

7030 Ryburn Dr. Millington, TN

Phone: (901) 873-5300

Fax: (901) 873-5301

www.gohispeed.com

January 11, 2023

Seth McMillan Lanxess Memphis, TN

Seth,

The following is a summary of findings from the recent quarterly vibration survey at your facility. Please let us know if there are any questions or comments.

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.

Machine Summary Table

Date Collected												
Month	5	8	1									
Day	3	18	10									
Year	22	22	23									
		•	•									
					-							
Item					C	ondi	tion	I	I	1	I	-
Refrigeration Compressor A												
Refrigeration Compressor B			NR									
East Cooling Tower Pump												
Middle Cooling Tower Pump	NR		NR									
West Cooling Tower Pump		NR										
West Neutralization Pump	NR	NR	NR									
East Neutralization Pump												
KOH Feed Pump												
Peroxide Feed Pump												
Crystallizer Recirc Pump												
Slurry Transfer Pump												
Quench Tank Pump												
Centrifuge Feed Pump												
Caro's Acid Pump												
Scrubber Circulation Pump												
Brine Tank Pump	NR	NR	NR									
Dust Collector Blower	NA											
Vent Scrubber Blower	NA											
Hold Tank Agitator												
Crystallizer Agitator												
Pre-Crusher	NA											
Grinder	NA											

Database:	oxone.rh	om
Station:	MEMPHIS	OXONE

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
REFGCOMP1 - REFRIGERATION	COMPRESSOR 1 ((10-Jan-23)
	OVERALL LEVEL	1-20 kHZ
MOH	.051 In/Sec	.590 G-s
MOV	.053 In/Sec	.208 G-s
MOA	.023 In/Sec	.108 G-s
MIH	.057 In/Sec	.366 G-s
MIV	.037 In/Sec	.272 G-s
MIA	.031 In/Sec	.117 G-s
C1H	.041 In/Sec	.765 G-s
ClV	.047 In/Sec	.403 G-s
CIA	.058 In/Sec	.472 G-s
C2H	.035 In/Sec	.807 G-s

	C2V	.213 In/Sec	.265 G-s
	C2A	.098 In/Sec	.306 G-s
	СЗН	.035 In/Sec	.524 G-s
	C3V	.282 In/Sec	.308 G-s
	C3A	.072 In/Sec	.375 G-s
	C4H	.036 In/Sec	.730 G-s
	C4V	.066 In/Sec	.491 G-s
	C4A	.096 In/Sec	.288 G-s
7371-0	7	- EAST COOLING TOWER PUMP	(10-Jan-23)
		OVERALL LEVE	L 1-20 kHZ
	11	1.242 In/Sec	1.662 G-s
	12	.494 In/Sec	1.591 G-s
	13	.944 In/Sec	1.609 G-s
	14	.195 In/Sec	1.293 G-s
7371-0	5	- WEST COOLING TOWER PUMP	(10-Jan-23)
		OVERALL LEVE	L 1-20 kHZ
	11	.080 In/Sec	1.168 G-s
	12	.077 In/Sec	1.326 G-s
	13	.075 In/Sec	2.132 G-s
	14	.091 In/Sec	1.839 G-s
X2		- EAST NEUTRALIZATION PUMP	(10-Jan-23)
		OVERALL LEVE	L 1-20 kHZ
	11	.086 In/Sec	.691 G-s
	12	.080 In/Sec	.853 G-s
362-13		- KOH FEED PUMP	(10-Jan-23)
		OVERALL LEVE	L 1-20 kHZ
	11	.124 In/Sec	.501 G-s
	21	.137 In/Sec	.580 G-s
	23	.096 In/Sec	.179 G-s
	71	.225 In/Sec	1.043 G-s
	72	.283 In/Sec	1.153 G-s
357-13		- PEROXIDE FEED PUMP	(10-Jan-23)
		OVERALL LEVE	L 1-20 kHZ
	11	.030 In/Sec	.138 G-s
	21	.028 In/Sec	.165 G-s
	23	.034 In/Sec	.107 G-s
	71	.070 In/Sec	.221 G-s
	72	.072 In/Sec	.152 G-s
262 06		CRYCHAIIIRED DECIDC DIMD	(10 Tam 22)
303-00		- CRISTALLIZER RECIRC PUMP	(10-Jan-23)
		OVERALL LEVE	
	11	.018 In/Sec	.297 G-S
	21	.016 In/Sec	.3/2 G-S
	23	.013 In/Sec	.180 G-s
	71	.027 In/Sec	.077 G-s
	72	.021 In/Sec	.109 G-s
	81	.027 In/Sec	.106 G-s
262-07	~		(10 - 70 - 22)
303-011	n	- SLORRI IRANSFER FOMP	(10-0an-25)
	11	075 TR/Soc	011 C-C
	21	.075 IN/Sec	.911 G-S
	22	.050 III/Sec	.025 G-S
	2J 71	.042 II/SEC	.10/ G-S
	72	.075 II/Sec	.092 G-S
	12	.040 11/360	.075 6-8
106-01		- PUMP,#2 QUENCH TANK	(10-Jan-23)
		OVERALL LEVE	L 1-20 kHZ
	11	.048 In/Sec	.650 G-s
	21	.043 In/Sec	.652 G-s
	23	.162 In/Sec	.208 G-s
	23 71	.162 In/Sec .616 In/Sec	.208 G-s 1.020 G-s
	23 71 72	.162 In/Sec .616 In/Sec .104 In/Sec	.208 G-s 1.020 G-s 1.090 G-s

363-13		-	CENTRIFUGE FEED	PUMP	(10-Jan-23)
				OVERALL LEVEL	1-20 kHZ
	11			.175 In/Sec	.635 G-s
	21			.115 In/Sec	.617 G-s
	23			.279 In/Sec	.070 G-s
	71			.160 In/Sec	.319 G-s
	72			.272 In/Sec	.327 G-s
360-05		_	CARO'S ACTD PIIMP		(10Tan-23)
500 05				OVERALL LEVEL	1-20 kHZ
	11			.066 In/Sec	.438 G-s
	21			.074 In/Sec	.610 G-s
	23			.068 In/Sec	.190 G-s
	71			.126 In/Sec	.301 G-s
	72			.116 In/Sec	.229 G-s
363-18		-	AGITATOR, HOLD T.	ANK	(10-Jan-23)
	11			112 Tr/Coc	1-20 KHZ
	21			.112 IN/Sec	.732 G-S
	23			086 In/Sec	.905 G-s
	31			107 In/Sec	1 315 G-s
	32			.061 In/Sec	.674 G-s
	-				
363-03		-	AGITATOR, OXONE C	RYSTALLIZER	(10-Jan-23)
				OVERALL LEVEL	1K-20K HZ
	UBH			.059 In/Sec	.018 G-s
	LBH			.099 In/Sec	.022 G-s
	GOH			.095 In/Sec	.463 G-s
				OVERALL LEVEL	1-20 kHZ
	GIH			.110 In/Sec	.424 G-s
	21			.225 In/Sec	.322 G-s
	11			.173 In/Sec	.442 G-s
106 00				2 2 2 2	(10 Tom 02)
106-08		-	BLOWER, QUENCH T.	ANK OVEDALL LEVEL	(10-Jan-23) 1-20 kH7
	11			A14 Tr/Sec	867 G-8
	12			.865 In/Sec	.275 G-s
	13			.157 In/Sec	.192 G-s
	21			.128 In/Sec	1.001 G-s
	22			.853 In/Sec	.395 G-s
	23			.204 In/Sec	.187 G-s
	71			.400 In/Sec	.802 G-s
	81			.493 In/Sec	1.136 G-s
					(10 - 00)
DC BLO	WER	-	BLOWER, DUST COL	LECTOR	(10 - Jan - 23)
				OVERALL LEVEL	1-20 KHZ
	12			.2/8 In/Sec	.683 G-S
	13			.204 IN/Sec	.4/4 G-S
	21			265 In/Sec	1 402 G-s
	22			179 In/Sec	382 G-s
	23			.106 In/Sec	.376 G-s
	71			.075 In/Sec	1.025 G-s
	81			.090 In/Sec	.710 G-s
VNTSCR	BBLW	-	BLOWER, VENT SCR	UBBER	(10-Jan-23)
				OVERALL LEVEL	1-20 kHZ
	11			.047 In/Sec	1.701 G-s
	12			.022 In/Sec	.385 G-s
	τ3			.038 In/Sec	.317 G-s
	21 22			.028 IN/Sec	1.335 G-S
	22			.034 IN/Sec	./01 G-S
	23 71			085 Th/Sec	515 C-s
	81			.053 In/Sec	.891 G-s
370-03		-	GRINDER, OXONE		(10-Jan-23)
				OVERALL LEVEL	1-20 kHZ
	11			.099 In/Sec	.456 G-s

71		.224	In/Sec	3.478 G-s	5
366-41	- SCRUBBER C	IRCULATION PU	JMP	(10-Jan-23)	
		OVERAL	LL LEVEL	1-20 kHZ	
11		.227	In/Sec	5.846 G-s	5
21		.203	In/Sec	4.028 G-s	5
23		.116	In/Sec	1.117 G-s	5
71		.163	In/Sec	1.240 G-s	S
81		.219	In/Sec	.602 G-s	5
7368-03	- PRECRUSHER	OXONE		(10-Jan-23)	
		OVERAL	LL LEVEL	1-20 kHZ	
23		1.668	In/Sec	.054 G-s	S
11		. 398	In/Sec	.182 G-s	5
21		.342	In/Sec	.757 G-s	5
22		1.236	In/Sec	.297 G-s	S
71		.585	In/Sec	.598 G-s	S
81		. 655	In/Sec	1.281 G-s	5
2STAGEWTR	- TWO STAGE	WATER PUMP		(10-Jan-23)	
		OVERAL	LL LEVEL	1-20 kHZ	
11		.048	In/Sec	.648 G-s	5
21		.048	In/Sec	.696 G-s	S
23		.053	In/Sec	.267 G-s	5
71		.104	In/Sec	3.818 G-s	S
72		.066	In/Sec	1.026 G-s	5
Clarification	Of Vibration	Units:			
Acc -	-> G-s	PK			
Vel -	-> In/Sec	PK			

Vibration Analysis

East Cooling Tower Pump CLASS III

oxone.rbm / OXON / EAST COOLING TOWER PUMP / 11 - CT EAST PUMP - MOTOR TOP N-S



Observation:

Motor data shows a high 1 x rpm vibration in the N-S direction (in line with piping). Trend data shows a decrease from 2.1 ips-pk to 1.24 ips-pk.

Recommendation:

There is still likely an issue with the pump/pump shaft that may be causing the increased 1 x rpm vibration. Inspect pump/coupling/shaft for deflection/run-out soon.

Quench Tank Pump CLASS II



Observation:

Pump horizontal data shows a dominant vibration at 6 x rpm.

Recommendation:

If impeller has 6 vanes, then this vibration is pump vane pass and may be caused by internal pump/impeller issue or pump flow issue. Ensure pump is operating within the proper flow parameters and inspect pump as scheduling allows.

Scrubber Circulation Pump CLASS II



Observation:

Multi-pint spectral waterfall shows high amplitude acceleration and non-synchronous peaks in motor spectra.

Recommendation:

Motor bearings are showing signs of defect/wear. We are monitoring this closely. Motor may need to be swapped at next major down time.

Pre-Crusher CLASS III



Observation:

Non-synchronous peaks are present in spectrum. Waveform data still shows high amplitude and large amount of impacting.

Recommendation:

Data is still showing some large amount of acceleration in the ODE pre-crusher bearing. Product going through the unit may influence this some, but data still indicates bearing is defective. Inspect/repair unit ASAP.

As always, it has been a pleasure to serve the Lanxess Oxone Memphis Plant. If there are any comments or questions, do not hesitate to contact us.

Sincerely,

ISO Certified Vibration Analyst, Category III



QualiTest Diagnostics Cell: 901-486-4565 Email: kwilliam@gohispeed.com