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Seth McMillan Lanxess Memphis, TN

Seth,

The following is a summary of findings from the 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	Coll	ecte	d							
Month	5										
Day	3										
Year	22										
					 <b>^</b>	1.4.1					
Item		1			 Jona	lition	1	1	1	1	
East Cooling Tower Pump											
Middle Cooling Tower Pump	NR										
West Cooling Tower Pump											
West Neutralization Pump	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										

Abbreviated Last	Measurement Summa	ary *****************	****
Da St	tabase: oxone.rh ation: MEMPHIS	om OXONE	
MEASUREMENT	POINT	OVERALL LEVEL	HFD / VHFD
7371-07 11 12	- EAST COOLING TO	OWER PUMP OVERALL LEVEL .664 In/Sec .260 In/Sec	(03-May-22)
7371-05 11 12	- WEST COOLING TO	OWER PUMP OVERALL LEVEL .046 In/Sec .041 In/Sec	(03-May-22)
x2 11 12	- EAST NEUTRALIZ	ATION PUMP OVERALL LEVEL .236 In/Sec .215 In/Sec	(03-May-22)
362-13 11 21 23	- KOH FEED PUMP	OVERALL LEVEL .070 In/Sec .075 In/Sec .065 In/Sec	(03-May-22)

.195 In/Sec PEROXIDE FEED PUMP (03-May-22) OVERALL LEVEL .079 In/Sec .065 In/Sec .052 In/Sec .060 In/Sec .076 In/Sec OVERALL LEVEL .013 In/Sec .011 In/Sec .024 In/Sec .024 In/Sec .024 In/Sec SLURRY TRANSFER PUMP (03-May-22) OVERALL LEVEL .071 In/Sec .024 In/Sec .044 In/Sec .044 In/Sec .042 In/Sec .042 In/Sec .049 In/Sec .022 In/Sec PUMP,#2 QUENCH TANK (03-May-22) OVERALL LEVEL .037 In/Sec
PEROXIDE FEED PUMP (03-May-22) OVERALL LEVEL .079 In/Sec .052 In/Sec .052 In/Sec .060 In/Sec .076 In/Sec .076 In/Sec .011 In/Sec .011 In/Sec .024 In/Sec .044 In/Sec .044 In/Sec .042 In/Sec .049 In/Sec .022 In/Sec .022 In/Sec
OVERALL LEVEL .079 In/Sec .065 In/Sec .052 In/Sec .060 In/Sec .076 In/Sec .076 In/Sec .011 In/Sec .011 In/Sec .024 In/Sec .024 In/Sec .024 In/Sec .024 In/Sec .024 In/Sec .024 In/Sec .024 In/Sec .024 In/Sec .044 In/Sec .042 In/Sec .042 In/Sec .049 In/Sec .049 In/Sec .021 In/Sec .049 In/Sec .049 In/Sec .022 In/Sec .023 In/Sec
.079 In/Sec .065 In/Sec .052 In/Sec .060 In/Sec .076 In/Sec .076 In/Sec .076 In/Sec .013 In/Sec .011 In/Sec .011 In/Sec .024 In/Sec .024 In/Sec .024 In/Sec .024 In/Sec .024 In/Sec .024 In/Sec .024 In/Sec .044 In/Sec .044 In/Sec .042 In/Sec .049 In/Sec .049 In/Sec .022 In/Sec
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PUMP,#2 QUENCH TANK (03-May-22) OVERALL LEVEL .037 In/Sec
OVERALL LEVEL
.037 In/Sec
.048 In/Sec
.059 In/Sec
.548 In/Sec
.491 11/560
CENTRIFUGE FEED PUMP (03-May-22)
105 TP/See
.195 IN/Sec
.154 IN/Sec
.195 IN/Sec
.151 In/Sec
CARO'S ACID POMP (03-May-22) OVERALL LEVEL
.116 In/Sec
.139 In/Sec
.074 In/Sec
.082 In/Sec
.073 In/Sec
SCRUBBER CIRCULATION PUMP (03-May-22)
• · · ·
OVERALL LEVEL
OVERALL LEVEL .136 In/Sec
OVERALL LEVEL .136 In/Sec .139 In/Sec
OVERALL LEVEL .136 In/Sec .139 In/Sec .108 In/Sec
OVERALL LEVEL .136 In/Sec .139 In/Sec .108 In/Sec .160 In/Sec
OVERALL LEVEL .136 In/Sec .139 In/Sec .108 In/Sec .160 In/Sec .254 In/Sec
OVERALL LEVEL .136 In/Sec .139 In/Sec .108 In/Sec .160 In/Sec .254 In/Sec

## **Vibration Analysis**

## East Cooling Tower Pump CLASS II



#### **Observation:**

Motor data shows a high 1 x rpm vibration in the N-S direction (in line with piping). Overall amplitude is .66 ips-pk.

#### **Recommendation:**

Motor may have some imbalance, or pump may have issue which could cause the high 1 x rpm at the top of the motor. We recommend performing a field trim balance on the motor as time allows to help alleviate the high 1 x rpm vibration.

## Quench Tank Pump CLASS II



#### **Observation:**

Pump horizontal data shows a dominant vibration at 6 x rpm. There are also some harmonics of 6 x rpm present as well.

#### **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.

## Caro's Acid Pump CLASS I



### **Observation:**

Motor and pump both have low amplitude vibration at this time. However, we do know that this pump has had history of coupling failures. This could be due to the fact that the base appears to be loose.

#### **Recommendation:**

Inspect base for looseness and repair/replace as necessary. Ensure a precision alignment is performed after repairs.

## Scrubber Circulation Pump CLASS II



## **Observation:**

Motor data shows high amplitude acceleration and non-synchronous peaks in spectra and time waveform.

#### **Recommendation:**

Motor bearings are defective and likely damaged by electrical fluting (if this motor is operated by a Variable Frequency Drive). This is a common issue and can be prevented by installing a grounding mechanism such as an AEGIS grounding brush ring. Motor should be replaced as time allows. Ensure new motor has shaft grounding protection.

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

Sincerely,

Kevin W. Maxuell

ISO Certified Vibration Analyst, Category III



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