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June 26th, 2023

NUCOR Melt Shop

Subject: June 2023 vibration survey

Below is a summary report for the Melt Shop monthly vibration survey that was performed on 06/20/23. 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.

Class IV; 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.

As always, it has been a pleasure to serve NUCOR Steel Flowood-Jackson, MS. If there are any comments or questions, do not hesitate to contact us.

Sincerely,

ISO Certified Vibration Analyst, Category III

HI-SPEED
INDUSTRIAL SERVICE
QualiTest Diagnostics

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Defects

East Caster Mold Water Pump

Pump was down this survey; however, the following still applies: Pump is still showing some signs of internal wear. Couplings may also have wear likely due to misalignment. Perform a precision alignment with less than .002" offset and angularity. Ensure there is no soft foot present. Rated as a **CLASS II** defect.

Cooling Tower Pump #5

Data still shows high 1 x rpm axial vibration in the pump. Pump impeller/shaft could be out of balance or bent. Pump could also have cocked bearing or some other internal misalignment. Inspect as time allows. Rated as a **CLASS II** defect.

Cooling Tower #6 Supply Pump

The pump vibration data still indicates that there is bearing wear, and possibly cavitation in the pump. Inspect ODE pump bearing SOON. Ensure the pump has no inlet restrictions and is operating in the correct part of the curve. Impeller may have excessive wear. Rated as a **CLASS II** defect.

Servo Hyd. Recirc. Pump

The pump has elevated vibration. Spectral data shows harmonics of hydraulic vane frequency. This may be due to internal pump wear and or flow issue. Rated as a **CLASS II** defect.

2nd Deck Hyd. Pumps

The middle and south pumps have increased vibration again. Pumps have significant hydraulic passing frequencies with some high 1 x rpm vibration in pump verticals. We are monitoring this closely. Rated as **CLASS I** defects.

Caster ID Baghouse Fan

Motor DE and fan DE waveform data still shows an impacting or knock type vibration. DE motor vibration is slightly lower while the fan DE is slightly higher in amplitude. Waveform data shows the fan DE having the more pronounced impacting. 1 x rpm fan vibration is about the same as last survey but higher than average. A trim balance or fan cleaning is recommended during next extended outage. DE fan bearing needs a visual inspection soon. It is also recommended to pull back coupling flange on fan shaft and inspect fan coupling gear hub as scheduling allows. Rated as a CLASS II defect for now but getting very close to CLASS III because of the impacting of the DE fan bearing.

Furnace Reverse Air Fan

The impacting seen in fan bearings was not present this survey. Motor does appear to have some early signs of bearing defects. According to trend data, the motor bearing issue is minor at this time. We will monitor this issue closely. Rated as a **CLASS I** defect.

Spray Chamber Exhaust Fan

Motor and fan have high fan speed vibration with motor having a much higher amplitude of vibration. This unit is very likely operating near a critical speed and is resonant which is likely influencing the high vibration in the motor and fan. **Fan also has some imbalance likely caused by build-up**. Because of the high vibration amplitudes, this is rated as a **CLASS III** defect.

South Caster Oscillator

Equipment was not in service during this survey; however, the following likely still applies: This unit has visible axial movement of the input of the gear drive. You can see the movement at the coupling gap. Data of the gear drive does show some gear noise and this unit seems to be knocking worse than the other two drives. Inspect unit as scheduling allows. Rated as a **CLASS II** defect.

Database: nucorja9.rbm Station: Melt Shop

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MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
WCMWP - WEST CASTER N		
11011	OVERALL LEVEL	IK-20KHz
MOH	.054 In/Sec	.123 G-s
MIH	.085 In/Sec .125 In/Sec	.207 G-s
MIA		
PIA	.256 In/Sec	.300 G-s
PIH	.186 In/Sec	.390 G-s
POH	.193 In/Sec	.475 G-s
MCMWP - MID CASTER MC	OLD WATER PUMP (21	-Jun-23)
MOH	OVERALL LEVEL .146 In/Sec	.560 G-s
MIH	.151 In/Sec	
MIA	.249 In/Sec	
PIA	.249 In/Sec .164 In/Sec	1 056 G-s
PIH	.190 In/Sec	
POH	.175 In/Sec	
EBOSTRP - EAST Booster		
	OVERALL LEVEL	1K-20KHz
MOH	.053 In/Sec .057 In/Sec	.362 G-s
MIH	.057 In/Sec	.243 G-s
MIA	.031 In/Sec	.193 G-s
PIA	.076 In/Sec	.042 G-s
PIH	.076 In/Sec .064 In/Sec	.107 G-s
POH	.069 In/Sec	.156 G-s
ECSWP 1LFT - EAST CASTER S		
	OVERALL LEVEL	1K-20KHz
MOH	.141 In/Sec	.286 G-s
MIH	.071 In/Sec .069 In/Sec	.318 G-s
MIA	.069 In/Sec	.181 G-s
MCSWP 2LFT - MID CASTER SE	PRAY WP 2 LEFT (21	-Jun-23)
	OVERALL LEVEL	
MOH	.057 In/Sec	.032 G-s
MIH	.097 In/Sec	.096 G-s
MIA	.097 In/Sec .099 In/Sec	.021 G-s
MCSWP 3RT - MID CASTER SE	PRAY WP 3 RIGHT (21 OVERALL LEVEL	-Jun-23)
MOT	.140 In/Sec	1K-20KHz
MOH	.140 In/Sec	1.139 G-s
MIH	.114 In/Sec	.499 G-s
MIA	.087 In/Sec	.311 G-s
WCSWP 4RT - WEST CASTER S	SPRAY WP 4 RIGH (21	-Jun-23)
	OVERALL LEVEL	
мон	.131 In/Sec	.797 G-s
MIH	.101 In/Sec	
MIA	.117 In/Sec	.597 G-s
ESERVOHYDP - EAST SERVO Hy		
	OVERALL LEVEL	1K-20KHz
MOH	.021 In/Sec	.110 G-s .155 G-s
MIH	.035 In/Sec	.155 G-s

PIV .123 In/Sec .507 G-s

MSERVOHYDP	- MIDDLE SERVO Hyd	PUMP	(21-Jun-23)
	-	OVERALL LEVEL	1K-20KHz
MOH		107 Tm/Coo	.227 G-s
MOH		.197 In/Sec	.227 G-S
MIH		.056 In/Sec	.202 G-s
PIV		.168 In/Sec	.685 G-s
CEDMOUDECD	- SERVO Hyd RECIRC	DIIMD	(21 - Tup - 23)
SERVOIRECE	- SERVO HYG RECIRC	COMP	177 00777
		OVERALL LEVEL .097 In/Sec	IK-2UKHZ
MOH		.097 In/Sec	.175 G-s
MIH		.127 In/Sec	1.157 G-s
PIV		251 In/Sec	3.739 G-s
2DEKRECIP	- 2ND DECK L&S Hyd		
		OVERALL LEVEL	1K-20KHz
MOH		.172 In/Sec	1.116 G-s
MIH		231 In/Sec	1.116 G-s 1.501 G-s
		245 7-/2	2.507.6
PIV		.345 In/Sec	2.527 G-s
M2DECKHYDP	- MIDDLE 2ND DECK	Hyd PUMP	(21-Jun-23)
		OVERALL LEVEL	1K-20KHz
мон		136 In/Soc	727 C-2
		.130 111/300	.727 G-s
MIH		.300 In/Sec	.907 G-s
PIV		1.049 In/Sec	.727 G-s .907 G-s 5.391 G-s
SOUECKHAUDD	- SOUTH 2ND DECK H	rd DIIMD	(21 - Tun - 23)
SZDECKIIIDE			
		OVERALL LEVEL	
MOH		.273 In/Sec	.703 G-s
MIH		.411 In/Sec	1.997 G-s
PIV		380 Tn/Sec	1.997 G-s 4.897 G-s
		.500 111/560	4.057 G S
1SUPLYP	- #1 Supply Pump		(21-Jun-23)
		OVERALL LEVEL	1K-20KHz
MOH		.072 In/Sec	.270 G-s
MIH		090 In/Soc	204 G-s
		.090 111/360	.204 G-s
MIA		.080 In/Sec	.152 G-s .515 G-s
PIA			
PIH		.229 In/Sec	.361 G-s
			654 C-s
POH		186 Tn/Sec	
POH		.186 In/Sec	
	- #3 Supply Pump		(21-Jun-23)
	- #3 Supply Pump		(21-Jun-23)
3SUPLYP	- #3 Supply Pump	OVERALL LEVEL	(21-Jun-23) 1K-20KHz
3SUPLYP MOH	- #3 Supply Pump	OVERALL LEVEL	(21-Jun-23) 1K-20KHz .899 G-s
3SUPLYP MOH MIH	- #3 Supply Pump	OVERALL LEVEL .070 In/Sec .074 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s
3SUPLYP MOH MIH MIA	- #3 Supply Pump	OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s
3SUPLYP MOH MIH	- #3 Supply Pump	OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s
3SUPLYP MOH MIH MIA	- #3 Supply Pump	OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s
3SUPLYP MOH MIH MIA PIA PIH	- #3 Supply Pump	OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec .157 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s .393 G-s
3SUPLYP MOH MIH MIA PIA	- #3 Supply Pump	OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s .393 G-s
MOH MIH MIA PIA PIH POH		OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec .157 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s .393 G-s .929 G-s
MOH MIH MIA PIA PIH POH	- #3 Supply Pump	OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec .157 In/Sec .192 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s .393 G-s .929 G-s
MOH MIH MIA PIA PIH POH		OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec .157 In/Sec .192 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s .393 G-s .929 G-s (21-Jun-23) 1K-20KHz
MOH MIH MIA PIA PIH POH		OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec .157 In/Sec .192 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s .393 G-s .929 G-s (21-Jun-23) 1K-20KHz
MOH MIH MIA PIA PIH POH		OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec .157 In/Sec .192 In/Sec OVERALL LEVEL .078 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s .393 G-s .929 G-s (21-Jun-23) 1K-20KHz 1.036 G-s
MOH MIH MIA PIA PIH POH SSUPLYP		OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec .157 In/Sec .192 In/Sec OVERALL LEVEL .078 In/Sec .078 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s .393 G-s .929 G-s (21-Jun-23) 1K-20KHz 1.036 G-s .447 G-s
MOH MIH MIA PIA PIH POH 5SUPLYP MOH MIH MIA		OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec .157 In/Sec .192 In/Sec OVERALL LEVEL .078 In/Sec .078 In/Sec .115 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s .393 G-s .929 G-s (21-Jun-23) 1K-20KHz 1.036 G-s .447 G-s .324 G-s
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MOH MIH MIA PIA PIH POH 5SUPLYP MOH MIH MIA PIA PIH		OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec .157 In/Sec .192 In/Sec .192 In/Sec OVERALL LEVEL .078 In/Sec .078 In/Sec .115 In/Sec .349 In/Sec .197 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s .393 G-s .929 G-s (21-Jun-23) 1K-20KHz 1.036 G-s .447 G-s .324 G-s .119 G-s 1.212 G-s
MOH MIH MIA PIA PIH POH 5SUPLYP MOH MIH MIA PIA		OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec .157 In/Sec .192 In/Sec OVERALL LEVEL .078 In/Sec .078 In/Sec .115 In/Sec .349 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s .393 G-s .929 G-s (21-Jun-23) 1K-20KHz 1.036 G-s .447 G-s .324 G-s .119 G-s 1.212 G-s
MOH MIH MIA PIA PIH POH 5SUPLYP MOH MIH MIA PIA PIH POH	- #5 Supply Pump	OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec .157 In/Sec .192 In/Sec .192 In/Sec OVERALL LEVEL .078 In/Sec .078 In/Sec .115 In/Sec .349 In/Sec .197 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s .393 G-s .929 G-s (21-Jun-23) 1K-20KHz 1.036 G-s .447 G-s .324 G-s .119 G-s 1.212 G-s .902 G-s
MOH MIH MIA PIA PIH POH 5SUPLYP MOH MIH MIA PIA PIH POH		OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec .157 In/Sec .192 In/Sec .192 In/Sec OVERALL LEVEL .078 In/Sec .078 In/Sec .115 In/Sec .349 In/Sec .197 In/Sec .306 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s .393 G-s .929 G-s (21-Jun-23) 1K-20KHz 1.036 G-s .447 G-s .324 G-s .119 G-s 1.212 G-s .902 G-s
MOH MIH MIA PIA PIH POH 5SUPLYP MOH MIH MIA PIA PIH POH	- #5 Supply Pump	OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec .157 In/Sec .192 In/Sec .192 In/Sec OVERALL LEVEL .078 In/Sec .078 In/Sec .115 In/Sec .349 In/Sec .197 In/Sec .306 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s .393 G-s .929 G-s (21-Jun-23) 1K-20KHz 1.036 G-s .447 G-s .324 G-s .119 G-s 1.212 G-s .902 G-s
MOH MIH MIA PIA PIH POH 5SUPLYP MOH MIH MIA PIA PIH POH	- #5 Supply Pump	OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec .157 In/Sec .192 In/Sec OVERALL LEVEL .078 In/Sec .078 In/Sec .115 In/Sec .349 In/Sec .197 In/Sec .349 In/Sec .197 In/Sec .306 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s .393 G-s .929 G-s (21-Jun-23) 1K-20KHz 1.036 G-s .447 G-s .324 G-s .119 G-s 1.212 G-s .902 G-s (21-Jun-23) 1K-20KHz .226 G-s
MOH MIH MIA PIA PIH POH 5SUPLYP MOH MIH MIA PIA PIH POH 6SUPLYP MOH	- #5 Supply Pump	OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec .157 In/Sec .192 In/Sec OVERALL LEVEL .078 In/Sec .078 In/Sec .115 In/Sec .349 In/Sec .197 In/Sec .349 In/Sec .197 In/Sec .306 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s .393 G-s .929 G-s (21-Jun-23) 1K-20KHz 1.036 G-s .447 G-s .324 G-s .119 G-s 1.212 G-s .902 G-s (21-Jun-23) 1K-20KHz .226 G-s
MOH MIH MIA PIA PIH POH 5SUPLYP MOH MIH MIA PIA PIH POH 6SUPLYP MOH MIH MOH MIH MIA PIA PIH POH	- #5 Supply Pump	OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec .157 In/Sec .192 In/Sec .192 In/Sec OVERALL LEVEL .078 In/Sec .078 In/Sec .115 In/Sec .349 In/Sec .197 In/Sec .306 In/Sec OVERALL LEVEL .054 In/Sec .066 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s .393 G-s .929 G-s (21-Jun-23) 1K-20KHz 1.036 G-s .447 G-s .324 G-s .119 G-s 1.212 G-s .902 G-s (21-Jun-23) 1K-20KHz .226 G-s .215 G-s
MOH MIH MIA PIA PIH POH 5SUPLYP MOH MIH MIA PIA PIH POH 6SUPLYP MOH MIH MIA	- #5 Supply Pump	OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec .157 In/Sec .192 In/Sec .192 In/Sec OVERALL LEVEL .078 In/Sec .078 In/Sec .115 In/Sec .349 In/Sec .197 In/Sec .306 In/Sec .054 In/Sec .066 In/Sec .076 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s .393 G-s .929 G-s (21-Jun-23) 1K-20KHz 1.036 G-s .447 G-s .324 G-s .119 G-s 1.212 G-s .902 G-s (21-Jun-23) 1K-20KHz .226 G-s .215 G-s .139 G-s
MOH MIH MIA PIA PIH POH 5SUPLYP MOH MIH MIA PIA PIH POH 6SUPLYP MOH MIH MIA PIA PIH POH 6SUPLYP	- #5 Supply Pump	OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec .157 In/Sec .192 In/Sec .192 In/Sec OVERALL LEVEL .078 In/Sec .078 In/Sec .115 In/Sec .349 In/Sec .197 In/Sec .306 In/Sec .054 In/Sec .066 In/Sec .076 In/Sec .154 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s .393 G-s .929 G-s (21-Jun-23) 1K-20KHz 1.036 G-s .447 G-s .324 G-s .119 G-s 1.212 G-s .902 G-s (21-Jun-23) 1K-20KHz .226 G-s .215 G-s .139 G-s .541 G-s
MOH MIH MIA PIA PIH POH 5SUPLYP MOH MIH MIA PIA PIH POH 6SUPLYP MOH MIH MIA	- #5 Supply Pump	OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec .157 In/Sec .192 In/Sec .192 In/Sec OVERALL LEVEL .078 In/Sec .078 In/Sec .115 In/Sec .349 In/Sec .197 In/Sec .306 In/Sec .054 In/Sec .066 In/Sec .076 In/Sec .154 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s .393 G-s .929 G-s (21-Jun-23) 1K-20KHz 1.036 G-s .447 G-s .324 G-s .119 G-s 1.212 G-s .902 G-s (21-Jun-23) 1K-20KHz .226 G-s .215 G-s .139 G-s .541 G-s
MOH MIH MIA PIA PIH POH 5SUPLYP MOH MIH MIA PIA PIH POH 6SUPLYP MOH MIH MIA PIA PIH POH 6SUPLYP	- #5 Supply Pump	OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec .157 In/Sec .192 In/Sec .192 In/Sec OVERALL LEVEL .078 In/Sec .078 In/Sec .115 In/Sec .349 In/Sec .197 In/Sec .306 In/Sec .054 In/Sec .066 In/Sec .076 In/Sec .154 In/Sec .162 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s .393 G-s .929 G-s (21-Jun-23) 1K-20KHz 1.036 G-s .447 G-s .324 G-s .119 G-s 1.212 G-s .902 G-s (21-Jun-23) 1K-20KHz .226 G-s .215 G-s .139 G-s .541 G-s .621 G-s
MOH MIH MIA PIA PIH POH 5SUPLYP MOH MIH MIA PIA PIH POH 6SUPLYP MOH MIH MIA PIA PIH POH 6SUPLYP	- #5 Supply Pump	OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec .157 In/Sec .192 In/Sec .192 In/Sec OVERALL LEVEL .078 In/Sec .078 In/Sec .115 In/Sec .349 In/Sec .197 In/Sec .306 In/Sec .054 In/Sec .066 In/Sec .076 In/Sec .154 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s .393 G-s .929 G-s (21-Jun-23) 1K-20KHz 1.036 G-s .447 G-s .324 G-s .119 G-s 1.212 G-s .902 G-s (21-Jun-23) 1K-20KHz .226 G-s .215 G-s .139 G-s .541 G-s .621 G-s
MOH MIH MIA PIA PIH POH 5SUPLYP MOH MIH MIA PIA PIH POH 6SUPLYP MOH MIH POH 6SUPLYP	- #5 Supply Pump - #6 Supply Pump	OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec .157 In/Sec .192 In/Sec .192 In/Sec OVERALL LEVEL .078 In/Sec .078 In/Sec .115 In/Sec .349 In/Sec .197 In/Sec .306 In/Sec .054 In/Sec .066 In/Sec .076 In/Sec .154 In/Sec .162 In/Sec .227 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s .393 G-s .929 G-s (21-Jun-23) 1K-20KHz 1.036 G-s .447 G-s .324 G-s .119 G-s 1.212 G-s .902 G-s (21-Jun-23) 1K-20KHz .226 G-s .215 G-s .139 G-s .541 G-s .621 G-s 1.080 G-s
MOH MIH MIA PIA PIH POH 5SUPLYP MOH MIH MIA PIA PIH POH 6SUPLYP MOH MIH POH 6SUPLYP	- #5 Supply Pump	OVERALL LEVEL .070 In/Sec .074 In/Sec .079 In/Sec .176 In/Sec .157 In/Sec .192 In/Sec .192 In/Sec OVERALL LEVEL .078 In/Sec .078 In/Sec .115 In/Sec .349 In/Sec .197 In/Sec .306 In/Sec .054 In/Sec .066 In/Sec .076 In/Sec .154 In/Sec .154 In/Sec .162 In/Sec .227 In/Sec	(21-Jun-23) 1K-20KHz .899 G-s .911 G-s .637 G-s .181 G-s .393 G-s .929 G-s (21-Jun-23) 1K-20KHz 1.036 G-s .447 G-s .324 G-s .119 G-s 1.212 G-s .902 G-s (21-Jun-23) 1K-20KHz .226 G-s .215 G-s .139 G-s .541 G-s .621 G-s 1.080 G-s

	MOH			.034	In/Sec	.198 G-s
	MIH			.042	In/Sec	.155 G-s
	MIA			.032	In/Sec	.205 G-s
	FIH			.037	In/Sec	.509 G-s
	FOH			.066	In/Sec	.093 G-s
CBID		-	CASTER BAGHOUSE	ID FAN		(21-Jun-23)
				OVERA	LL LEVEL	1K-20KHz
	MOH			.105	In/Sec	.088 G-s
	MOV			.071	In/Sec In/Sec	.108 G-s
	MIH				In/Sec	
	MIV			.118	In/Sec	
	MIA			.069	In/Sec In/Sec	.218 G-s
	FIA			.233	In/Sec	.658 G-s
	FIH					2.076 G-s
	FIV			.182	In/Sec	1.627 G-s
	FOH			.287	In/Sec	.895 G-s
	FOV					.638 G-s
	FOA					.936 G-s
	- 011				111, 500	.330 6 5
FRAF		_	Furnace REVERSE	AIR Fai	n	(21-Jun-23)
			· · · · · · · · · · · · · · · · · · ·	OVERA	LL LEVET.	1K-20KHz
	мон			.023	In/Sec	.225 G-s
	MIH					.638 G-s
	MIA					
	FIA			040	In/Sec	.145 G-s .501 G-s
	FIH					.599 G-s
	FOH					.498 G-s
	1011			.010	III, bec	.470 G 3
THETT		_	East Furnace Bag	House	Fan	(21Tim-23)
			Last rarmace bag			1K-20KHz
	мон			061	In/Sec	.182 G-s
	MIH			082	In/Sec In/Sec	.692 G-s
	MIA			.002	In/Sec	.493 G-s
	FIA					
	FIH			102	In/Sec	1.024 G-s .937 G-s
						.93/ 6-8
				.103	In/Sec	1 000 C-c
	FOH			.090	In/Sec In/Sec	1.099 G-s
WERHE	FOH	_	WEST Furnace Bac			
WFBHF	FOH	-	WEST Furnace Bag	House	Fan	(21-Jun-23)
WFBHF	FOH	-	WEST Furnace Bag	House OVERAL	Fan LL LEVEL	(21-Jun-23) 1K-20KHz
WFBHF	FOH MOH	-	WEST Furnace Bag	House OVERAL	Fan LL LEVEL	(21-Jun-23) 1K-20KHz
WFBHF	FOH MOH MIH	-	WEST Furnace Bag	House OVERAL	Fan LL LEVEL	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s
WFBHF	MOH MIH MIA	-	WEST Furnace Bag	House OVERAL .056 .075	Fan LL LEVEL In/Sec In/Sec In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s
WFBHF	MOH MIH MIA FIA	-	WEST Furnace Bag	House OVERAL .056 .075 .128 .069	Fan LL LEVEL In/Sec In/Sec In/Sec In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s
WFBHF	MOH MIH MIA FIA FIH	-	WEST Furnace Bag	House OVERAL .056 .075 .128 .069	Fan LL LEVEL In/Sec In/Sec In/Sec In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s 1.264 G-s
WFBHF	MOH MIH MIA FIA	-	WEST Furnace Bag	House OVERAL .056 .075 .128 .069	Fan LL LEVEL In/Sec In/Sec In/Sec In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s 1.264 G-s
	MOH MIH MIA FIA FIH FOH			House OVERAL .056 .075 .128 .069 .084	Fan LL LEVEL In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s 1.264 G-s 1.216 G-s
	MOH MIH MIA FIA FIH FOH		WEST Furnace Bag	House OVERAL .056 .075 .128 .069 .084 .096	Fan LL LEVEL In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s 1.264 G-s 1.216 G-s (21-Jun-23) 1K-20KHz
	MOH MIH MIA FIA FIH FOH			House OVERAL .056 .075 .128 .069 .084 .096	Fan LL LEVEL In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s 1.264 G-s 1.216 G-s (21-Jun-23) 1K-20KHz
	MOH MIH MIA FIA FIH FOH			House OVERAL .056 .075 .128 .069 .084 .096 PUMP OVERAL	Fan LL LEVEL In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s 1.264 G-s 1.216 G-s (21-Jun-23) 1K-20KHz .421 G-s
	MOH MIH MIA FIA FIH FOH			House OVERAL .056 .075 .128 .069 .084 .096 PUMP OVERAL .056 .042	Fan LL LEVEL In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec LL LEVEL In/Sec In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s 1.264 G-s 1.216 G-s (21-Jun-23) 1K-20KHz .421 G-s .477 G-s
	MOH MIH MIA FIA FIH FOH			House OVERAL .056 .075 .128 .069 .084 .096 PUMP OVERAL .056 .042	Fan LL LEVEL In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s 1.264 G-s 1.216 G-s (21-Jun-23) 1K-20KHz .421 G-s .477 G-s
NCHYDP	MOH MIH MIA FIA FOH MOH MIH PIH	_	North CASTER Hyd	House OVERAL .056 .075 .128 .069 .084 .096 PUMP OVERAL .056 .042 .080	Fan LL LEVEL In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec LL LEVEL In/Sec In/Sec In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s 1.264 G-s 1.216 G-s (21-Jun-23) 1K-20KHz .421 G-s .477 G-s .722 G-s
NCHYDP	MOH MIH MIA FIA FOH MOH MIH PIH	_		House OVERAL .056 .075 .128 .069 .084 .096 PUMP OVERAL .056 .042 .080	Fan LL LEVEL In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec LL LEVEL In/Sec In/Sec In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s 1.264 G-s 1.216 G-s (21-Jun-23) 1K-20KHz .421 G-s .477 G-s .722 G-s
NCHYDP	MOH MIH MIA FIA FIH FOH	_	North CASTER Hyd	House OVERAL .056 .075 .128 .069 .084 .096 PUMP OVERAL .056 .042 .080	Fan LL LEVEL In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec LL LEVEL In/Sec In/Sec In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s 1.264 G-s 1.216 G-s (21-Jun-23) 1K-20KHz .421 G-s .477 G-s .722 G-s (21-Jun-23) 1K-20KHz
NCHYDP	MOH MIH MIA FIA FIH FOH MOH MIH PIH	_	North CASTER Hyd	House OVERAL .056 .075 .128 .069 .084 .096 PUMP OVERAL .056 .042 .080 PUMP OVERAL	Fan LL LEVEL In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec LL LEVEL In/Sec In/Sec In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s 1.264 G-s 1.216 G-s (21-Jun-23) 1K-20KHz .421 G-s .477 G-s .722 G-s (21-Jun-23) 1K-20KHz .320 G-s
NCHYDP	MOH MIH MIA FIA FIH FOH MOH MIH PIH	_	North CASTER Hyd	House OVERAL .056 .075 .128 .069 .084 .096 PUMP OVERAL .056 .042 .080 PUMP OVERAL .082 .070	Fan LL LEVEL In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec LL LEVEL In/Sec In/Sec In/Sec In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s 1.264 G-s 1.216 G-s (21-Jun-23) 1K-20KHz .421 G-s .477 G-s .722 G-s (21-Jun-23) 1K-20KHz .421 G-s .477 G-s .722 G-s
NCHYDP	MOH MIH MIA FIA FIH FOH MOH MIH PIH	_	North CASTER Hyd	House OVERAL .056 .075 .128 .069 .084 .096 PUMP OVERAL .056 .042 .080 PUMP OVERAL .082 .070	Fan LL LEVEL In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec LL LEVEL In/Sec In/Sec In/Sec In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s 1.264 G-s 1.216 G-s (21-Jun-23) 1K-20KHz .421 G-s .477 G-s .722 G-s (21-Jun-23) 1K-20KHz .320 G-s
NCHYDP	MOH MIH MIA FIA FIH FOH MOH MIH PIH	-	North CASTER Hyd	House OVERAL .056 .075 .128 .069 .084 .096 PUMP OVERAL .080 PUMP OVERAL .082 .070 .096	Fan LL LEVEL In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec LL LEVEL In/Sec In/Sec In/Sec In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s 1.264 G-s 1.216 G-s (21-Jun-23) 1K-20KHz .421 G-s .477 G-s .722 G-s (21-Jun-23) 1K-20KHz .320 G-s .482 G-s .609 G-s
NCHYDP	MOH MIH MIA FIA FIH FOH MOH MIH PIH	-	North CASTER Hyd	House OVERAL .056 .075 .128 .069 .084 .096 PUMP OVERAL .080 PUMP OVERAL .082 .070 .096	Fan LL LEVEL In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec LL LEVEL In/Sec In/Sec In/Sec In/Sec In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s 1.264 G-s 1.216 G-s (21-Jun-23) 1K-20KHz .421 G-s .477 G-s .722 G-s (21-Jun-23) 1K-20KHz .320 G-s .482 G-s .609 G-s
NCHYDP	MOH MIH MIA FIA FIH FOH MOH MIH PIH	-	North CASTER Hyd	House OVERAL .056 .075 .128 .069 .084 .096 PUMP OVERAL .080 PUMP OVERAL .082 .070 .096	Fan LL LEVEL In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec LL LEVEL In/Sec In/Sec In/Sec In/Sec LL LEVEL In/Sec In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s 1.264 G-s 1.216 G-s (21-Jun-23) 1K-20KHz .421 G-s .477 G-s .722 G-s (21-Jun-23) 1K-20KHz .320 G-s .482 G-s .609 G-s (22-Jun-23) 1K-20KHz
NCHYDP	MOH MIH MIA FIA FIH FOH MOH MIH PIH	-	North CASTER Hyd	House OVERAL .056 .075 .128 .069 .084 .096 PUMP OVERAL .080 PUMP OVERAL .082 .070 .096	Fan LL LEVEL In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec LL LEVEL In/Sec In/Sec In/Sec In/Sec LL LEVEL In/Sec In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s 1.264 G-s 1.216 G-s (21-Jun-23) 1K-20KHz .421 G-s .477 G-s .722 G-s (21-Jun-23) 1K-20KHz .320 G-s .482 G-s .609 G-s (22-Jun-23) 1K-20KHz
NCHYDP	MOH MIH MIA FIA FIH FOH MOH MIH PIH	-	North CASTER Hyd	House OVERAL .056 .075 .128 .069 .084 .096 PUMP OVERAL .080 PUMP OVERAL .082 .070 .096 HAUST I	Fan LL LEVEL In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec LL LEVEL In/Sec In/Sec In/Sec In/Sec LL LEVEL In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s 1.264 G-s 1.216 G-s (21-Jun-23) 1K-20KHz .421 G-s .477 G-s .722 G-s (21-Jun-23) 1K-20KHz .320 G-s .482 G-s .609 G-s (22-Jun-23) 1K-20KHz .320 G-s .169 G-s
NCHYDP	MOH MIH MIA FIA FIH FOH MOH MIH PIH	-	North CASTER Hyd	House OVERAL .056 .075 .128 .069 .084 .096 PUMP OVERAL .082 .070 .096 HAUST 1 OVERAL .796 .512 .485	Fan LL LEVEL In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec LL LEVEL In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s 1.264 G-s 1.216 G-s (21-Jun-23) 1K-20KHz .421 G-s .477 G-s .722 G-s (21-Jun-23) 1K-20KHz .320 G-s .482 G-s .609 G-s (22-Jun-23) 1K-20KHz .032 G-s .169 G-s .081 G-s
NCHYDP	MOH MIH MIA FIA FIH FOH MOH MIH PIH	-	North CASTER Hyd	House OVERAL .056 .075 .128 .069 .084 .096 PUMP OVERAL .082 .070 .096 HAUST 1 OVERAL .796 .512 .485 .429	Fan LL LEVEL In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec LL LEVEL In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s 1.264 G-s 1.216 G-s (21-Jun-23) 1K-20KHz .421 G-s .477 G-s .722 G-s (21-Jun-23) 1K-20KHz .320 G-s .482 G-s .609 G-s (22-Jun-23) 1K-20KHz .032 G-s .169 G-s .081 G-s .261 G-s
NCHYDP	MOH MIH MIA FIA FIH FOH MOH MIH PIH N MOH MIH MIH MIA FIA FIH	-	North CASTER Hyd	House OVERAL .056 .075 .128 .069 .084 .096 PUMP OVERAL .082 .070 .096 HAUST 1 OVERAL .796 .512 .485 .429 .683	Fan LL LEVEL In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec LL LEVEL In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s 1.264 G-s 1.216 G-s (21-Jun-23) 1K-20KHz .421 G-s .477 G-s .722 G-s (21-Jun-23) 1K-20KHz .320 G-s .482 G-s .609 G-s (22-Jun-23) 1K-20KHz .032 G-s .169 G-s .081 G-s .239 G-s
NCHYDP	MOH MIH MIA FIA FIH FOH MOH MIH PIH	-	North CASTER Hyd	House OVERAL .056 .075 .128 .069 .084 .096 PUMP OVERAL .082 .070 .096 HAUST 1 OVERAL .796 .512 .485 .429 .683	Fan LL LEVEL In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec LL LEVEL In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s 1.264 G-s 1.216 G-s (21-Jun-23) 1K-20KHz .421 G-s .477 G-s .722 G-s (21-Jun-23) 1K-20KHz .320 G-s .482 G-s .609 G-s (22-Jun-23) 1K-20KHz .032 G-s .169 G-s .081 G-s .261 G-s
NCHYDP SCHYDP	MOH MIH MIA FIA FIH FOH MOH MIH PIH N MOH MIH MIH MIH FIA FIA FIH FOH		North CASTER Hyd SOUTH CASTER Hyd SPRAY CHAMBER EX	House OVERAL .056 .075 .128 .069 .084 .096 PUMP OVERAL .082 .070 .096 HAUST I OVERAL .796 .512 .485 .429 .683 .628	Fan LL LEVEL In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s 1.264 G-s 1.216 G-s (21-Jun-23) 1K-20KHz .421 G-s .477 G-s .722 G-s (21-Jun-23) 1K-20KHz .320 G-s .482 G-s .609 G-s (22-Jun-23) 1K-20KHz .032 G-s .169 G-s .081 G-s .239 G-s .655 G-s
NCHYDP SCHYDP	MOH MIH MIA FIA FIH FOH MOH MIH PIH N MOH MIH MIH MIH FIA FIA FIH FOH		North CASTER Hyd	House OVERAL .056 .075 .128 .069 .084 .096 PUMP OVERAL .082 .070 .096 HAUST I OVERAL .796 .512 .485 .429 .683 .628	Fan LL LEVEL In/Sec In/Sec In/Sec In/Sec In/Sec In/Sec LL LEVEL In/Sec	(21-Jun-23) 1K-20KHz .644 G-s .475 G-s .522 G-s .739 G-s 1.264 G-s 1.216 G-s (21-Jun-23) 1K-20KHz .421 G-s .477 G-s .722 G-s (21-Jun-23) 1K-20KHz .320 G-s .482 G-s .609 G-s (22-Jun-23) 1K-20KHz .032 G-s .169 G-s .081 G-s .239 G-s .655 G-s

MOH .027 In/Sec .079 G-s MIH .029 In/Sec .118 G-s PIV .089 In/Sec .364 G-s

Clarification Of Vibration Units:

Acc --> G-s RMS Vel --> In/Sec PK