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December 2, 2024

NUCOR Melt Shop

Subject: November 2024 vibration survey

Below is a summary report for the Melt Shop monthly vibration survey that was performed on 11/25/24. 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.

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

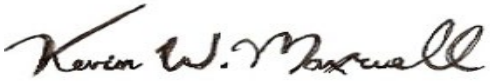
Class II: Defect (s) present that may cause problem in long term (2-6 months). Repair during normal maintenance scheduling. Continue to monitor.

Class III; 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

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,



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Defects

Middle Caster Mold Water Pump

Pump was down this survey; however, the following still applies: Vibration data shows issues in the pump. Data suggests looseness/wear of the pump bearings/fits. Impeller and other pump internals may also have wear. The pump will likely need attention soon. Rated as a **CLASS II** defect.

East Booster Pump

Pump was down this survey; however, the following still applies if no actions have been taken :Motor vibration data indicates defects are present in the motor bearings. Inspect motor as scheduling allows. Rated as a **CLASS II** defect.

Cooling Tower #4 Supply Pump

Pump data shows some signs of bearing defects/wear in the ODE pump bearing. Inspect pump as scheduling allows. Rated as a **CLASS III** defect.

Cooling Tower #5 Supply Pump

Pump has some 1 x rpm axial vibration. For now, it is recommended to inspect couplings, alignment, and all pump fasteners as scheduling 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. 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.

West Furnace Baghouse Fan

Data still shows a 2 x rpm vibration in the motor. This usually is an indication of an alignment and or coupling issue. Vibration is not at an alarm level yet, so this is a **CLASS I** defect.

Spray Chamber Exhaust Fan

Motor and fan both have increased vibration again this survey. Belts could be slipping which is allowing the fan to operate at speeds near a resonance which causing high 1 x fan rpm vibration in the unit. High 1 x rpm vibration could also be structural issue and or fan imbalance. Inspect all motor base mounts/fasteners. Inspect fan for build-up and inspect belt tension soon. Rated as a **CLASS III** defect.

Abbreviated Last Measurement Summary

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Database: nucorja9.rbm
Station: Melt Shop

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
WCMWP - WEST CASTER MOLD WATER PUMP (25-Nov-24)		
	OVERALL LEVEL	1K-20KHz
MOH	.066 In/Sec	.214 G-s
MIH	.060 In/Sec	.267 G-s
MIA	.111 In/Sec	.144 G-s
PIA	.304 In/Sec	.185 G-s
PIH	.195 In/Sec	.587 G-s
POH	.213 In/Sec	.545 G-s
ECMWP - EAST CASTER MOLD WATER PUMP (25-Nov-24)		
	OVERALL LEVEL	1K-20KHz
MOH	.110 In/Sec	.308 G-s
MIH	.082 In/Sec	.302 G-s
MIA	.118 In/Sec	.194 G-s
PIA	.177 In/Sec	2.169 G-s
PIH	.113 In/Sec	1.370 G-s
POH	.145 In/Sec	1.809 G-s
WBOSTRP - WEST Booster PUMP (25-Nov-24)		
	OVERALL LEVEL	1K-20KHz
MOH	.060 In/Sec	.681 G-s
MIH	.039 In/Sec	.313 G-s
MIA	.036 In/Sec	.241 G-s
PIA	.102 In/Sec	1.266 G-s
PIH	.130 In/Sec	1.246 G-s
POH	.211 In/Sec	1.944 G-s
ECSWP 1LFT - EAST CASTER SPRAY WP 1 LEFT (25-Nov-24)		
	OVERALL LEVEL	1K-20KHz
MOH	.247 In/Sec	.194 G-s
MIH	.059 In/Sec	.369 G-s
MIA	.131 In/Sec	.156 G-s
MCSWP 2LFT - MID CASTER SPRAY WP 2 LEFT (25-Nov-24)		
	OVERALL LEVEL	1K-20KHz
MOH	.246 In/Sec	.710 G-s
MIH	.096 In/Sec	.427 G-s
MIA	.123 In/Sec	.334 G-s
MCSWP 3RT - MID CASTER SPRAY WP 3 RIGHT (25-Nov-24)		
	OVERALL LEVEL	1K-20KHz
MOH	.135 In/Sec	.216 G-s
MIH	.088 In/Sec	.506 G-s
MIA	.118 In/Sec	.238 G-s
MSERVOHYDP - MIDDLE SERVO Hyd PUMP (25-Nov-24)		
	OVERALL LEVEL	1K-20KHz
MOH	.167 In/Sec	.248 G-s
MIH	.090 In/Sec	.241 G-s
PIV	.174 In/Sec	.521 G-s
WSERVOHYDP - WEST SERVO Hyd PUMP (25-Nov-24)		
	OVERALL LEVEL	1K-20KHz
MOH	.102 In/Sec	.183 G-s
MIH	.097 In/Sec	.169 G-s
PIV	.177 In/Sec	1.076 G-s
SERVOHRECP - SERVO Hyd RECIRC PUMP (25-Nov-24)		

		OVERALL LEVEL	1K-20KHz
	MOH	.105 In/Sec	.127 G-s
	MIH	.093 In/Sec	.810 G-s
	PIV	.218 In/Sec	2.276 G-s

N2DECKHYDP - North 2ND DECK Hyd PUMP (25-Nov-24)

		OVERALL LEVEL	1K-20KHz
	MOH	.149 In/Sec	.257 G-s
	MIH	.095 In/Sec	.606 G-s
	PIV	.201 In/Sec	3.593 G-s

2DEKRECIP - 2ND DECK L&S Hyd RECIRC PUM (25-Nov-24)

		OVERALL LEVEL	1K-20KHz
	MOH	.105 In/Sec	.309 G-s
	MIH	.097 In/Sec	.629 G-s
	PIV	.287 In/Sec	2.407 G-s

S2DECKHYDP - SOUTH 2ND DECK Hyd PUMP (25-Nov-24)

		OVERALL LEVEL	1K-20KHz
	MOH	.091 In/Sec	.389 G-s
	MIH	.092 In/Sec	.499 G-s
	PIV	.509 In/Sec	4.848 G-s

1SUPLYP - #1 Supply Pump (25-Nov-24)

		OVERALL LEVEL	1K-20KHz
	MOH	.081 In/Sec	.182 G-s
	MIH	.131 In/Sec	.195 G-s
	MIA	.141 In/Sec	.132 G-s
	PIA	.435 In/Sec	.112 G-s
	PIH	.324 In/Sec	.426 G-s
	POH	.214 In/Sec	.570 G-s

4SUPLYP - #4 Supply Pump (25-Nov-24)

		OVERALL LEVEL	1K-20KHz
	MOH	.094 In/Sec	1.177 G-s
	MIH	.080 In/Sec	1.235 G-s
	MIA	.091 In/Sec	.426 G-s
	PIA	.213 In/Sec	.407 G-s
	PIH	.189 In/Sec	.914 G-s
	POH	.418 In/Sec	4.127 G-s

5SUPLYP - #5 Supply Pump (25-Nov-24)

		OVERALL LEVEL	1K-20KHz
	MOH	.053 In/Sec	.700 G-s
	MIH	.076 In/Sec	1.150 G-s
	MIA	.104 In/Sec	.272 G-s
	PIA	.444 In/Sec	.563 G-s
	PIH	.211 In/Sec	.952 G-s
	POH	.245 In/Sec	1.026 G-s

6SUPLYP - #6 Supply Pump (25-Nov-24)

		OVERALL LEVEL	1K-20KHz
	MOH	.052 In/Sec	.247 G-s
	MIH	.072 In/Sec	.152 G-s
	MIA	.073 In/Sec	.145 G-s
	PIA	.155 In/Sec	.681 G-s
	PIH	.163 In/Sec	.738 G-s
	POH	.210 In/Sec	1.418 G-s

CBRA - CASTER BAGHOUSE REVERSE AIR (26-Nov-24)

		OVERALL LEVEL	1K-20KHz
	MOH	.027 In/Sec	.087 G-s
	MIH	.036 In/Sec	.078 G-s
	MIA	.029 In/Sec	.082 G-s
	FIH	.022 In/Sec	.269 G-s
	FOH	.041 In/Sec	.195 G-s

CBID - CASTER BAGHOUSE ID FAN (26-Nov-24)

		OVERALL LEVEL	1K-20KHz
	MOH	.042 In/Sec	.055 G-s

MOV	.029 In/Sec	.134 G-s
MIH	.040 In/Sec	.065 G-s
MIV	.033 In/Sec	.204 G-s
MIA	.029 In/Sec	.194 G-s
FIA	.168 In/Sec	.677 G-s
FIH	.065 In/Sec	.727 G-s
FIV	.041 In/Sec	.476 G-s
FOH	.049 In/Sec	.512 G-s
FOV	.022 In/Sec	.442 G-s
FOA	.057 In/Sec	.364 G-s

FRAF - Furnace REVERSE AIR Fan (26-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.042 In/Sec	.281 G-s
MIH	.046 In/Sec	.661 G-s
MIA	.043 In/Sec	.362 G-s
FIA	.117 In/Sec	.542 G-s
FIH	.050 In/Sec	.478 G-s
FOH	.042 In/Sec	.425 G-s

EFBHF - East Furnace Bag House Fan (26-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.068 In/Sec	.624 G-s
MIH	.079 In/Sec	.853 G-s
MIA	.093 In/Sec	.721 G-s
FIA	.081 In/Sec	.529 G-s
FIH	.117 In/Sec	1.021 G-s
FOH	.097 In/Sec	.821 G-s

WFBHF - WEST Furnace Bag House Fan (26-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.110 In/Sec	.510 G-s
MIH	.139 In/Sec	.365 G-s
MIA	.049 In/Sec	.472 G-s
FIA	.104 In/Sec	.563 G-s
FIH	.141 In/Sec	.871 G-s
FOH	.111 In/Sec	1.204 G-s

NCHYDP - North CASTER Hyd PUMP (26-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.091 In/Sec	.460 G-s
MIH	.062 In/Sec	.621 G-s
PIH	.084 In/Sec	.462 G-s

MIDCHYDP - MIDDLE CASTER Hyd PUMP (26-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.079 In/Sec	.303 G-s
MIH	.071 In/Sec	.494 G-s
PIH	.166 In/Sec	.590 G-s

SCEXFAN - SPRAY CHAMBER EXHAUST Fan (26-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.771 In/Sec	.067 G-s
MIH	.861 In/Sec	.082 G-s
MIA	.603 In/Sec	.344 G-s
FIH	1.123 In/Sec	.293 G-s
FOH	1.115 In/Sec	.841 G-s

ENARCOHYDP - EAST NARCO Hyd PUMP (26-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.059 In/Sec	.023 G-s
MIH	.047 In/Sec	.166 G-s
PIV	.139 In/Sec	.303 G-s

NC OCILLA - North Caster Oscillator (26-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.328 In/Sec	.079 G-s
MIH	.138 In/Sec	.102 G-s
MIA	.127 In/Sec	.119 G-s
GIA	.104 In/Sec	.152 G-s

GIH	.112 In/Sec	.090 G-s
GOH	.112 In/Sec	.823 G-s

MC OCILLA - Middle Caster Oscillator (26-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.550 In/Sec	.054 G-s
MIH	.398 In/Sec	.068 G-s
MIA	.158 In/Sec	.130 G-s
GIA	.113 In/Sec	.094 G-s
GIH	.143 In/Sec	.218 G-s
GOH	.136 In/Sec	.192 G-s

SC OCILLA - South Caster Oscillator (26-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.086 In/Sec	.049 G-s
MIH	.057 In/Sec	.053 G-s
MIA	.040 In/Sec	.123 G-s
GIA	.044 In/Sec	.173 G-s
GIH	.050 In/Sec	.090 G-s
GOH	.046 In/Sec	.075 G-s

Clarification Of Vibration Units:

Acc --> G-s RMS

Vel --> In/Sec PK