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December 2, 2024

Nucor Roll Mill
Jackson-Flowood, MS

Subject: November vibration survey

Below is a summary report for the monthly Roll Mill vibration survey that was performed on 11/25-26/24. Most of the machines surveyed were found to be in good condition except for the following.

HI-SPEED 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 NUCOR Steel Flowood, MS. If there are any comments or questions, do not hesitate to contact us.

Sincerely,

Kevin W. Maxwell

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Defects

Roll Stand 1A
Planetary gearbox still has some vibration and noise floor that comes and goes in spectral data at the input end of the gearbox. The amplitudes and gear mesh frequencies in spectral data may be influenced some due to load and speed; however, they may also indicate low level internal wear or defects in internal components. We are continuing to monitor this closely. Rated as a **CLASS I** defect.

Roll Stand 1
Drive motor continues to have elevated DE axial vibration associated with line frequency 60 Hz and 360 HZ. (6 x line freq.). The amplitudes tend to go up and down depending on motor load and speed. This may be an SCR issue or electrical resonance. It is recommended to inspect drive components for issues. Rated as a **CLASS I** defect.

Roll Stand 2
Inboard gearbox (Int.) is showing some gear mesh vibration with sidebands of input rpm. This issue appears to come and go based on load and speed. This type of vibration is an indication of heavy tooth load or possible gear wear. Rated as a **CLASS I** defect.

Roll Stand 6
A dominant gear mesh vibration is sometimes present towards the output of the gearbox. The up and down amplitude of this peak is likely due to changes in tooth load and speed. This vibration was lower this survey. We will continue to monitor this very closely. This is rated as a **CLASS I** defect.

Roll Stand 7
Gearbox vibration was lower in amplitude this survey. Vibration data shows dominant gear mesh harmonics on outboard end of the gear casing. The up and down amplitude of this peak from month to month is likely due to changes in tooth load and machine speed. We suspect this to be possibly due to a resonant gear mesh frequency vibration and we will continue to monitor this very closely. Rated as a **CLASS I** defect.

Roll Stand 12
Motor was not in service this survey; however, the following likely still applies: Drive motor spectral data is showing some non-synchronous peaks that may be associated with bearing race defects. Typically, this issue is caused by fluting of the bearing races. This is low level at this time, and we are monitoring this closely. Rated as a **CLASS I** defect.

Roll Stand 16
Cooling fan motor has elevated vibration at the ODE. Vibration has increased this survey to near 1 ips-pk. . Inspect the cooling fan structure, fasteners, and fan wheel as scheduling allows. Rated as a **CLASS III** defect.

Furnace Cooling Tower Drive South
Motor data shows axial and radial vibration that appears to be occurring at or near 1 x motor rpm and may indicate a structural issue such as loose fasteners, weak flexible motor base. This could also be caused by a resonance or air flow turbulence in this unit. We will continue to monitor this issue closely. Rated as a **CLASS II** defect.

Abbreviated Last Measurement Summary

Database: nucorja9.rbm
Station: Roll Mill Rolls

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
STD1A - Stand 1A	(26-Nov-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.023 In/Sec	.013 G-s
MIH	.088 In/Sec	.015 G-s
MIA	.084 In/Sec	.172 G-s
COH	.115 In/Sec	.037 G-s
GIA	.092 In/Sec	.114 G-s
GIH	.190 In/Sec	1.077 G-s
GI2	.153 In/Sec	.154 G-s
GI3	.143 In/Sec	.880 G-s
GI4	.111 In/Sec	.135 G-s
GI5	.065 In/Sec	.104 G-s
GI6	.059 In/Sec	.044 G-s
GOH	.059 In/Sec	.100 G-s
STD2A - Stand 2A	(26-Nov-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.128 In/Sec	.018 G-s
MIH	.116 In/Sec	.044 G-s
MIA	.202 In/Sec	.092 G-s
COH	.239 In/Sec	.031 G-s
STD1 - Stand 1	(26-Nov-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.117 In/Sec	.030 G-s
MIH	.113 In/Sec	.046 G-s
MIA	.564 In/Sec	.357 G-s
GIA	.041 In/Sec	.032 G-s
GIH	.056 In/Sec	.023 G-s
COH	.098 In/Sec	.088 G-s
STD2 - Stand 2	(26-Nov-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.114 In/Sec	.088 G-s
MIH	.165 In/Sec	.086 G-s
MIA	.369 In/Sec	.322 G-s
GIA	.147 In/Sec	.221 G-s
GIH	.120 In/Sec	.205 G-s
COH	.525 In/Sec	.097 G-s
STD3 - Stand 3	(26-Nov-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.053 In/Sec	.038 G-s
MIH	.073 In/Sec	.031 G-s
MIA	.177 In/Sec	.153 G-s
GIA	.035 In/Sec	.0078 G-s
GIH	.039 In/Sec	.051 G-s
COH	.185 In/Sec	.058 G-s
STD4 - Stand 4	(26-Nov-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.093 In/Sec	.014 G-s
MIH	.072 In/Sec	.038 G-s
MIA	.103 In/Sec	.096 G-s
GIA	.084 In/Sec	.049 G-s
GIH	.086 In/Sec	.056 G-s
COH	.288 In/Sec	.018 G-s
STD5 - Stand 5	(26-Nov-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.037 In/Sec	.111 G-s

	MIH	.044 In/Sec	.213 G-s
	MIA	.089 In/Sec	.136 G-s
	GIA	.222 In/Sec	.132 G-s
	GIH	.087 In/Sec	.030 G-s
	GOH	.278 In/Sec	.432 G-s
	COH	.343 In/Sec	.064 G-s

STD6 - Stand 6 (26-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.105 In/Sec	.015 G-s
MIH	.049 In/Sec	.076 G-s
MIA	.142 In/Sec	.051 G-s
GIA	.115 In/Sec	.026 G-s
GIH	.055 In/Sec	.097 G-s
GOH	.248 In/Sec	.639 G-s
COH	.271 In/Sec	.256 G-s

STD7 - Stand 7 (26-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.044 In/Sec	.050 G-s
MIH	.046 In/Sec	.087 G-s
MIA	.094 In/Sec	.077 G-s
GIA	.059 In/Sec	.040 G-s
GIH	.049 In/Sec	.184 G-s
GOH	.385 In/Sec	.473 G-s
COH	.506 In/Sec	.096 G-s

STD8 - Stand 8 (26-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.045 In/Sec	.037 G-s
MIH	.061 In/Sec	.043 G-s
MIA	.056 In/Sec	.193 G-s
GIA	.081 In/Sec	.129 G-s
GIH	.045 In/Sec	.023 G-s
COH	.130 In/Sec	.079 G-s

STD9 - Stand 9 (26-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.087 In/Sec	.041 G-s
MIH	.081 In/Sec	.153 G-s
MIA	.087 In/Sec	.073 G-s
GIA	.136 In/Sec	.097 G-s
GIH	.110 In/Sec	.024 G-s
COH	.107 In/Sec	.042 G-s

STD11 - Stand 11 (26-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.023 In/Sec	.019 G-s
MIH	.032 In/Sec	.445 G-s
MIA	.051 In/Sec	.208 G-s
GIA	.082 In/Sec	.020 G-s
GIH	.052 In/Sec	.293 G-s
GOH	.033 In/Sec	.101 G-s
COH	.182 In/Sec	.028 G-s

STD13 - Stand 13 (26-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.053 In/Sec	.063 G-s
MIH	.132 In/Sec	.085 G-s
MIA	.222 In/Sec	.133 G-s
GIA	.038 In/Sec	.126 G-s
GIH	.032 In/Sec	.214 G-s
GOH	.033 In/Sec	.226 G-s
COH	.105 In/Sec	.060 G-s

STD15 - Stand 15 (26-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.063 In/Sec	.022 G-s
MIH	.055 In/Sec	.015 G-s
MIA	.065 In/Sec	.105 G-s

	GIA	.072 In/Sec	.172 G-s
	GIH	.055 In/Sec	.115 G-s
	COH	.067 In/Sec	.083 G-s

STD16	- Stand 16		(26-Nov-24)
		OVERALL LEVEL	1K-20KHz
	MOH	.127 In/Sec	.048 G-s
	MIH	.199 In/Sec	.023 G-s
	MIA	.081 In/Sec	.059 G-s
	GIA	.225 In/Sec	.598 G-s
	GIH	.080 In/Sec	.024 G-s
	GOH	.026 In/Sec	.021 G-s
	COH	1.131 In/Sec	.084 G-s

SOUTH AC	- SOUTH AIR COMPRESSOR QUINCY		(26-Nov-24)
		OVERALL LEVEL	1 - 20 KHz
	MOH	.087 In/Sec	.241 G-s
	MIH	.106 In/Sec	.186 G-s
	MIA	.240 In/Sec	.215 G-s
		OVERALL LEVEL	1K-20KHz
	CIA	.254 In/Sec	.515 G-s
	CIH	.137 In/Sec	.543 G-s

Database: nucorja9.rbm
Station: Roll Mill Utilities

MEASUREMENT POINT		OVERALL LEVEL	HFD / VHFD
HYDPMP2	- Hydraulic Pump Center		(25-Nov-24)
		OVERALL LEVEL	1K-20KHz
	MOH	.080 In/Sec	.276 G-s
	MIH	.235 In/Sec	.234 G-s
	PIV	.305 In/Sec	1.575 G-s

HYDPMP3	- Hydraulic Pump West		(25-Nov-24)
		OVERALL LEVEL	1K-20KHz
	MOH	.116 In/Sec	.469 G-s
	MIH	.371 In/Sec	.317 G-s
	PIV	.258 In/Sec	1.489 G-s

DESFAN	- Desolution Fan		(25-Nov-24)
		OVERALL LEVEL	1K-20KHz
	MOH	.027 In/Sec	.057 G-s
	MIH	.031 In/Sec	.034 G-s
	MIA	.046 In/Sec	.0064 G-s

COMFAN	- Combustion Air Fan		(25-Nov-24)
		OVERALL LEVEL	1K-20KHz
	MOH	.112 In/Sec	.117 G-s
	MIH	.108 In/Sec	.145 G-s
	MIA	.080 In/Sec	.096 G-s
	FIH	.071 In/Sec	.187 G-s
	FOH	.097 In/Sec	.412 G-s

EJCFAN	- Ejector Air Fan		(25-Nov-24)
		OVERALL LEVEL	1K-20KHz
	MOH	.030 In/Sec	.174 G-s
	MIH	.028 In/Sec	.178 G-s
	MIA	.018 In/Sec	.172 G-s
	FIA	.018 In/Sec	.068 G-s
	FIH	.016 In/Sec	.128 G-s
	FOH	.158 In/Sec	.363 G-s

COLPMP2	- Furnace Cooling Pump center		(25-Nov-24)
		OVERALL LEVEL	1K-20KHz
	MOH	.200 In/Sec	.321 G-s
	MIH	.220 In/Sec	.319 G-s
	MIA	.102 In/Sec	.187 G-s

FCTSOUTH - Furnace CT Drive South (25-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.185 In/Sec	.060 G-s
MIH	.144 In/Sec	.068 G-s
MIA	.387 In/Sec	.043 G-s

FCTNORTH - Furnace CT Drive North (25-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.583 In/Sec	.033 G-s
MIH	.309 In/Sec	.051 G-s
MIA	.187 In/Sec	.058 G-s

SCLPMP2 - Scale Pit Pump North (25-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.323 In/Sec	.280 G-s
MIH	.157 In/Sec	.219 G-s
MIA	.127 In/Sec	.304 G-s

CTWTR1 - CT Pump East/Middle Pump (25-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.067 In/Sec	.0043 G-s
MIH	.046 In/Sec	.0041 G-s
MIA	.036 In/Sec	.0032 G-s

MILWTR2 - Mill Water Pump Center (25-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.040 In/Sec	.222 G-s
MIH	.058 In/Sec	.513 G-s
MIA	.042 In/Sec	.833 G-s

MILWTR1 - Mill Water Pump East (25-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.064 In/Sec	.490 G-s
MIH	.040 In/Sec	.250 G-s
MIA	.042 In/Sec	.167 G-s

Clarification Of Vibration Units:

Acc --> G-s RMS

Vel --> In/Sec PK