7030 Ryburn Dr. Millington, TN Phone: (901) 873-5300 Fax: (901) 873-5301 www.gohispeed.com

February 6, 2024

Nucor Roll Mill
Jackson-Flowood, MS

Subject: January vibration survey

Below is a summary report for the monthly Roll Mill vibration survey that was performed on 2/1/24. 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

ISO Certified Vibration Analyst, Category III

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

Defects

Roll Stand 1A
Planetary gearbox has some slightly higher than normal vibration and noise floor in spectral data at the input end of the gearbox. The increased amplitudes and gear mesh frequencies in spectral data may be influenced some due to load and speed; however, they may also indicate internal wear or defects in internal components. We are monitoring this closely. Rated as a **CLASS I** defect.

Roll Stand 2
Inboard gearbox (Int.) is showing some elevated 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 II** defect for now.

Roll Stand 5
Cooling fan motor still has some 1 x rpm vibration. Check all fasteners and motor frame for looseness. The cooling fan may have build up causing imbalance. As far as the gearbox goes, gear mesh vibration decreased slightly this month. Previous gear inspections of the gearbox show some tooth wear in this gearbox. The up and down amplitude of this peak from month to month is likely due to change in tooth load and machine speed. We will continue to monitor this very closely. This is rated as a **CLASS II** defect.

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

Roll Stand 7
Gearbox vibration was much higher in amplitude this survey. Vibration data shows high amplitude gear mesh harmonics on outboard end of the gear casing. We suspect this to be possibly due to a resonant gear mesh frequency vibration. The up and down amplitude of this peak from month to month is likely due to change in tooth load and machine speed. We will continue to monitor this very closely. Because of the high amplitudes in the outboard end of gearbox, this is rated as a **CLASS II** 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.

West Air Compressor
Compressor was not in operation this survey; however, the following still applies: Motor and compressor has an increase in 1 x rpm vibration with vibration being the highest in the axial direction. For now, check couplings, check all base fasteners, and ensure alignment is good. Rated as a **CLASS III** defect.

Abbreviated Last Measurement Summary

****

Database: nucorja9.rbm
Station: Roll Mill Rolls

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
STD1A - Stand 1A	(01-Feb-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.098 In/Sec	.0091 G-s
MIH	.069 In/Sec	.051 G-s
MIA	.104 In/Sec	.053 G-s
COH	.154 In/Sec	.075 G-s
GIA	.169 In/Sec	.119 G-s
GIH	.291 In/Sec	1.151 G-s
GI2	.239 In/Sec	.271 G-s
GI3	.224 In/Sec	.528 G-s
GI4	.154 In/Sec	.319 G-s
GI5	.121 In/Sec	.666 G-s
GI6	.080 In/Sec	.273 G-s
GOH	.067 In/Sec	.050 G-s
STD2A - Stand 2A	(01-Feb-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.052 In/Sec	.0089 G-s
MIH	.050 In/Sec	.044 G-s
MIA	.080 In/Sec	.081 G-s
COH	.075 In/Sec	.056 G-s
STD1 - Stand 1	(01-Feb-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.127 In/Sec	.014 G-s
MIH	.105 In/Sec	.025 G-s
MIA	.362 In/Sec	.328 G-s
GIA	.038 In/Sec	.032 G-s
GIH	.046 In/Sec	.026 G-s
COH	.090 In/Sec	.018 G-s
STD2 - Stand 2	(01-Feb-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.129 In/Sec	.034 G-s
MIH	.166 In/Sec	.105 G-s
MIA	.297 In/Sec	.234 G-s
GIA	.099 In/Sec	.073 G-s
GIH	.212 In/Sec	.245 G-s
COH	.358 In/Sec	.045 G-s
STD3 - Stand 3	(01-Feb-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.062 In/Sec	.063 G-s
MIH	.100 In/Sec	.023 G-s
MIA	.096 In/Sec	.021 G-s
GIA	.052 In/Sec	.328 G-s
GIH	.057 In/Sec	.102 G-s
COH	.156 In/Sec	.032 G-s
STD4 - Stand 4	(01-Feb-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.070 In/Sec	.0079 G-s
MIH	.128 In/Sec	.021 G-s
MIA	.072 In/Sec	.106 G-s
GIA	.101 In/Sec	.219 G-s
GIH	.101 In/Sec	.056 G-s
COH	.365 In/Sec	.025 G-s
STD5 - Stand 5	(01-Feb-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.035 In/Sec	.027 G-s

	MIH	.061 In/Sec	.139 G-s
	MIA	.139 In/Sec	.184 G-s
	GIA	.139 In/Sec	.107 G-s
	GIH	.083 In/Sec	.024 G-s
	GOH	.357 In/Sec	.423 G-s
	COH	.454 In/Sec	.074 G-s

STD6 - Stand 6 (01-Feb-24)

	OVERALL LEVEL	1K-20KHz
MOH	.070 In/Sec	.015 G-s
MIH	.082 In/Sec	.018 G-s
MIA	.231 In/Sec	.053 G-s
GIA	.089 In/Sec	.0066 G-s
GIH	.073 In/Sec	.049 G-s
GOH	.203 In/Sec	.299 G-s
COH	.275 In/Sec	.150 G-s

STD7 - Stand 7 (01-Feb-24)

	OVERALL LEVEL	1K-20KHz
MOH	.083 In/Sec	.064 G-s
MIH	.070 In/Sec	.245 G-s
MIA	.181 In/Sec	.140 G-s
GIA	.084 In/Sec	.081 G-s
GIH	.142 In/Sec	.089 G-s
GOH	1.682 In/Sec	4.442 G-s
COH	.574 In/Sec	.074 G-s

STD8 - Stand 8 (01-Feb-24)

	OVERALL LEVEL	1K-20KHz
MOH	.089 In/Sec	.0087 G-s
MIH	.069 In/Sec	.054 G-s
MIA	.114 In/Sec	.054 G-s
GIA	.088 In/Sec	.079 G-s
GIH	.064 In/Sec	.0084 G-s
COH	.197 In/Sec	.088 G-s

STD9 - Stand 9 (01-Feb-24)

	OVERALL LEVEL	1K-20KHz
MOH	.122 In/Sec	.070 G-s
MIH	.103 In/Sec	.065 G-s
MIA	.078 In/Sec	.089 G-s
GIA	.205 In/Sec	.155 G-s
GIH	.089 In/Sec	.059 G-s
COH	.336 In/Sec	.046 G-s

STD14 - Stand 14 (01-Feb-24)

	OVERALL LEVEL	1K-20KHz
MOH	.192 In/Sec	.057 G-s
MIH	.131 In/Sec	.034 G-s
MIA	.134 In/Sec	.102 G-s
GIA	.036 In/Sec	.037 G-s
GIH	.022 In/Sec	.061 G-s
GOH	.025 In/Sec	.028 G-s
COH	.226 In/Sec	.252 G-s

STD15 - Stand 15 (01-Feb-24)

	OVERALL LEVEL	1K-20KHz
MOH	.084 In/Sec	.067 G-s
MIH	.062 In/Sec	.090 G-s
MIA	.060 In/Sec	.092 G-s
GIA	.038 In/Sec	.129 G-s
GIH	.042 In/Sec	.076 G-s
COH	.253 In/Sec	.044 G-s

NORTH AC - NORTH AIR COMPRESSOR QUINCY (01-Feb-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.094 In/Sec	.934 G-s
MIH	.079 In/Sec	.639 G-s
MIA	.077 In/Sec	.519 G-s
	OVERALL LEVEL	1K-20KHz

	CIA	.271 In/Sec	.450 G-s
	CIH	.173 In/Sec	.631 G-s
	COH	.170 In/Sec	.569 G-s

SOUTH AC - SOUTH AIR COMPRESSOR QUINCY (01-Feb-24)

		OVERALL LEVEL	1 - 20 KHz
	MOH	.113 In/Sec	.503 G-s
	MIH	.168 In/Sec	.533 G-s
	MIA	.264 In/Sec	.588 G-s
		OVERALL LEVEL	1K-20KHz
	CIA	.280 In/Sec	.892 G-s
	CIH	.174 In/Sec	.410 G-s
	COH	.288 In/Sec	.483 G-s

Station: Roll Mill Utilities

MEASUREMENT POINT		OVERALL LEVEL	HFD / VHFD
DESFAN	- Desolution Fan	(02-Feb-24)	
		OVERALL LEVEL	1K-20KHz
	MOH	.029 In/Sec	.049 G-s
	MIH	.039 In/Sec	.049 G-s
	MIA	.087 In/Sec	.0046 G-s
COLPMP2	- Furnace Cooling Pump center	(02-Feb-24)	
		OVERALL LEVEL	1K-20KHz
	MOH	.422 In/Sec	.136 G-s
	MIH	.244 In/Sec	.284 G-s
	MIA	.048 In/Sec	.043 G-s
FCTSOUTH	- Furnace CT Drive South	(02-Feb-24)	
		OVERALL LEVEL	1K-20KHz
	MOH	.171 In/Sec	.054 G-s
	MIH	.075 In/Sec	.093 G-s
	MIA	.416 In/Sec	.055 G-s
FCTNORTH	- Furnace CT Drive North	(02-Feb-24)	
		OVERALL LEVEL	1K-20KHz
	MOH	.414 In/Sec	.098 G-s
	MIH	.244 In/Sec	.063 G-s
	MIA	.168 In/Sec	.027 G-s
SCLPMP2	- Scale Pit Pump North	(02-Feb-24)	
		OVERALL LEVEL	1K-20KHz
	MOH	.164 In/Sec	.192 G-s
	MIH	.117 In/Sec	.373 G-s
	MIA	.109 In/Sec	.114 G-s
CTWTR2	- CT Pump West	(02-Feb-24)	
		OVERALL LEVEL	1K-20KHz
	MOH	.119 In/Sec	.310 G-s
	MIH	.082 In/Sec	.208 G-s
	MIA	.067 In/Sec	.177 G-s
MILWTR3	- Mill Water Pump West	(02-Feb-24)	
		OVERALL LEVEL	1K-20KHz
	MOH	.075 In/Sec	.260 G-s
	MIH	.051 In/Sec	.208 G-s
	MIA	.047 In/Sec	.088 G-s
MILWTR2	- Mill Water Pump Center	(02-Feb-24)	
		OVERALL LEVEL	1K-20KHz
	MOH	.080 In/Sec	.128 G-s
	MIH	.050 In/Sec	1.088 G-s
	MIA	.043 In/Sec	.092 G-s

Clarification Of Vibration Units:

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