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December 31, 2024

Nucor Roll Mill Jackson-Flowood, MS

Subject: December vibration survey

Below is a summary report for the monthly Roll Mill vibration survey that was performed on 12/19/24. 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. Maguell

ISO Certified Vibration Analyst, Category III



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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.

# 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 slightly 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 higher 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

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

*Motor was not in service; however, the following likely still applies:* 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.

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Database: nucorja9.rbm Station: Roll Mill Rolls Report Date: 31-Dec-24 14:26

MEASUREMENT POINT				OVERAL	L LEVEL	I	HFD ,	/ VHFD
97012 - Stand 12			1 <b>A</b>			(19-Dec	-24	)
				OVERA	LL LEVE	L 11	x-201	KHz
	MOH			.076	In/Sec		.019	G-s
	мтн			.074	In/Sec		.042	G-s
	MTA			.096	In/Sec		151	G-s
	COH			106	In/Sec		060	G-s
	GTA			087	In/Sec		107	G-s
	GTH			169	In/Sec		988	G-s
	GT2			133	In/Sec		330	G-9
	GT3			121	In/Sec		181	G-9
	GT4			109	In/Sec		329	G-9
	GT5			059	In/Sec		189	G-9
	GIS GIS			055	In/Sec		014	G 3 G-9
	GOH			.039	In/Sec		.013	G-s
STD2A	-	- Stand	2A			(19-Dec	2-24)	)
				OVERA	LL LEVE	ւ 11	K-201	KHz
	MOH			.078	In/Sec		.011	G-s
	MIH			.055	In/Sec		.018	G-s
	MIA			.090	In/Sec		.071	G-s
	СОН			.135	In/Sec		.034	G-s
STD1	-	- Stand	1			(19-Dec	2-24)	)
				OVERA	LL LEVE	L 11	K-201	KHz
	MOH			.090	In/Sec		. 229	G-s
	MIH			.172	In/Sec		.146	G-s
	MIA			.180	In/Sec		. 029	G-s
	GIA			.043	In/Sec		.036	G-s
	GIH			.047	In/Sec		.042	G-s
	СОН			.105	In/Sec		.182	G-s
STD2 - Stand 2		2			(19-Dec	2-24)	)	
				OVERA	LL LEVE	L 11	K-201	KHz
	MOH			.068	In/Sec		.068	G-s
	MIH			.125	In/Sec		.109	G-s
	MIA			.096	In/Sec		.023	G-s
	GIA			.105	In/Sec		. 277	G-s
	GIH			.149	In/Sec		. 294	G-s
	СОН			.441	In/Sec		.064	G-s
STD3	-	- Stand	3	(19-Dec		2-24	)	
				OVERA	LL LEVE.	L 11	x-201	(Hz
	мон			.052	In/Sec		.039	G-s
	MIH			.077	In/Sec		.020	G-s
	MIA			.140	In/Sec		.04/	G-S
	GIA			.054	In/Sec		.032	G-S
	COH			.044	In/Sec In/Sec		.054	G-s G-s
C TT 1		Stand	4			(19-Dec	-24	
STD4		stand	-2	0075553	TT TEX7E	(19-D60	2-24) 7-201	/ / U =
	MOIT			OVERA.	цп пеле; тр/с∘с	11 u ،	∿-∠01 ∿000	G-2
	мтн			105	Tn/Sec	. (	010	G-5 C-5
	MTA			124			172	G-8
	CT7			.134			169	G-8
	GIA			.007 094			060	G-8
	COH			.285	In/Sec		.024	G-s G-s
STD 5	-	- Stand	5			(19-De/	-24	)
			-	OVERA	LL LEVE	L 11	x-201	KHz

	MOH			.038	In/Sec	.129 G-s
	MIH			.042	In/Sec	.069 G-s
	MIA			.129	In/Sec	.102 G-s
	GIA			.111	In/Sec	.042 G-s
	GTH			069		055 6-8
	CON			226		275 C-2
	GOH			. 330	III/Sec	.275 G-S
	СОН			. 332	In/Sec	.092 G-S
			-			
STD6	- :	Stand	6			(19-Dec-24)
				OVERA	LL LEVEI	1K-20KHz
	MOH			.064	In/Sec	.014 G-s
	MIH			.072	In/Sec	.021 G-s
	MIA			.111	In/Sec	.021 G-s
	GIA			.127	In/Sec	.182 G-s
	GIH			.071	In/Sec	.0081 G-s
	GOH			.168	In/Sec	.379 G-s
	СОН			.166	In/Sec	.107 G-s
					,	
7 חידיפ	_ •	Stand	7			(19 - Dec - 24)
5107	•	ocana	,		тт т <b>т</b> т т т т т т т т т т т т т т т т	1K-20KH-
	MON			OVERA		
	MOH			.007	In/Sec	.079 G-S
	MIH			.049	In/Sec	.244 G-S
	MIA			.271	In/Sec	.098 G-s
	GIA			.054	In/Sec	.073 G-s
	GIH			.062	In/Sec	.137 G-s
	СОН			.495	In/Sec	.098 G-s
STD8	- :	Stand	8			(19-Dec-24)
				OVERA	LL LEVEI	1K-20KHz
	MOH			.072	In/Sec	.045 G-s
	мтн			.080	In/Sec	.041 G-s
	мта			070	Tn/Sec	170 G-s
	GTA			241	In/Sec	125 6-8
	GIA			170	In/Sec	.125 G-S
	GIH			144	In/Sec	.000 G-S
	СОН			.144	In/Sec	.321 G-S
		~	~			(10 - 04)
STD9	- :	Stand	9			(19-Dec-24)
				OVERA.	LL LEVEI	IK-20KHz
	MOH			.056	In/Sec	.093 G-s
	MIH			.108	In/Sec	.120 G-s
	MIA			.081	In/Sec	.112 G-s
	GIA			.085	In/Sec	.285 G-s
	GIH			.123	In/Sec	.665 G-s
	СОН			.123	In/Sec	.082 G-s
STD12	- :	Stand	12			(19-Dec-24)
				OVERA	LL LEVEI	1K-20KHz
	MOH			.033	In/Sec	.104 G-s
	мтн			.037	In/Sec	.294 G-s
	мта			046	In/Sec	116 G-s
	COH			130	In/Sec	032 6-8
	con			.159	III/ Sec	.052 G-5
C 1 C 1 C		etand	1 2			(19 - D - 24)
51015		Stand	13	OTTEDA		(19-Dec-24)
				OVERA.		
	мон			.055	In/Sec	.301 G-s
	MIH			.059	In/Sec	.206 G-s
	MIA			.077	In/Sec	.262 G-s
	GIA			.054	In/Sec	.019 G-s
	GIH			.032	In/Sec	.043 G-s
	GOH			.029	In/Sec	.095 G-s
	COH			.120	In/Sec	.121 G-s
STD14	- :	Stand	14			(19-Dec-24)
				OVERA	LL LEVEI	1K-20KHz
				.070	In/Sec	.032 G-s
	MOH					
	MOH MIH			.099	In/Sec	.040 G-s
	MOH MIH MIA			.099 .045	In/Sec In/Sec	.040 G-s .098 G-s
	MOH MIH MIA GIA			.099 .045 .058	In/Sec In/Sec In/Sec	.040 G-s .098 G-s .022 G-s
	MOH MIH MIA GIA GIH			.099 .045 .058 .033	In/Sec In/Sec In/Sec	.040 G-s .098 G-s .022 G-s .034 C-s
	MOH MIH MIA GIA GIH GOH			.099 .045 .058 .033	In/Sec In/Sec In/Sec In/Sec	.040 G-s .098 G-s .022 G-s .034 G-s .055 G-s

STD15	- Stand 15	(	(19-Dec-24)					
		OVERALL LEVEL	1K-20KHz					
MOH		.077 In/Sec	.093 G-s					
MIH		.113 In/Sec	.089 G-s					
MIA		.087 In/Sec	.133 G-s					
GIA		.097 In/Sec	.792 G-s					
GIH		.079 In/Sec	.600 G-s					
COH		.081 In/Sec	.159 G-s					
SOUTH AC	- SOUTH AIR	COMPRESSOR QUINCY (	19-Dec-24)					
		OVERALL LEVEL	1 - 20 KHz					
MOH		.099 In/Sec	.475 G-s					
MIH		.128 In/Sec	.192 G-s					
MIA		.291 In/Sec	.188 G-s					
		OVERALL LEVEL	1K-20KHz					
CIA		.218 In/Sec	.678 G-s					
CIH		.177 In/Sec	.472 G-s					
СОН		.191 In/Sec	.311 G-s					
Station: Roll Mill Utilities								
MEASUREMENT	F POINT	OVERALL LEVEL	hfd / vhfd					
HYDPMP2 - Hydraulic Pump Center (19-Dec-24)								
		OVERALL LEVEL	1K-20KHz					
MOH		.118 In/Sec	.042 G-s					
MIH		.219 In/Sec	.177 G-s					
PIV		.274 In/Sec	.445 G-s					

HYDPMP2	_	Hydraulic Pump	Center		(19-Dec-24)	)
			OVERALL	LEVEL	1K-20B	KHz
MOH			.118 I	n/Sec	.042	G-s
MIH			.219 I	n/Sec	.177	G-s
PIV			.274 I	n/Sec	.445	G-s
HYDPMP3	_	Hydraulic Pump	West		(19-Dec-24)	)
			OVERALL	LEVEL	1K-20B	KHz
MOH			.165 I	n/Sec	.314	G-s
MIH			.423 I	n/Sec	. 432	G-s
PIV			.317 I	n/Sec	1.325	G-s
DESFAN	_	Desolution Fan			(19-Dec-24)	1
			OVERALL	LEVEL	1K-20H	KHz
MOH			.031 I	n/Sec	.055	G-s
МІН			.036 I	n/Sec	.030	G-s
MIA			.060 I	n/Sec	.046	G-s
COMFAN	_	Combustion Air	Fan		(19-Dec-24)	
0011111			OVERALL	. LEVEL	18-201	(Hz
MOH			101 T	n/Sec	122	G-s
мтн			115 T	n/Sec	281	G-9
мта			082 T	n/Sec	047	G-9
 FTH			049 T	n/Sec	140	G-9
FOH			.096 I	n/Sec	.186	G-s
FICEAN	_	Finator Air Far			(19-Dog-24)	
LUCFAN		LJECCOL ALL FAL	OVERALL		1x-20p	(H-7
мон			069 T		242	G_8
мтн			.005 I 049 T	n/Sec	350	G - e
мта			024 T	n/Sec	176	G-e
FTA			016 T	n/Sec	108	G-9
111 I FTH			028 T	n/Sec	407	G-9
FOH			.117 I	n/Sec	.209	G-s
COLDMD2	_	Eurnace Cooling		tor	(19-Dec-24)	
COHEMEZ		ruinace cooring	OVERALL	. T.EVET.	1K-20F	(H-7
MOH			307 T		307	G-9
мтн			086 T	n/Sec	362	G-9
MIA			.083 I	n/Sec	.197	G-s
FCTSOITT	-		o South		(19-Dec-24)	
FCISOUTH	-	Furnace CT Driv		ד <b>ה</b> י <i>ו</i> הי	(17-DeC-24)	
MOU			ALL T	. TEAET	167	C-e
PUP					. 107	<u> </u>

MIH		.107	In/Sec	.108 G-s		
MIA		.459	In/Sec	.155 G-s		
FCTNORTH - Fur	nace CT Driv	e North		(19-Dec-24)		
		OVERA	LL LEVEL	1K-20KHz		
MOH		.345	In/Sec	.105 G-s		
MIH		.193	In/Sec	.122 G-s		
MIA		.176	In/Sec	.106 G-s		
667 DVD1 6	1	<b>C</b>		(10		
SCLPMPI - SCa	Te bit humb	South		(19-DeC-24)		
MON		OVERAL 122	LL LEVEL	1 IK-20KHZ		
MOH		.133	In/Sec	.430 G-S		
MOV		.102	In/Sec	.605 G-S		
MIV		.066	In/Sec	.16/ G-S		
MIH		.139	In/Sec	.155 G-S		
MIA		.115	In/Sec	.094 G-S		
CTWTR2 - CT	Pump West	(19-Dec-24)				
	· ·	OVERA	LL LEVEL	1K-20KHz		
MOH		.141	In/Sec	.237 G-s		
MIH		.088	In/Sec	.230 G-s		
MIA		.113	In/Sec	.172 G-s		
	1	<b>G</b>		(10		
MILWIRZ - MIL	.1 water Pump	Center		(19-Dec-24)		
		OVERA		IK-20KHZ		
MOH		.089	In/Sec	.232 G-S		
MIH		.056	In/Sec	./46 G-S		
MIA		.054	In/Sec	.526 G-S		
MILWTR1 - Mil	l Water Pump	East		(19-Dec-24)		
	_	OVERA	LL LEVEL	1K-20KHz		
MOH		.094	In/Sec	.108 G-s		
MIH		.051	In/Sec	.165 G-s		
MIA		.059	In/Sec	.117 G-s		
arification Of Vi	bration Unit.	s:				

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