HI-SPEED INDUSTRIAL SERVICE QualiTest® Diagnostics

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September 26, 2024

North Shelby Plant
Millington, TN

The following is a summary of findings from the September 2024 monthly vibration survey at the North Shelby site.

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.

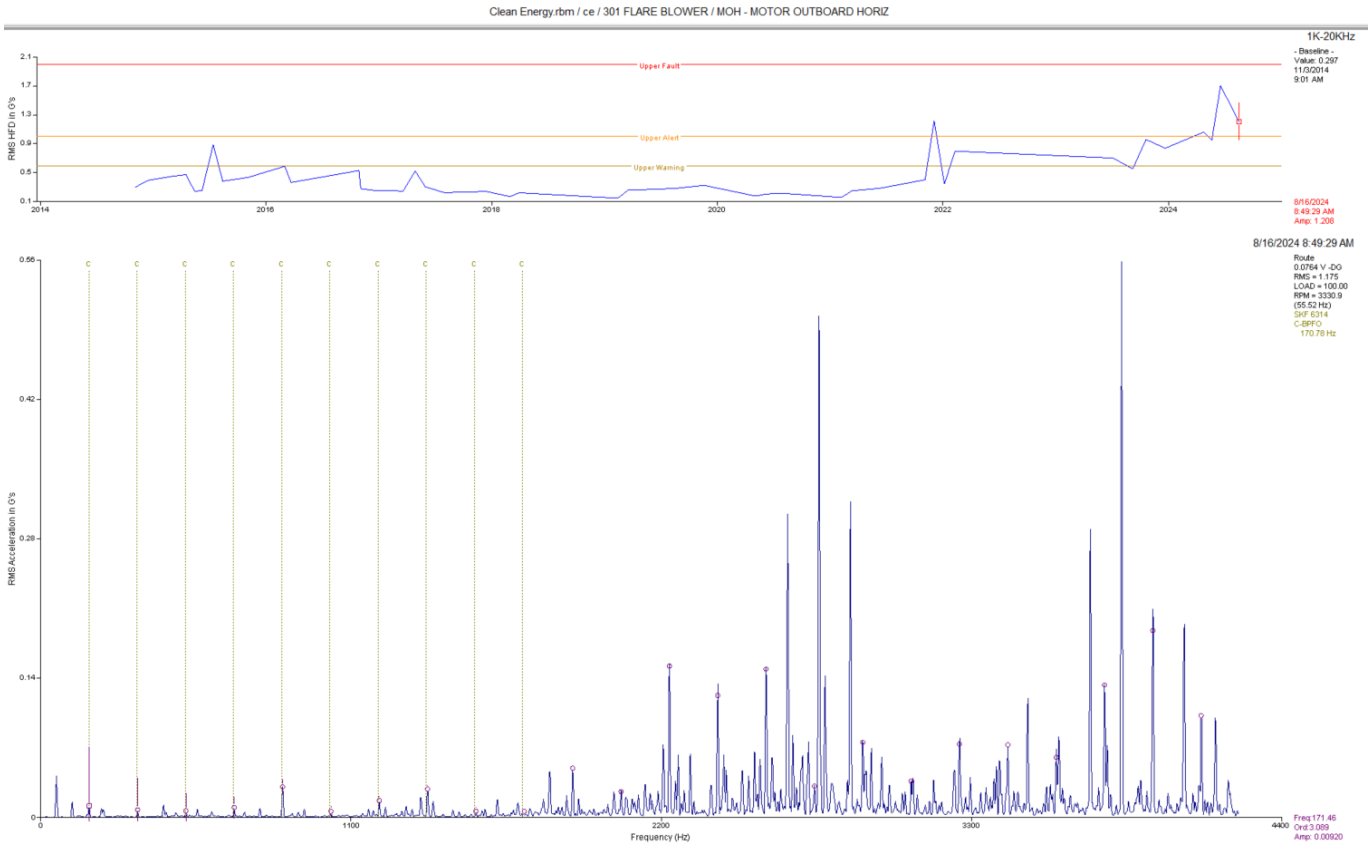
Class III; Defect (s) present that may cause failure in short term (less than 2 months). This should be addressed as soon as practical, with a high maintenance priority. Increase monitoring frequency.

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

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

301 Flare Blower CLASS II



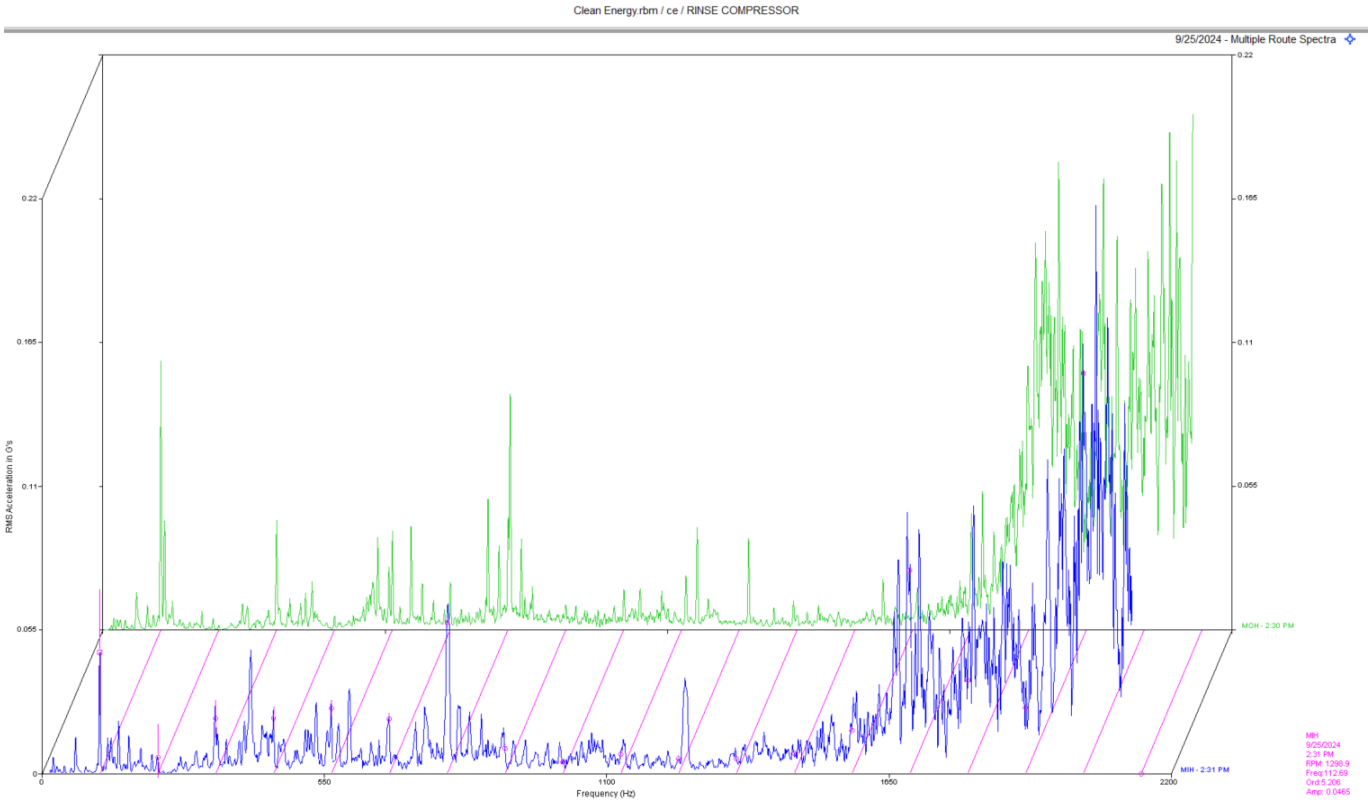
Observations:

Motor was not in service this survey; however, the following may still apply: Data above is the motor outboard horizontal. There appear to be several harmonics of a non-synchronous frequency (3.089 orders of rpm) present in the spectra that line up with outer race defect fundamental and its harmonics. This is indication of bearing defects in the motor.

Recommendations:

Motor should be replaced in the next few months. We are monitoring this closely.

Rinse Compressor CLASS II



Observations:

Drive motor data shows some high frequency vibration. Motor is also making a squealing type noise. The last reading showed amplitude to be 2.1 g's on average. Spectral data shows a noise floor 1500-5000 hz range. Peak to peak waveform amplitude is 12 to 13 g's.

Recommendations:

Vibration characteristics indicate a lube issue or bearing wear. Motor likely needs attention during next extended shutdown. We are monitoring this closely. Rated as a **CLASS II** defect for now.

Abbreviated Last Measurement Summary

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Database: Clean Energy.rbm
Area: millington plant

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
303 FLARE - 303 FLARE BLOWER	(25-Sep-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.050 In/Sec	.604 G-s
MOV	.099 In/Sec	.253 G-s
MIH	.037 In/Sec	.846 G-s
MIV	.070 In/Sec	.159 G-s
MIA	.022 In/Sec	.302 G-s
EIH	.070 In/Sec	.323 G-s
EIV	.045 In/Sec	.147 G-s
EIA	.048 In/Sec	.140 G-s
EOH	.041 In/Sec	.321 G-s
EOV	.219 In/Sec	.273 G-s
RINSE COMP - RINSE COMPRESSOR	(25-Sep-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.116 In/Sec	2.190 G-s
M1P	.050 In/Sec	
MIH	.088 In/Sec	2.171 G-s
M2P	.049 In/Sec	
MIA	.095 In/Sec	.229 G-s
IIH	.070 In/Sec	.954 G-s
IIA	.085 In/Sec	.198 G-s
IOH	.101 In/Sec	.725 G-s
OIH	.112 In/Sec	.632 G-s
OIA	.116 In/Sec	.098 G-s
OOH	.083 In/Sec	.663 G-s
VAC COMP - VACUUM COMPRESSOR	(25-Sep-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.085 In/Sec	1.254 G-s
MIH	.124 In/Sec	1.592 G-s
MIA	.079 In/Sec	.228 G-s
IIH	.090 In/Sec	.525 G-s
IIA	.053 In/Sec	.104 G-s
IOH	.110 In/Sec	.653 G-s
OIH	.063 In/Sec	.778 G-s
OIA	.052 In/Sec	.307 G-s
OOH	.093 In/Sec	.713 G-s
COOLFAN1 - COOLING FAN 1	(25-Sep-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.041 In/Sec	.295 G-s
MOV	.049 In/Sec	.080 G-s
MIH	.026 In/Sec	.490 G-s
MIV	.035 In/Sec	.165 G-s
MIA	.022 In/Sec	.149 G-s
COOLFAN2 - COOLING FAN 2	(25-Sep-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.052 In/Sec	.290 G-s
MOV	.063 In/Sec	.060 G-s
MIH	.053 In/Sec	.615 G-s
MIV	.062 In/Sec	.163 G-s
MIA	.054 In/Sec	.313 G-s
EIH	.074 In/Sec	.242 G-s
EIV	.039 In/Sec	.088 G-s
EIA	.051 In/Sec	.078 G-s
EOH	.054 In/Sec	.096 G-s
EOV	.055 In/Sec	.070 G-s

101A COMP - 101A FEED COMPRESSOR (25-Sep-24)

	OVERALL LEVEL	1K-20KHz
MOH	.180 In/Sec	.290 G-s
MIH	.110 In/Sec	.254 G-s
MIA	.097 In/Sec	.285 G-s
IIH	.225 In/Sec	1.410 G-s
IIA	.262 In/Sec	1.579 G-s
IOH	.212 In/Sec	1.445 G-s
OIH	.140 In/Sec	1.147 G-s
OIA	.371 In/Sec	1.212 G-s
OOH	.129 In/Sec	2.163 G-s

HX132A FAN - HX132A GAS OIL COOLER FAN (25-Sep-24)

	OVERALL LEVEL	1K-20KHz
EIH	.040 In/Sec	.051 G-s
EOH	.045 In/Sec	.104 G-s

451A PUMP - 451A VACCUM PUMP (25-Sep-24)

	OVERALL LEVEL	1K-20KHz
MOH	.072 In/Sec	.442 G-s
MOV	.071 In/Sec	.279 G-s
MIH	.100 In/Sec	.283 G-s
MIV	.126 In/Sec	.562 G-s
MIA	.060 In/Sec	.257 G-s
EIH	.162 In/Sec	.360 G-s
EIV	.152 In/Sec	.066 G-s
EIA	.104 In/Sec	.091 G-s
EOH	.158 In/Sec	.389 G-s
EOV	.151 In/Sec	.063 G-s

HX453A FAN - HX453A VAC PUMP OIL COOL FAN (25-Sep-24)

	OVERALL LEVEL	1K-20KHz
MOH	.245 In/Sec	.143 G-s
MIH	.132 In/Sec	.099 G-s

451B PUMP - 451B VACCUM PUMP (25-Sep-24)

	OVERALL LEVEL	1K-20KHz
MOH	.049 In/Sec	.495 G-s
MOV	.099 In/Sec	.098 G-s
MIH	.061 In/Sec	.931 G-s
MIV	.072 In/Sec	.238 G-s
MIA	.035 In/Sec	.128 G-s
EIH	.233 In/Sec	.626 G-s
EIV	.251 In/Sec	.211 G-s
EIA	.176 In/Sec	.263 G-s
EOH	.224 In/Sec	.672 G-s
EOV	.164 In/Sec	.186 G-s

HX453B FAN - HX453B VAC PUMP OIL COOL FAN (25-Sep-24)

	OVERALL LEVEL	1K-20KHz
MOH	.151 In/Sec	.265 G-s
MIH	.111 In/Sec	.099 G-s

451C PUMP - 451C VACCUM PUMP (25-Sep-24)

	OVERALL LEVEL	1K-20KHz
MOH	.067 In/Sec	.698 G-s
MOV	.085 In/Sec	.129 G-s
MIH	.090 In/Sec	.478 G-s
MIV	.129 In/Sec	.177 G-s
MIA	.049 In/Sec	.127 G-s
EIH	.128 In/Sec	.525 G-s
EIV	.125 In/Sec	.181 G-s
EIA	.100 In/Sec	.153 G-s
EOH	.128 In/Sec	.384 G-s
EOV	.213 In/Sec	.154 G-s

HX453C FAN - HX453C VAC PUMP OIL COOL FAN (25-Sep-24)

	OVERALL LEVEL	1K-20KHz
MOH	.165 In/Sec	.435 G-s

MIH	.116 In/Sec	.186 G-s

451D PUMP - 451D VACCUM PUMP (25-Sep-24)

	OVERALL LEVEL	1K-20KHz
MOH	.059 In/Sec	1.418 G-s
MOV	.071 In/Sec	.260 G-s
MIH	.079 In/Sec	1.463 G-s
MIV	.074 In/Sec	.215 G-s
MIA	.036 In/Sec	.349 G-s
EIH	.172 In/Sec	.495 G-s
EIV	.137 In/Sec	.230 G-s
EIA	.098 In/Sec	.197 G-s
EOH	.171 In/Sec	.804 G-s
EOV	.167 In/Sec	.263 G-s

HX453D FAN - HX453D VAC PUMP OIL COOL FAN (25-Sep-24)

	OVERALL LEVEL	1K-20KHz
MOH	.206 In/Sec	.137 G-s
MIH	.210 In/Sec	.126 G-s

506B COMP - 506B PRODUCT COMPRESSOR (25-Sep-24)

	OVERALL LEVEL	1K-20KHz
MOH	.048 In/Sec	.232 G-s
MIH	.063 In/Sec	.226 G-s
MIA	.048 In/Sec	.293 G-s
IIH	.150 In/Sec	.622 G-s
IIA	.155 In/Sec	1.065 G-s
IOH	.205 In/Sec	1.829 G-s
OIH	.290 In/Sec	1.343 G-s
OIA	.122 In/Sec	1.107 G-s
OOH	.227 In/Sec	.891 G-s

HX507B FAN - HX507B GAS COOL FAN (25-Sep-24)

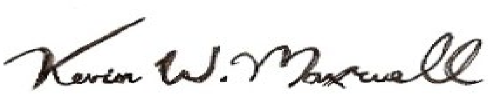
	OVERALL LEVEL	1K-20KHz
MOH	.099 In/Sec	.058 G-s
MIH	.142 In/Sec	.095 G-s

Clarification Of Vibration Units:

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

As always, it has been a pleasure to serve North Shelby-Archaea Energy. 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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