



QualiTest® Diagnostics

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December 8, 2023

North Shelby Plant
Millington, TN

The following is a summary of findings from the November 2023 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

101-B Feed Compressor

Equipment was not in service during this survey; however, the following still applies: Compressor data shows some high frequency acceleration amplitude with noise floor. Peaks in spectral data suggest possible wear of internal compressor components. We are watching this closely. Rated as a **CLASS I** defect.

506 B Product Compressor

Motor data continues to show defects are present in motor bearings. Motor will need to be swapped out as soon as practical. Rated as a **CLASS III** defect.

Abbreviated Last Measurement Summary *****

Database: Clean Energy.rbm
Area: millington plant
Route No. 1: CLEAN ENERGY

MEASUREMENT POINT -----	OVERALL LEVEL -----	HFD / VHFD -----
302 FLARE - 302 FLARE BLOWER (01-Dec-23)		
	OVERALL LEVEL	1K-20KHz
MOH	.079 In/Sec	.985 G-s
MOV	.066 In/Sec	.167 G-s
MIH	.124 In/Sec	1.046 G-s
MIV	.095 In/Sec	.143 G-s
MIA	.104 In/Sec	.240 G-s
EIH	.231 In/Sec	.536 G-s
EIV	.114 In/Sec	.127 G-s
EIA	.063 In/Sec	.210 G-s
EOH	.157 In/Sec	.207 G-s
EOV	.160 In/Sec	.117 G-s
RINSE COMP - RINSE COMPRESSOR (01-Dec-23)		
	OVERALL LEVEL	1K-20KHz
MOH	.150 In/Sec	2.356 G-s
MIH	.101 In/Sec	3.648 G-s
MIA	.099 In/Sec	.324 G-s
IIH	.100 In/Sec	.860 G-s
IIA	.212 In/Sec	.173 G-s
IOH	.141 In/Sec	.654 G-s
OIH	.091 In/Sec	.973 G-s
OIA	.170 In/Sec	.196 G-s
OOH	.123 In/Sec	.643 G-s
VAC COMP - VACUUM COMPRESSOR (01-Dec-23)		
	OVERALL LEVEL	1K-20KHz
MOH	.095 In/Sec	1.708 G-s
MIH	.134 In/Sec	2.301 G-s
MIA	.065 In/Sec	.341 G-s

IIH	.064 In/Sec	.712 G-s
IIA	.091 In/Sec	.113 G-s
IOH	.103 In/Sec	.904 G-s
OIH	.058 In/Sec	.642 G-s
OIA	.084 In/Sec	.189 G-s
OOH	.108 In/Sec	1.247 G-s

COOLFAN1 - COOLING FAN 1 (01-Dec-23)

	OVERALL LEVEL	1K-20KHz
MOH	.024 In/Sec	.491 G-s
MOV	.079 In/Sec	.132 G-s
MIH	.027 In/Sec	.291 G-s
MIV	.096 In/Sec	.071 G-s
MIA	.033 In/Sec	.073 G-s

101A COMP - 101A FEED COMPRESSOR (01-Dec-23)

	OVERALL LEVEL	1K-20KHz
MOH	.045 In/Sec	.352 G-s
MIH	.070 In/Sec	.295 G-s
MIA	.057 In/Sec	.258 G-s
IIH	.158 In/Sec	1.483 G-s
IIA	.338 In/Sec	1.421 G-s
IOH	.094 In/Sec	.767 G-s
OIH	.105 In/Sec	.714 G-s
OIA	.170 In/Sec	.886 G-s
OOH	.116 In/Sec	2.677 G-s

HX132A FAN - HX132A GAS OIL COOLER FAN (01-Dec-23)

	OVERALL LEVEL	1K-20KHz
EIH	.040 In/Sec	.037 G-s
EOH	.064 In/Sec	.055 G-s

451A PUMP - 451A VACCUM PUMP (01-Dec-23)

	OVERALL LEVEL	1K-20KHz
MOH	.070 In/Sec	.678 G-s
MOV	.082 In/Sec	.227 G-s
MIH	.082 In/Sec	.439 G-s
MIV	.114 In/Sec	.629 G-s
MIA	.047 In/Sec	.141 G-s
EIH	.139 In/Sec	.309 G-s
EIV	.109 In/Sec	.189 G-s
EIA	.101 In/Sec	.185 G-s
EOH	.144 In/Sec	.346 G-s
EOV	.123 In/Sec	.193 G-s

HX453A FAN - HX453A VAC PUMP OIL COOL FAN (01-Dec-23)

	OVERALL LEVEL	1K-20KHz
MOH	.284 In/Sec	.156 G-s
MIH	.178 In/Sec	.100 G-s

451B PUMP - 451B VACCUM PUMP (01-Dec-23)

	OVERALL LEVEL	1K-20KHz
MOH	.049 In/Sec	.700 G-s
MOV	.071 In/Sec	.238 G-s
MIH	.068 In/Sec	.332 G-s
MIV	.101 In/Sec	.121 G-s
MIA	.050 In/Sec	.078 G-s
EIH	.215 In/Sec	.212 G-s
EIV	.129 In/Sec	.259 G-s
EIA	.130 In/Sec	.254 G-s
EOH	.207 In/Sec	.338 G-s
EOV	.231 In/Sec	.171 G-s

HX453B FAN - HX453B VAC PUMP OIL COOL FAN (01-Dec-23)

	OVERALL LEVEL	1K-20KHz
MOH	.115 In/Sec	.173 G-s
MIH	.113 In/Sec	.106 G-s

451C PUMP - 451C VACCUM PUMP	(01-Dec-23)
	OVERALL LEVEL 1K-20KHz
MOH	.076 In/Sec .611 G-s
MOV	.081 In/Sec .115 G-s
MIH	.099 In/Sec .383 G-s
MIV	.147 In/Sec .145 G-s
MIA	.059 In/Sec .087 G-s
EIH	.147 In/Sec .597 G-s
EIV	.113 In/Sec .145 G-s
EIA	.077 In/Sec .144 G-s
EOH	.119 In/Sec .640 G-s
EOV	.124 In/Sec .157 G-s

HX453C FAN - HX453C VAC PUMP OIL COOL FAN	(01-Dec-23)
	OVERALL LEVEL 1K-20KHz
MOH	.147 In/Sec .287 G-s
MIH	.096 In/Sec .161 G-s

451D PUMP - 451D VACCUM PUMP	(01-Dec-23)
	OVERALL LEVEL 1K-20KHz
MOH	.088 In/Sec 1.551 G-s
MOV	.106 In/Sec .475 G-s
MIH	.111 In/Sec 1.874 G-s
MIV	.114 In/Sec .211 G-s
MIA	.046 In/Sec .356 G-s
EIH	.203 In/Sec .459 G-s
EIV	.123 In/Sec .189 G-s
EIA	.129 In/Sec .112 G-s
EOH	.156 In/Sec .314 G-s
EOV	.165 In/Sec .120 G-s

HX453D FAN - HX453D VAC PUMP OIL COOL FAN	(01-Dec-23)
	OVERALL LEVEL 1K-20KHz
MOH	.153 In/Sec .136 G-s
MIH	.163 In/Sec .114 G-s

506B COMP - 506B PRODUCT COMPRESSOR	(01-Dec-23)
	OVERALL LEVEL 1K-20KHz
MOH	.117 In/Sec 1.882 G-s
MIH	.183 In/Sec 5.834 G-s
MIA	.091 In/Sec 2.931 G-s
IIH	.181 In/Sec .639 G-s
IIA	.137 In/Sec 1.259 G-s
IOH	.225 In/Sec 2.089 G-s
OIH	.241 In/Sec 1.317 G-s
OIA	.141 In/Sec 1.096 G-s
OOH	.214 In/Sec 1.920 G-s

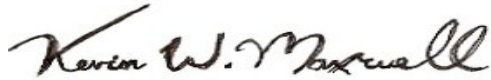
HX507B FAN - HX507B GAS COOL FAN	(01-Dec-23)
	OVERALL LEVEL 1K-20KHz
MOH	.124 In/Sec .058 G-s
MIH	.148 In/Sec .078 G-s

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,

A handwritten signature in black ink that reads "Kevin W. Maxwell". The signature is fluid and cursive, with the first name "Kevin" and last name "Maxwell" clearly legible.

ISO Certified Vibration Analyst, Category III



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