HI-SPEED INDUSTRIAL SERVICE QualiTest® Diagnostics

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March 4, 2024

North Shelby Plant
Millington, TN

The following is a summary of findings from the February 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

Defects

Rinse Compressor

Drive motor data still shows some elevated 1-20 Khz. amplitude. The last reading showed amplitude to be 3 g's. Baseline amplitude was 1.3 g's. Spectral data shows a noise floor starting around the 1500 hz range. This may be a lube issue or early stage bearing wear. For now, ensure motor bearings have clean adequate amounts of grease. We are monitoring this closely. Rated as a **CLASS I** defect for now.

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

Equipment was not in service during this survey; however, the following still applies: 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
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Database: Clean Energy.rbm
Area: millington plant

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
302 FLARE - 302 FLARE BLOWER	(23-Feb-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.071 In/Sec	1.025 G-s
MOV	.066 In/Sec	.193 G-s
MIH	.139 In/Sec	.841 G-s
MIV	.138 In/Sec	.159 G-s
MIA	.100 In/Sec	.287 G-s
EIH	.212 In/Sec	.406 G-s
EIV	.200 In/Sec	.096 G-s
EIA	.110 In/Sec	.127 G-s
EOH	.115 In/Sec	.209 G-s
EOV	.249 In/Sec	.137 G-s
RINSE COMP - RINSE COMPRESSOR	(23-Feb-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.153 In/Sec	3.028 G-s
MIH	.164 In/Sec	3.917 G-s
MIA	.131 In/Sec	.390 G-s
IIH	.092 In/Sec	.752 G-s
IIA	.098 In/Sec	.215 G-s
IOH	.143 In/Sec	.726 G-s
OIH	.088 In/Sec	.670 G-s
OIA	.132 In/Sec	.115 G-s
OOH	.110 In/Sec	.711 G-s
VAC COMP - VACUUM COMPRESSOR	(23-Feb-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.089 In/Sec	2.081 G-s
MIH	.112 In/Sec	1.972 G-s
MIA	.071 In/Sec	.165 G-s
IIH	.115 In/Sec	.648 G-s
IIA	.067 In/Sec	.099 G-s

	IOH	.118 In/Sec	.935 G-s
	OIH	.065 In/Sec	1.190 G-s
	OIA	.082 In/Sec	.122 G-s
	OOH	.121 In/Sec	.944 G-s

COOLFAN1 - COOLING FAN 1 (23-Feb-24)

	OVERALL LEVEL	1K-20KHz
MOH	.070 In/Sec	.464 G-s
MOV	.255 In/Sec	.109 G-s
MIH	.019 In/Sec	.456 G-s
MIV	.107 In/Sec	.051 G-s
MIA	.029 In/Sec	.152 G-s

101A COMP - 101A FEED COMPRESSOR (23-Feb-24)

	OVERALL LEVEL	1K-20KHz
MOH	.197 In/Sec	.396 G-s
MIH	.170 In/Sec	.282 G-s
MIA	.106 In/Sec	.299 G-s
IIH	.308 In/Sec	1.282 G-s
IIA	.406 In/Sec	1.607 G-s
IOH	.273 In/Sec	1.458 G-s
OIH	.346 In/Sec	1.012 G-s
OIA	.339 In/Sec	7.327 G-s
OOH	.145 In/Sec	1.201 G-s

HX132A FAN - HX132A GAS OIL COOLER FAN (23-Feb-24)

	OVERALL LEVEL	1K-20KHz
EIH	.056 In/Sec	.032 G-s
EOH	.082 In/Sec	.041 G-s

451A PUMP - 451A VACCUM PUMP (23-Feb-24)

	OVERALL LEVEL	1K-20KHz
MOH	.095 In/Sec	.586 G-s
MOV	.100 In/Sec	.388 G-s
MIH	.110 In/Sec	.550 G-s
MIV	.159 In/Sec	.499 G-s
MIA	.063 In/Sec	.442 G-s
EIH	.175 In/Sec	.266 G-s
EIV	.172 In/Sec	.064 G-s
EIA	.158 In/Sec	.102 G-s
EOH	.161 In/Sec	.372 G-s
EOV	.148 In/Sec	.077 G-s

HX453A FAN - HX453A VAC PUMP OIL COOL FAN (23-Feb-24)

	OVERALL LEVEL	1K-20KHz
MOH	.237 In/Sec	.125 G-s
MIH	.146 In/Sec	.080 G-s

451B PUMP - 451B VACCUM PUMP (23-Feb-24)

	OVERALL LEVEL	1K-20KHz
MOH	.048 In/Sec	.391 G-s
MOV	.067 In/Sec	.106 G-s
MIH	.061 In/Sec	.459 G-s
MIV	.083 In/Sec	.217 G-s
MIA	.038 In/Sec	.108 G-s
EIH	.173 In/Sec	.281 G-s
EIV	.144 In/Sec	.081 G-s
EIA	.136 In/Sec	.090 G-s
EOH	.178 In/Sec	.611 G-s
EOV	.160 In/Sec	.154 G-s

HX453B FAN - HX453B VAC PUMP OIL COOL FAN (23-Feb-24)

	OVERALL LEVEL	1K-20KHz
MOH	.145 In/Sec	.150 G-s
MIH	.111 In/Sec	.087 G-s

451C PUMP - 451C VACCUM PUMP (23-Feb-24)

	OVERALL LEVEL	1K-20KHz
MOH	.077 In/Sec	.493 G-s
MOV	.087 In/Sec	.108 G-s

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            MIH                      .086 In/Sec       .392 G-s
            MIV                      .134 In/Sec       .130 G-s
            MIA                      .055 In/Sec       .087 G-s
            EIH                      .146 In/Sec       .821 G-s
            EIV                      .102 In/Sec       .199 G-s
            EIA                      .101 In/Sec       .238 G-s
            EOH                      .120 In/Sec       .526 G-s
            EOV                      .132 In/Sec       .157 G-s

      HX453C FAN - HX453C VAC PUMP OIL COOL FAN  (23-Feb-24)
                                 OVERALL LEVEL     1K-20KHz
            MOH                      .100 In/Sec       .360 G-s
            MIH                      .083 In/Sec       .131 G-s

      451D PUMP  - 451D VACCUM PUMP              (23-Feb-24)
                                 OVERALL LEVEL     1K-20KHz
            MOH                      .099 In/Sec       .771 G-s
            MOV                      .104 In/Sec       .306 G-s
            MIH                      .124 In/Sec      1.421 G-s
            MIV                      .146 In/Sec       .350 G-s
            MIA                      .060 In/Sec       .442 G-s
            EIH                      .185 In/Sec       .459 G-s
            EIV                      .086 In/Sec       .111 G-s
            EIA                      .106 In/Sec       .112 G-s
            EOH                      .186 In/Sec       .595 G-s
            EOV                      .169 In/Sec       .112 G-s

      HX453D FAN - HX453D VAC PUMP OIL COOL FAN  (23-Feb-24)
                                 OVERALL LEVEL     1K-20KHz
            MOH                      .213 In/Sec       .103 G-s
            MIH                      .223 In/Sec       .097 G-s

      506C COMP  - 506C PRODUCT COMPRESSOR       (23-Feb-24)
                                 OVERALL LEVEL     1K-20KHz
            MOH                      .082 In/Sec       .495 G-s
            MIH                      .063 In/Sec      1.375 G-s
            MIA                      .045 In/Sec       .834 G-s
            IIH                      .185 In/Sec       .675 G-s
            IIA                      .164 In/Sec       .699 G-s
            IOH                      .197 In/Sec      1.348 G-s
            OIH                      .223 In/Sec       .647 G-s
            OOH                      .222 In/Sec       .661 G-s

      HX507C FAN - HX507C GAS COOL FAN           (23-Feb-24)
                                 OVERALL LEVEL     1K-20KHz
            MOH                      .220 In/Sec       .050 G-s
            MIH                      .343 In/Sec       .056 G-s

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   Clarification Of Vibration Units:
      Acc      -->  G-s      RMS
      Vel      -->  In/Sec   PK
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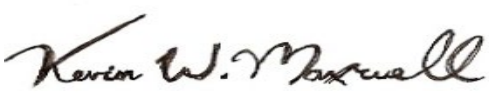
As always, it has been a pleasure to serve North Shelby-Archaea Energy. If there are any comments or questions, do not hesitate to contact us.

Sincerely,



ISO Certified Vibration Analyst, Category III

HI-SPEED INDUSTRIAL SERVICE

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