HI-SPEED INDUSTRIAL SERVICE QualiTest® Diagnostics

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

September 19th, 2023

Nathan Allen
North Shelby Plant
Millington, TN

Nathan,

The following is a summary of findings from the September 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

Defects

101-B Feed Compressor

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 shows 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
301 FLARE - 301 FLARE BLOWER	(07-Sep-23)	
	OVERALL LEVEL	1K-20KHz
MOH	.100 In/Sec	.552 G-s
MOV	.207 In/Sec	.142 G-s
MIH	.105 In/Sec	.808 G-s
MIV	.121 In/Sec	.117 G-s
MIA	.078 In/Sec	.267 G-s
EIH	.192 In/Sec	.277 G-s
EIV	.082 In/Sec	.416 G-s
EIA	.058 In/Sec	.152 G-s
EOH	.145 In/Sec	.254 G-s
EOV	.060 In/Sec	.259 G-s
RINSE COMP - RINSE COMPRESSOR	(07-Sep-23)	
	OVERALL LEVEL	1K-20KHz
MOH	.119 In/Sec	5.267 G-s
MIH	.119 In/Sec	2.442 G-s
MIA	.113 In/Sec	.295 G-s
IIH	.074 In/Sec	.625 G-s
IIA	.110 In/Sec	.150 G-s
IOH	.102 In/Sec	.522 G-s
OIH	.053 In/Sec	.835 G-s
OIA	.085 In/Sec	.122 G-s
OOH	.119 In/Sec	.605 G-s
VAC COMP - VACUUM COMPRESSOR	(07-Sep-23)	
	OVERALL LEVEL	1K-20KHz
MOH	.087 In/Sec	1.661 G-s
MIH	.124 In/Sec	1.998 G-s
MIA	.056 In/Sec	.163 G-s
IIH	.094 In/Sec	.304 G-s
IIA	.060 In/Sec	.090 G-s
IOH	.107 In/Sec	.606 G-s
OIH	.042 In/Sec	.386 G-s
OIA	.078 In/Sec	.084 G-s
OOH	.124 In/Sec	.729 G-s
COOLFAN1 - COOLING FAN 1	(07-Sep-23)	
	OVERALL LEVEL	1K-20KHz
MOH	.035 In/Sec	.737 G-s
MOV	.032 In/Sec	.240 G-s
MIH	.048 In/Sec	.420 G-s
MIV	.020 In/Sec	.142 G-s

MIA	.018 In/Sec	.104 G-s

101B COMP - 101B FEED COMPRESSOR (07-Sep-23)

	OVERALL LEVEL	1K-20KHz
MOH	.247 In/Sec	.226 G-s
MIH	.250 In/Sec	.262 G-s
MIA	.042 In/Sec	.263 G-s
IIH	.127 In/Sec	2.532 G-s
IIA	.356 In/Sec	2.463 G-s
IOH	.144 In/Sec	2.227 G-s
OIH	.176 In/Sec	2.981 G-s
OIA	.142 In/Sec	6.855 G-s
OOH	.161 In/Sec	3.065 G-s

HX132B FAN - HX132B GAS OIL COOLER FAN (07-Sep-23)

	OVERALL LEVEL	1K-20KHz
MOH	.047 In/Sec	.031 G-s
MIH	.093 In/Sec	.121 G-s
EIH	.104 In/Sec	.081 G-s
EOH	.061 In/Sec	.039 G-s

451A PUMP - 451A VACCUM PUMP (07-Sep-23)

	OVERALL LEVEL	1K-20KHz
MOH	.059 In/Sec	1.079 G-s
MOV	.069 In/Sec	.228 G-s
MIH	.078 In/Sec	.445 G-s
MIV	.104 In/Sec	.522 G-s
MIA	.057 In/Sec	.310 G-s
EIH	.194 In/Sec	.248 G-s
EIV	.145 In/Sec	.070 G-s
EIA	.108 In/Sec	.071 G-s
EOH	.169 In/Sec	.463 G-s
EOV	.171 In/Sec	.162 G-s

HX453A FAN - HX453A VAC PUMP OIL COOL FAN (07-Sep-23)

	OVERALL LEVEL	1K-20KHz
MOH	.173 In/Sec	.154 G-s
MIH	.101 In/Sec	.106 G-s

451B PUMP - 451B VACCUM PUMP (07-Sep-23)

	OVERALL LEVEL	1K-20KHz
MOH	.047 In/Sec	.424 G-s
MOV	.078 In/Sec	.093 G-s
MIH	.063 In/Sec	.453 G-s
MIV	.086 In/Sec	.145 G-s
MIA	.044 In/Sec	.144 G-s
EIH	.157 In/Sec	.370 G-s
EIV	.126 In/Sec	.085 G-s
EIA	.120 In/Sec	.095 G-s
EOH	.179 In/Sec	.606 G-s
EOV	.167 In/Sec	.133 G-s

HX453B FAN - HX453B VAC PUMP OIL COOL FAN (07-Sep-23)

	OVERALL LEVEL	1K-20KHz
MOH	.146 In/Sec	.192 G-s
MIH	.121 In/Sec	.111 G-s

451C PUMP - 451C VACCUM PUMP (07-Sep-23)

	OVERALL LEVEL	1K-20KHz
MOH	.115 In/Sec	.420 G-s
MOV	.115 In/Sec	.106 G-s
MIH	.138 In/Sec	.380 G-s
MIV	.216 In/Sec	.125 G-s
MIA	.082 In/Sec	.080 G-s
EIH	.161 In/Sec	.524 G-s
EIV	.102 In/Sec	.175 G-s
EIA	.097 In/Sec	.180 G-s
EOH	.144 In/Sec	.618 G-s
EOV	.158 In/Sec	.118 G-s

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HX453C FAN - HX453C VAC PUMP OIL COOL FAN   (07-Sep-23)
                                 OVERALL LEVEL      1K-20KHz
        MOH                       .152 In/Sec        .336 G-s
        MIH                       .151 In/Sec        .141 G-s

451D PUMP  - 451D VACCUM PUMP                (07-Sep-23)
                                 OVERALL LEVEL      1K-20KHz
        MOH                       .092 In/Sec        .861 G-s
        MOV                       .093 In/Sec        .314 G-s
        MIH                       .108 In/Sec       1.174 G-s
        MIV                       .086 In/Sec        .161 G-s
        MIA                       .034 In/Sec        .306 G-s
        EIH                       .205 In/Sec        .523 G-s
        EIV                       .155 In/Sec        .140 G-s
        EIA                       .129 In/Sec        .118 G-s
        EOH                       .164 In/Sec        .731 G-s
        EOV                       .151 In/Sec        .162 G-s

HX453D FAN - HX453D VAC PUMP OIL COOL FAN   (07-Sep-23)
                                 OVERALL LEVEL      1K-20KHz
        MOH                       .215 In/Sec        .129 G-s
        MIH                       .170 In/Sec        .085 G-s

506B COMP  - 506B PRODUCT COMPRESSOR         (07-Sep-23)
                                 OVERALL LEVEL      1K-20KHz
        MOH                       .137 In/Sec       2.151 G-s
        MIH                       .169 In/Sec       6.765 G-s
        MIA                       .093 In/Sec       3.152 G-s
        IIH                       .151 In/Sec        .638 G-s
        IIA                       .119 In/Sec        .935 G-s
        IOH                       .222 In/Sec       2.040 G-s
        OIH                       .218 In/Sec       1.422 G-s
        OOH                       .213 In/Sec       2.356 G-s

HX507B FAN - HX507B GAS COOL FAN             (07-Sep-23)
                                 OVERALL LEVEL      1K-20KHz
        MOH                       .100 In/Sec        .072 G-s
        MIH                       .141 In/Sec        .086 G-s

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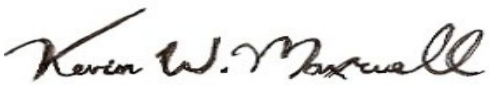
As always, it has been a pleasure to serve North Shelby-Archaea Energy. If there are any comments or questions, do not hesitate to contact us.

Sincerely,



ISO Certified Vibration Analyst, Category III

HI-SPEED INDUSTRIAL SERVICE

QualiTest® Diagnostics

Cell: 901-486-4565

Email: kwilliam@gohispeed.com