HI-SPEED INDUSTRIAL SERVICE QualiTest® Diagnostics

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January 12, 2021

Aria Energy
North Shelby Plant
Millington, TN

The following is a summary of findings from the January 2021 monthly vibration survey at your facility. Please let us know if there are any questions or comments.

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

451C Vacuum Pump

Motor drive end bearing vibration data shows an increase in peak-to-peak acceleration. Data shows some noise floor present which may be caused by lubrication issue. Bearing is starting to show some signs of wear also. Rated as a **CLASS I** defect for now. We will monitor this closely.

451D Vacuum Pump

Motor on this unit continues to have an electrical related vibration. We will monitor this closely. Rated as a **CLASS I** defect for now.

Product Compressor A

Compressor was down this survey; however, the following still applies: Compressor has lower axial vibration this survey. Data still shows some signs of internal wear or other internal issue of the compressor components. Rated as a low **CLASS II** defect.

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	(12-Jan-21)	
	OVERALL LEVEL	1K-20KHz
MOH	.068 In/Sec	.286 G-s
MIH	.116 In/Sec	.214 G-s
MIA	.050 In/Sec	.864 G-s
EIH	.088 In/Sec	.093 G-s
EIA	.087 In/Sec	.155 G-s
EOH	.105 In/Sec	.197 G-s
101A COMP - 101A FEED COMPRESSOR	(12-Jan-21)	
	OVERALL LEVEL	1K-20KHz
MOH	.031 In/Sec	.115 G-s
MIH	.054 In/Sec	.102 G-s
MIA	.031 In/Sec	.116 G-s
IIH	.075 In/Sec	.532 G-s
IIA	.165 In/Sec	.524 G-s
IOH	.074 In/Sec	.531 G-s
OIH	.112 In/Sec	.736 G-s
OIA	.104 In/Sec	.218 G-s
OOH	.116 In/Sec	1.203 G-s
101B COMP - 101B FEED COMPRESSOR	(12-Jan-21)	
	OVERALL LEVEL	1K-20KHz
MOH	.253 In/Sec	.464 G-s
MIH	.228 In/Sec	.214 G-s
MIA	.041 In/Sec	.174 G-s
IIH	.086 In/Sec	.823 G-s
IIA	.262 In/Sec	.711 G-s
IOH	.080 In/Sec	.723 G-s
OIH	.095 In/Sec	.925 G-s
OIA	.124 In/Sec	.687 G-s
OOH	.098 In/Sec	1.307 G-s

HX132A FAN - HX132A GAS OIL COOLER FAN (12-Jan-21)

	OVERALL LEVEL	1K-20KHz
MOH	.085 In/Sec	.162 G-s
MIH	.089 In/Sec	.205 G-s
EIH	.034 In/Sec	.030 G-s
EOH	.054 In/Sec	.039 G-s

HX132B FAN - HX132B GAS OIL COOLER FAN (12-Jan-21)

	OVERALL LEVEL	1K-20KHz
MOH	.060 In/Sec	.025 G-s
MIH	.145 In/Sec	.137 G-s
EIH	.203 In/Sec	.084 G-s
EOH	.071 In/Sec	.032 G-s

451A PUMP - 451A VACCUM PUMP (12-Jan-21)

	OVERALL LEVEL	1K-20KHz
MOH	.069 In/Sec	.585 G-s
MIH	.068 In/Sec	.251 G-s
MIA	.035 In/Sec	.290 G-s
EIH	.157 In/Sec	.324 G-s
EIA	.086 In/Sec	.264 G-s
EOH	.153 In/Sec	.259 G-s

HX453A FAN - HX453A VAC PUMP OIL COOL FAN (12-Jan-21)

	OVERALL LEVEL	1K-20KHz
MOH	.183 In/Sec	.088 G-s
MIH	.149 In/Sec	.030 G-s

451B PUMP - 451B VACCUM PUMP (12-Jan-21)

	OVERALL LEVEL	1K-20KHz
MOH	.067 In/Sec	.310 G-s
MIH	.099 In/Sec	.133 G-s
MIA	.043 In/Sec	.140 G-s
EIH	.161 In/Sec	.319 G-s
EIA	.084 In/Sec	.250 G-s
EOH	.176 In/Sec	.323 G-s

HX453B FAN - HX453B VAC PUMP OIL COOL FAN (12-Jan-21)

	OVERALL LEVEL	1K-20KHz
MOH	.166 In/Sec	.175 G-s
MIH	.109 In/Sec	.030 G-s

451C PUMP - 451C VACCUM PUMP (12-Jan-21)

	OVERALL LEVEL	1K-20KHz
MOH	.116 In/Sec	.633 G-s
MIH	.127 In/Sec	.859 G-s
MIA	.071 In/Sec	.532 G-s
EIH	.155 In/Sec	.388 G-s
EIA	.091 In/Sec	.266 G-s
EOH	.147 In/Sec	.929 G-s

HX453C FAN - HX453C VAC PUMP OIL COOL FAN (12-Jan-21)

	OVERALL LEVEL	1K-20KHz
MOH	.152 In/Sec	.053 G-s
MIH	.127 In/Sec	.096 G-s

451D PUMP - 451D VACCUM PUMP (12-Jan-21)

	OVERALL LEVEL	1K-20KHz
MOH	.066 In/Sec	.535 G-s
MIH	.089 In/Sec	.793 G-s
MIA	.042 In/Sec	.531 G-s
EIH	.237 In/Sec	.351 G-s
EIA	.103 In/Sec	.305 G-s
EOH	.112 In/Sec	.483 G-s

HX453D FAN - HX453D VAC PUMP OIL COOL FAN (12-Jan-21)

	OVERALL LEVEL	1K-20KHz
MOH	.193 In/Sec	.023 G-s
MIH	.193 In/Sec	.052 G-s

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506B COMP  - 506B PRODUCT COMPRESSOR       (12-Jan-21)
                                OVERALL LEVEL     1K-20KHz
        MOH                      .129 In/Sec       .242 G-s
        MIH                      .096 In/Sec       .261 G-s
        MIA                      .095 In/Sec       .205 G-s
        IIH                      .142 In/Sec       .483 G-s
        IIA                      .346 In/Sec       .415 G-s
        IOH                      .191 In/Sec      1.908 G-s

HX507B FAN - HX507B GAS COOL FAN           (12-Jan-21)
                                OVERALL LEVEL     1K-20KHz
        MOH                      .112 In/Sec       .030 G-s
        MIH                      .212 In/Sec       .063 G-s

506C COMP  - 506C PRODUCT COMPRESSOR       (12-Jan-21)
                                OVERALL LEVEL     1K-20KHz
        MOH                      .091 In/Sec       .188 G-s
        MIH                      .068 In/Sec       .368 G-s
        MIA                      .053 In/Sec       .150 G-s
        IIH                      .117 In/Sec       .538 G-s
        IIA                      .124 In/Sec       .376 G-s
        IOH                      .161 In/Sec      1.896 G-s

HX507C FAN - HX507C GAS COOL FAN           (12-Jan-21)
                                OVERALL LEVEL     1K-20KHz
        MOH                      .133 In/Sec       .069 G-s
        MIH                      .143 In/Sec       .050 G-s

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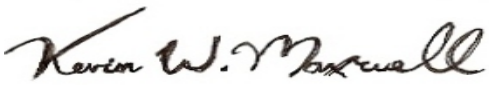
As always, it has been a pleasure to serve Aria Energy. If there are any comments or questions, do not hesitate to contact us.

Sincerely,



ISO Certified Vibration Analyst, Category III

HI-SPEED INDUSTRIAL SERVICE

QualiTest® Diagnostics

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