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August 20, 2020

Aria Energy
Millington, TN

The following is a summary of findings from the August 2020 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

Feed Compressor B

Motor 1 x rpm vibration is high again this survey. This is likely due to the motor operating at or near a resonant frequency. Rated as a **CLASS II** defect.

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 has elevated axial vibration. This may indicate internal wear or other internal issue of the compressor components. Rated as a **CLASS II** 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		(14-Aug-20)	
		OVERALL LEVEL	1K-20KHz
	MOH	.065 In/Sec	.208 G-s
	MIH	.119 In/Sec	.320 G-s
	MIA	.073 In/Sec	.620 G-s
	EIH	.179 In/Sec	.248 G-s
	EIA	.119 In/Sec	.184 G-s
	EOH	.113 In/Sec	.124 G-s
TX301 FAN - TX301 AFTERCOOLER FAN		(14-Aug-20)	
		OVERALL LEVEL	1K-20KHz
	MOH	.019 In/Sec	.182 G-s
	MIH	.017 In/Sec	.464 G-s
	MIA	.032 In/Sec	.118 G-s
	FIH	.012 In/Sec	.019 G-s
	FOH	.018 In/Sec	.030 G-s
101A COMP - 101A FEED COMPRESSOR		(14-Aug-20)	
		OVERALL LEVEL	1K-20KHz
	MOH	.062 In/Sec	.113 G-s
	MIH	.071 In/Sec	.144 G-s
	MIA	.039 In/Sec	.129 G-s
	IIH	.079 In/Sec	.819 G-s
	IIA	.177 In/Sec	.285 G-s
	IOH	.105 In/Sec	.435 G-s
	OIH	.074 In/Sec	.262 G-s
	OIA	.091 In/Sec	1.619 G-s
	OOH	.086 In/Sec	.561 G-s
101B COMP - 101B FEED COMPRESSOR		(14-Aug-20)	
		OVERALL LEVEL	1K-20KHz
	MOH	.794 In/Sec	.186 G-s
	MIH	.720 In/Sec	.251 G-s
	MIA	.082 In/Sec	.239 G-s
	IIH	.104 In/Sec	.851 G-s
	IIA	.270 In/Sec	.912 G-s

IOH	.130 In/Sec	1.052 G-s
OIH	.117 In/Sec	1.180 G-s
OIA	.169 In/Sec	.506 G-s
OOH	.152 In/Sec	1.291 G-s

HX132A FAN - HX132A GAS OIL COOLER FAN (14-Aug-20)

	OVERALL LEVEL	1K-20KHz
MOH	.104 In/Sec	.129 G-s
MIH	.099 In/Sec	.119 G-s
EIH	.048 In/Sec	.042 G-s
EOH	.068 In/Sec	.057 G-s

HX132B FAN - HX132B GAS OIL COOLER FAN (14-Aug-20)

	OVERALL LEVEL	1K-20KHz
MOH	.041 In/Sec	.025 G-s
MIH	.114 In/Sec	.103 G-s
EIH	.142 In/Sec	.077 G-s
EOH	.036 In/Sec	.026 G-s

451A PUMP - 451A VACCUM PUMP (14-Aug-20)

	OVERALL LEVEL	1K-20KHz
MOH	.049 In/Sec	.556 G-s
MIH	.072 In/Sec	.256 G-s
MIA	.037 In/Sec	.181 G-s
EIH	.136 In/Sec	.326 G-s
EIA	.091 In/Sec	.267 G-s
EOH	.140 In/Sec	.309 G-s

HX453A FAN - HX453A VAC PUMP OIL COOL FAN (14-Aug-20)

	OVERALL LEVEL	1K-20KHz
MOH	.127 In/Sec	.091 G-s
MIH	.100 In/Sec	.0095 G-s

451B PUMP - 451B VACCUM PUMP (14-Aug-20)

	OVERALL LEVEL	1K-20KHz
MOH	.045 In/Sec	.446 G-s
MIH	.060 In/Sec	.469 G-s
MIA	.037 In/Sec	.655 G-s
EIH	.134 In/Sec	.304 G-s
EIA	.088 In/Sec	.220 G-s
EOH	.162 In/Sec	.333 G-s

HX453B FAN - HX453B VAC PUMP OIL COOL FAN (14-Aug-20)

	OVERALL LEVEL	1K-20KHz
MOH	.156 In/Sec	.239 G-s
MIH	.123 In/Sec	.064 G-s

451C PUMP - 451C VACCUM PUMP (14-Aug-20)

	OVERALL LEVEL	1K-20KHz
MOH	.073 In/Sec	.388 G-s
MIH	.117 In/Sec	.412 G-s
MIA	.067 In/Sec	.118 G-s
EIH	.157 In/Sec	.438 G-s
EIA	.069 In/Sec	.294 G-s
EOH	.171 In/Sec	.774 G-s

HX453C FAN - HX453C VAC PUMP OIL COOL FAN (14-Aug-20)

	OVERALL LEVEL	1K-20KHz
MOH	.153 In/Sec	.033 G-s
MIH	.125 In/Sec	.048 G-s

451D PUMP - 451D VACCUM PUMP (14-Aug-20)

	OVERALL LEVEL	1K-20KHz
MOH	.070 In/Sec	.649 G-s
MIH	.085 In/Sec	1.243 G-s
MIA	.044 In/Sec	.994 G-s
EIH	.212 In/Sec	.341 G-s
EIA	.064 In/Sec	.243 G-s
EOH	.159 In/Sec	.243 G-s

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HX453D FAN - HX453D VAC PUMP OIL COOL FAN   (14-Aug-20)
                                OVERALL LEVEL      1K-20KHz
        MOH                      .230 In/Sec        .029 G-s
        MIH                      .204 In/Sec        .023 G-s
        MIA                      .251 In/Sec        .041 G-s

506A COMP  - 506A PRODUCT COMPRESSOR        (14-Aug-20)
                                OVERALL LEVEL      1K-20KHz
        MOH                      .073 In/Sec        .295 G-s
        MIH                      .065 In/Sec        .288 G-s
        MIA                      .069 In/Sec        .096 G-s
        IIH                      .228 In/Sec       1.040 G-s
        IIA                      .402 In/Sec        .589 G-s
        IOH                      .171 In/Sec       1.534 G-s

HX507A FAN - HX507A GAS COOL FAN            (14-Aug-20)
                                OVERALL LEVEL      1K-20KHz
        MOH                      .130 In/Sec        .048 G-s
        MIH                      .133 In/Sec        .050 G-s

506C COMP  - 506C PRODUCT COMPRESSOR        (14-Aug-20)
                                OVERALL LEVEL      1K-20KHz
        MOH                      .090 In/Sec        .186 G-s
        MIH                      .058 In/Sec        .673 G-s
        MIA                      .064 In/Sec        .204 G-s
        IIH                      .135 In/Sec        .819 G-s
        IIA                      .265 In/Sec        .377 G-s
        IOH                      .172 In/Sec       2.158 G-s

HX507C FAN - HX507C GAS COOL FAN            (14-Aug-20)
                                OVERALL LEVEL      1K-20KHz
        MOH                      .110 In/Sec        .089 G-s
        MIH                      .132 In/Sec        .080 G-s

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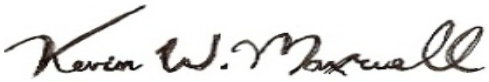
As always, it has been a pleasure to serve Aria Energy. If there are any comments or questions, do not hesitate to contact us.

Sincerely,



ISO Certified Vibration Analyst, Category III

HI-SPEED INDUSTRIAL SERVICE

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