

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

August 19, 2019

Aria Energy Millington, TN

The following is a summary of findings from the August 2019 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.

<u>Class I:</u> Defect is present, but effect on reliability is not clear; no immediate action is required. Continue to normally monitor.

<u>Class II:</u> Defect (s) present that may cause problem in long term (2-6 months). Repair during normal maintenance scheduling. Continue to monitor.

<u>Class III:</u> 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**

## **HX453C Vac Pump Oil Cool Fan**

Vibration data is showing signs of bearing defects. Motor bearings may need to be replaced as time allows. We will monitor this issue closely. Rated as a **CLASS II** defect.

## **HX453D Vac Pump Oil Cool Fan**

Vibration data is showing signs of bearing defects. Motor bearings may need to be replaced as time allows. We will monitor this issue closely. Rated as a **CLASS II** defect.

#### 101B Feed Compressor

Data of the compressor does vary some month to month due to load; with acceleration being highest in the compressor second stage axial. We will continue to monitor this closely. Rated as a **CLASS I** defect.

#### HX507B Gas Cool Fan

Drive end motor bearing is now showing signs of bearing defects. We will monitor this issue closely. Rated as a **CLASS II** defect.

#### **HX507C Gas Cool Fan**

Data of the top (DE) motor bearing is showing some increased vibration associated with bearing defects/wear. Motor will need to be swapped out SOON. We will monitor this closely. Rated as a **CLASS III** defect.

# Abbreviated Last Measurement Summary

Database: Clean Energy.rbm
Area: millington plant
Report Date: 19-Aug-19 15:34

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
301 FLARE - 301 FLARE BLOWER	R (	19-Aug-19)
	OVERALL LEVEL	1K-20KHz
MOH	.057 In/Sec	.281 G-s
MIH	.098 In/Sec	.435 G-s
MIA	.045 In/Sec	.548 G-s
EIH	.149 In/Sec	.367 G-s
EIA	.061 In/Sec	.848 G-s
EOH	.097 In/Sec	.114 G-s
TX301 FAN - TX301 AFTERCOOLI		
	OVERALL LEVEL	1K-20KHz
MOH	.062 In/Sec	.287 G-s
MIH	.038 In/Sec	
MIA	.077 In/Sec	.162 G-s
FIH	.027 In/Sec	.033 G-s
101A COMP - 101A FEED COMPRI	ESSOR (	19-Aug-19)
	OVERALL LEVEL	
MOH	.037 In/Sec	
MIH	.055 In/Sec	.133 G-s
MIA	.048 In/Sec	
IIH	.085 In/Sec	.564 G-s
IIA	.250 In/Sec	
IOH	.115 In/Sec	.745 G-s
OIH	.093 In/Sec	.569 G-s
OIA	.088 In/Sec	1.009 G-s

OOH .082 In/Sec .285 G-s

101B COMP	- 101B FEED COMP	PRESSOR (1	
		OVERALL LEVEL	1K-20KHz
MOH		.060 In/Sec	.197 G-s
MIH		.077 In/Sec	.125 G-s
MIA		.026 In/Sec	.227 G-s
IIH		.060 In/Sec .077 In/Sec .026 In/Sec .064 In/Sec .175 In/Sec .083 In/Sec	.379 G-s
IIA		.175 In/Sec	1.036 G-s
IOH		.083 In/Sec	.870 G-s
OIH		.076 In/Sec	1.137 G-s
OIA		078 In/Sec	1 604 G-s
ООН		.078 In/Sec .071 In/Sec	447 G-s
0011		.071 111,000	.117 0 5
UV1223 E3N	- HV1323 CAC OTT	COOLER FAN (1	0_7,,,,,_10\
DAISZA FAN	- HAISZA GAS OIL	COOLER FAN (I	9-Aug-19)
		OVERALL LEVEL	IK-2UKHZ
МОН		.112 In/Sec	.123 G-s
MIH		.112 In/Sec	.115 G-s
EIH		.048 In/Sec .060 In/Sec	.047 G-s
EOH		.060 In/Sec	.067 G-s
HX132B FAN	- HX132B GAS OIL	COOLER FAN (1	
		OVERALL LEVEL	
MOH		.063 In/Sec	.059 G-s
MIH		.193 In/Sec	.108 G-s
EIH		.257 In/Sec	.078 G-s
EOH		.193 In/Sec .257 In/Sec .062 In/Sec	.042 G-s
		• • • • • • • • • • • • • • • • • • • •	
451A PIIMP	- 451A VACCUM PU	IMP (1	9-Aug-19)
10111 10111	10211 11100011 10	OVERALL LEVEL	
мон		048 TR/Soc	231 C-s
MIH		.048 In/Sec .067 In/Sec .048 In/Sec .144 In/Sec	.231 G-s
		.007 III/Sec	.060 G-S
MIA		.048 In/Sec	.304 G-S
EIH		.144 In/Sec	.390 G-s
EIA		.092 In/Sec .123 In/Sec	.238 G-s
EOH		.123 In/Sec	.246 G-s
		,	
HX453A FAN	- HX453A VAC PUM	IP OIL COOL FAN (1	9-Aug-19)
HX453A FAN	- HX453A VAC PUM	IP OIL COOL FAN (1	9-Aug-19)
HX453A FAN		IP OIL COOL FAN (1: OVERALL LEVEL .213 In/Sec	9-Aug-19) 1K-20KHz .074 G-s
		IP OIL COOL FAN (1	9-Aug-19) 1K-20KHz .074 G-s
MOH MIH		IP OIL COOL FAN (1) OVERALL LEVEL .213 In/Sec .137 In/Sec	9-Aug-19) 1K-20KHz .074 G-s
MOH MIH		IP OIL COOL FAN (1) OVERALL LEVEL .213 In/Sec .137 In/Sec	9-Aug-19) 1K-20KHz .074 G-s
MOH MIH		IP OIL COOL FAN (1: OVERALL LEVEL .213 In/Sec .137 In/Sec	9-Aug-19) 1K-20KHz .074 G-s .043 G-s
MOH MIH	- 451B VACCUM PU	IP OIL COOL FAN (1: OVERALL LEVEL .213 In/Sec .137 In/Sec IMP (1: OVERALL LEVEL	9-Aug-19) 1K-20KHz .074 G-s .043 G-s 9-Aug-19) 1K-20KHz
мон мін 451в РИМР	- 451B VACCUM PU	IP OIL COOL FAN (1:  OVERALL LEVEL  .213 In/Sec  .137 In/Sec  MP (1:  OVERALL LEVEL  .033 In/Sec  .052 In/Sec	9-Aug-19) 1K-20KHz .074 G-s .043 G-s 9-Aug-19) 1K-20KHz .178 G-s
мон мін 451в РИМР мон	- 451B VACCUM PU	IP OIL COOL FAN (1:  OVERALL LEVEL  .213 In/Sec  .137 In/Sec  MP (1:  OVERALL LEVEL  .033 In/Sec  .052 In/Sec	9-Aug-19) 1K-20KHz .074 G-s .043 G-s 9-Aug-19) 1K-20KHz .178 G-s
MOH MIH 451B PUMP MOH MIH MIA	- 451B VACCUM PU	OVERALL LEVEL .213 In/Sec .137 In/Sec  MP OVERALL LEVEL .033 In/Sec .052 In/Sec .031 In/Sec	9-Aug-19) 1K-20KHz .074 G-s .043 G-s 9-Aug-19) 1K-20KHz .178 G-s .491 G-s .448 G-s
MOH MIH 451B PUMP MOH MIH MIA EIH	- 451B VACCUM PU	OVERALL LEVEL .213 In/Sec .137 In/Sec  MP OVERALL LEVEL .033 In/Sec .052 In/Sec .031 In/Sec .167 In/Sec	9-Aug-19) 1K-20KHz .074 G-s .043 G-s 9-Aug-19) 1K-20KHz .178 G-s .491 G-s .448 G-s .369 G-s
MOH MIH 451B PUMP MOH MIH MIA EIH EIA	- 451B VACCUM PU	OVERALL LEVEL .213 In/Sec .137 In/Sec  MP OVERALL LEVEL .033 In/Sec .052 In/Sec .031 In/Sec .167 In/Sec	9-Aug-19) 1K-20KHz .074 G-s .043 G-s 9-Aug-19) 1K-20KHz .178 G-s .491 G-s .448 G-s .369 G-s
MOH MIH 451B PUMP MOH MIH MIA EIH	- 451B VACCUM PU	OVERALL LEVEL .213 In/Sec .137 In/Sec  MP OVERALL LEVEL .033 In/Sec .052 In/Sec .031 In/Sec	9-Aug-19) 1K-20KHz .074 G-s .043 G-s 9-Aug-19) 1K-20KHz .178 G-s .491 G-s .448 G-s .369 G-s
MOH MIH 451B PUMP MOH MIH MIA EIH EIA EOH	- 451B VACCUM PU	OVERALL LEVEL .213 In/Sec .137 In/Sec  MP  OVERALL LEVEL .033 In/Sec .052 In/Sec .052 In/Sec .031 In/Sec .167 In/Sec .094 In/Sec .173 In/Sec	9-Aug-19) 1K-20KHz .074 G-s .043 G-s 9-Aug-19) 1K-20KHz .178 G-s .491 G-s .448 G-s .369 G-s .330 G-s .237 G-s
MOH MIH 451B PUMP MOH MIH MIA EIH EIA EOH	- 451B VACCUM PU	IP OIL COOL FAN (1:  OVERALL LEVEL .213 In/Sec .137 In/Sec  IMP (1:  OVERALL LEVEL .033 In/Sec .052 In/Sec .052 In/Sec .031 In/Sec .167 In/Sec .167 In/Sec .173 In/Sec .173 In/Sec	9-Aug-19) 1K-20KHz .074 G-s .043 G-s 9-Aug-19) 1K-20KHz .178 G-s .491 G-s .448 G-s .369 G-s .330 G-s .237 G-s
MOH MIH 451B PUMP MOH MIH MIA EIH EIA EOH	- 451B VACCUM PU	IP OIL COOL FAN (1:  OVERALL LEVEL  .213 In/Sec .137 In/Sec  IMP (1:  OVERALL LEVEL  .033 In/Sec .052 In/Sec .052 In/Sec .031 In/Sec .167 In/Sec .167 In/Sec .173 In/Sec .173 In/Sec IP OIL COOL FAN (1:  OVERALL LEVEL	9-Aug-19)  1K-20KHz  .074 G-s  .043 G-s  9-Aug-19)  1K-20KHz  .178 G-s  .491 G-s  .448 G-s  .369 G-s  .330 G-s  .237 G-s  9-Aug-19)  1K-20KHz
MOH MIH  451B PUMP  MOH MIH  MIA  EIH  EIA  EOH  HX453B FAN	- 451B VACCUM PU	IP OIL COOL FAN (1:  OVERALL LEVEL  .213 In/Sec .137 In/Sec  IMP (1:  OVERALL LEVEL  .033 In/Sec .052 In/Sec .052 In/Sec .031 In/Sec .167 In/Sec .167 In/Sec .173 In/Sec IP OIL COOL FAN (1:  OVERALL LEVEL .193 In/Sec	9-Aug-19)  1K-20KHz .074 G-s .043 G-s  9-Aug-19)  1K-20KHz .178 G-s .491 G-s .448 G-s .369 G-s .330 G-s .237 G-s  9-Aug-19)  1K-20KHz .232 G-s
MOH MIH 451B PUMP MOH MIH MIA EIH EIA EOH	- 451B VACCUM PU	IP OIL COOL FAN (1:  OVERALL LEVEL  .213 In/Sec .137 In/Sec  IMP (1:  OVERALL LEVEL  .033 In/Sec .052 In/Sec .052 In/Sec .051 In/Sec .167 In/Sec .167 In/Sec .173 In/Sec .173 In/Sec IP OIL COOL FAN (1:  OVERALL LEVEL	9-Aug-19)  1K-20KHz .074 G-s .043 G-s  9-Aug-19)  1K-20KHz .178 G-s .491 G-s .448 G-s .369 G-s .330 G-s .237 G-s  9-Aug-19)  1K-20KHz .232 G-s
MOH MIH  451B PUMP  MOH MIH  MIA  EIH  EIA  EOH  HX453B FAN  MOH  MIH	- 451B VACCUM PU	IP OIL COOL FAN (1:  OVERALL LEVEL .213 In/Sec .137 In/Sec  IMP (1:  OVERALL LEVEL .033 In/Sec .052 In/Sec .052 In/Sec .031 In/Sec .167 In/Sec .167 In/Sec .173 In/Sec IP OIL COOL FAN (1:  OVERALL LEVEL .193 In/Sec .103 In/Sec	9-Aug-19)  1K-20KHz  .074 G-s  .043 G-s  9-Aug-19)  1K-20KHz  .178 G-s  .491 G-s  .448 G-s  .369 G-s  .330 G-s  .237 G-s  9-Aug-19)  1K-20KHz  .232 G-s  .050 G-s
MOH MIH  451B PUMP  MOH MIH  MIA  EIH  EIA  EOH  HX453B FAN  MOH  MIH	- 451B VACCUM PU	IP OIL COOL FAN (1:  OVERALL LEVEL .213 In/Sec .137 In/Sec  IMP (1:  OVERALL LEVEL .033 In/Sec .052 In/Sec .052 In/Sec .031 In/Sec .167 In/Sec .167 In/Sec .173 In/Sec IP OIL COOL FAN (1: OVERALL LEVEL .193 In/Sec .103 In/Sec .103 In/Sec	9-Aug-19)  1K-20KHz  .074 G-s  .043 G-s  9-Aug-19)  1K-20KHz  .178 G-s  .491 G-s  .448 G-s  .369 G-s  .330 G-s  .237 G-s  9-Aug-19)  1K-20KHz  .232 G-s  .050 G-s
MOH MIH  451B PUMP  MOH MIH  MIA  EIH  EIA  EOH  HX453B FAN  MOH  MIH  451C PUMP	- 451B VACCUM PU - HX453B VAC PUM - 451C VACCUM PU	IP OIL COOL FAN (1:  OVERALL LEVEL  .213 In/Sec .137 In/Sec  IMP (1:  OVERALL LEVEL  .033 In/Sec .052 In/Sec .052 In/Sec .051 In/Sec .167 In/Sec .167 In/Sec .173 In/Sec IP OIL COOL FAN (1:  OVERALL LEVEL .193 In/Sec .103 In/Sec .103 In/Sec .103 In/Sec .103 In/Sec	9-Aug-19)  1K-20KHz  .074 G-s  .043 G-s  9-Aug-19)  1K-20KHz  .178 G-s  .491 G-s  .448 G-s  .369 G-s  .330 G-s  .237 G-s  9-Aug-19)  1K-20KHz  .232 G-s  .050 G-s
MOH MIH  451B PUMP  MOH MIH  MIA EIH EIA EOH  HX453B FAN  MOH MIH  451C PUMP	- 451B VACCUM PU - HX453B VAC PUM - 451C VACCUM PU	IP OIL COOL FAN (1:  OVERALL LEVEL  .213 In/Sec .137 In/Sec  IMP (1:  OVERALL LEVEL  .033 In/Sec .052 In/Sec .052 In/Sec .051 In/Sec .167 In/Sec .167 In/Sec .173 In/Sec IP OIL COOL FAN (1:  OVERALL LEVEL .193 In/Sec .103 In/Sec .103 In/Sec .103 In/Sec .103 In/Sec	9-Aug-19)  1K-20KHz  .074 G-s  .043 G-s  9-Aug-19)  1K-20KHz  .178 G-s  .491 G-s  .448 G-s  .369 G-s  .330 G-s  .237 G-s  9-Aug-19)  1K-20KHz  .232 G-s  .050 G-s
MOH MIH  451B PUMP  MOH MIH  MIA EIH EIA EOH  HX453B FAN  MOH MIH  451C PUMP  MOH MIH	- 451B VACCUM PU - HX453B VAC PUM - 451C VACCUM PU	IP OIL COOL FAN (1:  OVERALL LEVEL  .213 In/Sec .137 In/Sec  IMP (1:  OVERALL LEVEL  .033 In/Sec .052 In/Sec .052 In/Sec .051 In/Sec .167 In/Sec .167 In/Sec .167 In/Sec .173 In/Sec IP OIL COOL FAN (1:  OVERALL LEVEL .193 In/Sec .103 In/Sec .103 In/Sec .103 In/Sec .103 In/Sec .104 In/Sec .105 In/Sec	9-Aug-19)  1K-20KHz .074 G-s .043 G-s  9-Aug-19)  1K-20KHz .178 G-s .491 G-s .448 G-s .369 G-s .330 G-s .237 G-s  9-Aug-19)  1K-20KHz .232 G-s .050 G-s  9-Aug-19)  1K-20KHz .232 G-s .050 G-s
MOH MIH  451B PUMP  MOH MIH  MIA EIH EIA EOH  HX453B FAN  MOH MIH  451C PUMP  MOH MIH MIA	- 451B VACCUM PU - HX453B VAC PUM - 451C VACCUM PU	IP OIL COOL FAN (1:  OVERALL LEVEL  .213 In/Sec .137 In/Sec  .137 In/Sec  .137 In/Sec  .133 In/Sec .052 In/Sec .052 In/Sec .051 In/Sec .167 In/Sec .167 In/Sec .167 In/Sec .173 In/Sec .173 In/Sec .173 In/Sec .193 In/Sec .103 In/Sec .103 In/Sec .103 In/Sec .104 In/Sec .1055 In/Sec .049 In/Sec	9-Aug-19)  1K-20KHz .074 G-s .043 G-s  9-Aug-19)  1K-20KHz .178 G-s .491 G-s .448 G-s .369 G-s .330 G-s .237 G-s  9-Aug-19)  1K-20KHz .232 G-s .050 G-s  9-Aug-19)  1K-20KHz .232 G-s .050 G-s
MOH MIH  451B PUMP  MOH MIH  MIA EIH EIA EOH  HX453B FAN  MOH MIH  451C PUMP  MOH MIH MIA EIH	- 451B VACCUM PU - HX453B VAC PUM - 451C VACCUM PU	IP OIL COOL FAN (1:  OVERALL LEVEL  .213 In/Sec .137 In/Sec  IMP (1:  OVERALL LEVEL  .033 In/Sec .052 In/Sec .052 In/Sec .051 In/Sec .167 In/Sec .167 In/Sec .173 In/Sec IP OIL COOL FAN (1:  OVERALL LEVEL .193 In/Sec .103 In/Sec .103 In/Sec .103 In/Sec .104 In/Sec .105 In/Sec .049 In/Sec .142 In/Sec	9-Aug-19)  1K-20KHz .074 G-s .043 G-s  9-Aug-19)  1K-20KHz .178 G-s .491 G-s .448 G-s .369 G-s .330 G-s .237 G-s  9-Aug-19)  1K-20KHz .232 G-s .050 G-s  9-Aug-19)  1K-20KHz .232 G-s .050 G-s  9-Aug-19)  1K-20KHz .237 G-s
MOH MIH  451B PUMP  MOH MIH  MIA EIH EIA EOH  HX453B FAN  MOH MIH  451C PUMP  MOH MIH MIA	- 451B VACCUM PU - HX453B VAC PUM - 451C VACCUM PU	IP OIL COOL FAN (1:	9-Aug-19)  1K-20KHz .074 G-s .043 G-s  9-Aug-19)  1K-20KHz .178 G-s .491 G-s .448 G-s .369 G-s .330 G-s .237 G-s  9-Aug-19)  1K-20KHz .232 G-s .050 G-s  9-Aug-19)  1K-20KHz .232 G-s .050 G-s  9-Aug-19)  1K-20KHz .232 G-s .050 G-s
MOH MIH  451B PUMP  MOH MIH  MIA EIH EIA EOH  HX453B FAN  MOH MIH  451C PUMP  MOH MIH MIA EIH	- 451B VACCUM PU - HX453B VAC PUM - 451C VACCUM PU	IP OIL COOL FAN (1:  OVERALL LEVEL  .213 In/Sec .137 In/Sec  IMP (1:  OVERALL LEVEL  .033 In/Sec .052 In/Sec .052 In/Sec .051 In/Sec .167 In/Sec .167 In/Sec .173 In/Sec IP OIL COOL FAN (1:  OVERALL LEVEL .193 In/Sec .103 In/Sec .103 In/Sec .103 In/Sec .104 In/Sec .105 In/Sec .049 In/Sec .142 In/Sec	9-Aug-19)  1K-20KHz .074 G-s .043 G-s  9-Aug-19)  1K-20KHz .178 G-s .491 G-s .448 G-s .369 G-s .330 G-s .237 G-s  9-Aug-19)  1K-20KHz .232 G-s .050 G-s  9-Aug-19)  1K-20KHz .232 G-s .050 G-s  9-Aug-19)  1K-20KHz .232 G-s .050 G-s
MOH MIH  451B PUMP  MOH MIH  MIA EIH EIA EOH  MX453B FAN  MOH MIH  451C PUMP  MOH MIH MIA EIH EIA EIH EIA	- 451B VACCUM PU - HX453B VAC PUM - 451C VACCUM PU	IP OIL COOL FAN (1:	9-Aug-19)  1K-20KHz .074 G-s .043 G-s  9-Aug-19)  1K-20KHz .178 G-s .491 G-s .448 G-s .369 G-s .330 G-s .237 G-s  9-Aug-19)  1K-20KHz .232 G-s .050 G-s  9-Aug-19)  1K-20KHz .232 G-s .050 G-s  9-Aug-19)  1K-20KHz .232 G-s .050 G-s
MOH MIH  451B PUMP  MOH MIH  MIA  EIH  EIA  EOH  HX453B FAN  MOH  MIH  451C PUMP  MOH  MIH  MIA  EIH  EIA  EOH	- 451B VACCUM PU - HX453B VAC PUM - 451C VACCUM PU	IP OIL COOL FAN (1:	9-Aug-19)  1K-20KHz  .074 G-s .043 G-s  9-Aug-19)  1K-20KHz .178 G-s .491 G-s .448 G-s .369 G-s .330 G-s .237 G-s  9-Aug-19)  1K-20KHz .232 G-s .050 G-s  9-Aug-19)  1K-20KHz .232 G-s .050 G-s
MOH MIH  451B PUMP  MOH MIH  MIA  EIH  EIA  EOH  HX453B FAN  MOH  MIH  451C PUMP  MOH  MIH  MIA  EIH  EIA  EOH	- 451B VACCUM PU - HX453B VAC PUM - 451C VACCUM PU	IP OIL COOL FAN (1:  OVERALL LEVEL  .213 In/Sec .137 In/Sec  IMP (1:  OVERALL LEVEL  .033 In/Sec .052 In/Sec .052 In/Sec .051 In/Sec .167 In/Sec .167 In/Sec .173 In/Sec IP OIL COOL FAN (1:  OVERALL LEVEL .193 In/Sec .103 In/Sec .103 In/Sec .103 In/Sec .104 In/Sec .042 In/Sec .049 In/Sec .142 In/Sec .160 In/Sec .124 In/Sec	9-Aug-19)  1K-20KHz .074 G-s .043 G-s  9-Aug-19)  1K-20KHz .178 G-s .491 G-s .448 G-s .369 G-s .330 G-s .237 G-s  9-Aug-19)  1K-20KHz .232 G-s .050 G-s  9-Aug-19)  1K-20KHz .209 G-s .352 G-s .540 G-s .337 G-s .704 G-s .508 G-s
MOH MIH  451B PUMP  MOH MIH  MIA  EIH  EIA  EOH  HX453B FAN  MOH  MIH  451C PUMP  MOH  MIH  MIA  EIH  EIA  EOH	- 451B VACCUM PU - HX453B VAC PUM - 451C VACCUM PU	IP OIL COOL FAN (1:	9-Aug-19)  1K-20KHz .074 G-s .043 G-s  9-Aug-19)  1K-20KHz .178 G-s .491 G-s .448 G-s .369 G-s .330 G-s .237 G-s  9-Aug-19)  1K-20KHz .232 G-s .050 G-s  9-Aug-19)  1K-20KHz .209 G-s .352 G-s .540 G-s .337 G-s .704 G-s .508 G-s
MOH MIH  451B PUMP  MOH MIH  MIA  EIH  EIA  EOH  MX453B FAN  MOH  MIH  MIH  MIA  EIH  EIA  EOH  MIH  MIA  EIH  EIA  EOH	- 451B VACCUM PU - HX453B VAC PUM - 451C VACCUM PU	IP OIL COOL FAN (1:  OVERALL LEVEL  .213 In/Sec .137 In/Sec  IMP (1:  OVERALL LEVEL  .033 In/Sec .052 In/Sec .052 In/Sec .051 In/Sec .167 In/Sec .167 In/Sec .167 In/Sec .173 In/Sec IP OIL COOL FAN (1:  OVERALL LEVEL .193 In/Sec .103 In/Sec .103 In/Sec .1042 In/Sec .042 In/Sec .049 In/Sec .142 In/Sec .142 In/Sec .124 In/Sec .124 In/Sec .124 In/Sec	9-Aug-19)  1K-20KHz .074 G-s .043 G-s  9-Aug-19)  1K-20KHz .178 G-s .491 G-s .448 G-s .369 G-s .330 G-s .237 G-s  9-Aug-19)  1K-20KHz .232 G-s .050 G-s  9-Aug-19)  1K-20KHz .209 G-s .352 G-s .540 G-s .357 G-s .540 G-s .357 G-s .540 G-s .5508 G-s

AEID DIME	AEID WACCINA DINAD		(10-7110, 10)
FOID PUMP -	451D VACCUM PUMP	OVERALL LEVEL	1K-20KH-
мон		.065 In/Sec	.580 G-s
MIH		112 Tn/Sec	.560 G-S
MIA		.112 In/Sec	.915 G-s 1.061 G-s 1.441 G-s
EIH		214 Tn/Sec	1.001 G-S
EIA			.549 G-s
EOH		.122 In/Sec	
EOH		.122 In/Sec	.504 G-S
HX453D FAN -	HX453D VAC PUMP		
		OVERALL LEVEL .283 In/Sec	1K-20KHz
MOH		.283 In/Sec	.673 G-s
MIH		.097 In/Sec	.152 G-s
506D 6010	FACE PROPERTY COM	DDEGGOD	(10 3 10)
200B COMP -	506B PRODUCT COM		
***		OVERALL LEVEL	1K-20KHz
МОН		.119 In/Sec	.238 G-s
MIH		.076 In/Sec	.136 G-s .240 G-s
MIA			
IIH		.126 In/Sec	.932 G-s
IIA		.408 In/Sec	.671 G-s 2.599 G-s
IOH		.198 In/Sec	2.599 G-s
HX507B FAN -	HX507B GAS COOL	FAN	(19-Aug-19)
		OVERALL LEVEL	1K-20KHz
MOH		.114 In/Sec	.432 G-s
MIH		.243 In/Sec	.830 G-s
506C COMP -	506C PRODUCT COM		
		OVERALL LEVEL	1K-20KHz
MOH		.063 In/Sec .060 In/Sec	.235 G-s .261 G-s
MIH			
MIA		.036 In/Sec	.222 G-s
IIH		.108 In/Sec	.544 G-s .587 G-s
IIA		.110 In/Sec	.587 G-s
IOH		.201 In/Sec	2.074 G-s
HX507C FAN -	HX507C GAS COOL	FAN	(19-Aug-19)
		OVERALL LEVEL	
мон			.827 G-s
MIH		675 In/Sec	2.544 G-s
PILII		.0/5 111/560	2.344 G-5
	C 7711 77		

Clarification Of Vibration Units:

Acc --> G-s RMS Vel --> In/Sec PK

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

Kevin W. Morruell





Cell: 901-486-4565

Email: <a href="mailto:kwilliam@gohispeed.com">kwilliam@gohispeed.com</a>