HI-SPEED INDUSTRIAL SERVICE QualiTest® Diagnostics

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

December 3, 2021

Archaea Energy
North Shelby Plant
Millington, TN

The following is a summary of findings from the December 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

451D Vacuum Pump

Motor on this unit continues to have an electrical related vibration. There is also a high pitch noise that appears to be coming from the belt and or pump sheave. Vibration data does not show any evidence of a bearing race or roller defect. We recommend inspecting the belt and sheave for defects and wear as soon as scheduling allows. We will monitor this closely. Rated as a **CLASS II** defect because of the belt/sheave issue.

HX453D Vac Pump Oil Cool Fan

Motor inboard vibration has increased to the highest level on record at .35 ips. There is a high 1 x rpm vibration with a non-synchronous peak that also is high in amplitude. For now, it is recommended to ensure that the fan is seated properly in the taper and not cocked on the motor shaft and ensure all hub fasteners and motor fasteners are tight. We will monitor this closely. Rated as a **CLASS II** defect.

506 A Product Compressor

Compressor has had higher vibration since rebuilding unit. Spectral data shows high vibration peaks to be multiples of rpm. This may indicate excessive internal clearances. We will monitor this closely. Rated as a **CLASS I** defect.

Abbreviated Last Measurement Summary
****

Database: Clean Energy.rbm
Area: millington plant

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
301 FLARE - 301 FLARE BLOWER	(03-Dec-21)	
	OVERALL LEVEL	1K-20KHz
MOH - MOTOR OUTBOARD HORIZ	.065 In/Sec	1.221 G-s
MOV - MOTOR OUTBOARD VERT	.307 In/Sec	.273 G-s
MIH - MOTOR INBOARD HORIZ	.104 In/Sec	.751 G-s
MIV - MOTOR INBOARD VERT	.230 In/Sec	.202 G-s
MIA - MOTOR INBOARD AXIAL	.064 In/Sec	.670 G-s
EIH - EQUIPMENT INBOARD HORIZ	.280 In/Sec	.415 G-s
EIV - EQUIPMENT INBOARD VERT	.059 In/Sec	.296 G-s
EIA - EQUIPMENT INBOARD AXIAL	.044 In/Sec	.217 G-s
EOH - EQUIPMENT OUTBOARD HORIZ	.199 In/Sec	.609 G-s
EOV - EQUIPMENT OUTBOARD VERT	.205 In/Sec	.273 G-s
101A COMP - 101A FEED COMPRESSOR	(03-Dec-21)	
	OVERALL LEVEL	1K-20KHz
MOH - MOTOR OUTBOARD HORIZ	.061 In/Sec	.340 G-s
MIH - MOTOR INBOARD HORIZ	.072 In/Sec	.294 G-s
MIA - MOTOR INBOARD AXIAL	.047 In/Sec	.299 G-s
IIH - COMP INPUT INBOARD HORIZ	.087 In/Sec	.975 G-s
IIA - COMP INPUT INBOARD AXIAL	.233 In/Sec	.886 G-s
IOH - COMP INPUT OUTBOARD HORIZ	.078 In/Sec	.863 G-s
OIH - COMP OUTPUT INBOARD HORIZ	.118 In/Sec	1.178 G-s
OIA - COMP OUTPUT INBOARD AXIAL	.078 In/Sec	3.288 G-s
OOH - COMP OUTPUT OUTBOARD HORIZ	.078 In/Sec	2.516 G-s

HX132A FAN - HX132A GAS OIL COOLER FAN	(03-Dec-21)	
	OVERALL LEVEL	1K-20KHz
MOH - MOTOR OUTBOARD HORIZ CH1	.163 In/Sec	.114 G-s
MIH - MOTOR INBOARD HORIZ CH2	.145 In/Sec	.151 G-s
EIH - EQUIPMENT INBOARD HORIZ CH3	.056 In/Sec	.036 G-s
EOH - EQUIPMENT OUTBOARD HORIZ CH4	.079 In/Sec	.044 G-s

451A PUMP - 451A VACCUM PUMP	(03-Dec-21)	
	OVERALL LEVEL	1K-20KHz
MOH - MOTOR OUTBOARD HORIZ	.087 In/Sec	.829 G-s
MOV - MOTOR OUTBOARD VERT	.099 In/Sec	1.206 G-s
MIH - MOTOR INBOARD HORIZ	.111 In/Sec	.451 G-s
MIV - MOTOR INBOARD VERT	.134 In/Sec	.489 G-s
MIA - MOTOR INBOARD AXIAL	.067 In/Sec	.235 G-s
EIH - EQUIPMENT INBOARD HORIZ	.204 In/Sec	.320 G-s
EIV - EQUIPMENT INBOARD VERT	.166 In/Sec	.338 G-s
EIA - EQUIPMENT INBOARD AXIAL	.141 In/Sec	.599 G-s
EOH - EQUIPMENT OUTBOARD HORIZ	.238 In/Sec	.386 G-s
EOV - EQUIPMENT OUTBOARD VERT	.173 In/Sec	.328 G-s

HX453A FAN - HX453A VAC PUMP OIL COOL FAN	(03-Dec-21)	
	OVERALL LEVEL	1K-20KHz
MOH - MOTOR OUTBOARD HORIZ	.259 In/Sec	.138 G-s
MIH - MOTOR INBOARD HORIZ	.140 In/Sec	.085 G-s

451B PUMP - 451B VACCUM PUMP	(03-Dec-21)	
	OVERALL LEVEL	1K-20KHz
MOH - MOTOR OUTBOARD HORIZ	.087 In/Sec	.585 G-s
MOV - MOTOR OUTBOARD VERT	.101 In/Sec	.638 G-s
MIH - MOTOR INBOARD HORIZ	.139 In/Sec	.609 G-s
MIV - MOTOR INBOARD VERT	.097 In/Sec	.238 G-s
MIA - MOTOR INBOARD AXIAL	.053 In/Sec	.211 G-s
EIH - EQUIPMENT INBOARD HORIZ	.179 In/Sec	.601 G-s
EIV - EQUIPMENT INBOARD VERT	.123 In/Sec	.323 G-s
EIA - EQUIPMENT INBOARD AXIAL	.126 In/Sec	.388 G-s
EOH - EQUIPMENT OUTBOARD HORIZ	.270 In/Sec	.516 G-s
EOV - EQUIPMENT OUTBOARD VERT	.190 In/Sec	.208 G-s

HX453B FAN - HX453B VAC PUMP OIL COOL FAN	(03-Dec-21)	
	OVERALL LEVEL	1K-20KHz
MOH - MOTOR OUTBOARD HORIZ	.181 In/Sec	.253 G-s
MIH - MOTOR INBOARD HORIZ	.105 In/Sec	.136 G-s

451C PUMP - 451C VACCUM PUMP	(03-Dec-21)	
	OVERALL LEVEL	1K-20KHz
MOH - MOTOR OUTBOARD HORIZ	.097 In/Sec	.816 G-s
MOV - MOTOR OUTBOARD VERT	.087 In/Sec	.144 G-s
MIH - MOTOR INBOARD HORIZ	.137 In/Sec	1.102 G-s
MIV - MOTOR INBOARD VERT	.109 In/Sec	.226 G-s
MIA - MOTOR INBOARD AXIAL	.049 In/Sec	.176 G-s
EIH - EQUIPMENT INBOARD HORIZ	.175 In/Sec	.760 G-s
EIV - EQUIPMENT INBOARD VERT	.132 In/Sec	.404 G-s
EIA - EQUIPMENT INBOARD AXIAL	.130 In/Sec	.596 G-s
EOH - EQUIPMENT OUTBOARD HORIZ	.177 In/Sec	.536 G-s
EOV - EQUIPMENT OUTBOARD VERT	.190 In/Sec	.276 G-s

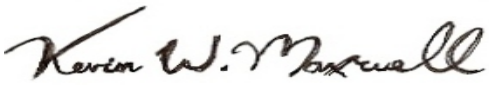
HX453C FAN - HX453C VAC PUMP OIL COOL FAN	(03-Dec-21)	
	OVERALL LEVEL	1K-20KHz
MOH - MOTOR OUTBOARD HORIZ	.120 In/Sec	.149 G-s
MIH - MOTOR INBOARD HORIZ	.112 In/Sec	.115 G-s

451D PUMP - 451D VACCUM PUMP	(03-Dec-21)	
	OVERALL LEVEL	1K-20KHz
MOH - MOTOR OUTBOARD HORIZ	.091 In/Sec	.864 G-s
MOV - MOTOR OUTBOARD VERT	.110 In/Sec	.264 G-s
MIH - MOTOR INBOARD HORIZ	.128 In/Sec	2.878 G-s
MIV - MOTOR INBOARD VERT	.083 In/Sec	.340 G-s
MIA - MOTOR INBOARD AXIAL	.062 In/Sec	.418 G-s
EIH - EQUIPMENT INBOARD HORIZ	.194 In/Sec	.411 G-s

```
   EIV - EQUIPMENT INBOARD VERT                .164 In/Sec       .237 G-s
   EIA - EQUIPMENT INBOARD AXIAL               .164 In/Sec       .355 G-s
   EOH - EQUIPMENT OUTBOARD HORIZ              .168 In/Sec       .540 G-s
   EOV - EQUIPMENT OUTBOARD VERT               .127 In/Sec       .193 G-s

   HX453D FAN - HX453D VAC PUMP OIL COOL FAN  (03-Dec-21)
                                               OVERALL LEVEL     1K-20KHz
   MOH - MOTOR OUTBOARD HORIZ                  .275 In/Sec       .115 G-s
   MIH - MOTOR INBOARD HORIZ                   .350 In/Sec       .083 G-s

   506A COMP  - 506A PRODUCT COMPRESSOR       (03-Dec-21)
                                               OVERALL LEVEL     1K-20KHz
   MOH - MOTOR OUTBOARD HORIZ                  .046 In/Sec       .315 G-s
   MIH - MOTOR INBOARD HORIZ                   .056 In/Sec       .415 G-s
   MIA - MOTOR INBOARD AXIAL                   .100 In/Sec       .708 G-s
   IIH - COMP INPUT INBOARD HORIZ              .347 In/Sec      1.139 G-s
   IIA - COMP INPUT INBOARD AXIAL              .418 In/Sec      1.519 G-s
   IOH - COMP INPUT OUTBOARD HORIZ             .284 In/Sec      4.326 G-s

   HX507A FAN - HX507A GAS COOL FAN           (03-Dec-21)
                                               OVERALL LEVEL     1K-20KHz
   MOH - MOTOR OUTBOARD HORIZ                  .141 In/Sec       .063 G-s
   MIH - MOTOR INBOARD HORIZ                   .195 In/Sec       .068 G-s

--------------------------------------------------------------------------------
   Clarification Of Vibration Units:
      Acc      -->  G-s      RMS
      Vel      -->  In/Sec   PK
```

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