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

July 27th, 2023

South Shelby RNG
Memphis, TN

The following is a summary of findings from the monthly vibration survey that was performed on July 19th, 2023.

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

C-551B Vacuum Compressor B

The compressor outboard end is still showing some acceleration with high frequency noise floor in the spectra. This may be process related but could also be signs of bearing noise. Ensure lube system is operating properly. This is being monitored closely. Rated as a **CLASS I** defect.

C-0600 A Feed Gas Compressor

High 1 x rpm vibration is still evident in the compressor section. The compressor may have an internal issue such as excessive shaft deflection causing high 1 x drive rpm vibration. Piping may also be strained. It is recommended to perform lift check of compressor shaft during next major down time. Ensure piping is not strained. Rated as a **CLASS II** defect.

C-0600 B Feed Gas Compressor

Compressor vertical data continues to show some dominant 1 x, 4 and 8 x male rotor rpm vibration. Internal clearance issue or some other process or loading issue may be causing the 4-x rpm vibration and harmonics of 4 x that also seen in the compressor data. Inlet piping is also showing an increase in vibration this survey. Well over 1 ips overall which is considered high amplitude. We will continue to monitor closely. Rated as a **CLASS II** defect.

C-0600 C Feed Gas Compressor

Motor has higher than normal 1 x motor rpm vibration. Compressor continues to have high harmonic vibrations that are related to 1 x male rotor and 4 x rpm of the male rotor. For now, we recommend performing a hot alignment on the unit. Ensure motor does not have soft foot condition. Inspect coupling hubs and element also. Rated as a **CLASS II** defect.

BLR-0200 A, B, C, and D LFG Blowers

These blowers have high amplitudes of acceleration (high frequency vibrations). Blower outboard axials are typically the highest amplitudes and may be process load related. Multiple harmonics at what appears to be 8 x blower rpm are present and is dominant in blower data. Amplitudes are as high as 80 g's peak to peak which is very high; however, this is likely a characteristic of this blowers' sliding vanes. We will continue to monitor closely. Rated as **CLASS I** defects for now.

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                    Abbreviated Last Measurement Summary
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             Database:  South Shelby RNG.rbm
             Area:      SOUTH SHELBY PLANT

MEASUREMENT POINT              OVERALL LEVEL       HFD / VHFD
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C-551B     - C-551B VACUUM COMPRESSOR B    (19-Jul-23)
                                OVERALL LEVEL     1K-20KHz
          MOH                     .068 In/Sec      1.750 G-s
          MOV                     .070 In/Sec      1.842 G-s
          MIH                     .095 In/Sec      1.309 G-s
          MIV                     .085 In/Sec       .393 G-s
          MIA                     .091 In/Sec       .455 G-s
          CIA                     .250 In/Sec      2.733 G-s
          CIH                     .199 In/Sec      3.202 G-s
          CIV                     .294 In/Sec      2.678 G-s
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	COH	.322 In/Sec	9.382 G-s
	COV	.314 In/Sec	3.317 G-s
	COA	.235 In/Sec	2.820 G-s

C-551A - C-551A VACUUM COMPRESSOR A (19-Jul-23)

	OVERALL LEVEL	1K-20KHz
MOH	.067 In/Sec	.888 G-s
MOV	.078 In/Sec	.633 G-s
MIH	.104 In/Sec	2.082 G-s
MIV	.085 In/Sec	1.355 G-s
MIA	.079 In/Sec	1.719 G-s
CIA	.374 In/Sec	1.229 G-s
CIH	.220 In/Sec	2.455 G-s
CIV	.447 In/Sec	1.030 G-s
COH	.300 In/Sec	4.995 G-s
COV	.289 In/Sec	1.961 G-s
COA	.252 In/Sec	2.664 G-s

C-601B - C-601B N2 RECYCLE COMP B (19-Jul-23)

	OVERALL LEVEL	1K-20KHz
MOH	.126 In/Sec	.666 G-s
MOV	.037 In/Sec	.276 G-s
MIH	.120 In/Sec	1.068 G-s
MIV	.044 In/Sec	.341 G-s
MIA	.044 In/Sec	.275 G-s
CIA	.118 In/Sec	1.202 G-s
CIH	.121 In/Sec	2.322 G-s
CIV	.084 In/Sec	1.705 G-s
COH	.156 In/Sec	2.306 G-s
COV	.136 In/Sec	1.164 G-s
COA	.138 In/Sec	.962 G-s

C-601A - C-601A N2 RECYCLE COMP A (19-Jul-23)

	OVERALL LEVEL	1K-20KHz
MOH	.045 In/Sec	.624 G-s
MOV	.025 In/Sec	.325 G-s
MIH	.100 In/Sec	1.048 G-s
MIV	.042 In/Sec	.329 G-s
MIA	.037 In/Sec	.376 G-s
CIA	.134 In/Sec	1.268 G-s
CIH	.101 In/Sec	2.524 G-s
CIV	.155 In/Sec	1.185 G-s
COH	.136 In/Sec	2.309 G-s
COV	.090 In/Sec	1.027 G-s
COA	.103 In/Sec	1.001 G-s

C-0600A - C-0600A FEED GAS COMP A (19-Jul-23)

	OVERALL LEVEL	1K-20KHz
MOH	.197 In/Sec	.638 G-s
MOV	.179 In/Sec	.174 G-s
MIH	.282 In/Sec	.629 G-s
MIV	.266 In/Sec	.203 G-s
MIA	.123 In/Sec	.190 G-s
CIA	.749 In/Sec	1.850 G-s
CIH	.638 In/Sec	4.072 G-s
CIV	.747 In/Sec	1.680 G-s
COH	.479 In/Sec	3.356 G-s
COV	.970 In/Sec	1.434 G-s
COA	.522 In/Sec	1.759 G-s
P1	.589 In/Sec	1.067 G-s

C-0600B - C-0600B FEED GAS COMP B (19-Jul-23)

	OVERALL LEVEL	1K-20KHz
MOH	.102 In/Sec	.347 G-s
MOV	.060 In/Sec	.213 G-s
MIH	.153 In/Sec	.786 G-s
MIV	.059 In/Sec	.257 G-s
MIA	.090 In/Sec	.226 G-s
CIA	.267 In/Sec	.510 G-s
CIH	.370 In/Sec	3.634 G-s

CIV	.511 In/Sec	.694 G-s
COH	.374 In/Sec	2.631 G-s
COV	.465 In/Sec	.542 G-s
COA	.243 In/Sec	.696 G-s
P1	1.134 In/Sec	.783 G-s

C-0600C - C-0600C FEED GAS COMP C (19-Jul-23)

	OVERALL LEVEL	1K-20KHz
MOH	.496 In/Sec	.334 G-s
MOV	.268 In/Sec	.130 G-s
MIH	.437 In/Sec	.535 G-s
MIV	.146 In/Sec	.238 G-s
MIA	.153 In/Sec	.259 G-s
CIA	.371 In/Sec	.986 G-s
CIH	.350 In/Sec	2.607 G-s
CIV	.604 In/Sec	1.302 G-s
COH	.496 In/Sec	2.123 G-s
COV	.624 In/Sec	1.142 G-s
COA	.456 In/Sec	1.378 G-s
P1	.701 In/Sec	.757 G-s

BLR-0200A - BLR-0200A LFG BLOWER A (19-Jul-23)

	OVERALL LEVEL	1K-20KHz
MOH	.120 In/Sec	.761 G-s
MOV	.084 In/Sec	.366 G-s
MIH	.078 In/Sec	1.056 G-s
MIV	.197 In/Sec	.229 G-s
MIA	.055 In/Sec	.383 G-s
BIA	.167 In/Sec	4.007 G-s
BIV	.463 In/Sec	4.395 G-s
BOV	.351 In/Sec	4.570 G-s
BOA	.299 In/Sec	4.846 G-s

BLR-0200B - BLR-0200B LFG BLOWER B (19-Jul-23)

	OVERALL LEVEL	1K-20KHz
MOH	.112 In/Sec	.750 G-s
MOV	.066 In/Sec	.357 G-s
MIH	.099 In/Sec	1.042 G-s
MIV	.200 In/Sec	.431 G-s
MIA	.094 In/Sec	.385 G-s
BIA	.223 In/Sec	2.576 G-s
BIH	.397 In/Sec	8.312 G-s
BIV	.430 In/Sec	2.735 G-s
BOH	.401 In/Sec	10.63 G-s
BOV	.348 In/Sec	3.787 G-s
BOA	.186 In/Sec	2.976 G-s

BLR-0200C - BLR-0200C LFG BLOWER C (19-Jul-23)

	OVERALL LEVEL	1K-20KHz
MOH	.140 In/Sec	.945 G-s
MOV	.093 In/Sec	.495 G-s
MIH	.087 In/Sec	1.201 G-s
MIV	.128 In/Sec	.369 G-s
MIA	.071 In/Sec	.375 G-s
BIA	.350 In/Sec	6.156 G-s
BIH	.569 In/Sec	17.25 G-s
BIV	.480 In/Sec	5.033 G-s
BOH	.660 In/Sec	17.37 G-s
BOV	.482 In/Sec	3.473 G-s
BOA	.218 In/Sec	3.268 G-s

BLR-0200D - BLR-0200D LFG BLOWER D (20-Jun-23)

	OVERALL LEVEL	1K-20KHz
MOH	.089 In/Sec	.812 G-s
MOV	.099 In/Sec	.536 G-s
MIH	.090 In/Sec	1.039 G-s
MIV	.163 In/Sec	.328 G-s
MIA	.053 In/Sec	.414 G-s
BIA	.140 In/Sec	2.545 G-s
BIH	.282 In/Sec	9.075 G-s

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            BIV                      .267 In/Sec      3.327 G-s
            BOH                      .268 In/Sec      10.26 G-s
            BOV                      .294 In/Sec      3.153 G-s
            BOA                      .150 In/Sec      2.664 G-s

      C-1300      - C-1300 SALES GAS COMP STG 1   (19-Jul-23)
                                     OVERALL LEVEL     1K-20KHz
            MOH                      .081 In/Sec       .489 G-s
            MOV                      .080 In/Sec       .094 G-s
            MIH                      .053 In/Sec       .351 G-s
            MIV                      .330 In/Sec       .185 G-s
            MIA                      .193 In/Sec       .380 G-s
            CIA                      .191 In/Sec       .934 G-s
            CIH                      .171 In/Sec      3.663 G-s
            CIV                      .231 In/Sec       .439 G-s
            COH                      .177 In/Sec      3.492 G-s
            COV                      .294 In/Sec       .845 G-s
            COA                      .138 In/Sec       .942 G-s
            P1                       .220 In/Sec      2.751 G-s

      C-1304      - C-1304 SALES GAS COMP STG 2   (19-Jul-23)
                                     OVERALL LEVEL     1K-20KHz
            MOH                      .174 In/Sec       .764 G-s
            MOV                      .160 In/Sec       .970 G-s
            MIH                      .204 In/Sec       .723 G-s
            MIV                      .113 In/Sec       .747 G-s
            MIA                      .098 In/Sec       .370 G-s
            CIA                      .147 In/Sec       .359 G-s
            CIH                      .165 In/Sec       .980 G-s
            CIV                      .125 In/Sec       .314 G-s
            COH                      .179 In/Sec       .373 G-s
            COV                      .141 In/Sec       .243 G-s
            COA                      .155 In/Sec       .241 G-s

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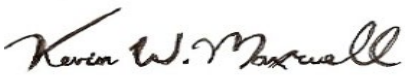
As always, it has been a pleasure to serve South Shelby RNG. If there are any comments or questions, do not hesitate to contact us.

Sincerely,



ISO Certified Vibration Analyst, Category III

HI-SPEED INDUSTRIAL SERVICE
QualiTest® Diagnostics

Cell: 901-486-4565
Email: kwilliam@gohispeed.com