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August 17th, 2023

South Shelby RNG
Memphis, TN

The following is a summary of findings from the monthly vibration survey that was performed on August 17th, 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 load related but could also be signs of internal compressor issues. For now ,ensure lube system is operating properly and ensure compressor parameters are within normal ranges. 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     (17-Aug-23)
                                OVERALL LEVEL     1K-20KHz
        MOH                      .086 In/Sec       .861 G-s
        MOV                      .073 In/Sec       .747 G-s
        MIH                      .127 In/Sec      1.809 G-s
        MIV                      .107 In/Sec      1.084 G-s
        MIA                      .083 In/Sec       .931 G-s
        CIA                      .277 In/Sec      2.876 G-s
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CIH	.207 In/Sec	3.288 G-s
CIV	.262 In/Sec	1.468 G-s
COH	.223 In/Sec	10.23 G-s
COV	.282 In/Sec	3.285 G-s
COA	.199 In/Sec	3.757 G-s

C-551A - C-551A VACUUM COMPRESSOR A (17-Aug-23)

	OVERALL LEVEL	1K-20KHz
MOH	.073 In/Sec	.459 G-s
MOV	.069 In/Sec	.615 G-s
MIH	.105 In/Sec	1.208 G-s
MIV	.089 In/Sec	.500 G-s
MIA	.063 In/Sec	.644 G-s
CIA	.448 In/Sec	2.913 G-s
CIH	.250 In/Sec	5.366 G-s
CIV	.360 In/Sec	2.005 G-s
COH	.308 In/Sec	6.056 G-s
COV	.343 In/Sec	3.661 G-s
COA	.344 In/Sec	4.124 G-s

C-601B - C-601B N2 RECYCLE COMP B (17-Aug-23)

	OVERALL LEVEL	1K-20KHz
MOH	.110 In/Sec	.669 G-s
MOV	.038 In/Sec	.153 G-s
MIH	.101 In/Sec	1.270 G-s
MIV	.033 In/Sec	.177 G-s
MIA	.037 In/Sec	.185 G-s
CIA	.170 In/Sec	1.147 G-s
CIH	.128 In/Sec	2.374 G-s
CIV	.102 In/Sec	2.683 G-s
COH	.116 In/Sec	3.404 G-s
COV	.148 In/Sec	1.223 G-s
COA	.104 In/Sec	1.259 G-s

C-601A - C-601A N2 RECYCLE COMP A (17-Aug-23)

	OVERALL LEVEL	1K-20KHz
MOH	.044 In/Sec	1.495 G-s
MOV	.032 In/Sec	.421 G-s
MIH	.077 In/Sec	1.413 G-s
MIV	.038 In/Sec	.423 G-s
MIA	.033 In/Sec	.297 G-s
CIA	.153 In/Sec	1.021 G-s
CIH	.082 In/Sec	1.990 G-s
CIV	.120 In/Sec	1.081 G-s
COH	.205 In/Sec	1.765 G-s
COV	.161 In/Sec	1.185 G-s
COA	.271 In/Sec	1.646 G-s

C-0600A - C-0600A FEED GAS COMP A (17-Aug-23)

	OVERALL LEVEL	1K-20KHz
MOH	.148 In/Sec	.549 G-s
MOV	.194 In/Sec	.179 G-s
MIH	.178 In/Sec	.779 G-s
MIV	.218 In/Sec	.230 G-s
MIA	.088 In/Sec	.239 G-s
CIA	.394 In/Sec	1.313 G-s
CIH	.574 In/Sec	7.047 G-s
CIV	.596 In/Sec	.962 G-s
COH	.522 In/Sec	4.894 G-s
COV	.978 In/Sec	1.435 G-s
COA	.676 In/Sec	1.663 G-s
P1	.973 In/Sec	.856 G-s

C-0600B - C-0600B FEED GAS COMP B (17-Aug-23)

	OVERALL LEVEL	1K-20KHz
MOH	.246 In/Sec	.415 G-s
MOV	.202 In/Sec	.534 G-s
MIH	.257 In/Sec	.802 G-s
MIV	.224 In/Sec	.252 G-s
MIA	.085 In/Sec	.236 G-s

CIA	.228 In/Sec	.517 G-s
CIH	.347 In/Sec	3.926 G-s
CIV	.447 In/Sec	.352 G-s
COH	.376 In/Sec	2.311 G-s
COV	.515 In/Sec	.793 G-s
COA	.218 In/Sec	.749 G-s
P1	1.071 In/Sec	.776 G-s

C-0600C - C-0600C FEED GAS COMP C (17-Aug-23)

	OVERALL LEVEL	1K-20KHz
MOH	.497 In/Sec	.421 G-s
MOV	.287 In/Sec	.328 G-s
MIH	.475 In/Sec	.857 G-s
MIV	.191 In/Sec	.394 G-s
MIA	.172 In/Sec	.437 G-s
CIA	.278 In/Sec	.839 G-s
CIH	.390 In/Sec	2.798 G-s
CIV	.671 In/Sec	.723 G-s
COH	.416 In/Sec	2.590 G-s
COV	.904 In/Sec	.729 G-s
COA	.493 In/Sec	1.024 G-s
P1	.730 In/Sec	.901 G-s

BLR-0200A - BLR-0200A LFG BLOWER A (17-Aug-23)

	OVERALL LEVEL	1K-20KHz
MOH	.121 In/Sec	.790 G-s
MOV	.095 In/Sec	.438 G-s
MIH	.108 In/Sec	1.240 G-s
MIV	.167 In/Sec	.193 G-s
MIA	.100 In/Sec	.417 G-s
BIA	.260 In/Sec	4.243 G-s
BIH	.399 In/Sec	18.67 G-s
BIV	.424 In/Sec	4.223 G-s
BOH	.390 In/Sec	18.06 G-s
BOV	.374 In/Sec	4.525 G-s
BOA	.319 In/Sec	6.093 G-s

BLR-0200B - BLR-0200B LFG BLOWER B (17-Aug-23)

	OVERALL LEVEL	1K-20KHz
MOH	.100 In/Sec	.847 G-s
MOV	.074 In/Sec	.273 G-s
MIH	.156 In/Sec	1.004 G-s
MIV	.167 In/Sec	.232 G-s
MIA	.066 In/Sec	.308 G-s
BIA	.324 In/Sec	3.309 G-s
BIH	.424 In/Sec	10.34 G-s
BIV	.331 In/Sec	2.929 G-s
BOH	.496 In/Sec	15.70 G-s
BOV	.390 In/Sec	3.296 G-s
BOA	.218 In/Sec	3.244 G-s

BLR-0200C - BLR-0200C LFG BLOWER C (17-Aug-23)

	OVERALL LEVEL	1K-20KHz
MOH	.146 In/Sec	.753 G-s
MOV	.104 In/Sec	.292 G-s
MIH	.114 In/Sec	.995 G-s
MIV	.157 In/Sec	.266 G-s
MIA	.063 In/Sec	.342 G-s
BIA	.343 In/Sec	5.207 G-s
BIH	.713 In/Sec	16.89 G-s
BIV	.475 In/Sec	4.640 G-s
BOH	.694 In/Sec	15.37 G-s
BOV	.465 In/Sec	3.061 G-s
BOA	.263 In/Sec	4.281 G-s

C-1300 - C-1300 SALES GAS COMP STG 1 (17-Aug-23)

	OVERALL LEVEL	1K-20KHz
MOH	.073 In/Sec	.534 G-s
MOV	.090 In/Sec	.105 G-s
MIH	.050 In/Sec	.563 G-s

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              MIV                      .281 In/Sec       .414 G-s
              MIA                      .234 In/Sec       .362 G-s
              CIA                      .195 In/Sec       .760 G-s
              CIH                      .161 In/Sec      3.006 G-s
              CIV                      .272 In/Sec       .453 G-s
              COH                      .183 In/Sec      3.909 G-s
              COV                      .310 In/Sec       .830 G-s
              COA                      .171 In/Sec      1.124 G-s
              P1                       .202 In/Sec      3.549 G-s

       C-1304     - C-1304 SALES GAS COMP STG 2    (17-Aug-23)
                                    OVERALL LEVEL     1K-20KHz
              MOH                      .126 In/Sec      1.059 G-s
              MOV                      .140 In/Sec      1.194 G-s
              MIH                      .109 In/Sec      1.284 G-s
              MIV                      .099 In/Sec      1.049 G-s
              MIA                      .094 In/Sec       .360 G-s
              CIA                      .134 In/Sec       .388 G-s
              CIH                      .144 In/Sec      1.210 G-s
              CIV                      .106 In/Sec       .312 G-s
              COH                      .146 In/Sec       .620 G-s
              COV                      .134 In/Sec       .151 G-s
              COA                      .174 In/Sec       .299 G-s

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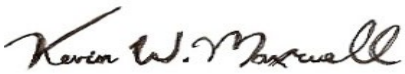
As always, it has been a pleasure to serve South Shelby RNG. If there are any comments or questions, do not hesitate to contact us.

Sincerely,



ISO Certified Vibration Analyst, Category III

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