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June 26th, 2023

South Shelby RNG
Memphis, TN

The following is a summary of findings from the monthly vibration survey that was performed on June 20th, 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 showing some elevated 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 movement 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 shows 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 had an increase in 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 still 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    (20-Jun-23)
                               OVERALL LEVEL     1K-20KHz
       MOH                      .071 In/Sec       .739 G-s
       MOV                      .064 In/Sec      1.614 G-s
       MIH                      .122 In/Sec      1.430 G-s
       MIV                      .122 In/Sec       .928 G-s
       MIA                      .102 In/Sec       .958 G-s
       CIA                      .304 In/Sec      2.733 G-s
       CIH                      .206 In/Sec      2.426 G-s
       CIV                      .253 In/Sec      2.322 G-s
       COH                      .288 In/Sec      9.129 G-s
       COV                      .214 In/Sec      2.463 G-s
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	COA	.207 In/Sec	3.388 G-s

C-551A - C-551A VACUUM COMPRESSOR A (20-Jun-23)

	OVERALL LEVEL	1K-20KHz
MOH	.080 In/Sec	.756 G-s
MOV	.071 In/Sec	.583 G-s
MIH	.115 In/Sec	1.146 G-s
MIV	.096 In/Sec	.386 G-s
MIA	.055 In/Sec	.275 G-s
CIA	.470 In/Sec	2.204 G-s
CIH	.247 In/Sec	3.932 G-s
CIV	.480 In/Sec	1.433 G-s
COH	.337 In/Sec	6.254 G-s
COV	.406 In/Sec	5.199 G-s
COA	.223 In/Sec	3.116 G-s

C-601B - C-601B N2 RECYCLE COMP B (20-Jun-23)

	OVERALL LEVEL	1K-20KHz
MOH	.083 In/Sec	1.797 G-s
MOV	.023 In/Sec	.203 G-s
MIH	.131 In/Sec	2.165 G-s
MIV	.041 In/Sec	.250 G-s
MIA	.046 In/Sec	.269 G-s
CIA	.150 In/Sec	1.021 G-s
CIH	.121 In/Sec	2.155 G-s
CIV	.082 In/Sec	2.061 G-s
COH	.159 In/Sec	3.780 G-s
COV	.147 In/Sec	1.117 G-s
COA	.167 In/Sec	.854 G-s

C-601A - C-601A N2 RECYCLE COMP A (20-Jun-23)

	OVERALL LEVEL	1K-20KHz
MOH	.054 In/Sec	.927 G-s
MOV	.024 In/Sec	.206 G-s
MIH	.093 In/Sec	2.193 G-s
MIV	.037 In/Sec	.217 G-s
MIA	.032 In/Sec	.297 G-s
CIA	.089 In/Sec	1.276 G-s
CIH	.092 In/Sec	2.441 G-s
CIV	.131 In/Sec	1.268 G-s
COH	.141 In/Sec	2.244 G-s
COV	.105 In/Sec	.991 G-s
COA	.124 In/Sec	1.061 G-s

C-0600A - C-0600A FEED GAS COMP A (20-Jun-23)

	OVERALL LEVEL	1K-20KHz
MOH	.160 In/Sec	.911 G-s
MOV	.132 In/Sec	.179 G-s
MIH	.156 In/Sec	.717 G-s
MIV	.262 In/Sec	.254 G-s
MIA	.129 In/Sec	.234 G-s
CIA	.338 In/Sec	.909 G-s
CIH	.450 In/Sec	8.343 G-s
CIV	.473 In/Sec	.762 G-s
COH	.312 In/Sec	4.116 G-s
COV	.899 In/Sec	1.050 G-s
COA	.434 In/Sec	2.048 G-s
P1	.405 In/Sec	1.105 G-s

C-0600B - C-0600B FEED GAS COMP B (20-Jun-23)

	OVERALL LEVEL	1K-20KHz
MOH	.175 In/Sec	.395 G-s
MOV	.171 In/Sec	.182 G-s
MIH	.144 In/Sec	.456 G-s
MIV	.149 In/Sec	.372 G-s
MIA	.116 In/Sec	.306 G-s
CIA	.240 In/Sec	.485 G-s
CIH	.367 In/Sec	3.151 G-s
CIV	.412 In/Sec	.294 G-s
COH	.350 In/Sec	2.095 G-s

COV	.514 In/Sec	.578 G-s
COA	.237 In/Sec	.698 G-s
P1	1.468 In/Sec	1.177 G-s

C-0600C - C-0600C FEED GAS COMP C (20-Jun-23)

	OVERALL LEVEL	1K-20KHz
MOH	.385 In/Sec	.352 G-s
MOV	.208 In/Sec	.167 G-s
MIH	.381 In/Sec	.723 G-s
MIV	.162 In/Sec	.396 G-s
MIA	.154 In/Sec	.477 G-s
CIA	.351 In/Sec	.768 G-s
CIH	.345 In/Sec	2.409 G-s
CIV	.669 In/Sec	1.011 G-s
COH	.411 In/Sec	2.642 G-s
COV	.882 In/Sec	1.118 G-s
COA	.709 In/Sec	1.160 G-s
P1	.538 In/Sec	.976 G-s

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

	OVERALL LEVEL	1K-20KHz
MOH	.067 In/Sec	.912 G-s
MOV	.052 In/Sec	.402 G-s
MIH	.079 In/Sec	1.128 G-s
MIV	.235 In/Sec	.319 G-s
MIA	.086 In/Sec	.509 G-s
BIA	.143 In/Sec	2.738 G-s
BIH	.447 In/Sec	14.79 G-s
BIV	.267 In/Sec	3.401 G-s
BOH	.417 In/Sec	15.49 G-s
BOV	.275 In/Sec	5.011 G-s
BOA	.209 In/Sec	4.284 G-s

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

	OVERALL LEVEL	1K-20KHz
MOH	.147 In/Sec	.729 G-s
MOV	.114 In/Sec	.358 G-s
MIH	.092 In/Sec	1.017 G-s
MIV	.131 In/Sec	.229 G-s
MIA	.052 In/Sec	.283 G-s
BIA	.158 In/Sec	2.774 G-s
BIH	.249 In/Sec	6.478 G-s
BIV	.235 In/Sec	2.867 G-s
BOH	.243 In/Sec	7.459 G-s
BOV	.360 In/Sec	2.468 G-s
BOA	.161 In/Sec	3.171 G-s

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

	OVERALL LEVEL	1K-20KHz
MOH	.158 In/Sec	.984 G-s
MOV	.125 In/Sec	.313 G-s
MIH	.113 In/Sec	.985 G-s
MIV	.137 In/Sec	.239 G-s
MIA	.048 In/Sec	.282 G-s
BIA	.279 In/Sec	4.470 G-s
BIH	.489 In/Sec	12.09 G-s
BIV	.289 In/Sec	3.716 G-s
BOH	.540 In/Sec	11.75 G-s
BOV	.364 In/Sec	2.807 G-s
BOA	.230 In/Sec	2.286 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   (20-Jun-23)
                                     OVERALL LEVEL     1K-20KHz
            MOH                      .071 In/Sec       .476 G-s
            MOV                      .125 In/Sec       .126 G-s
            MIH                      .073 In/Sec       .589 G-s
            MIV                      .323 In/Sec       .208 G-s
            MIA                      .136 In/Sec       .131 G-s
            CIA                      .171 In/Sec       .575 G-s
            CIH                      .146 In/Sec      2.896 G-s
            CIV                      .235 In/Sec       .587 G-s
            COH                      .147 In/Sec      2.645 G-s
            COV                      .321 In/Sec       .687 G-s
            COA                      .154 In/Sec       .853 G-s
            P1                       .184 In/Sec      2.694 G-s

      C-1304     - C-1304 SALES GAS COMP STG 2   (20-Jun-23)
                                     OVERALL LEVEL     1K-20KHz
            MOH                      .135 In/Sec       .787 G-s
            MOV                      .141 In/Sec       .812 G-s
            MIH                      .140 In/Sec      1.049 G-s
            MIV                      .091 In/Sec       .718 G-s
            MIA                      .076 In/Sec       .282 G-s
            CIA                      .162 In/Sec       .489 G-s
            CIH                      .152 In/Sec      1.368 G-s
            CIV                      .112 In/Sec       .257 G-s
            COH                      .142 In/Sec       .486 G-s
            COV                      .116 In/Sec       .189 G-s
            COA                      .151 In/Sec       .449 G-s

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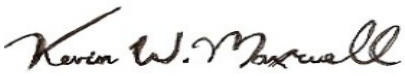
As always, it has been a pleasure to serve South Shelby RNG. If there are any comments or questions, do not hesitate to contact us.

Sincerely,



ISO Certified Vibration Analyst, Category III

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