



QualiTest® Diagnostics

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September 30, 2021

South Shelby RNG
Memphis, TN

The following is a summary of findings from the monthly vibration survey that was performed on September 29, 2021. 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

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.

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



QualiTest® Diagnostics

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Defects

C-0600 B Feed Gas Compressor

Compressor data shows 1/3 harmonics of the higher rpm rotor fundamental (1 x rpm). This indicates some type of internal fit looseness. Unit is also still experiencing some 1 x motor horizontal vibration. Internal clearance issue or some other loading issue may be causing the 4 x rpm and harmonics thereof also seen in the compressor data. We will continue to monitor closely. Rated as a **CLASS I** defect.

C-0600 C Feed Gas Compressor

Motor has higher than normal 1 x rpm vibration in the horizontal direction DE and ODE. Compressor also has high vibrations that are related to 4 x the speed of the male rotor. Compressor vibrations were around the same this month. We will continue to monitor these issues closely. Rated as a **CLASS I** defect for now.

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

These blowers have high amplitudes of acceleration (high frequency vibrations). Amplitudes are around the same as last survey. 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 70 g's peak to peak which is very high; however, this is likely a characteristic of this blowers' sliding vanes. Rated as **CLASS I** defects for now.

BLR-0200 D LFG Blower

Motor data shows signs of bearing defects in the DE motor bearing. Amplitudes have increased to alarm levels. Motor should be replaced soon. Rated as a **CLASS II** defect.

C-1300 Sales Gas Compressor Stage 2

Overall vibration was lower this survey. The up and down vibration is likely due to a natural frequency coinciding with a forcing frequency from the compressor causing resonance. We recommend planning on performing some other vibration testing with the VFD in local control so we can determine what frequencies may be causing the vibrations seen recently. Rated as a **CLASS I** defect for now.

Abbreviated Last Measurement Summary

Database: South Shelby RNG.rbm
Area: SOUTH SHELBY PLANT
Route No. 1: SOUTH SHELBY

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
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C-551B - C-551B VACUUM COMPRESSOR B (28-Sep-21)		
	OVERALL LEVEL	1K-20KHz
MOH	.084 In/Sec	.753 G-s
MOV	.072 In/Sec	.440 G-s
MIH	.121 In/Sec	.924 G-s
MIV	.104 In/Sec	.400 G-s
MIA	.070 In/Sec	.564 G-s
CIA	.189 In/Sec	2.104 G-s
CIH	.142 In/Sec	2.954 G-s
CIV	.201 In/Sec	2.144 G-s
COH	.153 In/Sec	3.803 G-s
COV	.224 In/Sec	2.054 G-s
COA	.159 In/Sec	2.167 G-s

C-551A - C-551A VACUUM COMPRESSOR A (28-Sep-21)

	OVERALL LEVEL	1K-20KHz
MOH	.067 In/Sec	.790 G-s
MOV	.063 In/Sec	.712 G-s
MIH	.095 In/Sec	.750 G-s
MIV	.064 In/Sec	.298 G-s
MIA	.071 In/Sec	.634 G-s
CIA	.240 In/Sec	2.417 G-s
CIH	.280 In/Sec	4.282 G-s
CIV	.166 In/Sec	.569 G-s
COH	.127 In/Sec	4.222 G-s
COV	.257 In/Sec	2.666 G-s
COA	.170 In/Sec	1.965 G-s

C-601B - C-601B N2 RECYCLE COMP B (28-Sep-21)

	OVERALL LEVEL	1K-20KHz
MOH	.087 In/Sec	1.388 G-s
MOV	.026 In/Sec	.234 G-s
MIH	.101 In/Sec	3.168 G-s
MIV	.038 In/Sec	.235 G-s
MIA	.039 In/Sec	.215 G-s
CIA	.146 In/Sec	.743 G-s
CIH	.134 In/Sec	2.422 G-s
CIV	.161 In/Sec	2.928 G-s
COH	.118 In/Sec	2.837 G-s
COV	.091 In/Sec	1.165 G-s
COA	.112 In/Sec	.956 G-s

C-601A - C-601A N2 RECYCLE COMP A (28-Sep-21)

	OVERALL LEVEL	1K-20KHz
MOH	.057 In/Sec	.893 G-s
MOV	.026 In/Sec	.215 G-s
MIH	.091 In/Sec	1.538 G-s
MIV	.043 In/Sec	.459 G-s
MIA	.044 In/Sec	.312 G-s
CIA	.085 In/Sec	1.170 G-s
CIH	.105 In/Sec	2.126 G-s
CIV	.135 In/Sec	.912 G-s
COH	.125 In/Sec	2.716 G-s
COV	.087 In/Sec	.859 G-s
COA	.144 In/Sec	1.659 G-s

C-0600A - C-0600A FEED GAS COMP A (28-Sep-21)

	OVERALL LEVEL	1K-20KHz
MOH	.087 In/Sec	.473 G-s
MOV	.055 In/Sec	.215 G-s
MIH	.112 In/Sec	.517 G-s
MIV	.094 In/Sec	.259 G-s
MIA	.058 In/Sec	.251 G-s
CIA	.331 In/Sec	.812 G-s
CIH	.327 In/Sec	3.763 G-s
CIV	.382 In/Sec	.386 G-s
COH	.255 In/Sec	2.155 G-s
COV	.428 In/Sec	.847 G-s
COA	.299 In/Sec	1.034 G-s

C-0600B - C-0600B FEED GAS COMP B (28-Sep-21)

	OVERALL LEVEL	1K-20KHz
MOH	.203 In/Sec	.484 G-s
MOV	.134 In/Sec	.413 G-s
MIH	.240 In/Sec	.522 G-s
MIV	.143 In/Sec	.160 G-s
MIA	.133 In/Sec	.295 G-s
CIA	.259 In/Sec	.391 G-s
CIH	.361 In/Sec	4.534 G-s
CIV	.565 In/Sec	.882 G-s
COH	.413 In/Sec	2.515 G-s
COV	.475 In/Sec	.678 G-s
COA	.279 In/Sec	.838 G-s

C-0600C	- C-0600C FEED GAS COMP C	(28-Sep-21)
	OVERALL LEVEL	1K-20KHz
MOH	.258 In/Sec	.298 G-s
MOV	.082 In/Sec	.336 G-s
MIH	.242 In/Sec	.587 G-s
MIV	.091 In/Sec	.240 G-s
MIA	.119 In/Sec	.287 G-s
CIA	.231 In/Sec	1.136 G-s
CIH	.266 In/Sec	2.694 G-s
CIV	.279 In/Sec	.713 G-s
COH	.261 In/Sec	2.684 G-s
COV	.469 In/Sec	1.258 G-s
COA	.226 In/Sec	1.306 G-s

BLR-0200A	- BLR-0200A LFG BLOWER A	(28-Sep-21)
	OVERALL LEVEL	1K-20KHz
MOH	.106 In/Sec	1.279 G-s
MOV	.115 In/Sec	.528 G-s
MIH	.129 In/Sec	1.763 G-s
MIV	.108 In/Sec	.347 G-s
MIA	.104 In/Sec	.753 G-s
BIA	.347 In/Sec	5.725 G-s
BIV	.546 In/Sec	5.099 G-s
BOV	.382 In/Sec	4.826 G-s
BOA	.325 In/Sec	4.587 G-s

BLR-0200B	- BLR-0200B LFG BLOWER B	(31-Aug-21)
	OVERALL LEVEL	1K-20KHz
MOH	.122 In/Sec	1.242 G-s
MOV	.097 In/Sec	.681 G-s
MIH	.107 In/Sec	1.634 G-s
MIV	.108 In/Sec	.382 G-s
MIA	.086 In/Sec	.394 G-s
BIA	.371 In/Sec	4.686 G-s
BIH	.499 In/Sec	12.50 G-s
BIV	.630 In/Sec	2.384 G-s
BOH	.547 In/Sec	11.78 G-s
BOV	.513 In/Sec	4.218 G-s
BOA	.493 In/Sec	4.886 G-s

BLR-0200C	- BLR-0200C LFG BLOWER C	(28-Sep-21)
	OVERALL LEVEL	1K-20KHz
MOH	.085 In/Sec	.980 G-s
MOV	.098 In/Sec	.424 G-s
MIH	.111 In/Sec	1.300 G-s
MIV	.151 In/Sec	.365 G-s
MIA	.120 In/Sec	.360 G-s
BIA	.364 In/Sec	3.325 G-s
BIH	.772 In/Sec	10.89 G-s
BIV	.787 In/Sec	3.243 G-s
BOH	.539 In/Sec	12.58 G-s
BOV	.556 In/Sec	3.150 G-s
BOA	.359 In/Sec	2.914 G-s

BLR-0200D	- BLR-0200D LFG BLOWER D	(28-Sep-21)
	OVERALL LEVEL	1K-20KHz
MOH	.096 In/Sec	1.668 G-s
MOV	.080 In/Sec	.709 G-s
MIH	.149 In/Sec	4.850 G-s
MIV	.145 In/Sec	1.207 G-s
MIA	.074 In/Sec	1.632 G-s
BIA	.265 In/Sec	5.247 G-s
BIV	.487 In/Sec	4.974 G-s
BOV	.363 In/Sec	5.539 G-s
BOA	.270 In/Sec	3.991 G-s

C-1300	- C-1300 SALES GAS COMP STG 1	(28-Sep-21)
	OVERALL LEVEL	1K-20KHz
MOH	.061 In/Sec	.611 G-s
MOV	.132 In/Sec	.174 G-s

MIH	.052 In/Sec	.456 G-s
MIV	.216 In/Sec	.158 G-s
MIA	.141 In/Sec	.199 G-s
CIA	.266 In/Sec	.313 G-s
CIH	.165 In/Sec	2.337 G-s
CIV	.395 In/Sec	.245 G-s
COH	.238 In/Sec	1.596 G-s
COV	.386 In/Sec	.426 G-s
COA	.197 In/Sec	.542 G-s

C-1304 - C-1304 SALES GAS COMP STG 2 (28-Sep-21)

OVERALL LEVEL 1K-20KHz

MOH	.140 In/Sec	1.242 G-s
MOV	.073 In/Sec	.640 G-s
MIH	.210 In/Sec	.928 G-s
MIV	.086 In/Sec	.680 G-s
MIA	.128 In/Sec	.280 G-s
CIA	.126 In/Sec	.190 G-s
CIH	.201 In/Sec	.412 G-s
CIV	.086 In/Sec	.156 G-s
COH	.175 In/Sec	.325 G-s
COV	.123 In/Sec	.169 G-s
COA	.148 In/Sec	.191 G-s

Clarification Of Vibration Units:

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