



QualiTest® Diagnostics

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September 9, 2020

South Shelby RNG
Memphis, TN

The following is a summary of findings from the initial monthly vibration survey that was performed on September 1, 2020. 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.

Defects

C-551B Vacuum Compressor B

Compressor data shows high frequency vibrations with amplitudes ranging from 2 to 5 g's. This is the first collection of this unit and we need to establish a trend. We will monitor this closely. Rated as a **CLASS I** defect for now.

C-551A Vacuum Compressor A

Compressor data shows high frequency vibrations with amplitudes ranging from 1.5 to 6 g's. This is the first collection of this unit and we need to establish a trend to help with condition monitoring. We will monitor this closely. Rated as a **CLASS I** defect for now.

C-0600A and B Feed Gas Compressors

Compressors have elevated 1 x rpm vibration. The frame at the concrete floor also has a high 1 x rpm vibration in the vertical position. This is an indication of a structural base issue. It is recommended to fill in frames with an epoxy resin grout ensuring all voids are filled in. Compressor bases are also possibly weak and may need to be stiffened in the future if filling in the base frame doesn't sufficiently lower the vibration. Rated as a **CLASS I** defect for now.

BLR-0200 A, B, and C LFG Blowers

These blowers have a very high amplitude of high frequency vibration. Multiple harmonics at what appears to be 8 x blower rpm are present and 8 or 16 x rpm peak is dominant in blower velocity data. Amplitudes range from 3 to nearly 10 g's which seems very high for new equipment. This may be a characteristic of this blower and we need to establish a trend and **we also need more information on these blowers such as bearing information, impeller, information, number of vanes, etc.** before we can correctly diagnose these units. Rated as **CLASS I** defects for now.

C-1300 Sales Gas Compressor Stage 1

Compressor inboard bearing spectral data shows a dominant peak at 74 orders of rpm. This may be a gear mesh frequency. There are also input rpm sidebands around this peak which are indication of gear issue as well. **We need gear teeth counts to help diagnose this issue.** This compressor also has elevated 1 x rpm vibration. The frame at the concrete floor also has a high 1 x rpm vibration in the vertical position. This is an indication of a structural base issue. It is recommended to fill in frame with an epoxy resin grout ensuring all voids are filled in. Compressor base directly under compressor is possibly weak and may need to be stiffened in the future if filling in the base frame doesn't sufficiently lower the vibration. Rated as a **CLASS I** defect for now.

Abbreviated Last Measurement Summary

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	(01-Sep-20)	
	OVERALL LEVEL	1K-20KHz
MOH	.065 In/Sec	.400 G-s
MOV	.039 In/Sec	.304 G-s
MIH	.093 In/Sec	.726 G-s
MIV	.074 In/Sec	.330 G-s
MIA	.059 In/Sec	1.026 G-s
CIA	.115 In/Sec	2.147 G-s
CIH	.109 In/Sec	3.818 G-s

CIV	.122 In/Sec	2.432 G-s
COH	.123 In/Sec	4.298 G-s
COV	.188 In/Sec	3.110 G-s
COA	.167 In/Sec	5.462 G-s

C-551A - C-551A VACUUM COMPRESSOR A (01-Sep-20)

	OVERALL LEVEL	1K-20KHz
MOH	.059 In/Sec	.319 G-s
MOV	.026 In/Sec	.218 G-s
MIH	.077 In/Sec	.645 G-s
MIV	.061 In/Sec	.274 G-s
MIA	.061 In/Sec	.719 G-s
CIA	.211 In/Sec	1.476 G-s
CIH	.240 In/Sec	1.699 G-s
CIV	.197 In/Sec	1.396 G-s
COH	.229 In/Sec	6.025 G-s
COV	.157 In/Sec	2.307 G-s
COA	.166 In/Sec	4.468 G-s

C-601B - C-601B N2 RECYCLE COMP B (01-Sep-20)

	OVERALL LEVEL	1K-20KHz
MOH	.094 In/Sec	.593 G-s
MOV	.049 In/Sec	.456 G-s
MIH	.090 In/Sec	.571 G-s
MIV	.028 In/Sec	.253 G-s
MIA	.030 In/Sec	.495 G-s
CIA	.110 In/Sec	.989 G-s
CIH	.119 In/Sec	.822 G-s
CIV	.084 In/Sec	.719 G-s
COH	.113 In/Sec	1.093 G-s
COV	.079 In/Sec	1.051 G-s
COA	.105 In/Sec	.785 G-s

C-601A - C-601A N2 RECYCLE COMP A (01-Sep-20)

	OVERALL LEVEL	1K-20KHz
MOH	.039 In/Sec	.606 G-s
MOV	.032 In/Sec	.549 G-s
MIH	.077 In/Sec	.509 G-s
MIV	.034 In/Sec	.509 G-s
MIA	.037 In/Sec	.525 G-s
CIA	.096 In/Sec	1.281 G-s
CIH	.101 In/Sec	.845 G-s
CIV	.084 In/Sec	1.035 G-s
COH	.137 In/Sec	1.001 G-s
COV	.075 In/Sec	1.485 G-s
COA	.089 In/Sec	1.266 G-s

C-0600A - C-0600A FEED GAS COMP A (01-Sep-20)

	OVERALL LEVEL	1K-20KHz
MOH	.121 In/Sec	.231 G-s
MOV	.215 In/Sec	.372 G-s
MIH	.043 In/Sec	.225 G-s
MIV	.171 In/Sec	.424 G-s
MIA	.190 In/Sec	.354 G-s
CIA	.225 In/Sec	1.010 G-s
CIH	.269 In/Sec	1.101 G-s
CIV	.331 In/Sec	1.558 G-s
COH	.185 In/Sec	1.085 G-s
COV	.185 In/Sec	1.472 G-s
COA	.211 In/Sec	1.871 G-s

C-0600B - C-0600B FEED GAS COMP B (01-Sep-20)

	OVERALL LEVEL	1K-20KHz
MOH	.180 In/Sec	.279 G-s
MOV	.158 In/Sec	.509 G-s
MIH	.088 In/Sec	.316 G-s
MIV	.347 In/Sec	.590 G-s
MIA	.366 In/Sec	.513 G-s
CIA	.400 In/Sec	1.471 G-s
CIH	.415 In/Sec	1.478 G-s

CIV	.328 In/Sec	1.556 G-s
COH	.364 In/Sec	1.125 G-s
COV	.256 In/Sec	1.434 G-s
COA	.343 In/Sec	1.677 G-s

BLR-0200A - BLR-0200A LFG BLOWER A (01-Sep-20)

	OVERALL LEVEL	1K-20KHz
MOH	.228 In/Sec	.642 G-s
MOV	.087 In/Sec	.423 G-s
MIH	.157 In/Sec	.726 G-s
MIV	.441 In/Sec	.747 G-s
MIA	.153 In/Sec	.660 G-s
BIH	.511 In/Sec	8.290 G-s
BIV	.562 In/Sec	7.377 G-s
BOH	.253 In/Sec	6.958 G-s
BOV	.280 In/Sec	8.278 G-s
BOA	.265 In/Sec	7.898 G-s

BLR-0200B - BLR-0200B LFG BLOWER B (01-Sep-20)

	OVERALL LEVEL	1K-20KHz
MOH	.253 In/Sec	.664 G-s
MOV	.066 In/Sec	.273 G-s
MIH	.261 In/Sec	.957 G-s
MIV	.185 In/Sec	.780 G-s
MIA	.107 In/Sec	.541 G-s
BIH	.499 In/Sec	7.277 G-s
BIV	.446 In/Sec	7.520 G-s
BOH	.382 In/Sec	6.193 G-s
BOV	.373 In/Sec	9.362 G-s
BOA	.342 In/Sec	8.768 G-s

BLR-0200C - BLR-0200C LFG BLOWER C (01-Sep-20)

	OVERALL LEVEL	1K-20KHz
MOH	.346 In/Sec	.393 G-s
MOV	.059 In/Sec	.115 G-s
MIH	.273 In/Sec	.694 G-s
MIV	.175 In/Sec	.632 G-s
MIA	.056 In/Sec	.265 G-s
BIH	.479 In/Sec	5.340 G-s
BIV	.469 In/Sec	3.026 G-s
BOH	.343 In/Sec	7.745 G-s
BOV	.493 In/Sec	9.913 G-s
BOA	.331 In/Sec	7.783 G-s

C-1300 - C-1300 SALES GAS COMP STG 1 (01-Sep-20)

	OVERALL LEVEL	1K-20KHz
MOH	.070 In/Sec	.312 G-s
MOV	.132 In/Sec	.704 G-s
MIH	.050 In/Sec	.279 G-s
MIV	.031 In/Sec	.502 G-s
MIA	.061 In/Sec	.373 G-s
CIA	.156 In/Sec	1.401 G-s
CIH	.215 In/Sec	4.713 G-s
CIV	.253 In/Sec	2.150 G-s
COH	.146 In/Sec	.997 G-s
COV	.267 In/Sec	1.192 G-s
COA	.133 In/Sec	2.151 G-s

C-1304 - C-1304 SALES GAS COMP STG 2 (01-Sep-20)

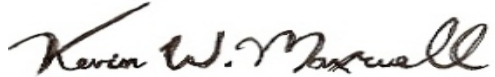
	OVERALL LEVEL	1K-20KHz
MOH	.113 In/Sec	.257 G-s
MOV	.066 In/Sec	.255 G-s
MIH	.140 In/Sec	.589 G-s
MIV	.087 In/Sec	.736 G-s
MIA	.076 In/Sec	.563 G-s
CIA	.113 In/Sec	.415 G-s
CIH	.159 In/Sec	.220 G-s
CIV	.077 In/Sec	.230 G-s
COH	.157 In/Sec	.362 G-s
COV	.090 In/Sec	.166 G-s

Clarification Of Vibration Units:

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

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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