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January 10, 2024

South Shelby RNG
Memphis, TN

The following is a summary of findings from the monthly vibration survey that was performed on January 10, 2024.

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.

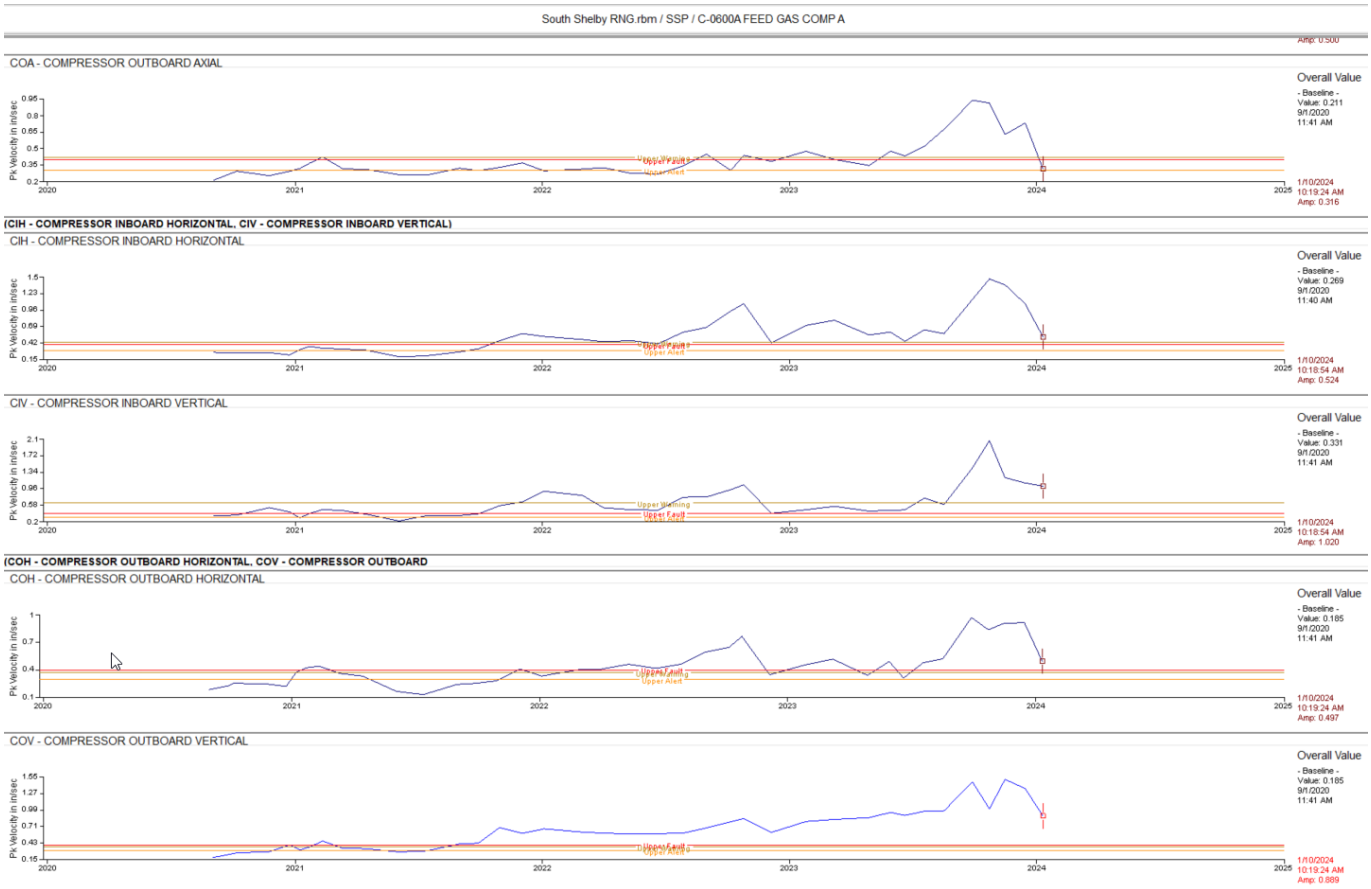
Class IV: Defect (s) present that makes continued reliability unpredictable, and possibility of secondary damage is high. Repairs should be made ASAP. An unscheduled shutdown should be considered for repairs

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-0600 A Feed Gas Compressor

Compressor vibration is lower since replacing the compressor, but overall amplitude of vibration remains high for a new or rebuilt compressor. See compressor trends below. Spectral data shows a 4 x male rotor rpm peak with harmonics. This type of vibration has been present in these compressors since their inception with amplitudes fluctuating some; however, vibration amplitudes are high for a new unit. The highest amplitude appears to be is in the compressor verticals. We are monitoring this closely. Rated as a **CLASS I** 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 continues to have higher than normal 1 x motor rpm vibration. Compressor data shows 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 68 g's peak to peakin waveform data. This is likely a characteristic of this blowers' sliding vanes. We will continue to monitor closely. Rated as **CLASS I** defects for now.

C-1300 Sales Gas Compressor Stage 1

Compressor drive end data shows some high frequency vibration that may be related to gear mesh frequency of the internal mating gears. We need more internal information such as gear ratio and number of gear teeth to confirm issue. 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
C-551B	- C-551B VACUUM COMPRESSOR B	(10-Jan-24)	
		OVERALL LEVEL	1K-20KHz
	MOH	.074 In/Sec	2.190 G-s
	MOV	.051 In/Sec	.393 G-s
	MIH	.097 In/Sec	6.970 G-s
	MIV	.090 In/Sec	.420 G-s
	MIA	.060 In/Sec	.406 G-s
	CIA	.383 In/Sec	.815 G-s
	CIH	.144 In/Sec	3.113 G-s
	CIV	.298 In/Sec	.860 G-s
	COH	.336 In/Sec	6.232 G-s
	COV	.273 In/Sec	1.111 G-s
	COA	.192 In/Sec	1.746 G-s
C-551A	- C-551A VACUUM COMPRESSOR A	(10-Jan-24)	
		OVERALL LEVEL	1K-20KHz
	MOH	.075 In/Sec	1.039 G-s
	MOV	.075 In/Sec	.390 G-s
	MIH	.125 In/Sec	1.001 G-s
	MIV	.076 In/Sec	.372 G-s
	MIA	.060 In/Sec	.274 G-s
	CIA	.296 In/Sec	.638 G-s
	CIH	.218 In/Sec	2.813 G-s
	CIV	.324 In/Sec	.566 G-s
	COH	.326 In/Sec	5.950 G-s
	COV	.307 In/Sec	.853 G-s
	COA	.161 In/Sec	1.253 G-s
C-601B	- C-601B N2 RECYCLE COMP B	(10-Jan-24)	
		OVERALL LEVEL	1K-20KHz
	MOH	.126 In/Sec	.465 G-s
	MOV	.055 In/Sec	.225 G-s
	MIH	.088 In/Sec	.697 G-s
	MIV	.056 In/Sec	.190 G-s
	MIA	.039 In/Sec	.148 G-s
	CIA	.118 In/Sec	.647 G-s
	CIH	.145 In/Sec	1.952 G-s
	CIV	.141 In/Sec	.331 G-s
	COH	.171 In/Sec	2.001 G-s
	COV	.173 In/Sec	.503 G-s
	COA	.143 In/Sec	.796 G-s
C-601A	- C-601A N2 RECYCLE COMP A	(10-Jan-24)	
		OVERALL LEVEL	1K-20KHz
	MOH	.048 In/Sec	.759 G-s
	MOV	.034 In/Sec	.367 G-s
	MIH	.078 In/Sec	.571 G-s
	MIV	.043 In/Sec	.192 G-s

MIA	.032 In/Sec	.242 G-s	
CIA	.065 In/Sec	.855 G-s	
CIH	.089 In/Sec	2.693 G-s	
CIV	.174 In/Sec	.501 G-s	
COH	.104 In/Sec	1.324 G-s	
COV	.119 In/Sec	.513 G-s	
COA	.135 In/Sec	.504 G-s	

C-0600A - C-0600A FEED GAS COMP A (10-Jan-24)

	OVERALL LEVEL	1K-20KHz
MOH	.183 In/Sec	.474 G-s
MOV	.190 In/Sec	.116 G-s
MIH	.124 In/Sec	.464 G-s
MIV	.117 In/Sec	.191 G-s
MIA	.037 In/Sec	.133 G-s
CIA	.500 In/Sec	.616 G-s
CIH	.524 In/Sec	2.496 G-s
CIV	1.020 In/Sec	.834 G-s
COH	.497 In/Sec	2.108 G-s
COV	.889 In/Sec	.599 G-s
COA	.316 In/Sec	.641 G-s
P1	.679 In/Sec	1.063 G-s

C-0600B - C-0600B FEED GAS COMP B (10-Jan-24)

	OVERALL LEVEL	1K-20KHz
MOH	.212 In/Sec	.615 G-s
MOV	.160 In/Sec	.106 G-s
MIH	.190 In/Sec	.803 G-s
MIV	.118 In/Sec	.184 G-s
MIA	.081 In/Sec	.211 G-s
CIA	.199 In/Sec	1.057 G-s
CIH	.373 In/Sec	3.876 G-s
CIV	.450 In/Sec	.543 G-s
COH	.355 In/Sec	1.960 G-s
COV	.572 In/Sec	.333 G-s
COA	.308 In/Sec	.432 G-s
P1	1.598 In/Sec	1.032 G-s

C-0600C - C-0600C FEED GAS COMP C (10-Jan-24)

	OVERALL LEVEL	1K-20KHz
MOH	.596 In/Sec	.398 G-s
MOV	.320 In/Sec	.074 G-s
MIH	.574 In/Sec	.657 G-s
MIV	.198 In/Sec	.186 G-s
MIA	.204 In/Sec	.164 G-s
CIA	.597 In/Sec	1.156 G-s
CIH	.778 In/Sec	3.358 G-s
CIV	.682 In/Sec	.962 G-s
COH	.640 In/Sec	1.893 G-s
COV	.818 In/Sec	1.357 G-s
COA	.613 In/Sec	1.365 G-s
P1	.667 In/Sec	1.568 G-s

BLR-0200A - BLR-0200A LFG BLOWER A (10-Jan-24)

	OVERALL LEVEL	1K-20KHz
MOH	.055 In/Sec	.801 G-s
MOV	.077 In/Sec	.364 G-s
MIH	.064 In/Sec	.973 G-s
MIV	.141 In/Sec	.202 G-s
MIA	.092 In/Sec	.309 G-s
BIA	.155 In/Sec	2.319 G-s
BIH	.383 In/Sec	12.71 G-s
BIV	.400 In/Sec	2.295 G-s
BOH	.333 In/Sec	17.22 G-s
BOV	.384 In/Sec	2.499 G-s
BOA	.195 In/Sec	2.713 G-s

BLR-0200B - BLR-0200B LFG BLOWER B (10-Jan-24)

	OVERALL LEVEL	1K-20KHz
MOH	.146 In/Sec	1.871 G-s

	MOV	.113 In/Sec	.331 G-s
	MIH	.163 In/Sec	3.252 G-s
	MIV	.125 In/Sec	.464 G-s
	MIA	.065 In/Sec	.715 G-s
	BIA	.132 In/Sec	1.377 G-s
	BIH	.289 In/Sec	6.494 G-s
	BIV	.255 In/Sec	1.591 G-s
	BOH	.266 In/Sec	6.112 G-s
	BOV	.293 In/Sec	1.219 G-s
	BOA	.160 In/Sec	2.689 G-s

BLR-0200C - BLR-0200C LFG BLOWER C (10-Jan-24)

	OVERALL LEVEL	1K-20KHz
MOH	.175 In/Sec	.743 G-s
MOV	.190 In/Sec	.227 G-s
MIH	.222 In/Sec	.984 G-s
MIV	.301 In/Sec	.194 G-s
MIA	.121 In/Sec	.287 G-s
BIA	.164 In/Sec	1.677 G-s
BIH	.490 In/Sec	11.23 G-s
BIV	.317 In/Sec	3.061 G-s
BOH	.466 In/Sec	9.933 G-s
BOV	.380 In/Sec	2.612 G-s
BOA	.201 In/Sec	1.821 G-s

C-1300 - C-1300 SALES GAS COMP STG 1 (10-Jan-24)

	OVERALL LEVEL	1K-20KHz
MOH	.054 In/Sec	.419 G-s
MOV	.197 In/Sec	.048 G-s
MIH	.061 In/Sec	.858 G-s
MIV	.318 In/Sec	.179 G-s
MIA	.195 In/Sec	.092 G-s
CIA	.187 In/Sec	1.043 G-s
CIH	.236 In/Sec	5.528 G-s
CIV	.293 In/Sec	.621 G-s
COH	.136 In/Sec	1.368 G-s
COV	.321 In/Sec	.489 G-s
COA	.238 In/Sec	.628 G-s
P1	.151 In/Sec	1.951 G-s

C-1304 - C-1304 SALES GAS COMP STG 2 (10-Jan-24)

	OVERALL LEVEL	1K-20KHz
MOH	.110 In/Sec	.862 G-s
MOV	.068 In/Sec	1.135 G-s
MIH	.124 In/Sec	.953 G-s
MIV	.081 In/Sec	.758 G-s
MIA	.074 In/Sec	.223 G-s
CIA	.129 In/Sec	.367 G-s
CIH	.190 In/Sec	1.019 G-s
CIV	.100 In/Sec	.276 G-s
COH	.188 In/Sec	.450 G-s
COV	.160 In/Sec	.153 G-s
COA	.149 In/Sec	.265 G-s
2SH	.299 In/Sec	1.294 G-s
2SV	.182 In/Sec	.435 G-s
2SA	.237 In/Sec	.426 G-s
3SH	.138 In/Sec	.743 G-s
3SV	.185 In/Sec	.100 G-s
3SA	.258 In/Sec	.204 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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