



QualiTest® Diagnostics

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December 16, 2019

The following is a summary of findings from the vibration survey on the Ammonia Compressors at the Brandon, MS plant. 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.

C-1 Ammonia Compressor

Motor/compressor appears to be operating within acceptable limits this survey. No actions necessary at this time.

C-2 Ammonia Compressor

Compressor data shows some signs of possible internal wear of the compressor. We will monitor this closely. Rated as a **CLASS I** defect for now.

C-3 Ammonia Compressor

Motor data shows some higher frequency electrical vibration that may be influenced by the IR issue that was found in the C-3 electrical panel. We will monitor this closely. Rated as a **CLASS I** defect.

Abbreviated Last Measurement Summary

Database: Atlantic Dry Ice.rbm
Area: Brandon MS Plant

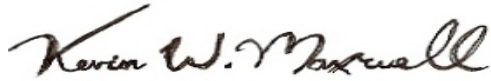
MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
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C-1 - C-1 AMMONIA COMPRESSOR	(10-Dec-19)	
	OVERALL LEVEL	1K-20KHz
MOH	.133 In/Sec	1.027 G-s
MOV	.066 In/Sec	.807 G-s
MIH	.138 In/Sec	.508 G-s
MIV	.076 In/Sec	.492 G-s
MIA	.080 In/Sec	.532 G-s
CIA	.128 In/Sec	.227 G-s
CIH	.072 In/Sec	.233 G-s
CIV	.104 In/Sec	.321 G-s
COH	.035 In/Sec	.148 G-s
COV	.088 In/Sec	.138 G-s
C-2 - C-2 AMMONIA COMPRESSOR	(10-Dec-19)	
	OVERALL LEVEL	1K-20KHz
MOH	.135 In/Sec	.169 G-s
MOV	.067 In/Sec	.258 G-s
MIH	.115 In/Sec	.327 G-s
MIV	.087 In/Sec	.260 G-s
MIA	.092 In/Sec	.357 G-s
CIA	.214 In/Sec	.868 G-s
CIH	.127 In/Sec	.676 G-s
CIV	.292 In/Sec	.968 G-s
COH	.062 In/Sec	.376 G-s
COV	.137 In/Sec	1.390 G-s
C-3 - C-3 AMMONIA COMPRESSOR	(10-Dec-19)	
	OVERALL LEVEL	1K-20KHz
MOH	.096 In/Sec	.521 G-s
MOV	.076 In/Sec	.489 G-s
MIH	.092 In/Sec	.632 G-s
MIV	.065 In/Sec	.706 G-s
MIA	.131 In/Sec	.431 G-s
CIA	.122 In/Sec	.395 G-s
CIH	.106 In/Sec	.187 G-s
CIV	.099 In/Sec	.283 G-s
COH	.044 In/Sec	.355 G-s
COV	.046 In/Sec	.303 G-s

Clarification Of Vibration Units:

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

As always, it has been a pleasure to serve Atlantic Dry Ice. If there are any comments or questions, do not hesitate to contact us.

Sincerely,

A handwritten signature in black ink that reads "Kevin W. Maxwell". The signature is fluid and cursive, with the first name "Kevin" and last name "Maxwell" clearly legible.

ISO Certified Vibration Analyst, Category III



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