



QualiTest® Diagnostics

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May 15, 2024

Tim Busby
Mark Busby
Atlantic Dry Ice
Brandon, MS

Tim/Mark,

The following is a summary of findings from the quarterly vibration survey on the Ammonia Compressors that was performed on 5/10/24 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.

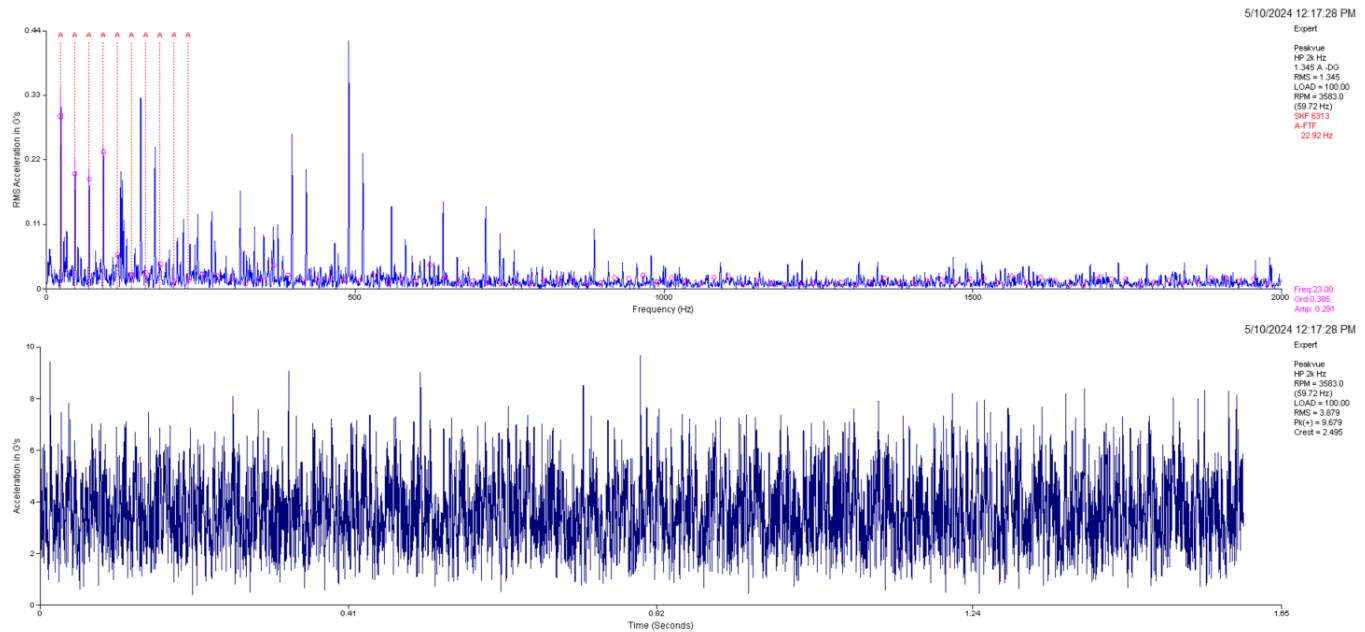
Class II: Defect (s) present that may cause problem in long term (2-6 months). Repair during normal maintenance scheduling. Continue to monitor.

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

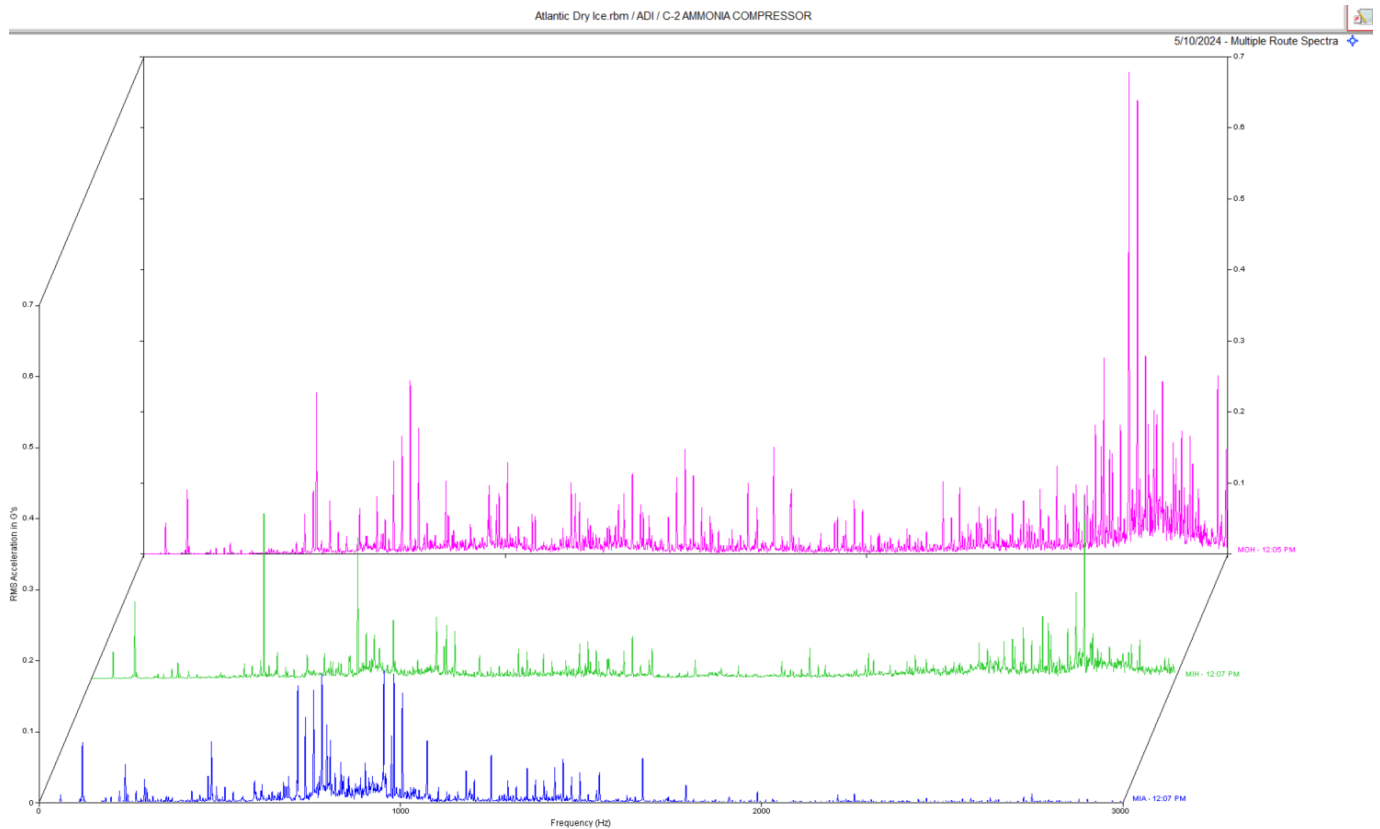
Hi-Speed Industrial Service tests and inspects industrial machinery and equipment and makes recommendations concerning maintenance and repairs based on its experience in the field of industrial repair and maintenance. The information contained herein is provided as an opinion only, not as a guaranty or warranty of the matters discussed herein.

Summary



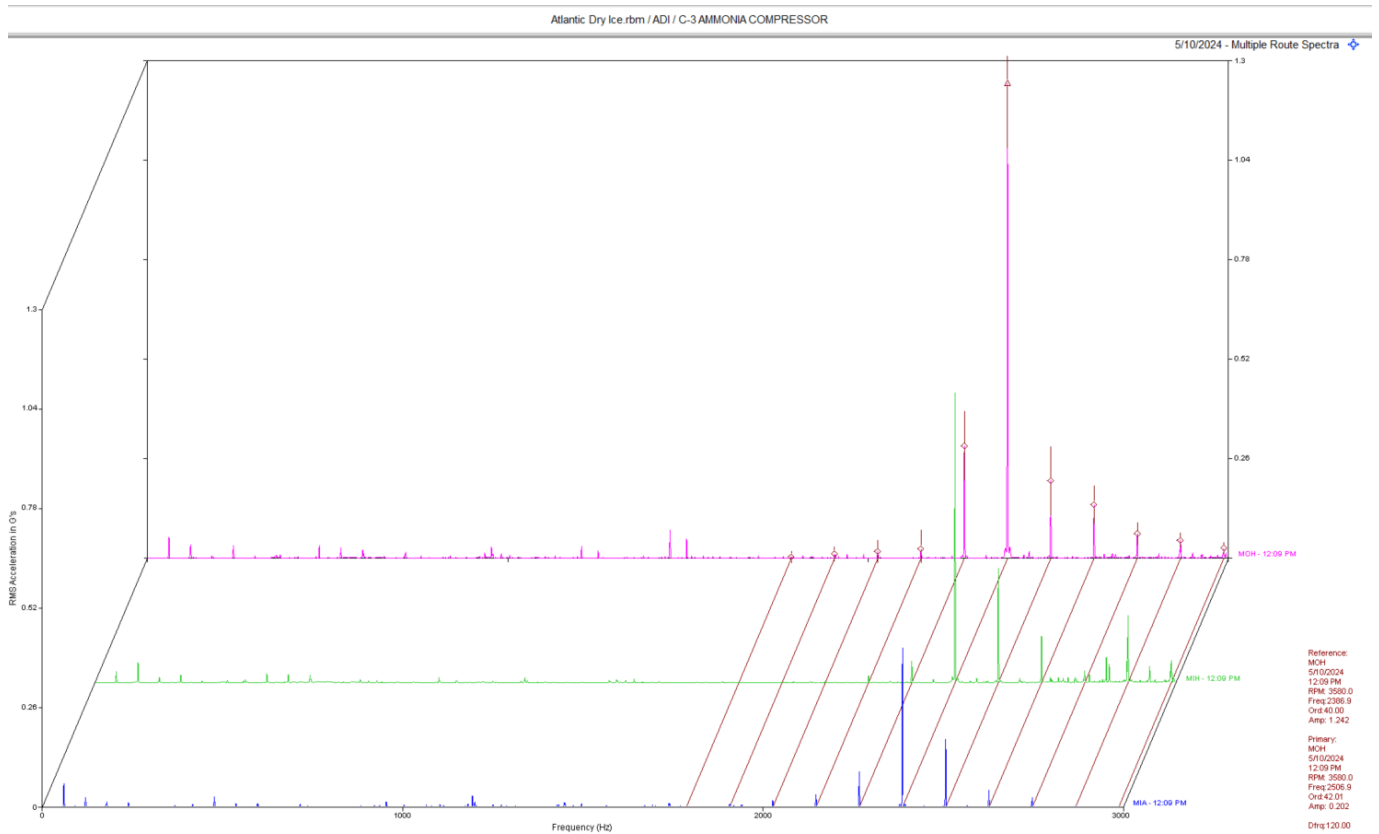
C-1 Ammonia Compressor

Motor data shows non-synchronous peaks in motor spectra that indicate bearing defects are present in the motor bearings. Amplitudes are higher in the ODE motor bearing (Outboard) and many peaks in the spectra are associated with bearing cage frequency. Inspect motor bearings for defects/wear and proper lubrication soon. Rated as a **CLASS III** defect.



C-2 Ammonia Compressor

Motor data is showing some evidence of bearing noise associated with lubrication issue and or defects occurring in the motor bearings. Inspect motor bearings for proper lubrication soon and ensure motor bearings are not defective. Compressor data shows some possible signs of internal wear of the compressor. Heavy load on the compressor can also be a factor. The compressor verticals show a dominant vibration at lobe pass (4 x rpm) with harmonics. We will continue to monitor this closely. Rated as a **CLASS II** defect.



C-3 Ammonia Compressor

Motor data shows electrical vibration associated with possible rotor bar bass frequency and 2 x electrical line frequency. This may be due to soft foot of the motor causing an air gap issue in the motor. This is not a significant issue; however, it is still recommended to inspect motor for soft foot condition and realign motor if soft foot is found. We are monitoring 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-May-24)
	OVERALL LEVEL	1K-20KHz
MOH	.117 In/Sec	2.582 G-s
MOV	.128 In/Sec	.837 G-s
MIH	.092 In/Sec	.888 G-s
MIV	.132 In/Sec	.346 G-s
MIA	.090 In/Sec	.303 G-s
CIA	.122 In/Sec	.192 G-s
CIH	.109 In/Sec	.563 G-s
CIV	.068 In/Sec	.079 G-s
COH	.054 In/Sec	.439 G-s
COV	.082 In/Sec	.157 G-s

C-2	- C-2 AMMONIA COMPRESSOR	(10-May-24)
	OVERALL LEVEL	1K-20KHz
MOH	.139 In/Sec	1.952 G-s
MOV	.233 In/Sec	.357 G-s
MIH	.119 In/Sec	1.040 G-s
MIV	.129 In/Sec	.292 G-s
MIA	.098 In/Sec	.333 G-s
CIA	.113 In/Sec	.208 G-s
CIH	.151 In/Sec	.544 G-s
CIV	.452 In/Sec	.156 G-s
COH	.076 In/Sec	.593 G-s
COV	.139 In/Sec	.316 G-s

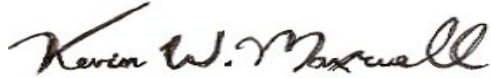
C-3	- C-3 AMMONIA COMPRESSOR	(10-May-24)
	OVERALL LEVEL	1K-20KHz
MOH	.106 In/Sec	1.367 G-s
MOV	.054 In/Sec	.371 G-s
MIH	.072 In/Sec	.927 G-s
MIV	.106 In/Sec	.313 G-s
MIA	.102 In/Sec	.474 G-s
CIA	.145 In/Sec	.098 G-s
CIH	.070 In/Sec	.304 G-s
CIV	.063 In/Sec	.123 G-s
COH	.053 In/Sec	.493 G-s
COV	.150 In/Sec	.180 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. Marshall". The signature is fluid and cursive, with the first name "Kevin" and last name "Marshall" clearly legible.

ISO Certified Vibration Analyst, Category III



QualiTest® Diagnostics

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