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December 2, 2024

North Shelby Plant
Millington, TN

The following is a summary of findings from the November 2024 monthly vibration survey at the North Shelby site.

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.

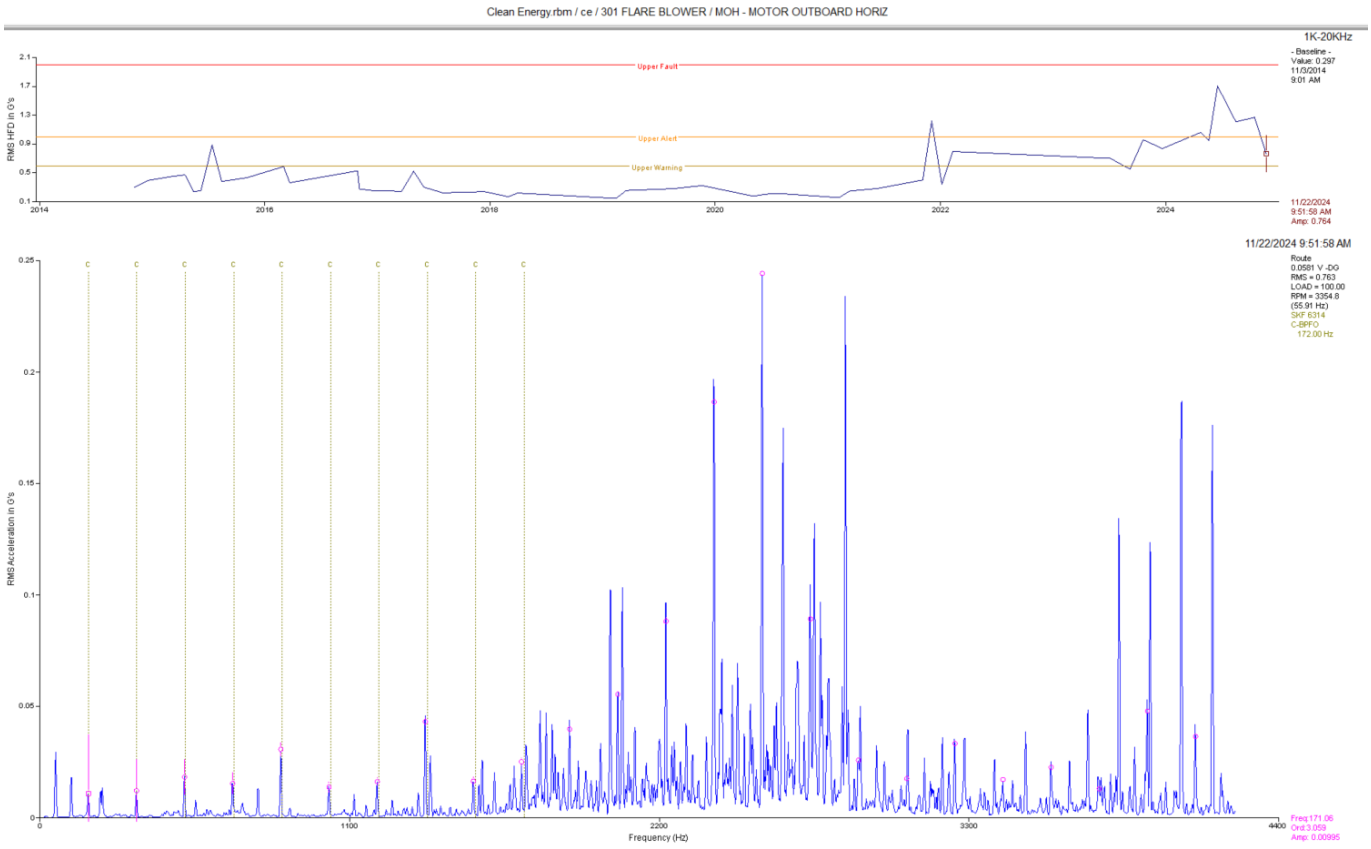
Class II: Defect (s) present that may cause problem in long term (2-6 months). Repair during normal maintenance scheduling. Continue to monitor.

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

Defects

301 Flare Blower CLASS II



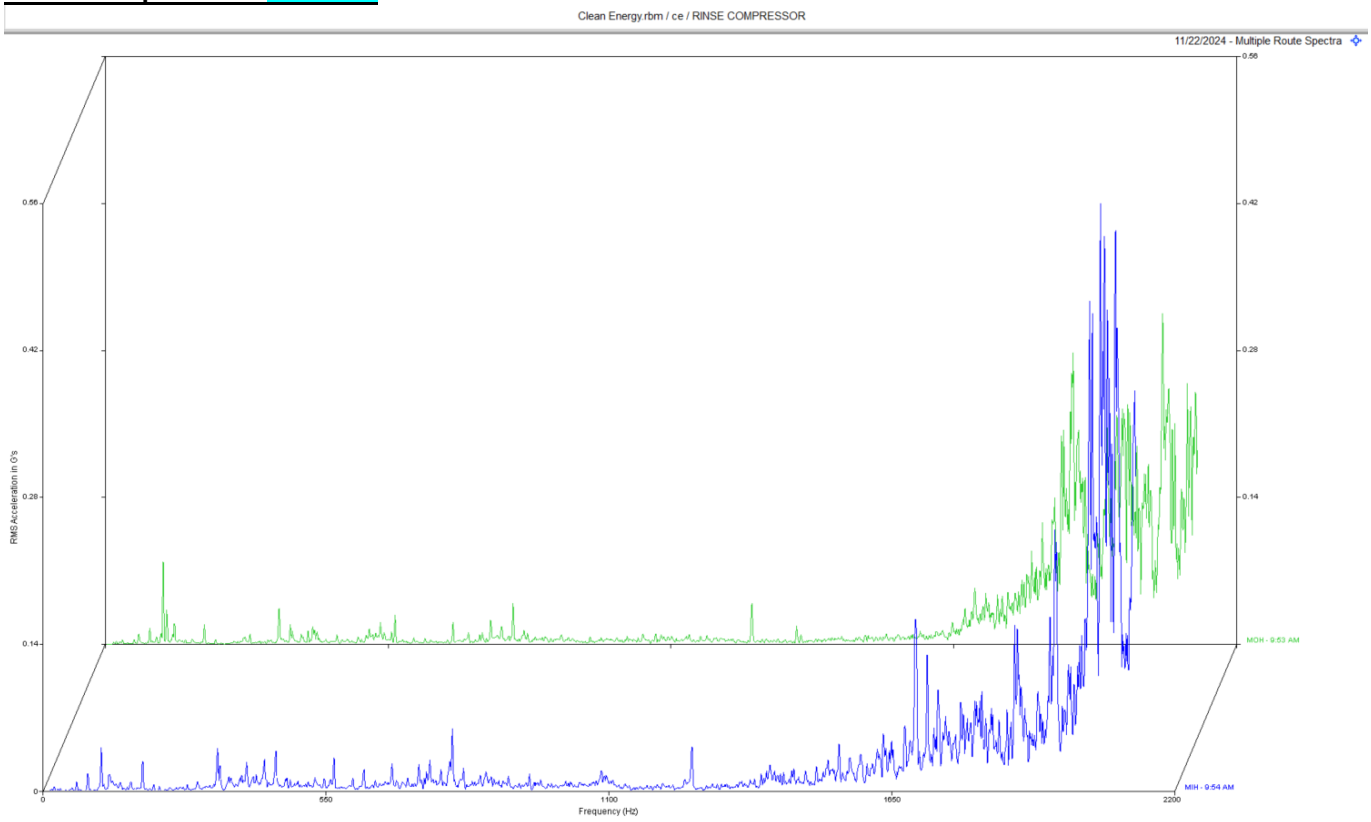
Observations:

Data above is the motor outboard horizontal. There appear to be several harmonics of a non-synchronous frequency present in the spectra that line up with outer race defect fundamental and its harmonics. This is indication of bearing defects in the motor.

Recommendations:

Motor should be replaced in the next few months. We are monitoring this closely.

Rinse Compressor **CLASS II**



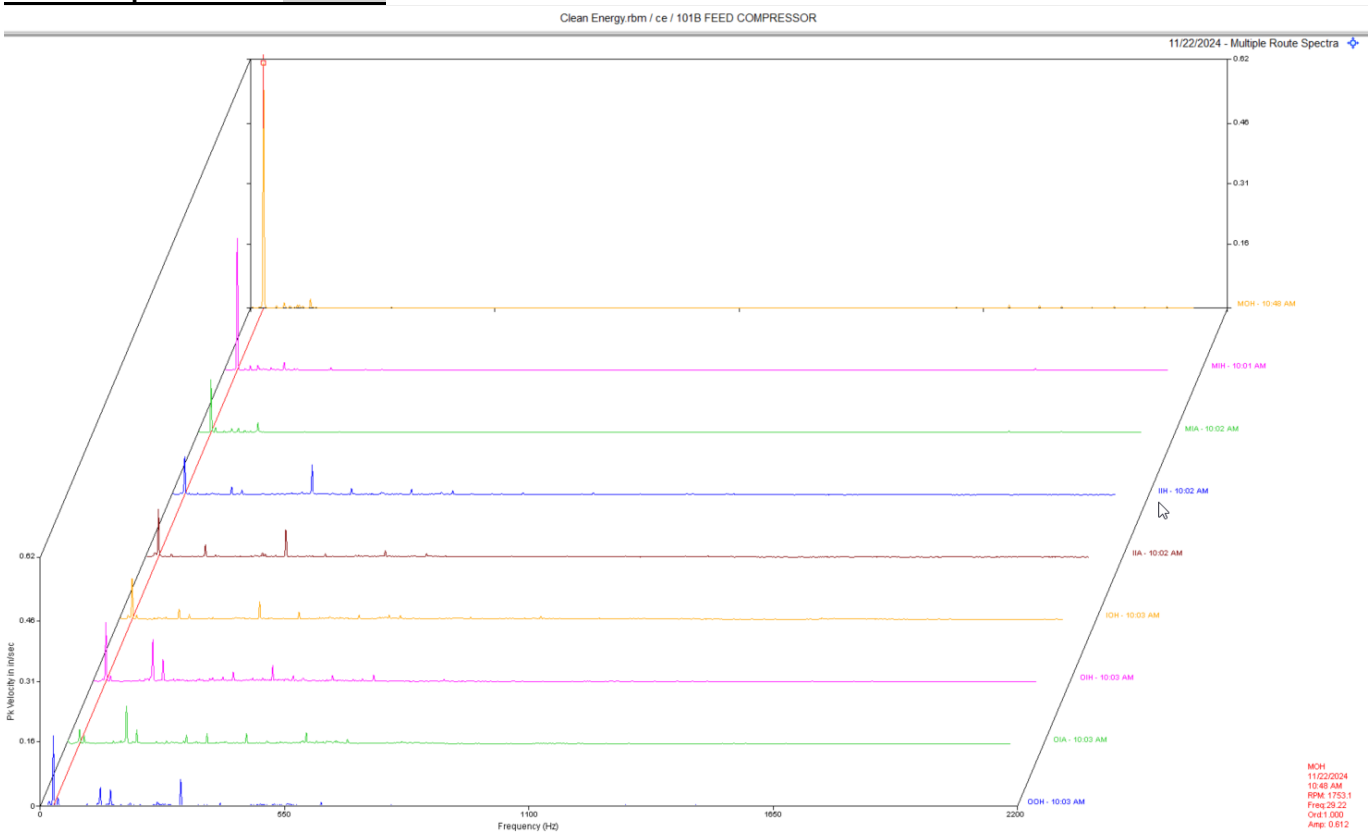
Observations:

Drive motor data shows some high frequency vibration. Motor is also making a squealing type noise. The last reading showed amplitude to be 2.1 g's on average. Spectral data shows a noise floor 1500-5000 hz range. Peak to peak waveform amplitude is 16 to 18 g's.

Recommendations:

Vibration characteristics indicate a lube issue or bearing wear. Motor likely needs attention during next extended shutdown. We are monitoring this closely. Rated as a **CLASS II** defect for now.

Feed Compressor B CLASS I



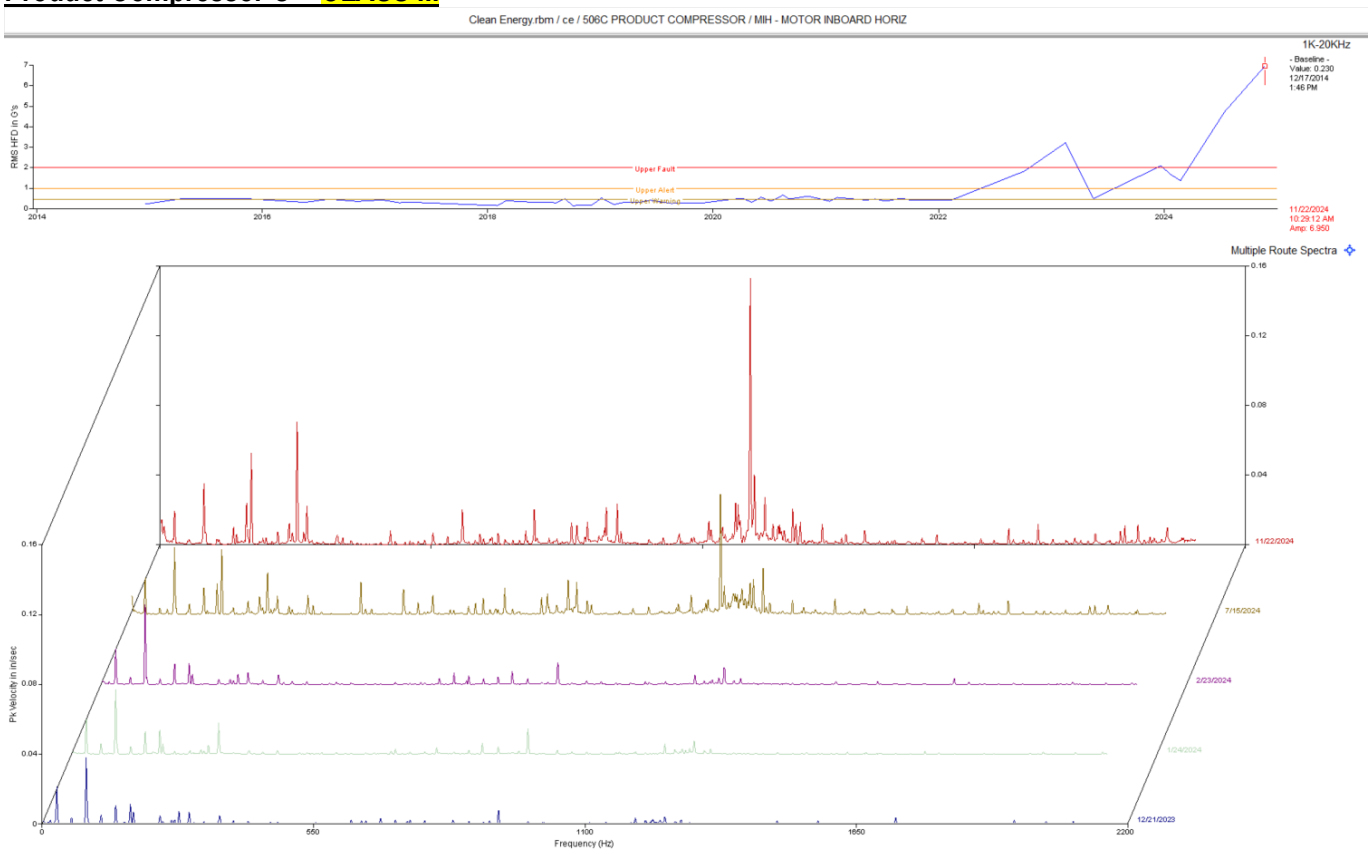
Observations:

New motor compressor data shows motor to have elevated 1 x rpm vibration.

Recommendations:

The 1 x rpm vibration may be due to process load and or motor rpm. There could also be an issue with the motor side of the coupling. It is recommended to recheck alignment, fasteners, and check couplings, at next opportunity.

Product Compressor C CLASS III



Observations:

Trend data shows increase in G's in motor data. Spectral waterfall of motor DE shows an increase in non-synchronous peaks over the past few surveys.

Recommendations:

Data indicates defects in motor bearings. Motor will need attention in the next couple of months.

Abbreviated Last Measurement Summary

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Database: Clean Energy.rbm
Area: millington plant

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
301 FLARE - 301 FLARE BLOWER	(22-Nov-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.058 In/Sec	.764 G-s
MOV	.199 In/Sec	.276 G-s
MIH	.077 In/Sec	1.075 G-s
MIV	.122 In/Sec	.263 G-s
MIA	.049 In/Sec	.502 G-s
EIH	.152 In/Sec	.322 G-s
EIV	.090 In/Sec	.513 G-s
EIA	.041 In/Sec	.143 G-s
EOH	.104 In/Sec	.409 G-s
EOV	.139 In/Sec	.376 G-s
RINSE COMP - RINSE COMPRESSOR	(22-Nov-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.115 In/Sec	2.026 G-s
M1P	.018 In/Sec	
MIH	.123 In/Sec	4.009 G-s
M2P	.022 In/Sec	
MIA	.085 In/Sec	.442 G-s
IIH	.084 In/Sec	1.391 G-s
IIA	.166 In/Sec	.199 G-s
IOH	.101 In/Sec	.584 G-s
OIH	.089 In/Sec	1.083 G-s
OIA	.114 In/Sec	.177 G-s
OOH	.107 In/Sec	.931 G-s
VAC COMP - VACUUM COMPRESSOR	(22-Nov-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.138 In/Sec	1.756 G-s
MIH	.065 In/Sec	1.361 G-s
MIA	.057 In/Sec	.155 G-s
IIH	.103 In/Sec	.595 G-s
IIA	.050 In/Sec	.123 G-s
IOH	.131 In/Sec	.860 G-s
OIH	.096 In/Sec	.910 G-s
OIA	.062 In/Sec	.217 G-s
OOH	.100 In/Sec	.780 G-s
101B COMP - 101B FEED COMPRESSOR	(22-Nov-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.625 In/Sec	.402 G-s
MIH	.339 In/Sec	.244 G-s
MIA	.139 In/Sec	.246 G-s
IIH	.137 In/Sec	1.340 G-s
IIA	.156 In/Sec	.778 G-s
IOH	.133 In/Sec	.748 G-s
OIH	.215 In/Sec	.876 G-s
OIA	.144 In/Sec	.789 G-s
OOH	.209 In/Sec	1.648 G-s
HX132B FAN - HX132B GAS OIL COOLER FAN	(22-Nov-24)	
	OVERALL LEVEL	1K-20KHz
MOH	.057 In/Sec	.027 G-s
MIH	.104 In/Sec	.163 G-s
EIH	.116 In/Sec	.090 G-s
EOH	.084 In/Sec	.036 G-s

451A PUMP - 451A VACCUM PUMP (22-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.078 In/Sec	.613 G-s
MOV	.078 In/Sec	.252 G-s
MIH	.094 In/Sec	.490 G-s
MIV	.129 In/Sec	.606 G-s
MIA	.069 In/Sec	.278 G-s
EIH	.227 In/Sec	3.875 G-s
EIV	.205 In/Sec	.803 G-s
EIA	.107 In/Sec	.763 G-s
EOH	.157 In/Sec	.572 G-s
EOV	.153 In/Sec	.156 G-s

HX453A FAN - HX453A VAC PUMP OIL COOL FAN (22-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.201 In/Sec	.124 G-s
MIH	.107 In/Sec	.076 G-s

451B PUMP - 451B VACCUM PUMP (22-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.056 In/Sec	.417 G-s
MOV	.070 In/Sec	.176 G-s
MIH	.091 In/Sec	.395 G-s
MIV	.100 In/Sec	.152 G-s
MIA	.079 In/Sec	.095 G-s
EIH	.254 In/Sec	.340 G-s
EIV	.241 In/Sec	.203 G-s
EIA	.209 In/Sec	.179 G-s
EOH	.202 In/Sec	.799 G-s
EOV	.236 In/Sec	.158 G-s

HX453B FAN - HX453B VAC PUMP OIL COOL FAN (22-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.161 In/Sec	.232 G-s
MIH	.122 In/Sec	.065 G-s

451C PUMP - 451C VACCUM PUMP (22-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.149 In/Sec	.590 G-s
MOV	.134 In/Sec	.151 G-s
MIH	.196 In/Sec	.757 G-s
MIV	.183 In/Sec	.457 G-s
MIA	.096 In/Sec	.243 G-s
EIH	.183 In/Sec	.760 G-s
EIV	.121 In/Sec	.280 G-s
EIA	.097 In/Sec	.184 G-s
EOH	.141 In/Sec	.336 G-s
EOV	.141 In/Sec	.125 G-s

HX453C FAN - HX453C VAC PUMP OIL COOL FAN (22-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.163 In/Sec	.241 G-s
MIH	.113 In/Sec	.262 G-s

451D PUMP - 451D VACCUM PUMP (22-Nov-24)

	OVERALL LEVEL	1K-20KHz
MOH	.058 In/Sec	.857 G-s
MOV	.069 In/Sec	.485 G-s
MIH	.073 In/Sec	.941 G-s
MIV	.079 In/Sec	.170 G-s
MIA	.039 In/Sec	.273 G-s
EIH	.157 In/Sec	.472 G-s
EIV	.133 In/Sec	.071 G-s
EIA	.104 In/Sec	.097 G-s
EOH	.199 In/Sec	.633 G-s
EOV	.235 In/Sec	.186 G-s

HX453D FAN - HX453D VAC PUMP OIL COOL FAN (22-Nov-24)

	OVERALL LEVEL	1K-20KHz

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            MOH                        .243 In/Sec        .149 G-s
            MIH                        .233 In/Sec        .160 G-s

      506C COMP  - 506C PRODUCT COMPRESSOR        (22-Nov-24)
                                    OVERALL LEVEL      1K-20KHz
            MOH                        .159 In/Sec       1.836 G-s
            MIH                        .233 In/Sec       6.950 G-s
            MIA                        .103 In/Sec       2.034 G-s
            IIH                        .220 In/Sec       1.372 G-s
            IIA                        .160 In/Sec       1.585 G-s
            IOH                        .216 In/Sec       2.040 G-s
            OIH                        .217 In/Sec       1.701 G-s
            OIA                        .174 In/Sec       1.196 G-s
            OOH                        .225 In/Sec       1.514 G-s

      HX507C FAN - HX507C GAS COOL FAN            (22-Nov-24)
                                    OVERALL LEVEL      1K-20KHz
            MOH                        .240 In/Sec        .064 G-s
            MIH                        .254 In/Sec        .062 G-s

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   Clarification Of Vibration Units:
      Acc       -->  G-s       RMS
      Vel       -->  In/Sec    PK
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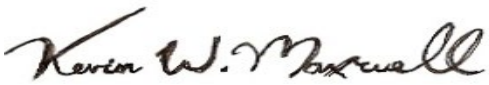
As always, it has been a pleasure to serve North Shelby-Archaea Energy. If there are any comments or questions, do not hesitate to contact us.

Sincerely,



ISO Certified Vibration Analyst, Category III

HI-SPEED INDUSTRIAL SERVICE

QualiTest® Diagnostics

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