HI-SPEED INDUSTRIAL SERVICE

QualiTest® Diagnostics

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April 2, 2025

North Shelby Plant
Millington, TN

The following is a summary of findings from the March 2025 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.

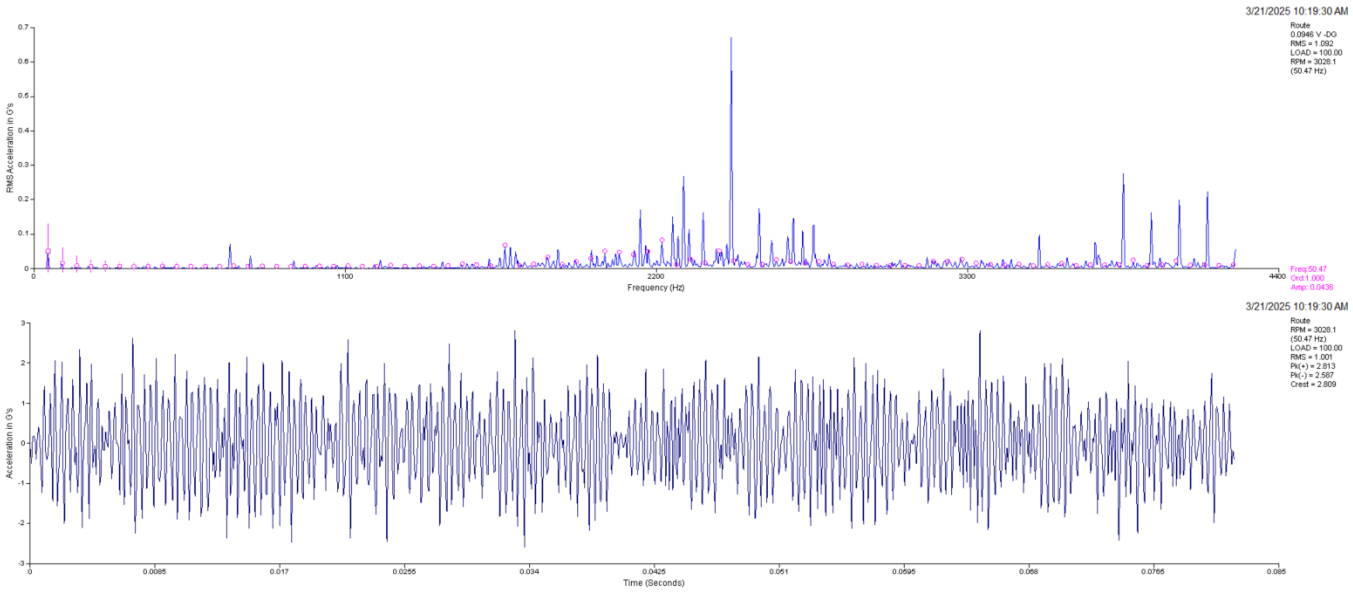
**Class II:** Defect (s) present that may cause problem in long term (2-6 months). Repair during normal maintenance scheduling. Continue to monitor.

**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



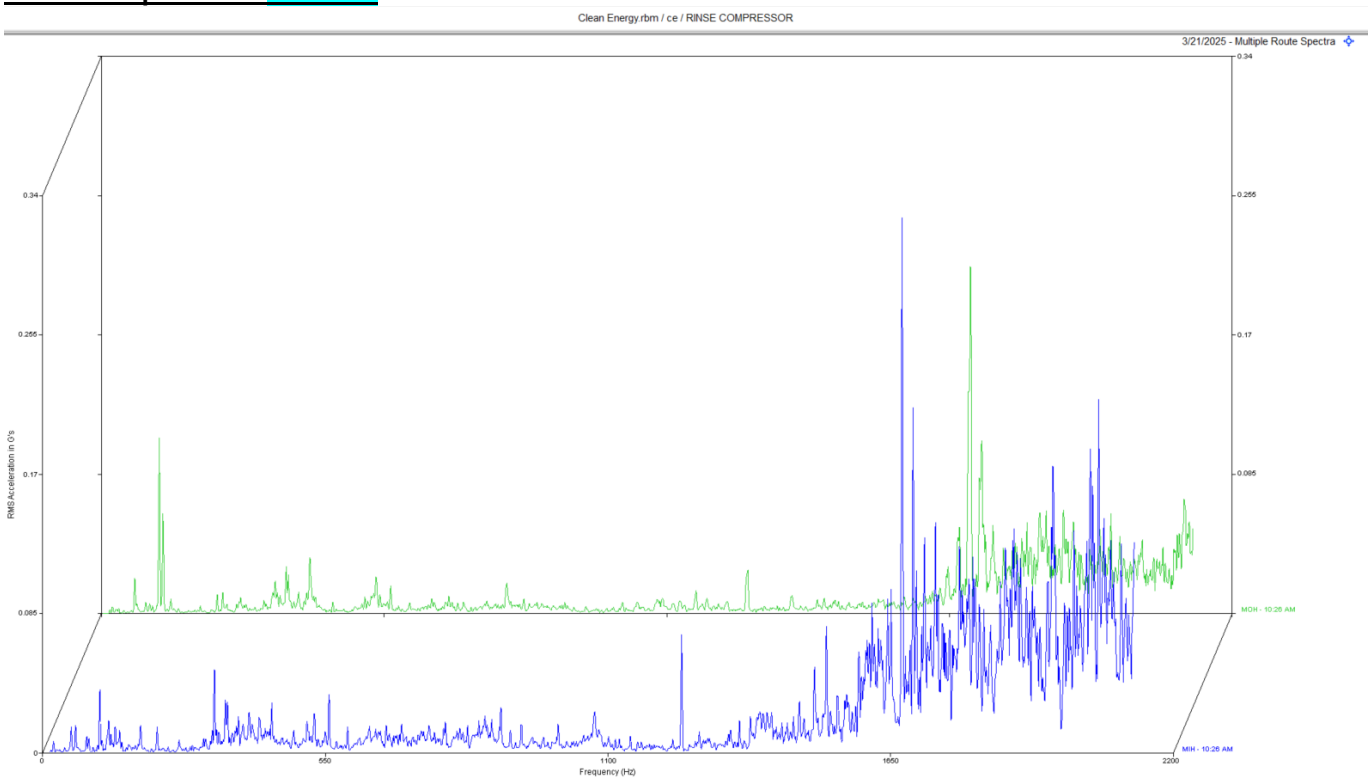

**Observations:**

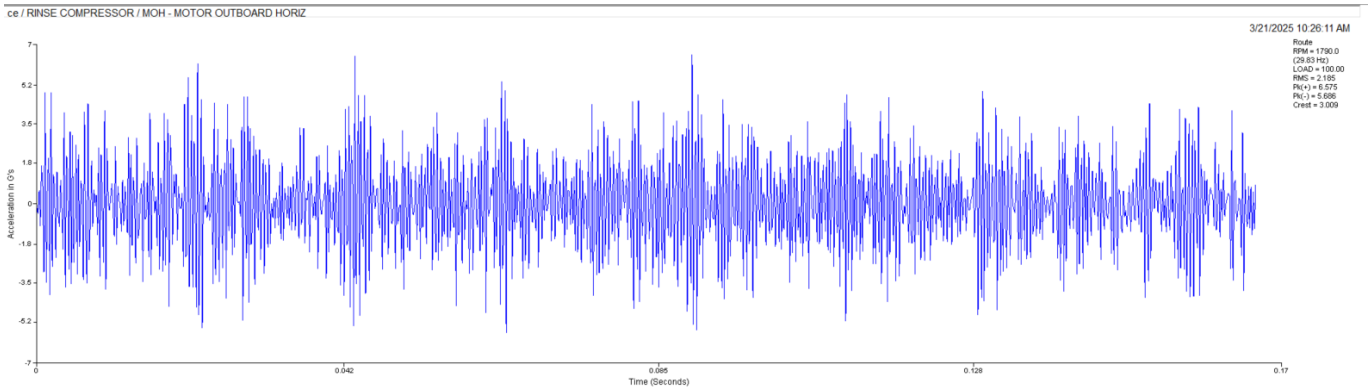
Data above is the motor outboard horizontal. There appear to be several harmonics of a non-synchronous frequency present in the spectra that line up with outer race defect fundamental and its harmonics. This is indication of bearing defects in the motor.

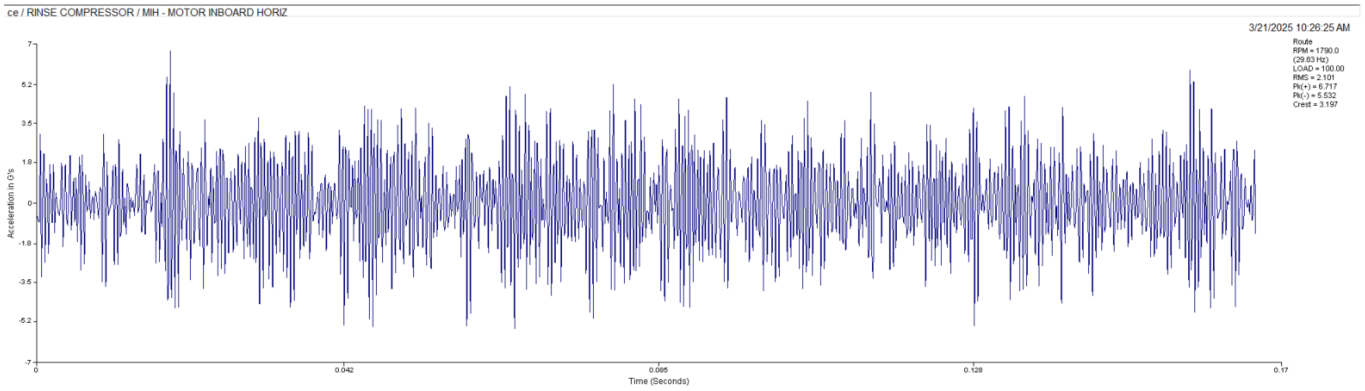
**Recommendations:**

Motor should be replaced in the next few months. This issue appears to be at a low level at this time. We are monitoring this closely.

## Rinse Compressor CLASS II



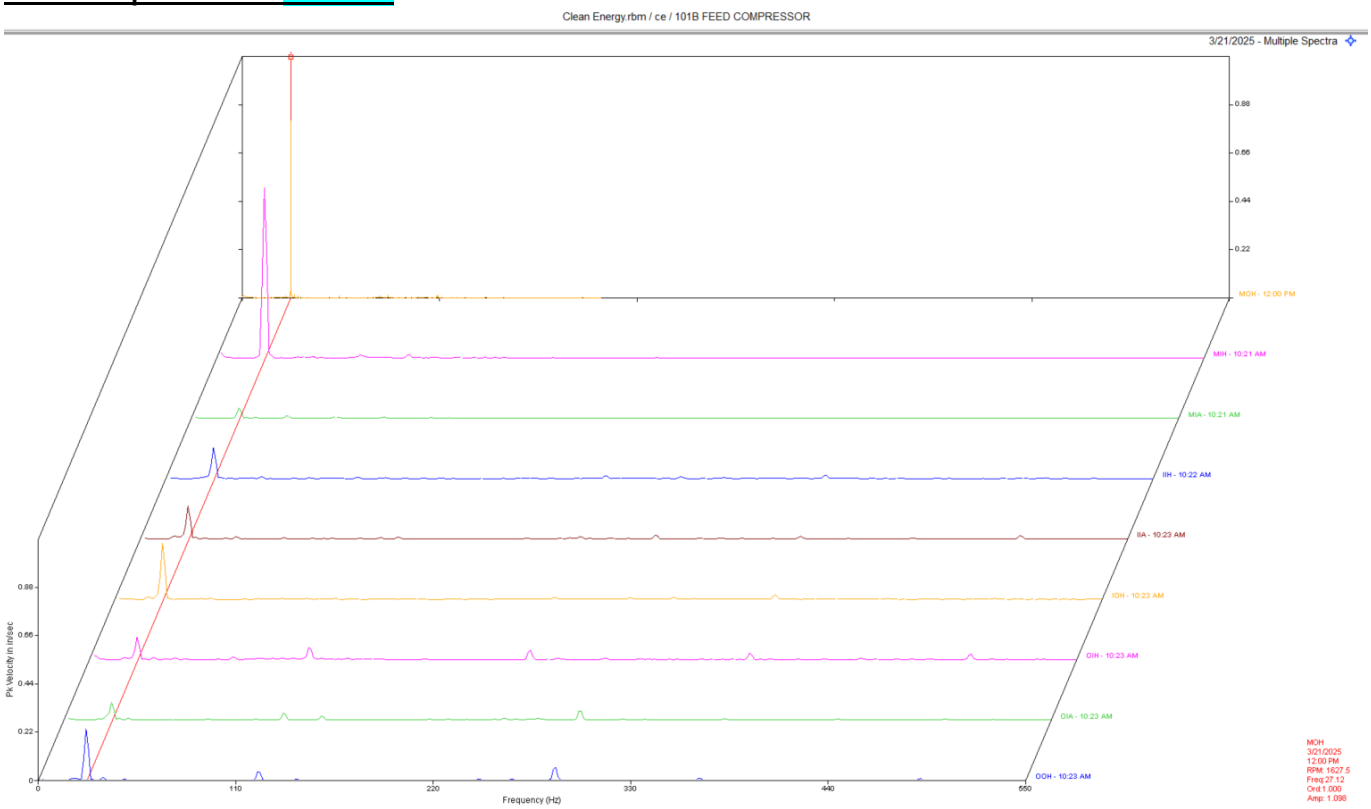

**Observations:**

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 around 12 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 II




**Observations:**

New motor data still shows motor to have elevated 1 x rpm vibration. Overall amplitude was higher this month at over 1 ips-pk. Motor rpm was 1627 during data acquisition. The increased 1 x rpm vibration may be due to motor operating near a resonant frequency.

**Recommendations:**

The 1 x rpm vibration may be due to rotor imbalance. There could also be an issue with the motor side of the coupling. It is recommended to run the motor solo, if possible, to help diagnose issue. It is also recommended to recheck alignment, inspect coupling hub, and fasteners at next opportunity.

# 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** | (21-Mar-25) | |
| | OVERALL LEVEL | 1K-20KHz |
| MOH | .095 In/Sec | 1.107 G-s |
| MOV | .227 In/Sec | .259 G-s |
| MIH | .145 In/Sec | .666 G-s |
| MIV | .150 In/Sec | .162 G-s |
| MIA | .096 In/Sec | .236 G-s |
| EIH | .253 In/Sec | .247 G-s |
| EIV | .078 In/Sec | .301 G-s |
| EIA | .070 In/Sec | .227 G-s |
| EOH | .175 In/Sec | .322 G-s |
| EOV | .087 In/Sec | .232 G-s |
| **303 FLARE - 303 FLARE BLOWER** | (21-Mar-25) | |
| | OVERALL LEVEL | 1K-20KHz |
| MOH | .085 In/Sec | .545 G-s |
| MOV | .083 In/Sec | .145 G-s |
| MIH | .123 In/Sec | .429 G-s |
| MIV | .068 In/Sec | .096 G-s |
| MIA | .108 In/Sec | .196 G-s |
| EIH | .129 In/Sec | .461 G-s |
| EIV | .052 In/Sec | .100 G-s |
| EIA | .048 In/Sec | .135 G-s |
| EOH | .057 In/Sec | .250 G-s |
| EOV | .295 In/Sec | .043 G-s |
| **RINSE COMP - RINSE COMPRESSOR** | (21-Mar-25) | |
| | OVERALL LEVEL | 1K-20KHz |
| MOH | .115 In/Sec | 2.000 G-s |
| M1P | .035 In/Sec | |
| MIH | .099 In/Sec | 1.957 G-s |
| M2P | .022 In/Sec | |
| MIA | .109 In/Sec | .387 G-s |
| IIH | .071 In/Sec | .763 G-s |
| IIA | .105 In/Sec | .113 G-s |
| IOH | .096 In/Sec | .698 G-s |
| OIH | .083 In/Sec | .661 G-s |
| OIA | .103 In/Sec | .158 G-s |
| OOH | .112 In/Sec | .781 G-s |
| **VAC COMP - VACUUM COMPRESSOR** | (21-Mar-25) | |
| | OVERALL LEVEL | 1K-20KHz |
| MOH | .146 In/Sec | 1.519 G-s |
| MIH | .094 In/Sec | 2.432 G-s |
| MIA | .069 In/Sec | .351 G-s |
| IIH | .106 In/Sec | .828 G-s |
| IIA | .071 In/Sec | .260 G-s |
| IOH | .098 In/Sec | .913 G-s |
| OIH | .081 In/Sec | .577 G-s |
| OIA | .076 In/Sec | .109 G-s |
| OOH | .111 In/Sec | .919 G-s |
| **COOLFAN2 - COOLING FAN 2** | (21-Mar-25) | |
| | OVERALL LEVEL | 1K-20KHz |
| MOH | .427 In/Sec | .575 G-s |
| MOV | .168 In/Sec | .100 G-s |
| MIH | .294 In/Sec | .635 G-s |
| MIV | .238 In/Sec | .205 G-s |
| MIA | .253 In/Sec | .277 G-s |
| EIH | .457 In/Sec | .818 G-s |

| | | | |
|---|---|---|---|
| EIV | .134 In/Sec | .364 G-s |
| EIA | .208 In/Sec | .358 G-s |
| EOH | .638 In/Sec | .382 G-s |
| EOV | .189 In/Sec | .223 G-s |

101B COMP - 101B FEED COMPRESSOR (21-Mar-25)

| | OVERALL LEVEL | 1K-20KHz |
|---|---|---|
| MOH | .933 In/Sec | .385 G-s |
| MIH | .784 In/Sec | .363 G-s |
| MIA | .055 In/Sec | .335 G-s |
| IIH | .152 In/Sec | .780 G-s |
| IIA | .165 In/Sec | .545 G-s |
| IOH | .263 In/Sec | 1.410 G-s |
| OIH | .148 In/Sec | .714 G-s |
| OIA | .117 In/Sec | 3.588 G-s |
| OOH | .257 In/Sec | 1.623 G-s |

HX132B FAN - HX132B GAS OIL COOLER FAN (21-Mar-25)

| | OVERALL LEVEL | 1K-20KHz |
|---|---|---|
| MOH | .079 In/Sec | .023 G-s |
| MIH | .117 In/Sec | .158 G-s |
| EIH | .150 In/Sec | .087 G-s |
| EOH | .091 In/Sec | .032 G-s |

451A PUMP - 451A VACCUM PUMP (21-Mar-25)

| | OVERALL LEVEL | 1K-20KHz |
|---|---|---|
| MOH | .077 In/Sec | .618 G-s |
| MOV | .080 In/Sec | .264 G-s |
| MIH | .092 In/Sec | .508 G-s |
| MIV | .116 In/Sec | .447 G-s |
| MIA | .093 In/Sec | .159 G-s |
| EIH | .228 In/Sec | 3.411 G-s |
| EIV | .185 In/Sec | .646 G-s |
| EIA | .102 In/Sec | .928 G-s |
| EOH | .161 In/Sec | .453 G-s |
| EOV | .151 In/Sec | .120 G-s |

HX453A FAN - HX453A VAC PUMP OIL COOL FAN (21-Mar-25)

| | OVERALL LEVEL | 1K-20KHz |
|---|---|---|
| MOH | .231 In/Sec | .124 G-s |
| MIH | .178 In/Sec | .085 G-s |

451B PUMP - 451B VACCUM PUMP (21-Mar-25)

| | OVERALL LEVEL | 1K-20KHz |
|---|---|---|
| MOH | .043 In/Sec | .413 G-s |
| MOV | .074 In/Sec | .142 G-s |
| MIH | .064 In/Sec | .378 G-s |
| MIV | .062 In/Sec | .151 G-s |
| MIA | .031 In/Sec | .085 G-s |
| EIH | .245 In/Sec | .512 G-s |
| EIV | .208 In/Sec | .243 G-s |
| EIA | .163 In/Sec | .230 G-s |
| EOH | .212 In/Sec | .668 G-s |
| EOV | .235 In/Sec | .154 G-s |

HX453B FAN - HX453B VAC PUMP OIL COOL FAN (21-Mar-25)

| | OVERALL LEVEL | 1K-20KHz |
|---|---|---|
| MOH | .120 In/Sec | .248 G-s |
| MIH | .095 In/Sec | .142 G-s |

451C PUMP - 451C VACCUM PUMP (21-Mar-25)

| | OVERALL LEVEL | 1K-20KHz |
|---|---|---|
| MOH | .061 In/Sec | .907 G-s |
| MOV | .087 In/Sec | .200 G-s |
| MIH | .092 In/Sec | .854 G-s |
| MIV | .100 In/Sec | .318 G-s |
| MIA | .054 In/Sec | .201 G-s |
| EIH | .144 In/Sec | .731 G-s |
| EIV | .136 In/Sec | .173 G-s |
| EIA | .091 In/Sec | .172 G-s |

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              EOH                      .126 In/Sec       .512 G-s
              EOV                      .150 In/Sec       .093 G-s

       HX453C FAN - HX453C VAC PUMP OIL COOL FAN  (21-Mar-25)
                                   OVERALL LEVEL     1K-20KHz
              MOH                      .113 In/Sec       .155 G-s
              MIH                      .166 In/Sec       .203 G-s

       451D PUMP  - 451D VACCUM PUMP              (21-Mar-25)
                                   OVERALL LEVEL     1K-20KHz
              MOH                      .068 In/Sec      1.405 G-s
              MOV                      .085 In/Sec       .400 G-s
              MIH                      .086 In/Sec       .891 G-s
              MIV                      .084 In/Sec       .237 G-s
              MIA                      .039 In/Sec       .290 G-s
              EIH                      .196 In/Sec       .438 G-s
              EIV                      .144 In/Sec       .105 G-s
              EIA                      .106 In/Sec       .129 G-s
              EOH                      .183 In/Sec       .595 G-s
              EOV                      .186 In/Sec       .210 G-s

       HX453D FAN - HX453D VAC PUMP OIL COOL FAN  (21-Mar-25)
                                   OVERALL LEVEL     1K-20KHz
              MOH                      .235 In/Sec       .132 G-s
              MIH                      .220 In/Sec       .104 G-s

       506B COMP  - 506B PRODUCT COMPRESSOR       (21-Mar-25)
                                   OVERALL LEVEL     1K-20KHz
              MOH                      .044 In/Sec       .288 G-s
              MIH                      .093 In/Sec       .240 G-s
              MIA                      .072 In/Sec       .267 G-s
              IIH                      .185 In/Sec       .458 G-s
              IIA                      .136 In/Sec      1.327 G-s
              IOH                      .189 In/Sec      3.214 G-s
              OIH                      .258 In/Sec       .787 G-s
              OIA                      .115 In/Sec      1.572 G-s
              OOH                      .203 In/Sec      1.254 G-s

       HX507B FAN - HX507B GAS COOL FAN           (21-Mar-25)
                                   OVERALL LEVEL     1K-20KHz
              MOH                      .114 In/Sec       .084 G-s
              MIH                      .119 In/Sec       .113 G-s

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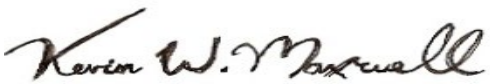
As always, it has been a pleasure to serve North Shelby-Archaea Energy. If there are any comments or questions, do not hesitate to contact us.

Sincerely,




**ISO Certified Vibration Analyst, Category III**

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