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April 30, 2024

Steve Benesch
Valero West Memphis Terminal
West Memphis, AR

Steve,

The following is a summary of findings from the April 2024 quarterly vibration survey at your facility.

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

Defect Summary

31-15-042 Short Horn Lateral Pump
Motor/Pump was not in service during this survey.

#1 Barge Loading Pump
Motor/Pump appeared to be operating at acceptable vibration levels during this survey.

#2 Barge Loading Pump
Motor/Pump appeared to be operating at acceptable vibration levels during this survey.

#3 Barge Loading Pump
Motor/Pump appeared to be operating at acceptable vibration levels during this survey.

#4 Barge Loading Pump
Motor/Pump appeared to be operating at acceptable vibration levels during this survey.

#8 LX Truck Loading Pump
Motor/Pump appeared to be operating at acceptable vibration levels during this survey.

#12 LX Truck Loading Pump
Motor/Pump appeared to be operating at acceptable vibration levels during this survey.

#13 XX Truck Loading Pump
Motor/Pump appeared to be operating at acceptable vibration levels during this survey.

#14 XX Truck Loading Pump
Motor/Pump appeared to be operating at acceptable vibration levels during this survey.

#17 LS Truck Loading Pump
Motor/Pump was not in service during this survey.

#15NL Truck Loading Pump
Pump data is still showing some signs of bearing defects/wear in the pump. Not much change to note at this time. We will monitor this issue closely. Rated as a **CLASS I** defect.

#18 NL Truck Loading Pump
Motor/Pump appeared to be operating at acceptable vibration levels during this survey.

#6 Transfer Pump
Motor/Pump was not in service during this survey.

#5 Truck Loading Pump
Motor data shows an increase in high frequency amplitude along with impacting in the time waveform. Spectral data indicates bearing defects may be present in the motor bearings. Ensure motor bearings are greased properly and inspect motor as time allows. Rated as a **CLASS II** defect.

#7 Truck Loading Pump
Motor/Pump appeared to be operating at acceptable vibration levels during this survey.

#43 Bio-Diesel Pump North
Motor/Pump appeared to be operating at acceptable vibration levels during this survey.

#44 Bio-Diesel Pump Middle
Motor axial vibration is high again this survey. Motor drive end bearing data also indicates bearing defects. Inspect motor as time allows. Ensure couplings and alignment are good. We will continue to monitor these issues closely. Rated as a **CLASS II** defect.

#45 Bio-Diesel Pump South
Pump was out of service**. Motor needs to be replaced while pump is out due to motor bearing defects present.**

We recommend changing the coupling type of the Bio-Diesel Pumps. The type of coupling that we recommend is the Rexnord Omega Coupling. TB Woods couplings tend to cause high vibration in high speed pumps when couplings begin to wear.
See link below for coupling information.
Omega Elastomeric Couplings Elastomeric Couplings - Couplings | Rexnord

Abbreviated Last Measurement Summary
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Database: west memphis.rbm
Station: WEST MEMPHIS TERMINAL

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
#1 BARGE - #1 BARGE LOADING PUMP	**(26-Apr-24)**	
	OVERALL LEVEL	**1 - 20 KHz**
MOH	**.202 In/Sec**	**.814 G-s**
MOV	**.141 In/Sec**	**.173 G-s**
MIH	**.136 In/Sec**	**.927 G-s**
MIV	**.115 In/Sec**	**.185 G-s**
MIA	**.083 In/Sec**	**.221 G-s**
#2 BARGE - #2 BARGE LOADING PUMP	**(26-Apr-24)**	
	OVERALL LEVEL	**1 - 20 KHz**
MOH	**.145 In/Sec**	**.765 G-s**
MOV	**.113 In/Sec**	**.222 G-s**
MIH	**.099 In/Sec**	**.682 G-s**
MIV	**.081 In/Sec**	**.210 G-s**
MIA	**.054 In/Sec**	**.218 G-s**
#3 BARGE - #3 BARGE LOADING PUMP	**(26-Apr-24)**	
	OVERALL LEVEL	**1 - 20 KHz**
MOH	**.092 In/Sec**	**.277 G-s**
MOV	**.197 In/Sec**	**.094 G-s**
MIH	**.099 In/Sec**	**.272 G-s**
MIV	**.135 In/Sec**	**.044 G-s**
MIA	**.107 In/Sec**	**.056 G-s**
#4 BARGE - #4 BARGE LOADING PUMP	**(26-Apr-24)**	
	OVERALL LEVEL	**1 - 20 KHz**
MOH	**.222 In/Sec**	**.398 G-s**
MOV	**.235 In/Sec**	**.026 G-s**
MIH	**.128 In/Sec**	**.462 G-s**

MIV		.174 In/Sec	.079 G-s
MIA		.102 In/Sec	.036 G-s

#8LX PUMP - #8 LX TRUCK LOADING PUMP (26-Apr-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.069 In/Sec	.627 G-s
MOV	.086 In/Sec	.101 G-s
MIH	.048 In/Sec	.523 G-s
MIV	.073 In/Sec	.082 G-s
MIA	.043 In/Sec	.154 G-s

#12LX PUMP - #12 LX TRUCK LOADING PUMP (26-Apr-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.256 In/Sec	.087 G-s
MOV	.206 In/Sec	.016 G-s
MIH	.145 In/Sec	.169 G-s
MIV	.084 In/Sec	.039 G-s
MIA	.063 In/Sec	.038 G-s

#13XX PUMP - #13 XX TRUCK LOADING PUMP (26-Apr-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.056 In/Sec	.334 G-s
MOV	.075 In/Sec	.108 G-s
MIH	.039 In/Sec	.480 G-s
MIV	.074 In/Sec	.055 G-s
MIA	.051 In/Sec	.126 G-s

#14XX PUMP - #14 XX TRUCK LOADING PUMP (26-Apr-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.074 In/Sec	.527 G-s
MOV	.100 In/Sec	.163 G-s
MIH	.064 In/Sec	.642 G-s
MIV	.107 In/Sec	.129 G-s
MIA	.060 In/Sec	.087 G-s

#15NL PUMP - #15 NL TRUCK LOADING PUMP (26-Apr-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.038 In/Sec	.221 G-s
MOV	.067 In/Sec	.074 G-s
MIH	.038 In/Sec	.182 G-s
MIV	.038 In/Sec	.031 G-s
MIA	.046 In/Sec	.032 G-s
EIH	.129 In/Sec	1.001 G-s
EIV	.210 In/Sec	.447 G-s
EIA	.079 In/Sec	.187 G-s
EOH	.115 In/Sec	.436 G-s
EOV	.162 In/Sec	.112 G-s
EOA	.179 In/Sec	.124 G-s

#18NL PUMP - #18 NL TRUCK LOADING PUMP (26-Apr-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.071 In/Sec	.088 G-s
MOV	.119 In/Sec	.027 G-s
MIH	.062 In/Sec	.085 G-s
MIV	.252 In/Sec	.016 G-s
MIA	.075 In/Sec	.014 G-s
EIH	.249 In/Sec	.070 G-s
EIV	.374 In/Sec	.076 G-s
EIA	.214 In/Sec	.093 G-s
EOH	.078 In/Sec	.319 G-s
EOV	.170 In/Sec	.084 G-s
EOA	.190 In/Sec	.098 G-s

#5TRCKLOAD - #5 TRUCK LOADING PUMP (26-Apr-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.134 In/Sec	.216 G-s
MOV	.181 In/Sec	.109 G-s
MIH	.121 In/Sec	.472 G-s
MIV	.203 In/Sec	.108 G-s
MIA	.169 In/Sec	.096 G-s

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            EIH                      .137 In/Sec       .156 G-s
            EIV                      .221 In/Sec       .109 G-s
            EIA                      .118 In/Sec       .079 G-s
            EOH                      .132 In/Sec       .503 G-s
            EOV                      .234 In/Sec       .220 G-s
            EOA                      .195 In/Sec       .126 G-s

      #7TRCKLOAD - #7 TRUCK LOADING PUMP         (26-Apr-24)
                                   OVERALL LEVEL     1 - 20 KHz
            MOH                      .157 In/Sec       .124 G-s
            MOV                      .146 In/Sec       .038 G-s
            MIH                      .097 In/Sec       .133 G-s
            MIV                      .186 In/Sec       .023 G-s
            MIA                      .121 In/Sec       .032 G-s
            EIH                      .179 In/Sec       .193 G-s
            EIV                      .300 In/Sec       .054 G-s
            EIA                      .179 In/Sec       .062 G-s
            EOH                      .237 In/Sec       .218 G-s
            EOV                      .148 In/Sec       .068 G-s
            EOA                      .194 In/Sec       .063 G-s

      #43BOIDSLP - #43 BIO-DIESEL PUMP NORTH     (26-Apr-24)
                                   OVERALL LEVEL     1 - 20 KHz
            MOH                      .099 In/Sec       .229 G-s
            MOV                      .160 In/Sec       .101 G-s
            MIH                      .116 In/Sec       .668 G-s
            MIV                      .241 In/Sec       .127 G-s
            MIA                      .313 In/Sec       .149 G-s
            EIH                      .132 In/Sec       .318 G-s
            EIV                      .210 In/Sec       .094 G-s
            EIA                      .055 In/Sec       .198 G-s
            EOH                      .090 In/Sec       .642 G-s
            EOV                      .339 In/Sec       .167 G-s
            EOA                      .128 In/Sec       .221 G-s

      #44BOIDSLP - #44 BIO-DIESEL PUMP MIDDLE    (26-Apr-24)
                                   OVERALL LEVEL     1 - 20 KHz
            MOH                      .239 In/Sec      1.340 G-s
            MOV                      .320 In/Sec       .280 G-s
            MIH                      .194 In/Sec      3.022 G-s
            MIV                      .201 In/Sec       .650 G-s
            MIA                      .547 In/Sec       .797 G-s
            EIH                      .210 In/Sec       .398 G-s
            EIV                      .221 In/Sec       .197 G-s
            EIA                      .133 In/Sec       .220 G-s
            EOH                      .113 In/Sec       .745 G-s
            EOV                      .242 In/Sec       .199 G-s
            EOA                      .181 In/Sec       .262 G-s

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   Clarification Of Vibration Units:
      Acc      -->  G-s      RMS
      Vel      -->  In/Sec   PK
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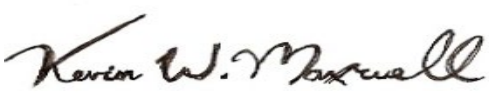
As always, it has been a pleasure to serve the Valero West Memphis Truck Terminal. If there are any comments or questions, do not hesitate to contact us.

Sincerely,



ISO Certified Vibration Analyst, Category III

HI-SPEED INDUSTRIAL SERVICE

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