



MILLINGTON, TN

May 27, 2020

Penn A Kem

Subject: May vibration service

Most of the machines surveyed were found to be in good condition with the exception of the following:

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.

This completes our assessment of your equipment for this survey. Thank you for your business and don't hesitate to call if you have any comments or questions.

Sincerely,

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Detailed Defects

R80-30 Reactor Agitator Motor and Gearbox

The motor shaft speed vibration is very high at nearly 1"/sec velocity peak in the time domain. Inspect the unit ASAP to determine the cause. We believe there could be damage to the fan, loose fasteners, broken feet or structure, or a coupling issue. **Rate a Class III Defect.**

P24-85 Degree Pump North

Vibration data shows an increase at shaft speed and vane pass (5x) for the inboard pump bearing. Water is now leaking from the seal also. Inspect for defects as time allows. **Rated a Class II Defect.**

Observations

Axial Twin Screw Compressor C67-51

Low level harmonics, or possibly sidebands of female shaft speed and 2x/4x vibrations of Male shaft speed are evident in the data. No significant bearing defect frequency vibration peaks have suggested distress in the bearings yet. Lobe pass vibrations dominate the data up to our current F-max. The data also seems to indicate the unit RPM varied between 1550 and 1610 during data collection. **Rated a Class I Defect.**

P4C-102A Boiler Feed Water Pump

The pump bearings still seem to be in mechanical distress due to the large jump in harmonics. Inspect the unit bearings as well as all other components for looseness. Seal water also seemed to be leaking profusely. **Rated a Class II Defect.**

P24-85DEGS: 85 Degree South Circulating Water Pump

Shaft speed harmonics are still evident.

Rated a Class I Defect.

CHLR45-1 20 Ton Trane Chiller

The East compressor is now vibrating near 1.3"/sec velocity peak at 60 Hz shaft speed. Vibrations at these levels in either unit will likely cause a reduced lifespan. Have the unit checked for compliance with the manufacture's specification. **Rated a Class II Defect for now.**

Big Blue Water Pump P24-BigBlue

The data still indicates possible looseness in the bearing fits as well as wear in the pump. No immediate actions are required at this time. **Rated a Class I Defect.**

R55-102 Reactor Agitator

The unit motor or gearbox could still be in distress. Highest velocity is in the coupling end of the motor axial at near 0.35"/sec at about 69.5 Hz. This vibration can be seen in multiple points in the gearbox data. The gearbox seemed to be generating audible noises too, which also concerns us. Have the oil analyzed for wear particulate. The next test could be to run the motor uncoupled. **Rated a Class II Defect.**

R53-301 Reactor Agitator

The motor inboard is still over 0.4"/sec velocity peak. Inspect the motor and coupling, and check the shaft alignment, fasteners and frame as time allows. **Rated a Class II Defect.**

P48-7B Roto Jet High Pressure Pump

The unit still has a high vibration at over 0.6"/sec velocity peak at 79.5 Hz which is what we believe to be pump speed. This vibration and harmonics can be seen in other data points also. We suspect some wear and looseness in the unit. Inspect as time allows. **Rated a Class II Defect.**

R48-2 Reactor Agitator

The possibly bent agitator shaft is still causing distress in the drive components. **Rated a Class II Defect.**

Not Running this Survey but reported previously

R55-106 Reactor Agitator Motor Gearbox

The vibration data still indicates a possible alignment or coupling issue. The outboard motor vibration is at near 0.6"/sec velocity peak. Inspect the coupling and all fasteners and check the alignment at the next opportunity. Pull an oil sample from the gearbox. **Rated a Class II Defect.**

Overall vibrations

Abbreviated Last Measurement Summary *****

Database: penn.rbm
Station: NEW EQUIPMENT
Report Date: 27-May-20 13:14

MEASUREMENT POINT -----	OVERALL LEVEL -----	HFD / VHFD -----
B4C101-877 - ZURN BOILER BLOWER	(26-May-20)	

	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.181 In/Sec	.977 G-s
12 - MOTOR OUTBOARD VERT	.122 In/Sec	.928 G-s
13 - MOTOR OUTBOARD AXIAL	.139 In/Sec	.128 G-s
21 - MOTOR INBOARD HORIZ	.178 In/Sec	.852 G-s
22 - MOTOR INBOARD VERT	.298 In/Sec	1.583 G-s
23 - MOTOR INBOARD AXIAL	.111 In/Sec	.966 G-s
71 - BLOWER INBOARD HORIZ	.162 In/Sec	.866 G-s
72 - BLOWER INBOARD VERT	.127 In/Sec	.233 G-s
73 - BLOWER INBOARD AXIAL	.124 In/Sec	.271 G-s
81 - BLOWER WHEEL END HORIZ	.154 In/Sec	.149 G-s
82 - BLOWER WHEEL END VERT	.119 In/Sec	.280 G-s

P4C-102A - BOILER FEEDWATER PUMP

(26-May-20)

	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.083 In/Sec	.401 G-s
12 - MOTOR OUTBOARD VERT	.037 In/Sec	.523 G-s
21 - MOTOR INBOARD HORIZ	.046 In/Sec	.426 G-s
22 - MOTOR INBOARD VERT	.034 In/Sec	.537 G-s
23 - MOTOR INBOARD AXIAL	.071 In/Sec	.390 G-s
71 - PUMP CPLG END HORIZ	.080 In/Sec	.541 G-s
72 - PUMP CPLG END VERT	.061 In/Sec	1.893 G-s
73 - PUMP CPLG END AXIAL	.081 In/Sec	1.253 G-s
81 - PUMP OPP END HORIZ	.082 In/Sec	1.728 G-s
82 - PUMP OPP END VERT	.066 In/Sec	4.071 G-s

P24-102B - JOCKEY FIRE FLANGE PUMP HZ

(26-May-20)

	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.079 In/Sec	.115 G-s
12 - MOTOR OUTBOARD VERT	.082 In/Sec	.043 G-s
21 - MOTOR INBOARD HORIZ	.054 In/Sec	.061 G-s
22 - MOTOR INBOARD VERT	.058 In/Sec	.072 G-s
23 - MOTOR INBOARD AXIAL	.062 In/Sec	.056 G-s

P24-63DEGN - 63 DEG N WATER PUMP

(26-May-20)

	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.054 In/Sec	.324 G-s
12 - MOTOR OUTBOARD VERT	.042 In/Sec	.495 G-s
21 - MOTOR INBOARD HORIZ	.061 In/Sec	.454 G-s
22 - MOTOR INBOARD VERT	.051 In/Sec	.583 G-s
23 - MOTOR INBOARD AXIAL	.036 In/Sec	.555 G-s
71 - PUMP CPLG END HORIZ	.070 In/Sec	.721 G-s
72 - PUMP CPLG END VERT	.038 In/Sec	.974 G-s
73 - PUMP CPLG END AXIAL	.140 In/Sec	2.680 G-s
81 - PUMP OPP END HORIZ	.076 In/Sec	.486 G-s
82 - PUMP OPP END VERT	.046 In/Sec	.701 G-s
83 - PUMP OPP END AXIAL	.112 In/Sec	2.724 G-s

P24-63DEGS - 63 DEG S WATER PUMP

(26-May-20)

	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.093 In/Sec	.230 G-s
12 - MOTOR OUTBOARD VERT	.060 In/Sec	.468 G-s
21 - MOTOR INBOARD HORIZ	.129 In/Sec	.297 G-s
22 - MOTOR INBOARD VERT	.051 In/Sec	.796 G-s
23 - MOTOR INBOARD AXIAL	.149 In/Sec	.265 G-s
71 - PUMP CPLG END HORIZ	.057 In/Sec	.355 G-s
72 - PUMP CPLG END VERT	.062 In/Sec	.491 G-s

73	- PUMP CPLG END AXIAL	.062 In/Sec	1.333 G-s
81	- PUMP OPP END HORIZ	.063 In/Sec	.471 G-s
82	- PUMP OPP END VERT	.028 In/Sec	.638 G-s
83	- PUMP OPP END AXIAL	.097 In/Sec	1.557 G-s

P24-85DEGN - 85 DEG N WATER CIRC PUMP 125 (26-May-20)

		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.085 In/Sec	.658 G-s
12	- MOTOR OUTBOARD VERT	.053 In/Sec	.884 G-s
21	- MOTOR INBOARD HORIZ	.072 In/Sec	1.259 G-s
22	- MOTOR INBOARD VERT	.103 In/Sec	.966 G-s
23	- MOTOR INBOARD AXIAL	.052 In/Sec	.548 G-s
71	- PUMP CPLG END HORIZ	.196 In/Sec	.835 G-s
72	- PUMP CPLG END VERT	.286 In/Sec	.754 G-s
73	- PUMP CPLG END AXIAL	.408 In/Sec	.367 G-s
81	- PUMP OPP END HORIZ	.302 In/Sec	.947 G-s
82	- PUMP OPP END VERT	.201 In/Sec	.844 G-s
83	- PUMP OPP END AXIAL	.281 In/Sec	1.297 G-s

P24-85DEGS - 85 DEG S WATER CIRC PUMP 125 (26-May-20)

		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.160 In/Sec	.423 G-s
12	- MOTOR OUTBOARD VERT	.107 In/Sec	.778 G-s
21	- MOTOR INBOARD HORIZ	.130 In/Sec	.665 G-s
22	- MOTOR INBOARD VERT	.562 In/Sec	.853 G-s
23	- MOTOR INBOARD AXIAL	.130 In/Sec	.516 G-s
71	- PUMP CPLG END HORIZ	.285 In/Sec	1.555 G-s
72	- PUMP CPLG END VERT	.275 In/Sec	1.566 G-s
73	- PUMP CPLG END AXIAL	.577 In/Sec	2.047 G-s
81	- PUMP OPP END HORIZ	.186 In/Sec	1.536 G-s
82	- PUMP OPP END VERT	.214 In/Sec	1.690 G-s
83	- PUMP OPP END AXIAL	.360 In/Sec	3.318 G-s

P24BGBL876 - BIG BLUE WATER PUMP-63 DEG (26-May-20)

		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.202 In/Sec	1.691 G-s
12	- MOTOR OUTBOARD VERT	.062 In/Sec	1.469 G-s
21	- MOTOR INBOARD HORIZ	.217 In/Sec	1.865 G-s
22	- MOTOR INBOARD VERT	.087 In/Sec	1.723 G-s
23	- MOTOR INBOARD AXIAL	.092 In/Sec	1.007 G-s
71	- PUMP CPLG END HORIZ	.307 In/Sec	.175 G-s
72	- PUMP CPLG END VERT	.179 In/Sec	.614 G-s
73	- PUMP CPLG END AXIAL	.267 In/Sec	.272 G-s
81	- PUMP OPP END HORIZ	.256 In/Sec	.600 G-s
82	- PUMP OPP END VERT	.196 In/Sec	.995 G-s
83	- PUMP OPP END AXIAL	.161 In/Sec	.319 G-s

P36-905A - N COOL TWR-NORTH PUMP (26-May-20)

		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.070 In/Sec	.257 G-s
12	- MOTOR OUTBOARD VERT	.052 In/Sec	.467 G-s
21	- MOTOR INBOARD HORIZ	.065 In/Sec	1.371 G-s
22	- MOTOR INBOARD VERT	.069 In/Sec	.943 G-s
23	- MOTOR INBOARD AXIAL	.038 In/Sec	.255 G-s
71	- PUMP CPLG END HORIZ	.130 In/Sec	2.945 G-s
72	- PUMP CPLG END VERT	.088 In/Sec	2.245 G-s
73	- PUMP CPLG END AXIAL	.179 In/Sec	.839 G-s

81	- PUMP OPP END HORIZ	.139 In/Sec	2.547 G-s
82	- PUMP OPP END VERT	.104 In/Sec	2.746 G-s
83	- PUMP OPP END AXIAL	.210 In/Sec	3.823 G-s

C36-EAST - UTILITY AIRCOMP ROTARY 200HP		(26-May-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.066 In/Sec	.997 G-s
12	- MOTOR OUTBOARD VERT	.052 In/Sec	.838 G-s
21	- MOTOR INBOARD HORIZ	.087 In/Sec	1.533 G-s
22	- MOTOR INBOARD VERT	.080 In/Sec	2.236 G-s
23	- MOTOR INBOARD AXIAL	.072 In/Sec	1.005 G-s
71	- MALE - CPLG END HORIZ	.123 In/Sec	1.266 G-s
72	- MALE - CPLG END VERT	.087 In/Sec	1.174 G-s
73	- MALE-CPLG END AXIAL	.153 In/Sec	.812 G-s
81	- MALE- OPP END HORIZ	.121 In/Sec	2.390 G-s
82	- MALE- OPP END VERT	.127 In/Sec	.774 G-s
71F	- FEMALE - CPLG END HORIZ	.179 In/Sec	2.932 G-s
72F	- FEMALE- CPLG END VERT	.105 In/Sec	1.421 G-s
81F	- FEMALE- OPP END HORIZ	.111 In/Sec	1.325 G-s
82F	- FEMALE- OPP END VERT	.096 In/Sec	1.843 G-s

C36-SOUTH - UTILITY AIRCOMP ROTARY 150HP		(26-May-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.094 In/Sec	.636 G-s
12	- MOTOR OUTBOARD VERT	.072 In/Sec	.792 G-s
21	- MOTOR INBOARD HORIZ	.106 In/Sec	.640 G-s
22	- MOTOR INBOARD VERT	.073 In/Sec	.876 G-s
23	- MOTOR INBOARD AXIAL	.129 In/Sec	.721 G-s
71	- MALE - CPLG END HORIZ	.203 In/Sec	2.546 G-s
72	- MALE - CPLG END VERT	.164 In/Sec	.919 G-s
73	- MALE-CPLG END AXIAL	.157 In/Sec	1.419 G-s
81	- MALE- OPP END HORIZ	.196 In/Sec	1.222 G-s
82	- MALE- OPP END VERT	.129 In/Sec	1.732 G-s
71F	- FEMALE - CPLG END HORIZ	.172 In/Sec	1.361 G-s
72F	- FEMALE- CPLG END VERT	.155 In/Sec	2.367 G-s
81F	- FEMALE- OPP END HORIZ	.151 In/Sec	1.258 G-s
82F	- FEMALE- OPP END VERT	.116 In/Sec	1.501 G-s

C36-WEST - UTILITY AIRCOMP ROTARY 150HP		(26-May-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.068 In/Sec	1.030 G-s
12	- MOTOR OUTBOARD VERT	.044 In/Sec	1.150 G-s
21	- MOTOR INBOARD HORIZ	.059 In/Sec	2.428 G-s
22	- MOTOR INBOARD VERT	.070 In/Sec	1.054 G-s
23	- MOTOR INBOARD AXIAL	.107 In/Sec	1.074 G-s
71	- MALE - CPLG END HORIZ	.062 In/Sec	.534 G-s
72	- MALE - CPLG END VERT	.060 In/Sec	1.273 G-s
73	- MALE-CPLG END AXIAL	.130 In/Sec	1.124 G-s
81	- MALE- OPP END HORIZ	.105 In/Sec	.562 G-s
82	- MALE- OPP END VERT	.073 In/Sec	1.168 G-s
71F	- FEMALE - CPLG END HORIZ	.067 In/Sec	1.749 G-s
72F	- FEMALE- CPLG END VERT	.074 In/Sec	1.052 G-s
81F	- FEMALE- OPP END HORIZ	.066 In/Sec	1.194 G-s
82F	- FEMALE- OPP END VERT	.092 In/Sec	1.442 G-s

P39-4-877 - WELL PUMP #4		(26-May-20)	
		OVERALL LEVEL	1-20 KHZ

11	- MOTOR TOP N-S	.281 In/Sec	.330 G-s
12	- MOTOR TOP E-W	.240 In/Sec	.485 G-s
13	- MOTOR TOP VERT	.105 In/Sec	.497 G-s
21	- MOTOR BOTTOM N-S	.139 In/Sec	.283 G-s
22	- MOTOR BOTTOM E-W	.110 In/Sec	.335 G-s
23	- MOTOR BOTTOM VERT	.062 In/Sec	.430 G-s

C42-4 - AXIAL TWIN SCREW COMPRESSOR		(26-May-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.101 In/Sec	.260 G-s
12	- MOTOR OUTBOARD VERT	.073 In/Sec	1.181 G-s
13	- MOTOR OUTBOARD AXIAL	.149 In/Sec	.131 G-s
21	- MOTOR INBOARD HORIZ	.107 In/Sec	.473 G-s
22	- MOTOR INBOARD VERT	.100 In/Sec	.733 G-s
23	- MOTOR INBOARD AXIAL	.123 In/Sec	1.252 G-s
71	- MALE - CPLG END HORIZ	.071 In/Sec	1.116 G-s
72	- MALE - CPLG END VERT	.063 In/Sec	1.108 G-s
73	- MALE-CPLG END AXIAL	.088 In/Sec	1.323 G-s
81	- MALE- OPP END HORIZ	.104 In/Sec	.680 G-s
82	- MALE- OPP END VERT	.116 In/Sec	.683 G-s
83	- MALE-OPP END AXIAL	.114 In/Sec	.650 G-s
71F	- FEMALE - CPLG END HORIZ	.108 In/Sec	.969 G-s
72F	- FEMALE- CPLG END VERT	.102 In/Sec	.454 G-s
73F	- FEMALE-CPLG END AXIAL	.119 In/Sec	1.589 G-s
81F	- FEMALE- OPP END HORIZ	.181 In/Sec	.746 G-s
82F	- FEMALE- OPP END VERT	.092 In/Sec	.221 G-s
83F	- FEMALE- OPP END AXIAL	.136 In/Sec	.857 G-s

P42-4A - CENTRIFUGAL HOT OIL PUMP 5HP		(26-May-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.015 In/Sec	.090 G-s
21	- MOTOR INBOARD HORIZ	.017 In/Sec	.068 G-s
23	- MOTOR INBOARD AXIAL	.036 In/Sec	.046 G-s
71	- PUMP COUPLING END HORIZ	.033 In/Sec	.529 G-s
73	- PUMP COUPLING END AXIAL	.013 In/Sec	.145 G-s
81	- PUMP IMPELLER END HORIZ	.014 In/Sec	.347 G-s

P42-4B - CENTRIFUGAL HOT OIL PUMP 5HP		(26-May-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.037 In/Sec	.055 G-s
21	- MOTOR INBOARD HORIZ	.029 In/Sec	.059 G-s
23	- MOTOR INBOARD AXIAL	.044 In/Sec	.093 G-s
71	- PUMP COUPLING END HORIZ	.030 In/Sec	.125 G-s
73	- PUMP COUPLING END AXIAL	.013 In/Sec	.050 G-s
81	- PUMP IMPELLER END HORIZ	.013 In/Sec	.064 G-s

P42-4C - CENTRIFUGAL HOT OIL PMP 15HP		(26-May-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.104 In/Sec	2.168 G-s
21	- MOTOR INBOARD HORIZ	.106 In/Sec	.682 G-s
23	- MOTOR INBOARD AXIAL	.061 In/Sec	.406 G-s
71	- PUMP COUPLING END HORIZ	.194 In/Sec	.274 G-s
81	- PUMP IMPELLER END HORIZ	.060 In/Sec	.302 G-s

P42-4D - CENTRIFUGAL HOT OIL PUMP 5HP		(26-May-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.015 In/Sec	.105 G-s

21	- MOTOR INBOARD HORIZ	.015 In/Sec	.075 G-s
23	- MOTOR INBOARD AXIAL	.032 In/Sec	.056 G-s
71	- PUMP COUPLING END HORIZ	.024 In/Sec	.176 G-s
81	- PUMP IMPELLER END HORIZ	.016 In/Sec	.094 G-s

P45-VAC - NEW VACUUM PUMP PILOT PLANT (26-May-20)

	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.100 In/Sec	.070 G-s
21 - MOTOR INBOARD HORIZ	.171 In/Sec	.413 G-s
23 - MOTOR INBOARD AXIAL	.054 In/Sec	.122 G-s
71M - PUMP MALE INPUT END HORIZONTAL	.045 In/Sec	.340 G-s
71F - PUMP INPUT END FEMALE HZ	.074 In/Sec	.356 G-s
73M - PUMP INPUT END MALE AXIAL	.033 In/Sec	.504 G-s
81M - PUMP MALE INPUT OPPOSITE END HZ	.056 In/Sec	.374 G-s
81F - PUMP FEMALE OPPOSITE END HZ	.061 In/Sec	.072 G-s

P48-7B - ROTOJET HIGH PRESS PUMP 15HP (26-May-20)

	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.137 In/Sec	1.297 G-s
12 - MOTOR OUTBOARD VERT	.379 In/Sec	.555 G-s
21 - MOTOR INBOARD HORIZ	.122 In/Sec	1.036 G-s
22 - MOTOR INBOARD VERT	.272 In/Sec	1.038 G-s
23 - MOTOR INBOARD AXIAL	.361 In/Sec	1.123 G-s
71 - PUMP CPLG END HORIZ	.501 In/Sec	5.891 G-s
72 - PUMP CPLG END VERT	.201 In/Sec	4.071 G-s
73 - PUMP CPLG END AXIAL	.073 In/Sec	2.834 G-s
81 - PUMP OPP END HORIZ	.559 In/Sec	2.233 G-s
82 - PUMP OPP END VERT	.249 In/Sec	2.036 G-s

R48-2 - AGITATOR GEARBOX FAULK 15HP (26-May-20)

	OVERALL LEVEL
11 - MOTOR OUTBOARD HORIZ	.405 In/Sec
12 - MOTOR OUTBOARD VERT	.410 In/Sec
21 - MOTOR INBOARD HORIZ	.265 In/Sec
22 - MOTOR INBOARD VERT	.321 In/Sec
23 - MOTOR INBOARD AXIAL	.091 In/Sec
31 - GEARBOX INPUT SHAFT-INBD HOR	.271 In/Sec
32 - GEARBOX INPUT SHAFT INBD VERT	.206 In/Sec
41 - GEARBOX INPUT SHAFT OUTBD HOR	.248 In/Sec
42 - GEARBOX INPUT SHAFT OUTBD VERT	.191 In/Sec
43 - GEARBOX INPUT SHAFT OUTBD AXIAL	.089 In/Sec
51 - GEARBOX OUTPUT SHAFT TOP N-S	.176 In/Sec
53 - GEARBOX OUTPUT SHAFT TOP VERT	.047 In/Sec

C53-1A-050 - C1-A H2 COMPRESSOR (26-May-20)

	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.073 In/Sec	1.402 G-s
12 - MOTOR OUTBOARD VERT	.032 In/Sec	1.015 G-s
21 - MOTOR INBOARD HORIZ	.084 In/Sec	.779 G-s
22 - MOTOR INBOARD VERT	.070 In/Sec	.438 G-s
23 - MOTOR INBOARD AXIAL	.056 In/Sec	.860 G-s
71 - PUMP CPLG END HORIZ	.110 In/Sec	.100 G-s
72 - PUMP CPLG END VERT	.032 In/Sec	.058 G-s
73 - PUMP CPLG END AXIAL	.027 In/Sec	.103 G-s
81 - PUMP OPP END HORIZ	.097 In/Sec	.102 G-s
82 - PUMP OPP END VERT	.019 In/Sec	.044 G-s

C53-301B	- C-301B RECIP COMPRESSOR	(26-May-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.046 In/Sec	1.895 G-s
12	- MOTOR OUTBOARD VERT	.044 In/Sec	.922 G-s
21	- MOTOR INBOARD HORIZ	.048 In/Sec	.582 G-s
22	- MOTOR INBOARD VERT	.039 In/Sec	1.194 G-s
23	- MOTOR INBOARD AXIAL	.041 In/Sec	.125 G-s
71	- CRANKSHAFT DRIVE END HORIZ	.049 In/Sec	.355 G-s
72	- CRANKSHAFT DRIVE END VERT	.041 In/Sec	.057 G-s
73	- CRANKSHAFT DRIVE END AXIAL	.088 In/Sec	.128 G-s
81	- CRANKSHAFT OPP END HORIZ	.050 In/Sec	.074 G-s
82	- CRANKSHAFT OPP END VERT	.034 In/Sec	.069 G-s
P53-301	- ANSI CENTRIFUGAL PUMP 50 HP	(26-May-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.096 In/Sec	.152 G-s
12	- MOTOR OUTBOARD VERT	.135 In/Sec	.090 G-s
21	- MOTOR INBOARD HORIZ	.097 In/Sec	.281 G-s
22	- MOTOR INBOARD VERT	.137 In/Sec	.337 G-s
23	- MOTOR INBOARD AXIAL	.144 In/Sec	.429 G-s
71	- PUMP CPLG END HORIZ	.072 In/Sec	.442 G-s
72	- PUMP CPLG END VERT	.073 In/Sec	.281 G-s
73	- PUMP CPLG END AXIAL	.079 In/Sec	.446 G-s
81	- PUMP OPP END HORIZ	.053 In/Sec	.765 G-s
82	- PUMP OPP END VERT	.058 In/Sec	.191 G-s
R53-301	- AGITATOR GBX CHEMINEER 15HP	(26-May-20)	
		OVERALL LEVEL	
11	- MOTOR OUTBOARD HORIZ	.296 In/Sec	
12	- MOTOR OUTBOARD VERT	.183 In/Sec	
21	- MOTOR INBOARD HORIZ	.275 In/Sec	
22	- MOTOR INBOARD VERT	.291 In/Sec	
23	- MOTOR INBOARD AXIAL	.433 In/Sec	
31	- GEARBOX INPUT SHAFT-INBD HOR	.168 In/Sec	
32	- GEARBOX INPUT SHAFT INBD VERT	.060 In/Sec	
33	- GEARBOX INPUT SHAFT INBD AXIAL	.157 In/Sec	
41	- GEARBOX INPUT SHAFT OUTBD HOR	.161 In/Sec	
42	- GEARBOX INPUT SHAFT OUTBD VERT	.052 In/Sec	
43	- GEARBOX INPUT SHAFT OUTBD AXIAL	.166 In/Sec	
51	- GEARBOX OUTPUT SHAFT TOP N-S	.160 In/Sec	
52	- GEARBOX OUTPUT SHAFT TOP E-W	.040 In/Sec	
61	- GEARBOX OUTPUT SHAFT MID N-S	.104 In/Sec	
62	- GEARBOX OUTPUT SHAFT MID E-W	.059 In/Sec	
71	- GEARBOX OUTPUT SHAFT BOT N-S	.020 In/Sec	
P53-310A	- GRUNDFOSS VERT PUMP 10HP	(26-May-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.117 In/Sec	.131 G-s
12	- MOTOR OUTBOARD VERT	.065 In/Sec	.244 G-s
21	- MOTOR INBOARD HORIZ	.020 In/Sec	.282 G-s
22	- MOTOR INBOARD VERT	.061 In/Sec	.655 G-s
23	- MOTOR INBOARD AXIAL	.047 In/Sec	.167 G-s
71	- PUMP CPLG END HORIZ	.072 In/Sec	.270 G-s
72	- PUMP CPLG END VERT	.160 In/Sec	.183 G-s
73	- PUMP CPLG END AXIAL	.014 In/Sec	.116 G-s
81	- PUMP OPP END HORIZ	.019 In/Sec	.072 G-s
82	- PUMP OPP END VERT	.015 In/Sec	.066 G-s

83	- PUMP OPP END AXIAL	.0078 In/Sec	.071 G-s
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C54--115	- COMP 2CYL 2 STAGE 75 HP	(26-May-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.050 In/Sec	.522 G-s
12	- MOTOR OUTBOARD VERT	.137 In/Sec	.238 G-s
21	- MOTOR INBOARD HORIZ	.059 In/Sec	1.234 G-s
22	- MOTOR INBOARD VERT	.059 In/Sec	.301 G-s
23	- MOTOR INBOARD AXIAL	.131 In/Sec	.118 G-s
71	- PUMP CPLG END HORIZ	.022 In/Sec	.038 G-s
72	- PUMP CPLG END VERT	.038 In/Sec	.028 G-s
73	- PUMP CPLG END AXIAL	.086 In/Sec	.059 G-s
81	- PUMP OPP END HORIZ	.056 In/Sec	.041 G-s
82	- PUMP OPP END VERT	.046 In/Sec	.034 G-s

P54-112	- CANNED MOTOR CENTRIFUG PUMP	(26-May-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.061 In/Sec	.017 G-s
12	- MOTOR OUTBOARD VERT	.031 In/Sec	.024 G-s
13	- MOTOR OUTBOARD AXIAL	.071 In/Sec	.151 G-s
21	- MOTOR INBOARD HORIZ	.049 In/Sec	.068 G-s
22	- MOTOR INBOARD VERT	.029 In/Sec	.097 G-s
71	- PUMP CPLG END HORIZ	.055 In/Sec	.0053 G-s
72	- PUMP CPLG END VERT	.028 In/Sec	.036 G-s
73	- PUMP CPLG END AXIAL	.030 In/Sec	.228 G-s
81	- PUMP OPP END HORIZ	.055 In/Sec	.034 G-s
82	- PUMP OPP END VERT	.043 In/Sec	.090 G-s

R55-102	- REACTOR AGIT R-102	(26-May-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.119 In/Sec	.311 G-s
12	- MOTOR OUTBOARD VERT	.192 In/Sec	.230 G-s
21	- MOTOR INBOARD HORIZ	.145 In/Sec	.695 G-s
22	- MOTOR INBOARD VERT	.277 In/Sec	.849 G-s
23	- MOTOR INBOARD AXIAL	.352 In/Sec	.225 G-s
31	- GEARBOX INPUT SHAFT-INBD HOR	.115 In/Sec	
32	- GEARBOX INPUT SHAFT INBD VERT	.082 In/Sec	
33	- GEARBOX INPUT SHAFT INBD AXIAL	.222 In/Sec	
41	- GEARBOX INPUT SHAFT OUTBD HOR	.167 In/Sec	
42	- GEARBOX INPUT SHAFT OUTBD VERT	.117 In/Sec	
43	- GEARBOX INPUT SHAFT OUTBD AXIAL	.209 In/Sec	
51	- GEARBOX OUTPUT SHAFT TOP PERP	.107 In/Sec	
52	- GEARBOX OUTPUT SHAFT TOP MA	.090 In/Sec	
61	- GEARBOX OUTPUT SHAFT MID PERP	.084 In/Sec	
62	- GEARBOX OUTPUT SHAFT MID MA	.083 In/Sec	

R55-104	- REACTOR AGIT R-104 (B55)	(26-May-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.054 In/Sec	.388 G-s
12	- MOTOR OUTBOARD VERT	.040 In/Sec	.203 G-s
21	- MOTOR INBOARD HORIZ	.048 In/Sec	.601 G-s
22	- MOTOR INBOARD VERT	.024 In/Sec	.651 G-s
23	- MOTOR INBOARD AXIAL	.029 In/Sec	.265 G-s
31	- GEARBOX INPUT SHAFT-INBD HOR	.041 In/Sec	
32	- GEARBOX INPUT SHAFT INBD VERT	.012 In/Sec	
33	- GEARBOX INPUT SHAFT INBD AXIAL	.023 In/Sec	
41	- GEARBOX INPUT SHAFT OUTBD HOR	.036 In/Sec	

42	- GEARBOX INPUT SHAFT OUTBD VERT	.014 In/Sec
43	- GEARBOX INPUT SHAFT OUTBD AXIAL	.023 In/Sec
51	- GEARBOX OUTPUT SHAFT TOP PERP	.059 In/Sec
52	- GEARBOX OUTPUT SHAFT TOP MA	.0098 In/Sec
61	- GEARBOX OUTPUT SHAFT MID PERP	.032 In/Sec
62	- GEARBOX OUTPUT SHAFT MID MA	.011 In/Sec

C67-51	- AXIAL TWIN SCREW COMPRESSOR	(26-May-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.083 In/Sec	2.922 G-s
11P	- MOTOR OUTBOARD PEAKVUE	.015 In/Sec	
12	- MOTOR OUTBOARD VERT	.105 In/Sec	5.982 G-s
13	- MOTOR OUTBOARD AXIAL	.149 In/Sec	2.904 G-s
21	- MOTOR INBOARD HORIZ	.080 In/Sec	.418 G-s
21P	- MOTOR INBOARD PEAKVUE	.0028 In/Sec	
22	- MOTOR INBOARD VERT	.110 In/Sec	2.049 G-s
23	- MOTOR INBOARD AXIAL	.091 In/Sec	2.843 G-s
71	- MALE - CPLG END HORIZ	.191 In/Sec	.431 G-s
71P	- COMPRESSOR INPUT INBOARD PEAKVUE	.0023 In/Sec	
72	- MALE - CPLG END VERT	.159 In/Sec	.717 G-s
73	- MALE-CPLG END AXIAL	.217 In/Sec	1.324 G-s
81	- MALE- OPP END HORIZ	.197 In/Sec	.202 G-s
82	- MALE- OPP END VERT	.274 In/Sec	.025 G-s
83	- MALE-OPP END AXIAL	.216 In/Sec	1.077 G-s
71F	- FEMALE - CPLG END HORIZ	.325 In/Sec	.626 G-s
7FP	- COMPRESS INPUT OUTBOARD PEAKVUE	.0016 In/Sec	
72F	- FEMALE- CPLG END VERT	.152 In/Sec	.141 G-s
73F	- FEMALE-CPLG END AXIAL	.298 In/Sec	1.085 G-s
81F	- FEMALE- OPP END HORIZ	.300 In/Sec	.130 G-s
82F	- FEMALE- OPP END VERT	.246 In/Sec	.081 G-s
83F	- FEMALE- OPP END AXIAL	.281 In/Sec	.615 G-s

P67-54	- HOT OIL CIRC PMP CENT 15HP	(26-May-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.081 In/Sec	.120 G-s
12	- MOTOR OUTBOARD VERT	.019 In/Sec	.160 G-s
13	- MOTOR OUTBOARD AXIAL	.019 In/Sec	.161 G-s
21	- MOTOR INBOARD HORIZ	.069 In/Sec	.259 G-s
22	- MOTOR INBOARD VERT	.044 In/Sec	.312 G-s
23	- MOTOR INBOARD AXIAL	.020 In/Sec	.071 G-s
71	- PUMP CPLG END HORIZ	.090 In/Sec	.088 G-s
72	- PUMP CPLG END VERT	.052 In/Sec	.126 G-s
73	- PUMP CPLG END AXIAL	.045 In/Sec	.157 G-s
81	- PUMP OPP END HORIZ	.056 In/Sec	.219 G-s
82	- PUMP OPP END VERT	.032 In/Sec	.164 G-s

P67-504	- HOT OIL CIRC PMP CENT 50HP	(26-May-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.025 In/Sec	.174 G-s
12	- MOTOR OUTBOARD VERT	.032 In/Sec	.370 G-s
13	- MOTOR OUTBOARD AXIAL	.038 In/Sec	.094 G-s
21	- MOTOR INBOARD HORIZ	.029 In/Sec	.310 G-s
22	- MOTOR INBOARD VERT	.040 In/Sec	.235 G-s
23	- MOTOR INBOARD AXIAL	.062 In/Sec	.118 G-s
71	- PUMP CPLG END HORIZ	.137 In/Sec	.190 G-s
72	- PUMP CPLG END VERT	.102 In/Sec	.179 G-s
73	- PUMP CPLG END AXIAL	.088 In/Sec	.168 G-s

81	- PUMP OPP END HORIZ	.128 In/Sec	.326 G-s
82	- PUMP OPP END VERT	.068 In/Sec	.119 G-s
83	- PUMP OPP END AXIAL	.090 In/Sec	.184 G-s

R80-10 - AGITATOR GBX (26-May-20)
OVERALL LEVEL

11	- MOTOR OUTBOARD HORIZ	.072 In/Sec
12	- MOTOR OUTBOARD VERT	.107 In/Sec
21	- MOTOR INBOARD HORIZ	.054 In/Sec
22	- MOTOR INBOARD VERT	.054 In/Sec
23	- MOTOR INBOARD AXIAL	.048 In/Sec
31	- GEARBOX INPUT SHAFT-INBD HOR	.043 In/Sec
32	- GEARBOX INPUT SHAFT INBD VERT	.069 In/Sec
33	- GEARBOX INPUT SHAFT INBD AXIAL	.035 In/Sec
41	- GEARBOX INPUT SHAFT OUTBD HOR	.041 In/Sec
42	- GEARBOX INPUT SHAFT OUTBD VERT	.059 In/Sec
43	- GEARBOX INPUT SHAFT OUTBD AXIAL	.030 In/Sec
51	- GEARBOX OUTPUT SHAFT TOP N-S	.040 In/Sec
52	- GEARBOX OUTPUT SHAFT TOP E-W	.063 In/Sec
61	- GEARBOX OUTPUT SHAFT MID N-S	.031 In/Sec
62	- GEARBOX OUTPUT SHAFT MID E-W	.046 In/Sec
63	- GEARBOX OUTPUT SHAFT MID VERT	.033 In/Sec
71	- GEARBOX OUTPUT SHAFT BOT N-S	.019 In/Sec

R80-30 - AGITATOR GBX 15HP CHEMINEER (26-May-20)
OVERALL LEVEL

11	- MOTOR OUTBOARD HORIZ	.138 In/Sec
12	- MOTOR OUTBOARD VERT	.791 In/Sec
21	- MOTOR INBOARD HORIZ	.124 In/Sec
22	- MOTOR INBOARD VERT	.370 In/Sec
23	- MOTOR INBOARD AXIAL	.244 In/Sec
31	- GEARBOX INPUT SHAFT-INBD HOR	.131 In/Sec
32	- GEARBOX INPUT SHAFT INBD VERT	.036 In/Sec
33	- GEARBOX INPUT SHAFT INBD AXIAL	.256 In/Sec
41	- GEARBOX INPUT SHAFT OUTBD HOR	.108 In/Sec
42	- GEARBOX INPUT SHAFT OUTBD VERT	.039 In/Sec
51	- GEARBOX OUTPUT SHAFT TOP N-S	.133 In/Sec
52	- GEARBOX OUTPUT SHAFT TOP E-W	.042 In/Sec
61	- GEARBOX OUTPUT SHAFT MID N-S	.092 In/Sec
62	- GEARBOX OUTPUT SHAFT MID E-W	.050 In/Sec
71	- GEARBOX OUTPUT SHAFT BOT N-S	.038 In/Sec

B82-101A - FAN FORCED DRAFT 10HP SOUTH (26-May-20)		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.110 In/Sec	.115 G-s
12	- MOTOR OUTBOARD VERT	.102 In/Sec	.092 G-s
21	- MOTOR INBOARD HORIZ	.146 In/Sec	.183 G-s
22	- MOTOR INBOARD VERT	.226 In/Sec	.086 G-s
23	- MOTOR INBOARD AXIAL	.296 In/Sec	.069 G-s

B82-102 - INDUCED DRAFT 150 HP (26-May-20)		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.028 In/Sec	.064 G-s
12	- MOTOR OUTBOARD VERT	.031 In/Sec	.046 G-s
21	- MOTOR INBOARD HORIZ	.034 In/Sec	.381 G-s
22	- MOTOR INBOARD VERT	.046 In/Sec	.137 G-s
23	- MOTOR INBOARD AXIAL	.035 In/Sec	.123 G-s

31	- FAN INBOARD HORIZONTAL	.023 In/Sec	.256 G-s
32	- FAN INBOARD VERTICAL	.029 In/Sec	.148 G-s
33	- FAN INBOARD AXIAL	.043 In/Sec	.037 G-s
41	- FAN OUTBOARD HORIZONTAL	.033 In/Sec	.036 G-s
42	- FAN OUTBOARD VERT	.032 In/Sec	.060 G-s

CHLR67-1N - 240T TRANE CHILLER NORTH		(26-May-20)
OVERALL LEVEL		
71	- COMP INBOARD HORIZ	.069 In/Sec
72	- COMP INBOARD VERT	.075 In/Sec
73	- COMP INBOARD AXIAL	.060 In/Sec
81	- COMP OUTBD HORIZ	.101 In/Sec
82	- COMP OUTBD VERT	.125 In/Sec
83	- COMP OUTBD AXIAL	.045 In/Sec

CHLR67-1W - 240T TRANE CHILLER WEST		(26-May-20)
OVERALL LEVEL		
11	- HOTOR OUTBOARD HORIZ	.144 In/Sec
12	- HOTOR OUTBOARD VERT	.156 In/Sec
71	- COMP INBOARD HORIZ	.055 In/Sec
72	- COMP INBOARD VERT	.066 In/Sec
73	- COMP INBOARD AXIAL	.099 In/Sec
81	- COMP OUTBD HORIZ	.078 In/Sec
82	- COMP OUTBD VERT	.104 In/Sec
83	- COMP OUTBD AXIAL	.044 In/Sec

CHLR67-1E - 240T TRANE CHILLER EAST		(26-May-20)
OVERALL LEVEL		
11	- HOTOR OUTBOARD HORIZ	.172 In/Sec
12	- HOTOR OUTBOARD VERT	.124 In/Sec
13	- HOTOR OUTBOARD AXIAL	.102 In/Sec
21	- HOTOR INBOARD HORIZ	.095 In/Sec
22	- HOTOR INBOARD VERT	.122 In/Sec
71	- COMP INBOARD HORIZ	.078 In/Sec
72	- COMP INBOARD VERT	.094 In/Sec
73	- COMP INBOARD AXIAL	.069 In/Sec
81	- COMP OUTBD HORIZ	.147 In/Sec
82	- COMP OUTBD VERT	.152 In/Sec
83	- COMP OUTBD AXIAL	.068 In/Sec

CHLR45-1 - 20T TRANE CHILLER		(26-May-20)
OVERALL LEVEL		
11W	- WEST MOTOR OUTBOARD HORIZ	.234 In/Sec
12W	- WEST MOTOR OUTBOARD VERT	.381 In/Sec
13W	- WEST MOTOR OUTBOARD AXIAL	.293 In/Sec
11E	- EASTMOTOR OUTBOARD HORIZ	1.350 In/Sec
12E	- EAST MOTOR OUTBOARD VERT	.819 In/Sec
13E	- EAST MOTOR OUTBOARD AXIAL	.147 In/Sec

Clarification Of Vibration Units:

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

MEASUREMENT POINT

OVERALL LEVEL

HFD / VHFD

CHLR45-1	- 20T TRANE CHILLER	(22-Apr-20)
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	OVERALL LEVEL
11W - WEST MOTOR OUTBOARD HORIZ	1.290 In/Sec
12W - WEST MOTOR OUTBOARD VERT	.498 In/Sec
13W - WEST MOTOR OUTBOARD AXIAL	.248 In/Sec
11E - EASTMOTOR OUTBOARD HORIZ	.049 In/Sec
12E - EAST MOTOR OUTBOARD VERT	.280 In/Sec
13E - EAST MOTOR OUTBOARD AXIAL	.100 In/Sec

P45-VAC - NEW VACUUM PUMP PILOT PLANT (22-Apr-20)		OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ		.082 In/Sec	.087 G-s
21 - MOTOR INBOARD HORIZ		.044 In/Sec	.537 G-s
23 - MOTOR INBOARD AXIAL		.132 In/Sec	.757 G-s
71M - PUMP MALE INPUT END HORIZONTAL		.050 In/Sec	.335 G-s
71F - PUMP INPUT END FEMALE HZ		.044 In/Sec	.321 G-s
73M - PUMP INPUT END MALE AXIAL		.023 In/Sec	.435 G-s
81M - PUMP MALE INPUT OPPOSITE END HZ		.070 In/Sec	.528 G-s
81F - PUMP FEMALE OPPOSITE END HZ		.061 In/Sec	.360 G-s

P39-4-877 - WELL PUMP #4 (22-Apr-20)		OVERALL LEVEL	1-20 KHZ
11 - MOTOR TOP N-S		.209 In/Sec	.384 G-s
12 - MOTOR TOP E-W		.184 In/Sec	.286 G-s
21 - MOTOR BOTTOM N-S		.126 In/Sec	.637 G-s
22 - MOTOR BOTTOM E-W		.097 In/Sec	.185 G-s
23 - MOTOR BOTTOM VERT		.044 In/Sec	.494 G-s

Clarification Of Vibration Units:

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