

August 4, 2020

Penn A Kem

Subject: July 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,

David W. Shook
Senior Reliability Specialists
Hi-Speed Industrial Service
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Detailed Defects

Axial Twin Screw Compressor C67-51

Motor vibration data shows two issues. Harmonics of shaft speed could indicate looseness in the bearings or fits. There is also a non-synchronous vibration peak with multiple harmonics (these are marked). They could indicate bearing race or rolling element defects. We are going to rate this a **Class II Defect for now**.

P4C-102A Boiler Feed Water Pump

Harmonics of a non-synchronous peak indicates an outer race defect, or a cocked bearing is most likely the root cause of the vibration in the outer pump bearing. **Rated a Class IV.**

P24-63 Degree Pump North

The pump axial vibrations still have a mound of noise in the spectrum that could be either bearing natural frequencies or some cavitation. We will watch closely going forward. No action required. **Rated a Class II Defect.**

P24-85 Degree Pump North

Extremely high shaft speed vibration in the axial plane for the pump drive end bearing after repairs. We suspect a poor bearing installation, bent shaft, rotor out of balance or eccentric coupling hub. There could possibly be an alignment issue, but not expected. **Rated a Class III Defect** due to the amplitude being over 1"/sec velocity peak.

Observations

R55-106 Reactor Agitator Motor Gearbox

Slight drop in 1x RPM sinusoidal vibration for the outboard vertical of the motor this survey. Inspect the motor and coupling for defects that could cause imbalance. Check the motor cooling fan. Loose fasteners can cause similar vibrations as well as shaft run out or eccentricity. **Rated a Class III Defect.**

R48-2 Reactor Agitator

The apparent bent agitator shaft is still causing distress in the drive components. Motor top bearing vibration is above 0.3"/sec velocity peak. **Rated a Class II Defect.**

R53-301 Reactor Agitator

The motor inboard axial is at 0.5"/sec velocity peak. Inspect the motor and coupling, and check the shaft alignment, fasteners and frame as time allows. **Rated a Class II Defect.**

Big Blue Water Pump P24-BigBlue

The pump data still indicates possible slight looseness in the bearing fits as well as wear in the pump. The motor data shows slight bearing frequency defects and harmonics, as well as vane pass: which we suspect is 5x RPM. 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.**

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.**

Not Running this Survey but reported previously as shown below:

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.**

Overall vibrations

Abbreviated Last Measurement Summary *****

Database: penn.rbm
Station: NEW EQUIPMENT
Route No. 4: HYDRO
Report Date: 04-Aug-20 09:24

MEASUREMENT POINT

OVERALL LEVEL

HFD / VHFD

C42-4	- AXIAL TWIN SCREW COMPRESSOR	(29-Jul-20)	
	OVERALL LEVEL		1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.114 In/Sec	.106 G-s
12	- MOTOR OUTBOARD VERT	.087 In/Sec	.478 G-s
13	- MOTOR OUTBOARD AXIAL	.045 In/Sec	.101 G-s
21	- MOTOR INBOARD HORIZ	.112 In/Sec	.586 G-s
22	- MOTOR INBOARD VERT	.052 In/Sec	.734 G-s
23	- MOTOR INBOARD AXIAL	.054 In/Sec	2.375 G-s
71	- MALE - CPLG END HORIZ	.060 In/Sec	1.344 G-s
72	- MALE - CPLG END VERT	.059 In/Sec	.323 G-s
73	- MALE-CPLG END AXIAL	.052 In/Sec	1.173 G-s
81	- MALE- OPP END HORIZ	.062 In/Sec	.330 G-s
82	- MALE- OPP END VERT	.041 In/Sec	.241 G-s
83	- MALE-OPP END AXIAL	.053 In/Sec	.997 G-s
71F	- FEMALE - CPLG END HORIZ	.083 In/Sec	1.468 G-s
72F	- FEMALE- CPLG END VERT	.042 In/Sec	.974 G-s
73F	- FEMALE-CPLG END AXIAL	.073 In/Sec	1.308 G-s
81F	- FEMALE- OPP END HORIZ	.088 In/Sec	.344 G-s
82F	- FEMALE- OPP END VERT	.035 In/Sec	.692 G-s
83F	- FEMALE- OPP END AXIAL	.080 In/Sec	.488 G-s
P42-4A	- CENTRIFUGAL HOT OIL PUMP 5HP	(29-Jul-20)	
	OVERALL LEVEL		1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.030 In/Sec	.062 G-s
21	- MOTOR INBOARD HORIZ	.025 In/Sec	.066 G-s
23	- MOTOR INBOARD AXIAL	.030 In/Sec	.087 G-s
71	- PUMP COUPLING END HORIZ	.023 In/Sec	.630 G-s
73	- PUMP COUPLING END AXIAL	.018 In/Sec	.220 G-s
81	- PUMP IMPELLER END HORIZ	.021 In/Sec	.419 G-s
P42-4B	- CENTRIFUGAL HOT OIL PUMP 5HP	(29-Jul-20)	
	OVERALL LEVEL		1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.027 In/Sec	.065 G-s
21	- MOTOR INBOARD HORIZ	.026 In/Sec	.098 G-s
23	- MOTOR INBOARD AXIAL	.040 In/Sec	.065 G-s
71	- PUMP COUPLING END HORIZ	.037 In/Sec	.165 G-s
73	- PUMP COUPLING END AXIAL	.014 In/Sec	.071 G-s
81	- PUMP IMPELLER END HORIZ	.018 In/Sec	.107 G-s
P42-4C	- CENTRIFUGAL HOT OIL PMP 15HP	(29-Jul-20)	
	OVERALL LEVEL		1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.016 In/Sec	.0062 G-s
21	- MOTOR INBOARD HORIZ	.010 In/Sec	.0063 G-s
23	- MOTOR INBOARD AXIAL	.0080 In/Sec	.0033 G-s
71	- PUMP COUPLING END HORIZ	.0080 In/Sec	.0034 G-s
81	- PUMP IMPELLER END HORIZ	.0094 In/Sec	.0059 G-s
P42-4D	- CENTRIFUGAL HOT OIL PUMP 5HP	(29-Jul-20)	
	OVERALL LEVEL		1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.019 In/Sec	.075 G-s
21	- MOTOR INBOARD HORIZ	.032 In/Sec	.051 G-s
23	- MOTOR INBOARD AXIAL	.050 In/Sec	.048 G-s
71	- PUMP COUPLING END HORIZ	.049 In/Sec	.175 G-s
81	- PUMP IMPELLER END HORIZ	.046 In/Sec	.047 G-s
CHLR67-1N	- 240T TRANE CHILLER NORTH	(29-Jul-20)	
	OVERALL LEVEL		

11	-	HOTOR OUTBOARD HORIZ	.135 In/Sec
12	-	HOTOR OUTBOARD VERT	.154 In/Sec
13	-	HOTOR OUTBOARD AXIAL	.086 In/Sec
21	-	HOTOR INBOARD HORIZ	.131 In/Sec
22	-	HOTOR INBOARD VERT	.127 In/Sec
71	-	COMP INBOARD HORIZ	.086 In/Sec
72	-	COMP INBOARD VERT	.085 In/Sec
81	-	COMP OUTBD HORIZ	.101 In/Sec
82	-	COMP OUTBD VERT	.104 In/Sec
83	-	COMP OUTBD AXIAL	.094 In/Sec

CHLR67-1W - 240T TRANE CHILLER WEST (29-Jul-20)
OVERALL LEVEL

11	-	HOTOR OUTBOARD HORIZ	.233 In/Sec
12	-	HOTOR OUTBOARD VERT	.198 In/Sec
13	-	HOTOR OUTBOARD AXIAL	.125 In/Sec
21	-	HOTOR INBOARD HORIZ	.149 In/Sec
22	-	HOTOR INBOARD VERT	.189 In/Sec
71	-	COMP INBOARD HORIZ	.123 In/Sec
72	-	COMP INBOARD VERT	.142 In/Sec
81	-	COMP OUTBD HORIZ	.175 In/Sec
82	-	COMP OUTBD VERT	.156 In/Sec
83	-	COMP OUTBD AXIAL	.105 In/Sec

CHLR67-1E - 240T TRANE CHILLER EAST (29-Jul-20)
OVERALL LEVEL

11	-	HOTOR OUTBOARD HORIZ	.099 In/Sec
12	-	HOTOR OUTBOARD VERT	.095 In/Sec
13	-	HOTOR OUTBOARD AXIAL	.079 In/Sec
21	-	HOTOR INBOARD HORIZ	.073 In/Sec
22	-	HOTOR INBOARD VERT	.089 In/Sec
71	-	COMP INBOARD HORIZ	.102 In/Sec
72	-	COMP INBOARD VERT	.084 In/Sec
81	-	COMP OUTBD HORIZ	.157 In/Sec
82	-	COMP OUTBD VERT	.108 In/Sec
83	-	COMP OUTBD AXIAL	.062 In/Sec

C67-51 - AXIAL TWIN SCREW COMPRESSOR (29-Jul-20)				
OVERALL LEVEL		1-20 KHZ		
11	-	MOTOR OUTBOARD HORIZ	.125 In/Sec	5.101 G-s
11P	-	MOTOR OUTBOARD PEAKVUE	.026 In/Sec	
12	-	MOTOR OUTBOARD VERT	.160 In/Sec	6.266 G-s
13	-	MOTOR OUTBOARD AXIAL	.156 In/Sec	3.464 G-s
21	-	MOTOR INBOARD HORIZ	.124 In/Sec	2.087 G-s
21P	-	MOTOR INBOARD PEAKVUE	.010 In/Sec	
22	-	MOTOR INBOARD VERT	.122 In/Sec	4.986 G-s
23	-	MOTOR INBOARD AXIAL	.122 In/Sec	3.178 G-s
71	-	MALE - CPLG END HORIZ	.200 In/Sec	.354 G-s
72	-	MALE - CPLG END VERT	.105 In/Sec	.142 G-s
73	-	MALE-CPLG END AXIAL	.134 In/Sec	.213 G-s
81	-	MALE- OPP END HORIZ	.198 In/Sec	.159 G-s
82	-	MALE- OPP END VERT	.209 In/Sec	.302 G-s
83	-	MALE-OPP END AXIAL	.180 In/Sec	.696 G-s
71F	-	FEMALE - CPLG END HORIZ	.285 In/Sec	.284 G-s
72F	-	FEMALE- CPLG END VERT	.181 In/Sec	.259 G-s
73F	-	FEMALE-CPLG END AXIAL	.188 In/Sec	2.238 G-s
81F	-	FEMALE- OPP END HORIZ	.210 In/Sec	.189 G-s

82F - FEMALE- OPP END VERT	.174 In/Sec	.221 G-s
83F - FEMALE- OPP END AXIAL	.217 In/Sec	.875 G-s

P67-54	- HOT OIL CIRC PMP CENT 15HP	(29-Jul-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.077 In/Sec	.296 G-s
12	- MOTOR OUTBOARD VERT	.014 In/Sec	.266 G-s
21	- MOTOR INBOARD HORIZ	.064 In/Sec	.272 G-s
22	- MOTOR INBOARD VERT	.033 In/Sec	.347 G-s
23	- MOTOR INBOARD AXIAL	.025 In/Sec	.055 G-s
71	- PUMP CPLG END HORIZ	.088 In/Sec	.226 G-s
72	- PUMP CPLG END VERT	.038 In/Sec	.145 G-s
73	- PUMP CPLG END AXIAL	.028 In/Sec	.312 G-s
81	- PUMP OPP END HORIZ	.064 In/Sec	.291 G-s
82	- PUMP OPP END VERT	.022 In/Sec	.231 G-s

P67-504	- HOT OIL CIRC PMP CENT 50HP	(29-Jul-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.016 In/Sec	.182 G-s
12	- MOTOR OUTBOARD VERT	.025 In/Sec	.475 G-s
21	- MOTOR INBOARD HORIZ	.023 In/Sec	.321 G-s
22	- MOTOR INBOARD VERT	.026 In/Sec	.245 G-s
23	- MOTOR INBOARD AXIAL	.023 In/Sec	.125 G-s
71	- PUMP CPLG END HORIZ	.082 In/Sec	.129 G-s
72	- PUMP CPLG END VERT	.044 In/Sec	.121 G-s
73	- PUMP CPLG END AXIAL	.063 In/Sec	.156 G-s
81	- PUMP OPP END HORIZ	.041 In/Sec	.212 G-s
82	- PUMP OPP END VERT	.038 In/Sec	.179 G-s

B82-101A	- FAN FORCED DRAFT 10HP SOUTH	(29-Jul-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.122 In/Sec	.145 G-s
12	- MOTOR OUTBOARD VERT	.127 In/Sec	.151 G-s
21	- MOTOR INBOARD HORIZ	.170 In/Sec	.187 G-s
22	- MOTOR INBOARD VERT	.247 In/Sec	.100 G-s
23	- MOTOR INBOARD AXIAL	.252 In/Sec	.075 G-s

B82-102	- INDUCED DRAFT 150 HP	(29-Jul-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.039 In/Sec	.020 G-s
12	- MOTOR OUTBOARD VERT	.028 In/Sec	.091 G-s
21	- MOTOR INBOARD HORIZ	.032 In/Sec	.176 G-s
22	- MOTOR INBOARD VERT	.048 In/Sec	.177 G-s
23	- MOTOR INBOARD AXIAL	.039 In/Sec	.108 G-s
31	- FAN INBOARD HORIZONTAL	.054 In/Sec	.017 G-s
32	- FAN INBOARD VERTICAL	.034 In/Sec	.078 G-s
41	- FAN OUTBOARD HORIZONTAL	.032 In/Sec	.129 G-s
42	- FAN OUTBOARD VERT	.045 In/Sec	.073 G-s

P76-103806	- P103 QUENCH PUMP-EAST H2 PLT	(29-Jul-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.058 In/Sec	.061 G-s
12	- MOTOR OUTBOARD VERT	.020 In/Sec	.039 G-s
21	- MOTOR INBOARD HORIZ	.043 In/Sec	.098 G-s
22	- MOTOR INBOARD VERT	.024 In/Sec	.128 G-s
23	- MOTOR INBOARD AXIAL	.054 In/Sec	.160 G-s

C53-301B	- C-301B RECIP COMPRESSOR	(29-Jul-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.039 In/Sec	1.704 G-s
12	- MOTOR OUTBOARD VERT	.051 In/Sec	1.057 G-s
21	- MOTOR INBOARD HORIZ	.082 In/Sec	.587 G-s
22	- MOTOR INBOARD VERT	.043 In/Sec	2.536 G-s
23	- MOTOR INBOARD AXIAL	.065 In/Sec	.286 G-s
71	- CRANKSHAFT DRIVE END HORIZ	.047 In/Sec	.073 G-s
72	- CRANKSHAFT DRIVE END VERT	.033 In/Sec	.059 G-s
73	- CRANKSHAFT DRIVE END AXIAL	.089 In/Sec	.098 G-s
81	- CRANKSHAFT OPP END HORIZ	.054 In/Sec	.072 G-s
82	- CRANKSHAFT OPP END VERT	.036 In/Sec	.057 G-s
P48-7B	- ROTOJET HIGH PRESS PUMP 15HP	(29-Jul-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.078 In/Sec	.299 G-s
12	- MOTOR OUTBOARD VERT	.142 In/Sec	.286 G-s
21	- MOTOR INBOARD HORIZ	.080 In/Sec	1.379 G-s
22	- MOTOR INBOARD VERT	.112 In/Sec	.764 G-s
23	- MOTOR INBOARD AXIAL	.240 In/Sec	.318 G-s
71	- PUMP CPLG END HORIZ	.205 In/Sec	.824 G-s
72	- PUMP CPLG END VERT	.148 In/Sec	1.273 G-s
73	- PUMP CPLG END AXIAL	.110 In/Sec	.729 G-s
81	- PUMP OPP END HORIZ	.288 In/Sec	1.020 G-s
82	- PUMP OPP END VERT	.124 In/Sec	.773 G-s
R48-2	- AGITATOR GEARBOX FAULK 15HP	(29-Jul-20)	
		OVERALL LEVEL	
11	- MOTOR OUTBOARD HORIZ	.261 In/Sec	
12	- MOTOR OUTBOARD VERT	.300 In/Sec	
21	- MOTOR INBOARD HORIZ	.163 In/Sec	
22	- MOTOR INBOARD VERT	.278 In/Sec	
23	- MOTOR INBOARD AXIAL	.073 In/Sec	
31	- GEARBOX INPUT SHAFT-INBD HOR	.119 In/Sec	
32	- GEARBOX INPUT SHAFT INBD VERT	.207 In/Sec	
41	- GEARBOX INPUT SHAFT OUTBD HOR	.094 In/Sec	
42	- GEARBOX INPUT SHAFT OUTBD VERT	.239 In/Sec	
43	- GEARBOX INPUT SHAFT OUTBD AXIAL	.043 In/Sec	
51	- GEARBOX OUTPUT SHAFT TOP N-S	.076 In/Sec	
R53-301	- AGITATOR GBX CHEMINEER 15HP	(29-Jul-20)	
		OVERALL LEVEL	
11	- MOTOR OUTBOARD HORIZ	.280 In/Sec	
12	- MOTOR OUTBOARD VERT	.217 In/Sec	
21	- MOTOR INBOARD HORIZ	.278 In/Sec	
22	- MOTOR INBOARD VERT	.352 In/Sec	
23	- MOTOR INBOARD AXIAL	.482 In/Sec	
31	- GEARBOX INPUT SHAFT-INBD HOR	.187 In/Sec	
32	- GEARBOX INPUT SHAFT INBD VERT	.043 In/Sec	
33	- GEARBOX INPUT SHAFT INBD AXIAL	.183 In/Sec	
41	- GEARBOX INPUT SHAFT OUTBD HOR	.179 In/Sec	
42	- GEARBOX INPUT SHAFT OUTBD VERT	.070 In/Sec	
43	- GEARBOX INPUT SHAFT OUTBD AXIAL	.121 In/Sec	
51	- GEARBOX OUTPUT SHAFT TOP N-S	.177 In/Sec	
53	- GEARBOX OUTPUT SHAFT TOP VERT	.042 In/Sec	
61	- GEARBOX OUTPUT SHAFT MID N-S	.103 In/Sec	
63	- GEARBOX OUTPUT SHAFT MID VERT	.054 In/Sec	

71 - GEARBOX OUTPUT SHAFT BOT N-S .025 In/Sec

P53-310A - GRUNDFOSS VERT PUMP 10HP (29-Jul-20)
OVERALL LEVEL 1-20 KHZ
11 - MOTOR OUTBOARD HORIZ .108 In/Sec .088 G-s
12 - MOTOR OUTBOARD VERT .053 In/Sec .142 G-s
21 - MOTOR INBOARD HORIZ .031 In/Sec .244 G-s
22 - MOTOR INBOARD VERT .074 In/Sec .414 G-s
23 - MOTOR INBOARD AXIAL .053 In/Sec .067 G-s
71 - PUMP CPLG END HORIZ .068 In/Sec .271 G-s
72 - PUMP CPLG END VERT .138 In/Sec .190 G-s
73 - PUMP CPLG END AXIAL .012 In/Sec .293 G-s
81 - PUMP OPP END HORIZ .043 In/Sec .106 G-s
82 - PUMP OPP END VERT .033 In/Sec .066 G-s

P53-301 - ANSI CENTRIFUGAL PUMP 50 HP (29-Jul-20)
OVERALL LEVEL 1-20 KHZ
11 - MOTOR OUTBOARD HORIZ .177 In/Sec .161 G-s
12 - MOTOR OUTBOARD VERT .095 In/Sec .132 G-s
21 - MOTOR INBOARD HORIZ .088 In/Sec .498 G-s
22 - MOTOR INBOARD VERT .107 In/Sec .409 G-s
23 - MOTOR INBOARD AXIAL .183 In/Sec .322 G-s
71 - PUMP CPLG END HORIZ .099 In/Sec .507 G-s
72 - PUMP CPLG END VERT .100 In/Sec .423 G-s
73 - PUMP CPLG END AXIAL .068 In/Sec .600 G-s
81 - PUMP OPP END HORIZ .067 In/Sec .933 G-s
82 - PUMP OPP END VERT .078 In/Sec .314 G-s

Clarification Of Vibration Units:

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

Abbreviated Last Measurement

Summary

Database: penn.rbm
Station: NEW EQUIPMENT
Route No. 5: UPI-FURAN
Report Date: 04-Aug-20 09:24

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
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C54--115 - COMP 2CYL 2 STAGE 75 HP	(29-Jul-20)	
	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.054 In/Sec	.747 G-s
12 - MOTOR OUTBOARD VERT	.160 In/Sec	.723 G-s
13 - MOTOR OUTBOARD AXIAL	3.035 In/Sec	.579 G-s Bad Data
21 - MOTOR INBOARD HORIZ	.064 In/Sec	1.256 G-s
22 - MOTOR INBOARD VERT	.059 In/Sec	.437 G-s
23 - MOTOR INBOARD AXIAL	.190 In/Sec	.241 G-s
71 - PUMP CPLG END HORIZ	.023 In/Sec	.029 G-s
72 - PUMP CPLG END VERT	.035 In/Sec	.042 G-s
73 - PUMP CPLG END AXIAL	.039 In/Sec	.079 G-s
81 - PUMP OPP END HORIZ	.020 In/Sec	.033 G-s
82 - PUMP OPP END VERT	.022 In/Sec	.046 G-s

P54-112	- CANNED MOTOR CENTRIFUG PUMP	(29-Jul-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.058 In/Sec	.098 G-s
12	- MOTOR OUTBOARD VERT	.026 In/Sec	.095 G-s
13	- MOTOR OUTBOARD AXIAL	.037 In/Sec	.087 G-s
21	- MOTOR INBOARD HORIZ	.049 In/Sec	.185 G-s
22	- MOTOR INBOARD VERT	.037 In/Sec	.248 G-s
71	- PUMP CPLG END HORIZ	.052 In/Sec	.188 G-s
72	- PUMP CPLG END VERT	.033 In/Sec	.231 G-s
81	- PUMP OPP END HORIZ	.047 In/Sec	.148 G-s
82	- PUMP OPP END VERT	.026 In/Sec	.107 G-s

Clarification Of Vibration Units:

Acc	-->	G-s	PK	
Vel	-->	In/Sec	PK	Abbreviated Last Measurement

Summary

Database: penn.rbm
Station: NEW EQUIPMENT
Route No. 6: BOILER
Report Date: 04-Aug-20 09:24

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
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B4C101-877 - ZURN BOILER BLOWER	(29-Jul-20)	
	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.164 In/Sec	.467 G-s
12 - MOTOR OUTBOARD VERT	.077 In/Sec	1.086 G-s
13 - MOTOR OUTBOARD AXIAL	.144 In/Sec	.488 G-s
21 - MOTOR INBOARD HORIZ	.159 In/Sec	.784 G-s
22 - MOTOR INBOARD VERT	.104 In/Sec	1.020 G-s
23 - MOTOR INBOARD AXIAL	.104 In/Sec	.787 G-s
71 - BLOWER INBOARD HORIZ	.157 In/Sec	.905 G-s
81 - BLOWER WHEEL END HORIZ	.133 In/Sec	1.153 G-s
P4C-102A - BOILER FEEDWATER PUMP	(29-Jul-20)	
	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.067 In/Sec	.519 G-s
12 - MOTOR OUTBOARD VERT	.079 In/Sec	.814 G-s
21 - MOTOR INBOARD HORIZ	.055 In/Sec	.708 G-s
22 - MOTOR INBOARD VERT	.070 In/Sec	.657 G-s
23 - MOTOR INBOARD AXIAL	.104 In/Sec	.471 G-s
71 - PUMP CPLG END HORIZ	.127 In/Sec	2.377 G-s
72 - PUMP CPLG END VERT	.088 In/Sec	2.691 G-s
73 - PUMP CPLG END AXIAL	.219 In/Sec	5.393 G-s
81 - PUMP OPP END HORIZ	.425 In/Sec	11.70 G-s
82 - PUMP OPP END VERT	.257 In/Sec	9.164 G-s
83 - PUMP OPP END AXIAL	.191 In/Sec	5.332 G-s
P24-63DEGN - 63 DEG N WATER PUMP	(29-Jul-20)	
	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.065 In/Sec	.758 G-s
12 - MOTOR OUTBOARD VERT	.034 In/Sec	.238 G-s

21	- MOTOR INBOARD HORIZ	.069 In/Sec	.550 G-s
22	- MOTOR INBOARD VERT	.051 In/Sec	.497 G-s
23	- MOTOR INBOARD AXIAL	.040 In/Sec	.590 G-s
71	- PUMP CPLG END HORIZ	.079 In/Sec	1.082 G-s
72	- PUMP CPLG END VERT	.053 In/Sec	2.174 G-s
73	- PUMP CPLG END AXIAL	.145 In/Sec	4.122 G-s
81	- PUMP OPP END HORIZ	.099 In/Sec	1.108 G-s
82	- PUMP OPP END VERT	.039 In/Sec	1.170 G-s
83	- PUMP OPP END AXIAL	.149 In/Sec	3.958 G-s

P24-63DEGS - 63 DEG S WATER PUMP

(29-Jul-20)

OVERALL LEVEL

1-20 KHZ

11	- MOTOR OUTBOARD HORIZ	.134 In/Sec	.369 G-s
12	- MOTOR OUTBOARD VERT	.092 In/Sec	.326 G-s
21	- MOTOR INBOARD HORIZ	.086 In/Sec	.687 G-s
22	- MOTOR INBOARD VERT	.072 In/Sec	.690 G-s
23	- MOTOR INBOARD AXIAL	.124 In/Sec	.430 G-s
71	- PUMP CPLG END HORIZ	.166 In/Sec	.695 G-s
72	- PUMP CPLG END VERT	.088 In/Sec	.719 G-s
73	- PUMP CPLG END AXIAL	.131 In/Sec	1.174 G-s
81	- PUMP OPP END HORIZ	.161 In/Sec	.395 G-s
82	- PUMP OPP END VERT	.070 In/Sec	.796 G-s
83	- PUMP OPP END AXIAL	.172 In/Sec	1.444 G-s

P24-85DEGN - 85 DEG N WATER CIRC PUMP 125

(29-Jul-20)

OVERALL LEVEL

1-20 KHZ

11	- MOTOR OUTBOARD HORIZ	.063 In/Sec	.653 G-s
12	- MOTOR OUTBOARD VERT	.073 In/Sec	1.466 G-s
21	- MOTOR INBOARD HORIZ	.068 In/Sec	1.248 G-s
22	- MOTOR INBOARD VERT	.056 In/Sec	.921 G-s
23	- MOTOR INBOARD AXIAL	.036 In/Sec	.281 G-s
71	- PUMP CPLG END HORIZ	.380 In/Sec	.718 G-s
72	- PUMP CPLG END VERT	.519 In/Sec	.965 G-s
73	- PUMP CPLG END AXIAL	.933 In/Sec	.849 G-s
81	- PUMP OPP END HORIZ	.174 In/Sec	.836 G-s
82	- PUMP OPP END VERT	.239 In/Sec	1.101 G-s
83	- PUMP OPP END AXIAL	.519 In/Sec	1.525 G-s

P24BGBL876 - BIG BLUE WATER PUMP-63 DEG

(29-Jul-20)

OVERALL LEVEL

1-20 KHZ

11	- MOTOR OUTBOARD HORIZ	.255 In/Sec	1.582 G-s
12	- MOTOR OUTBOARD VERT	.064 In/Sec	1.754 G-s
21	- MOTOR INBOARD HORIZ	.267 In/Sec	2.178 G-s
22	- MOTOR INBOARD VERT	.058 In/Sec	2.161 G-s
23	- MOTOR INBOARD AXIAL	.117 In/Sec	.572 G-s
71	- PUMP CPLG END HORIZ	.317 In/Sec	.502 G-s
72	- PUMP CPLG END VERT	.188 In/Sec	.598 G-s
73	- PUMP CPLG END AXIAL	.246 In/Sec	.363 G-s
81	- PUMP OPP END HORIZ	.246 In/Sec	1.027 G-s
82	- PUMP OPP END VERT	.195 In/Sec	.946 G-s
83	- PUMP OPP END AXIAL	.118 In/Sec	1.008 G-s

Clarification Of Vibration Units:

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

Abbreviated Last Measurement

Summary

Database: penn.rbm
 Station: NEW EQUIPMENT
 Route No. 7: B55-FINE CHME
 Report Date: 04-Aug-20 09:24

MEASUREMENT POINT -----	OVERALL LEVEL -----	HFD / VHFD -----
R55-102 - REACTOR AGIT R-102	(29-Jul-20)	
	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.177 In/Sec	.272 G-s
12 - MOTOR OUTBOARD VERT	.205 In/Sec	.709 G-s
21 - MOTOR INBOARD HORIZ	.128 In/Sec	.893 G-s
22 - MOTOR INBOARD VERT	.356 In/Sec	.892 G-s
23 - MOTOR INBOARD AXIAL	.333 In/Sec	.303 G-s
31 - GEARBOX INPUT SHAFT-INBD HOR	.140 In/Sec	
32 - GEARBOX INPUT SHAFT INBD VERT	.064 In/Sec	
33 - GEARBOX INPUT SHAFT INBD AXIAL	.200 In/Sec	
41 - GEARBOX INPUT SHAFT OUTBD HOR	.149 In/Sec	
42 - GEARBOX INPUT SHAFT OUTBD VERT	.094 In/Sec	
43 - GEARBOX INPUT SHAFT OUTBD AXIAL	.173 In/Sec	
51 - GEARBOX OUTPUT SHAFT TOP PERP	.085 In/Sec	
53 - GEARBOX OUTPUT SHAFT TOP VERT	.080 In/Sec	
61 - GEARBOX OUTPUT SHAFT MID PERP	.077 In/Sec	
63 - GEARBOX OUTPUT SHAFT MID VERT	.079 In/Sec	
71 - GEARBOX OUTPUT SHAFT BOT PERP	.056 In/Sec	
R55-104 - REACTOR AGIT R-104 (B55)	(29-Jul-20)	
	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.054 In/Sec	1.244 G-s
12 - MOTOR OUTBOARD VERT	.108 In/Sec	.216 G-s
21 - MOTOR INBOARD HORIZ	.053 In/Sec	.548 G-s
22 - MOTOR INBOARD VERT	.041 In/Sec	.608 G-s
23 - MOTOR INBOARD AXIAL	.085 In/Sec	.270 G-s
31 - GEARBOX INPUT SHAFT-INBD HOR	.039 In/Sec	
32 - GEARBOX INPUT SHAFT INBD VERT	.013 In/Sec	
33 - GEARBOX INPUT SHAFT INBD AXIAL	.043 In/Sec	
41 - GEARBOX INPUT SHAFT OUTBD HOR	.039 In/Sec	
42 - GEARBOX INPUT SHAFT OUTBD VERT	.020 In/Sec	
43 - GEARBOX INPUT SHAFT OUTBD AXIAL	.050 In/Sec	
51 - GEARBOX OUTPUT SHAFT TOP PERP	.040 In/Sec	
53 - GEARBOX OUTPUT SHAFT TOP VERT	.017 In/Sec	
61 - GEARBOX OUTPUT SHAFT MID PERP	.036 In/Sec	
63 - GEARBOX OUTPUT SHAFT MID VERT	.016 In/Sec	
R55-106 - REACTOR AGIT R-106	(29-Jul-20)	
	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.234 In/Sec	.538 G-s
12 - MOTOR OUTBOARD VERT	.695 In/Sec	.337 G-s
21 - MOTOR INBOARD HORIZ	.396 In/Sec	.205 G-s
22 - MOTOR INBOARD VERT	.264 In/Sec	.201 G-s
23 - MOTOR INBOARD AXIAL	.465 In/Sec	.102 G-s
31 - GEARBOX INPUT SHAFT-INBD HOR	.181 In/Sec	
32 - GEARBOX INPUT SHAFT INBD VERT	.103 In/Sec	
33 - GEARBOX INPUT SHAFT INBD AXIAL	.196 In/Sec	

41	- GEARBOX INPUT SHAFT OUTBD HOR	.300 In/Sec
42	- GEARBOX INPUT SHAFT OUTBD VERT	.064 In/Sec
43	- GEARBOX INPUT SHAFT OUTBD AXIAL	.194 In/Sec
51	- GEARBOX OUTPUT SHAFT TOP PERP	.219 In/Sec
53	- GEARBOX OUTPUT SHAFT TOP VERT	.073 In/Sec
61	- GEARBOX OUTPUT SHAFT MID PERP	.190 In/Sec
63	- GEARBOX OUTPUT SHAFT MID VERT	.112 In/Sec
71	- GEARBOX OUTPUT SHAFT BOT PERP	.040 In/Sec

P36-905C - N COOL TWR-EAST PUMP

(29-Jul-20)

	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.058 In/Sec	.093 G-s
12 - MOTOR OUTBOARD VERT	.054 In/Sec	.441 G-s
21 - MOTOR INBOARD HORIZ	.050 In/Sec	.524 G-s
22 - MOTOR INBOARD VERT	.045 In/Sec	.193 G-s
23 - MOTOR INBOARD AXIAL	.057 In/Sec	.110 G-s
71 - PUMP CPLG END HORIZ	.141 In/Sec	.999 G-s
72 - PUMP CPLG END VERT	.081 In/Sec	.915 G-s
73 - PUMP CPLG END AXIAL	.163 In/Sec	.412 G-s
81 - PUMP OPP END HORIZ	.101 In/Sec	.646 G-s
82 - PUMP OPP END VERT	.100 In/Sec	.778 G-s
83 - PUMP OPP END AXIAL	.164 In/Sec	.951 G-s

P36-905A - N COOL TWR-NORTH PUMP

(29-Jul-20)

	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.070 In/Sec	.215 G-s
12 - MOTOR OUTBOARD VERT	.044 In/Sec	.113 G-s
21 - MOTOR INBOARD HORIZ	.072 In/Sec	.269 G-s
22 - MOTOR INBOARD VERT	.078 In/Sec	.645 G-s
23 - MOTOR INBOARD AXIAL	.062 In/Sec	.122 G-s
71 - PUMP CPLG END HORIZ	.077 In/Sec	1.744 G-s
72 - PUMP CPLG END VERT	.064 In/Sec	1.281 G-s
73 - PUMP CPLG END AXIAL	.116 In/Sec	.303 G-s
81 - PUMP OPP END HORIZ	.082 In/Sec	.948 G-s
82 - PUMP OPP END VERT	.076 In/Sec	1.298 G-s
83 - PUMP OPP END AXIAL	.127 In/Sec	1.837 G-s

C36-EAST - UTILITY AIRCOMP ROTARY 200HP

(29-Jul-20)

	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.047 In/Sec	.486 G-s
12 - MOTOR OUTBOARD VERT	.066 In/Sec	.692 G-s
21 - MOTOR INBOARD HORIZ	.088 In/Sec	.289 G-s
22 - MOTOR INBOARD VERT	.080 In/Sec	1.225 G-s
23 - MOTOR INBOARD AXIAL	.082 In/Sec	.758 G-s
71 - MALE - CPLG END HORIZ	.133 In/Sec	1.895 G-s
72 - MALE - CPLG END VERT	.101 In/Sec	1.451 G-s
73 - MALE-CPLG END AXIAL	.178 In/Sec	.366 G-s
81 - MALE- OPP END HORIZ	.127 In/Sec	3.462 G-s
82 - MALE- OPP END VERT	.142 In/Sec	1.734 G-s
71F - FEMALE - CPLG END HORIZ	.148 In/Sec	1.196 G-s
72F - FEMALE- CPLG END VERT	.107 In/Sec	1.584 G-s
81F - FEMALE- OPP END HORIZ	.125 In/Sec	.749 G-s
82F - FEMALE- OPP END VERT	.108 In/Sec	.829 G-s

C36-SOUTH - UTILITY AIRCOMP ROTARY 150HP

(29-Jul-20)

	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.041 In/Sec	2.874 G-s

12	- MOTOR OUTBOARD VERT	.047 In/Sec	1.925 G-s
21	- MOTOR INBOARD HORIZ	.038 In/Sec	1.506 G-s
22	- MOTOR INBOARD VERT	.109 In/Sec	.998 G-s
23	- MOTOR INBOARD AXIAL	.069 In/Sec	3.796 G-s
71	- MALE - CPLG END HORIZ	.079 In/Sec	2.604 G-s
72	- MALE - CPLG END VERT	.112 In/Sec	1.826 G-s
73	- MALE-CPLG END AXIAL	.126 In/Sec	1.996 G-s
81	- MALE- OPP END HORIZ	.091 In/Sec	1.189 G-s
82	- MALE- OPP END VERT	.089 In/Sec	1.328 G-s
71F	- FEMALE - CPLG END HORIZ	.074 In/Sec	1.074 G-s
72F	- FEMALE- CPLG END VERT	.104 In/Sec	1.548 G-s
81F	- FEMALE- OPP END HORIZ	.095 In/Sec	1.772 G-s
82F	- FEMALE- OPP END VERT	.112 In/Sec	1.542 G-s

R80-10	- AGITATOR GBX	(29-Jul-20)
		OVERALL LEVEL
11	- MOTOR OUTBOARD HORIZ	.089 In/Sec
12	- MOTOR OUTBOARD VERT	.070 In/Sec
21	- MOTOR INBOARD HORIZ	.047 In/Sec
22	- MOTOR INBOARD VERT	.052 In/Sec
23	- MOTOR INBOARD AXIAL	.041 In/Sec
31	- GEARBOX INPUT SHAFT-INBD HOR	.043 In/Sec
32	- GEARBOX INPUT SHAFT INBD VERT	.052 In/Sec
33	- GEARBOX INPUT SHAFT INBD AXIAL	.029 In/Sec
41	- GEARBOX INPUT SHAFT OUTBD HOR	.082 In/Sec
42	- GEARBOX INPUT SHAFT OUTBD VERT	.047 In/Sec
43	- GEARBOX INPUT SHAFT OUTBD AXIAL	.028 In/Sec
51	- GEARBOX OUTPUT SHAFT TOP N-S	.054 In/Sec
61	- GEARBOX OUTPUT SHAFT MID N-S	.029 In/Sec
63	- GEARBOX OUTPUT SHAFT MID VERT	.036 In/Sec
71	- GEARBOX OUTPUT SHAFT BOT N-S	.018 In/Sec

Clarification Of Vibration Units:

Acc	-->	G-s	PK	
Vel	-->	In/Sec	PK	Abbreviated Last Measurement

Summary

Database: penn.rbm
Station: NEW EQUIPMENT
Route No. 8: PILOT-GUARD
Report Date: 04-Aug-20 09:25

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
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CHLR45-1 - 20T TRANE CHILLER	(29-Jul-20)	
	OVERALL LEVEL	
11W - WEST MOTOR OUTBOARD HORIZ	.128 In/Sec	
12W - WEST MOTOR OUTBOARD VERT	.048 In/Sec	
13W - WEST MOTOR OUTBOARD AXIAL	.182 In/Sec	
11E - EASTMOTOR OUTBOARD HORIZ	1.371 In/Sec	
12E - EAST MOTOR OUTBOARD VERT	.658 In/Sec	
13E - EAST MOTOR OUTBOARD AXIAL	.044 In/Sec	
P45-VAC - NEW VACUUM PUMP PILOT PLANT	(29-Jul-20)	

	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.051 In/Sec	.224 G-s
21 - MOTOR INBOARD HORIZ	.035 In/Sec	.501 G-s
23 - MOTOR INBOARD AXIAL	.042 In/Sec	.294 G-s
71M - PUMP MALE INPUT END HORIZONTAL	.041 In/Sec	.471 G-s
71F - PUMP INPUT END FEMALE HZ	.047 In/Sec	.401 G-s
73M - PUMP INPUT END MALE AXIAL	.024 In/Sec	.669 G-s
81M - PUMP MALE INPUT OPPOSITE END HZ	.055 In/Sec	.278 G-s
81F - PUMP FEMALE OPPOSITE END HZ	.052 In/Sec	.101 G-s

P39-4-877 - WELL PUMP #4

(29-Jul-20)

	OVERALL LEVEL	1-20 KHZ
11 - MOTOR TOP N-S	.157 In/Sec	.454 G-s
12 - MOTOR TOP E-W	.160 In/Sec	.335 G-s
21 - MOTOR BOTTOM N-S	.103 In/Sec	.332 G-s
22 - MOTOR BOTTOM E-W	.098 In/Sec	.217 G-s
23 - MOTOR BOTTOM VERT	.063 In/Sec	.567 G-s

Clarification Of Vibration Units:

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