

September 24, 2020

Penn A Kem

Subject: September 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
dshook@gohispeed.com

Detailed Defects

R80-30 Reactor Agitator Motor and Gearbox

The elevated vibrations in the motor last survey have dropped to acceptable levels this survey. No other items need attention.

R55-102 Reactor Agitator Motor and Gearbox

The vibration peak at 67 Hz has completely disappeared as well as most every other vibration at this scale. It was reported the gearbox had been repaired and there were input shaft issues found. The recent data supports quality repairs were performed. No further service is warranted at this time.

R55-106 Reactor Agitator Motor Gearbox

Most of the motor vibrations have dropped; however, the gearbox vibrations seem to have increased. The dominant vibration appears to be at input speed, which we believe to be about 25 Hz. Inspect the motor, coupling, gearbox, supports and structures for defects that could cause vibrations. **Rated a Class II Defect.**

C53-C1A Compressor

Data for the compressor indicates possible mechanical looseness in the unit. Inspect the unit for defects at the very next opportunity. **Rated a Class III Defect.**

Observations

R80-10 Reactor Agitator Motor/Gearbox

The unit motor vibrations are relatively low, but we believe the bearings are in distress due to the elevated crest factor of 5.9 for the outboard bearing. We recommend replacing the motor before years' end. **Rated a Class II Defect.**

P24-85 Degree Pump North

A low shaft speed vibration still exists in the axial plane for the pump drive end bearing after repairs. Axial in the pump is just below 0.3"/sec velocity peak. We still suspect one or more of the following: bent shaft, rotor out of balance, eccentric coupling hub, worn insert, soft foot, structural problems, or an alignment issue. Inspect unit soon. **Rated a Class I Defect**

B76 ID and FD Fan East H2 Plant

Both fan units have vibrations over 0.5"/sec peak velocity. Recommend complete cleaning and inspection of the fans and motors. Check all fasteners. Ensure belts and sheaves are serviceable and the sheaves are aligned, and belts tensioned properly. **Rated a Class II Defect.**

P24-63 Degree Pump North

The pump axial vibrations still have a slight 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 I Defect.**

R48-2 Reactor Agitator Motor and Gearbox

The apparent bent agitator shaft is still causing distress in the drive components. Motor top bearing vibration is above 0.4"/sec velocity peak. **Rated a Class II Defect.**

R53-301 Reactor Agitator Motor and Gearbox

The motor inboard axial is at 0.53"/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.**

CHLR45-1 20 Ton Trane Chiller

The East compressor is still vibrating near 1.2"/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:

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. Compressor shows harmonics of lobe pass throughout the unit. We are going to rate the **Motor A Class II Defect for now** and the **Compressor A Class I.**

Overall vibrations

Abbreviated Last Measurement Summary *****

Database: penn.rbm
Station: NEW EQUIPMENT
Route No. 4: HYDRO
Report Date: 24-Sep-20 13:44

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
-----	-----	-----
C42-4 - AXIAL TWIN SCREW COMPRESSOR	(22-Sep-20)	
	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.064 In/Sec	2.034 G-s
12 - MOTOR OUTBOARD VERT	.065 In/Sec	.814 G-s
13 - MOTOR OUTBOARD AXIAL	.081 In/Sec	1.571 G-s
21 - MOTOR INBOARD HORIZ	.063 In/Sec	.653 G-s
22 - MOTOR INBOARD VERT	.063 In/Sec	.868 G-s
23 - MOTOR INBOARD AXIAL	.053 In/Sec	.777 G-s
71 - MALE - CPLG END HORIZ	.123 In/Sec	1.310 G-s
72 - MALE - CPLG END VERT	.061 In/Sec	.507 G-s
73 - MALE-CPLG END AXIAL	.111 In/Sec	1.013 G-s
81 - MALE- OPP END HORIZ	.068 In/Sec	.289 G-s
82 - MALE- OPP END VERT	.058 In/Sec	.505 G-s
83 - MALE-OPP END AXIAL	.148 In/Sec	.487 G-s
71F - FEMALE - CPLG END HORIZ	.205 In/Sec	.799 G-s
72F - FEMALE- CPLG END VERT	.049 In/Sec	.917 G-s
73F - FEMALE-CPLG END AXIAL	.097 In/Sec	.988 G-s
81F - FEMALE- OPP END HORIZ	.095 In/Sec	.270 G-s
82F - FEMALE- OPP END VERT	.074 In/Sec	.783 G-s
83F - FEMALE- OPP END AXIAL	.125 In/Sec	.413 G-s
P42-4A - CENTRIFUGAL HOT OIL PUMP 5HP	(22-Sep-20)	
	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.013 In/Sec	.078 G-s
21 - MOTOR INBOARD HORIZ	.075 In/Sec	.071 G-s
23 - MOTOR INBOARD AXIAL	.038 In/Sec	.099 G-s
71 - PUMP COUPLING END HORIZ	.011 In/Sec	.517 G-s
73 - PUMP COUPLING END AXIAL	.011 In/Sec	.165 G-s
81 - PUMP IMPELLER END HORIZ	.010 In/Sec	.287 G-s
P42-4B - CENTRIFUGAL HOT OIL PUMP 5HP	(22-Sep-20)	
	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.024 In/Sec	.057 G-s
21 - MOTOR INBOARD HORIZ	.017 In/Sec	.109 G-s
23 - MOTOR INBOARD AXIAL	.069 In/Sec	.048 G-s
71 - PUMP COUPLING END HORIZ	.015 In/Sec	.135 G-s
73 - PUMP COUPLING END AXIAL	.012 In/Sec	.085 G-s
81 - PUMP IMPELLER END HORIZ	.076 In/Sec	.073 G-s
P42-4D - CENTRIFUGAL HOT OIL PUMP 5HP	(22-Sep-20)	
	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.026 In/Sec	.093 G-s

21	- MOTOR INBOARD HORIZ	.030 In/Sec	.133 G-s
23	- MOTOR INBOARD AXIAL	.064 In/Sec	.147 G-s
71	- PUMP COUPLING END HORIZ	.033 In/Sec	.230 G-s
81	- PUMP IMPELLER END HORIZ	.027 In/Sec	.132 G-s

CHLR67-1W - 240T TRANE CHILLER WEST		(22-Sep-20)	
		OVERALL LEVEL	
11	- MOTOR OUTBOARD HORIZ	.210 In/Sec	
12	- MOTOR OUTBOARD VERT	.178 In/Sec	
13	- MOTOR OUTBOARD AXIAL	.246 In/Sec	
71	- COMP INBOARD HORIZ	.115 In/Sec	
72	- COMP INBOARD VERT	.171 In/Sec	
81	- COMP OUTBD HORIZ	.113 In/Sec	
82	- COMP OUTBD VERT	.139 In/Sec	
83	- COMP OUTBD AXIAL	.194 In/Sec	

CHLR67-1E - 240T TRANE CHILLER EAST		(22-Sep-20)	
		OVERALL LEVEL	
71	- COMP INBOARD HORIZ	.065 In/Sec	
72	- COMP INBOARD VERT	.086 In/Sec	
81	- COMP OUTBD HORIZ	.073 In/Sec	
82	- COMP OUTBD VERT	.099 In/Sec	
83	- COMP OUTBD AXIAL	.048 In/Sec	

P67-54 - HOT OIL CIRC PMP CENT 15HP		(22-Sep-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.073 In/Sec	.083 G-s
12	- MOTOR OUTBOARD VERT	.021 In/Sec	.105 G-s
21	- MOTOR INBOARD HORIZ	.069 In/Sec	.200 G-s
22	- MOTOR INBOARD VERT	.051 In/Sec	.159 G-s
23	- MOTOR INBOARD AXIAL	.026 In/Sec	.057 G-s
71	- PUMP CPLG END HORIZ	.059 In/Sec	.316 G-s
72	- PUMP CPLG END VERT	.036 In/Sec	.124 G-s
73	- PUMP CPLG END AXIAL	.033 In/Sec	.453 G-s
81	- PUMP OPP END HORIZ	.052 In/Sec	.251 G-s
82	- PUMP OPP END VERT	.028 In/Sec	.127 G-s

P67-504 - HOT OIL CIRC PMP CENT 50HP		(22-Sep-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.021 In/Sec	.274 G-s
12	- MOTOR OUTBOARD VERT	.037 In/Sec	.011 G-s
21	- MOTOR INBOARD HORIZ	.023 In/Sec	.151 G-s
22	- MOTOR INBOARD VERT	.025 In/Sec	.153 G-s
23	- MOTOR INBOARD AXIAL	.026 In/Sec	.067 G-s
71	- PUMP CPLG END HORIZ	.127 In/Sec	.112 G-s
72	- PUMP CPLG END VERT	.065 In/Sec	.178 G-s
73	- PUMP CPLG END AXIAL	.061 In/Sec	.148 G-s
81	- PUMP OPP END HORIZ	.056 In/Sec	.194 G-s
82	- PUMP OPP END VERT	.050 In/Sec	.163 G-s

B82-101A - FAN FORCED DRAFT 10HP SOUTH		(22-Sep-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.113 In/Sec	.122 G-s
12	- MOTOR OUTBOARD VERT	.173 In/Sec	.102 G-s
21	- MOTOR INBOARD HORIZ	.125 In/Sec	.105 G-s
22	- MOTOR INBOARD VERT	.273 In/Sec	.061 G-s
23	- MOTOR INBOARD AXIAL	.257 In/Sec	.196 G-s

B82-102	- INDUCED DRAFT 150 HP	(22-Sep-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.038 In/Sec	.070 G-s
12	- MOTOR OUTBOARD VERT	.031 In/Sec	.056 G-s
21	- MOTOR INBOARD HORIZ	.039 In/Sec	.576 G-s
22	- MOTOR INBOARD VERT	.044 In/Sec	.390 G-s
23	- MOTOR INBOARD AXIAL	.035 In/Sec	.139 G-s
31	- FAN INBOARD HORIZONTAL	.026 In/Sec	.318 G-s
32	- FAN INBOARD VERTICAL	.032 In/Sec	.062 G-s
41	- FAN OUTBOARD HORIZONTAL	.031 In/Sec	.056 G-s
42	- FAN OUTBOARD VERT	.027 In/Sec	.132 G-s
B76-101806	- FD FAN- EAST H2 PLANT	(22-Sep-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.237 In/Sec	.221 G-s
12	- MOTOR OUTBOARD VERT	.226 In/Sec	.181 G-s
21	- MOTOR INBOARD HORIZ	.122 In/Sec	.273 G-s
22	- MOTOR INBOARD VERT	.584 In/Sec	.267 G-s
23	- MOTOR INBOARD AXIAL	.205 In/Sec	.046 G-s
71	- FAN SHEAVE END HORIZ	.225 In/Sec	.400 G-s
72	- FAN SHEAVE END VERT	.360 In/Sec	.201 G-s
73	- FAN SHEAVE END AXIAL	.461 In/Sec	.190 G-s
81	- FAN WHEEL END HORIZ	.139 In/Sec	.598 G-s
82	- FAN WHEEL END VERT	.162 In/Sec	.366 G-s
B76-103806	- ID FAN- EAST H2 PLANT	(22-Sep-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.526 In/Sec	.190 G-s
12	- MOTOR OUTBOARD VERT	.101 In/Sec	.138 G-s
21	- MOTOR INBOARD HORIZ	.182 In/Sec	.231 G-s
22	- MOTOR INBOARD VERT	.123 In/Sec	.120 G-s
23	- MOTOR INBOARD AXIAL	.409 In/Sec	.271 G-s
71	- FAN SHEAVE END HORIZ	.292 In/Sec	.018 G-s
81	- FAN WHEEL END HORIZ	.414 In/Sec	.364 G-s
P76-101806	- P101 BFW PUMP-EAST H2 PLANT	(22-Sep-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.066 In/Sec	1.308 G-s
12	- MOTOR OUTBOARD VERT	.127 In/Sec	3.032 G-s
21	- MOTOR INBOARD HORIZ	.042 In/Sec	.135 G-s
22	- MOTOR INBOARD VERT	.045 In/Sec	.165 G-s
23	- MOTOR INBOARD AXIAL	.028 In/Sec	.191 G-s
71	- PUMP CPLG END HORIZ	.052 In/Sec	.164 G-s
72	- PUMP CPLG END VERT	.038 In/Sec	.164 G-s
81	- PUMP HIGH SPEED HORIZ	.029 In/Sec	.107 G-s
82	- PUMP HIGH SPEED VERT	.023 In/Sec	.212 G-s
C53-301B	- C-301B RECIP COMPRESSOR	(22-Sep-20)	
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.045 In/Sec	.880 G-s
12	- MOTOR OUTBOARD VERT	.064 In/Sec	1.320 G-s
21	- MOTOR INBOARD HORIZ	.061 In/Sec	.375 G-s
22	- MOTOR INBOARD VERT	.038 In/Sec	2.279 G-s
23	- MOTOR INBOARD AXIAL	.044 In/Sec	.144 G-s
71	- CRANKSHAFT DRIVE END HORIZ	.051 In/Sec	.163 G-s
72	- CRANKSHAFT DRIVE END VERT	.039 In/Sec	.118 G-s

73	- CRANKSHAFT DRIVE END AXIAL	.117 In/Sec	.132 G-s
81	- CRANKSHAFT OPP END HORIZ	.054 In/Sec	.130 G-s
82	- CRANKSHAFT OPP END VERT	.035 In/Sec	.150 G-s

C53-1A-050 - C1-A H2 COMPRESSOR

(22-Sep-20)

		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.111 In/Sec	1.163 G-s
12	- MOTOR OUTBOARD VERT	.088 In/Sec	.947 G-s
21	- MOTOR INBOARD HORIZ	.122 In/Sec	1.686 G-s
22	- MOTOR INBOARD VERT	.132 In/Sec	1.618 G-s
23	- MOTOR INBOARD AXIAL	.095 In/Sec	.898 G-s
71	- PUMP CPLG END HORIZ	.284 In/Sec	.441 G-s
72	- PUMP CPLG END VERT	.098 In/Sec	.250 G-s
73	- PUMP CPLG END AXIAL	.188 In/Sec	.473 G-s
81	- PUMP OPP END HORIZ	.326 In/Sec	.443 G-s
82	- PUMP OPP END VERT	.080 In/Sec	.188 G-s

P48-7B - ROTOJET HIGH PRESS PUMP 15HP

(22-Sep-20)

		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.096 In/Sec	.425 G-s
12	- MOTOR OUTBOARD VERT	.099 In/Sec	.355 G-s
21	- MOTOR INBOARD HORIZ	.066 In/Sec	.705 G-s
22	- MOTOR INBOARD VERT	.101 In/Sec	.859 G-s
23	- MOTOR INBOARD AXIAL	.111 In/Sec	.342 G-s
71	- PUMP CPLG END HORIZ	.205 In/Sec	1.843 G-s
72	- PUMP CPLG END VERT	.138 In/Sec	1.622 G-s
73	- PUMP CPLG END AXIAL	.183 In/Sec	1.268 G-s
81	- PUMP OPP END HORIZ	.260 In/Sec	.547 G-s
82	- PUMP OPP END VERT	.123 In/Sec	.810 G-s

R48-2 - AGITATOR GEARBOX FAULK 15HP

(22-Sep-20)

		OVERALL LEVEL
11	- MOTOR OUTBOARD HORIZ	.346 In/Sec
12	- MOTOR OUTBOARD VERT	.403 In/Sec
21	- MOTOR INBOARD HORIZ	.210 In/Sec
22	- MOTOR INBOARD VERT	.267 In/Sec
23	- MOTOR INBOARD AXIAL	.100 In/Sec
31	- GEARBOX INPUT SHAFT-INBD HOR	.236 In/Sec
32	- GEARBOX INPUT SHAFT INBD VERT	.187 In/Sec
41	- GEARBOX INPUT SHAFT OUTBD HOR	.186 In/Sec
42	- GEARBOX INPUT SHAFT OUTBD VERT	.195 In/Sec
51	- GEARBOX OUTPUT SHAFT TOP N-S	.104 In/Sec

R53-301 - AGITATOR GBX CHEMINEER 15HP

(22-Sep-20)

		OVERALL LEVEL
11	- MOTOR OUTBOARD HORIZ	.246 In/Sec
12	- MOTOR OUTBOARD VERT	.239 In/Sec
21	- MOTOR INBOARD HORIZ	.265 In/Sec
22	- MOTOR INBOARD VERT	.328 In/Sec
23	- MOTOR INBOARD AXIAL	.538 In/Sec
31	- GEARBOX INPUT SHAFT-INBD HOR	.187 In/Sec
32	- GEARBOX INPUT SHAFT INBD VERT	.064 In/Sec
33	- GEARBOX INPUT SHAFT INBD AXIAL	.277 In/Sec
41	- GEARBOX INPUT SHAFT OUTBD HOR	.210 In/Sec
42	- GEARBOX INPUT SHAFT OUTBD VERT	.066 In/Sec
51	- GEARBOX OUTPUT SHAFT TOP N-S	.194 In/Sec
61	- GEARBOX OUTPUT SHAFT MID N-S	.138 In/Sec

71	- GEARBOX OUTPUT SHAFT BOT N-S	.024 In/Sec	
P53-310A - GRUNDFOSS VERT PUMP 10HP (22-Sep-20)			
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.109 In/Sec	.198 G-s
12	- MOTOR OUTBOARD VERT	.073 In/Sec	.192 G-s
21	- MOTOR INBOARD HORIZ	.033 In/Sec	.335 G-s
22	- MOTOR INBOARD VERT	.074 In/Sec	.396 G-s
23	- MOTOR INBOARD AXIAL	.034 In/Sec	.102 G-s
71	- PUMP CPLG END HORIZ	.062 In/Sec	.457 G-s
72	- PUMP CPLG END VERT	.116 In/Sec	.360 G-s
81	- PUMP OPP END HORIZ	.024 In/Sec	.112 G-s
82	- PUMP OPP END VERT	.018 In/Sec	.188 G-s

P53-301 - ANSI CENTRIFUGAL PUMP 50 HP (22-Sep-20)			
		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.094 In/Sec	.146 G-s
12	- MOTOR OUTBOARD VERT	.118 In/Sec	.113 G-s
21	- MOTOR INBOARD HORIZ	.080 In/Sec	.529 G-s
22	- MOTOR INBOARD VERT	.107 In/Sec	.443 G-s
23	- MOTOR INBOARD AXIAL	.144 In/Sec	.330 G-s
71	- PUMP CPLG END HORIZ	.099 In/Sec	.516 G-s
72	- PUMP CPLG END VERT	.115 In/Sec	.443 G-s
73	- PUMP CPLG END AXIAL	.108 In/Sec	.662 G-s
81	- PUMP OPP END HORIZ	.061 In/Sec	.461 G-s
82	- PUMP OPP END VERT	.059 In/Sec	.424 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: 24-Sep-20 13:44

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
-----	-----	-----
C54--115 - COMP 2CYL 2 STAGE 75 HP (22-Sep-20)		
	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.057 In/Sec	.806 G-s
12 - MOTOR OUTBOARD VERT	.134 In/Sec	.498 G-s
21 - MOTOR INBOARD HORIZ	.059 In/Sec	.916 G-s
22 - MOTOR INBOARD VERT	.053 In/Sec	.709 G-s
23 - MOTOR INBOARD AXIAL	.138 In/Sec	.307 G-s
71 - PUMP CPLG END HORIZ	.022 In/Sec	.076 G-s
72 - PUMP CPLG END VERT	.022 In/Sec	.043 G-s
73 - PUMP CPLG END AXIAL	.037 In/Sec	.045 G-s
81 - PUMP OPP END HORIZ	.022 In/Sec	.068 G-s
82 - PUMP OPP END VERT	.022 In/Sec	.051 G-s
P54-112 - CANNED MOTOR CENTRIFUG PUMP (22-Sep-20)		
	OVERALL LEVEL	1-20 KHZ

11	- MOTOR OUTBOARD HORIZ	.065 In/Sec	.041 G-s
12	- MOTOR OUTBOARD VERT	.028 In/Sec	.024 G-s
13	- MOTOR OUTBOARD AXIAL	.054 In/Sec	.026 G-s
21	- MOTOR INBOARD HORIZ	.057 In/Sec	.125 G-s
22	- MOTOR INBOARD VERT	.017 In/Sec	.152 G-s
71	- PUMP CPLG END HORIZ	.059 In/Sec	.104 G-s
72	- PUMP CPLG END VERT	.083 In/Sec	.131 G-s
81	- PUMP OPP END HORIZ	.065 In/Sec	.030 G-s
82	- PUMP OPP END VERT	.019 In/Sec	.071 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: 24-Sep-20 13:44

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
-----	-----	-----
B4C101-877 - ZURN BOILER BLOWER	(22-Sep-20)	
	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.173 In/Sec	.193 G-s
12 - MOTOR OUTBOARD VERT	.111 In/Sec	.976 G-s
21 - MOTOR INBOARD HORIZ	.176 In/Sec	.431 G-s
22 - MOTOR INBOARD VERT	.128 In/Sec	1.404 G-s
23 - MOTOR INBOARD AXIAL	.130 In/Sec	.734 G-s
71 - BLOWER INBOARD HORIZ	.164 In/Sec	.755 G-s
72 - BLOWER INBOARD VERT	.105 In/Sec	.428 G-s
73 - BLOWER INBOARD AXIAL	.167 In/Sec	.422 G-s
81 - BLOWER WHEEL END HORIZ	.158 In/Sec	.197 G-s
82 - BLOWER WHEEL END VERT	.110 In/Sec	.415 G-s
P4C-102A - BOILER FEEDWATER PUMP	(22-Sep-20)	
	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.053 In/Sec	.200 G-s
12 - MOTOR OUTBOARD VERT	.042 In/Sec	.591 G-s
21 - MOTOR INBOARD HORIZ	.056 In/Sec	.280 G-s
22 - MOTOR INBOARD VERT	.074 In/Sec	.356 G-s
71 - PUMP CPLG END HORIZ	.147 In/Sec	.321 G-s
72 - PUMP CPLG END VERT	.031 In/Sec	.317 G-s
73 - PUMP CPLG END AXIAL	.070 In/Sec	1.174 G-s
81 - PUMP OPP END HORIZ	.073 In/Sec	.631 G-s
82 - PUMP OPP END VERT	.023 In/Sec	.833 G-s
83 - PUMP OPP END AXIAL	.069 In/Sec	.458 G-s
P24-63DEGN - 63 DEG N WATER PUMP	(22-Sep-20)	
	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.065 In/Sec	.135 G-s
12 - MOTOR OUTBOARD VERT	.041 In/Sec	.131 G-s
21 - MOTOR INBOARD HORIZ	.071 In/Sec	.364 G-s
22 - MOTOR INBOARD VERT	.048 In/Sec	.279 G-s

23	- MOTOR INBOARD AXIAL	.038 In/Sec	.608 G-s
71	- PUMP CPLG END HORIZ	.071 In/Sec	.648 G-s
72	- PUMP CPLG END VERT	.036 In/Sec	1.231 G-s
73	- PUMP CPLG END AXIAL	.180 In/Sec	.564 G-s
81	- PUMP OPP END HORIZ	.067 In/Sec	.654 G-s
82	- PUMP OPP END VERT	.030 In/Sec	1.196 G-s
83	- PUMP OPP END AXIAL	.160 In/Sec	1.647 G-s

P24-63DEGS - 63 DEG S WATER PUMP

(22-Sep-20)

		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.124 In/Sec	.152 G-s
12	- MOTOR OUTBOARD VERT	.088 In/Sec	.200 G-s
21	- MOTOR INBOARD HORIZ	.169 In/Sec	.438 G-s
22	- MOTOR INBOARD VERT	.044 In/Sec	.402 G-s
23	- MOTOR INBOARD AXIAL	.184 In/Sec	.346 G-s
71	- PUMP CPLG END HORIZ	.102 In/Sec	.320 G-s
72	- PUMP CPLG END VERT	.066 In/Sec	.472 G-s
73	- PUMP CPLG END AXIAL	.068 In/Sec	1.004 G-s
81	- PUMP OPP END HORIZ	.101 In/Sec	.317 G-s
82	- PUMP OPP END VERT	.042 In/Sec	.446 G-s
83	- PUMP OPP END AXIAL	.094 In/Sec	1.325 G-s

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

(22-Sep-20)

		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.091 In/Sec	1.772 G-s
12	- MOTOR OUTBOARD VERT	.046 In/Sec	.220 G-s
21	- MOTOR INBOARD HORIZ	.073 In/Sec	1.330 G-s
22	- MOTOR INBOARD VERT	.048 In/Sec	.986 G-s
23	- MOTOR INBOARD AXIAL	.032 In/Sec	.354 G-s
71	- PUMP CPLG END HORIZ	.081 In/Sec	.666 G-s
72	- PUMP CPLG END VERT	.188 In/Sec	.651 G-s
73	- PUMP CPLG END AXIAL	.289 In/Sec	.739 G-s
81	- PUMP OPP END HORIZ	.113 In/Sec	.634 G-s
82	- PUMP OPP END VERT	.100 In/Sec	.819 G-s
83	- PUMP OPP END AXIAL	.197 In/Sec	.817 G-s

P24BGBL876 - BIG BLUE WATER PUMP-63 DEG

(22-Sep-20)

		OVERALL LEVEL	1-20 KHZ
11	- MOTOR OUTBOARD HORIZ	.202 In/Sec	1.163 G-s
12	- MOTOR OUTBOARD VERT	.207 In/Sec	.994 G-s
21	- MOTOR INBOARD HORIZ	.293 In/Sec	1.531 G-s
22	- MOTOR INBOARD VERT	.087 In/Sec	1.457 G-s
23	- MOTOR INBOARD AXIAL	.120 In/Sec	1.165 G-s
71	- PUMP CPLG END HORIZ	.341 In/Sec	.374 G-s
72	- PUMP CPLG END VERT	.136 In/Sec	.328 G-s
73	- PUMP CPLG END AXIAL	.242 In/Sec	.178 G-s
81	- PUMP OPP END HORIZ	.288 In/Sec	.575 G-s
82	- PUMP OPP END VERT	.214 In/Sec	.578 G-s
83	- PUMP OPP END AXIAL	.160 In/Sec	.335 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: 24-Sep-20 13:44

MEASUREMENT POINT -----	OVERALL LEVEL -----	HFD / VHFD -----
R55-101 - AGITATOR GBX AND MOTOR	(22-Sep-20)	
	OVERALL LEVEL	
11 - MOTOR OUTBOARD HORIZ	.150 In/Sec	
12 - MOTOR OUTBOARD VERT	.035 In/Sec	
21 - MOTOR INBOARD HORIZ	.126 In/Sec	
22 - MOTOR INBOARD VERT	.038 In/Sec	
23 - MOTOR INBOARD AXIAL	.062 In/Sec	
31 - GEARBOX INPUT SHAFT-INBD HOR	.104 In/Sec	
32 - GEARBOX INPUT SHAFT INBD VERT	.015 In/Sec	
33 - GEARBOX INPUT SHAFT INBD AXIAL	.062 In/Sec	
41 - GEARBOX INPUT SHAFT OUTBD HOR	.126 In/Sec	
42 - GEARBOX INPUT SHAFT OUTBD VERT	.016 In/Sec	
51 - GEARBOX OUTPUT SHAFT TOP N-S	.115 In/Sec	
53 - GEARBOX OUTPUT SHAFT TOP VERT	.018 In/Sec	
61 - GEARBOX OUTPUT SHAFT MID N-S	.092 In/Sec	
71 - GEARBOX OUTPUT SHAFT BOT N-S	.017 In/Sec	
R55-102 - REACTOR AGIT R-102	(22-Sep-20)	
	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.032 In/Sec	.163 G-s
12 - MOTOR OUTBOARD VERT	.043 In/Sec	.156 G-s
21 - MOTOR INBOARD HORIZ	.033 In/Sec	.399 G-s
22 - MOTOR INBOARD VERT	.050 In/Sec	.335 G-s
23 - MOTOR INBOARD AXIAL	.052 In/Sec	.176 G-s
31 - GEARBOX INPUT SHAFT-INBD HOR	.026 In/Sec	
32 - GEARBOX INPUT SHAFT INBD VERT	.015 In/Sec	
33 - GEARBOX INPUT SHAFT INBD AXIAL	.032 In/Sec	
41 - GEARBOX INPUT SHAFT OUTBD HOR	.024 In/Sec	
42 - GEARBOX INPUT SHAFT OUTBD VERT	.066 In/Sec	
51 - GEARBOX OUTPUT SHAFT TOP PERP	.022 In/Sec	
52 - GEARBOX OUTPUT SHAFT TOP MA	.019 In/Sec	
53 - GEARBOX OUTPUT SHAFT TOP VERT	.013 In/Sec	
61 - GEARBOX OUTPUT SHAFT MID PERP	.021 In/Sec	
63 - GEARBOX OUTPUT SHAFT MID VERT	.012 In/Sec	
71 - GEARBOX OUTPUT SHAFT BOT PERP	.017 In/Sec	
R55-106 - REACTOR AGIT R-106	(22-Sep-20)	
	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.166 In/Sec	.147 G-s
12 - MOTOR OUTBOARD VERT	.485 In/Sec	.140 G-s
21 - MOTOR INBOARD HORIZ	.134 In/Sec	.203 G-s
22 - MOTOR INBOARD VERT	.246 In/Sec	.165 G-s
23 - MOTOR INBOARD AXIAL	.291 In/Sec	.102 G-s
31 - GEARBOX INPUT SHAFT-INBD HOR	.433 In/Sec	
32 - GEARBOX INPUT SHAFT INBD VERT	.321 In/Sec	
33 - GEARBOX INPUT SHAFT INBD AXIAL	.203 In/Sec	
41 - GEARBOX INPUT SHAFT OUTBD HOR	.592 In/Sec	
42 - GEARBOX INPUT SHAFT OUTBD VERT	.317 In/Sec	
43 - GEARBOX INPUT SHAFT OUTBD AXIAL	.310 In/Sec	

51	- GEARBOX OUTPUT SHAFT TOP PERP	.456 In/Sec
53	- GEARBOX OUTPUT SHAFT TOP VERT	.202 In/Sec
61	- GEARBOX OUTPUT SHAFT MID PERP	.350 In/Sec
63	- GEARBOX OUTPUT SHAFT MID VERT	.177 In/Sec
71	- GEARBOX OUTPUT SHAFT BOT PERP	.033 In/Sec

P36-905C - N COOL TWR-EAST PUMP

(22-Sep-20)

	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.030 In/Sec	.182 G-s
12 - MOTOR OUTBOARD VERT	.046 In/Sec	.185 G-s
21 - MOTOR INBOARD HORIZ	.036 In/Sec	.563 G-s
22 - MOTOR INBOARD VERT	.029 In/Sec	.122 G-s
23 - MOTOR INBOARD AXIAL	.025 In/Sec	.041 G-s
71 - PUMP CPLG END HORIZ	.094 In/Sec	1.135 G-s
72 - PUMP CPLG END VERT	.090 In/Sec	1.440 G-s
73 - PUMP CPLG END AXIAL	.172 In/Sec	.331 G-s
81 - PUMP OPP END HORIZ	.081 In/Sec	.753 G-s
82 - PUMP OPP END VERT	.158 In/Sec	1.118 G-s
83 - PUMP OPP END AXIAL	.143 In/Sec	1.310 G-s

C36-EAST - UTILITY AIRCOMP ROTARY 200HP

(22-Sep-20)

	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.059 In/Sec	.473 G-s
12 - MOTOR OUTBOARD VERT	.056 In/Sec	.536 G-s
21 - MOTOR INBOARD HORIZ	.092 In/Sec	.390 G-s
22 - MOTOR INBOARD VERT	.084 In/Sec	1.218 G-s
23 - MOTOR INBOARD AXIAL	.082 In/Sec	.680 G-s
71 - MALE - CPLG END HORIZ	.130 In/Sec	1.604 G-s
72 - MALE - CPLG END VERT	.127 In/Sec	1.517 G-s
73 - MALE-CPLG END AXIAL	.148 In/Sec	1.714 G-s
81 - MALE- OPP END HORIZ	.120 In/Sec	3.725 G-s
82 - MALE- OPP END VERT	.130 In/Sec	1.967 G-s
71F - FEMALE - CPLG END HORIZ	.156 In/Sec	1.365 G-s
72F - FEMALE- CPLG END VERT	.110 In/Sec	1.414 G-s
81F - FEMALE- OPP END HORIZ	.111 In/Sec	1.963 G-s
82F - FEMALE- OPP END VERT	.102 In/Sec	2.191 G-s

C36-WEST - UTILITY AIRCOMP ROTARY 150HP

(22-Sep-20)

	OVERALL LEVEL	1-20 KHZ
11 - MOTOR OUTBOARD HORIZ	.062 In/Sec	1.035 G-s
12 - MOTOR OUTBOARD VERT	.066 In/Sec	.962 G-s
21 - MOTOR INBOARD HORIZ	.059 In/Sec	.528 G-s
22 - MOTOR INBOARD VERT	.081 In/Sec	1.067 G-s
23 - MOTOR INBOARD AXIAL	.130 In/Sec	1.409 G-s
71 - MALE - CPLG END HORIZ	.069 In/Sec	1.235 G-s
72 - MALE - CPLG END VERT	.085 In/Sec	1.562 G-s
81 - MALE- OPP END HORIZ	.097 In/Sec	.679 G-s
82 - MALE- OPP END VERT	.090 In/Sec	1.532 G-s
71F - FEMALE - CPLG END HORIZ	.066 In/Sec	2.059 G-s
72F - FEMALE- CPLG END VERT	.082 In/Sec	1.591 G-s
81F - FEMALE- OPP END HORIZ	.083 In/Sec	1.028 G-s
82F - FEMALE- OPP END VERT	.107 In/Sec	1.768 G-s

R80-10 - AGITATOR GBX

(22-Sep-20)

	OVERALL LEVEL
11 - MOTOR OUTBOARD HORIZ	.087 In/Sec
12 - MOTOR OUTBOARD VERT	.120 In/Sec

21	- MOTOR INBOARD HORIZ	.060 In/Sec
22	- MOTOR INBOARD VERT	.052 In/Sec
23	- MOTOR INBOARD AXIAL	.067 In/Sec
31	- GEARBOX INPUT SHAFT-INBD HOR	.047 In/Sec
32	- GEARBOX INPUT SHAFT INBD VERT	.060 In/Sec
33	- GEARBOX INPUT SHAFT INBD AXIAL	.053 In/Sec
41	- GEARBOX INPUT SHAFT OUTBD HOR	.057 In/Sec
42	- GEARBOX INPUT SHAFT OUTBD VERT	.066 In/Sec
51	- GEARBOX OUTPUT SHAFT TOP N-S	.052 In/Sec
61	- GEARBOX OUTPUT SHAFT MID N-S	.037 In/Sec
63	- GEARBOX OUTPUT SHAFT MID VERT	.039 In/Sec
71	- GEARBOX OUTPUT SHAFT BOT N-S	.026 In/Sec

R80-30 - AGITATOR GBX 15HP CHEMINEER (22-Sep-20)
OVERALL LEVEL

11	- MOTOR OUTBOARD HORIZ	.118 In/Sec
12	- MOTOR OUTBOARD VERT	.216 In/Sec
21	- MOTOR INBOARD HORIZ	.143 In/Sec
22	- MOTOR INBOARD VERT	.097 In/Sec
23	- MOTOR INBOARD AXIAL	.116 In/Sec
31	- GEARBOX INPUT SHAFT-INBD HOR	.068 In/Sec
32	- GEARBOX INPUT SHAFT INBD VERT	.035 In/Sec
33	- GEARBOX INPUT SHAFT INBD AXIAL	.090 In/Sec
41	- GEARBOX INPUT SHAFT OUTBD HOR	.069 In/Sec
42	- GEARBOX INPUT SHAFT OUTBD VERT	.019 In/Sec
51	- GEARBOX OUTPUT SHAFT TOP N-S	.059 In/Sec
53	- GEARBOX OUTPUT SHAFT TOP VERT	.024 In/Sec
61	- GEARBOX OUTPUT SHAFT MID N-S	.040 In/Sec
63	- GEARBOX OUTPUT SHAFT MID VERT	.026 In/Sec
71	- GEARBOX OUTPUT SHAFT BOT N-S	.046 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: 24-Sep-20 13:45

MEASUREMENT POINT

OVERALL LEVEL

HFD / VHFD

CHLR45-1 - 20T TRANE CHILLER		(22-Sep-20)
		OVERALL LEVEL
11W	- WEST MOTOR OUTBOARD HORIZ	.096 In/Sec
12W	- WEST MOTOR OUTBOARD VERT	.311 In/Sec
13W	- WEST MOTOR OUTBOARD AXIAL	.239 In/Sec
11E	- EASTMOTOR OUTBOARD HORIZ	1.211 In/Sec
12E	- EAST MOTOR OUTBOARD VERT	.421 In/Sec
13E	- EAST MOTOR OUTBOARD AXIAL	.213 In/Sec

P39-4-877 - WELL PUMP #4		(22-Sep-20)
		OVERALL LEVEL
		1-20 KHZ

11	- MOTOR TOP N-S	.161 In/Sec	.415 G-s
12	- MOTOR TOP E-W	.176 In/Sec	.416 G-s
21	- MOTOR BOTTOM N-S	.110 In/Sec	.276 G-s
22	- MOTOR BOTTOM E-W	.103 In/Sec	.325 G-s
23	- MOTOR BOTTOM VERT	.055 In/Sec	.415 G-s

Clarification Of Vibration Units:

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