HI-SPEED INDUSTRIAL SERVICE

MILLINGTON, TN

September 19, 2019

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,

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Detailed Defects

R53-301 Agitator

The high amplitude vibration data could indicate an issue in or adjacent to the motor. Ensure all fasteners are tight. Inspect the motor cooling fan and the shaft coupling for wear or damage. Have the shaft alignment checked and adjusted if necessary. Vibrations over 1"/sec velocity peak require attention. **Rated a Class III Defect.**

B82-101B FD Fan North

This unit should be shut down and inspected as soon as possible. The likelihood of secondary damage is extremely conceivable if allowed to run. Unit area should be barricaded until repairs are completed. Vibrations are over 3"/sec velocity peak in the time waveform of the motor inboard vertical and dominated by the shaft fundamental. We suspect imbalance and other factors such as loose fasteners, looseness in the bearing fits and possible structural defects. **Rated a Class IV Defect.**

P24-85DEGS: 85 Degree South Circulating Water Pump

Vibration data consists of: vane pass and harmonics, slightly elevated noise floor and impacting in the time waveform. We suspect the pump is worn and not running in the optimal area of the performance curve. Have the flow and pressure's checked as time allows. We will watch for changes. **Rated a Class II Defect.**

R55-102 Reactor Agitator

The unit gearbox could be in distress. We recommend a visual inspection and Oil analysis to confirm. This is the first survey so we will only rate this **Class II at this time.**

P24-63DEGN 63 Degree North Water Pump

Random impacting in the data is usually a good indicator of the presence of bearing defects. The addition of a large noise hump could help to support the analysis or sometimes it could indicate cavitation in the pump or both. We suspect the bearings are in some distress with possible cavitation. Inspect the outboard pump bearing and check process parameters. **Rated a Class III Defect.**

Observations

B82-101A FD Fan South
Motor axial is slightly high. Inspect the unit and clean the wheel. **Rated a Class I Defect.**

P24-85DEGn: 85 Degree North Circulating Water Pump
The pump vibration data consists of noise in the spectrums and impacting in time waveforms. We suspect the pump bearings could be severely worn; however, extreme cavitation can look similar in the data. Inspect the pump and process parameters for issues as time allows. We will watch carefully for changes. **Rated a Class II Defect.**

CHLR45-1 20 Ton Trane Chiller
The east pump vibration at the top horizontal was at 1”/sec velocity peak. We will watch for changes. **Rated a Class I Defect.**

P54-112B Canned Motor Centrifugal Pump.
The unit case is split and leaking from what looks to be previous hard freeze damage.

Overall vibrations

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                    Abbreviated Last Measurement Summary
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                 Database:  penn.rbm
                 Station:   NEW EQUIPMENT
                 Report Date:  19-Sep-19   08:04

       MEASUREMENT POINT                      OVERALL LEVEL       HFD / VHFD
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R48-2       - AGITATOR GEARBOX FAULK 15HP    (12-Sep-19)
                                              OVERALL LEVEL
11  - MOTOR OUTBOARD HORIZ                      .351 In/Sec
12  - MOTOR OUTBOARD VERT                       .334 In/Sec
21  - MOTOR INBOARD HORIZ                       .203 In/Sec
22  - MOTOR INBOARD VERT                        .227 In/Sec
23  - MOTOR INBOARD AXIAL                       .140 In/Sec
31  - GEARBOX INPUT SHAFT-INBD HOR              .214 In/Sec
32  - GEARBOX INPUT SHAFT INBD VERT             .230 In/Sec
33  - GEARBOX INPUT SHAFT INBD AXIAL            .136 In/Sec
41  - GEARBOX INPUT SHAFT OUTBD HOR             .167 In/Sec
42  - GEARBOX INPUT SHAFT OUTBD VERT            .208 In/Sec
43  - GEARBOX INPUT SHAFT OUTBD AXIAL           .127 In/Sec
51  - GEARBOX OUTPUT SHAFT TOP N-S              .161 In/Sec

R53-301     - AGITATOR GBX CHEMINEER 15HP    (12-Sep-19)
                                              OVERALL LEVEL
11  - MOTOR OUTBOARD HORIZ                     1.013 In/Sec
12  - MOTOR OUTBOARD VERT                       .413 In/Sec
21  - MOTOR INBOARD HORIZ                       .855 In/Sec
22  - MOTOR INBOARD VERT                        .296 In/Sec
23  - MOTOR INBOARD AXIAL                       .202 In/Sec
31  - GEARBOX INPUT SHAFT-INBD HOR              .418 In/Sec
32  - GEARBOX INPUT SHAFT INBD VERT             .063 In/Sec
33  - GEARBOX INPUT SHAFT INBD AXIAL            .199 In/Sec
41  - GEARBOX INPUT SHAFT OUTBD HOR             .198 In/Sec
42  - GEARBOX INPUT SHAFT OUTBD VERT            .044 In/Sec
43  - GEARBOX INPUT SHAFT OUTBD AXIAL           .060 In/Sec
51  - GEARBOX OUTPUT SHAFT TOP N-S              .391 In/Sec
52  - GEARBOX OUTPUT SHAFT TOP E-W              .088 In/Sec
53  - GEARBOX OUTPUT SHAFT TOP VERT             .123 In/Sec
61  - GEARBOX OUTPUT SHAFT MID N-S              .199 In/Sec
62  - GEARBOX OUTPUT SHAFT MID E-W              .120 In/Sec
63  - GEARBOX OUTPUT SHAFT MID VERT             .089 In/Sec
71  - GEARBOX OUTPUT SHAFT BOT N-S              .066 In/Sec

R55-101     - AGITATOR GBX AND MOTOR         (18-Sep-19)
                                              OVERALL LEVEL
11  - MOTOR OUTBOARD HORIZ                      .128 In/Sec
12  - MOTOR OUTBOARD VERT                       .084 In/Sec
21  - MOTOR INBOARD HORIZ                       .128 In/Sec
22  - MOTOR INBOARD VERT                        .064 In/Sec
23  - MOTOR INBOARD AXIAL                       .091 In/Sec
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31	– GEARBOX INPUT SHAFT–INBD HOR	.112 In/Sec
32	– GEARBOX INPUT SHAFT INBD VERT	.032 In/Sec
33	– GEARBOX INPUT SHAFT INBD AXIAL	.122 In/Sec
41	– GEARBOX INPUT SHAFT OUTBD HOR	.108 In/Sec
42	– GEARBOX INPUT SHAFT OUTBD VERT	.060 In/Sec
51	– GEARBOX OUTPUT SHAFT TOP N–S	.132 In/Sec
52	– GEARBOX OUTPUT SHAFT TOP E–W	.070 In/Sec
53	– GEARBOX OUTPUT SHAFT TOP VERT	.043 In/Sec
61	– GEARBOX OUTPUT SHAFT MID N–S	.089 In/Sec
62	– GEARBOX OUTPUT SHAFT MID E–W	.059 In/Sec
63	– GEARBOX OUTPUT SHAFT MID VERT	.032 In/Sec

R80–10	– AGITATOR GBX	(18–Sep–19)
		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.095 In/Sec
12	– MOTOR OUTBOARD VERT	.170 In/Sec
21	– MOTOR INBOARD HORIZ	.074 In/Sec
22	– MOTOR INBOARD VERT	.083 In/Sec
23	– MOTOR INBOARD AXIAL	.070 In/Sec
31	– GEARBOX INPUT SHAFT–INBD HOR	.090 In/Sec
32	– GEARBOX INPUT SHAFT INBD VERT	.068 In/Sec
33	– GEARBOX INPUT SHAFT INBD AXIAL	.097 In/Sec
41	– GEARBOX INPUT SHAFT OUTBD HOR	.060 In/Sec
42	– GEARBOX INPUT SHAFT OUTBD VERT	.098 In/Sec
51	– GEARBOX OUTPUT SHAFT TOP N–S	.088 In/Sec
52	– GEARBOX OUTPUT SHAFT TOP E–W	.080 In/Sec
61	– GEARBOX OUTPUT SHAFT MID N–S	.076 In/Sec
62	– GEARBOX OUTPUT SHAFT MID E–W	.056 In/Sec
63	– GEARBOX OUTPUT SHAFT MID VERT	.044 In/Sec

P53–310A	– GRUNDFOSS VERT PUMP 10HP	(12–Sep–19)
		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.163 In/Sec
12	– MOTOR OUTBOARD VERT	.120 In/Sec
21	– MOTOR INBOARD HORIZ	.087 In/Sec
22	– MOTOR INBOARD VERT	.041 In/Sec
23	– MOTOR INBOARD AXIAL	.051 In/Sec
71	– PUMP CPLG END HORIZ	.189 In/Sec
72	– PUMP CPLG END VERT	.092 In/Sec
81	– PUMP OPP END HORIZ	.023 In/Sec
82	– PUMP OPP END VERT	.178 In/Sec

P53–301	– ANSI CENTRIFUGAL PUMP 50 HP	(12–Sep–19)
		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.071 In/Sec
12	– MOTOR OUTBOARD VERT	.109 In/Sec
21	– MOTOR INBOARD HORIZ	.104 In/Sec
22	– MOTOR INBOARD VERT	.114 In/Sec
23	– MOTOR INBOARD AXIAL	.175 In/Sec
71	– PUMP CPLG END HORIZ	.154 In/Sec
72	– PUMP CPLG END VERT	.097 In/Sec
73	– PUMP CPLG END AXIAL	.083 In/Sec
81	– PUMP OPP END HORIZ	.053 In/Sec
82	– PUMP OPP END VERT	.070 In/Sec

P24–102B	– JOCKEY FIRE PUMP VERTICAL	(12–Sep–19)
		OVERALL LEVEL

11	– MOTOR OUTBOARD HORIZ	.040 In/Sec
12	– MOTOR OUTBOARD VERT	.111 In/Sec
13	– MOTOR OUTBOARD AXIAL	.131 In/Sec
21	– MOTOR INBOARD HORIZ	.071 In/Sec
22	– MOTOR INBOARD VERT	.145 In/Sec
23	– MOTOR INBOARD AXIAL	.151 In/Sec

B4C-101 – FAN, FORCED DRAFT 150 HP (12-Sep-19)

		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.164 In/Sec
12	– MOTOR OUTBOARD VERT	.107 In/Sec
13	– MOTOR OUTBOARD AXIAL	.142 In/Sec
21	– MOTOR INBOARD HORIZ	.156 In/Sec
22	– MOTOR INBOARD VERT	.132 In/Sec
23	– MOTOR INBOARD AXIAL	.138 In/Sec

B82-101A – FAN FORCED DRAFT 10HP SOUTH (12-Sep-19)

		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.131 In/Sec
12	– MOTOR OUTBOARD VERT	.093 In/Sec
21	– MOTOR INBOARD HORIZ	.184 In/Sec
22	– MOTOR INBOARD VERT	.200 In/Sec
23	– MOTOR INBOARD AXIAL	.348 In/Sec

B82-101B – FAN FORCED DRAFT 10HP NORTH (12-Sep-19)

		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	1.283 In/Sec
12	– MOTOR OUTBOARD VERT	1.259 In/Sec
21	– MOTOR INBOARD HORIZ	2.474 In/Sec
22	– MOTOR INBOARD VERT	2.643 In/Sec
23	– MOTOR INBOARD AXIAL	2.334 In/Sec

B82-102 – INDUCED DRAFT 150 HP (12-Sep-19)

		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.036 In/Sec
12	– MOTOR OUTBOARD VERT	.027 In/Sec
21	– MOTOR INBOARD HORIZ	.040 In/Sec
22	– MOTOR INBOARD VERT	.041 In/Sec
23	– MOTOR INBOARD AXIAL	.043 In/Sec

P4C-102A – BOILER FEEDWATER PUMP (12-Sep-19)

		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.053 In/Sec
12	– MOTOR OUTBOARD VERT	.056 In/Sec
13	– MOTOR OUTBOARD AXIAL	.040 In/Sec
21	– MOTOR INBOARD HORIZ	.045 In/Sec
22	– MOTOR INBOARD VERT	.094 In/Sec
23	– MOTOR INBOARD AXIAL	.045 In/Sec
71	– PUMP CPLG END HORIZ	.049 In/Sec
72	– PUMP CPLG END VERT	.044 In/Sec
73	– PUMP CPLG END AXIAL	.065 In/Sec
81	– PUMP OPP END HORIZ	.067 In/Sec
82	– PUMP OPP END VERT	.026 In/Sec

P24-85DEGN – 85 DEG N WATER CIRC PUMP 125 (12-Sep-19)

		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.079 In/Sec

12	– MOTOR OUTBOARD VERT	.037 In/Sec
13	– MOTOR OUTBOARD AXIAL	.099 In/Sec
21	– MOTOR INBOARD HORIZ	.077 In/Sec
22	– MOTOR INBOARD VERT	.046 In/Sec
23	– MOTOR INBOARD AXIAL	.094 In/Sec
71	– PUMP CPLG END HORIZ	.175 In/Sec
72	– PUMP CPLG END VERT	.259 In/Sec
73	– PUMP CPLG END AXIAL	.398 In/Sec
81	– PUMP OPP END HORIZ	.191 In/Sec
82	– PUMP OPP END VERT	.191 In/Sec
83	– PUMP OPP END AXIAL	.334 In/Sec

P24-85DEGS – 85 DEG S WATER CIRC PUMP 125 (12-Sep-19)

		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.147 In/Sec
12	– MOTOR OUTBOARD VERT	.108 In/Sec
13	– MOTOR OUTBOARD AXIAL	.099 In/Sec
21	– MOTOR INBOARD HORIZ	.084 In/Sec
22	– MOTOR INBOARD VERT	.077 In/Sec
23	– MOTOR INBOARD AXIAL	.089 In/Sec
71	– PUMP CPLG END HORIZ	.189 In/Sec
72	– PUMP CPLG END VERT	.322 In/Sec
73	– PUMP CPLG END AXIAL	.431 In/Sec
81	– PUMP OPP END HORIZ	.185 In/Sec
82	– PUMP OPP END VERT	.338 In/Sec
83	– PUMP OPP END AXIAL	.503 In/Sec

P67-504 – HOT OIL CIRC PMP CENT 50HP (12-Sep-19)

		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.021 In/Sec
12	– MOTOR OUTBOARD VERT	.065 In/Sec
13	– MOTOR OUTBOARD AXIAL	.059 In/Sec
21	– MOTOR INBOARD HORIZ	.025 In/Sec
22	– MOTOR INBOARD VERT	.044 In/Sec
23	– MOTOR INBOARD AXIAL	.052 In/Sec
71	– PUMP CPLG END HORIZ	.085 In/Sec
72	– PUMP CPLG END VERT	.092 In/Sec
73	– PUMP CPLG END AXIAL	.061 In/Sec
81	– PUMP OPP END HORIZ	.049 In/Sec
82	– PUMP OPP END VERT	.048 In/Sec
83	– PUMP OPP END AXIAL	.049 In/Sec

P67-54 – HOT OIL CIRC PMP CENT 15HP (12-Sep-19)

		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.235 In/Sec
12	– MOTOR OUTBOARD VERT	.050 In/Sec
13	– MOTOR OUTBOARD AXIAL	.119 In/Sec
21	– MOTOR INBOARD HORIZ	.192 In/Sec
22	– MOTOR INBOARD VERT	.042 In/Sec
23	– MOTOR INBOARD AXIAL	.072 In/Sec
71	– PUMP CPLG END HORIZ	.089 In/Sec
72	– PUMP CPLG END VERT	.040 In/Sec
73	– PUMP CPLG END AXIAL	.048 In/Sec
81	– PUMP OPP END HORIZ	.042 In/Sec
82	– PUMP OPP END VERT	.053 In/Sec

CHLR67-1 – 240T TRANE CHILLER (12-Sep-19)

		OVERALL LEVEL
11	- HOTOR OUTBOARD HORIZ	.122 In/Sec
12	- HOTOR OUTBOARD VERT	.127 In/Sec
13	- HOTOR OUTBOARD AXIAL	.045 In/Sec
21	- HOTOR INBOARD HORIZ	.074 In/Sec
22	- HOTOR INBOARD VERT	.071 In/Sec
71	- COMP INBOARD HORIZ	.054 In/Sec
72	- COMP INBOARD VERT	.096 In/Sec
73	- COMP INBOARD AXIAL	.064 In/Sec
81	- COMP OUTBD HORIZ	.071 In/Sec
82	- COMP OUTBD VERT	.119 In/Sec

CHLR45-1 - 20T TRANE CHILLER (12-Sep-19)

		OVERALL LEVEL
11	- HOTOR OUTBOARD HORIZ	1.007 In/Sec
12	- HOTOR OUTBOARD VERT	.505 In/Sec
13	- HOTOR OUTBOARD AXIAL	.212 In/Sec
21	- HOTOR INBOARD HORIZ	.195 In/Sec
22	- HOTOR INBOARD VERT	.338 In/Sec
23	- HOTOR INBOARD AXIAL	.162 In/Sec

P54-112B - CANNED MOTOR CENTRIFUG PUMP? (12-Sep-19)

		OVERALL LEVEL
11	- MOTOR OUTBOARD HORIZ	.049 In/Sec
12	- MOTOR OUTBOARD VERT	.018 In/Sec
21	- MOTOR INBOARD HORIZ	.044 In/Sec
22	- MOTOR INBOARD VERT	.016 In/Sec
23	- MOTOR INBOARD AXIAL	.058 In/Sec
71	- PUMP CPLG END HORIZ	.044 In/Sec
72	- PUMP CPLG END VERT	.015 In/Sec
81	- PUMP OPP END HORIZ	.231 In/Sec
82	- PUMP OPP END VERT	.012 In/Sec

Clarification Of Vibration Units:
Vel --> In/Sec PK

Abbreviated Last Measurement Summary

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Database: penn.rbm
Station: HYDROGEN PLANT (ALL)
Report Date: 19-Sep-19 08:05

MEASUREMENT POINT		OVERALL LEVEL	HFD / VHFD
C-301B	- C-301B COMPRESSOR	(12-Sep-19)	
		OVERALL LEVEL	
11	- MOTOR OUTBOARD HORIZ	.047 In/Sec	
12	- MOTOR OUTBOARD VERT	.036 In/Sec	
13	- MOTOR OUTBOARD AXIAL	.045 In/Sec	
21	- MOTOR INBOARD HORIZ	.035 In/Sec	
22	- MOTOR INBOARD VERT	.037 In/Sec	
23	- MOTOR INBOARD AXIAL	.056 In/Sec	
71	- CRANKSHAFT DRIVE END HORIZ	.044 In/Sec	
72	- CRANKSHAFT DRIVE END VERT	.032 In/Sec	
73	- CRANKSHAFT DRIVE END AXIAL	.100 In/Sec	

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   81  - CRANKSHAFT OPP END HORIZ                .065 In/Sec
   82  - CRANKSHAFT OPP END VERT                 .040 In/Sec
   83  - CRANKSHAFT OPP END AXIAL                .082 In/Sec

   C-4         - C-4 H2 COMPRESSOR, FA PLANT    (12-Sep-19)
                                                 OVERALL LEVEL
   11  - MOTOR OUTBOARD HORIZ                    .082 In/Sec
   12  - MOTOR OUTBOARD VERT                     .060 In/Sec
   13  - MOTOR OUTBOARD AXIAL                    .150 In/Sec
   21  - MOTOR INBOARD HORIZ                     .088 In/Sec
   22  - MOTOR INBOARD VERT                      .093 In/Sec
   23  - MOTOR INBOARD AXIAL                     .123 In/Sec
   71  - PUMP CPLG END HORIZ                     .105 In/Sec
   72  - PUMP CPLG END VERT                      .086 In/Sec
   73  - PUMP CPLG END AXIAL                     .190 In/Sec
   81  - PUMP OPP END HORIZ                      .209 In/Sec
   82  - PUMP OPP END VERT                       .127 In/Sec
   83  - PUMP OPP END AXIAL                      .159 In/Sec

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   Clarification Of Vibration Units:
      Vel      -->  In/Sec   PK                      Abbreviated Last Measurement
Summary
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                Database:  penn.rbm
                Station:   POLYMEG B 55
                Report Date:  19-Sep-19   08:05

          MEASUREMENT POINT                     OVERALL LEVEL       HFD / VHFD
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   R-102       - REACTOR AGIT R-102             (18-Sep-19)
                                                 OVERALL LEVEL
   11  - MOTOR OUTBOARD HORIZ                    .160 In/Sec
   12  - MOTOR OUTBOARD VERT                     .201 In/Sec
   13  - MOTOR OUTBOARD AXIAL                   2.530 In/Sec Bad reading
   21  - MOTOR INBOARD HORIZ                     .186 In/Sec
   22  - MOTOR INBOARD VERT                      .328 In/Sec
   23  - MOTOR INBOARD AXIAL                     .337 In/Sec
   31  - GEARBOX INPUT SHAFT-INBD HOR            .114 In/Sec
   32  - GEARBOX INPUT SHAFT INBD VERT           .078 In/Sec
   33  - GEARBOX INPUT SHAFT INBD AXIAL          .249 In/Sec
   41  - GEARBOX INPUT SHAFT OUTBD HOR           .168 In/Sec
   42  - GEARBOX INPUT SHAFT OUTBD VERT          .108 In/Sec
   51  - GEARBOX OUTPUT SHAFT TOP PERP           .100 In/Sec
   51L - GEARBOX OUTPUT SHAFT TOP PERP           .028 In/Sec
   52  - GEARBOX OUTPUT SHAFT TOP MA             .091 In/Sec
   61  - GEARBOX OUTPUT SHAFT MID PERP           .083 In/Sec
   62  - GEARBOX OUTPUT SHAFT MID MA             .081 In/Sec
   63  - GEARBOX OUTPUT SHAFT MID VERT           .092 In/Sec

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   Clarification Of Vibration Units:
      Vel      -->  In/Sec   PK                      Abbreviated Last Measurement
Summary
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Database: penn.rbm
Station: NORTH COOLING TOWER
Report Date: 19-Sep-19 08:05

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
XYZ-E - SULLAIR AIR COMP-EAST-200 HP	(18-Sep-19)	
	OVERALL LEVEL	
11 - MOTOR OUTBOARD HORIZ	.069 In/Sec	
12 - MOTOR OUTBOARD VERT	.071 In/Sec	
21 - MOTOR INBOARD HORIZ	.110 In/Sec	
22 - MOTOR INBOARD VERT	.107 In/Sec	
23 - MOTOR INBOARD AXIAL	.106 In/Sec	
71 - MALE - CPLG END HORIZ	.106 In/Sec	
72 - MALE - CPLG END VERT	.109 In/Sec	
73 - MALE-CPLG END AXIAL	.119 In/Sec	
81 - MALE- OPP END HORIZ	.106 In/Sec	
82 - MALE- OPP END VERT	.129 In/Sec	
83 - MALE-OPP END AXIAL	.118 In/Sec	
71F - FEMALE - CPLG END HORIZ	.123 In/Sec	
72F - FEMALE- CPLG END VERT	.109 In/Sec	
81F - FEMALE- OPP END HORIZ	.082 In/Sec	
82F - FEMALE- OPP END VERT	.111 In/Sec	
83F - FEMALE- OPP END AXIAL	.118 In/Sec	
XYZ-W - SULLAIR AIR COMP-WEST-150 HP	(18-Sep-19)	
	OVERALL LEVEL	
11 - MOTOR OUTBOARD HORIZ	.099 In/Sec	
12 - MOTOR OUTBOARD VERT	.071 In/Sec	
13 - MOTOR OUTBOARD AXIAL	.119 In/Sec	
21 - MOTOR INBOARD HORIZ	.058 In/Sec	
22 - MOTOR INBOARD VERT	.052 In/Sec	
23 - MOTOR INBOARD AXIAL	.137 In/Sec	
71 - MALE - CPLG END HORIZ	.072 In/Sec	
72 - MALE - CPLG END VERT	.096 In/Sec	
73 - MALE-CPLG END AXIAL	.180 In/Sec	
81 - MALE- OPP END HORIZ	.150 In/Sec	
82 - MALE- OPP END VERT	.113 In/Sec	
71F - FEMALE - CPLG END HORIZ	.050 In/Sec	
72F - FEMALE- CPLG END VERT	.095 In/Sec	
81F - FEMALE- OPP END HORIZ	.078 In/Sec	
82F - FEMALE- OPP END VERT	.093 In/Sec	
83F - FEMALE- OPP END AXIAL	.139 In/Sec	
B36-CT901C - FAN, N COOL TWR,EAST CENTER	(18-Sep-19)	
	OVERALL LEVEL	
10 - CH 10- MOTOR INBOARD	.068 In/Sec	
P36-905A - N COOL TWR-NORTH PUMP	(18-Sep-19)	
	OVERALL LEVEL	
11 - MOTOR OUTBOARD HORIZ	.100 In/Sec	
12 - MOTOR OUTBOARD VERT	.043 In/Sec	
21 - MOTOR INBOARD HORIZ	.193 In/Sec	
22 - MOTOR INBOARD VERT	.066 In/Sec	

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   23  - MOTOR INBOARD AXIAL                    .058 In/Sec
   71  - PUMP CPLG END HORIZ                    .090 In/Sec
   72  - PUMP CPLG END VERT                     .088 In/Sec
   73  - PUMP CPLG END AXIAL                    .169 In/Sec
   81  - PUMP OPP END HORIZ                     .114 In/Sec
   82  - PUMP OPP END VERT                      .104 In/Sec
   83  - PUMP OPP END AXIAL                    3.199 In/Sec Bad reading

   P36-905B   - N COOL TWR-SOUTH PUMP         (18-Sep-19)
                                               OVERALL LEVEL
   11  - MOTOR OUTBOARD HORIZ                   .035 In/Sec
   12  - MOTOR OUTBOARD VERT                    .027 In/Sec
   21  - MOTOR INBOARD HORIZ                    .036 In/Sec
   22  - MOTOR INBOARD VERT                     .024 In/Sec
   23  - MOTOR INBOARD AXIAL                    .031 In/Sec
   71  - PUMP CPLG END HORIZ                    .133 In/Sec
   72  - PUMP CPLG END VERT                     .104 In/Sec
   73  - PUMP CPLG END AXIAL                    .180 In/Sec
   81  - PUMP OPP END HORIZ                     .142 In/Sec
   82  - PUMP OPP END VERT                      .135 In/Sec

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   Clarification Of Vibration Units:
      Vel      -->  In/Sec   PK                     Abbreviated Last Measurement
Summary
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               Database:  penn.rbm
               Station:   PUMP HOUSE
               Report Date:  19-Sep-19   08:05

         MEASUREMENT POINT                   OVERALL LEVEL       HFD / VHFD
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   P24-63DEGN - 63 DEG N WATER PUMP          (12-Sep-19)
                                               OVERALL LEVEL
   11  - MOTOR OUTBOARD HORIZ                   .099 In/Sec
   12  - MOTOR OUTBOARD VERT                    .055 In/Sec
   13  - MOTOR OUTBOARD AXIAL                   .080 In/Sec
   21  - MOTOR INBOARD HORIZ                    .105 In/Sec
   22  - MOTOR INBOARD VERT                     .113 In/Sec
   23  - MOTOR INBOARD AXIAL                    .077 In/Sec
   71  - PUMP CPLG END HORIZ                    .096 In/Sec
   72  - PUMP CPLG END VERT                     .053 In/Sec
   73  - PUMP CPLG END AXIAL                    .188 In/Sec
   81  - PUMP OPP END HORIZ                     .260 In/Sec
   82  - PUMP OPP END VERT                      .084 In/Sec
   83  - PUMP OPP END AXIAL                     .315 In/Sec

   P24-63DEGS - 63 DEG S WATER PUMP          (12-Sep-19)
                                               OVERALL LEVEL
   11  - MOTOR OUTBOARD HORIZ                   .105 In/Sec
   12  - MOTOR OUTBOARD VERT                    .121 In/Sec
   13  - MOTOR OUTBOARD AXIAL                   .140 In/Sec
   21  - MOTOR INBOARD HORIZ                    .095 In/Sec
   22  - MOTOR INBOARD VERT                     .056 In/Sec
   23  - MOTOR INBOARD AXIAL                    .147 In/Sec
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   71  - PUMP CPLG END HORIZ                    .147 In/Sec
   72  - PUMP CPLG END VERT                     .099 In/Sec
   73  - PUMP CPLG END AXIAL                    .126 In/Sec
   81  - PUMP OPP END HORIZ                     .115 In/Sec
   82  - PUMP OPP END VERT                      .054 In/Sec
   83  - PUMP OPP END AXIAL                     .125 In/Sec

   P24BGBL876 - BIG BLUE WATER PUMP-63 DEG    (12-Sep-19)
                                               OVERALL LEVEL
   11  - MOTOR OUTBOARD HORIZ                   .217 In/Sec
   11H - MOTOR OB HORIZ -hi freq                .206 In/Sec
   12  - MOTOR OUTBOARD VERT                    .076 In/Sec
   13  - MOTOR OUTBOARD AXIAL                   .157 In/Sec
   21  - MOTOR INBOARD HORIZ                    .249 In/Sec
   22  - MOTOR INBOARD VERT                     .075 In/Sec
   23  - MOTOR INBOARD AXIAL                    .152 In/Sec
   71  - PUMP CPLG END HORIZ                    .306 In/Sec
   72  - PUMP CPLG END VERT                     .129 In/Sec
   73  - PUMP CPLG END AXIAL                    .222 In/Sec
   81  - PUMP OPP END HORIZ                     .250 In/Sec
   82  - PUMP OPP END VERT                      .124 In/Sec
   83  - PUMP OPP END AXIAL                     .204 In/Sec

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   Clarification Of Vibration Units:
      Vel      -->  In/Sec   PK                     Abbreviated Last Measurement
Summary
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