HI-SPEED INDUSTRIAL SERVICE

MILLINGTON, TN

January 13, 2020

Penn A Kem

Subject: January 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

P24-63DEGN 63 Degree North Water Pump
Both the motor and pump still have issues. The motor bearings show multiple harmonics of shaft speed indicating mechanical looseness. Random impacting in the pump data is usually a good indicator of the presence of bearing defects also. The rear pump seal is gone and spraying the bearing hard. We recommend replacing the motor and pump in the near future. Renew the coupling if needed as well. **Rated a Class III Defect.**

R55-101 Reactor Agitator
The unit gearbox or input coupling could still be in distress. We recommend an inspection of the drivetrain and oil analysis of the gearbox oil to confirm. Impacting can be seen in the time domain. The gearbox seemed to be generating audible noises too; which also concerns us. Inspect as soon as practical. **Rated a Class II Defect.**

Reactor Agitator Motor Gearbox R55-106
The vibration data indicates a possible alignment or coupling issue. Inspect the coupling and check the alignment at the next opportunity. **Rated a Class II Defect.**

CHLR45-1 20 Ton Trane Chiller
The top measurements are shown in the waterfall data, the West compressor is vibrating near 1.5”/sec velocity peak at 60 Hz shaft speed. Vibrations at these levels in the West unit will likely cause a reduced lifespan. Have the unit checked for compliance with the manufactures specification. **Rated a Class II Defect for now.**

Observations

P24-85DEGS: 85 Degree South Circulating Water Pump
Vibration data still 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.**

Big Blue Water Pump P24-BigBlue
The data 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 gearbox or input coupling could still be in distress. We recommend an inspection of the drivetrain and oil analysis of the gearbox oil to confirm. Impacting can be seen in the time domain. The gearbox seemed to be generating audible noises too; which also concerns us. Inspect as soon as practical. **Rated a Class II Defect.**

P24-85DEGN: 85 Degree North Circulating Water Pump
The pump vibration data still consists of shaft speed harmonics, noise in the spectrums and impacting in time waveforms; (looseness). We suspect the pump bearings and fits could be worn; however, cavitation can sometimes 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 I Defect.**

Reported on last or recent surveys, but not running this survey.

P48-7B Rotojet Pump (NOT 7A)
This pump has a single high vibration at near 79 Hz. We suspect a resonance in the unit. Inspect the belts and sheaves for wear and alignment. Check the unit for soft foot and loose or missing fasteners. Check the piping for strain. Install flexible isolators near pump if not already equipped. **Rated a Class II Defect.**

R48-2 Reactor Agitator
Large noise floor in the acceleration spectrum and strong impacting in the acceleration time waveform for the gearbox. Bad sounds were coming from the unit as well as the appearance of the output shaft orbiting at the reactor shaft support bearing. (Water?), was apparently also coming out of top shaft seal. We recommend replacement of the drivetrain components. **Rated a Class III Defect.**

R53-301 Reactor Agitator
The motor shaft speed vibration is a good indicator of imbalance or loose fasteners. Inspect as soon as possible for loose or missing bolts and/or a defective coupling. Precision align during repairs. **Rated a Class III Defect.**

B76-101 FD Fan East
The motor and fan still have vibrations at around 0.35”/sec velocity peak at near 43 Hz. Harmonics are also present in the fan bearings. Inspect the belts and sheaves for wear. Check all fasteners. Perform a lift check on the fan shaft to determine if there is excessive clearances. Replace worn or damaged parts. **Rated a Class II Defect.**

B76-103 ID Fan East
The motor and fan still have vibrations at around 0.45”/sec velocity peak at near 43 Hz. Harmonics are also present in the fan bearings. Inspect the belts and sheaves for wear. Check all fasteners. Perform a lift check on the fan shaft to determine if there is excessive clearances. Replace worn or damaged parts. **Rated a Class II Defect.**

Overall vibrations

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                    Abbreviated Last Measurement Summary
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               Database:  penn.rbm
               Station:   NEW EQUIPMENT
               Route No.  1:  ROUTE 1 0-39
               Report Date:  13-Jan-20   08:17

      MEASUREMENT POINT                      OVERALL LEVEL       HFD / VHFD
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P24-102B   - JOCKEY FIRE PUMP VERTICAL     (08-Jan-20)
                                            OVERALL LEVEL
11  - MOTOR OUTBOARD HORIZ                    .117 In/Sec
12  - MOTOR OUTBOARD VERT                     .087 In/Sec
21  - MOTOR INBOARD HORIZ                     .078 In/Sec
22  - MOTOR INBOARD VERT                      .098 In/Sec
23  - MOTOR INBOARD AXIAL                     .126 In/Sec

P24-63DEGN - 63 DEG N WATER PUMP           (08-Jan-20)
                                            OVERALL LEVEL
11  - MOTOR OUTBOARD HORIZ                    .294 In/Sec
12  - MOTOR OUTBOARD VERT                     .150 In/Sec
13  - MOTOR OUTBOARD AXIAL                    .231 In/Sec
21  - MOTOR INBOARD HORIZ                     .222 In/Sec
22  - MOTOR INBOARD VERT                      .245 In/Sec
23  - MOTOR INBOARD AXIAL                     .277 In/Sec
71  - PUMP CPLG END HORIZ                     .149 In/Sec
72  - PUMP CPLG END VERT                      .073 In/Sec
73  - PUMP CPLG END AXIAL                     .320 In/Sec
81  - PUMP OPP END HORIZ                      .328 In/Sec
82  - PUMP OPP END VERT                       .079 In/Sec
83  - PUMP OPP END AXIAL                      .215 In/Sec

P24-63DEGS - 63 DEG S WATER PUMP           (08-Jan-20)
                                            OVERALL LEVEL
11  - MOTOR OUTBOARD HORIZ                    .115 In/Sec
12  - MOTOR OUTBOARD VERT                     .115 In/Sec
13  - MOTOR OUTBOARD AXIAL                    .138 In/Sec
21  - MOTOR INBOARD HORIZ                     .215 In/Sec
22  - MOTOR INBOARD VERT                      .056 In/Sec
23  - MOTOR INBOARD AXIAL                     .120 In/Sec
71  - PUMP CPLG END HORIZ                     .123 In/Sec
72  - PUMP CPLG END VERT                      .083 In/Sec
73  - PUMP CPLG END AXIAL                     .061 In/Sec
81  - PUMP OPP END HORIZ                      .108 In/Sec
82  - PUMP OPP END VERT                       .053 In/Sec
83  - PUMP OPP END AXIAL                      .126 In/Sec

P24-85DEGN - 85 DEG N WATER CIRC PUMP 125  (08-Jan-20)
                                            OVERALL LEVEL
11  - MOTOR OUTBOARD HORIZ                    .090 In/Sec
12  - MOTOR OUTBOARD VERT                     .048 In/Sec
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13	– MOTOR OUTBOARD AXIAL	.142 In/Sec
21	– MOTOR INBOARD HORIZ	.120 In/Sec
22	– MOTOR INBOARD VERT	.061 In/Sec
23	– MOTOR INBOARD AXIAL	.038 In/Sec
71	– PUMP CPLG END HORIZ	.118 In/Sec
72	– PUMP CPLG END VERT	.116 In/Sec
73	– PUMP CPLG END AXIAL	.205 In/Sec
81	– PUMP OPP END HORIZ	.251 In/Sec
82	– PUMP OPP END VERT	.103 In/Sec
83	– PUMP OPP END AXIAL	.178 In/Sec

P24-85DEGS – 85 DEG S WATER CIRC PUMP 125 (08-Jan-20)

		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.082 In/Sec
12	– MOTOR OUTBOARD VERT	.084 In/Sec
13	– MOTOR OUTBOARD AXIAL	.169 In/Sec
21	– MOTOR INBOARD HORIZ	.069 In/Sec
22	– MOTOR INBOARD VERT	.056 In/Sec
23	– MOTOR INBOARD AXIAL	.109 In/Sec
71	– PUMP CPLG END HORIZ	.190 In/Sec
72	– PUMP CPLG END VERT	.322 In/Sec
73	– PUMP CPLG END AXIAL	.540 In/Sec
81	– PUMP OPP END HORIZ	.215 In/Sec
82	– PUMP OPP END VERT	.260 In/Sec
83	– PUMP OPP END AXIAL	.508 In/Sec

P24BGBL876 – BIG BLUE WATER PUMP-63 DEG (08-Jan-20)

		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.178 In/Sec
11H	– MOTOR OB HORIZ -hi freq	.186 In/Sec
12	– MOTOR OUTBOARD VERT	.053 In/Sec
21	– MOTOR INBOARD HORIZ	.220 In/Sec
22	– MOTOR INBOARD VERT	.078 In/Sec
23	– MOTOR INBOARD AXIAL	.086 In/Sec
71	– PUMP CPLG END HORIZ	.302 In/Sec
72	– PUMP CPLG END VERT	.179 In/Sec
73	– PUMP CPLG END AXIAL	.242 In/Sec
81	– PUMP OPP END HORIZ	.249 In/Sec
82	– PUMP OPP END VERT	.222 In/Sec
83	– PUMP OPP END AXIAL	.158 In/Sec

P36-905A – N COOL TWR-NORTH PUMP (08-Jan-20)

		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.067 In/Sec
12	– MOTOR OUTBOARD VERT	.038 In/Sec
21	– MOTOR INBOARD HORIZ	.064 In/Sec
22	– MOTOR INBOARD VERT	.067 In/Sec
23	– MOTOR INBOARD AXIAL	.098 In/Sec
71	– PUMP CPLG END HORIZ	.074 In/Sec
72	– PUMP CPLG END VERT	.063 In/Sec
73	– PUMP CPLG END AXIAL	.085 In/Sec
81	– PUMP OPP END HORIZ	.099 In/Sec
82	– PUMP OPP END VERT	.078 In/Sec
83	– PUMP OPP END AXIAL	.114 In/Sec

C36-EAST – UTILITY AIRCOMP ROTARY 200HP (08-Jan-20)

OVERALL LEVEL

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   11  - MOTOR OUTBOARD HORIZ                    .045 In/Sec
   12  - MOTOR OUTBOARD VERT                     .062 In/Sec
   21  - MOTOR INBOARD HORIZ                     .098 In/Sec
   22  - MOTOR INBOARD VERT                      .087 In/Sec
   23  - MOTOR INBOARD AXIAL                     .080 In/Sec
   71  - MALE - CPLG END HORIZ                   .118 In/Sec
   72  - MALE - CPLG END VERT                    .089 In/Sec
   73  - MALE-CPLG END AXIAL                     .105 In/Sec
   81  - MALE- OPP END HORIZ                     .111 In/Sec
   82  - MALE- OPP END VERT                      .111 In/Sec
  71F - FEMALE - CPLG END HORIZ                  .157 In/Sec
  72F - FEMALE- CPLG END VERT                    .091 In/Sec
  73F - FEMALE-CPLG END AXIAL                    .137 In/Sec
  81F - FEMALE- OPP END HORIZ                    .093 In/Sec
  82F - FEMALE- OPP END VERT                     .092 In/Sec

   C36-SOUTH  - UTILITY AIRCOMP ROTARY 150HP  (08-Jan-20)
                                               OVERALL LEVEL
   11  - MOTOR OUTBOARD HORIZ                    .146 In/Sec
   12  - MOTOR OUTBOARD VERT                     .100 In/Sec
   21  - MOTOR INBOARD HORIZ                     .135 In/Sec
   22  - MOTOR INBOARD VERT                      .077 In/Sec
   23  - MOTOR INBOARD AXIAL                     .073 In/Sec
   71  - MALE - CPLG END HORIZ                   .151 In/Sec
   72  - MALE - CPLG END VERT                    .185 In/Sec
   73  - MALE-CPLG END AXIAL                     .252 In/Sec
   81  - MALE- OPP END HORIZ                     .181 In/Sec
   82  - MALE- OPP END VERT                      .135 In/Sec
  71F - FEMALE - CPLG END HORIZ                  .148 In/Sec
  72F - FEMALE- CPLG END VERT                    .188 In/Sec
  73F - FEMALE-CPLG END AXIAL                    .282 In/Sec
  81F - FEMALE- OPP END HORIZ                    .220 In/Sec
  82F - FEMALE- OPP END VERT                     .154 In/Sec

   P39-4-877  - WELL PUMP #4                  (08-Jan-20)
                                               OVERALL LEVEL
   11  - MOTOR TOP N-S                           .348 In/Sec
   12  - MOTOR TOP E-W                           .230 In/Sec
   21  - MOTOR BOTTOM N-S                        .141 In/Sec
   22  - MOTOR BOTTOM E-W                        .174 In/Sec
   23  - MOTOR BOTTOM VERT                       .076 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:   NEW EQUIPMENT
                Route No.  2:  ROUTE 2 42-55
                Report Date:  13-Jan-20   08:17

         MEASUREMENT POINT                    OVERALL LEVEL       HFD / VHFD
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   P42-4A     - CENTRIFUGAL HOT OIL PUMP 5HP  (08-Jan-20)
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		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.030 In/Sec
12	– MOTOR OUTBOARD VERT	.017 In/Sec
21	– MOTOR INBOARD HORIZ	.017 In/Sec
22	– MOTOR INBOARD VERT	.031 In/Sec
23	– MOTOR INBOARD AXIAL	.040 In/Sec
71	– PUMP COUPLING END HORIZ	.140 In/Sec
72	– PUMP COUPLING END VERT	.017 In/Sec
73	– PUMP COUPLING END AXIAL	.027 In/Sec
81	– PUMP IMPELLER END HORIZ	.025 In/Sec
82	– PUMP IMPELLER END VERT	.114 In/Sec

P42-4B – CENTRIFUGAL HOT OIL PUMP 5HP (08-Jan-20)

		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.026 In/Sec
12	– MOTOR OUTBOARD VERT	.016 In/Sec
21	– MOTOR INBOARD HORIZ	.022 In/Sec
22	– MOTOR INBOARD VERT	.032 In/Sec
23	– MOTOR INBOARD AXIAL	.043 In/Sec
71	– PUMP COUPLING END HORIZ	.025 In/Sec
72	– PUMP COUPLING END VERT	.083 In/Sec
73	– PUMP COUPLING END AXIAL	.018 In/Sec
81	– PUMP IMPELLER END HORIZ	.032 In/Sec
82	– PUMP IMPELLER END VERT	.014 In/Sec

P42-4C – CENTRIFUGAL HOT OIL PMP 15HP (08-Jan-20)

		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.092 In/Sec
12	– MOTOR OUTBOARD VERT	.086 In/Sec
21	– MOTOR INBOARD HORIZ	.082 In/Sec
22	– MOTOR INBOARD VERT	.089 In/Sec
23	– MOTOR INBOARD AXIAL	.117 In/Sec
71	– PUMP COUPLING END HORIZ	.250 In/Sec
72	– PUMP COUPLING END VERT	.167 In/Sec
73	– PUMP COUPLING END AXIAL	.094 In/Sec
81	– PUMP IMPELLER END HORIZ	.109 In/Sec
82	– PUMP IMPELLER END VERT	.103 In/Sec

P42-4D – CENTRIFUGAL HOT OIL PUMP 5HP (08-Jan-20)

		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.025 In/Sec
12	– MOTOR OUTBOARD VERT	.155 In/Sec
21	– MOTOR INBOARD HORIZ	.025 In/Sec
22	– MOTOR INBOARD VERT	.029 In/Sec
23	– MOTOR INBOARD AXIAL	.028 In/Sec
71	– PUMP COUPLING END HORIZ	.018 In/Sec
72	– PUMP COUPLING END VERT	.016 In/Sec
73	– PUMP COUPLING END AXIAL	.039 In/Sec
81	– PUMP IMPELLER END HORIZ	.046 In/Sec
82	– PUMP IMPELLER END VERT	.020 In/Sec

C53-1A-050 – C1-A H2 COMPRESSOR (08-Jan-20)

		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.075 In/Sec
12	– MOTOR OUTBOARD VERT	.089 In/Sec
21	– MOTOR INBOARD HORIZ	.091 In/Sec
22	– MOTOR INBOARD VERT	.144 In/Sec

23	– MOTOR INBOARD AXIAL	.186 In/Sec
71	– PUMP CPLG END HORIZ	.088 In/Sec
72	– PUMP CPLG END VERT	.071 In/Sec
73	– PUMP CPLG END AXIAL	.174 In/Sec
81	– PUMP OPP END HORIZ	.083 In/Sec
82	– PUMP OPP END VERT	.081 In/Sec

P53-301 – ANSI CENTRIFUGAL PUMP 50 HP (08-Jan-20)

		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.095 In/Sec
12	– MOTOR OUTBOARD VERT	.107 In/Sec
21	– MOTOR INBOARD HORIZ	.083 In/Sec
22	– MOTOR INBOARD VERT	.127 In/Sec
23	– MOTOR INBOARD AXIAL	.161 In/Sec
71	– PUMP CPLG END HORIZ	.101 In/Sec
72	– PUMP CPLG END VERT	.150 In/Sec
73	– PUMP CPLG END AXIAL	.109 In/Sec
81	– PUMP OPP END HORIZ	.061 In/Sec
82	– PUMP OPP END VERT	.097 In/Sec

R55-101 – AGITATOR GBX AND MOTOR (08-Jan-20)

		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.104 In/Sec
12	– MOTOR OUTBOARD VERT	.040 In/Sec
21	– MOTOR INBOARD HORIZ	.104 In/Sec
22	– MOTOR INBOARD VERT	.046 In/Sec
23	– MOTOR INBOARD AXIAL	.072 In/Sec
31	– GEARBOX INPUT SHAFT-INBD HOR	.093 In/Sec
32	– GEARBOX INPUT SHAFT INBD VERT	.031 In/Sec
33	– GEARBOX INPUT SHAFT INBD AXIAL	.061 In/Sec
41	– GEARBOX INPUT SHAFT OUTBD HOR	.072 In/Sec
42	– GEARBOX INPUT SHAFT OUTBD VERT	.032 In/Sec
51	– GEARBOX OUTPUT SHAFT TOP N-S	.070 In/Sec
52	– GEARBOX OUTPUT SHAFT TOP E-W	.058 In/Sec
53	– GEARBOX OUTPUT SHAFT TOP VERT	.031 In/Sec
71	– GEARBOX OUTPUT SHAFT BOT N-S	.065 In/Sec
72	– GEARBOX OUTPUT SHAFT BOT E-W	.045 In/Sec
73	– GEARBOX OUTPUT SHAFT BOT VERT	.027 In/Sec

R55-102 – REACTOR AGIT R-102 (08-Jan-20)

		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.121 In/Sec
12	– MOTOR OUTBOARD VERT	.171 In/Sec
21	– MOTOR INBOARD HORIZ	.122 In/Sec
22	– MOTOR INBOARD VERT	.193 In/Sec
23	– MOTOR INBOARD AXIAL	.196 In/Sec
31	– GEARBOX INPUT SHAFT-INBD HOR	.091 In/Sec
32	– GEARBOX INPUT SHAFT INBD VERT	.068 In/Sec
33	– GEARBOX INPUT SHAFT INBD AXIAL	.155 In/Sec
41	– GEARBOX INPUT SHAFT OUTBD HOR	.146 In/Sec
42	– GEARBOX INPUT SHAFT OUTBD VERT	.078 In/Sec
43	– GEARBOX INPUT SHAFT OUTBD AXIAL	.142 In/Sec
51	– GEARBOX OUTPUT SHAFT TOP PERP	.078 In/Sec
51L	– GEARBOX OUTPUT SHAFT TOP PERP	.045 In/Sec
52	– GEARBOX OUTPUT SHAFT TOP MA	.130 In/Sec
53	– GEARBOX OUTPUT SHAFT TOP VERT	.080 In/Sec
61	– GEARBOX OUTPUT SHAFT MID PERP	.091 In/Sec

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   62  - GEARBOX OUTPUT SHAFT MID MA            .132 In/Sec
   71  - GEARBOX OUTPUT SHAFT BOT PERP          .085 In/Sec
   72  - GEARBOX OUTPUT SHAFT BOT MA            .102 In/Sec
   73  - GEARBOX OUTPUT SHAFT BOT VERT          .077 In/Sec

   R55-106    - REACTOR AGIT R-106            (08-Jan-20)
                                               OVERALL LEVEL
   11  - MOTOR OUTBOARD HORIZ                   .269 In/Sec
   12  - MOTOR OUTBOARD VERT                    .458 In/Sec
   21  - MOTOR INBOARD HORIZ                    .278 In/Sec
   22  - MOTOR INBOARD VERT                     .185 In/Sec
   23  - MOTOR INBOARD AXIAL                    .456 In/Sec
   31  - GEARBOX INPUT SHAFT-INBD HOR           .085 In/Sec
   32  - GEARBOX INPUT SHAFT INBD VERT          .148 In/Sec
   33  - GEARBOX INPUT SHAFT INBD AXIAL         .144 In/Sec
   41  - GEARBOX INPUT SHAFT OUTBD HOR          .147 In/Sec
   42  - GEARBOX INPUT SHAFT OUTBD VERT         .066 In/Sec
   43  - GEARBOX INPUT SHAFT OUTBD AXIAL        .136 In/Sec
   51  - GEARBOX OUTPUT SHAFT TOP PERP          .128 In/Sec
   52  - GEARBOX OUTPUT SHAFT TOP MA            .134 In/Sec
   53  - GEARBOX OUTPUT SHAFT TOP VERT          .087 In/Sec
   61  - GEARBOX OUTPUT SHAFT MID PERP          .125 In/Sec
   62  - GEARBOX OUTPUT SHAFT MID MA            .127 In/Sec
   71  - GEARBOX OUTPUT SHAFT BOT PERP          .097 In/Sec
   72  - GEARBOX OUTPUT SHAFT BOT MA            .134 In/Sec
   73  - GEARBOX OUTPUT SHAFT BOT VERT          .065 In/Sec

   P45-VAC    - NEW VACUUM PUMP PILOT PLANT    (08-Jan-20)
                                               OVERALL LEVEL
   11  - MOTOR OUTBOARD HORIZ                   .065 In/Sec
   12  - MOTOR OUTBOARD VERT                    .051 In/Sec
   21  - MOTOR INBOARD HORIZ                    .045 In/Sec
   22  - MOTOR INBOARD VERT                     .031 In/Sec
   23  - MOTOR INBOARD AXIAL                    .035 In/Sec
   71  - PUMP COUPLING END HORIZ                .044 In/Sec
   72  - PUMP COUPLING END VERT                 .040 In/Sec
   73  - PUMP COUPLING END AXIAL                .028 In/Sec
   81  - PUMP IMPELLER END HORIZ                .049 In/Sec
   82  - PUMP IMPELLER END VERT                 .043 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:   NEW EQUIPMENT
                Route No.  3:  ROUTE 3 67-UPD
                Report Date:  13-Jan-20   08:17

          MEASUREMENT POINT                    OVERALL LEVEL       HFD / VHFD
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   C67-51     - AXIAL TWIN SCREW COMPRESSOR    (08-Jan-20)
                                               OVERALL LEVEL
   11  - MOTOR OUTBOARD HORIZ                   .115 In/Sec
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12	– MOTOR OUTBOARD VERT	.150 In/Sec
21	– MOTOR INBOARD HORIZ	.069 In/Sec
22	– MOTOR INBOARD VERT	.078 In/Sec
23	– MOTOR INBOARD AXIAL	.103 In/Sec
71	– MALE – CPLG END HORIZ	.231 In/Sec
72	– MALE – CPLG END VERT	.143 In/Sec
73	– MALE–CPLG END AXIAL	.155 In/Sec
71F	– FEMALE – CPLG END HORIZ	.263 In/Sec
72F	– FEMALE– CPLG END VERT	.235 In/Sec
73F	– FEMALE–CPLG END AXIAL	.157 In/Sec
81F	– FEMALE– OPP END HORIZ	.265 In/Sec

P67–504 – HOT OIL CIRC PMP CENT 50HP (08–Jan–20)

		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.029 In/Sec
12	– MOTOR OUTBOARD VERT	.038 In/Sec
21	– MOTOR INBOARD HORIZ	.024 In/Sec
22	– MOTOR INBOARD VERT	.056 In/Sec
23	– MOTOR INBOARD AXIAL	.060 In/Sec
71	– PUMP CPLG END HORIZ	.112 In/Sec
72	– PUMP CPLG END VERT	.103 In/Sec
73	– PUMP CPLG END AXIAL	.063 In/Sec
81	– PUMP OPP END HORIZ	.053 In/Sec
82	– PUMP OPP END VERT	.065 In/Sec

R80–10 – AGITATOR GBX (08–Jan–20)

		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.077 In/Sec
12	– MOTOR OUTBOARD VERT	.098 In/Sec
21	– MOTOR INBOARD HORIZ	.052 In/Sec
22	– MOTOR INBOARD VERT	.052 In/Sec
23	– MOTOR INBOARD AXIAL	.037 In/Sec
31	– GEARBOX INPUT SHAFT–INBD HOR	.049 In/Sec
32	– GEARBOX INPUT SHAFT INBD VERT	.052 In/Sec
33	– GEARBOX INPUT SHAFT INBD AXIAL	.037 In/Sec
41	– GEARBOX INPUT SHAFT OUTBD HOR	.049 In/Sec
42	– GEARBOX INPUT SHAFT OUTBD VERT	.043 In/Sec
43	– GEARBOX INPUT SHAFT OUTBD AXIAL	.027 In/Sec
51	– GEARBOX OUTPUT SHAFT TOP N–S	.038 In/Sec
52	– GEARBOX OUTPUT SHAFT TOP E–W	.089 In/Sec
53	– GEARBOX OUTPUT SHAFT TOP VERT	.041 In/Sec
71	– GEARBOX OUTPUT SHAFT BOT N–S	.040 In/Sec
72	– GEARBOX OUTPUT SHAFT BOT E–W	.047 In/Sec
73	– GEARBOX OUTPUT SHAFT BOT VERT	.031 In/Sec

B82–101A – FAN FORCED DRAFT 10HP SOUTH (08–Jan–20)

		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.130 In/Sec
12	– MOTOR OUTBOARD VERT	.142 In/Sec
21	– MOTOR INBOARD HORIZ	.174 In/Sec
22	– MOTOR INBOARD VERT	.247 In/Sec
23	– MOTOR INBOARD AXIAL	.254 In/Sec

B82–102 – INDUCED DRAFT 150 HP (08–Jan–20)

		OVERALL LEVEL
11	– MOTOR OUTBOARD HORIZ	.034 In/Sec
12	– MOTOR OUTBOARD VERT	.033 In/Sec

21	– MOTOR INBOARD HORIZ	.052 In/Sec
22	– MOTOR INBOARD VERT	.045 In/Sec
23	– MOTOR INBOARD AXIAL	.033 In/Sec

CHLR67–1W – 240T TRANE CHILLER WEST (08–Jan–20)

		OVERALL LEVEL
11	– HOTOR OUTBOARD HORIZ	.156 In/Sec
12	– HOTOR OUTBOARD VERT	.171 In/Sec
21	– HOTOR INBOARD HORIZ	.099 In/Sec
22	– HOTOR INBOARD VERT	.111 In/Sec
23	– HOTOR INBOARD AXIAL	.078 In/Sec
71	– COMP INBOARD HORIZ	.066 In/Sec
72	– COMP INBOARD VERT	.072 In/Sec
81	– COMP OUTBD HORIZ	.091 In/Sec
82	– COMP OUTBD VERT	.103 In/Sec

CHLR45–1 – 20T TRANE CHILLER (08–Jan–20)

		OVERALL LEVEL
11W	– WEST MOTOR OUTBOARD HORIZ	1.497 In/Sec
12W	– WEST MOTOR OUTBOARD VERT	.550 In/Sec
13W	– WEST MOTOR OUTBOARD AXIAL	.252 In/Sec
11E	– EASTMOTOR OUTBOARD HORIZ	.133 In/Sec
12E	– EAST MOTOR OUTBOARD VERT	.294 In/Sec
13E	– EAST MOTOR OUTBOARD AXIAL	.205 In/Sec

Clarification Of Vibration Units:

Vel --> In/Sec PK