HI-SPEED INDUSTRIAL SERVICE

MILLINGTON, TN

July 23, 2020

Plaskolite

Subject: July vibration report

Most of the machines surveyed were found to be in good condition, with 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 Specialist
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Millington, TN 38053
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Data

Blower Slow Cooling (Lower)
The acceleration overall shows over 20 g's RMS for the drive end bearing. Speed affects vibration amplitude. I would say the fluting needs to be addressed soon. Replace the bearings or complete motor. Now would be a good time to consult our sales staff on reducing bearing fluting going forward. **Rated a Class III Defect.**

Blower Slow Cooling (Upper)
The acceleration overall shows almost 4 g's RMS for the drive end bearing. Speed affects vibration amplitude. We will keep an eye on this one. No Immediate action required. **Rated a Class II Defect.**

Middle Syrup Cool Pump
The output end of the gearbox overall is 0.262"/sec velocity peak. Multiple harmonics suggest looseness in the gearbox, wear in the coupling or an alignment issue. **Rated a Class II Defect.**

West Syrup Cool Pump
A single 35 Hz vibration in the outboard end of the pimp suggests vane pass is the vibration. Amplitude is 0.345"/sec overall velocity Flow restrictions could be the cause. **Rated a Class II Defect.**

Vertical Hot water pumps
1 and 2 have vibrations at or above 0.450" and 0.396"/sec velocity peak respectfully. Try to trim balance. **Rated a Class II Defect.**

Please note the following:
The tower roof fans on the vibration route could use some modifications. The return air fan (RAF-100) guards need to be modified so better data can be acquired directly from the motor and fan bearing housings. Currently it is fully enclosed. The flare blower mounted on the platform above should have a remote accelerometer installed for data collection to prevent analyst from getting stung by wasps during climbing and data collection.

Overall vibrations follow:

Abbreviated Last Measurement Summary

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Database: mmaold.rbm
Station: PLASKOLITE MEMPHIS
Route No. 3: PLASKOLITE NEW
Report Date: 23-Jul-20 16:20

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
5285-09 - FAN,COOLING TWR WEST	(23-Jul-20)	
	OVERALL LEVEL	1-20 KHz
W1 - CELL FRAME -WEST END N-S DIR	.011 In/Sec	.027 G-s
W2 - CELL FRAME -WEST END E-W DIR	.031 In/Sec	.054 G-s
5285-11 - FAN,COOLING TWR MIDDLE	(23-Jul-20)	
	OVERALL LEVEL	1-20 KHz
M1 - CELL FRAME -MIDDLE N-S DIR	.013 In/Sec	.040 G-s
M2 - CELL FRAME -MIDDLE E-W DIR	.011 In/Sec	.081 G-s
5285-21 - RETURN AIR FAN 100 AREA	(23-Jul-20)	
	OVERALL LEVEL	1-20 KHz
11 - MOTOR OUTBD HORIZ	.047 In/Sec	.035 G-s
21 - MOTOR INBD HORIZ	.109 In/Sec	.044 G-s
23 - MOTOR INBD AXIAL	.066 In/Sec	.024 G-s
71 - FAN INBD (ON FRAME UNDER BRG)	.058 In/Sec	.027 G-s
81 - FAN OUTBD (ON FRAME UNDER BRG)	.065 In/Sec	.022 G-s
S1100 - FLARE BLOWER	(23-Jul-20)	
	OVERALL LEVEL	1-20 KHz
11 - MOTOR FLARE STACK END HORIZ	.013 In/Sec	.025 G-s
12 - MOTOR FLARE STACK END VERT	.013 In/Sec	.026 G-s
13 - MOTOR FLARE STACK END AXIAL	.0095 In/Sec	.026 G-s
5214-04 - EAST SYRUP COOL PUMP	(23-Jul-20)	
	OVERALL LEVEL	1-20 KHz
11 - MOTOR OUTBOARD HORIZONTAL	.030 In/Sec	.120 G-s
21 - MOTOR INBOARD HORIZONTAL	.040 In/Sec	.118 G-s
23 - MOTOR INBOARD AXIAL	.018 In/Sec	.206 G-s
31 - GEARBOX INPUT HORIZONTAL	.090 In/Sec	
61 - GEARBOX OUTPUT SHAFT HORIZ	.166 In/Sec	
71 - PUMP COUPLING END HORIZ	.086 In/Sec	.041 G-s
81 - PUMPIMPELLER END HORIZ	.053 In/Sec	.045 G-s
5214-03 - MIDDLE SYRUP COOL PUMP	(23-Jul-20)	
	OVERALL LEVEL	1-20 KHz
11 - MOTOR OUTBOARD HORIZONTAL	.092 In/Sec	.070 G-s
21 - MOTOR INBOARD HORIZONTAL	.093 In/Sec	.071 G-s
23 - MOTOR INBOARD AXIAL	.132 In/Sec	.073 G-s
31 - GEARBOX INPUT HORIZONTAL	.249 In/Sec	
61 - GEARBOX OUTPUT SHAFT HORIZ	.262 In/Sec	
71 - PUMP COUPLING END HORIZ	.110 In/Sec	.011 G-s
81 - PUMP IMPELLER END HORIZ	.109 In/Sec	.051 G-s
5214-01 - WEST SYRUP COOL PUMP	(23-Jul-20)	
	OVERALL LEVEL	1-20 KHz

11	- MOTOR OUTBOARD HORIZONTAL	.081 In/Sec	.122 G-s
21	- MOTOR INBOARD HORIZONTAL	.091 In/Sec	.154 G-s
23	- MOTOR INBOARD AXIAL	.095 In/Sec	.057 G-s
31	- GEARBOX INPUT HORIZONTAL	.104 In/Sec	
61	- GEARBOX OUTPUT HORIZ	.139 In/Sec	
71	- PUMP CPLG END HORIZ	.328 In/Sec	.855 G-s
81	- PUMP IMPELLER END HORIZ	.345 In/Sec	.227 G-s

5282-02	- PUMP #1 HOT WATER 5282-02	(23-Jul-20)	
		OVERALL LEVEL	1-20 KHz
11	- #1 Hot Water Pump Mtr Top N-S	.472 In/Sec	.164 G-s
12	- #1 Hot Water Pump Mtr Top E-W	.323 In/Sec	.015 G-s

5282-03	- PUMP #2 HOT WATER 5282-03	(23-Jul-20)	
		OVERALL LEVEL	1-20 KHz
11	- #2 Hot Water Pump Mtr Top N-S	.396 In/Sec	.674 G-s
12	- #2 Hot Water Pump Mtr Top E-W	.256 In/Sec	.435 G-s

5282-04	- PUMP #3 HOT WATER 5282-04	(23-Jul-20)	
		OVERALL LEVEL	1-20 KHz
11	- #3 Hot Water Pump Mtr Top N-S	.126 In/Sec	.418 G-s
12	- #3 Hot Water Pump Mtr Top E-W	.211 In/Sec	.349 G-s

5282-06	- PUMP #5 HOT WATER 5282-06	(23-Jul-20)	
		OVERALL LEVEL	1-20 KHz
11	- #5 Hot Water Pump Mtr Top N-S	.217 In/Sec	.614 G-s
12	- #5 Hot Water Pump Mtr Top E-W	.243 In/Sec	.600 G-s

5283-01	- BLOWER, EDGE WATER REMOVAL	(23-Jul-20)	
		OVERALL LEVEL	1-20 KHz
11	- MOTOR OUTBOARD HORIZONTAL	.124 In/Sec	.142 G-s
21	- MOTOR INBOARD HORIZONTAL	.104 In/Sec	.121 G-s
23	- MOTOR AXIAL	.063 In/Sec	.152 G-s
71	- BLOWER COUPLING END HORIZONTAL	.050 In/Sec	.607 G-s
81	- BLOWER WHEEL END HORIZONTAL	.115 In/Sec	.309 G-s

5281-12	- BLOWER,SLOW COOLING (UPPER)	(23-Jul-20)	
		OVERALL LEVEL	1-20 KHz
11	- MOTOR OUTBD HORIZ	.054 In/Sec	2.388 G-s
21	- MOTOR INBD HORIZ	.095 In/Sec	3.880 G-s
23	- MOTOR INBD AXIAL	.039 In/Sec	.670 G-s
71	- FAN INBD (ON PILLOWBLOCK FOOT)	.050 In/Sec	.439 G-s
81	- FAN OUTBD (ON PILLOWBLOCK FOOT)	.036 In/Sec	.174 G-s

5281-13	- BLOWER,SLOW COOLING (LOWER)	(23-Jul-20)	
		OVERALL LEVEL	1-20 KHz
11	- MOTOR OUTBD HORIZ	.082 In/Sec	5.195 G-s
21	- MOTOR INBD HORIZ	.102 In/Sec	20.92 G-s
21H	- MOTOR INBD HORIZ	.592 In/Sec	
23	- MOTOR INBD AXIAL	.080 In/Sec	5.561 G-s
71	- FAN INBD (ON PILLOWBLOCK FOOT)	.031 In/Sec	.306 G-s
81	- FAN OUTBD (ON PILLOWBLOCK FOOT)	.040 In/Sec	.250 G-s

5281-14	- BLOWER,RAPID COOLING (UPPER)	(23-Jul-20)	
		OVERALL LEVEL	1-20 KHz
11	- MOTOR OUTBD HORIZ	.044 In/Sec	.337 G-s
21	- MOTOR INBD HORIZ	.164 In/Sec	1.772 G-s

23 - MOTOR INBD AXIAL		.066 In/Sec	.256 G-s
71 - FAN INBD (ON PILLOWBLOCK FOOT)		.023 In/Sec	.149 G-s
81 - FAN OUTBD (ON PILLOWBLOCK FOOT)		.023 In/Sec	.189 G-s
5281-08 - BLOWER,RAPID COOLING (LOWER)	(23-Jul-20)		
	OVERALL LEVEL	1-20 KHz	
11 - MOTOR OUTBD HORIZ		.041 In/Sec	.926 G-s
21 - MOTOR INBD HORIZ		.091 In/Sec	1.552 G-s
23 - MOTOR INBD AXIAL		.074 In/Sec	1.198 G-s
71 - FAN INBD (ON PILLOWBLOCK FOOT)		.019 In/Sec	.136 G-s
81 - FAN OUTBD (ON PILLOWBLOCK FOOT)		.015 In/Sec	.141 G-s
5281-10 - 200 BELT DRIVE, POLYMERIZER	(23-Jul-20)		
	OVERALL LEVEL	1-20 KHz	
11 - MOTOR OUTBOARD HORIZ		.044 In/Sec	.499 G-s
21 - MOTOR INBD HORIZ		.043 In/Sec	.225 G-s
33 - GEARBOX INPUT AXIAL		.013 In/Sec	.060 G-s
31 - GEARBOX INPUT HORIZ		.017 In/Sec	.305 G-s
61 - GEARBOX OUTPUT HORIZ		.0063 In/Sec	.115 G-s
71 - INBOARD PILLOWBLOCK		.0034 In/Sec	.0024 G-s
81 - OUTBOARD PILLOWBLOCK		.0036 In/Sec	.0020 G-s

Clarification Of Vibration Units:
Acc --> G-s PK
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