HI-SPEED INDUSTRIAL SERVICE

MILLINGTON, TN

September 11, 2019

SONOCO

Subject: September vibration report

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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Data

Three of the route machines had vibrations at or above the 0.25”/sec Velocity peak threshold. Please find the vibration summary below:

Hot Water Pumps 4 and 5 are just above the limit and the vibrations are at shaft speed indicating possible imbalance from wear or build up. No immediate action is suggested at this time. **Rated a Class I Defect.**

The Middle Syrup Cooling Pump Gearbox is vibrating at motor speed and the first and second harmonics. We suspect some type of mechanical looseness or associated shaft misalignment. Inspect both couplings for wear or damage, all gearbox mounting bolts and shims and finally align the complete drive train; motor to pump. **Rated a Class III Defect.**

Abbreviated Last Measurement Summary

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Database: mmaold.rbm
Station: PLASKOLITE MEMPHIS
Route No. 3: PLASKOLITE NEW
Report Date: 11-Sep-19 10:34

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
5285-09 - FAN,COOLING TWR WEST	(11-Sep-19)	
	OVERALL LEVEL	1-20 KHz
W1 - CELL FRAME -WEST END N-S DIR	.013 In/Sec	.020 G-s
W2 - CELL FRAME -WEST END E-W DIR	.035 In/Sec	.028 G-s
5285-11 - FAN,COOLING TWR MIDDLE	(11-Sep-19)	
	OVERALL LEVEL	1-20 KHz
M1 - CELL FRAME -MIDDLE N-S DIR	.014 In/Sec	.020 G-s
M2 - CELL FRAME -MIDDLE E-W DIR	.0089 In/Sec	.096 G-s
5285-12 - FAN,COOLING TWR EAST	(11-Sep-19)	
	OVERALL LEVEL	1-20 KHz
E1 - CELL FRAME -EAST END E-W DIR	.0066 In/Sec	.013 G-s
	OVERALL LEVEL	HFD (>5 kHz)
E2 - CELL FRAME -EAST END N-S DIR	.0091 In/Sec	.0007 G-s
5285-21 - RETURN AIR FAN 100 AREA	(11-Sep-19)	
	OVERALL LEVEL	1-20 KHz
11 - MOTOR OUTBD HORIZ	.186 In/Sec	.020 G-s
21 - MOTOR INBD HORIZ	.079 In/Sec	.020 G-s
23 - MOTOR INBD AXIAL	.070 In/Sec	.045 G-s
71 - FAN INBD (ON FRAME UNDER BRG)	.080 In/Sec	.034 G-s
81 - FAN OUTBD (ON FRAME UNDER BRG)	.080 In/Sec	.037 G-s

S1100	– FLARE BLOWER	(11–Sep–19)	
		OVERALL LEVEL	1–20 KHz
11	– MOTOR FLARE STACK END HORIZ	.010 In/Sec	.017 G–s
12	– MOTOR FLARE STACK END VERT	.0074 In/Sec	.016 G–s
13	– MOTOR FLARE STACK END AXIAL	.0098 In/Sec	.0089 G–s
21	– MOTOR DAMPER END HORIZ	.0087 In/Sec	.0082 G–s
22	– MOTOR DAMPER END VERT	.0081 In/Sec	.0089 G–s
23	– MOTOR DAMPER END AXIAL	.012 In/Sec	.0068 G–s
5214–04	– EAST SYRUP COOL PUMP	(11–Sep–19)	
		OVERALL LEVEL	1–20 KHz
11	– MOTOR OUTBOARD HORIZONTAL	.038 In/Sec	.075 G–s
21	– MOTOR INBOARD HORIZONTAL	.037 In/Sec	.083 G–s
23	– MOTOR INBOARD AXIAL	.018 In/Sec	.083 G–s
31	– GEARBOX INPUT HORIZONTAL	.068 In/Sec	
61	– GEARBOX OUTPUT SHAFT HORIZ	.102 In/Sec	
71	– PUMP COUPLING END HORIZ	.045 In/Sec	.055 G–s
81	– PUMPIMPELLER END HORIZ	.032 In/Sec	.046 G–s
5214–03	– MIDDLE SYRUP COOL PUMP	(11–Sep–19)	
		OVERALL LEVEL	1–20 KHz
11	– MOTOR OUTBOARD HORIZONTAL	.062 In/Sec	.025 G–s
21	– MOTOR INBOARD HORIZONTAL	.065 In/Sec	.061 G–s
23	– MOTOR INBOARD AXIAL	.104 In/Sec	.039 G–s
31	– GEARBOX INPUT HORIZONTAL	.470 In/Sec	
61	– GEARBOX OUTPUT SHAFT HORIZ	.345 In/Sec	
71	– PUMP COUPLING END HORIZ	.119 In/Sec	.134 G–s
81	– PUMP IMPELLER END HORIZ	.111 In/Sec	.020 G–s
5214–01	– WEST SYRUP COOL PUMP	(11–Sep–19)	
		OVERALL LEVEL	1–20 KHz
11	– MOTOR OUTBOARD HORIZONTAL	.061 In/Sec	.096 G–s
21	– MOTOR INBOARD HORIZONTAL	.062 In/Sec	.091 G–s
23	– MOTOR INBOARD AXIAL	.062 In/Sec	.085 G–s
31	– GEARBOX INPUT HORIZONTAL	.078 In/Sec	
61	– GEARBOX OUTPUT HORIZ	.111 In/Sec	
71	– PUMP CPLG END HORIZ	.092 In/Sec	.279 G–s
81	– PUMP IMPELLER END HORIZ	.072 In/Sec	.033 G–s
5282–02	– PUMP #1 HOT WATER 5282–02	(11–Sep–19)	
		OVERALL LEVEL	1–20 KHz
11	– #1 Hot Water Pump Mtr Top N–S	.079 In/Sec	1.018 G–s
12	– #1 Hot Water Pump Mtr Top E–W	.124 In/Sec	.632 G–s
5282–05	– PUMP #4 HOT WATER 5282–05	(11–Sep–19)	
		OVERALL LEVEL	1–20 KHz
11	– #4 Hot Water Pump Mtr Top N–S	.192 In/Sec	.403 G–s
12	– #4 Hot Water Pump Mtr Top E–W	.361 In/Sec	.736 G–s
5282–06	– PUMP #5 HOT WATER 5282–06	(11–Sep–19)	
		OVERALL LEVEL	1–20 KHz
11	– #5 Hot Water Pump Mtr Top N–S	.254 In/Sec	.427 G–s
12	– #5 Hot Water Pump Mtr Top E–W	.193 In/Sec	.302 G–s
5283–01	– BLOWER, EDGE WATER REMOVAL	(11–Sep–19)	
		OVERALL LEVEL	1–20 KHz
11	– MOTOR OUTBOARD HORIZONTAL	.068 In/Sec	.182 G–s

21 – MOTOR INBOARD HORIZONTAL		.095 In/Sec	.145 G-s
23 – MOTOR AXIAL		.064 In/Sec	.113 G-s
71 – BLOWER COUPLING END HORIZONTAL		.040 In/Sec	.582 G-s
81 – BLOWER WHEEL END HORIZONTAL		.095 In/Sec	.425 G-s

5281-12 – BLOWER,SLOW COOLING (UPPER)	(11-Sep-19)		
		OVERALL LEVEL	1-20 KHz
11 – MOTOR OUTBD HORIZ		.0095 In/Sec	.393 G-s
21 – MOTOR INBD HORIZ		.012 In/Sec	1.111 G-s
23 – MOTOR INBD AXIAL		.012 In/Sec	.840 G-s
71 – FAN INBD (ON PILLOWBLOCK FOOT)		.012 In/Sec	.079 G-s
81 – FAN OUTBD (ON PILLOWBLOCK FOOT)		.012 In/Sec	.106 G-s

5281-13 – BLOWER,SLOW COOLING (LOWER)	(11-Sep-19)		
		OVERALL LEVEL	1-20 KHz
11 – MOTOR OUTBD HORIZ		.063 In/Sec	.478 G-s
21 – MOTOR INBD HORIZ		.076 In/Sec	.774 G-s
21H – MOTOR INBD HORIZ		.097 In/Sec	
23 – MOTOR INBD AXIAL		.051 In/Sec	.261 G-s
71 – FAN INBD (ON PILLOWBLOCK FOOT)		.031 In/Sec	.085 G-s
81 – FAN OUTBD (ON PILLOWBLOCK FOOT)		.020 In/Sec	.099 G-s

5281-14 – BLOWER,RAPID COOLING (UPPER)	(11-Sep-19)		
		OVERALL LEVEL	1-20 KHz
11 – MOTOR OUTBD HORIZ		.040 In/Sec	.385 G-s
21 – MOTOR INBD HORIZ		.101 In/Sec	.684 G-s
23 – MOTOR INBD AXIAL		.027 In/Sec	.241 G-s
71 – FAN INBD (ON PILLOWBLOCK FOOT)		.025 In/Sec	.111 G-s
81 – FAN OUTBD (ON PILLOWBLOCK FOOT)		.021 In/Sec	.114 G-s

5281-08 – BLOWER,RAPID COOLING (LOWER)	(11-Sep-19)		
		OVERALL LEVEL	1-20 KHz
11 – MOTOR OUTBD HORIZ		.049 In/Sec	.430 G-s
21 – MOTOR INBD HORIZ		.108 In/Sec	.766 G-s
23 – MOTOR INBD AXIAL		.091 In/Sec	.470 G-s
71 – FAN INBD (ON PILLOWBLOCK FOOT)		.025 In/Sec	.069 G-s
81 – FAN OUTBD (ON PILLOWBLOCK FOOT)		.019 In/Sec	.084 G-s

5281-10 – 200 BELT DRIVE, POLYMERIZER	(11-Sep-19)		
		OVERALL LEVEL	1-20 KHz
11 – MOTOR OUTBOARD HORIZ		.019 In/Sec	.226 G-s
21 – MOTOR INBD HORIZ		.033 In/Sec	.469 G-s
33 – GEARBOX INPUT AXIAL		.0086 In/Sec	.031 G-s
31 – GEARBOX INPUT HORIZ		.016 In/Sec	.079 G-s
61 – GEARBOX OUTPUT HORIZ		.0060 In/Sec	.030 G-s
71 – INBOARD PILLOWBLOCK		.0031 In/Sec	.0013 G-s
81 – OUTBOARD PILLOWBLOCK		.0059 In/Sec	.0013 G-s

Clarification Of Vibration Units:

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