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September 27, 2023

Darrell Davis PMC-Biogenix Memphis, TN

Mr. Davis,

The following is a summary report for the vibration analysis that was performed on seven specific pieces of equipment on 9/19/23. This report will only contain defects that were found according to the data collected.

QualiTest® uses a four-step rating system for defects.

<u>CLASS I</u>: Defect is present, but effect on reliability is not clear; no immediate action is required. Continue to normally monitor.

<u>CLASS II</u>: Defect (s) present that may cause problem in long term (2-6 months). Repair during normal maintenance scheduling. Continue to monitor.

<u>CLASS III</u>; 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.

Nuisance Dust Collector CLASS I



Observation:

The first plot is a multipoint waterfall of the blower bearings. Data shows quite a bit of non-synchronous peaks and noise floor throughout the spectra. The second plot is the outboard bearing vertical of the blower. Data shows $\frac{1}{2}$ harmonics of rpm in the lower end of the spectrum.

Recommendation:

The noise floor, non-synchronous peaks, and ½ harmonics are indications of lubrication issue/bearing wear. It is recommended to inspect the blower bearings for defects and wear soon. Ensure bearings have adequate clean grease.

Starrence House Vac Pump CLASS II



Observation:

The multi-point spectra above is the motor and pump. Notice the large peak in the lower end of the spectra. This is 1 x rpm peak and is highest in the horizontal direction.

Recommendation:

Data suggests alignment or coupling issue may be the cause of the high horizontal vibration in the motor and pump. It is recommended to inspect the coupling and re-align the motor to the pump ensuring all base, motor, and pump fasteners are tight.

Emulsifier Spray Tower Blower (MOTOR) CLASS II



Observation:

Data above is the motor inboard vertical. The spectrum shows quite a bit of non-synchronous peaks. The marked peaks in the spectrum appear to be 4.661 orders of motor rpm indicating a likely bearing race/roller element defect.

Recommendation:

Data does indicate bearing issues in this motor. Severity is unclear as we do not have recent trend able data. It is recommended to inspect the motor as scheduling allows. Motor will likely need replacing in the near future.

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD				
NUSCE DC - NUISANCE DUST C	ANCE DUST COLLECTOR (19-Sep-23)					
	OVERALI LEVEL	1r 20ru-				
	OVERALL LEVEL	IK-ZUKHZ				
MOH	.065 In/Sec	.175 G-s				
MOV	.039 In/Sec	.328 G-s				
MIH	.101 In/Sec	.311 G-s				
MIV	.130 In/Sec	.307 G-s				
МТА	116 In/Sec	.269 G-s				
etu	210 Tp/Soc	1 140 C-s				
	.210 III/Sec	1.005 0 -5				
EIV	.103 In/Sec	1.825 G-s				
EOH	.289 In/Sec	2.511 G-s				
EOV	.307 In/Sec	1.750 G-s				
STARHSEVAC - STARRENCE HOUSE	VAC (19-	Sep-23)				
		1K-20KH-				
	OVERALL LEVEL	IK-ZUKHZ				
MOH	.34/ In/Sec	.635 G-S				
MOV	.031 In/Sec	.581 G-s				
MIH	.474 In/Sec	.769 G-s				
MIV	.111 In/Sec	.778 G-s				
МТА	131 In/Sec	657 G-s				
ET 7	005 Tp/Soc	560 C-c				
	.095 11/360	.500 G-S				
EIH	.428 In/Sec	.8/2 G-S				
EIV	.071 In/Sec	.644 G-s				
EOH	.337 In/Sec	.582 G-s				
EOV	.063 In/Sec	.520 G-s				
BLOWER 7 - BLOWER 7	(19-)	Sen-23)				
BIOWER / BIOWER /		1v 20vu-				
	OVERALL LEVEL	IK-ZUKHZ				
MOH	.032 In/Sec	.438 G-s				
MOV	.028 In/Sec	.367 G-s				
MIH	.031 In/Sec	.591 G-s				
MIV	.024 In/Sec	.549 G-s				
MTA	075 Tp/Sec	315 6-8				
MIA	.075 IN/Sec	.515 6 5				
BLOWER 6 - BLOWER 6	(19-)	Sep-23)				
	OVERALL LEVEL	1K-20KHz				
MOH	.076 In/Sec	.590 G-s				
MOV	.024 In/Sec	.581 G-s				
мтн	.075 In/Sec	1.492 G-s				
 MTV	0.13 Tr/Sec	1 268 C-s				
MIX	.040 In/Sec	707 0 -				
	.040 In/Sec	./8/ G-S				
EIA	.130 In/Sec	.769 G-s				
EIH	.053 In/Sec	.961 G-s				
EIV	.063 In/Sec	1.189 G-s				
WDA FEED - WDA FEED	(19-	Sep-23)				
	OVEDATT TEVET	1K-20KH4				
Non						
MOH	.155 In/Sec	./26 G-S				
MOV	.081 In/Sec	.914 G-s				
MIH	.174 In/Sec	1.001 G-s				
MIV	.117 In/Sec	1.342 G-s				
MIA	.175 In/Sec	1.716 G-s				
 	144 Tp/Soc	2 743 6-6				
EIN	240 Tr/2-2	060 0 -				
E1H	.349 IN/Sec	.808 G-S				
EIV	.151 In/Sec	.992 G-s				
EOH	.205 In/Sec	1.297 G-s				
EOV	.070 In/Sec	1.281 G-s				
	-					
WFT.T. WATTER - WETT WATER	(10	Sen-231				
NGTT MATER - METT MATER	(19-)	1 v 00 v ···-				
	OVERALL LEVEL	IK-20KHZ				
MOH	.326 In/Sec	.398 G-s				
MOV	.473 In/Sec	.443 G-s				
MIH	.173 In/Sec	.500 G-s				

MIV		.194	In/Sec	. 397	G-s
MIA		.082	In/Sec	. 332	G-s
EMSPYTWRBL -	- EMULSIFIER S	SPRAY TOWER	BLWR	(19-Sep-23))
		OVERAI	L LEVEL	1K-20H	KHz
MOH		.229	In/Sec	. 669	G-s
MOV		.118	In/Sec	1.107	G-s
MIH		.178	In/Sec	.880	G-s
MIV		.252	In/Sec	1.636	G-s
MIA		.271	In/Sec	.476	G-s
Clarification C	or vibration (UNITS:			
Acc>	≻G-s Rl	MS			
Vel>	> In/Sec PI	к			

This concludes our report and as always, it has been a pleasure to serve PMC-Biogenix. If there are any comments or questions, do not hesitate to contact us.

Sincerely,

Kerin W. Maxwell

ISO Certified Vibration Analyst, Category III



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