HI-SPEED INDUSTRIAL SERVICE

MILLINGTON, TN

October 22, 2019

AECI Dell Power

Subject: October 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

Starting motor/Gearbox unit
We still suspect some wear in the gearbox, but cannot at this time call for replacement of this unit. Running speed harmonics/sidebands can be seen above 1500 Hz. Overall acceleration in the gearbox exceeds 5 g's RMS and 15 g's RMS. Perform oil analysis to assist in defect classification.
Rated a Class II Defect at this time.

Jacking Oil Pump 1
Data for this pump clearly indicates what looks to be bearing issues. Non-synchronous vibration peaks have multiple sidebands in this unit also. Could be a piston or vane pass if so equipped and gear driven. Inspect the coupling if installed. We do recommend replacement as time allows. **Rated a Class III Defect.**

Lube Oil Vapor Extractor Fan 2
#2 Lube oil vapor extractor fan still has a high 1xRPM vibration. We recommend inspecting and cleaning the fan wheel as soon as possible to avoid overloading the bearings. Other inspections might be required if the fan wheel is clean, such as a bent shaft, loose or missing fasteners or structural cracks. **Rated a Class II Defect.**

Observations

Air Compressor
This reciprocating air compressor is still generating strong levels of vibration axial vibration in the motor. Inspect the unit belts and sheaves for wear and alignment. Also inspect the motor base for stress cracks and loose or missing fasteners.
Rated a Class II Defect.

Jacking Oil Pump 2
Similar to #1 but clean discreet peaks. Inspect the coupling if installed. No immediate action. **Rated a Class I Defect.**

Lube Oil Vapor Extractor Fan 1
Motor still has slight high frequency vibration that could possibly be due to a rotor bar issue or electrical fluting. No immediate action is required. **Rated a Class I Defect.**

Lube Oil Cooler Fan 1
Vibration is up in the motor bearings. No immediate issue yet. **Rated a Class I Defect.**

Abbreviated Last Measurement Summary

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Database: ESSEX.rbm
Area: POWER PLANT
Report Date: 22-Oct-19 13:29

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
4F - STARTING MOTOR	(18-Oct-19)	
	OVERALL LEVEL	1-20 KHz
MOH - MOTOR OUTBOARD HORIZONTAL	.054 In/Sec	.290 G-s
MIH - MOTOR INBOARD HORIZONTAL	.066 In/Sec	.666 G-s
MIA - MOTOR INBOARD AXIAL	.060 In/Sec	.670 G-s
EIA - EQIUPMENT INBOARD AXIAL	.252 In/Sec	1.585 G-s
EIH - ERQUIPMENT INBOARD HORIZONTAL	.220 In/Sec	5.869 G-s
EOH - EQUIPMENT OUTBOARD HORIZONTAL	.289 In/Sec	5.498 G-s
2H - LUBE OIL PUMP 1	(18-Oct-19)	
	OVERALL LEVEL	1-20 KHz
MOH - MOTOR OUTBOARD HORIZONTAL	.078 In/Sec	.276 G-s
MIH - MOTOR INBOARD HORIZONTAL	.043 In/Sec	.341 G-s
MIA - MOTOR INBOARD AXIAL	.044 In/Sec	.083 G-s
2M - LUBE OIL PUMP 2	(18-Oct-19)	
	OVERALL LEVEL	1-20 KHz
MOH - MOTOR OUTBOARD HORIZONTAL	.080 In/Sec	.375 G-s
MIH - MOTOR INBOARD HORIZONTAL	.027 In/Sec	.405 G-s
MIA - MOTOR INBOARD AXIAL	.048 In/Sec	.495 G-s
7J - JACKING OIL PUMP 1	(18-Oct-19)	
	OVERALL LEVEL	1-20 KHz
MOH - MOTOR OUTBOARD HORIZONTAL	.134 In/Sec	.332 G-s
MIH - MOTOR INBOARD HORIZONTAL	.221 In/Sec	2.008 G-s
MIA - MOTOR INBOARD AXIAL	.291 In/Sec	3.795 G-s
PIA - PUMP INBOARD AXIAL	.261 In/Sec	1.604 G-s
PIH - PUMP INBOARD HORIZONTAL	.323 In/Sec	1.562 G-s
7M - JACKING OIL PUMP 2	(18-Oct-19)	
	OVERALL LEVEL	1-20 KHz
MOH - MOTOR OUTBOARD HORIZONTAL	.255 In/Sec	1.368 G-s
MIH - MOTOR INBOARD HORIZONTAL	.220 In/Sec	1.123 G-s
MIA - MOTOR INBOARD AXIAL	.313 In/Sec	.439 G-s
PIA - PUMP INBOARD AXIAL	.469 In/Sec	1.424 G-s
PIH - PUMP INBOARD HORIZONTAL	.408 In/Sec	1.236 G-s
8C - LUBE OIL COOLER FAN 1	(18-Oct-19)	
	OVERALL LEVEL	1-20 KHz
MOH - MOTOR OUTBOARD HORIZONTAL	.128 In/Sec	1.381 G-s
MIH - MOTOR INBOARD HORIZONTAL	.118 In/Sec	1.114 G-s
MIA - MOTOR INBOARD AXIAL	.104 In/Sec	.698 G-s
8F - LUBE OIL COOLER FAN 2	(18-Oct-19)	
	OVERALL LEVEL	1-20 KHz
MOH - MOTOR OUTBOARD HORIZONTAL	.105 In/Sec	.335 G-s
MIH - MOTOR INBOARD HORIZONTAL	.102 In/Sec	.268 G-s

MIA – MOTOR INBOARD AXIAL		.092 In/Sec	.277 G-s
8J	– LUBE OIL VAPOR EXTRACTOR 1	(18-Oct-19)	
		OVERALL LEVEL	1-20 KHz
MOH – MOTOR OUTBOARD HORIZONTAL		.346 In/Sec	.118 G-s
MIH – MOTOR INBOARD HORIZONTAL		.212 In/Sec	.365 G-s
MIA – MOTOR INBOARD AXIAL		.187 In/Sec	.271 G-s
8M	– LUBE OIL VAPOR EXTRACTOR 2	(18-Oct-19)	
		OVERALL LEVEL	1-20 KHz
MOH – MOTOR OUTBOARD HORIZONTAL		.441 In/Sec	.172 G-s
MIH – MOTOR INBOARD HORIZONTAL		.368 In/Sec	.347 G-s
MIA – MOTOR INBOARD AXIAL		.198 In/Sec	.160 G-s
1G	– TURNING GEAR	(18-Oct-19)	
		OVERALL LEVEL	1-20 KHz
MOH – MOTOR OUTBOARD HORIZONTAL		.166 In/Sec	.059 G-s
MIH – MOTOR INBOARD HORIZONTAL		.051 In/Sec	.052 G-s
MIA – MOTOR INBOARD AXIAL		.037 In/Sec	.056 G-s
EIA – EQIUPMENT INBOARD AXIAL		.030 In/Sec	.062 G-s
EIH – ERQUIPMENT INBOARD HORIZONTAL		.029 In/Sec	.130 G-s
EOH – EQUIPMENT OUTBOARD HORIZONTAL		.044 In/Sec	.057 G-s
2M DC	– EMERGENCY LUBE OIL PUMP	(18-Oct-19)	
		OVERALL LEVEL	1-20 KHz
MOH – MOTOR OUTBOARD HORIZONTAL		.263 In/Sec	.152 G-s
MIH – MOTOR INBOARD HORIZONTAL		.058 In/Sec	.097 G-s
MIA – MOTOR INBOARD AXIAL		.063 In/Sec	.059 G-s
AIRCOMP	– RECIPROCATING AIR COMPRESSOR	(18-Oct-19)	
		OVERALL LEVEL	1-20 KHz
MOH – MOTOR OUTBOARD HORIZONTAL		.587 In/Sec	.080 G-s
MIH – MOTOR INBOARD HORIZONTAL		.629 In/Sec	.079 G-s
MIA – MOTOR INBOARD AXIAL		1.219 In/Sec	.061 G-s
FIA – FAN INBOARD AXIAL		.185 In/Sec	.368 G-s
FIH – FAN INBOARD HORIZONTAL		.185 In/Sec	.348 G-s
FOH – FAN OUTBOARD HORIZONTAL		.247 In/Sec	.401 G-s
PUMP	– PUMP	(18-Oct-19)	
		OVERALL LEVEL	1-20 KHz
MOH – MOTOR OUTBOARD HORIZONTAL		.046 In/Sec	.125 G-s
MIH – MOTOR INBOARD HORIZONTAL		.025 In/Sec	.209 G-s
MIA – MOTOR INBOARD AXIAL		.068 In/Sec	.092 G-s
MOV – MOTOR OUTBOARD VERTICAL		.050 In/Sec	.234 G-s
MIV – MOTOR INBOARD VERTICAL		.036 In/Sec	.233 G-s
PIV – PUMP INBOARD VERTICAL		.028 In/Sec	.149 G-s

Clarification Of Vibration Units:

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