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November 8, 2024

Dell Power Plant Dell, AR

The following report is a summary of findings from the vibration survey that was performed on October 25, 2024. The report only contains defects/issues found from the survey.

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.

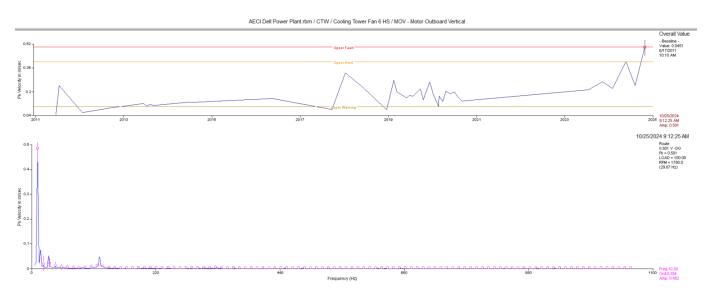
<u>Class III</u>; Defect (s) present that may cause failure in short term (less than 2 months). This should be addressed as soon as practical, with a high maintenance priority. Increase monitoring frequency.

<u>Class IV:</u> 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.

COOLING TOWER AREA

Cooling Tower Fan 6 High Speed CLASS II



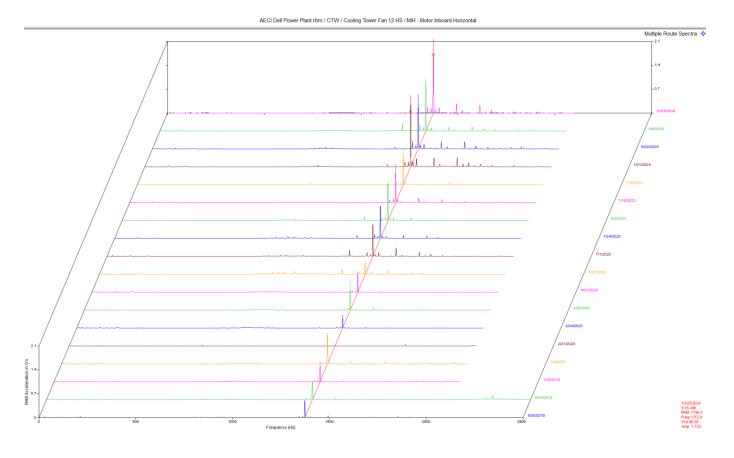
Observation:

Motor inboard vertical trend shows increase in vibration. Spectral data shows a dominant peak is at 10 Hz.

Recommendation:

Data shows a sub-synchronous vibration that is likely related to fan speed. Check gearbox foot bolts/structure and fan hub as time allows. Ensure all are tight. Check gearbox shaft for excessive play if possible.

Cooling Tower Fan 12 CLASS II



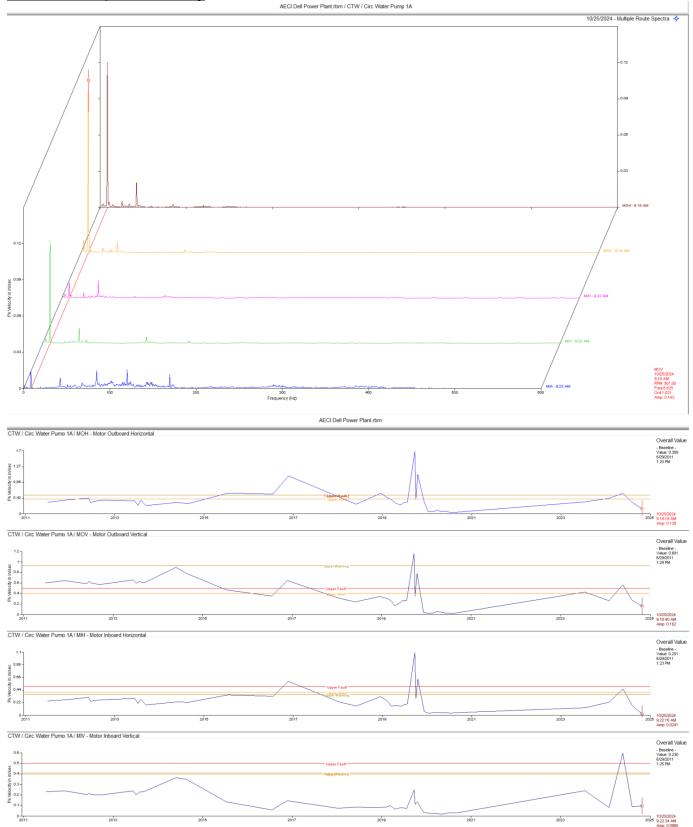
Observation:

Motor inboard horizontal spectral waterfall shows a dominant vibration at 46 orders of rpm the appears to be increasing in amplitude . This peak may be rotor bar pass frequency or 2 x depending on number rotor bars. There are also some small sidebands of rpm around this peak.

Recommendation:

Vibration data suggests an electrical issue, possibly a rotor issue as well. Check motor for soft foot and recheck alignment. If possible, check current on each phase ensuring the motor does not have current imbalance. We are monitoring this closely.

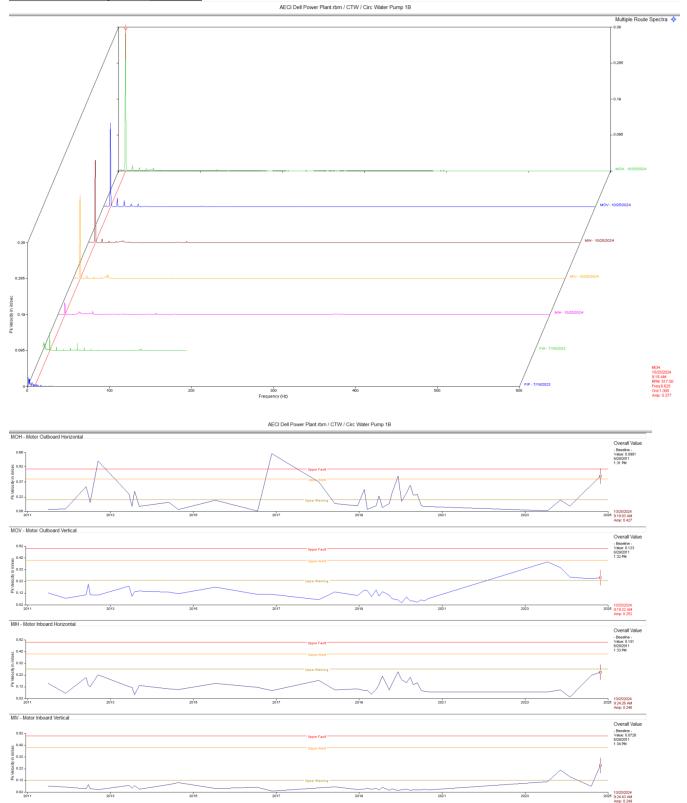
Circ Water Pump 1A Info Only



Observation: Multi point spectra of the motor shows a dominant vibration at 8.6 Hz. which appears to be 1 x motor rpm.

Recommendation:

Overall, the velocity amplitudes of the motor are around average or below according to trend data.. We are monitoring this closely.

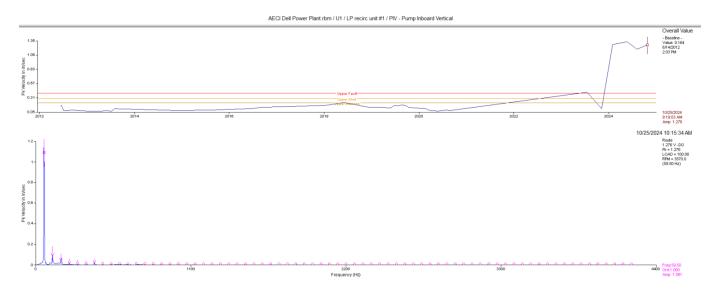


Observation: Motor velocity spectra show a dominant vibration at 8.6 Hz. which appears to be 1 x motor rpm. Trend data above shows a slight increase in overall amplitude at the MOH from .34 ips-pk to .427 ips-pk. **Recommendation:**

Overall, the velocity amplitudes of the motor are slightly above average according to trend data. The 1 x motor rpm vibration seen in the MOH can possibly be influenced by the pump if the pump has internal issues such as shaft/bushing wear/excessive run-out, impeller imbalance. Pump flows can also contribute somewhat. Ensure flows are good. We are monitoring this closely.

GAS TURBINE UNIT 1

LP Recirc Unit 1 CLASS III



Observation:

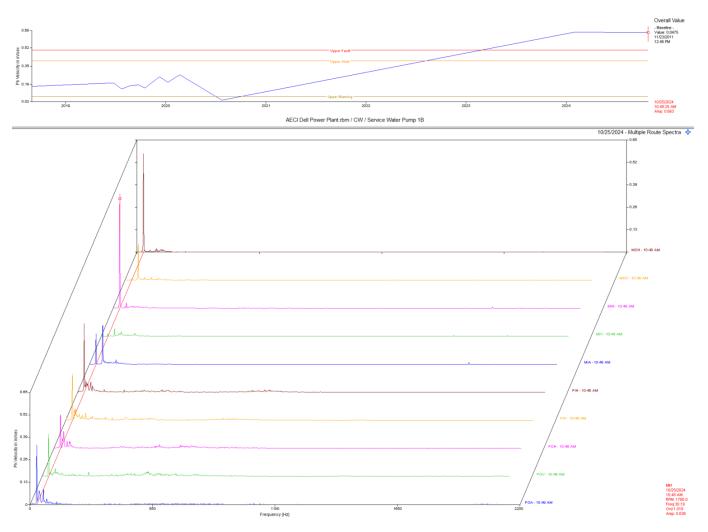
Pump inboard vertical trend shows another increase in vibration this survey. Overall amplitude is 1.27 ips-pk at the PIV.

Recommendation:

Data suggests a coupling issue, or issue with pump. It is recommended to check pump coupling for wear and check pump shaft for run out as time allows. Ensure all fasteners are tight.

UTILITY PUMPS

Service Water Pump 1B CLASS II



Observation:

Multi-point spectra of the motor and pump show dominant 1 x rpm vibration in motor with some 1 x rpm in pump. Motor inboard axial spectrum shows some 1 and 2 x rpm vibration. Trend data of MIH shows overall vibration to be near what is was when it was last tested in Jan 2024.

Recommendation:

Data suggests possible coupling and/or alignment issue. Check drivetrain for these issues.

Database:	AECI Dell Power Plant.rbm
Area:	Cooling Tower
Route No.	1: COOLING TOWER

	EMENT POINT		OVERALI	L LEVEL	HFD /	/ VHFD
CTW1	- Cooling	Tower			(25-Oct-24) 1K-201	
	MOH		.193	In/Sec	1.166	G-s
	MOP			G-s		•••
	MOV		.276	In/Sec	1.308	G-s
	MIH		.179	In/Sec	1.308 1.015	G-s
	MIP			G-s		
	MIV		.240	In/Sec	. 600	G-s
	MIA		.204	In/Sec In/Sec	. 359	
CTW2	- Cooling	Tower	Fan 2 HS		(25-Oct-24))
	-				1K-201	
	MOH		.207	In/Sec	. 985	G-s
	MOP		.271	G-s		
	MOV		.239	In/Sec	.366 1.749	G-s
	MIH		.168	In/Sec	1.749	G-s
	MIP		.873	G-s		
	MIV		.208	In/Sec	. 882	G-s
	MIA		.286	In/Sec In/Sec	.504	G-s
стиз	- Cooling	Tower	Fan 3 HS		(25-Oct-24))
			OVERAI	LL LEVEL	1K-201	
	MOH		.151	In/Sec	. 639	G-s
	MOP		.078	G-s		
	MOV		.230	In/Sec	.304 .672	G-s
	MIH				. 672	G-s
	MIP			G-s		
	MIV		.292	In/Sec In/Sec	.457	G-s
	MIA		. 325	In/Sec	.245	G-s
CTW4	- Cooling	Tower			(25-Oct-24)	
					1K-201	
	MOH			In/Sec	.643	G-s
	MOP			G-s		
	MOV		.368	In/Sec	.190 .769	G-s
	MIH		.201	In/Sec	.769	G-s
	MIP		.207	G-s		
	MIV		.325	In/Sec In/Sec	.359	
	MIA		. 323	In/Sec	.251	G-s
CTW5	- Cooling	Tower			(25-Oct-24)	
	NOT			LL LEVEL		
	MOH MOP		.211	In/Sec	.320	6-8
					. 476	~ ~
	MOV			In/Sec In/Sec		
	MIH		. 382	•	1.550	G-S
	MIP MIV			G-S In/Sec	1.319	C
	MIV MIA			In/Sec In/Sec		
					1.105	G-S
CTW6	- Cooling	Tower			(25-Oct-24)	
				LL LEVEL		
	MOH			In/Sec	.826	G-s
	MOP		.050			
	MOV			In/Sec		
	MIH				1.038	G-s
	MIP		. 483			_
	MIV			In/Sec	.344	
	MIA		.280	In/Sec	.563	G-s

CTW8		- Cooling Tower	Fan 8 HS (2	25-Oct-24)
			OVERALL LEVEL	
	MOH		.235 In/Sec	
	MOP		.146 G-s	
	MOV		.182 In/Sec	.379 G-s
	MIH		.178 In/Sec	1.542 G-s
	MIP		.425 G-s	
	MIV			555 G-s
	MIA		.239 In/Sec .244 In/Sec	683 G-s
	MIA		.244 117 560	.005 6 5
CTW9		- Cooling Tower	Fan 9 HS (2	25-Oct-24)
02.00			OVERALL LEVEL	
	MOH		.390 In/Sec	
	MOP		132 C-s	
	MOV		.169 In/Sec	337 C-s
	MIH		.356 In/Sec	2 289 G-s
	MIP			
	MIV		.195 G-s .234 In/Sec	457 G-8
	MIN		.381 In/Sec	1 032 C-s
	MIA		.381 11/360	1.032 G-S
CTW10		- Cooling Tower	Fan 10 HS (2	25-Oct-24)
			OVERALL LEVEL	
	MOH		.219 In/Sec	
	MOP		.219 IN/Sec	
	MOP		.335 In/Sec	376 6-0
	MOV		.225 In/Sec	1 049 6-3
	MIH		.225 In/Sec .457 G-s	1.040 G-S
	MIP		.326 In/Sec	427 C a
	MIV		.242 In/Sec	.427 G-S
	MIA		.242 In/Sec	.012 G-S
Стw11		- Cooling Tower	Fan 11 HS (2	25 - 0ct - 24
CINII		cooring rower	OVERALL LEVEL	
	мон		.156 In/Sec	
	MOP		.187 G-s	.,01 0 5
	MOV		.220 In/Sec	179 C-8
	MIH		.154 In/Sec	
	MIP		.112 G-s	. / 5 / 8 3
	MIV		.193 In/Sec	170 G-8
	MIA		.180 In/Sec	438 G-s
			.100 111,000	
CTW12		- Cooling Tower	Fan 12 HS (2	25-Oct-24)
			OVERALL LEVEL	1K-20kHz
	MOH		.168 In/Sec	
	MOP		.122 G-s	
	MOV		.271 In/Sec	.196 G-s
	MIH		.179 In/Sec	
	MIP		.103 G-s	
	MIV		.228 In/Sec	1.071 G-s
	MIA		.249 In/Sec	
3CW-P-	-001 ·	- Circ Water Pu	•	25-Oct-24)
			OVERALL LEVEL	
	MOH		.138 In/Sec	.106 G-s
	MOP		.060 G-s	
	MOV		.162 In/Sec	
	MIH		.024 In/Sec	.413 G-s
	MIP		.233 G-s	
	MIV		.097 In/Sec	
	MIA		.058 In/Sec	.155 G-s
.				
3CM-D-	-002	- Circ Water Pu	•	25-Oct-24)
			OVERALL LEVEL	
	MOH		.427 In/Sec	.168 G-s
	MOP		.089 G-s	
	MOV		.252 In/Sec	
	MIH		.245 In/Sec	.168 G-s
	MIP		.071 G-s	
			• • • • •	
	MIV MIA		.249 In/Sec .046 In/Sec	.122 G-s

LFAA2	- LFAA	1в		(25-0ct-	-24)
			OVERA	LL LEVEL	1K-	-20kHz
	мон		.069	In/Sec	. 6	531 G-s
	MOP		.375	G-s		
	MOV		.055	In/Sec	. 5	513 G-s
	MIH		.087	In/Sec	. 6	551 G-s
	MIP		.476	G-s		
	MIV		.087	In/Sec	. 4	43 G-s
	MIA		.072	In/Sec	. 5	514 G-s
			OVERA	LL LEVEL	1K-	20KHz
	PIH		.014	In/Sec	. 1	38 G-s
	PIP		.077	G-s		

Route No. 2: CT MTRS LOW SP

MEASUREMEN		OVERALL LEVEL	HFD / VHFD
CTW1 LS	- Cooling Tower	Fan 1 LS (22-May-24)
	-	OVERALL LEVEL	1K-20kHz
MOH		.137 In/Sec	.442 G-s
MOP	,	.200 G-s	
MOV	•	.115 In/Sec	.107 G-s
MIH		.103 In/Sec	.0024 G-s
MIV	•	.103 In/Sec .091 In/Sec	.0033 G-s
MIA		.037 In/Sec	.0045 G-s
CTW2 LS	- Cooling Tower	Fan 2 LS (
		OVERALL LEVEL	
MOH		.111 In/Sec	.219 G-s
MOP		.120 G-s	
MOV		.102 In/Sec	.137 G-s
MIH		.123 In/Sec	1.364 G-s
MIP		.674 G-s	
MIV		.105 In/Sec .121 In/Sec	.210 G-s
MIA		.121 In/Sec	.165 G-s
CTW3 LS	- Cooling Tower	Fan 3 LS (
		OVERALL LEVEL	
MOH		.104 In/Sec	.138 G-s
MOP		.056 G-s	
MOV		.096 In/Sec	
MIH		.122 In/Sec	.998 G-s
MIP		.505 G-s	
MIV		.111 In/Sec	.072 G-s
MIA		.114 In/Sec	.237 G-s
CTW4 LS	- Cooling Tower	Fan 4 LS (
		OVERALL LEVEL	
MOH		.148 In/Sec	.110 G-S
MOP		.049 G-s .105 In/Sec	040 0
MOV			
MIH		.144 In/Sec .114 G-s	.208 G-S
MIP			051 0
MIV		.104 In/Sec .093 In/Sec	.051 G-s
MIA			
CTW5 LS		Fan 5 LS (
		OVERALL LEVEL	
MOH		.138 In/Sec	.310 G-s
MOP		.138 G-s	070 0 -
MOV		.157 In/Sec .173 In/Sec	.073 G-s
MIH		.173 In/Sec .383 G-s	.318 G-s
MIP			100 0 -
MIV		.162 In/Sec	.120 G-s
MIA		.094 In/Sec	.176 G-s
CTW6 LS	- Cooling Tower	Fan 6 LS (22-May-24)

	OVERALL LEVEL	1K-20kHz
MOH	.115 In/Sec	.225 G-s
MOP	.105 G-s	
MOV	.100 In/Sec	.077 G-s
MIH	.109 In/Sec	.321 G-s
MIP	.087 G-s	
MIV	.105 In/Sec	.072 G-s
MIA	.094 In/Sec	.148 G-s

Route No. 1: UNIT 1

MEASUREMENT POINT	OVERALL LEVEL	HED / VHED
LP #1 - LP recirc unit #	1 (25-	Oct-24)
	OVERALL LEVEL	
MOH	.099 In/Sec	.231 G-s
MOP	.059 G-s	
MOV	.130 In/Sec	
MIH	.102 In/Sec	.643 G-s
MIP	.337 G-s	040 0 -
MIV MIA	.177 In/Sec .295 In/Sec	
PIH	OVERALL LEVEL .568 In/Sec	252 C-a
PIP	.105 G-s	.255 G-5
PIV	1.275 In/Sec	168 G-8
POH	.674 In/Sec	.225 G-s
POP	.097 G-s	.220 0 0
POV	.602 In/Sec	.208 G-s
POA	.636 In/Sec	.224 G-s
1FD-P-001B - Boiler Feed Wate		
	OVERALL LEVEL	1K-20KHz
MOH	.069 In/Sec	.410 G-s
MOP	.019 G-s	
MOV	.153 In/Sec .086 In/Sec	.300 G-s
MIH		.109 G-s
MIP	.0046 G-s	070 0 -
MIV MIA	.157 In/Sec .122 In/Sec	.198 G-s
MIA	OVERALL LEVEL	.198 G-S
NIA		.409 G-s
NIH	.116 In/Sec .056 In/Sec .061 In/Sec	.149 G-s
NIV	.061 In/Sec	.186 G-s
NOV	.065 In/Sec	
NOH	.055 In/Sec	.094 G-s
NOA	.052 In/Sec	.228 G-s
	OVERALL LEVEL	
BFA	.035 In/Sec	.197 G-s
PIH	.070 In/Sec	.137 G-s
PIV	.076 In/Sec	.202 G-s
POV	.088 In/Sec	.139 G-s
POH	.093 In/Sec	.113 G-s
	1 ()5	0-+ 04)
CT1 - CT Lube Oil Pump	OVERALL LEVEL	
МОН	.054 In/Sec	.273 G-s
MOP	.113 G-s	.275 9-5
MOV	.054 In/Sec	.228 G-s
MIH	.064 In/Sec	.093 G-s
MIP	.024 G-s	
MIV	.065 In/Sec	.018 G-s
MIA	.072 In/Sec	.116 G-s
CTHYD !1 - CT Hyd Pump 2	(25-	Oct-24)
	OVERALL LEVEL	1K-20kHz
MOH	.162 In/Sec	.073 G-s
MOP	.016 G-s	

MOV	.350 In/Sec	.225 G-s
MIH	.084 In/Sec	.426 G-s
MIP	.136 G-s	
MIV	.046 In/Sec	.160 G-s
MIA	.118 In/Sec	.672 G-s

Route No. 1: UNIT 2

MEASUREMENT	POINT	OVERALL LEVEL	HFD / VHFD
LP #2	- LP recirc unit	#2 (2	25-Oct-24)
		OVERALL LEVEL	1K-20kHz
MOH		.120 In/Sec	.277 G-s
MOP		.049 G-s	
MOV		.119 In/Sec	.740 G-s
MIH		.146 In/Sec	
MIP		.357 G-s	
MIV		.153 In/Sec	.776 G-s
MIA		.229 In/Sec	.807 G-s
		OVERALL LEVEL	1K-20KHz
PIH		.122 In/Sec	.347 G-s
PIP		.078 G-s	
PIV		.149 In/Sec	.316 G-s
POH		.109 In/Sec	.936 G-s
POP		.469 G-s	
POV		.124 In/Sec	.657 G-s
POA		.116 In/Sec	.413 G-s
2FD-P-002A	- Boiler Feed Wat		
		OVERALL LEVEL	1K-20KHz
MOH		.017 In/Sec	.119 G-s
MOP		.067 G-s	
MOV		.054 In/Sec	.126 G-s
MIH		.069 In/Sec	.119 G-s
MIP		.057 G-s	
MIV		.055 In/Sec	.197 G-s
MIA		.034 In/Sec	.553 G-s
		OVERALL LEVEL	
NIA		.091 In/Sec	
NIH		.073 In/Sec	.259 G-s
NIV		.036 In/Sec	.472 G-s
NOV		.030 In/Sec	.219 G-s
NOH		.046 In/Sec	.150 G-s .209 G-s
NOA		.062 In/Sec	.209 G-s
		OVERALL LEVEL	1K-20KHz
BFA		.024 In/Sec	.182 G-s
PIH		.067 In/Sec	.129 G-s
PIV		.088 In/Sec	.176 G-s
POV		.094 In/Sec	.143 G-s
POH		.083 In/Sec	.047 G-s
	Deiler Reed Met	0D ((NE Oct 04)
2ED-E-005B	- Boiler Feed Wat	er 2B (2 OVERALL LEVEL	1K-20KHz
MOH		.062 In/Sec	.141 G-s
MOH MOP		.052 IN/Sec	.141 G-S
MOP		.050 G-S	
CT2	- CT Lube Oil Pum	p 2 (2	25-Oct-24)
		OVERALL LEVEL	1K-20kHz
MOH		.044 In/Sec	.459 G-s
MOP		.066 G-s	
MOV		.036 In/Sec	.250 G-s
MIH		.029 In/Sec	.157 G-s
MIP		.059 G-s	
MIV		.030 In/Sec	.333 G-s
MIA		.056 In/Sec	
		·	
CTHYD !1	- CT Hyd Pump 2	(2	25-Oct-24)
		OVERALL LEVEL	1K-20kHz

MOH	.050 In/Sec	.113 G-s
MOP	.034 G-s	
MOV	.048 In/Sec	.039 G-s
MIH	.025 In/Sec	.317 G-s
MIP	.097 G-s	
MIV	.040 In/Sec	.101 G-s
MIA	.049 In/Sec	.342 G-s

Route No. 1: STEAM TURBINE

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
3CW-P-004 - CCW Booster B	25 Pump 2	-Oct-24)
	OVERALL LEVEL	1K-20kHz
MOH	.048 In/Sec	.280 G-s
MOP	.083 G-s	
MOV		.275 G-s
MIH	.031 In/Sec .051 In/Sec	.362 G-s
MIP	.178 G-s	
MIV	.042 In/Sec	.367 G-s
MIA	.042 In/Sec .090 In/Sec	.155 G-s
	OVERALL LEVEL	1K-20KHz
PIH	.073 In/Sec	.250 G-s
PIP	.140 G-s	
PIV	.049 In/Sec	.334 G-s
PIA	.052 In/Sec	.544 G-s
0CC-P-001 - CLosed Coolir		
	OVERALL LEVEL	1K-20kHz
MOH	.057 In/Sec	.372 G-s
MOP	.215 G-s	
MOV	.042 In/Sec	
MIH	.048 In/Sec	.308 G-s
MIP	.162 G-s	
MIV	.031 In/Sec	.369 G-s
MIA	.029 In/Sec	.377 G-s
	OVERALL LEVEL	
PIH	.046 In/Sec	.808 G-s
PIP	.252 G-s	F 47 0 -
PIV POH	.051 In/Sec .108 In/Sec	.547 G-s .460 G-s
POP	.079 G-s	.400 G-S
POV		.482 G-s
POA	.059 In/Sec .070 In/Sec	.664 G-s
3CH-P-001A - Condensate Pu	ump A (25	-0ct-24)
МОН	OVERALL LEVEL .192 In/Sec	.128 G-s
MOR	.044 G-s	.120 G-S
MOP	160 Tr/Sec	.153 G-s
MUV MIH	.160 In/Sec .094 In/Sec	.329 G-s
MIN MIP	.183 G-s	.329 6-8
MIV	.058 In/Sec	.452 G-s
MIA	.060 In/Sec	.374 G-s
3CH-P-001C - Condensate Pu	umpC (25	-Oct-24)
	OVERALL LEVEL	1K-20kHz
MOH	.269 In/Sec	.223 G-s
MOP	.048 G-s	
MOV	.361 In/Sec	.616 G-s
MIH	.153 In/Sec	.454 G-s
MIP	.256 G-s	
MIV	.164 In/Sec	.618 G-s
MIA	.093 In/Sec	.655 G-s
3AE-P-001 - Vacuum Pump 1	-	-Oct-24)
	OVERALL LEVEL	1K-20kHz
MOH	.115 In/Sec	.608 G-s

MOP		.100 G-	-	
MOV		.151 In	/Sec .632	G-s
MIH		.122 In	/Sec .343	G-s
MIP		.167 G-	-	
MIV		.199 In	/Sec .463	G-s
MIA		.120 In	/Sec .403 /Sec .421 LEVEL 1K-20	G-s
		OVERALL	LEVEL 1K-20	KHz
PIH		.161 In	/Sec .961	G-s
PIP		1.005 G-	S	
PIV		.242 In	/Sec 1.315	G-s
POH		.168 In	/Sec .752	G-s
POP		.206 G-		
POV		.317 In	/Sec .638	G-s
POA		.138 In	/Sec .821	G-s
STG2	- STG Lube Oil	Pump 2	(25-0ct-24)
		OVERALL	LEVEL 1K-20	kHz
MOH		.030 In	/Sec .310	G-s
MOP		.165 G-	S	
MOV		.045 In	/Sec . 372	G-s
MIH		.036 In	/Sec .565	G-s
MIP		.254 G-		
MIV		.034 In	/Sec .870	G-s
MIA		.046 In	/Sec .466	G-s
STGHyd1	- STG Hyd Pump	1	(25-0ct-24)
		OVERALL	LEVEL 1K-20	kHz
MOH		.035 In	/Sec .600	G-s
MOP		.225 G-		
MOV		.069 In	/Sec 1.106	G-s
MIH		.023 In		
MIP		.187 G-		
MIV		.031 In	/Sec .552	G-s
MIA		.034 In	/Sec .484	G-s

Route No. 1: UTILITY PUMPS

MEASUREMENT POINT	OVERALL LEVEL	hfd / vhfd
OSW-P-001B - Service Water	r Pump 1B (2	5-Oct-24)
	OVERALL LEVEL	1K-20kHz
MOH	.593 In/Sec	.106 G-s
MOP	.013 G-s	
MOV	.245 In/Sec	.125 G-s
MIH	.663 In/Sec	.248 G-s
MIP	.101 G-s	
MIV	.088 In/Sec	.185 G-s
MIA	.325 In/Sec	.315 G-s
	OVERALL LEVEL	1K-20KHz
PIH	.465 In/Sec	1.223 G-s
PIP	.908 G-s	
PIV	.355 In/Sec	.717 G-s
POH	.308 In/Sec	.780 G-s
POP	.363 G-s	
POV	.335 In/Sec	.946 G-s
POA	.418 In/Sec	1.180 G-s

Clarification Of Vibration Units:

Acc --> G-s RMS Vel --> In/Sec PK As always, it has been a pleasure to serve AECI Dell Power Plant. If there are any comments or questions, do not hesitate to contact us.

Sincerely,

Kerrin W. Maxuell



Category III Vibration Analyst

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