HI-SPEED INDUSTRIAL SERVICE QualiTest® Diagnostics

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July 3, 2024

US Farathane
Jackson, TN

The following is a summary of findings from the vibration survey performed at your facility on 7/1/24. Please let us know if there are any questions or comments.

QualiTest® uses a four step rating system for defects.

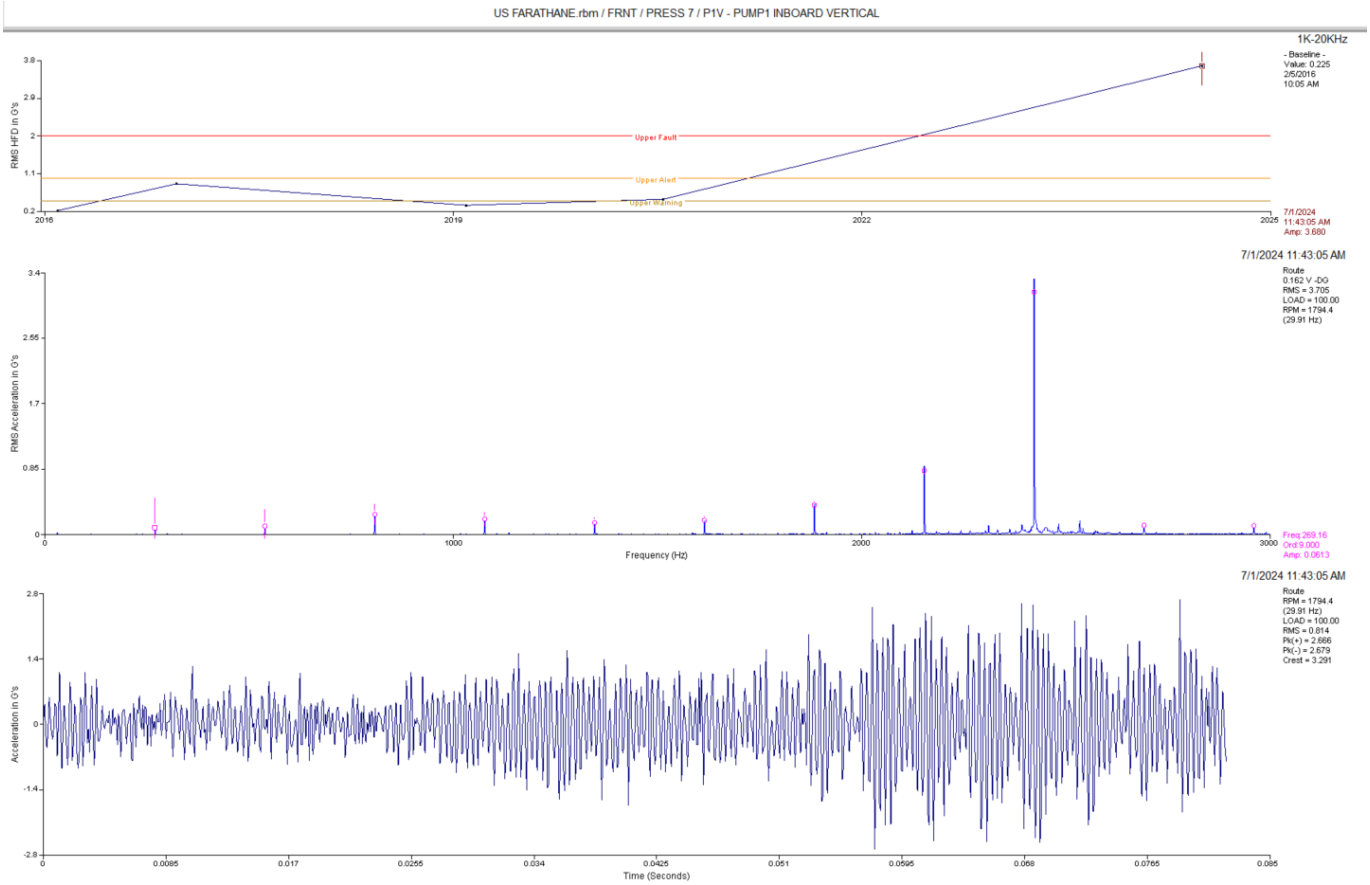
Class I: Defect is present, but effect on reliability is not clear; no immediate action is required. Continue to normally monitor.

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.

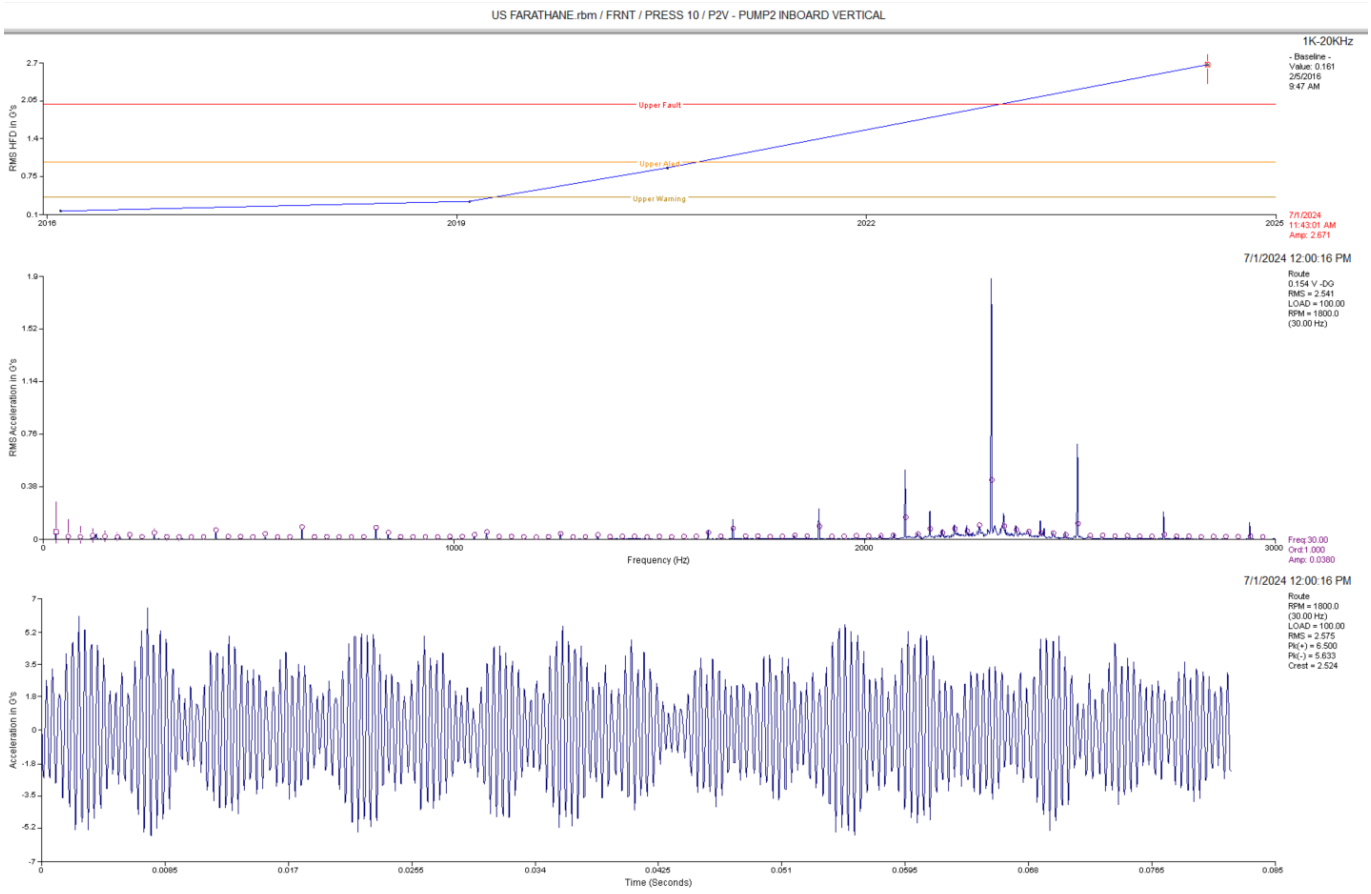
Class IV; Defect (s) present that makes continued reliability unpredictable, and possibility of secondary damage is high. Repairs should be made ASAP. An unscheduled shutdown should be considered for repairs

Defects



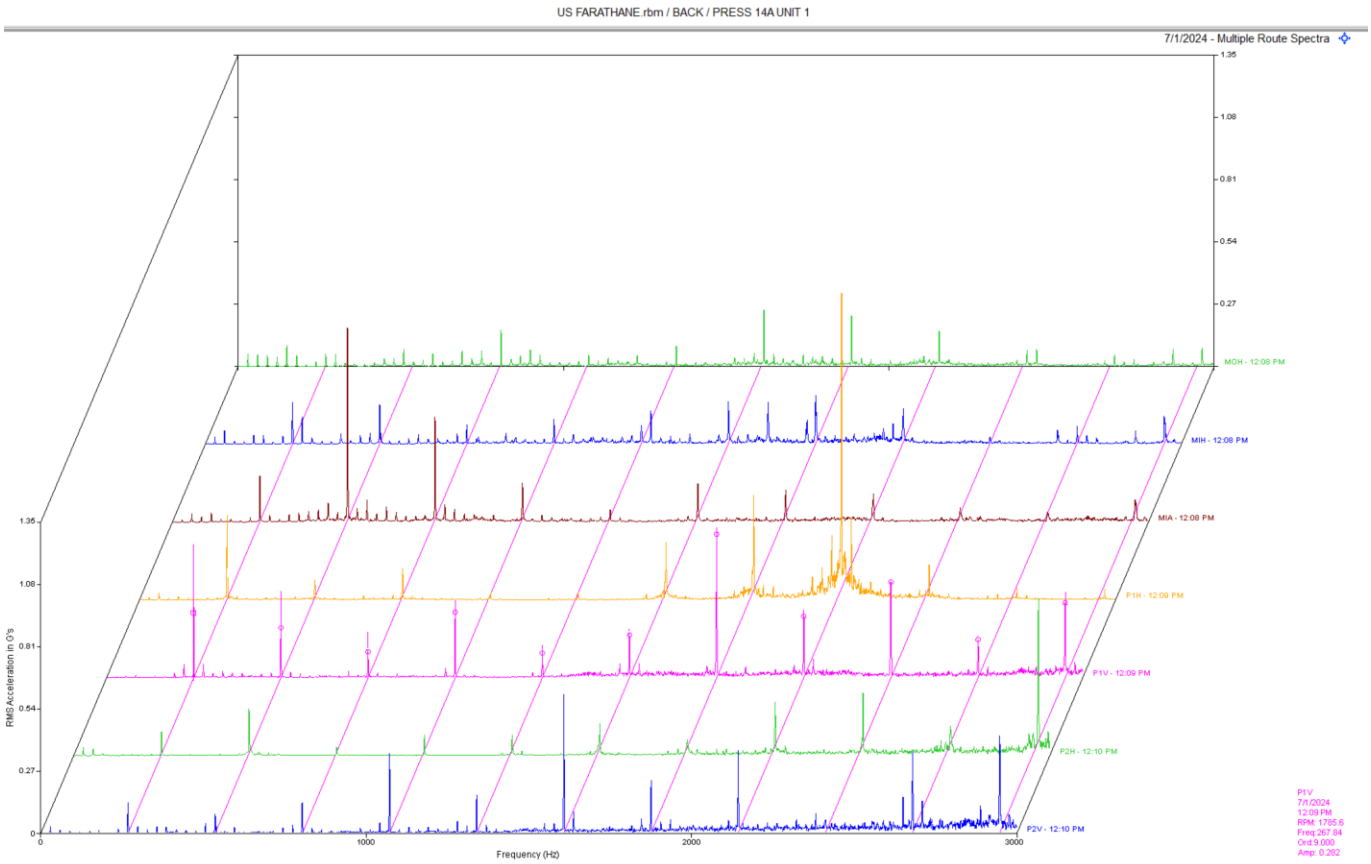
CLASS II Press 7

Pump data shows vibrations at 9 x rpm with harmonics thereof. This is the vane pass vibration of the pump. Pump flow issues can cause this type of vibration . Internal pump wear can also be the cause. For now, ensure pump has proper flow. Ensure filters aren't clogged if equipped If flow is good, then pump likely has internal wear.



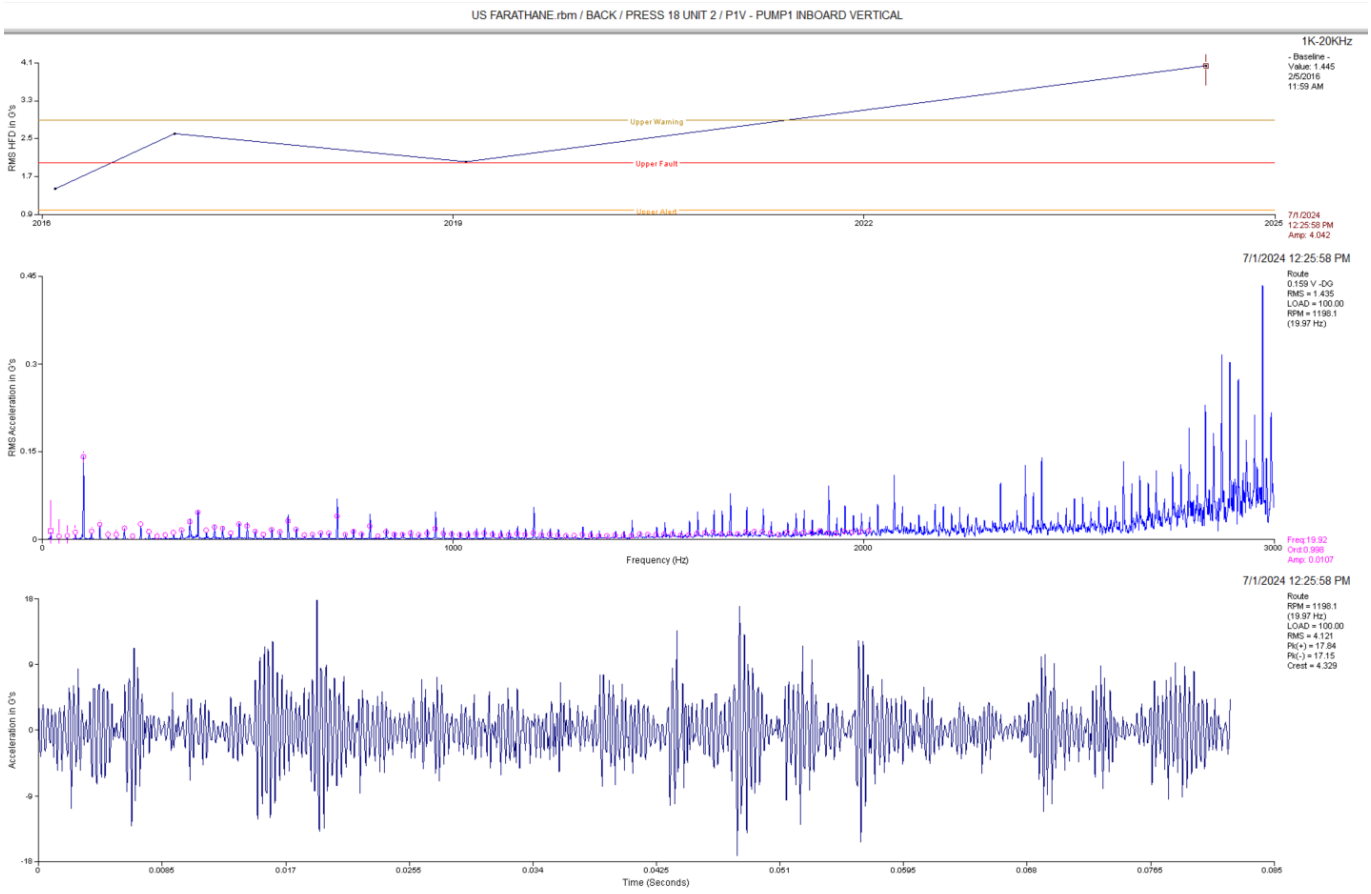
CLASS II Press 10

Trend data shows an increase in overall acceleration amplitude. Pump inboard vertical data shows several harmonics of rpm. High frequency peak is synchronous which may indicate fit looseness/wear of pump internals. Check pump for signs of wear as scheduling allows.



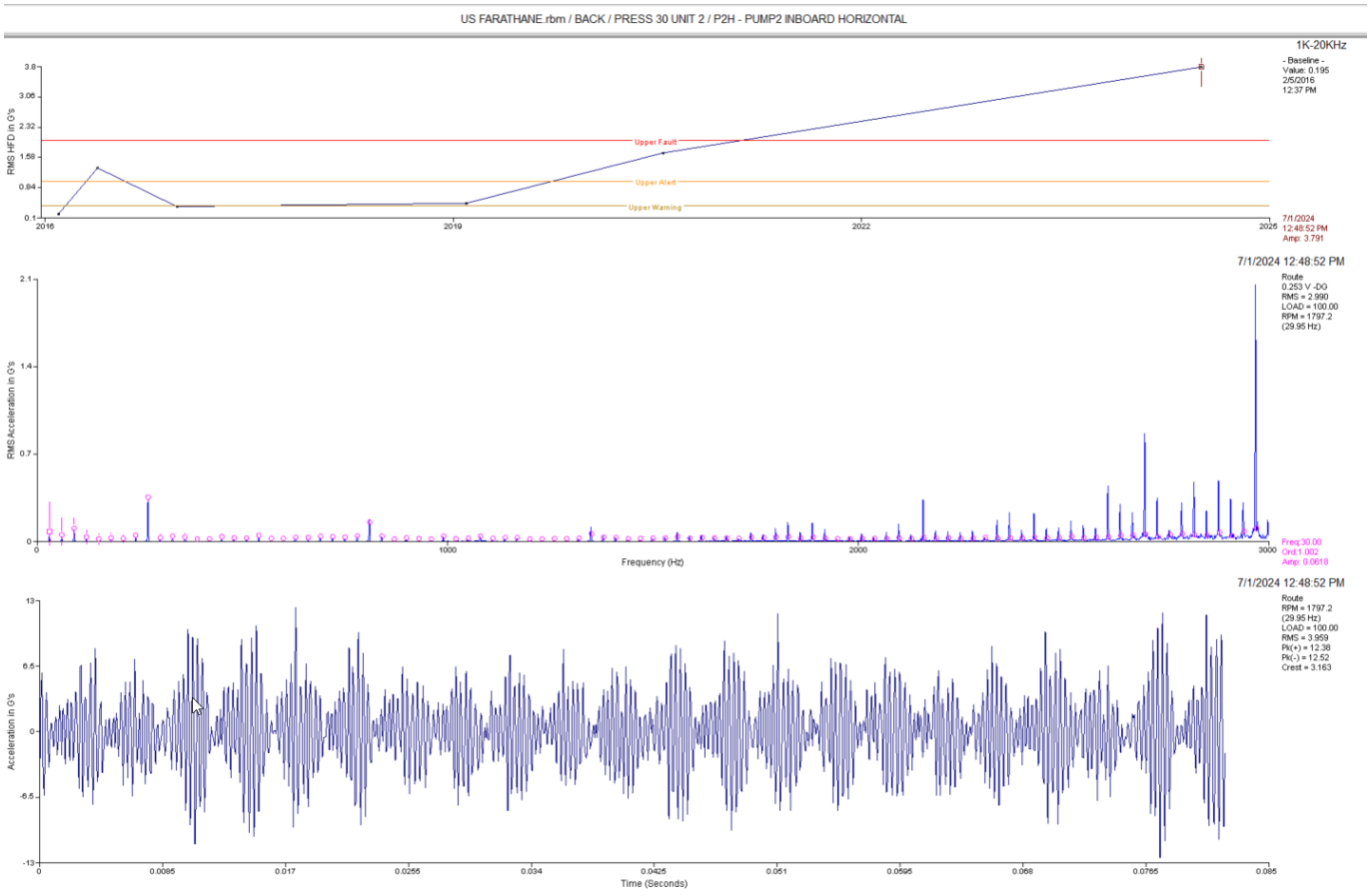
CLASS II Press 14A Unit 1

Multi-point spectral waterfall of the motor and pump shows several harmonics of rpm in motor and pump. The 9 x rpm vibration and harmonics thereof is related to the vane pass vibration of the pump. Pump flow issues can cause this type of vibration . Internal pump wear can also be the cause. For now, ensure pump has proper flow. Ensure filters aren't clogged if equipped If flow is good, then pump likely has internal wear.



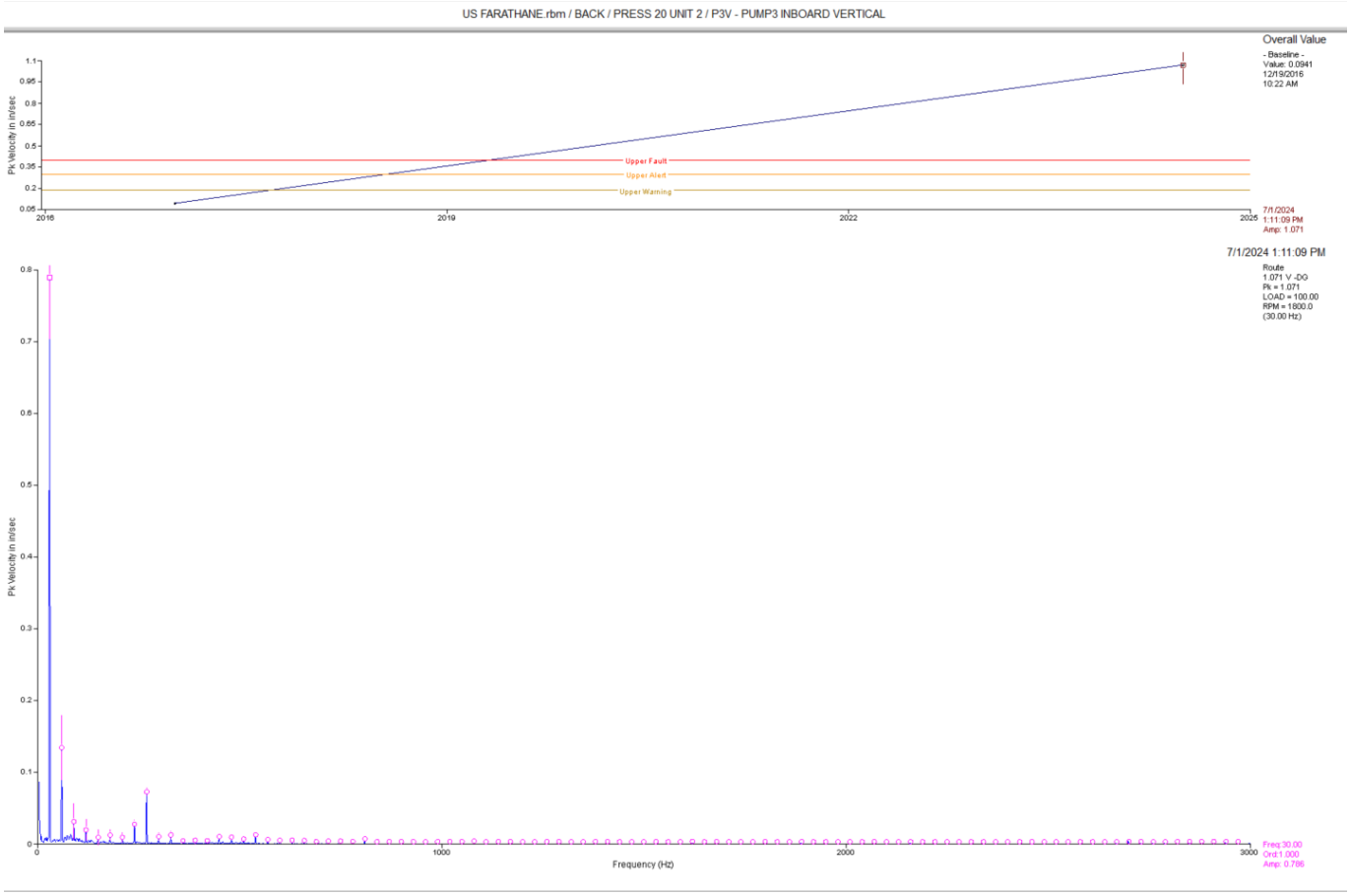
CLASS III Press 18 Unit 2

Pump inboard vertical data shows strong signs of pump wear. Pump needs attention soon.



CLASS II Press 30 Unit 2

Pump inboard horizontal data indicates pump wear. Trend shows an increase in G's. Pump will attention as scheduling allows.



CLASS III Press 20 Unit 2

Dominant high vibration in Pump 3 vertical appears to be 1 x rpm. Pump 2 has some high 1 x rpm vibration but not as high in amplitude. This could be due to imbalance, bent shaft, loose bolts, or coupling issue. Check pump for these issues as soon as possible.

Abbreviated Last Measurement Summary

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Database: US FARATHANE.rbm
Area: FRONT LINE

MEASUREMENT POINT		OVERALL LEVEL	HFD / VHFD
1B	- PRESS 1B	(01-Jul-24)	
		OVERALL LEVEL	1K-20KHz
	MOH	.072 In/Sec	.311 G-s
	MIH	.054 In/Sec	.326 G-s
	MIA	.072 In/Sec	.537 G-s
	P1H	.036 In/Sec	.348 G-s
	P1V	.046 In/Sec	.217 G-s
	P2H	.070 In/Sec	.645 G-s
	P2V	.055 In/Sec	.599 G-s
5B	- PRESS 5B	(01-Jul-24)	
		OVERALL LEVEL	1K-20KHz
	MOH	.198 In/Sec	.150 G-s
	MIH	.071 In/Sec	.226 G-s
	MIA	.210 In/Sec	.219 G-s
	P1H	.129 In/Sec	.174 G-s
	P1V	.216 In/Sec	.280 G-s
	P2H	.149 In/Sec	.408 G-s
	P2V	.163 In/Sec	.697 G-s
7B	- PRESS 7B	(01-Jul-24)	
		OVERALL LEVEL	1K-20KHz
	MOH	.058 In/Sec	.174 G-s
	MIH	.068 In/Sec	.140 G-s
	MIA	.054 In/Sec	.184 G-s
	P1H	.059 In/Sec	.167 G-s
	P1V	.164 In/Sec	.250 G-s
	P2H	.118 In/Sec	.479 G-s
	P2V	.109 In/Sec	.542 G-s
3-1	- PRESS 3 UNIT 1	(01-Jul-24)	
		OVERALL LEVEL	1K-20KHz
	MOH	.046 In/Sec	.163 G-s
	MIH	.040 In/Sec	.240 G-s
	MIA	.055 In/Sec	.312 G-s
	PIH	.114 In/Sec	.688 G-s
	PIV	.097 In/Sec	.608 G-s
	PIA	.031 In/Sec	.516 G-s
3-2	- PRESS 3 UNIT 2	(01-Jul-24)	
		OVERALL LEVEL	1K-20KHz
	MOH	.022 In/Sec	.156 G-s
	MIH	.025 In/Sec	.212 G-s
	MIA	.039 In/Sec	.322 G-s
	PIH	.036 In/Sec	.263 G-s
	PIV	.040 In/Sec	.489 G-s
	PIA	.030 In/Sec	.332 G-s
4-1	- PRESS 4 UNIT 1	(01-Jul-24)	
		OVERALL LEVEL	1K-20KHz
	MOH	.055 In/Sec	.289 G-s
	MIH	.048 In/Sec	.344 G-s
	MIA	.049 In/Sec	.486 G-s
	PIH	.070 In/Sec	.782 G-s
	PIV	.041 In/Sec	.441 G-s
	PIA	.117 In/Sec	.470 G-s
4-2	- PRESS 4 UNIT 2	(01-Jul-24)	
		OVERALL LEVEL	1K-20KHz
	MOH	.046 In/Sec	.368 G-s
	MIH	.065 In/Sec	.494 G-s

MIA	.137 In/Sec	.337 G-s
PIH	.100 In/Sec	.508 G-s
PIV	.096 In/Sec	1.926 G-s
PIA	.063 In/Sec	.438 G-s

7 - PRESS 7 (01-Jul-24)

	OVERALL LEVEL	1K-20KHz
MOH	.110 In/Sec	.502 G-s
MIH	.067 In/Sec	1.021 G-s
MIA	.042 In/Sec	.792 G-s
P1H	.143 In/Sec	.729 G-s
P1V	.162 In/Sec	3.680 G-s
P2H	.147 In/Sec	.627 G-s
P2V	.109 In/Sec	.675 G-s

34 - PRESS 34 (01-Jul-24)

	OVERALL LEVEL	1K-20KHz
MOH	.029 In/Sec	.154 G-s
MIH	.027 In/Sec	.239 G-s

9 - PRESS 9 (01-Jul-24)

	OVERALL LEVEL	1K-20KHz
MOH	.057 In/Sec	.274 G-s
MIH	.093 In/Sec	.525 G-s
MIA	.088 In/Sec	1.148 G-s
P1H	.080 In/Sec	.787 G-s
P1V	.066 In/Sec	1.116 G-s
P2H	.101 In/Sec	.939 G-s
P2V	.080 In/Sec	.531 G-s

10 - PRESS 10 (01-Jul-24)

	OVERALL LEVEL	1K-20KHz
MOH	.058 In/Sec	.520 G-s
MIH	.074 In/Sec	.552 G-s
MIA	.039 In/Sec	.939 G-s
P1H	.112 In/Sec	.508 G-s
P1V	.106 In/Sec	1.120 G-s
P2H	.162 In/Sec	.438 G-s
P2V	.154 In/Sec	2.671 G-s

11 - PRESS 11 (01-Jul-24)

	OVERALL LEVEL	1K-20KHz
MOH	.047 In/Sec	.190 G-s
MIH	.058 In/Sec	.373 G-s
MIA	.029 In/Sec	.725 G-s
PIH	.050 In/Sec	.645 G-s
PIV	.099 In/Sec	1.320 G-s
PIA	.025 In/Sec	.787 G-s

Area: BACK LINE

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD

13 - PRESS 13 (01-Jul-24)

	OVERALL LEVEL	1K-20KHz
MOH	.106 In/Sec	.379 G-s
MIH	.120 In/Sec	.468 G-s
MIA	.033 In/Sec	.723 G-s
PIH	.143 In/Sec	1.469 G-s
PIV	.089 In/Sec	.778 G-s
PIA	.047 In/Sec	.986 G-s

14A-1 - PRESS 14A UNIT 1 (01-Jul-24)

	OVERALL LEVEL	1K-20KHz
MOH	.209 In/Sec	.698 G-s
MIH	.194 In/Sec	.932 G-s
MIA	.201 In/Sec	.831 G-s

	P1H	.185 In/Sec	2.045 G-s
	P1V	.137 In/Sec	2.198 G-s
	P2H	.142 In/Sec	1.908 G-s
	P2V	.129 In/Sec	2.446 G-s

14A-2 - PRESS 14A UNIT 2 (01-Jul-24)

	OVERALL LEVEL	1K-20KHz
MOH	.073 In/Sec	.975 G-s
MIH	.118 In/Sec	.899 G-s
MIA	.184 In/Sec	.610 G-s
P1H	.201 In/Sec	.928 G-s
P1V	.075 In/Sec	.305 G-s

15-2 - PRESS 15 UNIT 2 (01-Jul-24)

	OVERALL LEVEL	1K-20KHz
MOH	.053 In/Sec	.233 G-s
MIH	.032 In/Sec	.189 G-s
MIA	.063 In/Sec	.113 G-s
P1H	.075 In/Sec	.451 G-s
P1V	.085 In/Sec	.433 G-s
P2H	.058 In/Sec	.850 G-s
P2V	.061 In/Sec	.607 G-s
P3H	.087 In/Sec	2.384 G-s
P3V	.085 In/Sec	2.082 G-s

18-2 - PRESS 18 UNIT 2 (01-Jul-24)

	OVERALL LEVEL	1K-20KHz
MOH	.048 In/Sec	.288 G-s
MIH	.068 In/Sec	.148 G-s
MIA	.037 In/Sec	.558 G-s
P1H	.095 In/Sec	3.779 G-s
P1V	.159 In/Sec	4.042 G-s

33-1 - PRESS 33 UNIT 1 (01-Jul-24)

	OVERALL LEVEL	1K-20KHz
MOH	.089 In/Sec	.558 G-s
MIH	.051 In/Sec	.629 G-s
MIA	.078 In/Sec	.945 G-s
P1H	.214 In/Sec	2.319 G-s
P1V	.216 In/Sec	.156 G-s

33-2 - PRESS 33 UNIT 2 (01-Jul-24)

	OVERALL LEVEL	1K-20KHz
MOH	.084 In/Sec	.137 G-s
MIH	.058 In/Sec	.313 G-s
MIA	.045 In/Sec	.553 G-s
P1H	.046 In/Sec	1.183 G-s
P1V	.063 In/Sec	1.019 G-s
P2H	.145 In/Sec	1.511 G-s
P2V	.069 In/Sec	2.283 G-s
P3H	.284 In/Sec	1.516 G-s
P3V	.195 In/Sec	1.221 G-s

30-1 - PRESS 30 UNIT 1 (01-Jul-24)

	OVERALL LEVEL	1K-20KHz
MOH	.073 In/Sec	.534 G-s
MIH	.082 In/Sec	.493 G-s
MIA	.135 In/Sec	1.149 G-s

30-2 - PRESS 30 UNIT 2 (01-Jul-24)

	OVERALL LEVEL	1K-20KHz
MOH	.268 In/Sec	.148 G-s
MIH	.232 In/Sec	.188 G-s
MIA	.047 In/Sec	.644 G-s
P1H	.173 In/Sec	2.205 G-s
P1V	.181 In/Sec	1.806 G-s
P2H	.253 In/Sec	3.791 G-s
P2V	.244 In/Sec	4.945 G-s
P3H	.376 In/Sec	.762 G-s
P3V	.222 In/Sec	.918 G-s

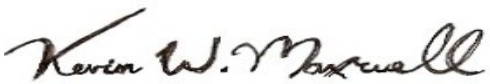
29-1	- PRESS 29 UNIT 1	(01-Jul-24)	
		OVERALL LEVEL	1K-20KHz
	MOH	.052 In/Sec	.232 G-s
	MIH	.066 In/Sec	.438 G-s
	MIA	.108 In/Sec	.855 G-s
	P1H	.083 In/Sec	1.022 G-s
	P1V	.107 In/Sec	1.501 G-s
	P2H	.200 In/Sec	3.751 G-s
	P2V	.155 In/Sec	.977 G-s
	P3H	.220 In/Sec	.945 G-s
	P3V	.276 In/Sec	1.324 G-s
29-2	- PRESS 29 UNIT 2	(01-Jul-24)	
		OVERALL LEVEL	1K-20KHz
	MOH	.241 In/Sec	1.585 G-s
	MIH	.202 In/Sec	.539 G-s
	MIA	.081 In/Sec	.625 G-s
	P1H	.129 In/Sec	1.438 G-s
	P1V	.031 In/Sec	.591 G-s
20-1	- PRESS 20 UNIT 1	(01-Jul-24)	
		OVERALL LEVEL	1K-20KHz
	MOH	.080 In/Sec	.233 G-s
	MIH	.094 In/Sec	.214 G-s
	MIA	.068 In/Sec	.655 G-s
	P1H	.050 In/Sec	.374 G-s
	P1V	.270 In/Sec	.680 G-s
	P2H	.296 In/Sec	.620 G-s
	P2V	.372 In/Sec	.498 G-s
20-2	- PRESS 20 UNIT 2	(01-Jul-24)	
		OVERALL LEVEL	1K-20KHz
	MOH	.089 In/Sec	.247 G-s
	MIH	.063 In/Sec	.330 G-s
	MIA	.172 In/Sec	.216 G-s
	P1H	.193 In/Sec	.585 G-s
	P1V	.216 In/Sec	.412 G-s
	P2H	.258 In/Sec	.590 G-s
	P2V	.457 In/Sec	.745 G-s
	P3H	.813 In/Sec	.420 G-s
	P3V	1.071 In/Sec	.303 G-s

Clarification Of Vibration Units:

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

As always, it has been a pleasure to serve US Farathane-Jackson, TN. If there are any comments or questions, do not hesitate to contact us.

Sincerely,



ISO Certified Vibration Analyst, Category III

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