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RELIABILITY MAINTENANCE SOLUTIONS

Case Study
Pump Blockage Problem

Automotive Manufacturing

The Challenge

- The client was experiencing repetitive blockage problems on vertical pumps and was unable to accurately identify and resolve the issue ahead of pump failure

- Sensoteq Kappa sensors were installed to monitor machine health and a detailed vibration report was actioned to diagnose the problem

- Automated alarms were set up at each pump, acting to alert the site manager to potential blockages which would break vanes and cause irreparable damage

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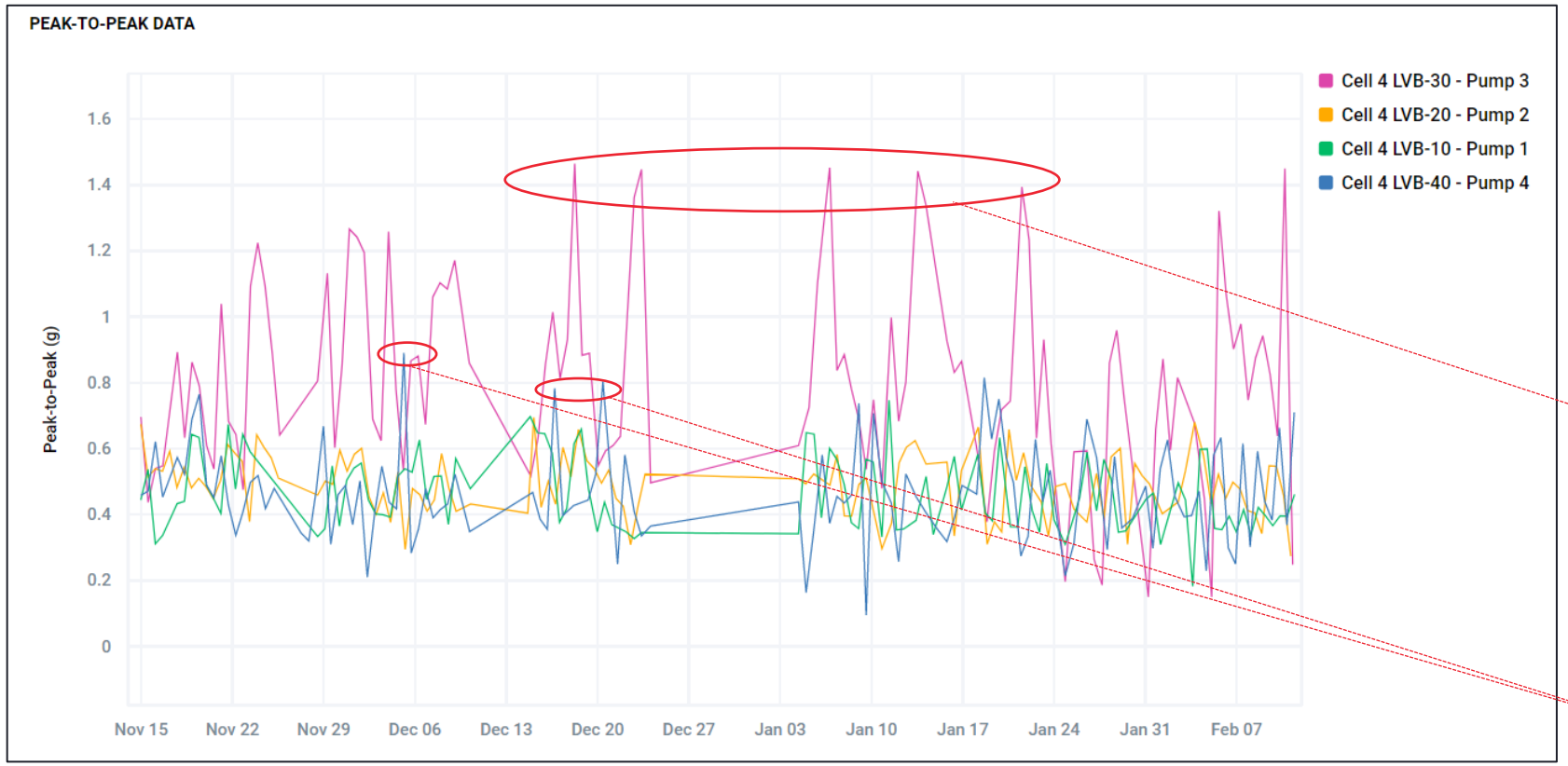
Analysis



- Peak vibration is a key indicator of impacting in the waveform. The OA Vibration graph plots Peak to Peak data from each machine under surveillance at a site level
- The graph indicates an anomaly at Pump 3, which exhibits significantly more peak vibration at 1.46g vs around 0.5g for the other pumps
- Pump 4 displays periodic peaks at 0.89g

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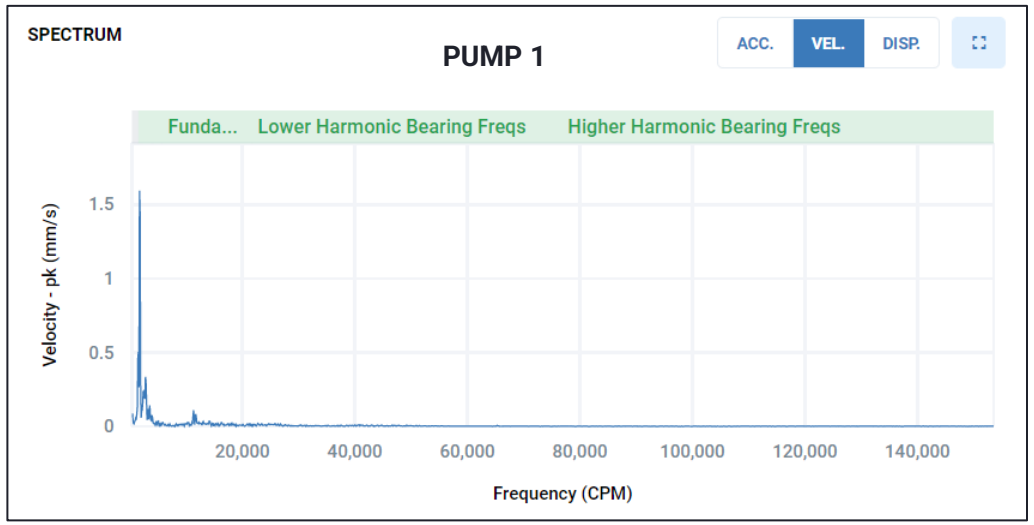
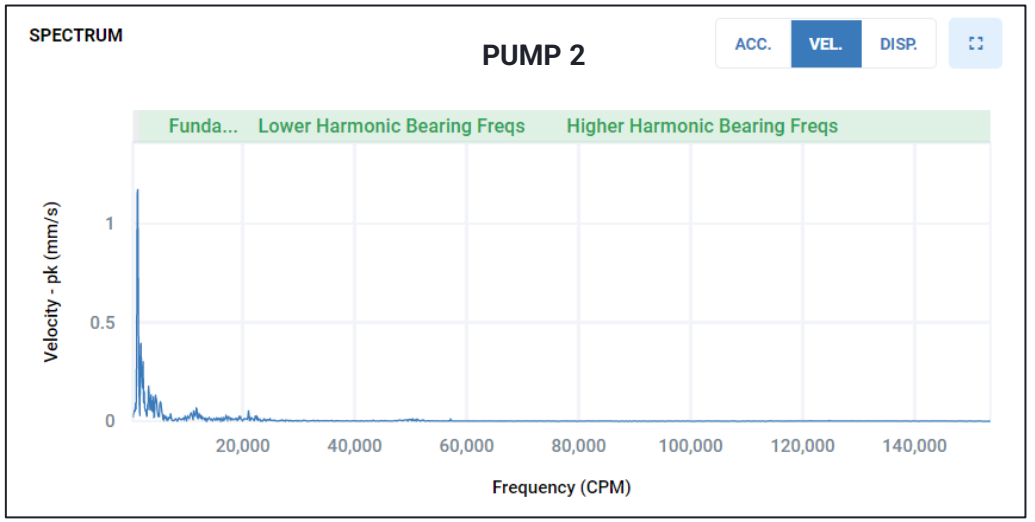
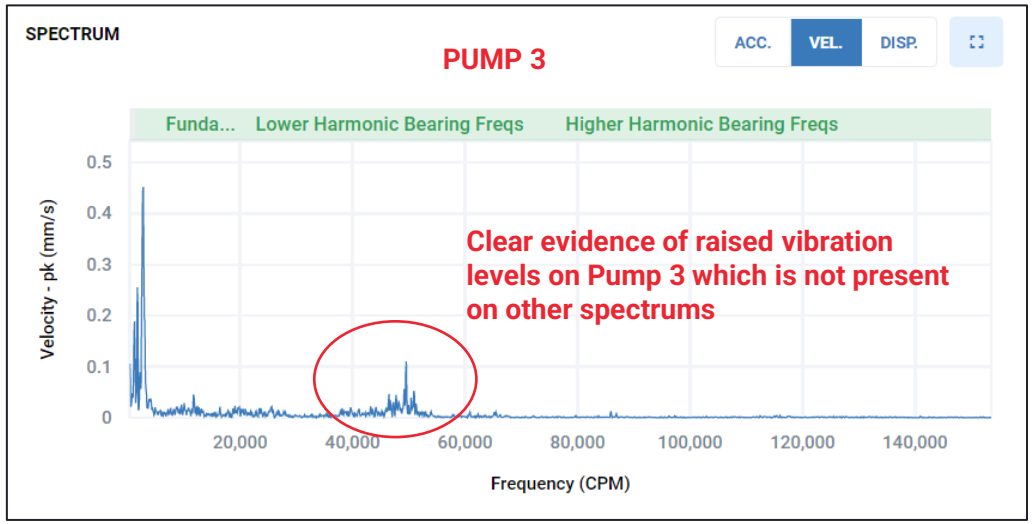
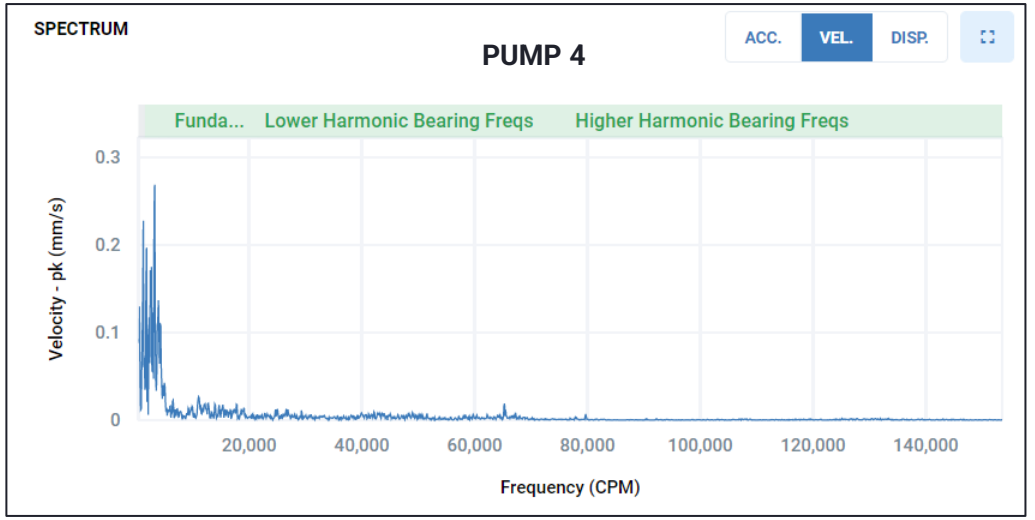
Vibration Spectrum









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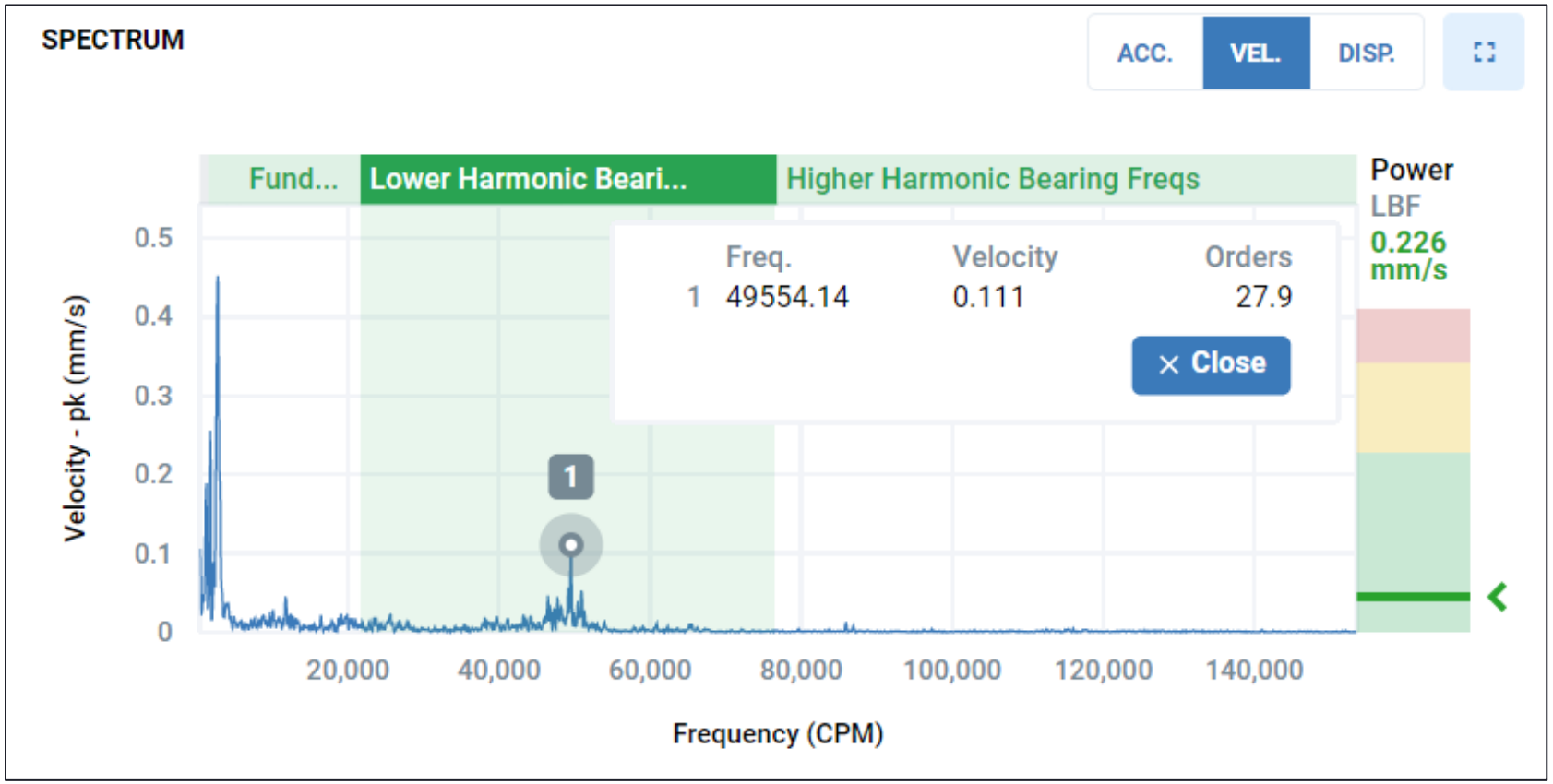

- On closer inspection the Vibration Spectrum depicts a raised noise floor with no clear side bands at approximately 27.9xRPM
- This is within the Lower Harmonic Bearing Frequency Band. Both Peak to Peak and Lower Harmonic Bearing Frequencies provide indication of suspected faults occurring at Pump 3
- This could be evidence of
  - Cavitation
  - Debris
  - Surges in liquid supply

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Action

- Maintenance inspection of the pump identified the culprits of blockage problems

← The items pictured were removed from the pump

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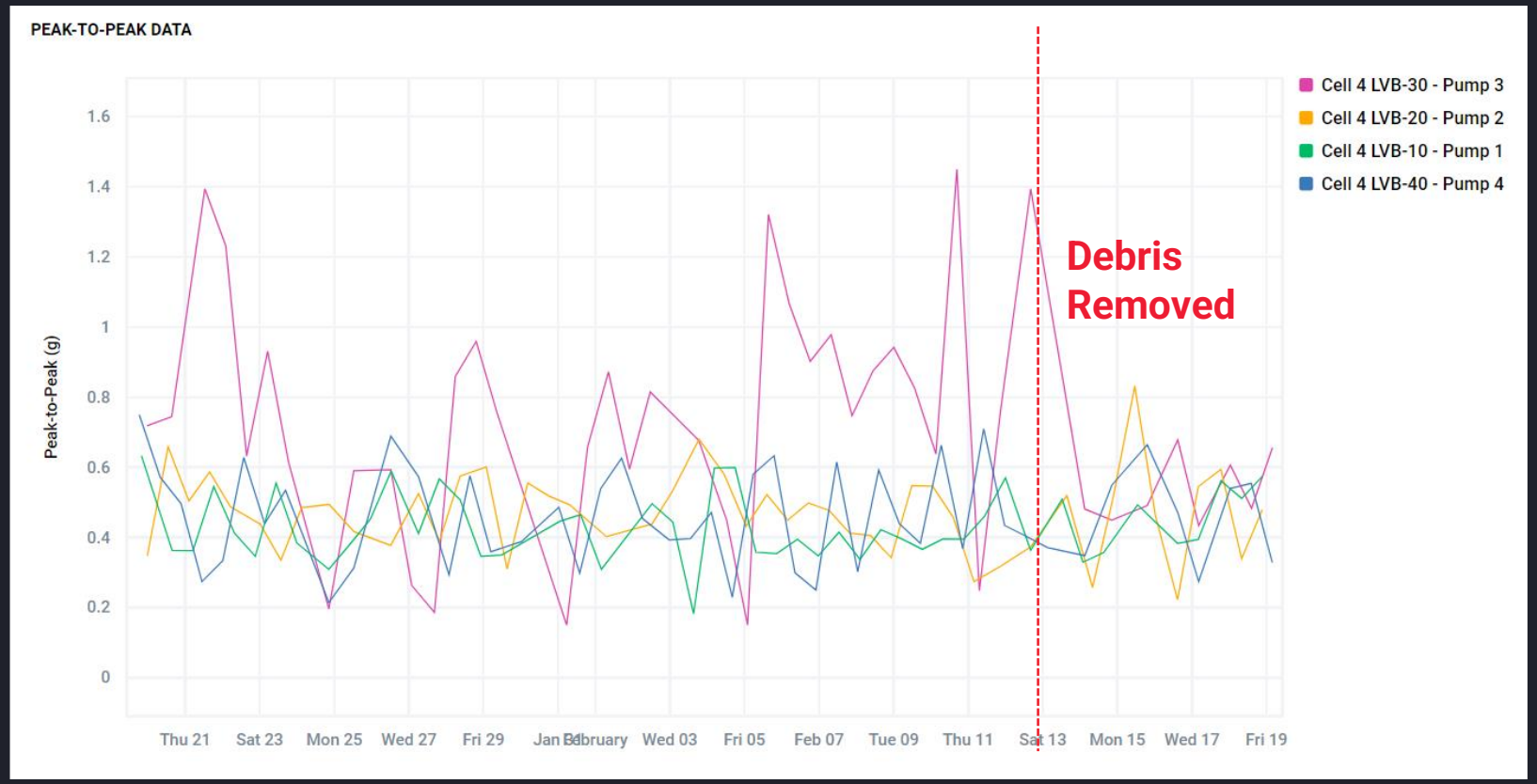

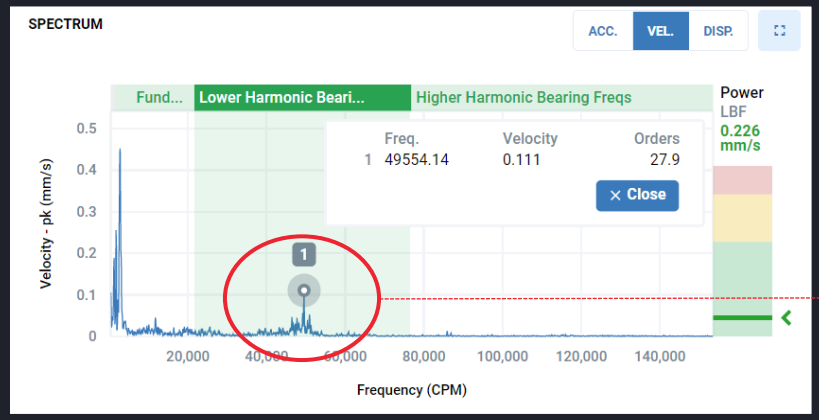

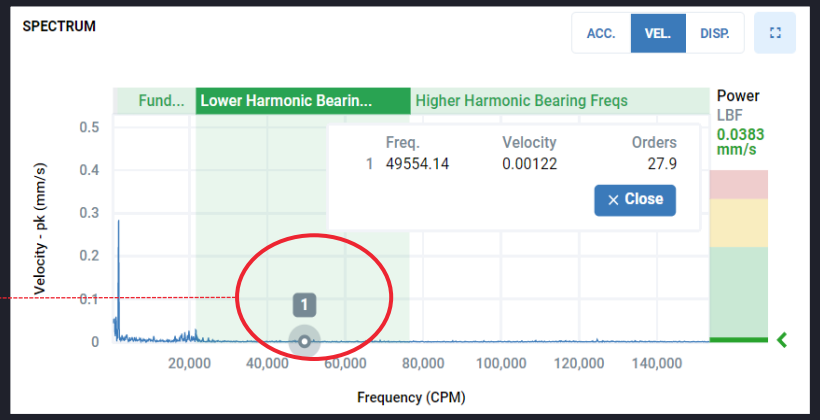

Result

- With debris removed Peak to Peak vibration fell to within normal levels
- The raised noise floor in the lower harmonic bearing frequency disappeared

Conclusion

- By detecting debris blockages early, irreparable pump breakage is avoided
- Machine Health Monitoring was implemented on all 80 pumps site-wide

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FURTHER INFORMATION

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