CASE

Excessive vibrations on a dredge pump

When excessive vibrations disrupted production on a trailing suction hopper dredger, Royal IHC's Measurements & Diagnostics Services provided a clear analysis and solution in just one day, ensuring safe and efficient operations

Customers challenge

A client experienced excessive vibrations (up to 50mm/s RMS) in its inboard dredge pump and discharge pipe, leading to fatigue cracks. This limited the pump's operational speed and negatively impacted production capacity. Adding structural supports to the piping turned out an unsuccessful attempt. A quick and effective solution was critical to restoring full functionality without compromising safety.

Our approach

Our team of specialists in Life Cycle Engineering, Measurements & Diagnostics, and Dredge Equipment collaborated to investigate the issue. Initially, air entrapment in the dredge pipe system was suspected, and modifications to the air-breathing functionality were recommended. However, this did not resolve the problem.

To dig deeper, one of our diagnostic engineers was mobilised to take onboard vibration measurements. After an initial water pumping test showed no anomalies, the focus shifted to the dredging process. The vibrations appeared sporadic, leading our experts to suspect gas pockets in the soil as the root cause.

Vibration measurement with hand-held spectrum analyser

Royal IHC

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Root cause

Discussions with the crew confirmed that the dredging area was known for gas pockets, which caused the intermittent high vibrations, even though the vessel was equipped with a special degassing installation. A preliminary test with a higher vacuum setting indicated a positive effect. Therefore, further monitoring and optimization of this auxiliary system's functionality was recommended to prevent similar issues in the future.

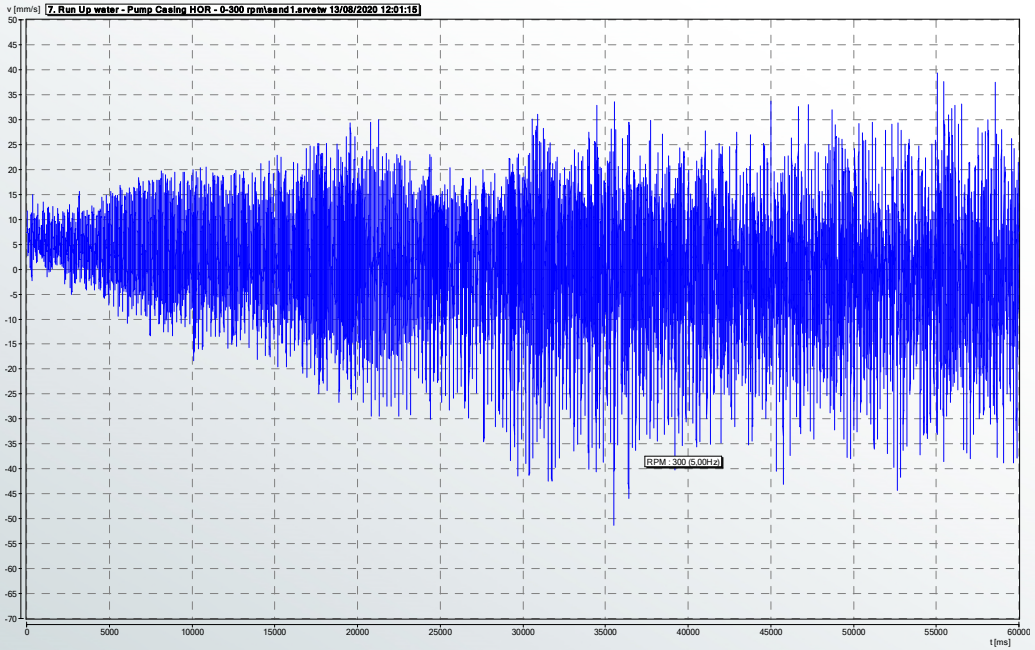
Results & Key Takeaways

Root cause resolved: Gas pockets were identified as the primary cause, ruling out significant mechanical issues like resonance or imbalance.

Swift diagnosis: Our team completed the analysis within one day, with no disruption to ongoing operations.

Specialised expertise: Deep knowledge of dredging processes was essential in diagnosing this vibration issue effectively.

Onsite insight: Being physically present onboard allowed our engineer to gather critical context and expedite the solution.



Time signal result showing the randomness of vibrations.

Ready to solve your challenges?

If you're facing operational or reliability challenges with your critical equipment, contact us today to discover how our team Measurements & Diagnostics Services can optimise your performance and reduce downtime.

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