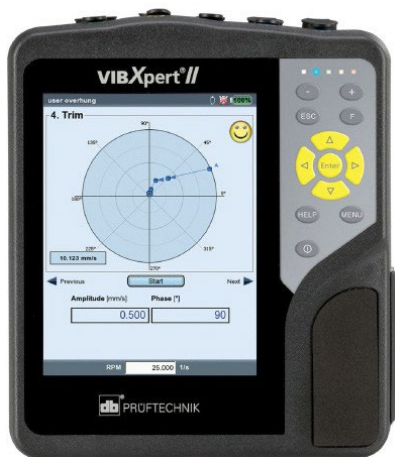


# SUMMIT WATER

# Pump Vibration Analysis

The importance of asset management is growing and playing an important role in infrastructure spending, grant and decision making. For example, pump vibration reduction and the proper balancing of rotating equipment will reduce life cycle costs and the likelihood of critical equipment breakdown.

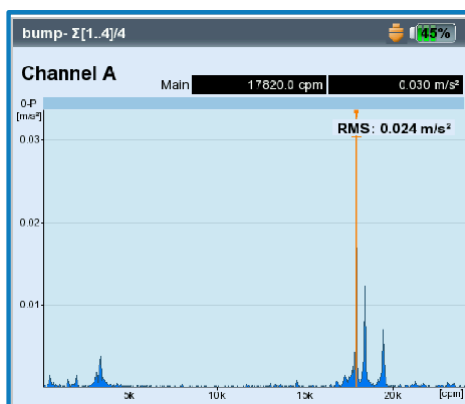


Vibration is a common problem found in both pumps and motors, particularly motors installed at the top of vertical turbine pumps. A variety of sources, including the pump, motor, coupling, bearings, impellers or shaft, can directly cause imbalance and the resulting vibration.

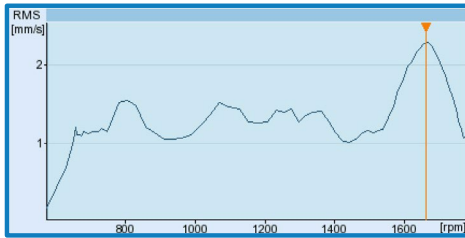
In addition, the increased use of VFDs (variable frequency drives) has made resonance problems more prevalent. When rotating equipment is operated through a range of speeds, the pump's operating frequency may align with the system structure's natural frequency, resulting in amplification of vibrations. Pump vibration analysis may also help identify other potential pump

vibration sources, including piping and associated support deficiencies, grouting or hydraulic disturbances.

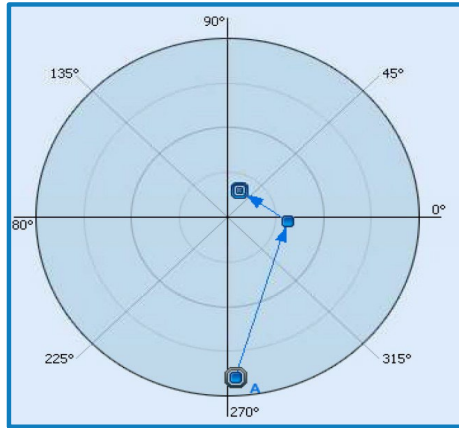
Using high performance balancing equipment, Summit Water provides a complete diagnostic approach to your pump installation. We provide:



Bump Test to determine if the system structure has a natural frequency that interferes with pump frequencies



Ramp Up/Ramp Down test to determine at what speed the highest vibration occurs. This is an effective tool for VFD applications



On vertical turbine pumps we do a motor balance to lower the vibration levels of pump and motor

SERVICE PROGRAMS ALSO INCLUDE COMPLETE REPORTING, DOCUMENTATION, CHARTING AND RECOMMENDATIONS.

#### KEY BENEFITS OF VIBRATION ANALYSIS AND PUMP BALANCING FOR COMMISSIONING AND AS PART OF AN ONGOING SERVICE PROGRAM FROM SUMMIT WATER

- A cost effective regular maintenance program is easy to budget for on a yearly basis, and overall life cycle costs are reduced
- Critical and emergency breakdowns are reduced by monitoring patterns of wear in the pump assembly and advising on required parts replacement
- Service and engineering staff at Summit Water are pump experts and understand the range of issues and dynamics of pump system operation

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