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A Vertical Pump Case History

# Resonance Analysis A Vertical Pump Case History

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## **Resonance Analysis A Vertical Pump**

External items in large vertical pumps that could excite a natural frequency are: Mechanical resonance is the tendency of a mechanical system to absorb more energy when the frequency of its oscillations (external excitation source) matches the system's natural frequency of vibration than it does at

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other frequencies.

## **Structural Resonance Problems on Vertical Pumps | Pumps ...**

Resonance, pump, vibration, impact test, stiffness, structure Background: The case history in this article is for a vertical cooling water pump delivering seawater from a bay to a power plant's

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heat exchangers. The maintenance activities implemented based on vibration analysis were quite inexpensive and brief in time

### **Resonance Analysis A Vertical Pump Case History**

- Suspected issue with structural resonance. In a vertical pump, the motor

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is a large cantilevered mass. The natural frequency associated with a cantilever mode is sometimes referred to as a reed critical frequency due to the mode shape being similar to that of a musical reed. If the pump motor combination

## **Vertical Pump Resonance Problem**

Level 1 Analysis - includes simple

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calculations using standard equations that may be performed with a hand calculator. Level 1 calculations involve significant simplifying assumptions. For example, calculating the structural resonance in vertical pumps, where foundations and bolted joints are assumed to be infinitely stiff.

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## **Lateral, Torsional and Structural Analyses of Pumps Can ...**

Resonance Analysis - a Vertical Pump Case Study This article written by Ali Al-Shurafa of Jubail Industrial College in Saudi Arabia describes a vibration analysis case study, examining resonance in a vertical pump used to deliver sea water to a power station's

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cooling towers.

## **Bearing and Vibration Analysis Articles**

Finite element analysis for structural modification and control resonance of a vertical pump 1. Introduction. The pumping system is the most important water system supplying water for

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irrigation and removing... 2. Problem description & task. In this research, dynamic measurements are evaluated for ...

## **Finite element analysis for structural modification and ...**

Torsional vibration analysis for vertical pump was performed. This pump is

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driven by induction motor, and, it utilizes a constant speed driver and is connected to the pump shaft via flexible coupling. This analysis computes torsional critical speed, mode shapes, torque response and transient analysis for train shaft.

## **Torsional Vibration Analysis for**

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## **vertical pump - INERTANCE**

A good example of this is the reed frequency vibration that often occurs with vertical turbine pumps that have a motor mounted on top of the discharge elbow. Machine components can also be resonant; there are many examples of two-pole electric motors where a resonant end bracket caused very high

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axial vibration at 1 x rpm or 2 x rpm.

## **Plant Engineering | Understanding of resonance essential ...**

The FDA warns of serious adverse events related to medication dosing inaccuracies associated with Implantable Infusion Pumps in the Magnetic Resonance (MR) Environment. ... the

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pump. An analysis ...

## **Safety Concerns with Implantable Infusion Pumps in the ...**

Good ODS software can make it easier to analyze phase and magnitude data from a large number of test points. Analysis of an ODS involves observation and interpretation of the machine in motion.

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Figure 14 is an ODS structure drawing of a vertical pump. Figure 14. Vertical Pump Operational Deflection Shape Structure Drawing. Conclusion

### **Phase Analysis: Making Vibration Analysis Easier**

Any attempt to solve vibration problems on vertical pump motors should begin

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with a basic frequency analysis using a portable vibration analyzer. In most cases, a single vibration frequency will be dominant — often at rotating speed. Then, by simple process of elimination, zero-in on the source of the problem.

### **Solving Motor Vibration Problems on Vertical Pumps | EC&M**

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Operating deflection shape (ODS) analysis. There are several common resonance mode shapes for vertical turbine pumps, one of which is shown with accompanying vibration vector data in Figure 1. In this case, flexure of the base plate is the source of the resonance, so corrective measures should be directed there.

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## **Limiting Vibration Issues in Vertical Turbine Pumps ...**

Any attempt to solve vibration problems on vertical pump motors should begin with a basic frequency analysis using a portable vibration analyzer. In most cases, a single vibration frequency will be dominant – often at rotating speed.

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Then, by simple process of elimination, users can zero in on the source of the problem.

## **Solve vertical pump motor vibration | Processing Magazine**

Vibration field data was measured on several large motor driven vertical cooling water pumps which experienced

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excessive wear of the impellers, wear rings and seals after a short period of operation. The data indicated that the problem was due to the operating speed being near the pump-motor system 61 mechanical natural frequency, which resulted in excessive vibration levels on the ...

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## **[PDF] Vibration Analysis Of Vertical Pumps. | Semantic Scholar**

Vertical Turbine Pumps Vertical Turbine Pumps 3 Goulds Vertical Turbine Pumps Pump Bowl Assembly The bowl assembly is the heart of the vertical turbine pump. The impeller and diffuser type casing are designed to deliver the head and capacity that your system requires in

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the most efficient way possible. The fact that the vertical

## **An ITT Brand Vertical Turbine Pumps**

Resonance analysis: Resonance analysis identifies all the natural vibrations and frequencies in machines. The presence of resonance means high vibration,

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which could reach damaging levels.  
Categories of Vibration Measurement.  
Overall level of vibration: You can think of checking the overall level of vibration like a "rough check" on a machine ...

## **Vibration Analysis Explained | Reliable Plant**

unit is operating on or near a system

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resonance and the vibration amplitudes are excessive. This paper presents an approach which can be taken to analyze vertical pump dynamics and investigates the effects of several factors which should be considered in order to accurately produce a mathematical model of the system. It also

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## **VIBRATIONAL PROBLEMS OF LARGE VERTICAL PUMPS AND MOTORS by**

...

Goulds Vertical Turbine Pumps 3 Goulds  
Vertical Turbine Pumpsev v Pump Bowl  
Assembly The bowl assembly is the  
heart of the vertical turbine pump. The  
impeller and diffuser type casing are  
designed to deliver the head and

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capacity that your system requires in the most efficient way possible. The fact that the vertical turbine pump can be multi ...

### **Vertical Turbine Pumps - Lenntech**

The high readings show a resonance problem at 1,200 cpm (the motor rpm) that occurred when a new sole plate was

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installed on a motor and pump. This was verified by a bump test (see sidebar for definition of Resonance). The supporting structure for the motor that elevated it to line up with the pump literally rang like a bell, resonating at ...

**Predictive Maintenance | Vibration analysis: What does it ...**

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In Vertical Pumps. Malcolm E. Leader  
Kelly J Conner Jamie D. Lucas Case Study  
#8 ... • Primary Vibration Component at  
1,750 CPM • Shaft Whirling or Whipping  
Suspected • Structural Resonance near  
 $\frac{1}{2} X$  • Solution. Pump Layout 164.  
Inches. Pump System 6 Vertical Pumps  
in 3 Separate Sumps Single Stage 81  
GPM 219 Ft Head 40 HP ...

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