



SERVICE BRIEF: Rotating Equipment Troubleshooting

Rotating equipment, with its multiple components and sub-assemblies, is subjected to varying vibrational forces. While certain levels of vibration are inherent to the normal operation of pumps, fans, gen-sets, and similar equipment – sometimes vibration levels become excessive. As vibration increases equipment and supporting structures are susceptible to cracks, fatigue and catastrophic failure putting machinery, production and worker safety at risk.

When troubleshooting rotating equipment it's critical to quickly determine the root cause of the problem(s). A cracked fan blade, bent shaft, or crumbling foundation may or may not be the result of poor design, manufacturing or installation. The culprit could be vibration originating from the unfavorable dynamic interaction of otherwise good systems/components. Testing and Analysis is used to determine the cause and correct the problem as effectively and quickly as possible.

The Key is to
Identify the
Root Cause &
Engineer an
Effective yet
Practical
Solution

6D's SYSTEM ANALYSIS APPROACH

When troubleshooting rotating equipment it's critical to adopt a system-level approach. Because each subassembly is generally designed and manufactured independently, little consideration may have been given to its interaction with other units when installed as a part of a larger system. Premature wear, excessive or abnormal maintenance, high vibration and/or structural cracking are indicators of a serious, potentially catastrophic issue that should be addressed immediately.

When symptoms of potential issues first appear, 6D can quickly identify the cause of the problem and recommend a solution that will allow the equipment to continue to operate at peak efficiency. 6D will:

- Utilize testing/analysis to determine the problem's root cause
- Develop corrective action and verify with analysis
- Support and validate implementation of the corrective action

In the field, equipment re-designs are rarely practical. What's important is getting the equipment back on-line by reducing vibration to safe/acceptable levels. Recommendations usually include stiffening of specific structural members, adding dampening, modifying couplings, and similar structural changes to allow the equipment to operate together more smoothly.

ROTATING EQUIPMENT

A History of Addressing Structural Dynamics Issues

6D founders and senior management were the original structural test and analysis engineers at SDRC (Structural Dynamics Research Corporation – now Siemens PLM). Here we pioneered many of the troubleshooting tools, technologies, and best practices now standard. Today we continue to apply our experience and expertise to help power plants, refineries, and similar facilities reduce and eliminate rotating equipment downtime.

Challenges & Experience

Across the board industries face similar challenges:

- Reducing unscheduled equipment downtime
- Minimizing maintenance costs
- Increasing throughput & productivity
- Enhancing product quality

We apply proven and evolving testing technologies and analysis tools to help meet these goals by solving vibration, noise, stress and fatigue-related problems in industrial processing equipment.

Our engineers have extensive experience with:

- Steel & Aluminum Mills
- Refineries
- Pulp & Paper Processing Mills
- Chemical & plastic processing
- Reciprocation-Driven Equipment
- Packaging Equipment
- Food Processing Equipment
- Pumps, Fans, Gen-Sets & More

Fast Response - Fast Answers

When key equipment fails – or is operating at less than full capacity – time is critical. We respond to emergency situations like nobody else. We'll identify the cause of the problem(s) and work with you to quickly implement a solution.

No matter if you're on an off-shore oil platform, deep underground, a secluded power generation facility, or just across town – our field troubleshooting services provide assistance to meet mechanical / structural engineering challenges anywhere and at anytime.

