**Systematic Mechanical Troubleshooting**

The focus of this course is systematic troubleshooting and getting to the source of the mechanical problem. Root cause analysis is taught so that the maintenance personnel can prevent reoccurring breakdowns that create excessive downtime. The participant will learn to focus energies on identifying the problem, the cause, and the best possible solution. An emphasis is placed on correcting mechanical problems to avoid excessive downtime. This course can be customized to focus on problem areas within your plant.

I. If its got nuts, bolts, gears, pulleys or bearings sooner or later it will give you trouble
    A. Diagnosis - Getting directly to the problem
    B. Root Cause Analysis - What caused the problem?
    C. Maintenance - What is the best plan to fix the problem?


II. Mechanical Troubleshooting - A skill worth learning
    A. The systematic approach to solving mechanical problems
        1. Bearing Failure Examples
        2. Belt Drive Systems - What to look for
        3. Gearing - How to find the problem fast
        4. Chain Drive Systems - What to look for


III.  Tools to Use and Tricks of the Trade
    A. Use Your Experience
    B. Be open to new methods
        1. Spot Radiometers
        2. Heat Thermography
        3.  Vibration Analysis
    C. Indicators of upcoming failures


IV. Don't Just Wait for Failures - Prevent Them
    A. Belt Drives
        1. How to visually spot a bad belt
        2. Inspect your pulleys to prevent belt failures
    B. Chain Drives

    1. What is acceptable chain wear?
    2. Are you using the correct chain for the job?
  C. Gear Drives
    1. Where to look first for a failure
    2. How to identify the problems inside a gearbox
  D. Bearings
    1. What to look for - find a bearing that is no failure mode
    2. Is this the bearings fault or can we improve the application?
  E. Pumps
    1. How to troubleshoot the condition of a centrifugal pump using
pressures.
    2. Positive Displacement pumps - what to look for


V. Mechanical Wrap-up – Tying it all together
  A. The mechanical system – Start to finish
  B. Root Cause Analysis – Preventing repeat failures