



## **Mechanical Reliability Seminar**

### **OBJECTIVES**

The techniques used to address mechanical components in the evaluation of System Reliability are both similar to and remarkably different from those used for Electrical components. This seminar describes these “Mechanically oriented” techniques highlighting the similarities and differences between the two disciplines.

### **WHO SHOULD ATTEND**

Mechanical Engineers, Design Engineers, and Electrical Engineers who want to better understand good design practices for achieving higher reliability in mechanical subsystems or systems.

### **OUTLINE**

- Mechanical Reliability
  - Role in Systems Reliability
  - Analogy to Electrical Reliability
  - Special tools and techniques
- Reliability Block Models for Mechanical Components
  - Using RBD's in Goal Setting
- Probability Distributions
  - Gaussian Distribution
  - Weibull
  - Exponential
- Finite Element Analysis (FEA)
  - Definition of FEA
  - Simulation Tools
  - Software Tools Available
- Tolerance and Worst Case Analysis (WCA)
  - Definition of WCA
  - Simulation Tools
  - Software Tools Available
- Tolerance and Worst Case Analysis (WCA)
  - Definitions
  - Methodology
- Probabilistic Design System (PDS)
  - Monte Carlo Simulation
  - PDS for Design for Six Sigma (DfSS)
- Mechanical Component failure Mechanisms
  - Stress Overload
  - Fatigue
  - Fracture – Brittle & Ductile

- Creep
- Wear
- Failure Analysis Techniques for Mechanical Reliability
  - Forensic Methodology
  - Failure Analysis Tools
- Other Topics related to Mechanical Reliability
  - Risk Analysis
  - Reliability Centered Maintenance
- Integrating Mechanical Reliability into a Reliability Program
  - Role of FEA
  - Effective testing of Mechanical Systems