

Reliability Training



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Practical Plant Failure Analysis - Earn up to 24 PDH Credits

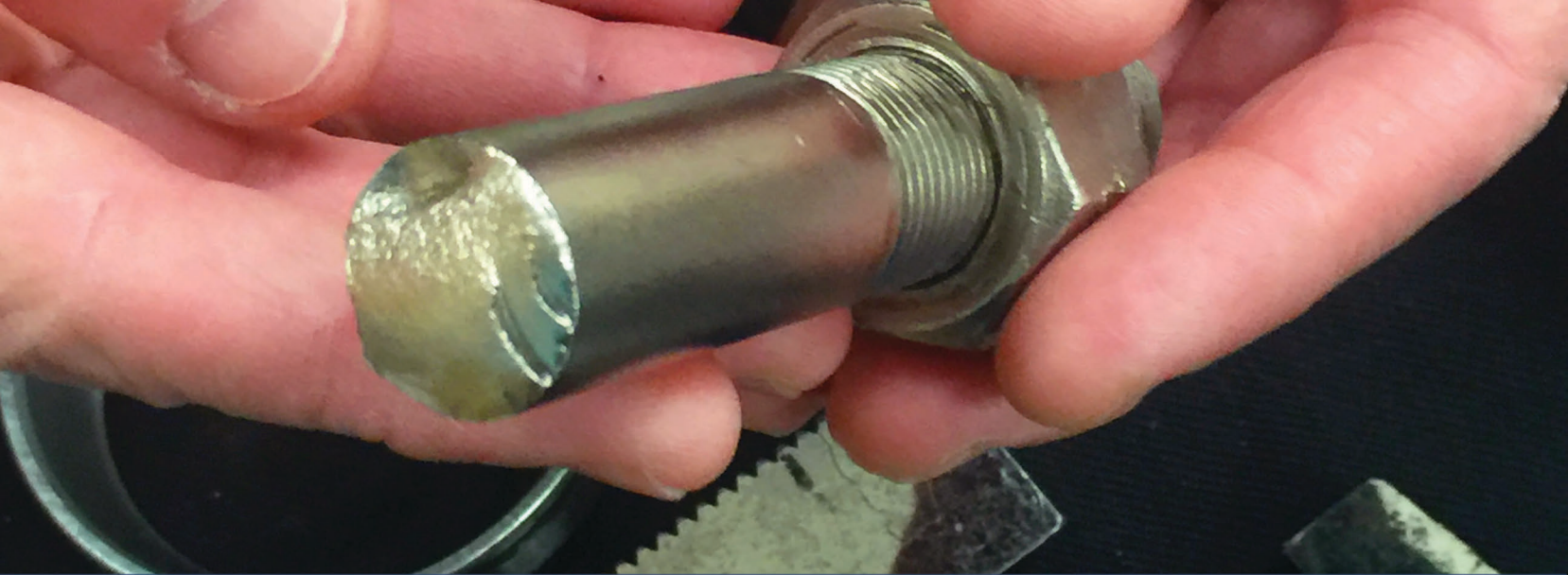
Our training course provides reliability engineers, plant engineers, maintenance mechanics, technicians, and supervisors the knowledge and skills required to understand and eliminate failures. With over 30 years of development, this course offers extensive hands-on experience to give students the opportunity to evaluate actual broken components.

The 1 - 3 day course is available at your facility or at our location in Marietta, Georgia and completely customizable to fit your needs. ATS Instructors are also field inspectors and certified in vibration, lubrication, and infrared.

Upon completion of the course participants will demonstrate the ability to:

- Lead a practical and systematic analysis to determine the physical and root cause of the failure
- Classify and understand the basic properties of materials including heat treatment and hardening
- Determine the causes of roller element bearing failure and what proactive methods can be used to prevent them
- Identify importance of material, strength, and proper torque practices of threaded fasteners
- Evaluate lubrication selection and usage in different applications
- Inspect power transmission elements and gears for unusual wear and degradation
- Understand the influence of corrosion in different materials (stainless vs carbon steels)
- Recommend corrective actions to prevent future failures





Course Modules

Day 1

- **The Roots of Failures:** Introduction to the differences between physical, human, and management system (latent) failure roots; the pervasive nature of human error; how failures always result from multiple causes
- **Materials:** Discussion about the basic properties of common materials of construction used in industrial plants
- **Fracture Analysis:** The differences between overload and fatigue as failure mechanisms. Introduction to the concepts of stress concentrations and residual stresses - showing how these factors result in different fracture appearances

Day 2

- **Fastener Failures:** A review of the importance of uniform tightening procedures and adequate clamping force, including a discussion of torque vs. tightness
- **Lubrication:** Introduce the 3 different lubrication regimes and how different loads require different lubricant properties. Discuss the thermal effects on lubrication quality. Discussion of proper viscosity specifications, lubrication additives, and lubrication frequencies
- **Roller Bearing Failure Analysis:** How rolling element bearings work and how they fail (Hertzian fatigue versus surface fatigue)

Day 3

- **Gears:** Discussion of materials of construction, the effect of loads and lubrication, and failure identification
- **Corrosion Recognition:** Review of factors that affect corrosion, material loss, and cracking damage
- **Power Transmission Elements:** Discussion of: V-Belts, Synchronous Belts, Chains & Coupling operation, and failure identification
- **Centrifugal Pumps:** Discussion of pump curve versus system curves and the common causes of pump failure



**We Take A
Closer Look!**

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