

Day 1 - Rotating Machinery Reliability Excellence Powerpoints 98 slides

See details and download at

[http://www.feedforward.com.au/Powerpoints/Reliability/machinery\\_reliability\\_Excellence.htm](http://www.feedforward.com.au/Powerpoints/Reliability/machinery_reliability_Excellence.htm)

#### COURSE OVERVIEW

First day - Cause of Rotating Machinery failures

Second day - Standards, condition monitoring and top-class maintenance

Third day - Shafts, bearings and seals for reliability excellence, Maintenance for reliability

Fourth day - Improving machinery reliability, reducing maintenance cost, sustaining RE integrity

What is 'Rotating Machinery Excellence'?

#### PLANT AND MACHINERY DOWNTIME COSTS

The True Cost of Failure

Where Profit is Lost in Business Processes

The Purpose of Business

Maintenance is an Economic Decision

Impact of Defects and Failures

Defect and Failure True (DAFT) Costs go Company-wide

Failure Costs Surge thru the Company

Separate the True Downtime Costs so you can see them for what they are

Calculating the True Downtime Costs

#### MACHINERY RISK MANAGEMENT

Understanding Risk and Its Consequences

Risk Calculations

The Shape of Risk

Risk Relationships

What Risk Means

Determine Your Acceptable Failure Domain

Maintenance is Used to Manage Risk

Benefits of Reducing Operating Risk

#### VARIATION, DEFECTS AND FAILURES

Defects and Failures Enter Your Business Everyday

Normal ways to Control Defects and Failures

Preventing Defects and Failures

The Trouble with Accepting a Defect

Defects Lead to Failures and High Costs

Act to Control the Defects and Risks

Problems, Defects and Failures start with Variation

Effects of Process Condition Disruptions

Special and Common Cause Variation

Preventing Process Condition Disruptions

#### MACHINERY DESIGN ISSUES

The Unforgiving Nature of Machine Design

Activity 1 - Design Shaft Rotor and Material Selection

The Slow Destroyers

Good Process Control Prevents Rapid Internal Equipment Changes

Supporting Structure and Foundation Strength and Rigidity

Vibration Basics

Forced Vibration

Natural Frequency

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Attenuation of Vibration  
Dissipating Loads and Forces  
Preventing Equipment Deformation  
Preventing Deformation from Pipe Stress  
Activity 2 - Soft Foot Case Study  
Soft Foot Case Study  
Soft Foot Distorts MOTOR Armature Air Gap

### ROTATING MACHINERY PARTS FAILURE

Causes of Shaft Failures  
Causes of Roller Bearing Failures  
Calculating L10 Lifetime  
Effects of Fluctuating Loads and Forces  
Lubrication Contamination  
Lubrication Contamination Control  
Tell-tale Bearing Failure Signs  
Causes of Contact Shaft Seal Failures

### ROTATING MACHINERY RELIABILITY

The Payoff is Reliability, Availability, Maintainability, Safety (RAMS)  
Equipment Degradation Cycle  
Equipment Life Extension  
Valuable Precision Maintenance  
Rotating Equipment Precision Maintenance  
Precision Maintenance of Rotating Equipment is ...  
Accuracy Controlled Enterprise (ACE) Procedures  
Activity 3 - Develop an ACE procedure

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rotating machinery, reliability excellence, powerpoints, powerpoint course, defect costs, true downtime cost, equipment failure, machinery downtime, machinery failures, process control, risk analysis, case study soft foot, control defects, true downtime

