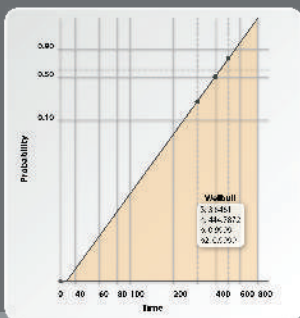
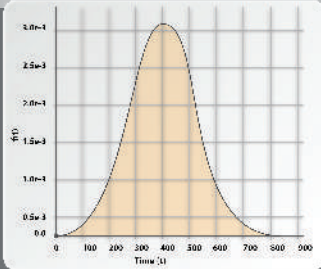


# RELIABILITY ENGINEERING APPLIED TO MAINTENANCE MANAGEMENT



CONSCIOUS  
RELIABILITY

## DESCRIPTION:



You will learn how to determine the predominant failure patterns of assets as revealed by statistical analyzes of failure events. You'll be able to make the best decisions by choosing the most convenient failure consequence management to better reduce the risks that affect your organization's objectives. The hands-on class allows you to apply various types of reliability analysis to real-world failure data to identify appropriate proactive tasks and their corresponding execution frequencies designed to make your maintenance program both operationally and economically successful.

**DURATION: 2 Days**

## Benefits:

- 1- Acquiring knowledge to apply several quantitative reliability tools.
- 2- Understanding the application of the Assets' Life Cycle concept.
- 3- Analyzing your plant's equipment failure events by using quantitatively reliability methods such as Weibull and RAM analyses.
- 4- Learning how to determine optimal replacement time for T tasks.
- 5- Defining optimal maintenance strategies based on failure statistical analysis
- 6- Understanding Condition Monitoring fundamentals and benefits
- 7- Determining optimal frequencies for CM tasks

## WHO SHOULD ATTEND:

Maintenance Managers, Maintenance Engineers, Reliability Engineers, Predictive Maintenance Technicians, Reliability Based Maintenance Practitioners and Maintenance Planners.

## OBJECTIVE:

**To provide Maintenance Management with the necessary tools for achieving sound decision-making regarding the maintenance and operations of physical assets.**

Any professional interested in achieving his/her organization's goals by improving plant asset's performance and reducing maintenance costs should attend this seminar.

## **I - Introduction to Reliability Centered Maintenance**

- What is RCM
- It's origins
- Applying the RCM Process
- RCM-R Process Diagram

## **II – Fundamentals of Maintenance and Reliability Engineering**

- Reliability
- Functions
- Failures
- Reliability as Probability
- MTTF and MTBF
- Failure phases / Human Analogy

## **III – Asset Life Cycle and System Reliability**

- The bathtub curve
- RAM Indicators Analysis
- What is the optimum reliability?
- Systems' Reliability
- Failure rate
- Probability destiny function
- Reliability function
- Maintenance personnel focus with reliability

## **IV – Failure Statistical Analysis Fundamentals**

- Histograms
- Cumulative probability of failure
- Weibull distribution parameters
- Weibull plots

## **V – Weibull Distribution Fundamentals**

- Distribution Formulae
- Plotting
- Reliability, Cumulative, Hazard and Density functions of Weibull

## **VI - Failure Data Analysis with Weibull**

- Weibull Probabilistic Plot Paper
- Weibull Parameters
- Plotting Age
- Median Rank
- Examples and Exercises

*Certification Issued  
by Conscious Reliability*

## **VII- Weibull Analysis (special cases)**

- Low Number of Failures
- Suspended Data
- Practice Exercises

## **VIII- Weibull Analysis with Software**

- Practice Exercise

## **IX - Maintenance Strategy Definition with Weibull**

- Premature, Random and Wearout Failures
- The Maintenance Plan

## **X – Preventive Replacement**

- ROOF Policy
- HBRP - Policy
- Block Replacement
- Financial Analysis of Capital Equipment Replacement

## **XI – Condition Monitoring Tasks Frequency Calculation**

- PF
- Failure Costs
- Inspection Costs
- Probability of Detection
- Task frequency

## **XII – Condition Monitoring Benefits**

- Techniques and Benefits