**Salt Lake City Seminar on Predicting & Improving Product Reliability**

**Predicting & Improving Product Reliability 2016 Seminar**

**Product Reliability Seminar 2016**

**Course "Predicting and Improving Product Reliability" has been pre approved by RAPS as eligible for up to 12 credits towards a participant's RAC recertification upon full completion.**

**Overview:**

Although a primary objective of reliability analysis is to improve product reliability, there are many possible reasons for collecting and analyzing reliability data. Several examples are the following:

* Assessing product reliability in the field
* Predicting product warranty costs
* Estimate replacement part/spares requirements
* Assessing the effect of a proposed design change
* Demonstrating product reliability to customers or government agencies
* Comparing components from multiple suppliers
* Comparing components from different production periods, operating environments, or materials
* Improving reliability through the use of laboratory experiments

Participants will gain awareness of the overall methodology for setting reliability targets, estimating product reliability from test data and/or field data, and determining whether or not reliability targets are achieved. Methods for estimating the reliability of subsystems and systems are also discussed. Participants will also learn how to calculate sample sizes for reliability testing and utilize reliability models to develop forecasts of future failures (e.g. warranty forecasts).

**Why should you attend?**

* Understand reliability concepts and unique aspects of reliability data
* Understand underlying probability and statistical concepts for reliability analysis
* Develop competency in the modeling and analysis of time-to-failure data
* Understand reliability metrics and how to estimate and report them
* Estimate reliability of subsystems and systems
* Determine if reliability specifications are met (at specified confidence level) or whether design improvements are required
* Develop competency in the planning of reliability tests (excluding ALT)
* Analyze existing warranty data to predict future returns
* Develop awareness of more advanced topics in Reliability

**Who will benefit:**

The target audience includes anyone with a vested interest in product quality and reliability

* Product Engineers
* Reliability Engineers
* Design Engineers
* Quality Engineers
* Quality Assurance Managers
* Project / Program Managers
* Manufacturing Personnel

**Agenda:**

**Day 1 Schedule**

Lecture 1:

**Reliability Concepts and Reliability Data**

* Reliability in Product and Process Development
* Unique Characteristics of Reliability Data
* Censored Data

**Probability and Statistics Concepts**

* Basic Probability Concepts
* Probability Distributions (e.g. Weibull, Lognormal, etc.)

Lecture 2:

**Probability and Statistics Concepts (cont'd)**

* Probability Distribution Functions
* CDF and Reliability Functions
* Reliability Metrics: Hazard Rate, Mean Time to Failure, Percentiles
* Conditional Reliability
* Burn-In (for Infant Mortality)

Lecture 3:

**Assessing ∓ Selecting Models (Distributions) for Failure Data**

* Probability Plotting with and without Censored Data
* Identifying the Best Distribution(s)
* Criteria for Comparing Models

Lecture 4:

**Estimation of Reliability Characteristics**

* Estimation Methods (Maximum Likelihood, Rank Regression)
* Reliability/Weibull Analysis (and other distributions)
* Precision of Estimates/Confidence Intervals

**Day 2 Schedule**

Lecture 1:

**Estimation of Reliability Characteristics (cont'd)**

* Handling Multiple Failure Modes
* Comparing Reliability of Different Groups

Lecture 2:

**Introduction to Reliability of Systems**

* Series Systems
* Parallel Systems
* K-out-of-n Systems
* Complex Systems
* Introduction to System Modeling, Reliability Allocation

Lecture 3:

**Introduction to Reliability Test Planning**

* Test planning regimes
* Reliability Estimation Test Plans
* Reliability Demonstration Test Plans
* Sample Sizes for Estimation and Demonstration Test Plans
* Sample Size / Testing Time Trade-offs

Lecture 4:

**Analysis of Warranty Data**

* Data Setup
* Identifying Models for Failure Data
* Forecasting Future Warranty Returns
* Non-Homogeneous Production Periods

**Speaker:**

**Steven Wachs**

**Principal Statistician, Integral Concepts, Inc**

**Steven Wachs** has 25 years of wide-ranging industry experience in both technical and management positions. Steve has worked as a statistician at Ford Motor Company where he has extensive experience in the development of statistical models, reliability analysis, designed experimentation, and statistical process control.

Steve is currently a Principal Statistician at Integral Concepts, Inc. where he assists manufacturers in the application of statistical methods to reduce variation and improve quality and productivity. He also possesses expertise in the application of reliability methods to achieve robust and reliable products as well as estimate and reduce warranty.

**Education**

M.A., Applied Statistics, University of Michigan, 2002

M.B.A, Katz Graduate School of Business, University of Pittsburgh, 1992

B.S., Mechanical Engineering, University of Michigan, 1986

**Location:** **Salt Lake City, UT Date: November 3rd & 4th, 2016 and Time: 9:00 AM to 6:00 PM**

**Venue: Hilton Garden Inn Salt Lake City Airport**

**Address: 4975 Wiley Post Way, Salt Lake City, Utah, 84116, USA**

**Price:** **$1,295.00 (Seminar Fee for One Delegate)**

**Register now and save $200. (Early Bird)**

Until September 20, Early Bird Price: $1,295.00 from September 21 to November 01, Regular Price: $1,495.00

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