

Reliability Engineering Applications for Productive Systems

Location to be determined

Workshop • Date will be advertised soon



Applications of the Most Powerful Tools in the Reliability Toolkit

In today's highly competitive and cost conscious environment, companies are turning their full attention to reliability strategies to drive higher levels of availability, utilization of asset and reduction in maintenance cost. **Is your organization prepared?**

THIS FOUR DAY INAUGURAL RELIABILITY BASED SEMINAR FOCUSES ON:

- Methods to achieve high reliability and availability through **strategic application of scientific techniques.**
- Reliability techniques **for improving reliability and availability** of productive systems and **reduce the cost** associated with unreliability.
- Outlining information for understanding why reliability data is an essential tool for executing maintenance strategy, and **improving productivity.**
- **Identifying tools or techniques** for evaluating and monitoring equipment production histories and downtime.
- **Reducing time and cost delay** by effectively implementing plant's reliability program.
- **Practical application of reliability methods** that prioritize equipment and maintenance problems.
- **Recommendations of reliability models** that can be applied to improve reliability and availability of the productive system.
- Providing information for **developing strategic reliability and maintenance programs** to boost production efficiency. Application of **reliability based maintenance** concepts to current maintenance strategy.
- Demonstrating how the cost associated with productive system equipment failures and downtime applies to the overall cost of unreliability and how this **impacts profitability.**

AVAILABLE AS AN ON SITE COURSE





WORKSHOP INFO.

Are you getting the most out of your plant asset?

High maintenance cost, less than optimum equipment and process reliability are major concerns in today's process industries. Now you can transform your maintenance engineering knowledge into best practice with training in reliability engineering applications. Information acquired from this training can be used to define future improvement efforts and set expectation from team members.

This four day, comprehensive, hands-on seminar, designed for both the new and seasoned practitioner, provides you with all the tools you need to help you initiate your reliability analysis. Learn the development and use of reliability engineering techniques and applications for improving reliability in industries.

As the global market changes and competition in the market place escalate there is less tolerance for high maintenance cost or unplanned downtime. Processing industries are experiencing the pressure of rising cost, global competition, and the need to improve work force efficiency and productivity.

Companies must ensure that their productive system is very reliable and is operating at a high level of availability. Reliability implementation has the greatest profit potential of any production or maintenance function - a guaranteed way to quickly improve availability performance and profitability.

Based on **current reliability practice and proven application** coupled with our vast expertise, we provide you with information and activities to better equip you to implement reliability program plan for your plant. These interactive sessions include information on developing a reliability model, analyzing failure data and making decisions relevant to the improvement of reliability, maintenance, and availability.

We present real world illustrations of fundamental reliability technique that will help you **increase productivity** and lower overall cost – which means faster repairs, less downtime and **greater availability**. Reliability application in productive system is of paramount importance in high performance organization. Let us help you achieve great success through practical reliability application that will enable you to become the best of the best.

Productive Systems Reliability Engineering Application

Who should participate in the training?

Production Supervisors: The training exposes them to new tools for understanding how reliability applications can improve reliability of processes. They will learn how to influence improvement in availability, and how they can assist in reducing process failures.

Maintenance Engineers: will identify new engineering modeling techniques for predicting reliability of process based on how equipment is operated and maintained for justifying equipment reliability.

Managers: will determine that the business aspect of reliability applications is helpful for measuring improvement in process and equipment to reduce cost of unreliability associated with equipment availability.

Maintenance Planning Personnel: They will find reliability tools and techniques helpful for understanding failure data in their CMMS systems, and how failure data is used to justify making equipment more reliable as a business decision.

Process Engineers: They will learn how to influence improvements in availability, how they can assist in reducing process failures, and how they can calculate the cost of unreliability for making business decisions to attack problems of unreliability

Reliability Engineers: will learn how to approach reliability as a collaborative process between management, design, process operations and maintenance.

Prerequisites

1. Basic understanding of probability and statistics
2. Basic knowledge of maintenance strategies



Improve Productivity [20% - 25%], Reduce Risk, Vulnerability, & Maintenance Cost [25% - 30%]



LEARNING OBJECTIVES

Upon completion of this training participant shall be able to:

- Develop basic understanding of applying statistical concepts and distribution for reliability data analysis.
- Outline how the application of RCM technique can be applied to managed failure and risk to meet specific business goals [MTBF specifications, Maximum downtime allowed].
- Demonstrates how maintenance impacts reliability.
- Recognize reliability specification.
- Distinguish between the different concepts of availability and determine system availability.
- Identify reliability strategy for optimizing maintenance
- Select the appropriate data collection method for documenting failure data.
- Develop general understanding of how reliability techniques are applied in production environment.
- Apply reliability method to determine if current maintenance strategy is optimal.
- Utilized reliability application to quantify risk associated with failure event.
- Identify and apply methods for analyzing repairable system.
- Utilized statistical application such as Weibull analysis to evaluate failure data.
- Apply maintainability techniques to predict MTTR.
- Perform a quantitative evaluation of the Fault Tree.
- Predict failure using data from existing maintenance record.
- Utilize reliability data to establish optimum maintenance schedule for planned shutdown.
- Utilize reliability data to identify potential catastrophic and critical failures.
- Develop a reliability model for their plant or production system.
- Determine the appropriate data to collect for reliability analysis.
- Develop a model that can be utilized for improving reliability of their production system.
- Determine cost associated with unreliability of productive system.
- Evaluate failure associated with production system and determine reliability.
- Determine production line availability.



RELIABILITY



PRODUCTIVITY



Seminar Content * Course Code – PSREA 401

DAY 1 - Date will be advertised soon

8:30 - REGISTRATION & MORNING COFFEE

9:00 - CHAIRMAN'S OPENING REMARKS

9:15 AM - MODULE 1

Introduction to Reliability Concepts

- Key reliability considerations in productive systems
- What is reliability / Definition of reliability
- Operational reliability
- Reliability Engineering
- Typical manufacturing reliability related measures
- Basic definitions of reliability
- Drivers of reliability
- Need for reliability in manufacturing
- Reliability activities and product life cycle
- Cost benefits of investment in reliability
- Failure definition
- Understanding reliability specifications
- Why items or equipment fails
- Repairable and non-repairable system [Repair Policy]

10:50 AM - MODULE 2

Reliability Performance Reporting

- How to setup
- What metrics to track
- Design phase reliability tools
- Manufacturing phase reliability tools

11:30 AM - NETWORK LUNCH

12:30 PM - MODULE 3

Probability and Statistics for Reliability Application

- Introduction to Probability
- Discrete and continuous distribution
- Methods of estimating failures
- Using Hypothesis Testing to solve reliability problems
- WEIBULL Application and its use in reliability
- Software application for WEIBULL analysis
- Interactive exercise

3:05 PM - TEA AND NETWORKING

3:30 PM - MODULE 4

Productive System Reliability Models

- Models that illustrate basic series reliability
- Application of basic parallel reliability model
- Use of active redundancy to improve reliability
- Identification and application of models designated as standby redundancy
- K-out-of-n configuration application
- Interactive exercise

5:10 CHAIRMAN'S CLOSING REMARKS

DAY 2 - Date will be advertised soon

8:30 AM - REGISTRATION AND MORNING COFFEE

9:00 AM - CHAIRMAN'S OPENING REMARKS

9:15 AM - MODULE 5

Equipment Reliability Quantification

- Reliability Block Diagram [RBD] Modeling
- Reliability modeling and analysis of a plant or production system equipment
- Fault Tree Analysis [FTA] for reliability risk assessment
- Success Tree Analysis [STA]
- Quantitative analysis of fault tree
- Interactive exercise

10:50 AM - COFFEE AND NETWORKING

11:00 AM - MODULE 6

Data Collection & Corrective Action System

- FRACAS application in production operation and as a DCS
- Application of RCFA to improve equipment reliability
- Reliability Trend analysis application for reliability evaluation
- CMMS as a viable option as a data collection system [DCS]

1:30 PM - NETWORKING LUNCH

2:30 PM - MODULE 7

Maintainability & Preventive Maintenance

- Basic concepts and definitions
- Quantifiable measures of maintainability
- Analysis of downtime
- Maintenance concepts and procedures
- How to perform maintainability predictions
- Maintenance strategies
- How to decide on PM schedule
- Optimum schedule for preventive maintenance
- Reliability under preventative maintenance
- Analytical maintenance models

5:10 PM - CHAIRMAN'S CLOSING REMARKS

Seminar Content * Course Code – PSREA 401

DAY 3 - Date will be advertised soon

8:30 AM - MORNING COFFEE

9:00 AM - CHAIRMAN'S OPENING REMARKS

9:15 AM - MODULE 8

Reliability Analysis of Repairable System

- Patterns of failure
- Methods of analysis
- Selecting the appropriate model
- Mean Cumulative Function
- Non-parametric analysis application
 1. Renewal
 2. Non-Homogeneous Poisson Process [NHPP]
 3. NHPP with power intensity
- Parametric analysis application
- Use of software application to perform analysis
- Interactive exercise

11:50 AM - NETWORK LUNCH

12:50 PM - MODULE 9

Productive System Equipment Reliability

- Reliability improvement process step
- Overall Equipment Effectiveness [OEE]
- Introduction to PFMEA concepts and applications
- Methods for evaluating reliability growth of equipment in production
- Predict failure from maintenance record using Crow-AMSAA model
- Software application to evaluate multiple production systems
- Interactive exercise

3:25 PM - TEA AND NETWORKING

3:40 PM - MODULE 10

Methods for Evaluating Productive System Availability

- Introduction to Availability
- Availability classifications [A_{inh}, A_a, O_a]
- Availability concepts and definitions
- Availability of repairable systems
- Determining availability of existing system
- Optimizing productive system availability
- System Availability
- Practical application illustrating cost of Unreliability
- Impact of R&M on operational availability
- Factors that affects availability
- Interactive exercise

5:10 PM - CHAIRMAN'S CLOSING REMARKS

DAY 4 - Date will be advertised soon

8:30 AM - MORNING COFFEE

9:00 AM - CHAIRMAN'S OPENING REMARKS

9:15 AM - MODULE 11

Process Reliability

- Overview of Process Reliability Application
- Process reliability definitions
- Weibull application of process reliability
- Process Weibull probability plot
- Identification of reliability losses
- Identification of efficiency and utilization loss
- Factors that leads to increased reliability
- Models for the cost of unreliability

10:20 AM - MODULE 12

Asset Performance & Reliability

- Introduction to reliability centered maintenance [RCM]
- Candidates for RCM Analysis
- RCM Modeling Process
- Impact of proactive maintenance [Predictive and Preventative]
- Optimum maintenance policy
- Reduction in maintenance spending through RCM
- Continuous Improvement Application
- Maintenance Optimization
- Building blocks for asset performance and reliability

12:30 PM - NETWORKING LUNCH

1:30 PM - MODULE 13

Special Industry Application Examples

- Transit system reliability analysis
- Power system reliability analysis
- Communication system reliability analysis
- Oil Analysis
- Airline Applications

3:05 PM - TEA AND NETWORKING

3:45 PM - MODULE 13

Special Industry Application Examples

- Network Application
- Warranty Analysis
- Life Data Analysis
 - Cutting Tool
 - Brake Pad

5:10 PM - CHAIRMAN'S CLOSING REMARKS

MEET THE SUBJECT MATTER EXPERT

Lennox Bennett



Lennox is an engineering consultant with more than 20 years in the field of education and the private sector. He worked eight years as a professional engineer five of which was spent as a reliability and manufacturing engineering consultant. His experience spans the following industries: education, consumer products, defense, printing, aviation and manufacturing. During the last eight years he worked internationally with numerous organizations, providing support in their manufacturing process analysis, reliability program planning and development, reliability testing and analysis, and application of specialized reliability techniques to their process and product.

Mr. Bennett has three years formal training in Industrial Technology [Teaching] with a specialization in mechanical technology. He worked for 9 years as an industrial instructor teaching and training students in technical schools as well as employee from various industries. He taught manufacturing process applications and mechanical engineering drawing and design. During his tenure as a teacher 80% of his students were successful in scoring a B-Grade or higher in their internal or external engineering examination.

Lennox is the lead consultant for LebenTech Innovative Solutions Inc. Previously he worked as a Sr. Reliability Engineer and has provided consulting services in the capacity of design verification engineer, manufacturing process engineer, quality engineer, RMA engineer, and reliability test engineer to companies such as: Sunbeam Products Inc, Maytag Appliance, Motorola, General Electric Appliance, Lockheed Martin, and Xerox. As a consultant he has applied various reliability techniques to validate, improve, and optimize product designs. He has also applied numerous manufacturing strategies to develop and optimize manufacturing process operations.

He also worked as manufacturing engineer in a metal fabrication facility where his responsibilities include asset and process management. He was instrumental in the maximization of asset utilization and production efficiencies. He offers deep experience and expertise, including knowledge of best practices, and has made tremendous impact in the manufacturing, quality, teaching and reliability field of service.

He holds a Master of Science degree in Engineering with a concentration in Industrial Engineering from the California Polytechnic State University. He is the recipient of a Bachelor of Science degree with a specialization in Manufacturing Engineering from the University of Miami. He also has to his credit a diploma in Industrial Technology and professional certification in Industrial Management from the College of Arts Science and Technology. He is trained and certified as a Six Sigma Black Belt.

RELIABILITY ENGINEERING APPLICATION FOR PRODUCTIVE SYSTEMS - Global

Location to be determined

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PRICES AND OFFERS

Early Bird Discount:

I am registering 3 months before to save US \$ 250 off the seminar price.

Seminar Information

Normal Price

<input type="checkbox"/> 4 Days Seminar	US \$1495
<input type="checkbox"/> Register on or 2 months before	US \$1295
<input type="checkbox"/> Register on or 1 month before	US \$1395

DELEGATE DETAILS

DELEGATE 1 Mr Mrs Ms Dr Other

Name: _____

Email: _____ Telephone: _____

Job Title: _____ Department: _____

Organization _____ Nature of Business: _____

Address: _____

Postcode: _____ Country: _____

Telephone: _____ Fax: _____

Dept. Head: _____ Title: _____

Name of person completing form if different from delegate

Signature: _____ Date: _____

I agree to LebenTech's payment terms

No. of employees: 1-3 3-5 5-10 10-15

Please indicate if you have already registered by Phone Fax Email Web

Please note: If you have not received an acknowledgement before the conference, please call us to confirm your booking

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By Cheque/Bank Draft: made payable to LebenTech

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All bank charges to be borne by payer. Please ensure that LebenTech receives the full invoiced amount.

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Please debit my credit card: Visa Mastercard Amex

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PAYMENT TERMS

Payment is required within 5 working days on receipt of invoice. If a booking is received 10 working days before the seminar a credit card number will be taken to confirm your place. Likewise if full payment has not been received before the conference date.

5 WAYS TO REGISTER

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Fax 954-323-4784
Post 6342 West Sample Rd.
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Online www.lebentech.com
Email info@lebentech.com

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VENUE & ACCOMODATION

VENUE: To be determinel

Accommodation: Hotel accomodation and travel costs are not included in the registration fee. A reduced corporate room rate has been arranged at _____ for attendees at this seminar. To take advantage of this special rate, please call the hotel directly at _____. Kindly mention that you are attending the Reliability Engineering Application for Productive Systems Seminar to obtain the special room rate.

SEMINAR DOCUMENTATION & AUDIO CD

- I am registering as a delegate, please send me an extra set of Seminar Documentation with Audio CD with a US \$50 discount: US \$300
- I cannot attend the event, please send me the Seminar Documentation and Audio CD at US \$350
- I cannot attend the event, please send me the Seminar Documentation only at US \$290
(Plus shipping and handling Jamaica US \$6, Trinidad US \$12 & other countries US \$30.)

(N.B. Advance orders will determine whether or not this conference will be recorded - Please enclose payment with your order.) Your order is risk free! If not satisfied simply return the product within 15 days for a full refund.

TERMS AND CONDITIONS

CANCELLATION, POSTPONEMENT AND SUBSTITUTION POLICY - You may substitute delegates at any time. For cancellations received in writing more than seven (7) days prior to the Seminar, you will receive a 100% credit minus US\$100 service charge. For cancellations received less than seven (7) days prior to the event, no credit will be issued. In the event that LebenTech cancels an event, delegate payment at the date of cancellation will be credited to company. In the event that LebenTech postpones an event, delegate payments at the postponemet date will be credited towards the rescheduled date. If the delegate is unable to attend the rescheduled event, the delegate will receive a 100% credit representing payments made towards a future LebenTech event. This credit will be available for cancellation or postponement.

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PROGRAM CHANGES - Please note that speakers and topics were confirmed at the time of publishing, however, circumstances beyond the control of the organizers may necessitate substitution, alteration or cancellation of the speakers and/or topics. As miuch, LebenTech reserves the right to alter or modify the advertised speakers and/or topics if necessary. Any substitution or alteration will be updated on our web page as soon as possible.

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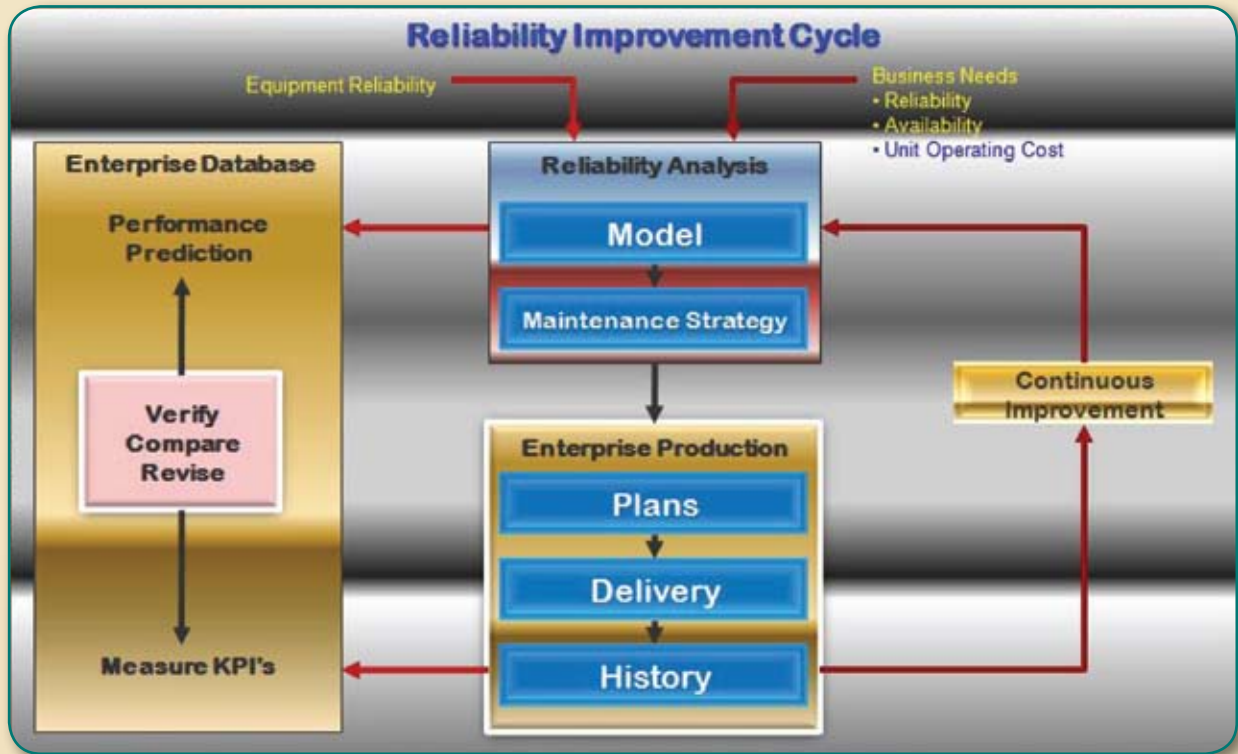
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