

Process Reliability Training Course

A two-day training course in using Weibull analysis of production data to answer these questions.
What is my process reliability?
How can I use the information to improve margins?

The training course is offered by:

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Manufacturing, Engineering, and Reliability Consultants

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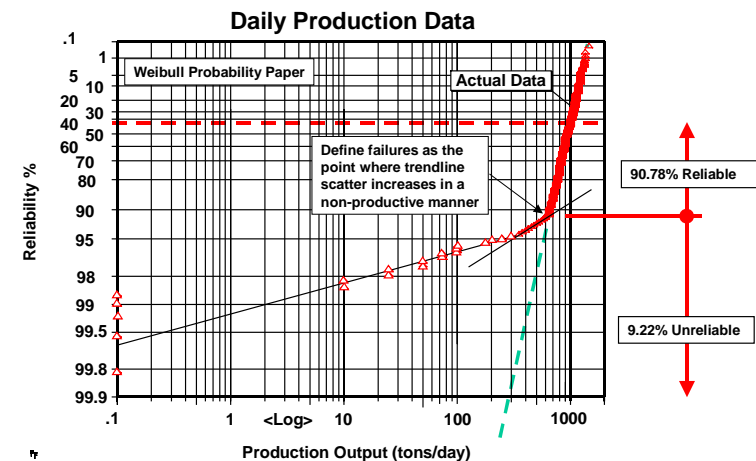
What is the reliability of your process? Does it matter?

Hundreds of manufacturing processes have been studied to quantify process reliability. Few have been labeled, “Do Not Disturb”. Data says the odds are about 199 out of 200 of having a process reliability problem. Seldom is reliability of processes measured and quantified—if you can’t measure things in a process, you can’t control them; and for processes, if you can’t control the features, they will usually work to your cost disadvantage.

The downside of process reliability problems is lost gross margin for the business and this really matters! Process reliability problems contribute to hidden factory losses and lower profits.

Actual production output data is used to construct a Weibull plot. Where the trend line of actual data departs from a straight line on the Weibull plot identifies the process reliability value.

Production losses are quantified as the gap between the actual data and the demonstrated straight trend line. Gap analysis highlights the problems and enhances the facts by use of asset utilization reports. This method starts the root cause analysis.



The course—Process Reliability Training is a training course using data from both continuous and discrete manufacturing processes to assess manufacturing process reliability. The object is to quantify problems and losses so they can be eliminated for profit improvements. Reliable deliveries and consistent production output cannot be achieved from unreliable processes. *The course will show how to identify process reliability on one-side of one-sheet of paper.*

The \$ issue—Reliability is the capacity of equipment or processes to operate without failure. Failures cause reliability problems that waste money. The business issue of reliability is prevention and control of failures to reduce costs for improving customer satisfaction. *The course emphasizes identification of gaps in profitability by using actual production quantities as a precursor for quantifying gross margins by use of improvement programs.*

Failures—Process failures occur when a process cannot perform its intended function. The process reliability point is identified on a Weibull probability plot. Failure to follow the demonstrated path in product output, results in a gap in lost production volumes which can be quantified. *The course teaches fact based data analysis methods for identifying patterns which contribute to failure problems.*

Costs—Failures have unfavorable cost implications. At the heart of the reliability effort is the need to find affordable levels of business reliability. *The course shows methods for modeling failure costs to obtain a corrective action plan based on the cost of unreliability.*

Reliability engineering—Good reliability engineering is not the search for perfection—rather, it is the search for pragmatic solutions to business problems. *The cost of unreliability, from gaps in production, funds engineering solutions for making reliability improvements.*

Production or maintenance problem?—Process reliability techniques, in conjunction with asset utilization programs, provides insights into how the system is performing. *Process reliability*

analysis is not a silver bullet. It supports the blood, sweat, and tears engineering for finding what went wrong so corrective action can be precisely applied to eliminate gaps in production thus reducing costs.

Teamwork—Process reliability techniques help avoid the endless finger pointing exercises that delay effective resolution of problems. The one-side of one-page analysis, based on data, clearly carves production gaps into broad categories of losses so problems can be attacked from a strategic point of view. *Teamwork solves old business problems and builds critical mass for ongoing improvements as neither side is blameless for process problems.*

Business solutions—Process reliability analysis is about improving gross margins to make business better. This requires a new approach to get new and improved results. *The course emphasizes business solutions to process reliability problems.*

Process reliability data—The hardest part of solving a reliability problem is getting the appropriate data. Process reliability techniques use data available at any plant—daily output of prime quantities produced.

Each student is expected to bring along a set of production output on a diskette in Excel format from 1) a process that performs nicely and 2) a process that performs poorly. The data will be normalized by the instructor to a central value of 1000 so that proprietary output data is not compromised and the data can be discussed openly in class.

The normalized data will be usable with the latest demonstration software from Fulton FindingsTM. Students can reproduce the analysis on their own computers during or after the training class.

Process reliability tools will use actual student data for class discussions so the students can gain engineering experience to put both the art and science of engineering to work in a search for key problems that restrict production output.

Weibull analysis-A practical PC software tool such as WinSmith Weibull™ will quickly produce the single page analysis of production data. A single picture is still worth a 1000 words in today's computer society. *Weibull analysis will provide the technique to help define a strategic course of action with the expectation for significant improvements.*

Other tools studied- The course is a broad introduction to reliability concepts. Topics studied are:

- What is reliability and what data is typically required
- Traditional tools for measuring reliability
- Availability concepts from reliability analysis
- Data for use in solving reliability problems
- Preparing reliability data for analysis
- Normal probability plots
- Log-normal probability plots
- Weibull probability plots
- Reliability block diagram models for cost of unreliability
- Monte Carlo simulations
- Pareto distributions
- Critical items list
- Reliability growth plots and forecast models
- Production's role in achieving reliability improvements
- Engineering's role in achieving reliability improvements
- Maintenance's role in achieving reliability improvements
- Management's role in achieving reliability improvements

Demonstration project- Homework assignments each day solidify classroom concepts. A demonstration project converts the classroom concepts into practical applications.

Demonstration projects are student commitments to put new reliability tools to work on a practical project. *A demonstration project is a contract between student and supervisor to make improvements, reduce costs, and increase production output. Successful demonstration projects, convert reliability concepts into actual and quantifiable cost reduction opportunities.*

Course instructor- Paul Barringer is the instructor for the Reliability Engineering Principles course. He provides a student's notebook with examples worked out in detail. The course details are enhanced by use of color slides.

His course theme is making process reliability a practical cost reduction tool for operations. He uses the basics of reliability for understanding cost problems with commercially available PC based computer software. He reduces the mind numbing statistical details promoted in most probabilistic texts by using reliability concepts as engineering problem solving tools. Over 2000 engineers have completed the Reliability Engineering Principles course and over 300 engineers have completed the Life Cycle Cost course.

Barringer brings a unique and multifaceted set of skills to the course because of his 35+ years experience in industry. The breadth of his experiences avoids the usual narrowness of expertise in only a single area of reliability. He has:

- Experience as *Design Engineer* for ultra-high rotating speed centrifuges used in separation of isotopes and viruses.
- Experience as a *Plant Engineer* installing equipment and correcting equipment outages.
- Experience as a *Manufacturing Manager* and *Plant Manager* with financial responsibilities for equipment not performing to meet production schedules.
- Experience as *Director of Manufacturing* for building-in functional reliability levels for customers purchasing high quality and high reliability products while simultaneously experiencing effects of vendor supplied reliability problems in a worldwide manufacturing network of plants and equipment.
- Experience as *Director of Engineering* for guiding development of products used in the oil-patch for the world's deepest and highest pressure oil and gas wells where reliability is a critical performance characteristic.

Barringer's most recent industrial experience included Director of Manufacturing and Director of Engineering at an ISO 9001 approved manufacturing facility.

He is a registered professional engineer (Texas). He is named inventor in five USA patents. His education includes an MS and BS with honors in Mechanical Engineering from North Carolina State University where he also worked as a graduate teaching assistant. He has also participated in Harvard University's Manufacturing Strategy conference.

Barringer is a contributor to **The New Weibull Handbook**, an advanced reliability text published by Dr. Robert B. Abernethy. He is a short course presenter on the subject of reliability and life cycle costs for the American Society Of Mechanical Engineers and for the Society of Maintenance and Reliability Professionals. His technical associations include: American Society For Quality, American Society Of Mechanical Engineers, and Society Of Manufacturing Engineers.

Who should attend?-

Production supervisors will find new tools for understanding how operations can improve reliability of their processes. 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.

Engineering personnel will find new modeling techniques for predicting process reliability based on how equipment is installed, operated, and maintained for making life cycle cost decisions in justifying new equipment and new processes.

Maintenance engineers will find reliability tools helpful for providing supporting evidence during root cause analysis failure investigations. They will find reliability tools and techniques helpful for understanding failure data in their CMSS systems, and how failure data is used to justify making equipment more reliable as a business decision.

Managers will find business aspects of process reliability helpful for measuring and motivating improvements in processes, procedures, people, and equipment to reduce the cost of unreliability through use of non-traditional tools as they ferret-out hidden factories wasting time and money. They will learn how to predict future failures as a selling point for improvement projects.

For more information-

Training course details:

<http://www.barringer1.com/prtraining.htm>

Schedules and availability for in-house seminars:

<http://www.barringer1.com/schedule.htm>

Prices for seminars:

<http://www.barringer1.com/pricelst.htm>

Problems solved using reliability engineering principles:

<http://www.barringer1.com/problem.htm>

For other details contact:

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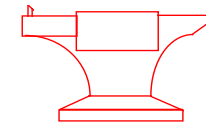
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**Wise use of process reliability concepts in your operation
really will save you money!**



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