TANGENT
DESIGN ENGINEERING

reliability SOLUTIONS

RPD™ PRODUCT DEVELOPMENT BOOT CAMP

Increasing the likelihood of getting your products to market

WHEN
October 2nd and 3rd
8:30 AM - 4:30 PM

WHERE
Fort Calgary
750-9th Avenue SE

Free parking at Fort Calgary!

CONTACT
Gord Paynter
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Tel: (403) 274-4647 X202

Reliable Product Development

Developing real, reliable products that survive in the market

There is so much more to developing a product besides making a prototype. Almost all customers under-estimate the challenges in not only manufacturing a product, but in making sure that the product they have designed will survive in the hands of your customer!

In our seminar, we will walk you through the development of real products, based on our experience helping customer with design, testing and manufacturing transfer. You can make your product more reliable by following simple, straightforward principles of product reliability. Recognize that most companies don't test their products properly, and you can learn from their mistakes to gain a competitive advantage.

ADVANCED RELIABILITY EDUCATION

Participants will walk away with the ability to...

- Understand and apply key reliability concepts of hazard rate, mean time to failure (MTTF) and product failure rates.
- Apply the Reliability Solutions calculator models to quickly estimate likely failure rates and sample sizes following exponential and power models; understand how to apply the Bathtub model and Weibull failure models to practical scenarios.
- Evaluate different types of stress testing using the Hughes Test Strength Equation.
- Accelerate product failures and your learning at the sub-assembly level to quickly deliver effective, low-cost reliability test results and insight.
- Incorporate manufacturing data and case studies to deliver a meaningful reliability model for predicting early-life warranty failures.
- Focus your scarce product development resources.
- Prototype on a budget.
- Go beyond functional testing.
- Build a project schedule that helps your team.
- Construct a design review that uncovers issues.
- Select a contract manufacturer that is a good match for your company and product.
- Understanding where most manufacturing failures occur.
- Set up Key Performance Indicators to hold your supplier accountable for quality.
- Apply Design of Experiments to improve your reliability testing.
- Know when to release your product by applying Design Quality Assurance (DQA) to score your Design Maturity.

COURSE DETAILS

Agenda:

Day 1 - Monday October 2nd
8:00 AM - Light Breakfast/Networking
8:30 AM - Course begins
10:15 AM - Coffee Break
10:30 AM - Course resumes
12:00 PM - Lunch Break
12:45 PM - Course resumes
2:15 PM - Coffee Break
4:30 PM - Course completed (Day 1)

Day 2 - Tuesday October 3rd
8:00 AM - Light Breakfast/Networking
8:30 AM - Course begins
10:15 AM - Coffee Break
10:30 AM - Course resumes
12:00 PM - Lunch Break
12:45 PM - Course resumes
2:15 PM - Coffee Break
4:30 PM - Course completed (Day 2)

Printed course material provided. A laptop is recommended for students to take advantage of in class exercises.

Course Fees:

First registrant from company: $1050 + GST; Additional registrant from company: $840 + GST

http://www.tangentservices.com/bootcamp

Register:

Gord Paynter
gpaynter@tangentservices.com
Tel: (403) 274-4647 X202

Purchase orders, cheques, credit card and Paypal accepted.

Who should attend

- Design and Product and Testing Engineers
- Reliability and Quality Engineers
- Engineering Management
- New Product Introduction Engineering
- Professionals involved in delivering reliable products to their company's customers

"It is not enough to do your best; you must know what to do, and then do your best"

- W. Edwards Deming

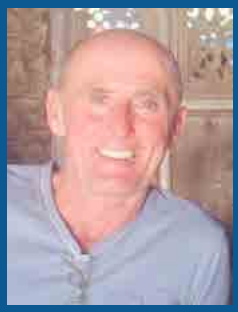
Why you should attend

If you are truly interested in improving your product quality in a manner that drives results quickly, then you should attend this seminar. The seminar is packed with real life case studies across a range of clients the trainer has consulted with in the last 20 years.

The seminar is NOT simply using theory from standard quality references and literature like most Quality Improvement seminars. It shows how to use the fundamental steps mixed with unique measurement and reporting approaches which enable engineers and management to see clearly where they should be making changes for improvements. The seminar also provides a proven methodology to predict escape rates from process to customer and how these can be minimized towards zero defects.

Finally, course attendees will get an insight into product reliability testing and how to set up their development processes to get further control of early life failures within the customer environment, delivering further value to the business.

RELIABILITY SOLUTIONS BACKGROUND



Program Facilitator and Trainer – Martin Shaw, (BSc Hons)
Managing Director, Reliability Solutions UK

Successful results achieved by current and past clients

- TPV China (World No. 1 LCD Monitor / TV Maker) – 100% improvement in warranty fail levels, 2008-2009
- Vestel Electronics Turkey – 300% improvement in warranty fail levels, 2008-2012
- SMART Technology Canada – 70% Supplier Process Quality Improvement

Awards

- Gold Award for Best Paper at Reliasoft Applied Reliability Symposium, Berlin March 2010 (Achieving World Class Reliability)
- Gold Award for Best Paper at Reliasoft Applied Reliability Symposium, Singapore October 2010 (Achieving World Class Reliability)
- Gold Award for Best Paper at Reliasoft Applied Reliability Symposium, Warsaw, March 2012 (Predicting Warranty FRR using Process Yield Data).

Publications

- CRT Bleed Resistor Reliability [Quality and Reliability Engineering International]
- Recognizing the optimum burn-in period [Quality and Reliability Engineering International]
- Weibull Analysis of Component Failure Data from Accelerated Testing [Reliability Engineering]
- Use of Bayes Theorem and Best Distribution for Reliability Estimation [Reliability Engineering]

Conference Presentations

- IEEE workshop on Accelerated Stress Testing and Reliability (ASTR), [San Diego, October 2013]
- Power Supply Process Optimization using Random Vibration [European Symposium of Reliability, Nov 1994]
- Planning Early Life Reliability Testing using the Hughes Model, [European Symposium of Reliability, Nov 1994]
- IBM Interplant Technical Liaison presentations, [IBM 1988-1993]

WHAT OTHERS HAVE TO SAY

"The course is really applicable to most companies. Not only necessarily for reliability staff only. Designers should also know this information."
Plexus Manufacturing

"Martin is surely an expert in this field, I would recommend it to others who would need this training".
NI Malaysia

"Instructor credentials are evident in the training."
Infineon Technologies

"Good presentation skills and has a lot of experience giving this course."
Premium Sound

"Increased my knowledge in this area."
Clarion

"I am a specialist in statistical analysis, and I know the theory and background. However, Martin can share some points in practice that gave me a better understanding and showed me how to apply this in the future."
Sanmina Thailand

"Fantastic. Gained a lot of knowledge from this course."
Finisar

"Martin is a serious guy and in reliability testing and with his vast experience was able to give better insight and a new approach for NPD / NPI reliability testing."
Dyson Manufacturing

TANGENT DESIGN ENGINEERING BACKGROUND

Tangent Design Engineering Ltd was formed in 2005 as product engineering consulting organization. From the start, Tangent has focused on delivering a systematic design process for its clients and has completed over 230 projects for clients in consumer, industrial, and medical sectors. Tangent has worked with clients of all sizes, from new startups to established, successful organizations. Tangent maintains its Permit to Practice in the Province of Alberta, and has current quality certification for ISO 9001 and ISO 13485 (medical devices).

Gord Paynter, MBA, P.Eng

Gord has over 20 years of experience as an engineering manager and product manager, overseeing all facets of product development from concept to manufacturing with large and small technology companies from startups to global corporations such as Sharp Electronics, Nortel Networks and Emerson in telecommunications, industrial, utility and consumer electronic sectors. Along the way, he has seen (and experienced) a large number of product development processes, learning a key lesson: if your product has a weakness, your customer will find it.

Tangent Engineering can be found at: www.tangentservices.com

DETAILED AGENDA

Day 1 Morning

- Integrating Design and Reliability
- Product Life Cycle - Development methodology
- Moving from an idea to a specification
- Understanding basic Reliability Theory
  i. Application of Bathtub Curve theory
  ii. Importance of Early Life Reliability and the Importance of Exponential and Normal Distributions in Reliability Prediction
  iii. Definition of Hazard Rate and its importance in reliability estimation at RD stage
  iv. Understanding MTTF and its effect on Product Level Failure Rates
- Understanding Accelerated Testing to set up Predictive Testing Models for all products at Design Stage
  i. High Temp Arrhenius model and Activation Energies used for key component failure modes
  ii. Maximizing Acceleration Factors by combining Temperature, Thermal Cycling, Power Cycling and Humidity
  iii. Real life examples of how to calculate Activation Energy level from experimental work at product and component level
- Evaluating the effectiveness of different stress test types with the Hughes Test Strength Equation to optimize Early Life Test programs
  i. Developing an effective reliability test strategy , using modern stress techniques, including Random Vibration and Thermal Cycling
  ii. Product Level Case Study with real life examples using the FREE Reliability Solutions calculation models

Day 1 Afternoon

- Your design testing strategy – mistakes that engineering teams make
- How to plan your design testing campaign for maximum effectiveness

DETAILED AGENDA

- Accelerated Life Testing and Life Test Planning
  i. Theory and setup behind classical Life Testing. Use the FREE Reliability Solutions calculation models to combine Acceleration Factors / Sample Sizes / % confidence predictions
- Relationship of Manufacturing Yield with Early Life Failure Rate
  ii. Using yield performance data from PCBA and product assembly processes to predict warranty Field Failure Rates
  iii. How to predict and control Early Life Failure Rates using manufacturing data and case studies using the FREE Reliability Solutions calculation model
- Electronic Sub-Assy Reliability Stress Testing
  i. Making Reliability more effective at sub-assembly level
  ii. How to Accelerate Failures by stress testing at PCBA levels to drive Fast, Effective, Low-cost Reliability Testing that provides FAST RESULTS – Control Board and Power board case studies
- Weibull Analysis of failure data and how to apply to any product failure data

Day 2 Morning

- Your manufacturing strategy
- How to control your contract manufacturer and supply chain
- How to control your processes as well as your product in a factory
- Applying DOE using Fractional Factorial techniques to maximize effect of Stress Test with Reduced samples and how to apply for Process Optimization
- Setting up strong Design Quality Test Program and using Design Maturity Measurement to measure Design Capability
  i. High Design Maturity controls Design Reliability
  ii. Providing a Key metric for measuring Design Eng success in providing highest level of Design Quality
- Predicting Field fail Rates using development test Information from a Design Quality Engineering Test program
  i. Combining Mil-217 predictions and using Design Maturity Ratings to form an efficient model for accurately predicting product failure rates from design test data

DETAILED AGENDA

Day 2 Afternoon

- Setting up New Product Introduction scoring model to deliver strongest Design Quality into Mass Production to maximize Reliability
  i. Using the 'Unique' Reliability Solutions model to bring wide range of measures together prior to Mass Production and 'scoring' the product's readiness for Mass Production
  ii. Using the FREE Reliability Solutions calculation model to measure the % NPI Score
- Defining how to develop a new reliability test program from bottom up to ensure best possible solution
  i. Students learn what to consider and how to optimize the test program
  ii. How to evaluate defect stimulation and detection capability
  iii. How to minimize cost of your reliability testing program
  iv. Classroom session where students use the Reliability Solutions calculation models to define an Early Life Reliability Test for their own products and share experience with class
- The importance of establishing a quality assurance function
- How to install a quality system in your company and make it a competitive advantage