Managing & Improving Reliability within Electronics Product Design

4th – 5th August 2016 – Bangkok, Thailand

Set up and manage World Class Electronic Reliability Improvement Programmes to drive Failure Rate Reduction

www.petro1.com.my
What could an unreliable product really cost your company?

- Your credibility?
- Your reputation?
- Your future?

Markets are demanding cheaper, more reliable electronic products and systems and many manufacturers find that traditional, established procedures and processes. Yet in today's market-driven climate you need, even more, to review procedures, examine options and pursue cost-effective solutions that will allow you to stay competitive and profitable, and increase your market credibility.

Reliability enhancement is now within everyone's reach

Leading-edge reliability enhancement technologies used to be regarded as solely the province of safety-critical avionics and aerospace applications.

But things change. These technologies are now within the grasp of all electronic designers and manufacturers; crucially the benefits in reliability that they bring are now expected by the market are now being questioned.

The idea of running months of extensive reliability testing is fast becoming a luxury – and one that few can justify.

Global customers seek out suppliers whose enhanced reliability performance improves their own market penetration and consolidates their own position – the rewards are substantial for those suppliers ready to meet the new demands.

These 2 days masterclass will have a good balance of Practical and theory. Initial theory to set the scene goes quickly into multiple case studies so participants learn quickly how to do similar on their own product types.

Attend this course to Master:

- Understand how to develop Unique and Effective Low Cost Accelerated Stress Test programmes.
- Predict Reliability from Accelerated Testing.
- Understand how to focus on Early Life Reliability Testing and Improvement to drive Customer Satisfaction improvement.
- Realizing the need to develop unique Reliability Test programmes as opposed to following old ineffective Military Standards for Reliability Testing.
- How to set up a World Class Reliability Test approach to suit all product types.
- Changing company culture from Retrospective to Predictive.
- Giving engineers and management the ability to control and predict Process Reliability.
- Learn how to improve and manage Design Quality.

CASE STUDIES & PAST PARTICIPANTS ACHIEVEMENT:

- Realize how world class companies manage Reliability and make major cost savings in Field Failure costs.
- Understand how to make your Accelerated Testing most efficient and low cost.
- Making Reliability Testing much more effective and NOT generic according to Military Std specs which many companies follow due to lack of knowledge.
- Realizing the need for making Accelerated Testing unique to the product type to maximise effectiveness.
- Ability to drive 50% REDUCTION in Field Failures within 12-18 months once a new and effective low cost programme set up.

This program is intended

The Course is designed to:

- R&D engineers.
- Research Team.
- Quality Lab/Departments.
- Design Team.
- Manufacturing
- Design reliability section.
- Electronic Team.
- Anyone who is doing reliability testing at design stage.
<table>
<thead>
<tr>
<th>DAY 1 (AM Agenda)</th>
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<tbody>
<tr>
<td><strong>Understanding Basic Reliability</strong></td>
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<tr>
<td>• Application of Bathtub Curve theory</td>
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<tr>
<td>• Importance of Early Life Reliability and the Importance of Exponential and Normal Distributions in Reliability Prediction</td>
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<tr>
<td>• Definition of Hazard Rate and its importance in Reliability estimation at RD stage</td>
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<tr>
<td><strong>Understanding MTTF and effect on Product Level Fail Rates</strong></td>
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<tr>
<td>• Realising the Importance of Component Reliability and MTTF spec</td>
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<tr>
<td>• Combining different MTTF levels for Different Components / Sub-Assemblies</td>
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<tr>
<td><strong>Accelerated Stress Testing and effect of Activation Energy</strong></td>
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<tr>
<td>• Real Life examples of how to calculate Activation Energy level from experimental work at Product and Component level</td>
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<tr>
<td><strong>Understand Accelerated Testing to set up Predictive Testing Models for all products at RD stage</strong></td>
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<tr>
<td>• High Temp Arrhenius model and Activation Energies used for key component failure modes</td>
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<tr>
<td>• Maximising Acceleration Factors by combining Temperature, Thermal Cycling, Power Cycling and Humidity</td>
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<tr>
<td><strong>Semiconductor Defect Types Review</strong></td>
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<tr>
<td>• Summary of defect types and types of Reliability Tests that are most effective in stimulating Latent Semicon defects</td>
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<tr>
<td><strong>Brainstorming session to define most effective Sequential Stress Test programme for packaged device reliability evaluation</strong></td>
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<tr>
<td>• How to develop matrix of stress test types to apply and comparison with JEDEC</td>
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<tr>
<td><strong>Statistics involved in Reliability Estimation and Decision Making</strong></td>
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<tr>
<td><strong>Evaluating the effectiveness of different stress test types with the Hughes Test Strength Equation</strong></td>
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<tr>
<td>• Developing an Effective Reliability test Strategy, using Modern stress techniques, including Random Vibration and Thermal Cycling</td>
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<tr>
<td>• Product Level Case Study with real life examples</td>
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<tr>
<td><strong>Relationship of Manufacturing Yield with Early Life Failure Rate</strong></td>
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<tr>
<td>• Component Level prediction from Yield data</td>
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<tr>
<td>• Using yield performance data from Board and Assembly processes to Predict Warranty Field Fail Rates</td>
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<tr>
<td>• How to predict and control Early Life Fails using manufacturing data</td>
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Day 2 (AM Agenda)

Life Test Planning

- Setting up most effective Design Quality Life Testing to evaluate Design Reliability and using the appropriate Stress Model to maximise defect detection
- Predicting MTTF from reduced Sample Sizes

Sub-Assy Reliability Stress Testing

- Making Reliability more effective at Sub-Assy level
- How to Accelerate Failures by stress testing Control boards, Power boards,
- Combining Rel predictions of different Sub-Assemblies to make Total product
- Understanding stresses involved at board level and how to simulate at packaged device level

Weibull Analysis of Failure data and how to apply to any product failure data

Applying DOE using Fractional Factorial techniques to maximise effect of Stress Test with reduced samples
- Developing best mix of Stress Testing for a Packaged Device

Day 2 (PM Agenda)

Setting up strong Design Quality Test Programme and using Design Maturity Measurement to measure Design Capability

- High Design Maturity controls Design Reliability
- Workshop to define methodology for Packaged Device Design Quality Testing

Predicting Field fail Rates using development test Information from a Design Quality Engineering Test programme

- Combining Mil-217 predictions and using Design Maturity Ratings to form an efficient model

Setting up New Product Introduction scoring model to deliver strongest Design Quality into Mass Production to maximise Reliability

Workshop / General Q&A

“Very practical and useful to develop in reliability concept.”

“Excellent. Good mix of theory and real life experiences.”
Martin’s 34 years Professional Achievements

- Success with several of the top 3 LCD TV makers and Personal Computer power supply makers in implementing strong Design Quality / Reliability Testing to reduce no. of Design Repeat Testing by more than 2X, saving significant costs and more importantly reducing overall development cycle.

- Reduction in Field Return Rates of more than 60% within 18 months period of starting to implement Reliability Solutions unique Reliability Test and Defect Prevention processes.

- First 30 day Customer Failure Rates reduced by 50% within 12 months period.

- Cost Reduction by removal of wasteful testing such as ineffective ORT and low stress ALT programmes which rarely stimulate Early Life Defects.

- Development of Sub -System Reliability Test programmes for complex products to guarantee stimulating wide range of latent defects and reduce excessive full assy test costs.

Martin’s Blue Chips Clients:

Reliability Solutions
Reliability Solutions focuses on providing the complete range of Reliability Improvement tools and Application Solutions to Significantly Reduce your product failure levels at the most expensive end of the product cycle, the Consumer.

Martin a 34 years veteran expert:
- Previously of IBM as Quality and Reliability Specialist within PC business unit.
- During this time he worked extensively throughout Asia, USA and Europe with wide range of suppliers. Since 1997 he has worked with a wide range of companies Worldwide and provided solutions to ensure RAPID improvement in a dynamic environment.

Energy1 is a sub-division of PETRO1 focus on provide trainings & technical Consultancy services ranging from Revenue losses reduction, Maintenance & reliability, spares parts optimization, electrical & electronics and business related activities in the Energy & Utilities industry. We had successfully made impact to energy & utilities professional mainly the top players in the South East Asia Region.

- Metropolitan Waterworks Authority Thailand.
- Tenaga nasional berhad.
- San Fernando Electric Light & Power co, Inc
- Sarawak Energy
- SP Powergrid ltd.
- Power Seraya
- Star Energy Geothermal
- Perbadanan bekalan air pulau pinang
- Aliran ihsan resources berhad
- Power - Visayan Electrical company
- Glow Company
- Suruhanjaya Tenaga
- Indah Water Konsortium
- Jimah O&M
REGISTRATION FORM

Investment Packages

<table>
<thead>
<tr>
<th>Managing &amp; Improving Reliability within electronics product design</th>
<th>Early Bird Full 2 Days</th>
<th>Standard Price Full 2 Days</th>
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<tr>
<td>Per Delegate</td>
<td>USD 1599</td>
<td>USD 1799</td>
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REGISTER 3 AND SENT THE 4TH FREE
- Please note that all registrations must be made at the same time to qualify.
- Early Bird Promotion Deadline – 5th July 2016

Delegate Details

1. Name: ___________________________ Mr. Mrs. Ms. Dr.
   Job Title: _________________________
   Email: ___________________________
   Contact No: _______________________
   Department: _______________________

2. Name: ___________________________ Mr. Mrs. Ms. Dr.
   Job Title: _________________________
   Email: ___________________________
   Contact No: _______________________
   Department: _______________________

3. Name: ___________________________ Mr. Mrs. Ms. Dr.
   Job Title: _________________________
   Email: ___________________________
   Contact No: _______________________

Invoice Details

Invoice Attention to: ___________________________
Company: ___________________________
Industry: ___________________________
Address: ___________________________
Postcode: __________ Country: __________
Telephone: __________ Fax: __________
Email: ___________________________

Authorized Signature: ___________________________

PROGRAM DETAILS

Venue: Bangkok, Thailand
Date: 4th – 5th August 2016

REGISTER NOW
CONTACT: kelvin
MAIN: +603 7727 3952
FAX: +603 7722 5278
Email: registration@petro1.com.my

Payment Method
By cheque / Bank Draft: Made Payable to PETRO1 SDN BHD
By Direct Transfer: Please quote invoice numbers on remittance advice.

ACCOUNT NAME: PETRO1 LIMITED
BANK: MAYBANK
ACCOUNT NO : 7151 2001 3353 (USD)
SWIFT CODE : MBBEMYKL

All bank charges to be borne by payers. Please ensure that PETRO1 SDN BHD received the full invoice amount.
* Credit card payment will include a charges 2.8%

Payment Policy: Upon receipt of a completed registration form, it confirms that the organization is registering for the seat(s) of the participant(s) to attend the conference or training workshop. Payment is required with registration and must be received prior to the event to guarantee the seat. Payment has to be received 7 working days prior to the event date to confirm registration.

Venue: All of our training courses are held in 4 – 5 star venues.
The course fee does not include accommodation or travel cost. It’s recommended to book the hotel room early as there are only limited room available at the discounted corporate rate.

DATA PROTECTION

The information you provide will be safeguarded by Petro1 that may be used to keep you informed of relevant products and services. We take it seriously when it comes to protection of our client data.

Cancellation & Substitutions: Upon receipt of a completed registration form, it confirms that the organization is registering for the seat(s) of the participant(s) to attend the conference or training workshop. You should be unable to attend, substitutes are always welcome at no additional cost. Please inform us as early as possible. Payment is non-refundable if cancellation occurs 7 working days prior to event commencement. However a substitute is welcome at no additional charges. If cancellation occurs 5 working days prior to the registration date and there is no substitute, the organizer reserves the right to charge 50% of the total investment from your organization.

PETRO1 SDN BHD is not responsible for any loss or damage as a result of a substitution, alteration or cancellation/postponement of an event. PETRO1 SDN BHD shall assume no liability whatsoever in the event this training course is cancelled, rescheduled or postponed due to a fortuitous event, Act of God, war, fire, labor strike, extreme weather or other emergency.

Walk-in Registration: Walk-in participants with payment will only be admitted on the basis of seat availability at the event and with immediate full payment.

Program Change policy: The organizer reserves the right to make any amendments and/or changes to the workshop, venue, facilitator replacements and/or modules if warranted by circumstances beyond its control.

Please Debit my credit card:

☐ VISA    ☐ MASTERCARD

Card Number: ______________  Expiry Date: ______________

Security Code: ______________

Named printed on card: ___________________________

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