OPS A La Carte Reliability News

TOP EVENTS: *Open House* *ASTR* *ARS* *print version*

Fall 2008

IN THIS ISSUE

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Theme this newsletter:
DESIGN FOR 6 SIGMA

MESSAGE FROM THE CEO

Recession. What recession? We just came off our busiest summer ever. We started with a hugely successful webinar on RCA with over 500 attendees. Then we spent the rest of the summer working deals in the US, China, Israel, India, and the UK. Now we are gearing up for our fall Open House on Sept 17. After that, we go on a 3 week tour of Asia - Singapore, Taiwan, and China - doing presentations, seminars, and meeting customers. This truly is an exciting time not only for our company but for the whole reliability profession. We are seeing more companies and more industries caring about reliability and seeking to design reliability into their product. We thank you for continued patronage and please call us if we can help you in any way.

- Mike Silverman, Managing Partner/CEO

COURSES

- Certified Quality Engineer (CQE) Preparation Course (pdf) - **October 7 - November 25, 2008**
- To register go to: eventsinfo
- For information on other course offerings go to: Ops A La Carte Schedule

SEMINARS

- **Reliability Seminars by Ops A La Carte - November 3-6, 2008, Shenzhen China.**

We will be giving two open seminars the week of November 3rd.
- November 3-4: Design for Reliability (DfR)
- November 5-6: HALT and HASS

Please email us contact form for more information on these seminars. Our sponsor for the event is our China partner Sinorel. For a description of the seminars in Mandarin, please go to their website at www.sinorel.com.

SinoRel
Best Reliability Service Provider

EVENTS

Ops A La Carte / HALT and HASS Labs Open House, Santa Clara, CA - Sept 17, 2008 from 11am-5pm

In celebration of the Olympics just ending, baseball coming to a close, and football just starting, the theme for our open house is Sports, Sports, Sports! We will have a lot of fun sports activities including a Wii contest. **Grand prize is a Wii Entertainment System**. Email us via our contact form for more information on this event. You can also download our flyer at Open House Flyer. In addition to the fun, we will have a lot of educational information in the form of Poster Sessions on the following topics:

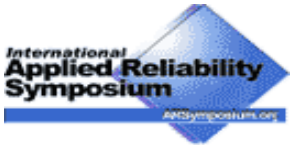
- Software Reliability *with George de la Fuente of OPS*
- Warranty Cost Reduction Methodology *with Bob Mueller of OPS*
- Design for Six Sigma *with Greg Swartz of OPS*
- Semiconductor Reliability *with George Denes of OPS*
- Secrets for Medical Packaging *with David Thysen of OPS*
- HASS Fixturing Techniques *with Mike Abdella from Adaptive Innovations*
- Using Electronic Design Automation (EDA) Tools for Parts Obsolescence *with Bryan Stallard of OPS*
- Product Realization Network - *meet members of the PRN team, including ACS, AMS, Airtronics, Fusion Design, Haas Industries, Kent Landsberg, Millennium Design, NPI Solutions, Nuvation, Paramit, SMP Tech, SofTEQ, Solution Sources Programming, and TBCG.*

Accelerated Stress Test and Reliability Workshop, Portland, Oregon - October 1-3, 2008.

OPS will be exhibiting and presenting two papers: "Linking Leading Indicators with HALT and HASS" ; "To ALT or Not to ALT". For more details, please go to ASTR. Email us via our contact form for more information on this event.

Applied Reliability Symposium (ARS) in Singapore - October 22-24, 2008.

We will be giving a presentation called "Trapped by MTBF", a discussion on some metrics much more powerful than MTBF. We will also be exhibiting at this symposium so please come by our booth. For more details, please go to ARS Asia. Email us via our contact form for more information on this event.



International Test and Inspection Conference , Santa Clara, California - November 10-12, 2008.

OPS will be presenting a paper on: "New Techniques for more effective ESS". For more details, please go to IPC Test Conference. Email us via our contact form for more information on this event.

Email us at via our contact form for more information on any of these events above.

SPECIAL OFFERS

$1000 off your next service or one free pass to any of our upcoming events or seminars *to any individual that introduces us to a new consultant that we hire.*

Free use of HALT MTBF calculation (when the calculator becomes available) to anyone that supplies us HALT/Field data that we can use in developing our HALT calculator. Please see "Problem Solver" for more details on this.

Email us via our Special Offers Contact Form

NEWS

- **Sept 8, 2008**

Ops A La Carte's Managing Partner Mike Silverman will be in Asia from October 22 through November 7. If you have any team members, customers, or vendors that may be interested in having him stop in, please pass this information on. We would be happy to discuss any areas of reliability or provide in-house training or consulting. If interested, please email us at Asia Visit.

The schedule will be as follows:
- October 22-24 - Singapore
- October 27-31 - Taiwan
- November 3-7 - China

And while in China, we already have two public seminars scheduled in Shenzhen. November 3-4 will be on DfR and November 5-6 will be on HALT and HASS. Please email us at China Reliability Classes if you would like more details.

- Sept 1, 2008

We have added 4 new consultants to our company in several different regions of the US:

Steve Brenner *(Northern California)* has been working in the field of environmental simulation and reliability testing for over 30 years. Beginning in the late sixties with reliability and design verification testing on the Lunar Module, the Space Shuttle in the eighties, to semiconductor manufacturing equipment in the nineties, Steve has always been involved with the latest techniques for verifying equipment integrity through testing.

Stephen King *(Northwest US)* has over 20 years of quality and reliability engineering, root cause failure analysis and management experience. He has worked on many different types of products from hand-held and portable devices to large-scale networked systems. He is proficient in reliability assessment and advanced statistical analysis. Stephen has developed systems for assessing and monitoring the reliability of fielded products to identify reliability improvement and cost reduction opportunities.

Rian Leichter (*Northern California*) has over 40 years of experience in reliability and product development. He provides services in the areas of product development engineering, product documentation, reliability and maintainability analysis, integrated logistics support, quality engineering services, product qualification testing and documentation and pilot manufacturing support. He has consulted in the computer, networking, and military communications industries.

Dev Raheja *(East Coast)* is a new product engineering consultant since in 1981, dedicated to the Design Assurance Technologies. His range of consulting encompasses automotive, high tech industry, aerospace, defense systems, medical systems, and consumer products.

More information about each consultant can be found on our website at About_Team.

- July 23, 2008

Over 500 attendees for our webinar on Root Cause Analysis. Instructors Cliff Lange, PhD of Ops A La Carte, Kim Parnell, PhD of Ops A La Carte and PEC, Jim McLeish of DfR Solutions, PhD, and Al Alaverdi of SigmaQuest each gave short presentations on their areas of expertise within RCA. Please let us know if you'd like copies of these presentations by emailing us at RCA Webinar Slides or you can download at TechPapers.

We polled the audience for suggested next topics and the largest request was for the topic "Green Reliability". If you have a topic you would like to see presented, please respond to us at webinar suggestion form. Stay tuned for more webinar annoucements.

- June 17-20, 2008

Ops A La Carte gave a joint presentation at the annual Applied Reliability Symposium called "Practical Software Failure Analysis". You can view this presentation as well as others from past seminars and shows at TechPapers. Also, we exhibited at this symposium. Congratulations to Ramu Ramamurthy of Eaton Aerospace for winning our grand prize give-away - a Garmin GPS.

Below is a picture of our "Ops Blue Team" at the show.

Left to Right: Mike Silverman, Clayton Bonn, Harry McLean, Harvey Altstadter, Cliff Lange

- June 8, 2008

Our HALT and HASS Lab just celebrated its 14th Anniversary in May, making it one of the oldest and most experienced reliability labs in the world. OPS Managing Partner Mike Silverman started the lab in May 1995 when he was working with Qualmark and then in 2006 he purchased the lab from Qualmark to make it a division of Ops A La Carte.

For more information on news, please visit our News Page or call (408) 654-0499.

FEATURED SERVICE

Design for Six Sigma

Contributing Author: Greg Swartz

Design for Six Sigma (DFSS) is the application of Six Sigma principles to the design of products and their manufacturing and support processes. Often the acronym DMADV (define, measure, analyze, design and verify) is used synonymously with Design for Six Sigma. While DFSS can apply to the design or a product, manufacturing process, business process or service, our focus in the paper is the development of new products.

HIGHLIGHTS OF DFSS INCLUDE
1. Determining Critical to Quality (CTQ) attributes most important to the customer
2. Enhanced Process Capability: What your process can deliver
3. Reduce Variation to a Minimum in final product output
4. Stable Operations: Ensuring consistent, predictable processes and improve what the customer sees and feels
5. Designing performance excellence to meet customer needs and process capability

SITUATION

In this dynamically changing world, product cycles are being reduced drastically. Just a few years ago, it was not uncommon to have 18-24 month product cycles, whereas today, we are seeing 3-6 month product life cycles. To meet these demanding requirements product developers have to develop products in the shortest amount of time that are safe, reliable, and competitive.

VALUE TO YOUR ORGANIZATION

Using the methods of DfSS, we can assure the design of a product with the highest quality and reliability in the shortest amount of time.

RELIABILITY INTEGRATION

An example of Reliability Integration during Software Reliability is as follows:

Design for Six Sigma is a methodology that calls upon many of the fundamental design tools such as Design of Experiments (DoE), Failure Modes and Effects Analysis (FMEA), Design for Reliability (DfR), and Design for Testability (DfT). Using DfSS in conjunction with our Reliability Plan, we will know when to use which tool and how to integrate each together to produce a reliable product in the shortest amount of time.

BACKGROUND

Six Sigma initiatives have achieved recent popularity because of their bottom line focus versus previous TQM initiatives which often tended to be unfocused.

In one respect, DFSS is the repackaging of many quality tools and techniques appropriate for product development into a framework. This framework contains many of the same elements as the Advanced Product Quality Planning (APQP) process used in the automotive industry.

American Society of Quality's Body of Knowledge on Design for Six Sigma (DFSS) includes the following:
1. Quality Function Deployment (QFD)
2. Robust design and processes (includes functional requirements)
3. Failure Mode and Effects Analysis
4. Design for X (DFX)
5. Special design tools

General Electric originally defined the principles of DFSS as the following:
1. Disciplined CTQ flowdown
2. Controlled design parameters
3. Product performance modeled and simulated
4. Designed for robust performance and producibility
5. Functionally integrated product development
6. Quality "designed in"

METHODOLOGY

The following represents our more specific list of elements of the DFSS framework:
1. Understand real customer needs through voice of the customer (VOC) analysis.
2. Use Quality Function Deployment (QFD) to translate customer needs into critical technical characteristics of the product and into critical to quality (CTQ) characteristics of the product and process.
3. Focus on designing for the lifecycle to minimize lifecycle costs, value analysis and target costing and to enhance reliability with Design for Reliability (DfR) and Design for Testability (DfT).
4. Mistake-proof the product and process.
5. Perform Failures Modes and Effects Analysis (FMEA) or Anticipatory Failure Determination (AFD) to identify potential failures and take corrective action to mitigate or prevent those failures. FMEA and AFD apply to both the design of the product and the design of the process.
6. Develop capable manufacturing processes and select processes that are capable of meeting the design requirements, especially with CTQ parameters.
7. Use Design of Experiments (DoE) or Taguchi Methods to optimize parameter values and reduce variation, in other words, develop a robust design.
8. Verify and validate that the product design will meet customer needs with peer reviews, checklists, design reviews, simulation and analysis, qualification testing, production validation testing, focus groups and market testing.
9. Measure results with DFSS scorecard; estimate sigma - do results meet quality target?

CASE STUDIES

The following case studies and options provide example approaches. We will tailor our approach to meet your specific situation.

Using DfSS with a Medical Company making an Infusion Pump

A Medical company was re-designing a product and needed to get the product out in the shortest amount of time, but their reputation was on the line because customers were expecting a much higher level of reliability than the previous generation. We turned to the methodology of DfSS and linked it in with the Reliability Plan to know which DfSS tools to use and how to integrate each of the tools together to maximize the reliability payback while shortening the development time as much as possible. We ended up deploying FMEA across the entire product, Design of Experiments early on for the new tolerance-critical assemblies, and Accelerated Life Testing on the new mechanical components of the product. The results were that we developed the product in half the time of the original and the initial product defect rate was 1/4 of the rate from the previous generation product.

To read more about our DfSS service, please go to DfSS Service
To read more about our DfSS seminar, please go to DfSS Seminar

Mention this article and receive 25% off your next Design for Six Sigma service.

PROBLEM SOLVER

HALT CALCULATOR

This month's challenge is going to be a bit different. A distinguished member of our reliability community Harry McLean, is working on a model to calculate MTBF from HALT and Field Data and he needs your help.

How many of us have wanted to use the HALT data to estimate Annualized Failure Rate (AFR)? The common response is that "it cannot be done." In fact, it is possible but what you need is a good model and good data to back the model. This is exactly what Harry is working on. The model has been developed. As more data is added, the more accurate the model will become. What he needs is the following:

1) HALT results from a sample size of at least three units (final HALT values after corrective actions have been verified).
2) Estimated MTBF.
3) Annualized field failure (AFR). Type of product, i.e., internet server, etc.
4) Your contact info in case of questions.

Harry will be presenting this calculator at the annual *ASTR Conference*

Send Responses to:

Email us via our HALT Calculator Contact Form. We need the data by September 30, 2008. Any individual who sends us usable data will be entitled to use this calculator for no charge once it is released.

Solution to **L**ast **Q**uarter's **P**roblem of the **M**onth on **Prognostics**:

ROOT CAUSE ANALYSIS

Name at least 10 different tools used during the Root Cause Analysis process.

SOLUTION: Of course there are many different answers to this problem, but the first correct answer came from Matthew Rhoades of Woodward who answered as follows:

1) Apollo Root Cause Methodology
2) Fishbone

3) 5 Why's
4) CNX diagrams - Control, Noise, X=No Control
5) Cause and Effect Diagrams
6) DMAIC - Define, Measure, Analyze, Improve, Control Methodology
7) Design of Experiments - DOE
8) Control Charting
9) Pareto Charting
10) TOPS 8D Methodology

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DfR Solutions has world-renowned expertise in applying the science of Reliability Physics to electrical and electronics technologies, and is a leading provider of quality, reliability, and durability (QRD) research and consulting for the electronics industry. The company's integrated use of Physics of Failure (PoF) and Best Practices provides crucial insights and solutions early in product design and development and throughout the product life cycle. DfR Solutions specializes in providing knowledge- and science-based solutions to maximize and accelerate the product integrity assurance activities of their clients in every marketplace for electronic technologies (consumer, industrial, automotive, medical, military, telecom, oil drilling, and throughout the electronic component and material supply chain). For more information visit www.dfrsolutions.com.

Ops A La Carte's newsletter goes out to over 15,000 subscribers. If you would like to advertise in next quarter's "Reliability News", email us via our Advertise Contact Form or call at (408) 654-0499.

JOB OPENINGS

Reliability Engineering Manager

The Reliability Manager will provide reliability leadership within the Apple hardware organization, and will be responsible for aspects of product qualification and failure analysis. The position will manage a team of Reliability engineers, and be responsible for ensuring appropriate test plan development and execution, the appropriate analysis of failures, communication of risk to design teams and sr. management, and involvement with the design teams in developing appropriate corrective actions.

Email: sprakash@apple.com (Simon Prakash)

NPI Solutions, Inc.
New Product Integration

Senior Manufacturing Engineer

Utilize New Product Introduction criteria for the following: manufacturing process development, tool design, integrated schedules, design to cost, sourcing technical support, quality qualifications, test support, product cost out, and introduction into the supply chain.

For more info, please go to http://npisolutions.com/NewJob8.htm or email kevina@npisolutions.com

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OPS A LA CARTE™
RELIABILITY CONSULTANTS

Senior Reliability Consultant

Ops A La Carte is looking for Senior Reliability Consultants *around the world* to join our team of consultants and work on some of the most exciting and challenging projects in the industry. Whether you have an existing consulting practice or are interested in developing one, please contact us.

If interested, email us via our OPS Job Search Contact Form or call (408) 654-0499.

Ops A La Carte's newsletter goes out to over 15,000 subscribers. If you would like to put a job opening in next quarter's "Reliability News", email us via our Job Openings Contact Form or call at (408) 654-0499.