



TOP EVENTS:  RAMS  CMSE  OPS SYMPOSIUM  Print Version

Winter 2008

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MESSAGE FROM THE CEO

Happy holidays from all of us at OPS. We hope your whole holiday season is filled with joy.

Fall was a very busy season for us. We started off the quarter with our annual Open House. We had 50% more people than last year and everyone had a lot of fun with our sports theme. We changed the technical portion of our Open House from formal presentations to informal poster sessions. We presented papers at ASTR in Portland, at IPC in Santa Clara, and at ARS in Singapore. Also, we brought on 7 new consultants, each with specific expertise and loads of experience to help us with our growth and expansion.

And my trip to Asia was very successful, meeting with our partners at Sinorel to visit prospective customers, developing partnerships with our consulting firms and labs, and putting on a very successful seminar in Shenzhen. During the trip, I came to realize that many of our Asian customers need a different type of service than what we have been offering in the U.S. Rather than needing a consultant to solve specific issues, what many need is an expert to validate the work they have already done. For these types of customers, we have introduced a new service called [EXPERT REVIEW](#).

Thank you for your continued support. and interest.

- Mike Silverman, Managing Partner/CEO

COURSES

- ▶ [Certified Reliability Engineer \(CRE\) Preparation Course](#) (pdf) - **January 13 - February 24, 2009**
- ▶ To register go to: [eventsinfo](#)
- ▶ For information on other course offerings go to: [Ops A La Carte Schedule](#)

SEMINARS

- ▶ **Ops A La Carte Webinar on GREEN RELIABILITY - Spring, 2009 (date and time to be announced)**

Ops A La Carte will be hosting a FREE webinar on **GREEN RELIABILITY** - some of the current trends and concerns around reliability in this rapidly expanding market. Please contact us at [contact form](#) with any topic within **GREEN** you would like covered (Alternative Energy, Energy Savings, Banned Substances, etc.)

▶ **Ops 2009 Reliability Symposium - Apr 6-10, 2009, San Jose, California (also via webinar)**

We will be offering the following seminars at our annual symposium:

- ▶ [Design for Reliability \(DfR\), Apr 6-7](#)
- ▶ [Design of Experiments \(DoE\), Apr 6-7](#)
- ▶ [Climatic Testing Fundamentals, Apr 6-7](#)
- ▶ [Design for Testability \(DfT\), Apr 8](#)
- ▶ [Mechanical Design for Reliability \(MDfR\), Apr 8](#)
- ▶ [Best Accelerated Reliability Test Methods: HALT, ALT, and RDT, Apr 8-9](#)
- ▶ [Root Cause Analysis / Advanced Problem Solving, Apr 9-10](#)
- ▶ [Software Design for Reliability, Apr 9](#)
- ▶ [Applied Data Analysis \(ADA\) with Capability Improvement, Apr 10](#)
- ▶ [Design for Warranty Cost Reduction \(DfW\), Apr 10](#)

This year, we are also adding a *Quality/Operations* section to our symposium.

- ▶ [Lean Practices for the Supply Chain, Apr 6](#)
- ▶ [Set Up Reduction \(quick changeover\), Apr 7](#)
- ▶ [Cycle Time Reduction, Apr 8](#)
- ▶ [Vendor Managed Inventory \(VMI\), Apr 9](#)
- ▶ [Supplier Selection, Apr 10](#)

EVENTS

▶ **Reliability and Maintainability Symposium (RAMS) - January 26-29, 2009, Fort Worth, TX**

Ops A La Carte is on the management committee for this year's symposium being held in Fort Worth.

We will also be exhibiting at this symposium so please come by our booth. For more details, go to [RAMS](#).



▶ **Components for Military and Space Electronics - February 9-12, 2009, San Diego, CA**

Ops A La Carte will be presenting a paper entitled: "*Transitioning to Lead Free for Military and High Reliability Products*" by Mike Silverman and Fred Schenkelberg of OPS A La Carte and Dr. Hillman of DfR Solutions.



Email us via our [contact form](#) for more information on any of the above events

SPECIAL OFFERS

- ▶ **\$1000 off** your next service or seminar or one free pass to any of our upcoming events or seminars *to any individual who introduces us to a new customer with whom we engage.*

Email us via our [Special Offers Contact Form](#)

NEWS**7 NEW CONSULTANTS**

We have added new 7 consultants to our company in several different regions of the US: **Allen Adolph, John Cooper, Michael Gozzo, Bill Holt, and Jay Pisharodi** for Northern California, **Bob Bowman** for the Northwest US, and **Mark Van Veen** for the Southwest US. More information about each consultant can be found on our website at [About Team](#).

We now have 43 consultants across the US and in 4 countries outside the US. To get a better understanding of their locations, the attached link [About Clients Map](#). The map also shows where our customers and where our consultants are located. We also provided a map of where our customers are in relation to the consultants. In addition, we have also updated our [About Clients](#) page and added a number of new industries we have worked in, for a total of 67 different industries.

NEW SERVICE: EXPERT REVIEW

Ops A La Carte announces a new service, called EXPERT REVIEW. This service is designed specifically for companies that need someone to review a plan or report and give expert guidance only.

We have many different types of customers - those that are short on manpower and need our help to fill in as well as those that have the manpower but lack a specific area of specialty. However, this new service is targeted at a third type of customer - one that has the manpower and the specific area of specialty, but needs one of our engineers to review their work before it goes on to senior management or out to a customer. Having OPS certify a plan or report will provide three main benefits to companies:

- 1) it will save the company a lot of time and money by quickly assuring that company they are on the right track, or providing minor re-direction to get them back on track.
- 2) it will provide an extra level of credibility. All our reviewers are CRE certified and when they sign off on a document, it will carry extra meaning to the reader.
- 3) it will provide a certification that is a permanent record for your design history file.

Contracts can be set up on a per review basis, or on a monthly basis. Ask us about our monthly pricing discount. Also, we offer language translation services in most of our customers' languages. Email us at via our [contact form](#) for more information on this new service.

HALT & HASS LABS ADDS 3RD HALT CHAMBER

We just brought on-line our 3rd HALT chamber - a small 1 foot x 1 foot chamber. And we are pricing this new chamber very attractively - lowest prices we have ever offered. Please contact us to find out about our new lower pricing for this chamber. Also, in spite of the economy, our lab remains busy.

QUALITY RISKS IN OUTSOURCING

OPS gave a presentation at the PRN Lunch/Learn entitled "Quality Risks in Outsourcing", which provides a look at some of the risks involved when outsourcing your design and manufacturing, and some of the methods that can be employed to reduce these risks. Feel free to download copies at [TechPapers](#).

USING EDA THROUGHOUT PRODUCT LIFE-CYCLES

OPS Bryan Stallard and Mike Silverman wrote an article on "Using EDA Tools Throughout Product Life-Cycles" and got published in the quarterly [RMS Newsletter](#). This is a follow up to the presentation that Bryan, Mike, & JW Smith gave at CMSE in Feb, 2008. Feel free to download copies at [TechPapers](#).

NEW TECHNIQUES FOR MORE EFFECTIVE ESS

OPS gave a presentation at the International Test and Inspection Conference in San Jose, CA on "New Techniques for More Effective ESS." Feel free to download copies at [TechPapers](#). Congratulations to Arthur Pashos of Segway for winning our grand prize drawing at the IPC event, a lovely Autumn gift basket.

SUCCESSFUL ASIA TRIP - SINGAPORE AND CHINA

Ops A La Carte's Asian trip a big success. We were in Singapore and China from Oct 22 through Nov 7.

▶ October 22-23 - Singapore Applied Reliability Symposium. We presented a paper on "Trapped by MTBF." Congratulations to Noor Hamizhi for winning the drawing for a new IPOD nano.



▶ October 24 - Singapore private seminar at ST Engineering. We presented "Developing a Better Reliability Test Program"

▶ October 27-31 - Shanghai, China: Ops A La Carte and China partner Sinorel met with prospective partners and customers. Our long-time US partner [Speck Design](#) has an office in Shanghai. We met with the office manager, Judy Huang, and worked out a plan on how we will cooperate with them going forward in China. Here is a link to [Speck China](#) and the capabilities of their China office.

▶ November 3-6 - Shenzhen, China: OPS and Sinorel joined together to give two public seminars - one on Design for Reliability and one on HALT and HASS. Below are pictures of students in our two seminars.



- Oct 3, 2008

OPS exhibited and gave two presentations at the Accelerated Stress Test and Reliability Workshop in Portland Oregon October 1-3. The presentations were titled "Linking Leading Indicators with HALT and HASS" and "To ALT or Not to ALT". Feel free to download copies at [TechPapers](#).

Congratulations to Hao Lam of Schlumberger for winning our grand prize drawing, a lovely Portland gift basket.



- Sep 17, 2008

Ops A La Carte/HALT and HASS Labs held its annual Open House on Sept 17. The theme for our open house was Sports! and we sure had a lot of fun. Click on the link [Open House](#) to view pictures of the event. Also, congratulations to Stuart Chessen of Savi for winning our grand prize give-away "Win a Wii for peanuts" - a new **Wii Entertainment System**. Stuart made the closest guess of how many peanuts in the jar. The correct answer was 1704. Below is a picture of a few Open House scenes along with Stuart with his new Wii (and his peanuts).



In addition to the fun, we had a lot of educational information in the form of Poster Sessions on the following topics: Software Reliability, Warranty Cost Reduction Methodology, Design for Six Sigma, Semiconductor Reliability, Secrets for Medical Packaging, HASS Fixturing Techniques, Using Electronic Design Automation (EDA) Tools for Parts Obsolescence, and Product Realization Network Introduction.

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

FEATURED SERVICE



Quality Risks in Outsourcing

Contributing Authors: Bob MacLevey and Mike Silverman

Today, more and more companies are outsourcing their designs to Original Design Manufacturers (ODMs) and outsourcing their manufacturing to Contract Manufacturers (CMs). Whether we are going to China, India, Mexico, or Eastern Europe, the fact remains that as we outsource our design and manufacturing, we are outsourcing the quality of our product.

But this does not mean that we have to lose our ability to control our quality. It just means we have to use new and innovative methods to assure good quality. And we need to stay on top of the situation.

Here are some of the risks and how we can control them:

1. *Lack of Control over Design Process*
2. *Lack of Control over Manufacturing Process*
3. *Lack of Visibility into the Manufacturing Testing Process*
4. *Correlation of Field Failures to Production Failures*
5. *Driving Changes in Production to Improve Quality*

1. Lack of Control over Design Process

In assuring a reliable design before transfer to manufacturing the two main areas to consider are the Design Analysis techniques and the Design Testing techniques.

1.1 Ownership of design *analysis* techniques used

Many different techniques that can be used to assure a reliable design before testing begins - Predictions, FMEAs, Derating Analysis, Thermal Analysis, and others. But how does the ODM know which techniques to use and how to use them.

1.1.1 Allowing ODM to decide which are the best tools to use

This method will work only if the ODM has first written a reliability plan and then uses this plan to drive which activities are best to use. In other words, the ODM must justify why the tools are being chosen and what will be the benefits of each tool. If this is not done, then the ODM may be choosing tools that may have worked on other products or for other customers but they may not work on this program.

1.1.2 Specifying which tools to use

This method will work only if the ODM has been trained on the use of the tools and the integration between each of the tools. Otherwise, little benefit will be gained from the use of the tools and the ODM will just be producing reports that have little meaning towards the overall reliability goal, and worse, the engineers will not know what design changes to make as a result of each of the analyses.

1.2 Ownership of design *testing* techniques/Test Plan used

There are many different techniques that can be used to prove a reliable design during testing - HALT, ALT, RDT, RQT, and others are often used. But how does the ODM know which techniques to use and how to use them.

1.2.1 Allowing ODM to Develop their own Testing Program

This method will work only if the ODM understands how to write a test plan based on the design analysis results. If this is not done, then the ODM may be choosing tests that may have worked on other products or for other customers, but they may not work on this program.

1.2.2 Providing a Test Plan for the ODM

This method will work only if the ODM has been trained on how to perform each of the tests and what to do with the results. Similar to the design analysis, if this is not done, little benefit will be gained from the tests and the ODM will just be producing reports that have little meaning towards the overall reliability goal, and worse, they will not know what design changes to make as a result of the tests.

2. Lack of Control over Manufacturing Process

2.1 Identifying the Process Capabilities

2.1.1 What is the inherent failure rate of the production line?

Every production line has an inherent failure rate, often referred to as the process capabilities. It is important to understand exactly what is contributing to the yield loss. Pick and place equipment, test equipment and even the operators affect the yield. Since you do not own the process or equipment, it is very difficult to characterize it and identify the contributing factors to yield loss.

2.1.2 Are failures induced by the production line?

Failures can be generated by the production equipment and/or personnel. Electrical Overstress or Electro Static Discharge is created by many sources, such as poorly grounded equipment or people not properly wearing grounding straps.

2.2 Quick and timely identification of inferior material

Since the production line is typically offshore there is a time lag between when failures are detected and when the data is reported. At best it is hours but more often than days.

This means when yield problems occur, typically you find out about it only after the product has shipped.

2.2.1 Inventory control

Inventory control is a problem with outsourcing. Obtaining information on inventory levels is difficult, especially if you need to determine inventory levels by Date Codes.

2.2.2 Ability to quarantine suspect material

When problems are identified with a material, it is difficult to quarantine the material. When parts are suspected as causing a problem and further investigation is needed it is difficult to quarantine the material while the investigation is being performed. Often the suspect parts or boards have to be returned to the engineering group for the evaluation. Since it takes days to get faulty material in the hands of the engineer, valuable time is lost. Often there are problems with communication channel with the offshore facility.

This happened with a CM in Asia where the line yield went from 92% down to around 82%. When the OEM learned this, they wanted to quarantine the material for further testing, but the CM misunderstood. When the material arrived at the OEM, they discovered that only the failing material had been shipped to them. When they inquired about the entire lot, they learned that it had been shipped to customers.

3. Lack of Visibility into the Manufacturing Testing Process

3.1 Quick and accurate data reporting & analysis

This can be a real issue. Often the data is spread across different databases and reports are lacking in complete and real information, which makes it difficult to analyze. Data can be duplicated inadvertently, which results in a lot of data but not much information, making it difficult to take proper corrective action. It can also be difficult to determine if previous actions taken were effective.

3.2 First pass yields

By the time you get first pass yield data the material has most likely been shipped to customers.

3.3 Analysis performed on failures

3.3.1 Depth of analysis performed

Accurate and complete failure analysis on line failures is impossible. The production people do not have the skills or knowledge of your product to be able to analyze failures. Therefore, failures must be shipped back to the engineering group or failure analysis group for analysis. This can take weeks and determining if the material from this production run should be shipped or quarantined is impossible.

3.3.2 Rework

In order to determine if rework should be done, how many times a board can be reworked, or which parts can be reworked, can be difficult when outsourcing. How do you assess the quality of the rework?

3.3.3 No Fault Found

No fault founds or false failures can be issues difficult to resolve. There have been reports of intermittent failures being shipped to customers because the boards passed the second time or in some cases the third time they were tested.

3.3.4 Bone pile

Without the proper test verification and failure analysis the boards that end up in the bonepile can accumulate quickly. Most contract manufacturers get paid for the boards out the door and this is where they put most of their efforts. Who is responsible for line failures?

3.4 Feedback on Manufacturing Screening/HASS

3.4.1 Setting up the Screen

Setting up a manufacturing screening process can be tricky and if not done properly, can induce failures. Good communication is required between you and your CM for this to be implemented successfully.

3.4.2 What failures is HASS finding

Closely monitoring the HASS process is essential because the failures from HASS will be a sign of the process shifts that are occurring.

3.4.3 When and how to tweak the screening profiles

Frequently we want to tweak a profile to optimize it especially early in the manufacturing process. After a design change is made, we will usually have to re-prove a screen and make changes if necessary.

4 Correlation of Field Failures to Production Failures

One great method of continual process improvement is to closely monitor the field results and then to change the process accordingly.

4.1 Test escapes?

This may require changing the testing process if we determine that the cause of the escape was due to lack of test coverage.

4.2 Production generated failures?

The mistake may have been something that testing cannot find but inspection is the answer.

4.3 Intermittent failures?

Correlation of field failures is an important part of process improvements. Are the failures something that should have been screened out during production testing (Test Escapes) or are the failures being generated by the production line? Having the ability to run the failing material through the production testing again to see if it now fails is extremely important, but difficult to manage. If the field failure still passes production testing do you have the ability to improve the test program? Are the proper people in the proper place to manage this?

5. Driving Changes in Production to Improve Quality

5.1 Do you have control to do this?

Quality improvements come in various ways. In some cases it's personnel related and in other cases it is equipment related. Improvement can come from changes in process flow and the handling of the material, as well as how material is stored and inventoried. CMs can make changes on the fly without notifying you, and often what they say is not exactly how it is being performed. You need to walk the process often to ensure changes are carried out and to ensure other changes are not being made without your knowledge.

5.2 Correlating the effects of change

This is important but difficult with a CM. Obtaining the data necessary to properly assess the effects of change is often delayed and does not contain the data needed.

CONCLUSION

Managing your outsourcing means you must take an active role with your suppliers and build a trust relationship. It does NOT mean jumping around to find the lowest price. It may be more expensive at first but it will pay off once you establish the process.

SOLUTIONS PROVIDED

Frequently companies do not have the technical expertise or the bandwidth to manage the quality of an overseas supplier. That is where Ops A La Carte can help! We have consultants in Asia and Europe that can travel to your ODM or CM and either audit the facility and/or work with them to improve their reliability through training and consulting.

We also have a new service called EXPERT REVIEW in which we can review work performed by your overseas division, your ODM or your CM and provide guidance on how to improve.

Mention this article and receive \$1K off your next EXPERT REVIEW service.

PROBLEM SOLVER

QUALITY RISKS IN OUTSOURCING

*In the article above, we pointed out many different risks with outsourcing and how each can be solved. **Who can come up with a risk and solution that is not on our list above.** OFFER: Free pass to any upcoming event or seminar, or \$1K off your next lab or consulting service.*

HALT CALCULATOR

We are posting the same Problem Solver as in last quarter's newsletter because we are close to completing the HALT Calculator model and just need a bit more data to complete.

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. Note that this is the second newsletter in which we have run this challenge because we need just a little bit more data to complete the model.

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 (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 presented this calculator at the annual ASTR Conference. Download a copy at [TechPapers](#).

Send Responses to:

Email us via our [HALT Calculator Contact Form](#). We are looking for information by Dec 31. Any individual who sends us usable data will be entitled to use this calculator for no charge once it is released.

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Ops A La Carte's newsletter goes out to over 16,000 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



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



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 16,000 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.

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