



Reliability News

TOP EVENT: [Ops A La Carte Announces New Software Reliability Div.](#)  [Click here for print version](#)

Fall -Winter 2006

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Theme this newsletter:
SOFTWARE RELIABILITY

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COURSES

- ▶ [Certified Reliability Engineer \(CRE\) Preparation Course](#) (pdf) - Jan 9-Feb 27, 2007
- To register, email us at CRECourse@opsalacarte.com
- ▶ For details see the [Ops A La Carte Schedule](#)

SEMINARS

- Design for Reliability (DfR)** ([click here for outline](#))
- ▶ We have revamped our DfR Seminar, adding many new modules, and making the seminar highly user selectable on which modules to choose from a list of over 20 modules. This DfR Seminar can focus on Hardware Reliability, Software Reliability, or a combination of the two for an overall System Reliability approach.
- ▶ Most of our seminars are taught as **in-house tailored** seminars. To view a list of all our seminars, go to [Ops A La Carte Course List](#)
- ▶ For details see the [Ops A La Carte Schedule](#)

OTHER SEMINARS WE DEVELOPED IN 2006 - inquire if interested at education@opsalacarte.com

- ▶ [Mechanical Design for IC Packaging](#)
- ▶ [Design for Manufacturability \(DfM\)](#)
- ▶ [Design for Testability \(DfT\)](#)
- ▶ [Design for 6 Sigma \(DfSS\)](#)
- ▶ [Design for 'X' \(DfX\)](#)
- ▶ [Design of Experiments \(DoE\)](#)
- ▶ [HALT and HASS Application](#)
- ▶ [Statistics for 6 Sigma](#)
- ▶ [Fundamentals of Statistical Process Control](#)
- ▶ [Design for Climatic Conditions](#)
- ▶ [Design for Vibration and Shock](#)
- ▶ [Software Reliability](#)
- ▶ [RoHS](#)
- ▶ [Root Cause Analysis](#)

▶ For details on these NEW seminars, see the [Ops A La Carte Course List](#)

EVENTS

▶ Reliability, Availability, and Maintainability Symposium (RAMS) - January 22-25, 2007

The annual RAMS is happening in January in Orlando, Florida. We will have a booth at the show and will be one of the presenters. If you are planning to go, please check out our booth.



SPECIAL OFFERS

▶ **Free Admission** to the [Reliability, Availability, and Maintainability Symposium \(RAMS\)](#) to the first individual that turns us onto a new consultant. We are growing rapidly and are looking for the best technical operations' consultants out there. If you know of anyone, please pass their name to us at events@opsalacarte.com. **This is a \$800 value.**

NEWS



- Nov 15, 2006

Ops A La Carte announces their new Software Reliability services. Companies find that their software engineers spend more time debugging than designing or coding, and accurate software reliability measurements are not available at deployment to share with customers. What can development organizations do to increase software reliability without significant increases to schedules or budgets?

Ops A La Carte offers software reliability training and consulting services that integrate with the above approaches to produce better results. Our training and consulting services focus directly on the practices of software and test engineers.



- Nov 1, 2006

Ops A La Carte welcomes 5 more consultants to our team. Please welcome Gil Bastien, Keya Bhattacharyya, Gerry Cohen, George de la Fuente, and Harold Hart. Gil is an expert at HALT and HASS, including fixturing. Keya is an expert at new product introductions. Gerry has expertise in both Quality and Reliability Management. George is our resident Software Reliability expert and has developed our newest services in the area of [Software Reliability](#). George's services are featured in this month's [newsletter article](#). And Harold has expertise at the reliability management level, helping to set up and develop reliability departments.,

We have also added two new Sales Managers to our team. Clayton Bonn is our new Sales Manager for the Southwest region (Southern California, Arizona, Nevada, and Mexico). And Randy Bloom is our new Sales Manager for the Northwest region (Oregon, Washington, Idaho, and British Columbia). Each consultants' profile is shown on our [Our Team's](#) webpage.

- Oct 4-6, 2006

Ops A La Carte consultants presented 5 papers at the annual **Accelerated Stress Testing for Reliability (ASTR) Workshop** held in San Francisco October 4-6. Ops A La Carte is on the AST committee for deciding the location and the speakers. Next year's workshop is scheduled for October 2007 in College Park, Maryland.



- Sep 24 through Oct 2, 2006

Ops A La Carte Develops Alliance with SGS in Taiwan and delivers joint seminar

SGS Testing Services and Ops A La Carte put on a free one-day Reliability seminar in Taiwan on September 26th and in Singapore on September 29th to over 250 engineers to announce their partnership with SGS and to kick off their entrance into the Asian market.



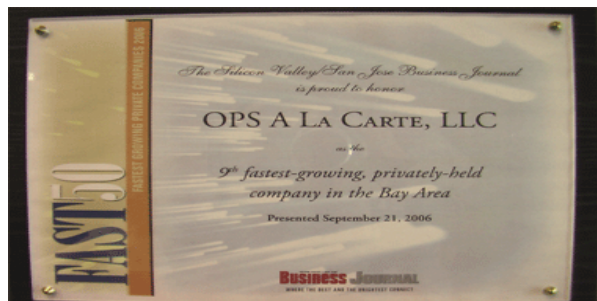
- Sep 27, 2006

Ops A La Carte's presents a paper at the **Asian National Quality (ANQ) 2006 Conference in Singapore**. Ops A La Carte was the United States' sole representative at this yearly conference. We presented our paper on [.HALT vs. ALT: When to Use Which Technique](#)



- Sep 21, 2006

SJ Business Journal announces Ops A La Carte as the 9th fastest growing private company in the Bay Area. Each year, the Silicon Valley/San Jose Business Journal comes out with a list of the 50 fastest growing private companies in Silicon Valley, and this year, Ops A La Carte has made the list. On September 21st, they held a banquet and announced that we placed 9th on the list. For more details, go to [SJ Business Journal's Fast 50 List](#)



- July 1, 2006

Ops A La Carte completes purchase of QualMark HALT Lab in Santa Clara. The Santa Clara HALT Lab was started in May, 1995 by Mike Silverman when he was an employee of QualMark. Mike ran the lab for 5 years before leaving to start Ops A La Carte in 2000. Then last year, Ops A La Carte took back over the management of the lab, and on July 1st, we officially purchased the facility from QualMark. Please go to our revised [HALT](#) and [HASS](#) Web Pages for more details. Below is our new logo for the lab.



▶ **Presentations for the above events** are available for download on the [Resources Page](#) of our website.

▶ **For more information** on news, please visit our [News Page](#) or call (408) 472-3889.

FEATURED SERVICE



Software Reliability

THE STATE OF SOFTWARE RELIABILITY PROGRAMS TODAY

Companies developing products containing embedded software use the following approaches to create reliable software:

- Traditional software reliability programs
- Process control
- Quality through software testing

Traditional software reliability programs treat the development process as a software-generating black box. Predictive models are generated, usually by a separate team of reliability engineers, to provide estimates of the number of faults in the resulting software; greater consistency in reliability leads to increased accuracy in the modeling output. Within the black box, a combination of reliability techniques like failure analysis, e.g., FMEAs (Failure Mode and Effects Analysis), FTAs (Fault Tree Analysis), defect tracking, and operational profile testing are used to identify defects and produce software reliability metrics.

Process control assumes a correlation between process maturity and latent defect density in the final software. Organizations implementing CMM Level 3 processes generate software containing 2.0-3.5 faults per KSLOC (1000 source lines of code). If the current process level does not yield the desired software reliability, audits and stricter process controls are implemented.

Quality through software testing is the most prevalent approach for implementing software reliability within small or unstructured development organizations. This approach assumes that reliability can be increased by expanding the types of system tests (e.g., integration, performance and loading) and increasing the duration of testing. Software reliability is measured by various methods of defect counting and classification. Generally, these approaches fail to achieve their software reliability targets. Companies find that their software engineers spend more time debugging than designing or coding, and accurate software reliability measurements are not available at deployment to share with customers.

What can development organizations do to increase software reliability without significant increases to schedules or budgets?



Ops A La Carte offers software reliability training and consulting services that integrate with the above approaches to produce better results. Our training and consulting services focus directly on the practices of software and test engineers.

We offer services that apply to the reliability of all products and are typically executed at the organizational level:

Software Reliability Integration for the Organization

- Software Reliability Assessment
- Software Development Best Practices Assessment

Software Reliability Integration for the Organization

Before assisting with specific programs, we recommend that an organization assess its development practices against industry best practices to ensure they have a solid foundation upon which to integrate our reliability services. If necessary, we will help an organization fill in gaps by identifying existing, internal best practices and tools to yield the desired results. Then, we help define a set of reliability practices to move defect prevention and detection as far upstream of the development cycle as possible.

Once we have assessed the Software Reliability Program, we can assist with specific software programs. Below is a list of our product-level Software Reliability services along with an explanation of how these services are integrated throughout a product life cycle:

Software Reliability Integration in the Concept Phase

- Software Reliability Goal Setting
- Software Reliability Program and Integration Plan

Software Reliability Integration in the Design Phase

- Facilitation of Team Design Template Reviews
- Facilitation of Team Design Reviews
- Software Failure Analysis
- Software Fault Tolerance

Software Reliability Integration in the Implementation Phase

- Facilitation of Code Reliability Reviews
- Software Robustness and Coverage Testing Techniques

Software Reliability Integration in the Testing Phase

- Software Reliability Measurements and Metrics
- Usage Profile-based Testing
- Software Reliability Estimation Techniques
- Software Reliability Demonstration Tests

Software Reliability Integration for the Concept Phase

In the concept phase, the software team should be able to assist in defining system level reliability and availability software goals, which are different from hardware goals. These goals become part of the overall Reliability Program and Integration Plan and are applied to the design and testing phases.

Software Reliability Integration for the Design Phase

In the design phase, group pre-design review meetings provide engineers with forums to expand their knowledge base of design techniques by exchanging design templates. Design inspection results will be greatly improved if they are preceded by brief, informal reviews that are highly-interactive at multiple points throughout the progression from system architecture through low-level design. Prior to the final stage of design, software failure analysis is used to identify core and vulnerable sections of the software which may benefit from additional run-time protection by incorporating software fault tolerance techniques.

Software Reliability Integration for the Implementation Phase

In the implementation phase, reliability reviews target only the core and vulnerable sections of code to allow the owner of the source code to develop sufficient synergy with a small team of developers in finding defects. Unit testing efforts focus on efficient detection of software faults using robustness and coverage testing techniques for through module-level testing.

Software Reliability Integration for the Testing Phase

In the system testing phase, reliability measurements and metrics are used to track the number of remaining software defects, the software MTTF (Mean Time To Failure) and to anticipate when the software is ready for deployment. The test engineers will be able to apply usage profiling mechanisms to emphasize test cases based on their anticipated frequency of execution in the field.

PROBLEM SOLVER

Problem on Software Reliability

Below are the definitions for software defects, faults and failures:

- 1) A software defect as a logic error within the static source code, i.e., a defect can exist regardless of whether the software is executed.
- 2) A software fault is the run-time triggering of a logic error by executing the source code associated with a defect, i.e., a fault exists only when at run-time when the associated code is triggered.
- 3) A software failure is the a problem with the run-time software that is visible to a customer or connecting system(s), i.e., a failure is the visible aspects of one or more faults.

Based on these definitions, create an example scenario to explain the following scenario: Two, identical

systems at different customer sites trigger the same software fault with the same input data. However, only one of the two systems experiences a software failure. How is this possible?

Free Admission to the [Reliability, Availability, and Maintainability Symposium \(RAMS\)](#) to the first individual that emails us the correct solution. You can email us at events@opsalacarte.com. **This is an \$800 value.**

Solution to **Last Quarter's Problem of the Month on Accelerated Life Testing:**

An accelerated life test is performed on a new electronic device. The accelerated test is conducted at 150°C, with a mean failure time of the devices equaling 100 hours. Given an activation energy of 0.25 eV and an acceleration factor of 2.0, determine the normal operating temperature in °C.

Answer: 111.1 C

ADVERTISEMENTS



The GoldSim simulation framework allows one to probabilistically simulate the reliability and performance of complex engineered systems over time. GoldSim provides the ability to model the interdependence of components through requirements and fault trees, as well as the capability to define multiple independent failure modes for each component. This facilitates both reliability modeling and risk analysis within a variety of industries, including space and defense, manufacturing, mining, telecommunications, electronics and infrastructure. For more information, contact Tim Schmitt at tschmitt@goldsim.com or go to www.goldsim.com



Link Silicon of Valley, LLC (LinkSV) is an online networking resource for researching, identifying and contacting the companies and people within the 6,000 plus active & inactive companies in the greater Bay Area. Our company records identify the senior team, board members, financing, key partners and customers. There are many features which allow you to view the information from different angles and "connect all the dots".

LinkSV helps you tap into previously scarce and extraordinarily hard-to-find information on early stage companies and the key people associated with them. This will improve your effectiveness without the hassle and time of trying to do it all on your own. LinkSV is ideally suited to help you quickly identify and leverage your own connections in career search, in identifying new business opportunities, new investors and Board members.



The Reliability, Maintainability, and Supportability Partnership (RMS/P) organization's goal is to enhance communication, coordination and collaboration between industry and government in a manner that will encourage individuals and organizations to adopt an integrated systems engineering approach, or end-to-end management approach, when addressing RMS issues. The RMS Partnership also encourages individuals, professional societies, and industry associations to develop, use and maintain world-class RMS non-government standards. The RMS Partnership publishes a quarterly newsletter which is freely available on the Web site. Membership in the RMS Partnership is open to individuals and organizations interested in being on the cutting edge of RMS issues and initiatives both nationally and internationally.

Ops A La Carte's newsletter goes out to over 7500 subscribers. If you would like to advertise in next quarter's "Reliability News", email us at advertise@opsalacarte.com or call at (408) 472-3889.

JOB OPENINGS



Senior Reliability Consultants Needed !

Ops A La Carte is looking for Senior Reliability Consultants *around the world* with their own consulting practice to join our team of consultants and work on some of the most exciting and challenging projects in the industry.

CONSULTANT PROFILE

- *Set your own hours*
- *Control your own future*
- *Work on fascinating projects in new industries*
- *Travel as little/much as you'd like*
- *Be looked upon as an expert*
- *Work with the best consultants in the industry*
- *Run your own business*
- *Eligible for free seminars and symposia*
- *Freedom to work on the projects you want*

If interested, please email hr@opsalacarte.com or call (408) 472-3889.

Ops A La Carte's newsletter goes out to over 7500 subscribers. If you would like to put a job opening in next quarter's "Reliability News", email us at jobopenings@opsalacarte.com or call at (408) 472-3889.

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