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**Ops A La Carte LLC**  
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[www.opsalacarte.com](http://www.opsalacarte.com)

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*Theme this newsletter:*

**ROOT CAUSE ANALYSIS**

**COURSES and SEMINARS - RCA Webinar, CRE Certification**

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**EVENTS - Applied Reliability Symposium (ARS), HALT&HASS Labs' Open House**

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**SPECIAL OFFERS - Free Admission to any upcoming Ops a La Carte event**

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**NEWS - China partnership with SinoRel, Singapore partnership with ST Eng., 7 new consultants, OPS expansion in Southwest**

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**FEATURED SERVICE - Root Cause Analysis**

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**PROBLEM SOLVER - Root Cause Analysis: Name 10 RCA Tools**

.....  
**ADVERTISEMENTS - SigmaQuest, LinkSV, and DfR Solutions**

.....  
**JOB OPENINGS - Apple, Cisco, Fairchild Imaging, NPI Solutions, OPS A La Carte**

**MESSAGE FROM THE CEO**

*We are excited about the growth and expansion we've been able to achieve over the past quarter. We've expanded both geographically and in new services and seminars. Geographical we are strengthening our position in Asia with a new partnership in China, and we have continued to expand our operations in Singapore as well (and we have brought on some new talent in the US as well). And on the Services side, we've completely revamped our Root Cause Analysis service and seminar as well as our Design for Six Sigma service and seminar.*

- Mike Silverman, Managing Partner/CEO

**COURSES**

- ▶ [Certified Reliability Engineer \(CRE\) Preparation Course](#) (pdf) - **August 26 - October 7, 2008**
- ▶ To register go to: [eventsinfo](#)
- ▶ For information on other course offerings go to: [Ops A La Carte Schedule](#)

**SEMINARS**

- ▶ **Webinar: Root Cause Analysis**  
**Date(s):** July 23, 2008  
**Time:** 9am-1pm, Pacific Standard Time (PST)  
**Instructors:** :Cliff Lange, PhD, Kim Parnell, PhD, Craig Hillman, PhD  
**Length:** 4 hours  
**Cost:** Free  
**Location:** Call in (information to be provided after registration)

**Description:** RCA is a structured, team-based and streamlined approach for solving chronic failure problems in a process, product, or service. RCA applies practical, systematic methods for analyzing performance problems to uncover root causes. It prioritizes which problems should be analyzed first, and then explores effective ways of gathering data for root cause determination. Finally, RCA resolves to the primary root cause where the problem is found and fixed. This 4 hour webinar will familiarize you with the tools and techniques

and provide some case studies of how RCA is being applied in the industry today.

▶ To register for this webinar, please go to [webinar registration form](#).



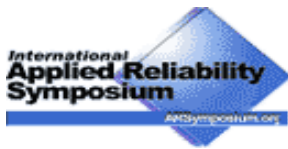
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## EVENTS

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▶ **Applied Reliability Symposium (ARS) in Reno, Nevada - June 17-20, 2008.**

We will be giving a joint presentation called "Practical Software Failure Analysis". We will also be exhibiting at this symposium so please come by our booth. For more details, please go to [ARS Reno](#). Email us via our [contact form](#) for more information on this event.



▶ **HALT and HASS Labs Open House - September 17, 2008.**

We will be holding our annual open house. Just like last year, we will have free presentations, great food, and fun prizes. More details to follow. Email us via our [contact form](#) for more information on this event.



▶ **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.



▶ **Prognostics and Health Maintenance (PHM) Conference, Denver, Colorado - October 6-9, 2008.**

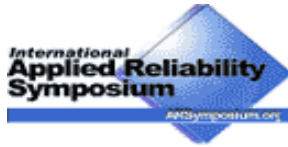
OPS will be presenting a paper on: "Leading Indicators - A More Effective Method for Accelerated Life Testing and Prognostics" For more details, please go to [PHM](#). Email us via our [contact form](#) for more information on this event.



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► **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.



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

#### SPECIAL OFFERS

► **\$1000 off** your next service or a free pass to any of our upcoming events or seminars *to any individual that introduces us to a new consultant that we hire*. Email us via our [Special Offers Contact Form](#)

#### NEWS



- June 6, 2008

OPS A La Carte signs agreement with SinoRel of China to create joint consulting partnership. OPS A La Carte is based in Saratoga, California and SinoRel is based in Beijing China. Both companies have consultants in their local area. SinoRel has many China-based companies in need of expert consulting services, and OPS has many US customers with subsidiaries and contract manufacturers in China that need consulting expertise. We plan to use SinoRel's local consultants for much of the day-to-day consulting and OPS A La Carte's U.S. consultants to set the direction of the projects as well as to offer high end project management and training expertise.

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- May 25, 2008

OPS A La Carte and ST Engineering of Singapore sign a joint partnership agreement. ST Engineering is based in Singapore and OPS A La Carte is based in Northern California several offices across the U.S. along with offices in Singapore, China, India, and the U.K. The two companies have signed a joint partnership agreement to serve the reliability program and testing needs of the industry. This partnership leverages OPS' expertise in reliability program development and implementation and STS' strong test capability and experience with a wide range of reliability test facilities. This solid partnership aims to make both companies leaders in the Electronics, Infocom, Medical, and Automotive Industries within the region. "This really strengthens our ability to serve customers in the local Singapore market", says Managing Partner Mike Silverman. "We can use this to serve both local companies as well as U.S. customers with subsidiaries in Singapore. We now have three great lab partnerships (the other two being LabOne and iNeTest) as well as alliances with ReliaSoft Singapore and HALT and HASS NZ."

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- May 15, 2008

We have added 7 new consultants to our company in several different regions of the US and in China:

**Harvey Altstadter (Arizona):** Harvey utilizes his more than 40 years of experience to provide clients with services that include Root Cause Analysis, Reliability Prediction, Stress Analysis, Worst Case Circuit Analysis, Data Analysis, Trend Analysis, Process and Procedure development for manufacture of Hybrid Microelectronic products, Screening Procedures, Training and Customer Interface for Engineering, Reliability and Failure Analysis functions.

**Lennox Bennett (Southeast US)** has more than ten years of experience leading reliability, quality and

manufacturing in electronics, medical device, appliance, printing and manufacturing industry. He has experience in disciplines such as manufacturing engineering, advance quality engineering, reliability engineering, teaching and supervisory management. He has successfully improved process and product performances during previous assignments. He is president of Lebentech in Florida. Lennox has worked with many small and large companies, including Xerox, Maytag, Real-Time Labs, Sunbeam, GE Appliances, Motorola, Alcon Labs, and Taco Metals. He has an M.S. degree in Industrial Engineering from California Polytechnic State University.

**Chet Haibel** (*Northwest US*) has been in New Product Development all his professional life. His first 18 years were spent learning by doing as an R&D Engineer, Project Leader, and Program Manager on a wide variety of products. Chet has Bachelor of Science in Electrical Engineering and Master of Engineering degrees, both from Cornell University. He is a senior member of the American Society for Quality and is certified by ASQ as a Reliability Engineer, Quality Manager, Quality Engineer, Software Quality Engineer, Quality Auditor, and Biomedical Auditor. Chet is certified by Johnson and Johnson as a Six Sigma Green Belt.

**Jeff Jin** (*China*) holds an M.S from ZheJiang University. Mr. Jin's experience includes Measure System Analysis (MSA), Failure Modes and Effects Analysis (FMEA), Design of Experiments (DOE), Statistical Process Control (SPC), Highly Accelerated Life Testing/Highly Accelerated Stress Screening (HALT/HASS), Accelerated Life Testing (ALT), Reliability Demonstration Testing (RDT), and Root Cause Analysis (RCA) including the 8D methodology. He is a Six Sigma Black Belt and a Certified Reliability Engineer.

**Cliff Lange** (*Northern California*) has 30 years of industry experience in both reliability engineering and root cause failure analysis. Most recently Dr. Lange spent 12 years developing reliability programs for the Semiconductor Equipment Manufacturing industry. He is proficient in reliability assessment, reliability training and all aspects of design for reliability techniques as applied to the entire life cycle of product development.

**Vijay Prasad** (*LA, San Diego*): Vijay has 20 years of combined reliability experience, and as a multi-disciplinary Senior RMA Engineer. He possesses a strong product development background within the aerospace, military defense, and automotive environments.

**Aron Rolnitzky** (*Central US*) is an ASQ Certified Reliability Engineer with over 35 years of industry experience in design, reliability and quality assurance and management in the computer and medical electronics industry. He has consulted or provided training for companies in product areas including communication, medical, computers, large and small industrial, and military. Expertise includes reliability design analysis, field data analysis and corrective action systems, reliability testing including accelerated tests, reliability and quality improvement, and training.

We also added a new lab supervisor to our **HALT and HASS Labs**. Please welcome **Jon Ferguson** to our staff. Jon has over 25 years of electronics experience, with 14 in HALT and HASS at various companies such as Apple, Tyco, Harmonic, and Quantum/Maxtor.

More information about each consultant can be found on our website at [About Team](#).

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- May 7, 2008

### **OPS A La Carte expands its Southwest US Office**

Although OPS A La Carte is headquartered in Northern California, we haven't lost sight of the growing business in the Southwest - LA, San Diego, Arizona, New Mexico, and Nevada. These areas are booming with activity and we are poised to make a significant impact in these regions with the team we now have in place.

The Southwest team is head up by Sales Manager Clayton Bonn. Clayton has almost 30 years experience as a sales engineer.

And our consulting team consists of **Alex Fashandi** (*San Diego*), **Vijay Prasad** (*LA, San Diego*), **Gil Bastien** (*LA*), and **Harvey Altstadter** (*Arizona*). More information about each consultant can be found on our website at [About Team](#).

In addition to our HALT and HASS Lab in Silicon Valley, we have affiliations with some of the best test labs in the area - SoCal Testing, Wyle Labs, SGS, and NTS - for a wide variety of environmental testing, and Quality Testing Services for specific HALT and HASS test requirements. These labs complement our offerings in the bay area, and our consultants in Southwest US work closely with them to assure the results are integrated

with our overall solutions.

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- May 1, 2008

Ops A La Carte exhibited at the Del Mar Electronics (DMES) show and gave a presentation on HALT vs. ALT: When to Use Which Technique. Please go to [HALT vs. ALT](#) for a free copy.



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- April 14, 2008

The 2nd annual OPS A La Carte Reliability Symposium in Campbell and Santa Clara, CA—a notable success—took place the week of April 7 -11, 2008. The Symposium featured seven, one and two day seminars focused on the application and practices of reliability engineering. Topics included: Best Accelerated Reliability Test Methods, Design for Reliability, Design of Experiments, Mechanical Reliability, Root Cause Analysis, Software Reliability, and Statistical Process Control. See our [seminar list](#) for more details on each seminar. And we used five of our top instructors for the event, plus two distinguished guests including Dr. Michael Pecht from the University of Maryland's Center for Advanced Life Cycle Engineering (CALCE). Dr. Pecht gave an overview on his work in Electronic Prognostics.

Over 75 attendees from a wide variety of industries attended during the course of the week. Represented were companies from the following industries: Audio/Video, Automotive, Avionics, Computers, Contract Manufacturers, Defense, Handheld/PDA Devices, Medical, Oil Exploration, Semiconductor, Semiconductor Equipment, Space, and Telecom. We also had 6 different countries represented – Belgium, Canada, China, Japan, United Kingdom, and United States.

"The annual Reliability Symposium provides not only valuable training and real-world applications to our attendees, it is also an opportunity to discuss and exchange information on the depth and breadth of the most up-to-date reliability methods," said Mike Silverman, OPS A La Carte principal and partner. "We are looking at plans to increase our training portfolio and seminar offerings to better equip our customers with state-of-the-art reliability tools and methods."

The symposium also included a tour and demonstrations of the HALT and HASS Lab in Santa Clara, a division of OPS A La Carte.

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- March 14, 2008

Ops A La Carte and SigmaQuest teamed up for their 2nd combined webinar. This one was entitled "Managing Outsourcing Quality Risks". Please go to [Managing Outsourcing Risks](#) for a free download or go to [Managing Outsourcing Risks Video Broadcast](#) for a live video broadcast.



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- March 13, 2008

Ops A La Carte joined a panel of three to discuss "Three Views on Consultant Marketing." Ops A La Carte represented the vantage point of the entrepreneur - "It just takes hard work. Get your name out there again and again by networking, advertising, partnering, and constantly promoting your company." Please go to [Three Views on Consultant Marketing](#) for a free copy.

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

**FEATURED SERVICE**



## Root Cause Analysis

### A Foundation for Effective Reliability Programs

Contributing Authors: Harvey Altstadter, Cliff Lange, Kim Parnell, and Mike Silverman

*One of the most important aspects of an organization's reliability program is the ability to identify and correct failure related issues. Failures can prevent reliability goals from being achieved and increase warranty costs. Often, internal resources are limited in the availability and use of Root Cause Analysis (RCA) tools. Many problems are of a specialized nature, and companies do not understand how to approach these problems.*

RCA is a process that is often used for identifying the actual cause of events and then applying corrective and preventative actions to solve problems. A Root Cause can be associated with any of the elements of a product, including its design, manufacturing, and use. This process has significant value in helping to respond to everything from customer complaints, process problems, and accident investigation.

Root cause analysis is not a single, sharply defined methodology; there are many different tools, processes, and philosophies of RCA in existence. Success is achieved by applying the appropriate tool at a specific point in the RCA process.

To more fully assist customers with their respective reliability programs, OPS A La Carte continues to mature the RCA services it provides to the engineering community.

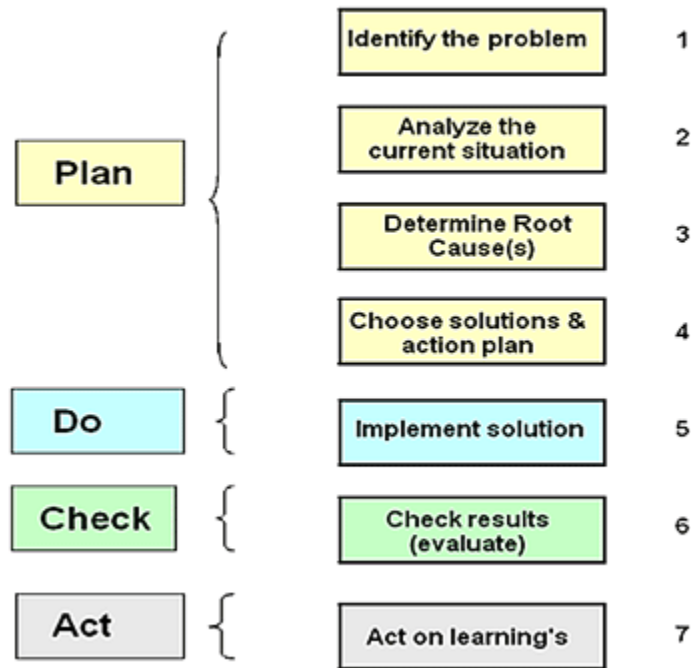
#### The 7-Step Process Defined:

Many companies employ *structured problem solving* techniques to assist with their RCA and corrective action activities. The "7-Step Process" (see figure below) is one method frequently used to approach and focus on continuous improvement of existing processes. This process is one that is frequently used today and is summarized below.

1. Define/Identify the problem.
2. Analyze and gather data/evidence.
3. Determine Root Cause: Ask why and identify the causal relationships associated with the defined problem. Identify which causes, if removed or changed, will prevent recurrence.
4. Choose solutions and action plan: Identify effective solutions that prevent recurrence, are within your control, meet your goals and objectives and do not cause other problems. The solution should not only address the problem at hand, but also assure that similar problems also do not occur.
5. Implement solution(s) and the recommendations.
6. Evaluate: Observe the recommended solutions to ensure effectiveness.
7. Act/report on what was learned.

(NOTE: some companies call it the 8-Step Process, adding in a last step for celebrating after success).

## 7 STEP PROCESS



***The process seems simple enough, but companies fail when implementing this process for a few reasons:***

- a. They work on Step 5 (solution) in parallel with Steps 1-4 (or just as likely, they skip Steps 1-4 altogether). And as a result, they never really understood the problem and either fix the wrong problem, or more likely, only partially fix the problem.
- b. Step 5 not only requires that a solution be identified, but that it does not cause other problems. Often times a change in one area may cause a problem in another. A hardware change can cause a software error or vice versa, a change due to a temperature issue can then manifest as a vibration issue, etc. A robust verification and validation process must be defined so that these escapes do not occur.
- c. Also in Step 5, the solution tends to be very narrowly focused rather than looking at how to prevent similar problems. If a failure occurred because a component was improperly derated for electrical stress, then a fix may be to change the component to one with a higher rating. A full solution would look at derating guidelines to see if there are changes required to prevent future issues with component derating.
- d. Step 7 is rarely done well. Lack of documentation and routine updating of company standards and operating procedures often reduce RCA activity to tribal knowledge. Surprisingly, it is not unusual to see organizations solving the same problems over and over again, only to address the issues with different customers using different engineering personnel. Engineering organizations need to be effective at avoiding errors even when an entire design team moves on to other projects.
- e. Steps 6 and 7 often lack reliability metrics. Without the correct metrics in place, it is difficult to measure the effectiveness of corrective actions. Properly selected metrics provide the feedback necessary to assure that the right actions are taken to address the issues at hand. Furthermore, they provide evidence to management that engineering's actions are having a positive impact to the organizations profitability, customer satisfaction and overall engineering effectiveness.
- f. Perhaps the most challenging portions of this 7 Step Process are Steps 3 and 4. Many companies attempt to identify the casual relationships and key contributors to failure using a limited tool set available within their engineering organizations. Here, companies need to really understand what happened and why, and for this, they often need to employ more advanced failure analysis tools and techniques. This usually falls outside their comfort zone or knowledge level. Techniques such as material analysis, finite element analysis, design of experiments, dynamic load analysis, thermal analysis, computational fluid dynamics (CFD), and probabilistic evaluations play a key role in RCA and are generally not part of a company's engineering capabilities. It is not enough to know about the tools; but also to understand when it is appropriate to use a specific tool and how to apply the tool.

Over the past few years, OPS A La Carte has been maturing both the disciplines and the expertise that makes use of them. Our system approach focuses on:

- ▶ Implementation of multi-disciplinary approaches capable of solving a broad range of problems quickly and effectively, saving both time and money;
- ▶ Partnering with over 50 other specialized firms to continue expanding RCA expertise;
- ▶ Identifying, testing and verifying potential design changes;
- ▶ Unbiased, independent RCA services capable of satisfying all end-customer inquiries;
- ▶ Identification of the appropriate reliability metrics to measure the resulting improvements to product reliability.

Our expertise extends to both the system and component level for a wide variety of different areas including electrical, mechanical, materials, chemical, optical, and software. We tap into our vast experience in each of these areas to solve problems quicker and more effectively.

## SUMMARY

RCA is the foundation for every effective reliability program and is most often the most challenging discipline, because of the many factors involved —design, testing, manufacturing, and installation; including customer usage and environmental effects. It is an essential function of the continuous improvement process and the difference between merely repairing pattern failures and truly eliminating the underlying problems. Only by eliminating the underlying problems can organizations experience improvements in reliability. By putting in place reliability metrics, we can monitor the effectiveness of a RCA program.

OPS A La Carte's business model of end-to-end integrated reliability solutions is a perfect fit because as the issues become more complex, the only way to solve them is to take an end-to-end, multi-disciplinary approach.

For more information about OPS A LA Carte's RCA Services and Training, please visit the reliability prototyping and training pages of our web at:

[http://www.opsalacarte.com/Pages/reliability/reliability\\_prot\\_failure.htm](http://www.opsalacarte.com/Pages/reliability/reliability_prot_failure.htm) and  
[http://www.opsalacarte.com/Pages/education/edu\\_25rca.htm](http://www.opsalacarte.com/Pages/education/edu_25rca.htm).

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*Mention this article and receive 10% off your next Root Cause Analysis service.*

## **PROBLEM SOLVER**

### **ROOT CAUSE ANALYSIS**

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

#### **Send Responses to:**

Email us via our [Problem Solver Contact Form](#). The first individual that emails us a correct solution will receive **\$1000 off** your next service or a free pass to any of our upcoming events or seminars.

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Solution to **Last Quarter's Problem of the Month on Prognostics:**

### **PRODUCTION LINE YIELD**

A plastics plant operates 8 extruders producing plastic film. Production volume requirements cannot be met if

less than 6 extruders are operating. There is a 0.30 probability that a machine stopping malfunction will occur. What is the probability that 6 extruders can remain operating throughout the day?

**SOLUTION:** We will use the binomial distribution as follows:

$$P(x,n,p) = \sum_{i=0}^x \frac{n!}{i!(n-i)!} p^i (1-p)^{n-i}$$

where:  $p(x,n,p)$  is the probability of exactly  $x$  or fewer successes in  $n$  trials with a probability of success equal to  $p$  on each trial.

Using the binomial distribution, we can expand the equation as follows:

$$P(0,8,0.3) = \frac{8!}{0!(8-0)!} 0.3^0 (1-0.3)^8 = 0.0576$$

$$P(1,8,0.3) = \frac{8!}{1!(8-1)!} 0.3^1 (1-0.3)^7 = 0.1977$$

$$P(2,8,0.3) = \frac{8!}{2!(8-2)!} 0.3^2 (1-0.3)^6 = 0.2965$$

$$P_T = 0.0576 + 0.1977 + 0.2965 = 0.5518$$

is  $1 - 0.5518 = 0.4482$

This is the probability that 6 extruders will NOT remain operating throughout the day. The probability of success

**COMMENTARY:** Note that we could have found the answer more quickly by using a binomial table because the binomial table is set up to find “x or fewer” events.

Also note that we could have used the Poisson distribution. The Poisson distribution can be used to approximate the binomial distribution when  $p$  is small (generally, less than 0.1) and  $n$  is large (generally,  $n > 15$ ) by using  $np$  as the mean of the Poisson distribution.

**CONGRATULATIONS:** Congratulations to Charles Meyerson who was the first to answer this question correctly. Charles chose as his prize a free pass to our annual Reliability Symposium this past April.

## ADVERTISEMENTS



SigmaQuest enables you to automatically upload & analyze your product, supplier, manufacturing test, RMA/Warranty & repair data using any web-browser.

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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.



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](http://www.dfrsolutions.com).

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*Ops A La Carte's newsletter goes out to over 14,000 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](mailto:sprakash@apple.com) (Simon Prakash)



### Senior Reliability Engineer

Cisco is looking for a senior reliability engineer to develop and support all aspects of reliability engineering to include design-for-reliability, reliability measurement and validation, with an emphasis on reliability testing. You will engage directly with the design engineering teams, product introduction teams, manufacturing

operations, as well as Cisco's high profile customer base. This is a highly visible position within the Technology and Quality organization of Cisco and you will be expected to bring "new world" ideas to continue the world class quality and reliability for which Cisco is known.

For more info, email Sylvain Tourangeau at [stourang@cisco.com](mailto:stourang@cisco.com)

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### Quality Engineer

Support the development of Quality processes and procedures used in the documentation, control and monitoring of medical, scientific and commercial imaging sensors and camera systems. Develop Master Batch Records documenting product compliance and capable of being used in FDA or customer audits. Assure compliance to internal, external, contractual and regulatory requirements. Participate in the creation of FMEAs and their speedy resolution. Support risk/ hazard analysis efforts as prescribed in ISO 14971/ IEC60601-1 / UL 60601-1 and IEC 60601-1-1-4. Train Fairchild personnel in quality and compliance related topics. Provide support to the Fairchild ISO 9001:2000 quality program including being a member of the internal audit team.

For more info, please go to <http://www.fairchildimaging.com/careers/> or email [mark.k.pierce@fcimg.com](mailto:mark.k.pierce@fcimg.com)

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### 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](mailto:kevina@npisolutions.com)

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### 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.

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*Ops A La Carte's newsletter goes out to over 14,000 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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**To remove** yourself from this email, send an email with the word REMOVE in the subject line.