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***International***  
Applied Reliability  
Symposium

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**2004**

## PROGRAM HIGHLIGHTS

**THEME:** Sharing applications, success stories and lessons learned in reliability and maintainability engineering.



**KEYNOTE ADDRESS:** Rear Admiral Michael C. Bachmann - *The Challenge of Sustaining Aging Naval Weapon Systems*. Thursday June 17, 2004 at 8 a.m.



**20 PRESENTATIONS:** Twenty results-oriented presentations by actual practitioners in industry and government. Topics range from the development of reliability specifications through the analysis of warranty information.



**4 TUTORIALS:** Four tutorials by experts in the field of reliability analysis. Topics include: Quantitative Accelerated Life Testing Analysis, Essential Elements of a Reliability Program, Reliability Growth Testing and Data Analysis and Reliability Leadership.



**RECEPTION:** An evening cruise and hosted reception aboard the Bahia Belle, a "Turn of the Century" Mississippi-style sternwheeler. Thursday June 17, 2004 from 6 p.m. to 9 p.m.



**VENUE AND HOTEL ACCOMMODATIONS:** Summer in San Diego, California, USA. A special Symposium rate has been negotiated for hotel accommodations at the Catamaran Resort on Mission Bay.

## SPONSORS

The Symposium is organized by ReliaSoft Corporation and the Reliability Analysis Center (RAC) with sponsorship from Quantum Corporation, General Electric and the U.S. Army.

INDUSTRY

AND

GOVERNMENT

SHARING

SUCCESS STORIES

AND

LESSONS LEARNED.

**REGISTER NOW...**

## **2004 INTERNATIONAL APPLIED RELIABILITY SYMPOSIUM**

The **International Applied Reliability Symposium** provides a forum for expert presenters from industry and academia to come together with reliability practitioners from all over the world to discuss the application of reliability principles to meet real-world challenges. The majority of the presenters have been applying reliability, maintainability and related techniques in their day-to-day work for years and the Symposium has been designed to encourage results-oriented presentations with interactive discussions about best practices, success stories and lessons learned.

**2004 Symposium Theme: "Sharing applications, success stories and lessons learned in reliability and maintainability engineering."**

**Keynote Address:** Rear Admiral Michael C. Bachmann, United States Navy Assistant Commander for Aviation Logistics Naval Air Systems Command - *The Challenge of Sustaining Aging Naval Weapon Systems*

**The Symposium's 20 presentations and 4 tutorials cover a range of subjects, including:**

- |   |  |
|---|--|
| <ul style="list-style-type: none"><li>◆ Warranty reduction</li><li>◆ Reliability as an investment, not a cost</li><li>◆ Specifying reliability and reliability metrics</li><li>◆ Supplier management</li><li>◆ Data collection, management and analysis</li></ul> | <ul style="list-style-type: none"><li>◆ Reliability and safety</li><li>◆ Reliability and market share</li><li>◆ Reliability testing</li><li>◆ Software reliability</li><li>◆ Manufacturing reliability</li></ul> |
|---|--|

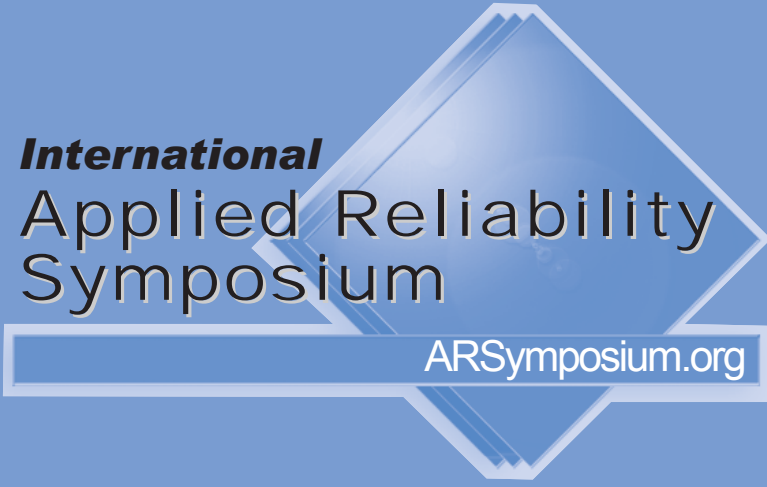
**JUNE 16 - 18, 2004**  
**SAN DIEGO, CALIFORNIA**

**[HTTP://WWW.ARSYMPIOSIUM.ORG](http://www.arsymposium.org)**

# PROGRAM MATRIX

The 2004 Symposium program matrix consists of two concurrent tracks with ten presentations and two tutorials for each track. **You can attend presentations/tutorials from either track.** With two options for every session, you can configure the Symposium experience to meet your specific interests and needs!

2004	Wednesday - June 16		Thursday -
	Track 1	Track 2	Track 1
7:00-8:00	Registration		Registration
8:00-8:30	Welcome		Keynote Address
8:45-10:00	Implementing FRACAS in a Commercial Environment <b>Doug Kemp</b> GE  T1-S1 <input type="checkbox"/>	Reliability Demonstration Tools: Advantages and Limitations <b>Joseph Boyle</b> Delphi  T2-S1 <input type="checkbox"/>	Reliability as a Systems Engineering Investment, Not a Cost <b>Bob Kuper</b> U.S. Army  T1-S5 <input type="checkbox"/>
10:00-10:30	Break		
10:30-11:45	Accelerated Life Testing for Consumer Appliance Products <b>Bill Stoner</b> Access Business Grp  T1-S2 <input type="checkbox"/>	Successful Applications of Physics of Failure <b>Thomas Stadterman</b> AMSAA  T2-S2 <input type="checkbox"/>	Customer Usage Profiling and Development of Fatigue-Based Reliability Specifications <b>Brent Tracy</b> Herman Miller  T1-S6 <input type="checkbox"/>
11:45-1:00	Lunch Break		
1:00-2:15	Novel Uses of Distribution Analysis Methods in the Development of Implantable Medical Devices <b>Daniel Cooke</b> Guidant  T1-S3 <input type="checkbox"/>	FMEA and Design of Experiments: Working Together, They Are Decision-Making Gems <b>Jim McBride</b> Seagate  T2-S3 <input type="checkbox"/>	Manufacturing Reliability – Burden Reduction <b>John McLaughlin</b> ICA  T1-S7 <input type="checkbox"/>
2:15-2:45	Break		
2:45-4:00	Software Reliability Success Stories <b>Ann Marie Neufelder</b> SoftRel  T1-S4 <input type="checkbox"/>	Naval Air Systems Command Integrated In-Service Reliability Program (IISRP) <b>Les Wetherington</b> U.S. Navy  T2-S4 <input type="checkbox"/>	Challenges in System Reliability – Modeling and Analysis <b>Wendai Wang</b> General Electric  T1-S8 <input type="checkbox"/>
4:00-4:15	Break		
4:15-5:45	Understanding Quantitative Accelerated Life Testing <b>Pantelis Vassiliou</b> ReliaSoft Corporation  Tutorial T1-1 <input type="checkbox"/>	Essential Elements of a Reliability Program <b>Pat Hetherington</b> Reliability Analysis Center (RAC)  Tutorial T2-1 <input type="checkbox"/>	Reliability Growth Testing and Data Analysis <b>Larry Crow</b> ReliaSoft Corporation  Tutorial T1-2 <input type="checkbox"/>
6:00-7:00			<b>Reception</b> Aboard the Bahia Belle
7:00-8:00			
8:00-9:00			

June 17	Friday - June 18	
Track 2	Track 1	Track 2
A Reliability Engineer's Use of Warranty Cost Information <b>Fred Schenkelberg HP</b>  T2-S5 <input type="checkbox"/>	Reliability Measurement and Specification in the Tape Drive and Related Electronics Industries <b>Paul Jaramillo Quantum</b>  T1-S9 <input type="checkbox"/>	A Success Story in the Making – The F15 AN/APG-63(v)1 Radar <b>Ken Millsbaugh Raytheon</b>  T2-S9 <input type="checkbox"/>
Assess Your Program for Probability of Success Using the Raytheon Reliability Scorecard <b>Darvin Heer Raytheon</b>  T2-S6 <input type="checkbox"/>	Implementation of Reliability Principles at Ingersoll-Rand <b>Jeff Hynds Ingersoll-Rand</b>  T1-S10 <input type="checkbox"/>	Up-Front Reliability Tools and the John Deere Product Development Process <b>Charles L. Noel Jr. John Deere</b>  T2-S10 <input type="checkbox"/>
Reliable Operations – Integrating Reliability Methods with Operations Management <b>Tony Luna Pitney Bowes</b>  T2-S7 <input type="checkbox"/>	 <p><b>International Applied Reliability Symposium</b></p> <p>ARSymposium.org</p>	
Data Collection, Management and Analysis <b>Bryan Fox Capstone Turbine</b>  T2-S8 <input type="checkbox"/>		
Reliability Leadership <b>David Olwell</b> <b>Naval Postgraduate School</b>  Tutorial T2-2 <input type="checkbox"/>		

You can use this matrix to mark the presentations/tutorials that you plan to attend. It is not necessary to pre-register for selected sessions.

# WEDNESDAY JUNE 16, 2004

After registration activities from 7 a.m. to 8 a.m., the **2004 International Applied Reliability Symposium** kicks off on Wednesday June 16, 2004 with a brief welcome from the Symposium's organizers. After that, you can choose any four of the eight presentations and one of the two tutorials that are offered on the first day.

## Welcome - 8:00 to 8:30 a.m. Wednesday June 16, 2004

To begin the program, Patrick Hetherington and Pantelis Vassiliou will represent the Symposium's organizers by delivering a brief welcome address.

Patrick Hetherington is the Reliability Analysis Center Director and Manager of Research at Alion Science and Technology with fifteen years experience in the field of applied reliability methods. He routinely serves as Program Manager for projects that strive to optimize maintainability, lower life cycle costs, maintain safety and address design reliability concerns. Mr. Hetherington has managed efforts in support of the DoD, medical, automotive, industrial and transportation industries. Mr. Hetherington is the developer of the RAC's standard Mechanical Reliability Training Course as well as many custom training programs. He received his BSME from Clarkson University and is an ASQ Certified Reliability Engineer.

Pantelis Vassiliou is President and CEO of ReliaSoft Corporation. He directs and coordinates ReliaSoft's R&D efforts to deliver state-of-the-art software tools for applying reliability engineering concepts and methodologies. He also consults, trains and lectures on reliability engineering and related topics to Fortune 1000 companies worldwide. Mr. Vassiliou is the original architect of ReliaSoft's Weibull++ software and ReliaSoft's founder. He holds an M.S. in Reliability Engineering from the University of Arizona.

Session 1 8:45 to 10:00 a.m. Wednesday June 16, 2004	
<b>A Corporate Memory Process to Eliminate Recurrence of Issues - Implementing FRACAS in a Commercial Environment</b> <b>Doug Kemp, Ken Whaling, Eric Kaufman and Jim Gardner GE Power Systems</b> T1-S1 <input type="checkbox"/>	<b>Reliability Demonstration Tools: Advantages and Limitations</b> <b>Joseph Boyle and Andre Kleyner Delphi Corporation</b> T2-S1 <input type="checkbox"/>
A formal Failure Reporting and Corrective Action System (FRACAS) was implemented at a large multinational corporation using an automated database. The ability to never forget lessons learned and to thereby prevent recurrence of issues was the powerful incentive. The system was piloted in two different organizations: Reliability to resolve field issues and Product Safety to resolve issues arising from both field complaints and from results of proactive risk assessments.  The system had to be globally accessible, fast, intuitive and easy to use. It had to follow the workflow of the organization using it so it would not be perceived as adding "extra work." The system had to readily demonstrate its effectiveness to management by on-demand reports and metrics that came directly from the records themselves.	This presentation will discuss various methodologies of reliability demonstration techniques with emphasis on "Test to a Bogey," often referred to as "Success Run Testing." During the product development cycle, many industries utilize a testing of N test samples with the goal of observing N successes or other reliability demonstration techniques. However, the overall approach of using reliability demonstration as a primary metric for expected life in the field is sometimes misapplied, often leading to unreasonable expectations and conclusions. The presentation addresses such questions as: What are the appropriate and inappropriate applications of reliability demonstration tools? What do the reliability numbers actually mean?

Session 2 10:30 to 11:45 a.m. Wednesday June 16, 2004	
<b>Accelerated Life Testing for Consumer Appliance Products</b> <b>Bill Stoner Access Business Group</b> T1-S2 <input type="checkbox"/>	<b>Successful Applications of Physics of Failure</b> <b>Thomas Stadterman AMSAA</b> T2-S2 <input type="checkbox"/>
This presentation provides an overview of reliability involvement in the product development cycle at Access Business Group with special emphasis given to Accelerated Testing for consumer appliance products. Basic theory will be reviewed with case studies to demonstrate principles covered.	This presentation provides an overview of two physics-of-failure case studies. The case studies address physics-of-failure applications to electronic circuit cards and vehicle structures. Each case study outlines the data required to perform the analysis, the testing to provide model input and validate the analysis and the benefits of performing the analysis. The electronics case study describes the vibration, thermal and fatigue analyses conducted for circuit cards in a tri-service radio used for aviation applications. The vehicle structures case study involves a fatigue analysis of an Army trailer's drawbar using dynamic simulations to provide the loading.

## Session 3 1:00 to 2:15 p.m. Wednesday June 16, 2004

### Novel Uses of Distribution Analysis Methods in the Development of Implantable Medical Devices

**Daniel Cooke** Guidant

T1-S3

This presentation describes how distribution analysis methods have been used to solve a wide variety of problems that are different from the classical life data problems generally associated with these techniques. Distribution analysis methods were taught to a group of engineers and scientists engaged in developing advanced technologies for implantable cardiac leads. The group developed a deeper appreciation of the nature of variability and the importance of understanding and evaluating variability throughout the technology development process. This bias for statistical thinking has had profound and beneficial effects on the department and the company. The presentation also addresses the role of the manager and the leadership and organization aspects necessary to ensure the successful implementation of the program.

### FMEA and Design of Experiments: Working Together, They Are Decision-Making Gems

**Jim McBride** Seagate

T2-S3

This presentation describes a procedure of combining the FMEA (Failure Mode Effects Analysis) and the power of DOE (Design of Experiments). FMEA and DOE have been used independently for years to investigate and solve many types of problems in many different fields. The FMEA procedure generates many ideas leading to definitions of failure modes, causes and effects for any given system. Design of Experiments methods can take the FMEA output and determine, through planned experimentation, which problems are the most important and what the solution might be. All the required input for the DOE is contained in the FMEA. Once the FMEA is started the DOE planning can also be started. The presentation shows how integrating the two tools can capture the problems normally missed by applying just FMEA.

## Session 4 2:45 to 4:00 p.m. Wednesday June 16, 2004

### Software Reliability Success Stories

**Ann Marie Neufelder** SoftRel

T1-S4

For the last 10 years, the development practices employed by dozens of software organizations in defense, manufacturing, medical and other industries have been benchmarked against the actual defect density rates produced with those practices. The organizations with the lowest defect density and with the greatest improvements in defect density did so with simple but effective techniques. Along the way, they also avoided a few hidden traps that can make reliable software difficult to achieve. They also avoided going over budget or schedule to achieve lower defect density and ultimately higher availability, reliability and MTTF. Their success stories will be presented.

### Naval Air Systems Command Integrated In-Service Reliability Program (IISRP)

**Les Wetherington and Debbie Vergos** U.S. Navy

T2-S4

The NAVAIR Integrated In-Service Program Management Team will discuss the development and implementation of NAVAIR's In-Service Reliability Process that has been successfully used to increase the "Time on Wing" and lower component overhaul and repair costs for selected high value aircraft components. Attendees will be aware of the processes and techniques used by NAVAIR to monitor aircraft component reliability and to identify causes for unreliability and non-availability. The local IISRP teams have combined a "hands-on" maintenance practice verification process and comprehensive maintenance/supply data collection and analysis techniques to select, analyze, fix and measure high value aircraft components with a goal to increase component "Time on Wing" and derive the financial benefits of an in-service reliability program.

## Tutorial 1 4:15 to 5:45 p.m. Wednesday June 16, 2004

### Understanding Quantitative Accelerated Life Testing

**Pantelis Vassiliou** ReliaSoft Corporation

Tutorial T1-1

Accelerated testing can be divided into two areas: qualitative accelerated testing and quantitative accelerated life testing. In qualitative accelerated testing, the engineer is mostly interested in identifying failures and failure modes without attempting to make any predictions as to the product's life under normal use conditions. In quantitative accelerated life testing (QALT), the engineer is interested in predicting the life characteristics of the product (such as MTTF, B10 life, etc.) at normal use conditions from data obtained in an accelerated life test.

This tutorial introduces the basic principles and concepts behind quantitative accelerated life testing.

### Essential Elements of a Reliability Program

**Pat Hetherington** Reliability Analysis Center (RAC)

Tutorial T2-1

Making a quantifiable impact on the reliability of a product or system should not be accidental. A reliability plan that is an integral part of the product development process is absolutely essential to cost effectively supporting and driving design decisions from product concept through full scale production. This tutorial will reflect the essential steps in developing a tailorable reliability engineering process that focuses on the needs of the original equipment manufacturer and the end user. The presentation will include examples of reliability program benefits and pitfalls as seen from a wide variety of companies and government organizations.

# THURSDAY JUNE 17, 2004

Thursday's activities will begin with another registration period from 7 a.m. to 8 a.m. (for anyone who missed Wednesday's registration) followed by the Symposium's featured Keynote speaker, Rear Admiral Michael C. Bachmann. After that, you can choose any four of the eight presentations and one of the two tutorials that are offered on the second day.

## Keynote Address - 8:00 to 8:30 a.m. Thursday June 17, 2004

### The Challenge of Sustaining Aging Naval Weapon Systems

Rear Admiral Michael C. Bachmann, United States Navy

Rear Admiral Michael C. Bachmann is currently assigned as the Assistant Commander for Aviation Logistics. Prior to this, he was assigned as the Commander, Naval Air Warfare Center Weapons Division with additional duties as the Assistant Commander for Test and Evaluation and Shore Station Management. Rear Admiral Bachmann has attained a B.S. in Aerospace Engineering, an M.S. in Systems Management, a Ph.D. in Psychology and Technology and an M.A. in National Security and Strategic Studies. He is fully certified in both the Program Management and the Manufacturing, Production and Quality Assurance Career Fields. He also has proven subspecialties in Information Systems, Logistics and Training Systems. Rear Admiral Bachmann has acquired extensive acquisition and logistics management experience through a wide variety of afloat, shore-based and joint duty assignments. These include NAVAIR Executive Director for Aviation Depots, assignment to the Chief of Naval Operations, Air Warfare Division as Head, Aviation Maintenance Programs and Director of Joint Depot Maintenance Analysis Group. More information is available at <http://www.ARSymposium.org/2004/keynote.htm>.



## Session 5 8:45 to 10:00 a.m. Thursday June 17, 2004

**Reliability as a Systems Engineering Investment, Not a Cost**  
**Bob Kuper U.S. Army** T1-S5

The Army is making revolutionary changes in Reliability to assure the success of their Transformation process. To do that they had to diagnose the systemic Reliability, Maintainability and Supportability (RMS) issues plaguing many programs and, through root cause analyses and the Lean, Six Sigma and Design for Six Sigma disciplines, set into motion a new Systems Engineering framework with emphasis on RMS. The key to proving the proposed solution sets for this program were valid requirements for change, required demonstration that a new culture could be developed and emplaced within the Systems Engineering life cycle processes. These SE processes, consist of advanced RMS tools, best practices, methodologies, advanced technology investments and a continuous improvement mechanism with valid life cycle measures. Likewise, a systemic methodology for culture change is required to assure success. Predominant in that culture change process is the need for aggressive core competency growth and development.

**A Reliability Engineer's Use of Warranty Cost Information**  
**Fred Schenkelberg Hewlett-Packard** T2-S5

This presentation discusses HP's approach to using warranty costs as a mechanism to systematically evaluate reliability's influence on total product cost and outlines the challenges to establishing and maintaining a global company-wide perspective and appropriate core competencies in an increasingly outsourced and commoditized electronics industry. This includes a discussion of how HP uses warranty cost information as part of design trade-off analysis, how HP is structuring management emphasis on warranty costs over the entire product life cycle and how HP selects and balances core competencies (both HP's and vendors') around reliability engineering.

## Session 6 10:30 to 11:45 a.m. Thursday June 17, 2004

**Customer Usage Profiling and Development of Fatigue-Based Reliability Specifications**  
**Brent Tracy Herman Miller** T1-S6

This presentation describes the process of customer usage profiling to establish and implement fatigue-based reliability test specifications, using an office seating example from Herman Miller. The example demonstrates the evolution from in-house legacy testing to usage-based reliability testing, Customer Usage Profiling (CUP). Topics discussed will include planning, product instrumentation, usage clinics and field studies. The resulting development of a fatigue-based, equivalent damage test will be described. Finally, issues and challenges of applying reliability specifications to the resulting test will be discussed.

**Assess Your Program for Probability of Success Using the Raytheon Reliability Scorecard**  
**Darvin Heer and R.J. Miller Raytheon** T2-S6

The Reliability Scorecard is an assessment of reliability program tasks, both planned and completed, that have been correlated to achievement of customer required field reliability. This presentation describes how the scorecard was developed and how it can be used to forecast the field reliability performance of the system, with confidence, during customer observed trials. The scorecard concept is applicable to commercial and military programs where field performance is important. The scorecard has been validated on diverse programs within Raytheon representing Radar, EO, Missile, Airborne and Ground systems for the Navy, Air Force and Army.

# THURSDAY JUNE 17, 2004

Session 7 1:00 to 2:15 p.m. Thursday June 17, 2004	
<b>Manufacturing Reliability – Burden Reduction</b> <b>John McLaughlin ICA Cinetic Automation</b> <b>T1-S7</b> <input type="checkbox"/>	<b>Reliable Operations – Integrating Reliability Methods with Operations Management</b> <b>Tony Luna Pitney Bowes</b> <b>T2-S7</b> <input type="checkbox"/>
This presentation discusses an approach to restructure your business and product for increased reliability and cost reduction to yourself and your customers. The focus is on historical performance gathering in the field and within your facility, then making decisions on best practices and implementing these for all future projects with the BlockSim software as a solid guide for standardization and end user burden reduction.	Reliability methods have traditionally been applied to the design of new products or the evaluation of existing products in the field. However, these same disciplines can be utilized to determine the production output of nearly any discrete industrial process. Utilizing basic reliability concepts, this session shows how industrial processes can be better measured and evaluated, thus providing new opportunities for reliability professionals.  Reliability concepts can be applied to operations management to more accurately predict and monitor industrial processes. Using actual examples of the work done at Pitney Bowes, the audience will gain a fresh perspective at how to show value in using reliability analyses to compliment operations management principles.

Session 8 2:45 to 4:00 p.m. Thursday June 17, 2004	
<b>Challenges in System Reliability -- Modeling and Analysis</b> <b>Wendai Wang General Electric</b> <b>T1-S8</b> <input type="checkbox"/>	<b>Data Collection, Management and Analysis</b> <b>Bryan Fox Capstone Turbine</b> <b>T2-S8</b> <input type="checkbox"/>
This presentation provides an overview of system reliability modeling and analysis methods and tools (commercially available software) with emphasis on large complex systems. Engineering practice and author's experiences (using the existing tools) to model and analyze reliabilities of large, complex systems are addressed. Several real-world systems are then presented to challenge current methods and tools in practical aspects. A performance-based system reliability approach will be proposed, illustrated and discussed.	This presentation provides a review of the development and implementation of a web-based FRACAS (Failure Reporting and Corrective Action) system to enhance the data collection, problem resolution and reliability analysis capabilities of an organization. This includes a discussion of the challenges of collecting large amounts of data from customers in the field, organizing that data to understand the problems experienced and to effectively address the problems and analyzing the raw data to understand main causes of failure over time using Weibull analysis. Managing customer information and combining that data with incident reports to create a story for each system recorded in the database will also be discussed.

Tutorial 2 4:15 to 5:45 p.m. Thursday June 17, 2004	
<b>Reliability Growth Testing and Data Analysis</b> <b>Larry Crow ReliaSoft Corporation</b> <b>Tutorial T1-2</b> <input type="checkbox"/>	<b>Reliability Leadership</b> <b>David Olwell Naval Postgraduate School</b> <b>Tutorial T2-2</b> <input type="checkbox"/>
During the first phases of a product's development, the estimate of the product's final reliability is called the "reliability goal." However, the first prototypes produced will almost certainly contain design, manufacturing and/or engineering deficiencies that prevent the product from reaching that goal. In order to identify and correct these deficiencies, prototypes are usually subjected to a rigorous testing program and appropriate corrective actions are implemented to improve the design. This structured process of finding reliability problems and monitoring the increase of the product's reliability through successive phases is called "reliability growth." This tutorial addresses the principles of reliability growth testing and data analysis, including techniques to analyze data from time-based tests (where corrective actions may be implemented during the test, after the test and/or not at all) and from various types of one-shot success/failure tests.	Reliability programs must enjoy the full, informed support of the organizational leadership to be successful. To gather that support, leaders must understand the impact of reliability on the success of the organization. This requires data systems, metrics, models, and financial data, all geared to effective decision support for leaders. This presentation reviews techniques for providing these tools to leaders and the impact on organizations where the leadership has adopted them. Attendees will take away a strategy for gaining support of their leadership for improved reliability.

# FRIDAY JUNE 18, 2004

## Session 9 8:45 to 10:00 a.m. Friday June 18, 2004

### Reliability Measurement and Specification in the Tape Drive and Related Electronics Industries

Paul Jaramillo Quantum

T1-S9

Data back-up and recovery has become a multi-billion dollar a year industry where reliability metrics are crucial to customer acceptance of products. Examples of current methods and trends within the tape drive industry are presented and discussed.

This presentation will describe actual practices and future directions for reliability measurement and specification within the tape drive industry. Three examples will be presented: customer return rate, reliability demonstration testing and media durability testing.

### A Success Story in the Making – The F15 AN/APG-63(v)1 Radar

Ken Millspaugh Raytheon

T2-S9

This presentation provides an overview of the development and fielding of the AN/APG-63(v)1 Radar system for the USAF F-15C aircraft. Starting as a parts obsolescence initiative, the program evolved to one of the USAF's showcase programs. Program requirements were pushed to greater than 10X better than any previous system backed by an industry first – a fielded reliability warranty. This presentation discusses why and how this is a success story in the making.

## Session 10 10:30 to 11:45 a.m. Friday June 18, 2004

### Implementation of Reliability Principles at Ingersoll Rand

Jeff Hynds Ingersoll-Rand

T1-S10

This presentation provides a discussion of the implementation of reliability engineering best practices in a large, multi-divisional and geographically dispersed organization, including a presentation of the reasons for embarking on such an effort and the difficulties encountered.

### Up-Front Reliability Tools and the John Deere Product Development Process

Charles L. Noel Jr. John Deere

T2-S10

Up-front reliability activities are the most cost effective way to meet project requirements with today's Product Development Process requirements. We must move from fixing physical test failures to preventing test failures from occurring in the first place. This presentation will describe up-front reliability tools and techniques used at John Deere to assure the reliability goal is met and also to track the reliability throughout the Product Development Process.

## RECEPTION AND HOTEL ACCOMMODATIONS

### Reception

Symposium attendees are invited to attend a hosted reception aboard the *Bahia Belle*, a "Turn of the Century" Mississippi-style sternwheeler, on Thursday June 17, 2004 from 6 p.m. to 9 p.m.

### Hotel Accommodations

The 2004 Symposium will be held at the Catamaran Resort on Mission Bay in San Diego, California, USA.

Through a special arrangement with the hotel, the reduced rate of \$110.00 per night (which is also the current government rate) is available for seminar participants. **Rooms must be reserved by May 1, 2004 to be eligible for this rate.**

#### Location:

Catamaran Resort on Mission Bay  
3999 Mission Boulevard  
San Diego, California 92109

#### Reservations:

**Toll Free Phone (U.S. and Canada):** 1.800.422.8386

**Phone:** +1.858.488.1081

**Fax:** +1.858.488.1387



# The 2004 International Applied Reliability Symposium

Industry and government  
sharing applications,  
success stories and lessons learned.

June 16 - 18, 2004  
San Diego, CA, USA

# International Applied Reliability Symposium

ARSymposium.org

## Registration Information - One Form Per Attendee

- |   |                   |
|---|-------------------|
| <input type="checkbox"/> <b>Advanced Registration</b> (must be received by March 1, 2004) | <b>US\$795.00</b> |
| <input type="checkbox"/> <b>Standard Registration</b>                                     | <b>US\$895.00</b> |
| <input type="checkbox"/> <b>Full-Time Student</b> (Student ID Required)                   | <b>US\$195.00</b> |

### Submit Registration Via Phone, Fax or Mail:

Phone: +1.520.886.0410      Fax: +1.520.886.0399  
Mail: ReliaSoft Corporation, 115 South Sherwood Village Drive, Tucson, AZ, 85710, USA

## Payment Method

<input type="checkbox"/> <b>Company Purchase Order</b> (attached) We accept Purchase Orders from government and industry on NET 30 terms	<input type="checkbox"/> <b>Check or Money Order</b> Made payable to ReliaSoft Corporation
<b>Credit Card Order</b> (Vcode and credit card billing address are required. Please indicate the billing address below or provide it separately.)	
<b>Credit Card:</b> <input type="checkbox"/> <b>VISA</b> <input type="checkbox"/> <b>MASTERCARD</b> <input type="checkbox"/> <b>AMERICAN EXPRESS</b>	
<b>Card Number:</b> _____ <b>Exp:</b> _____ <b>Vcode:</b> _____	
<b>Name on Card:</b> _____ <b>Signature:</b> _____	

Attendee Information	Billing Information (if other than attendee)
<input type="checkbox"/> Same as credit card billing address.	<input type="checkbox"/> Same as credit card billing address.
<b>Name:</b>	<b>Name:</b>
<b>Company:</b>	<b>Company:</b>
<b>Address:</b>	<b>Address:</b>
<b>City, State, Zip:</b> (Province, Country)	<b>City, State, Zip:</b> (Province, Country)
<b>Phone:</b>	<b>Phone:</b>
<b>Fax:</b>	<b>Fax:</b>
<b>E-mail:</b>	<b>E-mail:</b>

## Additional Information

- **Hotel Reservations:** You will need to make reservations on your own. Please contact the Catamaran Resort on Mission Bay at 1.800.422.8386 (toll free in U.S. and Canada) or +1.858.488.1081.
- **Substitutions:** Substitutions are allowed provided that ARS is notified 7 days prior to the Symposium start date (June 9, 2004).
- **Cancellations:** Cancellations received up to 15 working days prior to the Symposium start date (June 1, 2004) will be entitled to a full refund of the registration fee minus a \$50 administration fee. After this period, all cancellations will be subject to the full registration fee.
- **No Shows:** Registrants who do not attend and who do not notify ARS of cancellations are subject to the full registration fee.
- ARS reserves the right to cancel/reschedule the Symposium at any time up to 4 weeks prior to its start date. In the event of cancellation, all registration fees will be refunded. ARS is not responsible for any other charges, such as non-refundable airline tickets.

**Registration fee includes** attendance to all presentations, copies of the proceedings and any other handouts, daily continental breakfast, refreshments provided during the breaks and the Thursday night reception. A certificate of attendance will be provided.

***International***

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