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An Invitation To:

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The Annual Reliability and Maintainability Symposium

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OUR 56th YEAR

January 25 - 28, 2010
Doubletree Hotel San Jose
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Transcending Traditional Reliability Approaches — from Theory to Practice

The theme of the 56th Annual Reliability & Maintainability Symposium (RAMS®) to be held in San Jose, California in 2010 is Transcending Traditional Reliability Approaches — from Theory to Practice. Reliability, maintainability, and safety have never been more crucial in the design, development and operation of components, systems, and networks. Customers expect that products and services be 100% reliable. Products and services that do not reach beyond existing reliability standards will lose market share. In order to attain this level of reliability, approaches that transcend existing approaches are needed. In communications, energy, space, defense, transportation, and medicine, reliability is becoming the paramount property.

In communications, networks must be designed to minimize outages even during natural disasters like Hurricane Ike or Hurricane Gustav. In defense, inadequate reliability can lead to complete mission failures, the loss of lives, battles and even wars. In energy, designing reliable renewable energy sources is the newest challenge. In the manufacturing environment, "reliability is king." Collecting and using data on the reliability, performance and security of products and services is the scientific way to make improved reliability operational. Many of the new approaches will utilize different types of data and many more sources of data simultaneously. And finally, there are important new theoretical insights in all of these areas that can help others achieve advancements in the science and engineering of reliability, maintainability, and safety.

RAMS 2010 features a diverse technical program of over 90 papers in 23 sessions. There are sessions on reliability modeling, risk assessment, safety models, accelerated life testing, etc. Each of these sessions contain new and useful methods for transcending the results of traditional approaches. There is even a panel discussion on the revision to MIL-HDK-217.

For the Tutorial Program, RAMS 2010 attendees can choose from an offering of twenty tutorials. The topics of these tutorials range from the basic concepts of R&M engineering to advanced topics in cutting-edge areas of R&M research and applications. We are continuing the very successful RAMS Certificate Program that was started last year. Attendees can complete the first level of the certificate program by attending the five core concept tutorials:

Introduction to R&M Management
Introduction to Life Data Analysis
Introduction to Fault Tree Analysis
Fundamentals of Failure Modes & Effects Analysis
Introduction to Probabilistic Methods in Reliability Modeling

Completing the second level of the certificate program requires attendees to attend an additional ten tutorials across at least two Symposia. Attendees are free to choose these ten tutorials based on their own professional needs and interests. Upon completion of the program, attendees receive a RAMS certificate and a letter of completion including a list of tutorials attended.

The Keynote Speaker for RAMS is **Edmond Thomas** who will be discussing technology trends in communications. Ed has held senior positions in business management, R&D, satellite and cellular/land based radio system design, and telecommunication/data network design and implementation. Ed is currently a partner at the law firm of Harris, Wiltshire & Grannis. He formerly was the Chief Engineer of the Federal Communications Commission. In 2003, he was named by *Wired Magazine* as one of the four most influential technical people in Washington.

There is one major change to RAMS this year that we believe will enhance the exposure of each of our speakers at the paper sessions. All but two of the technical paper sessions will be webcast in their entirety. This means attendees from around the world can view each paper presented.

RAMS is unique in the field of international conferences around the world in that it is produced and supported by ten professional societies that share the common objectives of improving reliability, availability, and safety. There is no doubt that these three tenets are of growing importance in the world community over an increasing range of products and processes.

In January, 2010, RAMS will mark its 56th year. Regardless of the products, systems, and processes that create your reliability universe, there is a great deal more to learn than can be obtained in any classroom, library or literature search. Please join us in San Jose for a rich, human-based experience, in a unique, historical environment, where we can learn from each other.

Dr. John Healy, General Chair, 2010 RAMS
Federal Communications Commission
(chair@rams.org)

Check out our all new website at http://rams.org .
It has been completely redesigned to provide more functionality and information.
Sign up to follow RAMS on Twitter.com, or get our RSS news feeds and more!

The Management Committee and Board of Directors gratefully acknowledge our 2010 RAMS Corporate Patrons.

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Program Highlights

New This Year – RAMS Webcast! — This year RAMS® is offering an additional registration option – webcast attendance. Purchase an individual or group license, and you'll get access to the live stream of RAMS® 2010 technical program, as well as 7 days of access to the symposium technical program footage, and PDFs of all of the relevant papers. In a different time zone, or want to watch simultaneous programs? Not a problem–the RAMS® live stream package gives you a full week to view any of the included content at your convenience and as many times as you'd like.

Attending RAMS® in person provides the richest experience, with access to the tutorial program as well as the technical program (paper sessions) and the ability to network across the reliability fields. But, recognizing that not everyone who wants to attend is able to, the RAMS® live stream package will allow our technical content to come to you in a convenient and cost-effective form.

This webcast attendance option includes the Keynote and Advisory Board meeting, and the technical sessions listed in the 2010 program brochure. Registration for the webcast option is $2000 for an individual viewing, or $8000 for a "site license," where a site is defined as one geographical location for a particular organization. As many people who want to view the webcasts at that site are welcome to do so. The individual package is for one viewer only. Register now via the RAMS website, http://rams.org/register-now/

The webcast is being sponsored by ARES Corporation, FLOWSERVE - Integrated Solutions Group, and Baker Hughes.

Tutorials — We offer an informative and educational set of tutorials, ranging from introductory topics in reliability and maintainability engineering, to intermediate tutorials for further study, to special topic tutorials introducing new and innovative technologies. A number of tutorial sessions are linked to technical paper sessions, providing a lead-in to understanding the latest developments in the assurance technologies. The tutorials are presented by leading researchers and practitioners in the field.

Panel/Paper Sessions — Sessions are linked to tutorials to bridge the gap between theory and experience. Panels are structured to provide an open exchange of information between technology experts, corporate executives, and Symposium attendees. Paper sessions provide technical details addressing how principles are applied. Access to authors is provided for follow-up subsequent to presentation of papers.

Exhibits Program — The 26th annual RAMS Exposition will feature exhibits in key technical areas such as Supportability, CAD/CAM/CAE/CAT, Failure Analysis, R&M Software, ESS, and Logistics. Come visit and "test drive" the exciting products. For information on exhibiting, write Scien-Tech Associates, Inc., P.O. Box 2097, Banner Elk, NC 28604-2097 USA or call 1-828-898-6375. FAX: 1-828-898-6379. Email: dbarbsta@aol.com

Computer Aided Engineering (CAE) Capabilities and Solutions — See advanced CAE capabilities being developed by industry, government, and university research centers. Additionally, RAMS exhibitors will highlight their latest CAE capabilities through exhibits and demonstrations.

Advisory Board Panel — Leaders from industry and government will discuss the technical, management, and training issues associated with using reliability as a competitive advantage in today's global business environment. Symposium attendees may submit questions in advance to the panelists or raise them from the floor.

ASQ Certified Reliability Engineer, Six Sigma Black Belt and Six Sigma Green Belt Examinations — Special arrangements have been made with the American Society for Quality (ASQ) to offer the ASQ Certified Reliability Engineer (CRE), Six Sigma Black Belt (SSBB) and Six Sigma Green Belt (SSGB) examinations at the 2010 RAMS Symposium. These 4 hour examinations will be held on Thursday morning, January 28. The exams are open book and any silent, hand-held, battery-operated calculator without an alphabetic keyboard will be permitted. Please note that a PICTURE IDENTIFICATION IS REQUIRED FOR ADMITTANCE. For full details about ASQ's certifications, please visit ASQ's Certification website at: *http://www.asq.org/training-and-certification.html* On line registration for the exams is available at: https://secure.asq.org/certification/rams-2010-application.html The deadline for advance registration and a guaranteed seat for the exam is January 4, 2010. Walk in registration, until noon on Wednesday of the Symposium, will be permitted on a space available basis for the CRE and SSGB examinations only.

Ralph A. Evans/P.K. McElroy Award and Alan O. Plait Awards — The Ralph A. Evans/P.K. McElroy Award for the best paper of the 2009 Symposium and the Alan O. Plait award for Best Tutorial of the 2009 Symposium will be presented at the Wednesday night banquet.

Conference Hotel — RAMS 2010 is being held at the beautiful Doubletree Hotel San Jose. Set in the heart of the Silicon Valley, San Jose, California flourishes with industry, beauty and a culture rich with history. The Doubletree Hotel San Jose places you in an ideal, central San Jose location - less than a half-mile from San Jose International Airport, 45 minutes from San Francisco International Airport, and an hour south of San Francisco and north of Monterey/Carmel.

Job Posting Board — This year RAMS is sponsoring a job posting board to list openings in the assurance sciences. ANY business interested in describing its employment opportunities to the world's premier gathering of assurance professionals is asked to contact Ray Sears at 1-603-863-2832. The bulletin board will be made available to all RAMS attendees. It is an extraordinary opportunity to get your employment message out!

Publications of Previous Symposia Available — Copies of proceedings and tutorial notes from previous RAMS are available from: Annual Reliability & Maintainability Symposium, c/o IPS Group, Inc., 4405 Tarpon Lane, Alexandria, VA 22309 USA. For pricing and availability information, please e-mail: sales@rams.org or order via our Web site at *www.rams.org*.

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For exhibit information contact: **David F. Barber, Jr.,** Scien-Tech Associates, Inc.,
1-828-898-6375 FAX 1-828-898-6379, email: dbarbsta@aol.com

TUTORIALS

An informative and educational set of tutorials, from introductory to special topics, is included in the program. Introductory tutorials cover basic topics in reliability and maintainability engineering; intermediate tutorials present the latest approaches; and special topic tutorials introduce new and innovative technologies. A number of tutorial sessions are linked to technical paper sessions, providing a lead-in to understanding the latest developments in the assurance technologies. The tutorials are presented by leading researchers and practitioners in the field, and are accompanied by an extensive set of tutorial notes and references for further study. For more information on the tutorial program, contact: **Caroline P. Lubert, James Madison University,** lubertcp@jmu.edu, 1-540-568-2922.

INTRODUCTION TO PROBABILISTIC METHODS IN RELIABILITY MODELING

C. Richard Cassady, Ph.D. University of Arkansas

This tutorial provides attendees with basic coverage of the traditional, fundamental probability models used to describe, improve, and optimize system reliability and maintainability. The course content includes a probability primer, a review of static reliability models, a random variable primer and a detailed review of time dependent "black box" reliability models.

ACHIEVING AVAILABILITY COST-EFFECTIVELY IN COMPLEX SYSTEMS

Pierre Dersin, Ph.D. ALSTOM Transport

How does one accommodate today's ever higher demands on complex system availability targets, while remaining mindful of life-cycle cost (LCC)? A method will be presented to assess the impact of testability strategies, maintenance policies, and redundancy management on system availability and LCC. Markov diagrams and Petri nets are used to that end. The impact of aging and imperfect maintenance is taken into account. The method is illustrated with communication networks and railroad industry examples.

ACCELERATED RELIABILITY DEMONSTRATION AND ASSURANCE TESTS

Milena Krasich, PE Raytheon, UIDS

This tutorial explains the technical and mathematical methodology for acceleration of reliability qualification (fixed duration with and without replacement) and reliability assurance tests (Sequential Probability Ratio Tests) using physics and engineering rationale along with appropriately modified mathematical approaches in the test design and data analysis. This approach is with the intent to obtain meaningful and relevant information on the reliability of products in their actual use and in a cost and schedule effective manner.

INTRODUCTION TO RAM MANAGEMENT

Dr. Duane L. Dietrich, ReliaSoft

In this tutorial a product is followed from design inception to product retirement. The appropriate location and use of 1) overstress tests; 2) design reviews; 3) FMEA; 4) reliability system analysis; 5) accelerated life tests; 6) real time life tests; 7) reliability growth tests; 8) burn-in; 9) environmental stress screens; and 10) statistical process control are discussed.

DYNAMIC APPROACHES TO RISK AND RELIABILITY IN DESIGN AND OPERATIONS

Vitali Volovoi, Ph.D., Georgia Institute of Technology

This tutorial provides an overview of the current state of the art in system risk, reliability, and maintenance modeling using dynamic methods. The target audience is engineers who are familiar with the basic concepts of static (Boolean-based) system reliability modeling (RBD and/or FT) and who are unsure when (if at all) the benefits of using dynamic tools outweigh their drawbacks.

INTRODUCTION TO LIFE DATA ANALYSIS

Dr. Clifford H. Lange, Structural Integrity Assoc., Inc. and **Dr. Caroline P. Lubert, James Madison University**

This tutorial provides an introduction to key concepts and techniques used in statistical analysis of reliability, maintainability and supportability data. The rationale behind the use of qualitative and quantitative tools to advance the understanding of underlying failure mechanisms is explained. Key concepts associated with statistical analysis of data are defined and widely used analysis techniques are discussed in terms of the mechanics of analysis and interpretation of results.

ACCELERATED DEGRADATION TESTING AND ANALYSIS

Dr. Guangbin Yang, Ford Motor Company

For many products, accelerated degradation testing is more efficient than accelerated life testing. This tutorial presents accelerated degradation test methods, degradation models, estimation of model parameters, relationships between degradation and reliability, and estimation of reliability. Several practical examples are presented for illustration.

RISK MANAGEMENT PRINCIPLES AND TECHNIQUES

Richard B. Jones, Solomon Associates

Even though risk management is not a new topic in life, science, or business, there has been a growing emphasis on applying formal risk-based methods to decision-making. This tutorial provides a foundation for scientists, engineers, and business executives to explicitly apply risk-based approaches to help solve problems in their disciplines. The emphasis in the tutorial is on understanding risk and its many attributes, using both subjective and quantitative examples.

INTRODUCTION TO FAULT TREE ANALYSIS

Professor John Andrews, Loughborough University

The tutorial covers the essential features of performing a fault tree assessment for a specified system failure mode. It details the construction of the failure logic diagram and its subsequent analysis. The analysis yields the minimal combinations of component failures required to cause the event (minimal cur sets), parameters that express the likelihood of the system failure event occurrence, and an indication as to where the main contributions to this event lie.

ADVANCES IN FIELD RELIABILITY ESTIMATION AND APPLICATIONS

Laurence L. George, Ph.D., Problem Solving Tools

This tutorial will describe "field" reliability estimation and applications. Field reliability is what really happens in the hands of customers, not what happens in the laboratory, in tests, or in the minds of designers or managers. Applications extend throughout product life cycles and across product generations. The presentation will cover: estimates of age-specific field reliability, quantification of uncertainty in those estimates, and their application to decisions and actions.

FUNDAMENTALS OF FAILURE MODES AND EFFECTS ANALYSIS

Dr. John B. Bowles, University of South Carolina

FMEA is potentially one of the most beneficial and productive tasks in a well structured reliability program. It consists of examining the modes and causes of potential item failures and determining the product response to the failure. Steps can then be taken to change the design to eliminate the failure, mitigate its effects, or develop compensating provisions if the failure should occur. This tutorial focuses on how to perform a FMEA and how it should be integrated into the design process.

AN INTRODUCTION TO OPTIMIZATION METHODS IN RELIABILITY AND MAINTAINABILITY

Thomas G. Yeung, Ph.D., Ecole des Mines de Nantes and Edward A. Pohl, Ph.D., University of Arkansas

The purpose of this tutorial is to introduce the basic concepts of optimization in R&M. We review the fundamentals of optimization theory, then explore various optimization techniques, including specific optimization models for R&M problems, methods for solving them, and provide some examples for understanding the application. This is an advanced tutorial and upon completion of the tutorial, attendees should have an understanding of optimization in general and how it applies to R&M problems.

INTRODUCTION TO MARKOV-CHAIN MODELING, ANALYSIS & OPTIMIZATION

Dr. Lisa M. Maillart, University of Pittsburgh

Markov chains are a class of stochastic processes that can be used to model a wide variety of issues related to reliability and maintainability. This tutorial covers the fundamental concepts of discrete-time and continuous-time Markov chains and some advanced concepts related to Markov modeling and decision-making.

EMPIRICAL METHODS FOR PROCESS AND EQUIPMENT PROGNOSTICS

J. Wesley Hines, Ph.D., University of Tennessee

The purpose of this tutorial is to introduce attendees to empirical modeling techniques for process and equipment monitoring, detection, diagnostics, and prognostics. The tutorial will provide a brief background and an overview of the theoretical foundations. It will be applications oriented in that the assumptions inherent in the techniques will be explained so that the appropriate technique can be selected and applied to solve specific engineering problems. Case studies are included.

LESSONS LEARNED FOR EFFECTIVE FMEAS

Carl S. Carlson, Carlson Reliability Consulting

Failure Mode & Effects Analysis has the potential to be a powerful reliability tool to reduce product design and manufacturing risk in a cost effective manner. With shorter product development times, tighter budgets and intense global competition, tools such as FMEA must be applied correctly. Why is it that some companies have outstanding success in their FMEA application and others do not? What is the difference between well done and poorly done FMEAs? The purpose of this tutorial is to share the key factors for achieving success in FMEAs and to highlight an FMEA process that is helpful for consistently good results.

RELIABILITY DEMONSTRATION: THEORY AND APPLICATIONS

Andre V. Kleyner, Delphi Corporation

This tutorial will provide an overview of several reliability demonstration methods and techniques practiced in industry. Tutorial will cover the pros and cons of the application of each method based on product type, reliability requirements, and cost considerations.

SOFTWARE RELIABILITY APPLICATIONS

Jon R. Peterson, Raytheon

This tutorial will address practical software reliability concepts, models, and tools, and how they should be applied throughout the product life cycle. Discussions will include the Software Reliability Process, Capability Maturity Model, Rayleigh Model Analysis (Software Error Estimation Program - SWEEP), and the Computer Aided Software Reliability Estimation (CASRE) tool. The tutorial attendee will gain a basic understanding of SW Reliability and know how to get and apply pertinent tools.

SYSTEM SAFETY IN A VARIETY OF INDUSTRIES

Dev G. Raheja, PE, CRE, Design for Competiveness, Inc.

This tutorial is presented by a veteran of the System Safety Society. The goal is to learn the science of system safety and how to implement safety measures proactively and efficiently in any industry. It is intended for beginning level engineers and intermediate level practitioners in design and safety. Technical managers in all engineering fields will find it a good overview of system safety. Examples from aerospace, medical device, automotive, and health care industries are covered.

FRACAS FUNDAMENTALS, BEST PRACTICES, AND PRACTICAL APPLICATION

Jennifer Akers, CRE, and Ken Stillwell, Relex Software Corporation

This tutorial introduces basic information about closed loop corrective action processes such as FRACAS. Closed loop corrective processes may collect a wide range of data, from test and field data to repair data. Customizable outputs can be any number of both qualitative and quantitative outputs. Also addressed are several of the key obstacles, best practices suggestions, a proven methodology, several case studies, and an interactive exercise relevant to closed loop corrective action processes.

STATISTICAL WARRANTY FORECASTING

Dr. Vasiliy V. Krivtsov, Ford Motor Company

This tutorial reviews probabilistic models and statistical methods used for the forecasting of warranty claims and the associated cost. The discussion is illustrated by case studies from the author's corporate and consulting experience.

TECHNICAL PROGRAM — PAPER SESSIONS

Over 90 technical papers are planned for 23 Paper Sessions. These papers were selected from a much larger number of abstracts received in response to the 2010 Annual Reliability and Maintainability Symposium Call for Papers. Selection is based on quality of the paper and relevance to the Symposium.

DESIGN ACTIONS AND SOLUTIONS FOR PRODUCT RELIABILITY

The papers present recommended and new practices, techniques, and new technical design and theoretical solutions for achievement and enhancement of reliability as it is designed into the products.

INCREASING IMPORTANCE OF RELIABILITY ACROSS PROGRAM MANAGEMENT

Both government and commercial organizations across the world are recognizing the importance of a strong reliability program to ensure success. This session will explore improvements and best practices for R&M implementation by the US Military, commercial entities and transportation companies.

EXTENDING RELIABILITY MODELS TO NEW APPLICATIONS

This session covers applying reliability tools to new products or new uses. Papers include applying Petri nets to hybrid vehicles; an efficient method to determine optimal design configurations for repairable systems; comparing classic spares tools vs. newer reliability-based tools in Performance Based Logistics; and combinatorial methods for reliability and sensitivity analysis of multi-state systems.

RELIABILITY OPTIMIZATION THROUGH ROBUST ASSESSMENT AND GROWTH TECHNIQUES

System reliability needs to be optimized through proven assessment and growth techniques during the development phase of all projects. This session will assist in formulating such techniques through successful case studies and newly developed methodologies for complex systems.

DOD INVITED PAPERS SESSION ON IMPLEMENTATION OF NEW RAM INITIATIVES WITHIN THE DEPARTMENT OF DEFENSE

This session describes actions being taken within the Department of Defense to implement new RAM initiatives directed by the Under Secretary of Defense for Acquisition, Technology, and Logistics. Information is presented on the use of reliability engineering design practices; the concept, definition, and rationale for Materiel Availability (Am); and guidelines for Army T&E community use to insure RAM engineering and RAM T&E requirements remain at the forefront of T&E planning and management.

MIL-HDBK-217 - RELIABILITY PREDICTION, DATA ANALYSIS, TECHNIQUES, AND NEW METHODOLOGIES

Four members of the MIL-HDBK-217 Working Group present their ideas and thoughts on the military handbook revision progress, and accomplishments towards completion of Rev G in December 2009.

EARLY RELIABILITY ASSESSMENT AT CONCEPTUAL PHASE

Early-on assessment of reliability is becoming more important these days with demanding reliability requirements of advanced technology projects. This session will discuss the available tools to make intelligent high impact decisions during the proposal and selection phase of projects.

MODELING AND ANALYSIS OF AGING SYSTEMS

This session contains a collection of papers that explore a variety of modeling and analysis approaches for repairable systems, multi-state systems, and systems that age.

ADVANCEMENTS IN ACCELERATED LIFE TEST (ALT) THEORY, MODELS AND APPROACHES

The papers in this session explore innovations, advanced theories, and new ideas for conducting accelerated life testing. In this session, papers include a method for accelerating life of viscoelastic materials at sub-sea pressures, accelerated test designs (PRST, fixed time tests and others), modular approaches to testing, and an alternative step-stress test process.

BAYESIAN METHODS IN RELIABILITY

This session will present many novel ideas and new applications of Bayesian approaches in reliability engineering, from risk assessment to design decision making to system reliability analysis to condition-based maintenance.

APPLICATION OF ACCELERATED LIFE TESTING (ALT) CONCEPTS AND PRACTICAL METHODOLOGIES

Practical applications of accelerated life testing are considered in this session. Papers in this session include shaft-seals with complex failure modes, applications to avionics, accelerated tests for software, and a case study of quartz flexible accelerometers.

EFFECTIVE RELIABILITY DATA ANALYSIS

Papers in this session will tell you how to read and use field data correctly, and show you some brilliant ways to estimate reliability from testing results.

PHYSICAL AND LOGICAL SIMULATION FOR ENHANCEMENT OF RELIABILITY AND RISK ASSESSMENT

This session includes papers demonstrating the application of a spectrum of physical and logical models to the solution of reliability and risk related problems. The physical models are developed for a variety of environments including fragmentation and combustion physics. The logical models include both discrete event Monte Carlo based analyses and continuous time Markov related models.

RISK ASSESSMENT

This session includes papers on a wide variety of risk related applications. From Lunar surface systems analysis, through the assessment of the fire risk in an historic hanger, and the assessment of a residential care facility. The session demonstrates the broad spectrum of applications that have been addressed with risk assessment models.

ADVANCED RELIABILITY ANALYSES AND MEASURES FOR PRODUCT RELIABILITY ACHIEVEMENT

The session is a combination of analytical reliability and risk modeling techniques, design-reliability cooperation, and test techniques for product reliability achievement and enhancement.

RELIABILITY MODELS FOR COMPLEX SYSTEMS

This sessions contains several papers that explore modeling strategies and issues for complex systems. Common cause failures and dependent systems are analyzed in this session.

ADVANCED TECHNIQUES IN RELIABILITY ASSESSMENT

The session compiles advanced reliability assessment techniques as applied to the specific types of modern components and systems including the lead free electronics.

OPTIMIZATION AND CONTROL OF REPAIRABLE SYSTEMS

In this session, a variety of optimization and control strategies are presented that are applicable for modeling and analysis of repairable systems. Heuristic optimization techniques are discussed as well as techniques for measuring performance

PRACTICAL RELIABILITY TEST PLANNING APPLICATIONS

Today's companies need to develop reliable products faster. The session will cover papers showing common product validation practices across several industries in order to achieve an expected field reliability level.

RELIABILITY AND SAFETY MODELS AND ASSESSMENT

This session includes a broad range of models and methods for reliability and safety assessment. Included are: A new approach to include oil aging in reliability modeling; The use of Support Vector Machines to provide more accurate results than Artificial Neural Networks (ANN); An ANN approach that uses both failure and suspension condition monitoring histories; and a methodology supporting the qualitative and quantitative safety analysis of complex embedded systems.

EVALUATION OF RISK THROUGH SYSTEM SAFETY

This session will explore different system safety methodologies and how they can be used to define system risk. The presentations will cover a broad range of topics from subsystem testing up through evaluation of commercial new business decision-making.

PERFORMANCE BASE RELIABILITY MODELING METHODS

This session covers multi objective optimization, Reliability Based design Optimization, Robust Design, Markov Modeling, Shock base degradation systems, Software Reliability Predictions methods in several industrial applications

CONDITION MONITORING AND MAINTAINABILITY MODELING APPLICATIONS

The session deals with condition-based maintenance, sensitivity analysis for Maintenance of gradually deteriorating systems or devices which undergo a change in its deterioration rate due to an environment or operational condition.

PANEL SESSIONS AND WORKSHOPS

GENERAL CHAIR'S WELCOME AND KEYNOTE SPEAKER

Dr. John Healy, *General Chair, 2010 RAMS*
The 2010 Keynote Speaker this year is **Edmond Thomas** from Harris, Wiltshire & Grannis and his keynote is entitled "Technology Trends - Implications."

ADVISORY BOARD PANEL

Leaders from industry and government will discuss the technical, management, and training issues associated with using reliability as a competitive advantage in today's global business environment. Symposium attendees may submit questions in advance to the panelists or raise them from the floor.

APPROPRIATE AND PRACTICAL APPLICATION OF EMPIRICAL, HANDBOOK & PHYSICS OF FAILURE RELIABILITY MODELING METHOD

The Panel session will focus on 2 topics: 1) the methods used for reliability predictions, including the uses and misuses of empirical, handbooks and PoF Models and Methods and 2) the future improvements to MIL-HDBK-217, with new methods that should be included in a future revision of MIL-HDBK-217 to satisfy the needs for accurate field reliability assessments. This panel will discuss the potential inclusion of Physics of Failure (PoF) methods, system failure cause models, and other methods.

R&M EXHIBITORS' PRESENTATIONS & DEMONSTRATIONS

R&M CAE tools continue to evolve in support of industry's business processes. Our RAMS Exhibitors will highlight their latest functionality through brief presentations and demonstrations in a neutral setting. Please check outside the room for the vendor presentation schedule.

Plan now to present a paper or tutorial, and to attend the Year 2011 RAMS at the Disney Contemporary Hotel, Orlando, Florida USA.
For more information, visit our Web site at: *www.rams.org.*

RAMS 2010 Registration Options and Rates

The registration fee for the Symposium is $1025.00. Discounts are available for those registering online with a credit card prior to January 9, 2010, for members of sponsoring societies, for students, and for groups of six or more. Please go to *www.rams.org* for details and to register. If you need further information for symposium registration please contact:

RAMS Registration Contact Information:
Dr. Raymond W. Sears, Jr.
23 Fairway Drive
P.O. Box 1407
Grantham, NH 03753-1407 USA

Phone: 1-603-863-2832 (8 AM - 10 PM Eastern Standard Time)
E-mail: r.w.sears@ieee.org (For information only)

Doubletree Hotel Registration Information

Hotel reservations must be made directly with the Doubletree San Jose before January 4, 2010 to qualify for the RAMS discount rate. The RAMS Registration web page *www.rams.org/registration* contains the following link to the Doubletree's RAMS reservation site:
http://doubletree.hilton.com/en/dt/groups/personalized/JOSE-DT-RMS-20100121/index.jhtml.
The "Special Accounts" Promotion/Offer Code is "RMS". If you need further information for symposium registration please contact:

Hotel Information:
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2050 Gateway Place
San Jose, CA 95110 USA

Phone: 1-800-222-8733
1-408-453-4000
Fax: 1-408-437-2898

Earliest check-in: January 21, 2010, latest check-out: January 31, 2010
Rate $139/night plus taxes
Hotel provides a free shuttle from the San Jose International (SJC) Airport.
Call guest services at 1-408-437-2155 to arrange free shuttle service.

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OUR 56th YEAR

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