

# Reliability Society Newsletter

Editors: Gary Kushner and Mark Snyder

Vol. 35, No. 3, July 1989 (USPS 460-200)

## RS Newsletter Inputs

All RS Newsletter inputs should be sent to one of the associate editors, **Gary Kushner** or **Mark Snyder**, per the following schedule:

For October Newsletter	by July 25
For January Newsletter:	by Oct. 25
For April Newsletter:	by Jan. 25
For July Newsletter:	by Apr. 25

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## 1989 RS Award Nominations

### Nominations for 1989 Reliability Society Award Now Being Accepted

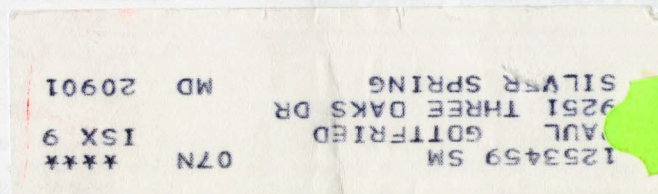
Would you like to nominate a deserving individual for our Annual Award? If so, please send your nomination including a brief write-up of your rationale for selection to:

Thomas L. Fagan  
Chairman, Awards Committee  
344 Davis Circle  
West Chester, PA 19380

Winners for the past four years were:

1985	Dr. Murray H. Woods
1986	Dr. Derald A. Stuart
1987	Ms. B. S. Orleans
1988	Brig. Gen. Frank Godell

(Nominations close September 30, 1989)



## Chapter News

### Boston

On April 27, 1989, the chapter held its Annual All Day Reliability Seminar at the Sheraton Tara in Framingham, MA. The program featured a keynote Address by William B. Smith, Senior Quality Control Manager—Motorola Comm. Sector followed by eight technical presentations. Following the technical presentations there was an awards ceremony and the annual chapter meeting. The newly elected officers for the upcoming year 1989-1990 were announced:

Chairman - Don Simpson, GTE  
 Vice-Chairman - Vivian Thorsen, Raytheon Co.  
 Treasurer - Don Markuson, Prime Computer  
 Secretary - Mark Snyder, Digital Equipment Corp.

The monthly chapter meeting for May, titled "The Fine Arts of Reliability" was both an enjoyable and informative experience. The meeting was held on May 12 at the Boston Museum of Fine Arts.

Below are two of the scenes captured at the all-day seminar held in April:



In the above picture, Gene Bridgers (left) presents Avery Hevesh (moderator) with a plaque with William Smith looking on.

### Denver

The Denver Chapter continues to have an active technical subcommittee on software reliability. This committee meets monthly for a half day to discuss concepts in software reliability. At the 1989 RAMS meeting in Atlanta, four people from the Denver Chapter participated in forums or presented papers.

The highlight of our current year was the sixth annual Software Reliability Symposium, held at Ford Aerospace, Colorado Springs, on Friday, May 12, 1989. This was another highly successful meeting with significant participation from local membership.

### Philadelphia

The following are the meetings held for the period:

January 17, 1989

- Speech Processing for Telecommunications Applications  
**Dr. Daniel Lin, International Machines Corporation**



In the above picture Mrs. Jane Cabral (chapter chairwoman) presents a plaque to William Smith, keynote speaker with Gene Bridgers (seminar chairman looking on).

The IEEE Reliability Society Newsletter is published quarterly by the Reliability Society of the Institute of Electrical and Electronics Engineers, Inc. Headquarters: 345 East 47th Street, New York, NY 10017-2394. Sent at a cost of \$1.00 per year to each member of the Reliability Society. Printed in U.S.A. Second class postage paid at New York, NY and at additional mailing offices. Postmaster: Send changes to IEEE Reliability Society Newsletter, IEEE 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08854-1331.

February 21, 1989

- Review of Open-Literature Techniques for Radar Cross Section Reduction  
**Dr. Ronald L. Fante—MITRE Corporation**
- Importance of High TC Superconductors for Microwaves  
**Dr. Erwin Bolohoubek—RCA Laboratories, Princeton, NJ**

April 18, 1989

- Phased Array Radar Design Challenges  
**Robert T. Hill—Consultant**
- Current Concepts in Personal Computing  
**Andrew Perch—University of PA**

The Philadelphia Chapter wishes to acknowledge Mr. Thomas L. Fagan, Jr. for being elected to the grade of Fellow in the Institute of Electrical and Electronics Engineers. It reflects great honor on the Philadelphia Chapter for Tom to be given this distinction for his extensive contributions and technical leadership in the field of reliability engineering.

Since his achievements are well known, the distinction did not come as a surprise to fellow members who know him. The nomination of Tom not only recognized his leadership in the Reliability discipline, but also enhanced the entire image of the Reliability Society. Again, our heart-felt congratulations to Tom.

### Washington/Northern Virginia

The Washington/Northern Virginia Chapter will join the National Capitol Chapter of the Institute of Environmental Sciences in sponsoring a four (4) day seminar on Software Quality Assurance Audits.

The seminar will be presented by Michael W. Smith of Software Quality International and will be conducted 7 thru 10 August 1989.

Further information can be obtained by contacting:

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 Suite 600  
 8730 Georgia Ave.  
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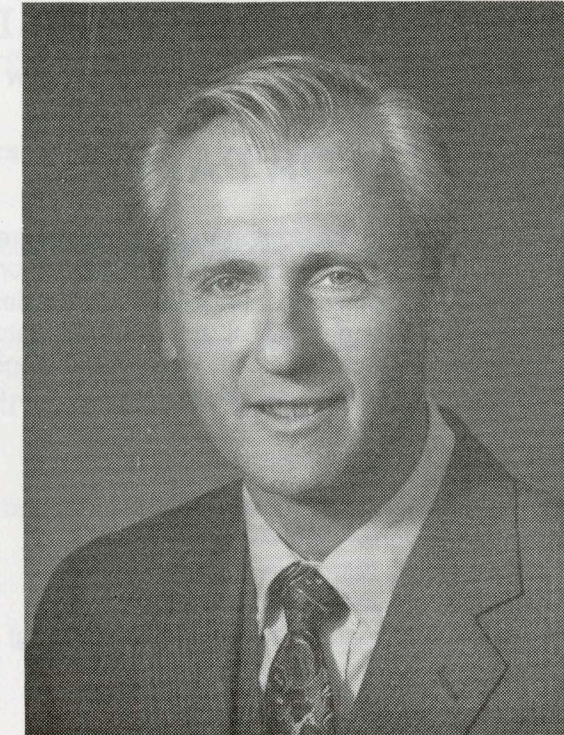
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## RS Fellow Profile



**Dr. Wayne Nelson, a private consultant and statistician at the GE Research and Development Center, recently was elected a Fellow of the IEEE. He is a member of the Reliability Society. Dr. Nelson was cited for his "contributions to reliability, accelerated test analysis, and reliability education."**

Born in Chicago, Ill., Dr. Nelson received his B.S. degree in physics from the California Institute of Technology. He joined the R&D Center in 1965 after earning his Ph.D. in statistics from the University of Illinois.

Dr. Nelson has worked with many GE departments as a statistical consultant on engineering and scientific applications involving planned experiments, data analysis, sample surveys, accelerated testing, and product life and reliability analysis. In 1981, he received the R&D Center's Dushman Award for his research and applications involving product life data analysis and accelerated testing.

Also a Fellow of the American Statistical Association (ASA) and the American Society for Quality Control

(ASQC), Dr. Nelson has published more than 80 technical papers and one book in the statistical and engineering literature. His publications have won him honors from the ASQC, including its Brumbaugh Award, the Frank Wilcoxon Prize, and the Jack Youden Prize.

Active in professional affairs, Dr. Nelson served on the Council of the ASA in 1975 and 1976, and established and chaired the organization's Presentation Awards Committee from 1977 to 1979. An adjunct Professor at Union College, he is teaching a course during the winter term on Accelerated Testing, based on his soon-to-be-published textbook.

Dr. Nelson lives in Schenectady.



Please detach and post on your Company bulletin board.

# THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS Incorporated

## 1990 INTERNATIONAL RELIABILITY PHYSICS SYMPOSIUM

March 26-29 1990 • New Orleans Marriott • New Orleans, LA

### CALL FOR PAPERS

Designing-in and validating reliability for present and developing VLSI and hybrid technologies are the major themes of the 28th Annual Symposium. The IRPS continues to be the premier international forum for reporting and discussing research on microelectronic reliability. The Symposium offers unusual opportunities for learning and in-depth discussions through such features as: technical sessions with author's corners, tutorials, workshops, hands-on demonstrations of analysis equipment and testing techniques, and the Proceedings available at the meeting. The IEEE Reliability Society and the Electron Devices Society are co-sponsors.

#### YOUR PAPERS ARE SOLICITED on the following subjects:

- BUILDING-IN RELIABILITY Through Design and Process Control for Si and GaAs
  - Circuit and multi-chip assembly designs
  - Materials selection and control; epoxy adhesives
  - Process design and control; real-time sensors for manufacturing
  - Packaging (bonding, die attachment, coating, encapsulation, sealing)
- ANALYSES FOR RELIABILITY
  - Failure analysis techniques (new, advanced, simplified)
  - Failure mechanisms and models, for example:
 

electrostatic discharge	contact/bond degradation & corrosion
hot carrier effect	surface mount
electromigration	package integrity
oxide breakdown	mechanical and thermal stress; voiding
- METHODOLOGIES FOR RELIABILITY
 

Wafer-level tests	Modeling
Test structures	Screening
Accelerated stress	Evaluation of field failures
Test combinations	Burn-in effectiveness and strategy
Statistical process control	Analytical instruments and techniques

#### ABSTRACT AND SUMMARY SUBMISSION

##### DEADLINE, OCTOBER 2, 1989

Submit a one-page, 50-word abstract, and a two-page, single-spaced, summary of your previously unpublished work suitable for a 20-minute presentation. The submission must state clearly (1) the purpose of the work, (2) why it is important, and (3) the specific results of the investigation.

The two-page summary may contain figures but no photographs. Include title of the paper, name and affiliation of author(s), complete return address, and telephone number at the top of the abstract and first summary pages. Place the title of the paper and author's name at the top of the second summary page. Use 8 1/2 by 11 inch paper.

Mail to: Harry A. Schafft  
Technical Program Chairman, 1990 IRPS  
National Institute of Standards and Technology  
Building 225, Room B360  
Route 270, Quince Orchard Road  
Gaithersburg, MD 20899

Tel. 301-975-2234  
FAX 301-975-2128

**PAPER REVIEW:** A committee of 25-30 members composed of a broad spectrum of experts from major electronics companies, semiconductor producers, universities and government organizations selects the papers for presentation. The selection policy is based solely on technical merit without any preset quota for number, subject matter, or origin.

**LATE PAPERS:** A limited number of late papers reflecting important last-minute developments will be considered on a space-available basis. Deadline for these submissions is January 19, 1990.

**FINAL MANUSCRIPT:** Final camera-ready manuscripts must be received by February 9, 1990 in order that they be included in the Proceedings.

**SLIDES:** Authors of accepted papers will be required to submit their slides for review to insure quality before February 23, 1990.

Submissions may be used for publicity purposes and portions may be quoted in magazine articles publicizing the Symposium.

Authors of accepted papers are encouraged to submit their papers to the appropriate IEEE Transactions.

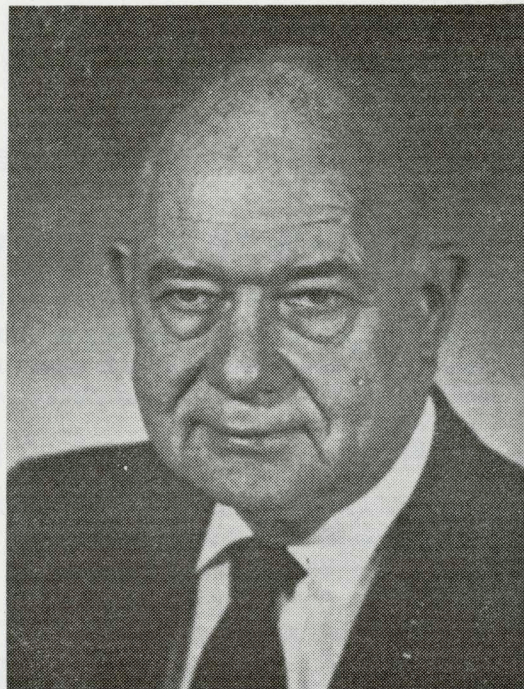
#### For general conference information contact:

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## RS Member as Candidate for Executive VP



Robert S. Duggan, Jr.

### Statement of Candidacy

Fellow IEEE Members:

It is an honor for me to have been chosen as a candidate for your 1990 Executive Vice President. This year marks my 40th year as an IEEE member, and I have served in many offices—Student Branch, Section, Area, Region, Board of Directors, and Executive Committee. My extensive background helps me to help you better.

My goals are to steadily push for greater *Openness* to the press, more *Opportunities* for service for members, more *Overseas* growth for the Institute, and a strong *Optimism* for our future.

My professional concerns are for greater job stability for our members and a portable pension plan for those who are mobile.

Your vote in the election is earnestly solicited. Remember to vote for the 4-0 candidate, Bob Duggan, for your next Executive Vice President!

### Biographical Data

Robert S. Duggan, Jr.  
Consulting Engineer  
Lockheed Electronics Company—Atlanta

“Bob” Duggan received his BEE with highest honors and his MSEE from Georgia Tech. His military service was in Navy electronics; he is now a retired Lieutenant Commander. After research work at Georgia Tech, he joined Lockheed and in 1989 celebrates his 32nd year there. He currently serves as a Consulting Engineer in Lockheed Electronics Company—Atlanta.

He is a registered Professional Engineer in Georgia, a member of various engineering societies, including not only

IEEE but also AIAA and the Association of Old Crows. His honor societies include Tau Beta Pi, Eta Kappa Nu, and Phi Kappa Phi. A member of IEEE since 1949, he has served in various offices at branch, chapter, section, area, region, and board levels. He was elected Director of IEEE Region 3 in 1984-85 and Vice President for Regional Activities in 1987. He is the only engineer to have received both the IEEE Region 3 Outstanding EE and Outstanding Service Awards, and in 1984 he received the IEEE Centennial Medal. He was selected as a participant in three IEEE delegations to the Soviet Union and two to the Peoples Republic of China.

An active “ham” and a member of the ARRL Honor Roll with over 320 countries, his Extra Class call is N41A.

### SHORT COURSE

#### APPLIED MAINTAINABILITY, AVAILABILITY AND OPERATIONAL READINESS ENGINEERING

Place: The University of California-Los Angeles (UCLA)  
Room G-33 West, UCLA Extension Building  
10995 Le Conte Avenue  
Los Angeles, CA 90024-1338

Presented By: The University of California-Los Angeles (UCLA)  
Los Angeles, California

Objectives: This short course covers equipment Reliability, Maintainability, Availability, and Operational Readiness interrelationships; the design of equipment to maximize their accessibility and minimize their downtime; determination of equipment downtime, time-to-restore distribution, and mean maintenance man-hours per operating hour; spare parts requirements at a desired confidence level and spares optimization; preventive maintenance policies and the quantification of the resulting increase in the reliability of maintained equipment; determination of the optimum preventive maintenance schedule of equipment to minimize their total corrective and preventive maintenance cost; quantification of reliability and availability of maintained equipment considering their failure and repair rates; determination of the various steady state availabilities of equipment and systems; the planning, execution, data acquisition, and data analysis of equipment maintainability demonstration tests per MIL-STD-471; integrated logistic support and its relationship to the design support; reliability and maintainability data sources; reliability centered maintenance; integration of LSA with Reliability and Maintainability Engineering functions; five unique and comprehensive Operational Readiness models and their quantification and all about life cycle costing.

Numerous applications will be presented. Course participants' problems will be solicited and solutions will be given or suggested.

Dates: August 7-10, 1989.

Fee: \$1,045.00, includes comprehensive and extensive lecture notes of over 600 pages.

Continuing Education Units: 2.4

Contact: Dr. Dimitri Kececioglu, P.E.  
Aerospace and Mechanical Engineering Department  
The University of Arizona  
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Tucson, Arizona 85721  
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Dr. William R. Goodin  
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## Welcome New Members

The Reliability Society would like to welcome the following new members:

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## Technical Operations

### Committee Reports from April AdCom Meeting:

*Systems Screening Committee:* William E. Wallace, Jr.,  
Chairman

Bill's committee is reviewing the final draft of Navy Manufacturing Screening Program, NAVSO P-9492A, November 1988.

The initiatives in environmental stress screening are in random vibration and temperature cycle. There are questions as to how much temperature excursion and how fast it is to be executed. There is also effort to go into some military

production contracts without a numerical reliability goal or one that has to be demonstrated via a test. Instead the government will rely on an environmental screen test to cull out weak units. This expedites the delivery cycle. This trend is our concern to Bill's group as they review new specifications. This dilutes the reliability support of production hardware.

*Software Reliability Committee:* Irv Dorshay, Chairman

Irv is citing development of a total system reliability predication model that simultaneously considers the effects of software and hardware on system reliability. This model uses Monte Carlo simulation. Via the use of this tool, not only can systems be realistically decomposed into hardware and software applications/requirements, but the design can be continuously evaluated as it evolves via changes in the simulation input parameters. The model has 27 input parameters to yield a RMA and logistic characterization of the system. Attachment 1 shows the HW - SW interdependency recognized by this model.

The draft guide for the use of Standard Dictionary of Measures to Produce Reliable Software is about to be formally approved. This document was developed by the technical committee on software engineering of the IEEE Computer Society. Irv represented the reliability society on this committee.

*CAD/CAE Committee:* Howard Kennedy, Chairman

A recent working meeting was held April 3-5. Mr. Dennis Hoffman, Texas Instruments, will be the 1989 General Chairman. He served as Technical Chairman in 1988. There is a tentative booking, again this year, for the Leesburg.

Vision: reliability, via MIL HDBK 217, built into an automated design system—The CAD/CAM System would automatically calculate electrical stresses and profile temperatures across the assembly. Then variational methods could be used to conduct trades and optimize this total configuration.

*Maintainability Committee:* Joe Gruessing, Chairman

The maintainability Committee is reviewing a proposed update to Mil Std 470B. Initiatives include: promoting maintainability as a design consideration, working with Integrated Diagnostic Support System Design (IDSS). This system is used to grade contractor designs and identify deficiencies. Joe is also supporting an EIA Committee on Testability and CAD, which falls into the general domain of Concurrent Engineering.

*Quality Interfaces Committee:* Richard Jacobs, Chairman

The following are working groups of the International Electro-Technical Commission.

Terminology	WG1	
Data Collection	WG2	
Reliability Test	WG3	Lee Weaver, Chairman
Reliability Verification and Analysis	WG4	
Formal Design	WG5	
Maintainability	WG6	
Component Reliability	WG7	

Reliability Management		
Methods	WG8	
Reliability Technology	WG9	
S/W Reliability	WG10	Hank Malec, Chairman

*Human Performance Reliability Committee:* Kenneth P. LaSala, Chairman

Committee achievements for the first quarter of 1989 consisted of the following:

- Member recruitment. Membership still remains to be stabilized.
- We currently are reviewing a new text entitled *Human Reliability Analysis* by E. M. Dougherty and J. R. Fragola (Wiley, 1988). A book review will be submitted to the IEEE Transactions on Reliability later this year.
- The questionnaire for the industry survey of human performance reliability techniques has been drafted. The distribution list remains to be developed. We are exploring two options for the list: (1) sending the questionnaire to the company vice presidents for engineering (for visibility and to account for organizational differences among companies); (2) sending the questionnaire to reliability functional experts. The first option is preferred but, in either case, help is needed from the ADCOM in formulating the distribution list.
- We have accepted an invitation from the EIA G-41 committee to prepare a road map for revising MIL-STD-785 to include human performance reliability. This roadmap is expected to be a topic at the 25, April 1989 G-41 meeting.

*Quality Assurance Management Committee (QAMC):* Henry A. Malec, Chairman

The QAMC last met in Hollywood, Florida on the 30th of November, 1988 as reported in the last report and will meet this month as scheduled. The future meetings are scheduled as follows:

No. 22 - April 29, 1989	Val David, Quebec, Canada
No. 23 - June, 1989	Boston, Massachusetts
No. 24 - September, 1989	Bolton Landing, New York
No. 25 - November, 1989	Dallas, Texas
No. 26 - April, 1990	Pine Mountain, Georgia

QAMC membership is approximately at 350. The third QAMC Workshop at Val David is scheduled for April 29-May 2, 1989. Bob Erickson of Bellcore and Bob Kessler of Bell Canada will co-chair this workshop on, "Measurement of Quality During the Life Cycle." The first QAMC Workshop at Bolton Landing is scheduled for September 25-27, 1989 on "Statistical Process Control." Phil Eisenberg has joined the program committee as the IEEE Reliability Society AdCom Representative. The

Society membership is encouraged to participate in this program.

The second QAMC Workshop at Callaway Gardens is scheduled for April, 1990 with Randy Sanders of Bellcore and Georg Grybowski of GTE co-chairing the workshop on "Telecommunications Software Quality and Productivity."

The February 1990 issue of *The Journal on Selected Topic in Communications*, sponsored by the QAMC, is "Telecommunications Software Quality and Productivity." Close to fifty paper proposals have been received at this time, and at most 25 to 30 will be published.

*Committee on Mechanical Reliability:* Richard L. Doyle, Chairman

A questionnaire was sent out recently to our committee. It is anticipated that most of the responses will be back by mid-May. The results will be compiled soon after and presented at the next Reliability Adcom meeting.

Additional tasks that this committee will undertake include:

- Compile a list of Mechanical Reliability References.
- Compile a list of IEEE Reliability References.
- Compile a list of Government Reliability References.
- Tasks determined by the responses in the questionnaire.

*International Reliability Committee:* Val Monshaw, Chairman

Following is a brief report on the international reliability

activities relative to TC56, Working Group 9. WG 9 is concerned with the development of documents for use by companies engaged in international commerce, both military and non-military. All these documents relate to reliability analysis techniques. A brief summary follows of the status of documents prepared by the committee to date.

Documents:

- Issued, or in final editing prior to issue:
- Failure Modes, Effects and Criticality Analysis
  - Analysis Techniques for System Reliability
  - Reliability Block Diagram Method

- Currently in final coordination/revision process:
- Application of Markov Techniques to Reliability/Availability/Maintainability Analysis
  - Parts Count Reliability Prediction
  - Fault Tree Analysis

- Under consideration:
- Availability Performance Prediction
  - Risk Assessment Techniques

Meetings:

June 1988	Tokyo, Japan
January 1989	Atlanta, GA
October 1989	Offenbach, Germany

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## Maintainability Committee Report

The Maintainability Committee has made some progress in achieving the objectives established for 1989. The response for support for the Committee has resulted in several IEEE members contacting the chairman to express their interest and offer assistance in "getting the maintainability/testability word out" to the society members at-large.

Although not overwhelming, the response to the request in the last newsletter did meet expectation. It appears that another tact may be necessary to lure the engineers interested in this area out to help spread the word and contribute to the society. Possibly we should begin with a request for comments about the last newsletter. What information would be desired in the newsletter? In the last report CALS was mentioned. There is a lot of activity going on here that will drive many "cultural" changes due primarily to automation. Under CALS the design process is being impacted with new concepts of automation evolving that will eliminate un-

necessary and redundant actions and ultimately simplify the older design concepts. As expressed recently in the ATE Newsletter, CALS was depicted as an "attitude representing the international breakdown of the separate data kingdoms involved with weapon system design, production and support." At a recent CALS seminar it was pointed out that CALS should stand for "Completely Automating Lots of Stuff" in reference to its widespread impact. IEEE members that have information that would be of interest to other members (on CALS, concurrent engineering, etc.) are requested to contact the chairman of this committee.

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## Maintainability/Testability Affairs

### CALS—An Opportunity for Maintainability Engineering

Computer-Aided Acquisition & Logistic Support, (CALS) as a DOD initiative, is well underway. Not so much a system (as might be implied from the fact that it is an OSD program) as an approach, it is essentially a "paperless" approach to the business of acquisition. For maintainability engineering, it is a gateway into CAE. The 1988 Joint Steering Group "Summer Study" identified a host of R&M tools that CALS should employ. Some are developed, some are not. Maintainability engineering, DOD or Non-DOD, stands to benefit greatly from these tools. It is a new, vibrant thrust. CALS points of contacts are:

		Autovon	Commercial
OSD	OASD (P&L) DASD(s) CALS The Pentagon, Room 2B322 Washington, D.C. 20301-8000	227-0051	(202) 697-0051
ARMY	HQTRS, US Army Material Command, ATTN: AMCRE-6 5001 Eisenhower Avenue Alexandria, VA 22333-0001	284-9759	(703) 274-9759
NAVY	OPNAV 46 The Pentagon, Room 4B546 Washington, D.C. 20350	225-5728	(202) 694-9111
AIR FORCE	HQTRS, Air Force Systems Command: Attn: PLXC Andrews AFB, D.C. 20334-5000	858-3915	(301) 981-3915
Defense Logistics Agency	DLA-Z (DRDO) 6301 Little River Turnpike Beauregard Square, Suite 310 Alexandria, VA 22312	284-4210	(703) 274-4210

Most of the data is free, rest at low-cost from GPO. While this is a DOD program, it may well be the standard for non-DOD maintainability engineering.

### International Test Conference

The International Test Conference (sponsored by the IEEE Computer Society) will be held at the Sheraton Washington Hotel in Washington, D.C. on August 29 through 31. This is a must for engineers working in testability design engineering. The agenda for this year provides topics that involve test management, test strategies and tools, test systems and testing components, and assemblies. The test strategy segment covers all aspects of testability design and analysis. If your interest is in this area and you desire to keep abreast of this discipline, attend this conference or at the least procure a copy of the proceedings.

### IDSS CAD Tool Development Update

At a recent meeting of the EIA G-42 Maintainability Committee, Jim Cigler clarified the distribution of the two CAD tools that were mentioned in the last newsletter. These tools, known as the Weapon System Testability Analyzer (WSTA) and the Adaptive Diagnostic Authoring program (ADA) will be available to interested parties as "freeware" midyear. The software is written in the ADA programming language and can be hosted on workstations using UNIX or VMS operating systems.

## IEEE P1149 Standard Testability Bus

An update to the IEEE P1149 standard has been issued that represents a departure from past thrusts. In this new edition a hierarchy of testability bus documents have been created that reflect only the lines, rules, and recommendations for the functions of the proposed standard bus. Protocol specifications will be prepared under other working group activities. Copies of the latest draft are available from P1149 co-chair Jon Turino's office (408) 374-3657.

## AUTOTESTCON '89

The AUTOTESTCON Conference will be held on September 25-28, 1989 at the Adam's Mark Hotel in Philadelphia, PA. This conference typically provides much coverage of the latest developments in maintainability and testability. This particular conference will be presenting many facets of two-level maintenance.

## New "Wafer-Level Reliability Testing" Short Course set for August 21-23

As the capabilities of integrated circuit technology drive the feature size of silicon chip circuitry to dimensions below 1.0 micrometer, the semiconductor industry will be faced with new challenges in achieving levels of reliability.

This summer, UCLA Extension will present "Wafer-Level Reliability Testing," a new course addressing the needs of future complex integrated circuits by introducing methods for evaluating quality during and after fabrication of the wafers.

Meeting August 21-23, this course will be taught by Vance Tyree, MS, member of the research staff, USC/Information Sciences Institute. It will meet at the Extension Building, 10995 Le Conte Ave., adjacent to the UCLA campus,

8 a.m.-5 p.m., for a fee of \$945.

Also being offered this summer is "Analog MOS Integrated Circuits," September 25-29, covering such topics as continuous-time and sampled-data filters, MOS and GaAs integrated circuits, switched-capacitor circuit design, and micropower integrated circuit techniques.

It will be taught by Gabor Temes, Ph.D., Professor, Electrical Engineering Dept., UCLA, and will meet at the Extension Building, 8 a.m.-5 p.m., for a fee of \$1145.

For complete details, including a free catalogue of summer quarter engineering short courses, call (213) 825-1047, or write: UCLA Extension, P.O. Box 24901, Los Angeles, CA 90024.

## —CALL FOR PARTICIPATION—

### INTERNATIONAL WORKSHOP: STATISTICAL PROCESS CONTROL

Monday Sept. 25 through Wednesday Noon September 27, 1989  
The Sagamore On Lake George (North of Albany, New York) USA  
Sponsored by: IEEE Quality Assurance Management Committee

#### OBJECTIVE

With the ever increasing awareness of the importance of quality and its attributes (reliability, maintainability, etc.) in the competitive international arena, both the customers and suppliers of complex products and services have become increasingly concerned about the need to adequately control quality and reliability in the engineering and manufacturing process environment. Significant issues include support of the organizations management, what tools are optimal and useful, how the selected tools should be applied, the validity of the process data, and the optimal methods to collect, analyze, and present data.

The goal of this workshop is to provide a forum for discussion among developers, manufacturers, distributors, and users of process control products (systems, hardware, software, and documentation) and services so that an improved understanding of statistical process control issues can be accomplished. Participation on the following topics is invited:

- Process Characterization
- Equipment Characterization
- Real Time Charts
- Corrective Action
- Statistical Methods
- Analytical Methods
- Implementing SPC
- Managing SPC
- Software
- Process Control
- Multivariable Analysis
- Yield Enhancement
- Experimental Design
- Optimization
- Case Histories
- Other Related Topics

#### ORGANIZING COMMITTEE

- Mark Cheng (DEC, Hudson, MA)
- Hank Malec (DEC, Hudson, MA)
- Madhav Phadke (AT&T-Bell Labs., Holmdel, NJ)
- Gordon Ray (NEC America, Melville, NY)
- Dave Sell (United Tech., Colorado Springs, CO)
- Ric Stone (SGS-Thomson, Carrollton, TX)
- Bill Trezenka (AT&T-Bell Labs., Holmdel, NJ)

#### ADDRESS ALL CORRESPONDENCE

Dan Billings-Workshop Manager  
Digital Equipment Corporation  
SemiConductor Operation-SCO  
77 Reed Road HLO2-3/J13  
Hudson, MA 01749-2809  
(508) 568-6234; Fax: 508-568-4681

#### PROGRAM COMMITTEE

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- Y. H. Shu (Mobile, Rochester, NY)
- Bill Stace (British Telecom, Birmingham, England)
- Chuck Stanfa (Texas Instruments, Attleboro, MA)
- S. T. Tseng (NTIT, Taiwan)

#### DATES

May 14, 1989-Deadline for abstracts  
July 1, 1989-Notification of acceptance  
August 1, 1989-Deadline for Registration  
Sunday Sept. 24, 1989-Participants arrive  
Monday Sept. 25, 1989-Workshop begins  
Wednesday Noon Sept. 27, 1989-Workshop ends  
November 30, 1989-Proceedings published

#### INFORMATION FOR PARTICIPANTS

The areas listed above will be covered in short presentations of up to 15 minutes, followed by discussion. These presentations should emphasize current practices, initiatives, opportunities, and future directions. Speakers are encouraged to present results of practical significance and to raise open questions. Case studies should be presented, wherever possible, to illustrate the results. Camera-ready papers will arrive with presenters for inclusion in the workshop proceedings.

Authors: Please submit an abstract of the paper (from 200 to 500 words) on a particular topic. Other participants should submit a brief statement of their relevant experience on a particular subject. The attendance will be limited in order to facilitate open discussion and enhance participant interactions.

**\* CALL FOR PAPERS \***

**1989 Advanced Microelectronics Technology - Qualification,  
Reliability & Logistics Workshop  
29-31 August 1989  
Albuquerque Marriott Hotel, Albuquerque, NM**

**Sponsored by the DoD VHSIC/MIMIC Qualification Committee**

The Tri-Service VHSIC/MIMIC Qualification Committee, in conjunction with ANALYTICS, Inc., is pleased to announce a workshop (formerly the VHSIC Qualification, Reliability & Logistics Workshop) dedicated to issues to assure highest quality, availability, testability, and reliability of advanced microcircuits. The impact of these technology concerns on system maintenance and logistics will be addressed. The objective is to provide an open forum for the DoD, the users, and suppliers of microcircuits to discuss recent developments and future direction in advanced Si and GaAs microelectronics. The workshop format will include general sessions of common Si/GaAs issues and separate technology specific discussions. The topics of interest for both VHSIC/MIMIC technologies include:

Generic Qualification (QML)	Testability and Self-Test (BIT/BIST)
Fabrication Line Certification	ATE and Performance Assessment
Statistical Process/Quality Control (SPC/SQC)	Electrostatic Discharge (ESD)
Chip/System Reliability	Design System Certification
Failure Mechanisms	Design Standards
Maintenance and Support Issues	Radiation Effects
Package Reliability/Qualification	Technology Transfer/Insertion

**Paper Submission:** Authors are requested to submit ten (10) copies of a one page abstract to John Recine, ANALYTICS, Inc., 766 Shrewsbury Avenue, Tinton Falls, NJ 07724, by 31 May 1989 for review by the Program Committee. Abstracts should include author's name(s), affiliation, complete address, and telephone number. Acceptance/rejection notices will be sent out by 30 June 1989. Abstracts will be selected on the basis of technical merit, supporting test results, and overall suitability to VHSIC and MIMIC issues. Authors must be U.S. citizens. Company and/or Government clearance of paper is author's responsibility.

Technical Program Committee  
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ATTN: SLCET-RR  
Ft. Monmouth, NJ 07703-5000

Workshop Administrator  
John Recine  
ANALYTICS, Inc. after April '89:  
766 Shrewsbury Avenue 442 Highway 35  
Tinton Falls, NJ 07724 Eatontown, NJ 07724

To receive a registration package and to aid in our planning for this workshop, please complete the enclosed Notice of Intent and return it to the Workshop Administrator by 31 May 1989. Single room rates for DoD/Government: \$59.00 per night; Industry: \$78.00 per night. The registration fee will be approximately \$105.00 and will include coffee breaks, lunches, and a copy of the Workshop Abstract Book and the Workshop Proceedings.

**THERE WILL BE NO ON-SITE REGISTRATION**

**Call for Papers**

**SPECIAL ISSUE**

**QUALITY AND RELIABILITY ENGINEERING INTERNATIONAL JOURNAL**

**ON**

**RESHAPING THE RELIABILITY TECHNOLOGY**

**The Quality and Reliability International Journal is planning to devote a special issue to appraising and reshaping the reliability technology.**

**In the last 35 years reliability engineering has matured into a full-blown technology encompassing myriads of techniques ranging from design derating, reliability prediction to reliability demonstration. Some of the assumptions and concepts that formed the foundation for the technology development have been under increasingly severe criticism. For example, the applicability of the exponential law to reliability is being attacked. This special issue will attempt to do three things with respect to the reliability technology:**

- (1) to assemble information to re-affirm the assumptions, concepts or techniques that are under attack,**
- (2) to identify and analyze the assumptions, concepts and techniques that are incorrect or questionable, and**
- (3) to propose and expound new techniques or method to replace the incorrect ones or to further improve the reliability method.**

**The special issue is planned to be published in the third quarter of 1990. In order to meet this deadline we would like you to meet the following schedule:**

**Notify intention to submit paper: as soon as possible**

**Provide abstract: August 1, 1989**

**Provide paper draft for review: December 1, 1989**

**Submit final manuscript: March 1, 1990**

**The editor for this issue is Mr. Kam L. Wong, Kambea Industries, 1130 Ronda Drive, Manhattan Beach, California 90266, U.S.A.. (Tel: (213)372-4533). Please contact and send your manuscript etc. for this special issue to Mr. Wong. The Quality and Reliability Engineering International Journal is in its fifth year of publication. It is published quarterly by John Wiley and Sons, Ltd.**

## Conference Calendar

DATE	CONFERENCE	PLACE	CONTACT
<b>1989</b>			
Aug. 21-25	Semiconductor Packaging, Testing and Reliability	Davos, Switzerland	Dr. Birgit E. Jacobson CEI-Europe P.O. Box 910 612 01 Finspang Tel: 0122-17 570 Telefax: 0122-143 47
Aug. 29-31	1989 Advanced Microelectronics Technology-Qualification Reliability and Logistics Workshop	Albuquerque, NM	John Recine Analytics, Inc. 442 Highway 55 Eatontown, NJ 07724 (201) 542-8383
Sept. 25-28	Autotestcon	Philadelphia, PA	Fred Liguori 38 Clubhouse Road Browns Mills, NJ 08015
Sept. 26-29	V International Conference on Performance Evaluation, Reliability and Exploitation of Computer Systems, Relcomex '89	Ksiaz Castle, Poland	Relomex '89 Institute of Engineering Cybernetics Wroclaw Technical Univ. Janiszewskiego Str. 11-17 50-372 Wroclaw, Poland Prof. Wojciech Zamojski (Tel. 21-26-77) Dr. Ireneusz Jozwiak (Tel. 20-28-23) Telex 0712254 PWR PL 0712559 PWR PL
Oct. 9-11	Reliability, Achievement—The Commercial Incentive	Stavanger, Norway	Terje Aven Statoil Box 300 4001 Stavanger, Norway +47-4-80 80 80 Telex: 73 600 Stast N Telefax: +47-4-80-98-89
<b>1990</b>			
Jan. 30 - Feb. 1	1990 Annual Reliability and Maintainability Symposium	Los Angeles, CA	V. R. Monshaw RCA Corporation Astro-Electronics P.O. Box 800 MS 55 Princeton, NJ 08540 (609) 426-2182
Mar. 26-29	1990 International Reliability Physics Symposium	New Orleans, LA	Alfred Tamburrion Member, Board of Director RADC/RBRP Griffiss AFB, NY 13441 (315) 330-2813

June 5-8	International Symposium on Reliability and Maintainability	Tokyo, Japan	ISR&M 1990 Tokyo Union of Japanese Scientists and Engineers 5-10-11 Sendagaya, Shibuya-ku, Tokyo 151 Japan
<b>1991</b>			
Jan. 29-31	Annual Reliability and Maintainability Symposium	Orlando, FL	V. R. Monshaw RCA, Astro-Electronics P.O. Box 800, MS 55 Princeton, NJ 08540 (609) 426-2182
Apr. 8-11	1991 International Reliability Physics Symposium	Las Vegas, NV	Alfred Tamburrino Member, Board of Director RADC/RBRP Griffiss AFB, NY 13441 (315) 330-2813
Sept. 24-26	1991 IEEE Autotestcon	Anaheim, CA	Robert C. Rassa Mantech Advance Systems International 150 S. Los Robles Ave. - Suite 350 Pasadena, CA 91101
<b>1992</b>			
Jan. 27-29	Annual Reliability and Maintainability Symposium	Las Vegas, NV	V. R. Monshaw RCA, Astro-Electronics P.O. Box 800, MS 55 Princeton, NJ 08540 (609) 426-2182
<b>1993</b>			
Jan. 26-28	Annual Reliability and Maintainability Symposium	Atlanta, GA	V. R. Monshaw RCA, Astro-Electronics P.O. Box 800, MS 55 Princeton, NJ 08540 (609) 426-2182

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