IEEE

Reliability Society Newsletter

Editors: Gary Kushner and Mark Snyder
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Chapter Awards 1987–1988

The Reliability Society AdCom held its annual Chapter Awards Dinner at the Turf Volley Hotel, Ellicotte City, Maryland on Thursday evening, October 20, 1988. Bob Jaquess, Chairman of the Chapter Awards Committe, reported that six of our 20 active chapters had completed awards questionnaires:

- Central New England
- Cleveland
- Denver
- Ottawa/Ontario
- Philadelphia
- Washington/Northern Virginia

Their responses included information on chapter activities, technical publications and membership growth. Bob applauded the efforts of each participating chapter and the thoroughness and completeness of their responses.

The winning chapters and their Chairmen are shown below. The AdCom congratulates you and your officers for outstanding efforts on behalf of our members.

FIRST PLACE	Philadelphia Certificate and $500 for Chapter expenses Chairman: Fulvio E. Oliveto Award accepted by Dave Troxel
SECOND PLACE	Denver Certificate and $150 for Chapter expenses Chairman: Dale Butler
THIRD PLACE	Washington/Northern Virginia Certificate and $100 for Chapter expenses Chairman: Ray Schaffer

Chapter Awards Winners

Bob Jacquess presents the First Place award to Dave Troxell.

Second Place to Dale Butler

Third Place to Ray Schafler.

Chapter Awards Program

Twenty years age the Reliability Society started the annual Chapter Awards Program. The purpose of this program is to encourage chapters to conduct continued program activities of the type to gain membership growth. The Chapter Awards Program encourage chapters to engage in six categories of activities:

1. meetings
2. symposium or conference
3. training courses
4. papers
5. newsletters
6. membership

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Chapter Awards Program Placement Summary

AWARD YEAR	FIRST PLACE	SECOND PLACE	THIRD PLACE
1967	Boston	Binghamton	Huntsville
1968	Philadelphia	Boston	Washington
1968–1970 (18 months)	Philadelphia	Boston	Canaveral/Datona
1970–1971	Boston	Philadelphia	Washington
1971–1972	Philadelphia	Boston	San Francisco
1972–1973	Baltimore	Washington	North Jersey
1973–1974	Boston	Washington	Baltimore
1974–1975	Los Angeles	Boston	San Francisco
1975–1976	Boston	Santa Clara	Chicago & Montreal
1976–1977	Santa Clara	Boston	Washington
1977–1978	Mohawk Valley	Los Angeles	Boston
1978–1979	Washington/ Northern Virginia	New York/ Long Island	Cleveland
1979–1980	Washington/	Boston	Philadelphia
1980–1981	Central New England	Washington/ Northern Virginia	Los Angeles
1981–1982	Cleveland, Los Angeles and Washington/ Northern Virginia	No Second Place	No Third Place
1982–1983	Denver	Central New England	Los Angeles and Washington/ Northern Virginia
1983–1984	Washington/ Northern Virginia	Philadelphia	Denver
1984–1985	Washington/ Northern Virginia	Philadelphia	Central New England
1985–1986	Philadelphia	Washington/ Northern Virginia	Central New England
1986–1987	Philadelphia	Central New England	Ottawa/Ontario
1987–1988	Philadelphia	Denver	Washington/ Northern Virginia

Each year the Chapter Awards program committee mails the rules and an activity questionnaire to the chairpersons. The committee evaluates the responses and awards points based on the reported activities. Chapters are ranked into first, second, and so on to determine the annual winners. The first place chapter is awarded $500.00. Second place is awarded $150.00. Third place receives $100.00, with the fourth and on receiving $60.00 each.

Records of chapter performance over the years show that larger chapters have become dominate. Realization of this has resulted in a change in the way points will be awarded for the various categories. The computation of the total points has been changed to normalize them over the full range of chapter sizes. The total points will now reflect an index of productivity. A summary of the changes are as follows.

1. The method of scoring category number 4 will be based on the number of members per published paper. Each author of a multiple author paper will earn the full points.
2. The method of arriving at the total number of points will be to take the sum of category numbers 1, 2, 3, 5, and 6, and multiply them by the productivity factor of category 4. These calculations will be accomplished by the awards committee after validation of the points.

Dr. R. Fleming
Ms. J. Josselyn
Mr. R. Jacquess

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

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For April Newsletter:	by Jan. 15
For July Newsletter:	by Apr. 15

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Chapter News

Boston Chapter

The last three months have been productive for the Central New England Council. During the months of October and November we hald our annual Fall lecture series on "Reliability Testing" to 50 attendees. The lecture series drew people from a cross section of industries in the Massachusetts, New Hampshire, and Rhode Island areas which resulted in a variety of questions and discussions. The topics included Reliability Growth Testing, Environmental Stress Screening, Reliability Qualification per MIL-STD 781C and 781D, and Software Reliability. The speakers were, respectively: Dr. Larry H. Crow, Supervisor Reliability Methods Group, AT&T Bell Laboratories; James E. (Gene) Bridgers, Quality Assurance Consulting Engineer, Codex Corporation; Michael Johnson, Consultant, Reliability Engineering of Lexington; and Karl Williams, Director Software Quality Assurance, Codex Corporation.

Our December monthly meeting was held in Bedford with Al Abele of Wang discussing Wangs' Component Engineering Program. This was a joint meeting with the Boston Section Components Chapter.

On the evening of January 18th, Phil Babcock of Draper Labs will be presenting at our monthly meeting. The topic will be "Next Generation of Reliability Analysis Tools". The location is the Hanscom Air Force Base Officer's Club in Lexington, MA. Those interested in attending may contact Ruth Evans at (508) 870-7828 by Friday, January 13th.

Jane Cabral
Reliability Chapter Chairperson

Denver Chapter

Denver has created a technical committee on software reliability. This committee meets monthly for half-days at different locations throughout the greater Denver area. The average attendance at these meetings is approximately 20.

Our most recent regular meeting was held at Digital Equipment Corporation in Colorado Springs on October 19. Forty attendees heard presentations on testing and data analysis techniques.

The Denver chapter continues to be very active, drawing attendees from a 150-mile area, from Fort Collins to Colorado Springs.

Member Survey

IEEE Reliability Society Professional Activities

Member Opinion Survey

The U.S. Member Opinion Survey for 1988 has several interesting items.

- The average IEEE member is a 44 year old white male who has been working in his field for more than 17 years.
- He joined the IEEE more than 10 years ago but never held an IEEE office.
- He remains in IEEE to maintain his specialized technical knowledge and gain an overview of related technical fields.
- The most important part of IEEE is the publications.
- IEEE leaders (those who have 1 year or more of experience holding a voluntary IEEE position) often have different characteristics and opinions than members who have no leadership experience. The differences grow as the number of years of leadership increase.

Leaders are more likely to:

- be registered PE's.
- be a Senior Member or IEEE Fellow.
- join IEEE to maintain contact with others.
- join IEEE to have a voice in the profession.
- think IEEE technical activities are important to them personally and to the profession.
- regard IEEE-sponsored conferences, seminars, symposia, and tutorials as a desirable mode of career development.
- regard writing books, papers, or reports as a desirable mode of career development.
- think that IEEE should not intervene on behalf of whistle-blowers.
- vote in IEEE elections.

Technical Information Packets Available

The Boston Chapter of the IEEE Reliability Society announces the availability of two technical information packets as part of the member services. They are:

1. A commercial IC data base containing over 700 parts. The list contains the parameters necessary to perform a MIL-Handbook-217 type stress prediction.
2. A commercial electrical part Derating Guide suggested for typical computer type of products which are expected to operate in a comfort-controlled environment.

Either packet is available to IEEE members upon request from Gene Bridgers at 28 Longmeadow Lane in Sharon, MA 02067. Phone requests should use (617) 784-6855. Please provide your IEEE membership number in any correspondence.

Commercial Data Base Description

The data offered consists of over 700 parts, concentrating on commercial grade parts. The data is believed to be appropriate for performing Reliability predictions using the Mil-Handbook-217D or E. The data base contains:

Part Number: Based on vendor number but omitted prefix and screening but added suffix for package (usually P for plastic and C for ceramic).
Part Name: Abbreviation of vendor part name.
Rated Power:Vender rating.
Typical Power: Estimate of the actual power dissipation used.
Theta JA: Typical value.
Theta JC: Typical value.
Pin Count: Per vendor data.
Complexity: Estimate of gates or transistors or bits as needed.
Package: The package assumed for the data.
Technology: Technology suggested for protection.

A few supplementary comments are offered to the purist of 217. Some parts are classified as "digita;" that others may classify as "linear." Specifically, these include line drivers, line receivers, and D-to-A devices. For Gate Arrays, the complexity is the maximum possible rather than the gate count actually being used by a specific implementation.

Please read the Data Disclaimer at the end of this announcement.

Design Derating Guide

This is a suggested Derating Guide for commercial equipments that use plastic IC's and operate in a typical office environment. A "Commercial Version" is needed because the commercial grade parts are not usually rated for as wide a temperature range and the equipments are not used in as wide a range of environments. It is available from Gene Bridgers at the location described above. This information is available as an 8½ × 11 inch hardcopy or on a 5¼ inch DSDD IBM PC compatible floppy in either ASCII or leading Edge Word Proceeding format.

RADC will provide the military recommended derating limits in a handy circular slide rule style, by calling (315) 330-4920.

Requests for Information to Contribute

If you have information to share for the benefit of the membership, please provide it and a written release to get this into the hands of the interested technologist. You can send requests, ideas, objections, and other material which we might distribute.

We suggest the release might be as simple as to state:

1. What is being offered.
2. What are the restrictions.
3. How do you want yourself and/or your organization to be identified as the contributors.
4. Any comments or constructive suggestions.

Data Disclaimer for Computer Information (Software, Printed Outputs, etc.) Supplied Through Boston Chapter of the IEEE Reliability Society

IEEE is a group of individuals which share a common technological interest. As computer users, we can share quite a bit of information without being overly sensitive about liability and litigation. We can share technical data with the understanding that there may be errors in the data and the user must check the information to assure that it is sufficiently accurate for the purposes intended. Everyone within our reach is encouraged to submit information that is believed to be useful to our membership.

Neither the IEEE nor the data contributor is providing a warranty for the accuracy, and the information we furnish is intended for the free use, without profit, by or through our members. The information is not authorized to be accumulated and redistributed for profit by anyone without the written approval of IEEE and the data contributors. We ask that the contributors be acknowledged when referring to their material in correspondence, articles, or technical publications.

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Continued on page 20

Announcement of ASA Reliability Subcommittee with Reliability Society Liaison

A Reliability Subcommittee of the American Statistical Association's (ASA's) Quality and Productivity Committee was organized at the August, 1988 meetings of the ASA in New Orleans. Attending were Larry Crow (Chairman), John Kitchin (Vice-chairman), Larry Danziger, Bill Golomski, Ray Vezina, Harrison Wadsworth, Gary Wasserman, and K. L. Weldon.

The Reliability Subcommittee agreed upon a charter with the following goals:

- Increase public, management, and professional awareness of the importance of sound methodology for reliability assurance, especially those methods based on statistical ideas.
- Promote scientific collaboration between statisticians and reliability specialists in engineering, physics, operations research, and management.
- Focus research and teaching in reliability methods to better meet the challenges of safely harnessing new technology and increasing competitiveness.

To begin to pursue the goals of its charter the Subcommittee appointed the following reliability professional society liaisons:

- Robert H. Lochner to the Societyi of Reliability Engineers.
- Harry Wadsworth to the ASQC, Reliability Division.
- Bill Golomski to the Institute of Industrial Engineers, Reliability Engineering Division, and to the ASTM, Reliability Subcommittee.
- John Kitchin to the IEEE Reliability Society.
- Larry Crow to the Institute of Environmental Science, Reliability Growth Committee, and to the IEC.
- Gary Wasserman to the Society of Automotive Engineers, Reliability Committee.
- Asit Basu to the American Society of Metals, Reliability Committee.

A principal activity of the Subcommittee will be to organize the next International Research Conferences on Reliability, tentatively set for 1991. Well-attended previous conferences were held in 1986 and 1988 at the Univ. of Missouri/Columbia and hosted by Professor Asit Basu. Other activities being organized include:

- coordination of review of Reliability Standards documents for correct use of statistical methods and terminology.
- generation of a list of speakers and a set of taped interviews of reliability experts for promting general awareness of the importance of reliability

For further information or to pursue ideas on joint activities contact:

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Tel. (508) 568-4650

1989 ANNUAL RELIABILITY AND MAINTAINABILITY SYMPOSIUM

R&M—Sharpening the Competitive Edge

In today's economic environment, the manufactured product must meet all the customer's expectations if the product's maker and distributor are to retain or increase their share of the market. The need for cost-effective innovations and techniques to assure a high quality product that is reliable and maintainable has never before been so essential. Just meeting the standard engineering and manufacturinging requirements will not provide the competitive edge so acutely needed today. The assurance sciences managers and engineers can sharpen the competitive edge by providing concrete, realistic input to their organization's strategic plans and implementation activities, input that has the potential leverage for achieving competitive value and customer satisfaction. Recognition of the need for cost-effective R&M technologies and the need to consider both the customer's and company's viewpoints is the basis for the theme of the 1989 Reliability and Maintainability Symposium: "R&M—Sharpening the Competitive Edge."

1989 ANNUAL RELIABILITY AND MAINTAINABILITY SYMPOSIUM

to be held at the

PEACHTREE PLAZA HOTEL ATLANTA, GEORGIA USA 1989 JANUARY 26–28

Because the Symposium is the major forum for addressing the issues facing the Assurance Technologies, your presentation of a significant paper will benefit your colleagues, your profession, and you.

Papers in the following areas are planned:

TECHNOLOGY

- CAD/CAM/CAT/CALS
- Robotics
- Design to Life Cycle Cost
- Design for Supportability
- Modeling/Simulation/Methods
- Software R&M
- Test/Demonstration
- Reliability Growth
- Screening
- Failure Analysis
- Built-in Test
- Hazard Analysis
- Fault Trees
- Self Repair
- Error Correction Code

MANAGEMENT

- Systems Effectiveness
- CAD/CAM/CAT/CALS
- Robotics
- R&M Contracting & Management
- R&M Requirements
- Risk Management
- Data Base Management
- R&M Cost Benefit Tradeoffs
- Design to Life Cycle Cost
- Testing Effectiveness
- Warranties/Guarantees
- Logistics Support
- International Programs
- Reliability Growth Management

INDUSTRIAL APPLICATIONS AND LESSONS LEARNED

- Aerospace & Defense
- Power & Other Utilities
- Oil & Other Resource Suppliers
- Mechanical/Structures
- Transportation
- Microelectronics
- Computers/Peripherals
- Microprocessors/Minicomputers
- Robotics
- Software
- Consumer Products
- Medical Systems
- Communications
- Office Automation

1989 INTERNATIONAL RELIABILITY PHYSICS SYMPOSIUM

April 10–13, 1989 • Hyatt Regency • Phoenix, Arizona

The 27th Annual Symposium, co-sponsored by the IEEE Reliability Society and the Electron Devices Society, has as its major theme, building-in and validating for present and developing VLSI and hybrid technologies.

- VLSI Package Design and Construction for High Reliability

- Building-in Reliability: Design and Process Control for Si and GaAs
  - Designing circuits, multi-chip assemblies, and subsystems
  - Materials selection and control; epoxy adhesives
  - Process design and control; computer-integrated manufacturing
  - Packaging (bonding, die and substrate attachment, coating, encapsulation, sealing, glass-metal seals)

- Analysis for Reliability
  Failure analysis techniques (new, advanced, simplified)
  Failure mechanisms and models, for example:
  - Electrostatic discharge
  - hot carrier effect
  - electromigration
  - oxide breakdown
  - Contact degradation and corrosion
  - surface mount
  - packages
  - Mechanical and thermal stress

- Methodologies
  - Wafer-level controls
  - Accelerated stress
  - Test combinations
  - Statistical process control
  - Screening
  - Field failure mechanisms
  - Burn in effectiveness and stretegy
  - Analytical instruments and techniques

For general conference information contact:

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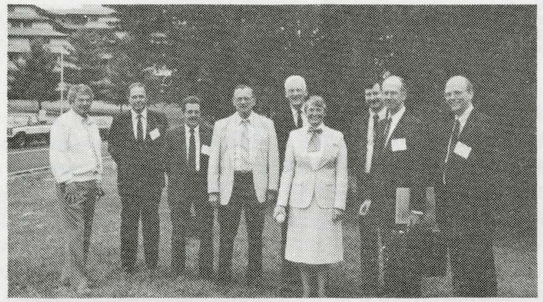
SYMPOSIUM FEATURES

- Proceedings at Symposium
- Tutorials and Workshops
- Hands-on, one-on-one, analytical equipment demonstrations.
- Awards Presentations
- Authors corners and attendee lounge for discussions

R&M In CAE Workshop



Shown here L. to R. Kurt Greene, Larry Griffin, John Graham, Bill Thomas, Howard Kennedy, Naomi McAfee, Don Hall, Tom Musson, and Henry Hartt.

The Second Workshop on Reliability and Maintainability in Computer-Aided Engineering was held from September 27–29, 1988 at the Xerox Training Center in Leesburg, Virginia. About 120 attendees participated in the interchange of ideas about integrating R&M with CAE.

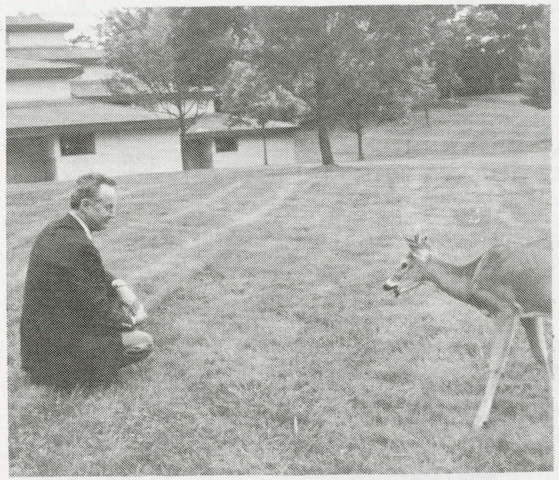
The Workshop was opened with a Keynote presentation by Col. Jack Reynolds, HQ AFLC/QA on Air Force activities in CALS, an initiative with objectives closely related to those of the Workshop. Following the Keynote, presentations on additional Government activities were made by other DOD representatives, including one by Tony Coppola. A series of presentations by representatives of Boeing, General Dynamics, Northrup, Westinghouse, Sanders, Langley, and Israeli aircraft then described CAE activities currently being undertaken by industry.

On the second day, two parallel workshop sessions arranged by Mr. Larry Linton of Litton Industries were conducted. One session, chaired by Mr. Gary Chunn of Harris, addressed CAE tools. The other session, moderated by Mr. Dick Gunkel of Sigma Plus, discussed Enabling Technologies/Functions. In each session, brief presentation by six invited speakers were followed by audience questions, comments, and observations.

The half-day session on the third day was devoted primarily to summaries of the previous days' workshop sessions. Some time was also allocated to an evaluation of the overall workshop and to soliciting participants' comments concerning follow-on activities. On each evening, five CAE/CAD vendors provided demonstrations of their systems.

The proceedings of the Workshop will be included in the April edition of the Reliability Transactions.

The entire management committee for the Workshop did its usual outstanding job. Headed by Naomi McAfee, the committee managed to put together a meeting that must be considered a highly successful event. Special recognition is due to Mr. Dennis Hoffman, Texas Instruments, our Program Chairman. He was largely responsible for structuring and staffing the entire technical program. He did the job so well that he was chosen by the committee to be the General Chairman for the 1989 event. In addition, the exceptional work done by Mr. Larry Linton during this year's event led to his selection as Program Chairman for the follow-up meeting. Tentative reservations were made to hold the 1989 event at the Xerox facilities since bookings well in advance are essential.



Program Chairman Dennis Hoffman and friend.

General Chairman Naomi McAfee and friend.

Northeastern University Program

NEW PROGRAM IN ASSURANCE TECHNOLOGY

Northeastern University's State-of-the-Art Program will offer courses leading to the new Certificate of Professional Achievement in Assurance Technology beginning January 1989. The Certificate program is designed to meet the needs of design engineers, quality engineers, management, and other technical professionals who must guarantee customer satisfaction while employing the most cost-effective methods.

The Assurance Technology Certificate program was developed under the direction of Framingham's Avery Hevesh, Principal Engineer in the Reliability Engineering Department of the Raytheon Equipment Division Product Assurance organization. Mr. Hevesh, who earned his MSEE at MIT, is a Senior Lecturer in the State-of-the-Art program.

According to Hevesh, senior member of IEEE and past Chairman of the Boston IEEE Reliability Chapter, American industry is "renewing its commitment to excellence as the key to strengthening its position in the international marketplace." The Assurance Technologies, based on Reliability Engineering and Quality Assurance, provide the foundation for the design, development, manufacture, and delivery of high quality products and services.

The State-of-the-Art program has brought together leaders in the Reliability and Quality fields to teach evening courses in Assurance Technology beginning the week of January 9 at locations throughout the Rte 128 area.

Brian Caputo, MBA, GTE Laboratories' Subcontract Assurance Manager, will teach *Advanced Product Assurance Development.*

Alexander Elentukh, MSEE, Systems Assurance Manager at Jupiter Technologies, will teach his newly developed course *Software Quality Assurance for Data Communications.*

Zareh Martin, PE, MEd, President of Martin Value Management Associates, will teach *Value Engineering Practice.*

Irwin Miller, PhD, Raytheon's Director of Statistical Analysis, will teach *Statistical Process Control.*

Marvin Wurtzel, MSEM, Senior Manager of Quality Planning at Prime Computer, will teach *The Quality Improvement Process.*

The State-of-the-Art program is celebrating its 25th year of helping professionals in industry stay current with rapidly changing technology. Part-time evening and seminar courses are taught by high tech professionals at over ten locations in the Boston, Routes 128 & 495, and Nashua areas. Custom-tailored courses are also available directly to companies to meet their specialized training and development needs. In addition to the new Assurance Technology program, courses are offered in Tele/Data Communications, Software Engineering, Programming Languages, Artificial Intelligence, Industrial Automation, and Microelectronics Engineering.

Contact the State-of-the-Art program at (617) 329-8775 for more information, to request a catalogue, or to register for courses.

CALL FOR PARTICIPATION

INTERNATIONAL WORKSHOP: MEASUREMENT OF QUALITY DURING THE LIFE CYCLE

Tuesday April 25 through Thursday Noon April 27, 1989
Hotel La Sapiniere, Val David (near Montreal), Canada
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 customers and suppliers of network products and services have become increasingly concerned about the need to adequately measure quality and reliability throughout a product's life cycle. Significant issues include what metrics are useful, how they should be used, the validity of underlying data, and how to collect and analyze data.

The goal of this workshop is to provide a forum for discussion among developers, manufacturers, providers, and users of telecommunications products (systems, hardware, software, and documentation) and services so that a better understanding of quality measurement issues can be reached. Participation on the following topics is invited:

- Hardware, software and firmware
- Field quality and performance
- System reliability modeling
- Software reliability
- Measurement of quality improvement
- Factory quality
- Test measurement and results
- Measurement of design quality
- Cost benefit analysis
- Hardware and software productivity
- Data collection, analysis and use
- Standards

ORGANIZING COMMITTEE

- Bob Erickson, Co-Chair (Bellcore, Red Bank, NJ)
- Bob Kessler, Co-Chair(Bell Canada, Montreal, Canada)
- Bill Trezenka (AT&T-Bell Laboratories, Holmdel, NJ)

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- Bill Hoberg (AT&T, Lisle, IL)
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- Rudolph Seviora (University of Waterloo)
- Bill Stace (British Telecom)
- Frank Townsend (EBASCO, NY)
- Brenda Wright (Northern Telecom, Raleigh, NC)

DATES

January 1, 1989 - Deadline for abstracts
February 15, 1989 - Notification of acceptance
March 1, 1989 - Deadline for registration and payment of workshop fees
Sunday April 23, 1989 - Organizers arrive
Monday April 24, 1989 - Participants arrive
Tuesday April 25, 1989 - Workshop begins
Thursday Noon April 27, 1989 - Workshop ends

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. problems, future directions, and initiatives. 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. Speakers should submit an abstract (between 200 and 500 words) of a proposed presentation on a particular topic. A full paper will not be required. Other participants should submit a brief statement of their relevant experience on a particular topic. The abstracts and statements should be submitted to the organizers as soon as possible, as the cutoff date is January 1, 1989. The attendance will be limited in order to facilitate open discussion and enhance interactions.

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Request for IRPS Proceedings

The following individual is seeking hardcopies of the 1967–1988 International Reliability Physics Symposium Proceedings. Anyone wishing to satisfy the request may contact:

C. L. Hilkey
IEEE Corporation
3700 E. Pontiac Street
Fort Wayne, IN 46801

or call:
(219) 423-9636

Conference Calendar

DATE	CONFERENCE	PLACE	CONTACT
1989			
Jan. 26–28	Annual Reliability and Maintainability Symposium	Atlanta, GA	R. G. Schueppert, Jr. Beckman Instruments, Inc. MS: B-14-D 2500 N. Harbor Boulevard Fullerton, CA 92634 (714) 773-8831 FAX (714) 773-8898
March 13–14	IEEE International Conference on Microelectronic Test Structures	Edinburgh, Scotland	A. J. Walton Edinburgh Microfabrication Department of Electrical Engineering Kings Building University of Edinburgh Edinburgh, EH9 3JL. UK Tel: 031 667 1081 x3261 FAX: 031 662 4358
Apr. 11–13	1989 International Reliability Physics Symposium	Phoenix, AZ	Alfred Tamburrino Member, Board of Director RADC/RBRP Griffiss AFB, NY 13441 (315) 330-2813
Apr. 12–13	Product Assurance Forum '89	Dover, NJ	Sid Markowitz Registration Chairman U.S. Army Picatinny Arsenal Building 62 Dover, NJ 07806-5000 (201) 724-2378
Apr. 27	27th Annual Spring Reliability Seminar	Framingham, MA	John Morgan Digital Equipment Corp. ML1-2/U2 146 Main St. Maynard, MA 01754
May 29 – Jun. 1	1989 16th International Reliability, Availability Maintainability Conference for the Electric Power Industry	Monterey, CA	Robert W. Filipovits General Vice Chairman Pennsylvania Power & Light P.O. Box 3328 Wescosville, PA 18106 (215) 398-5158
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

CALL FOR PAPERS

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
1990			
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

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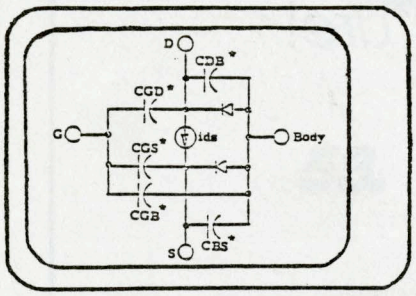
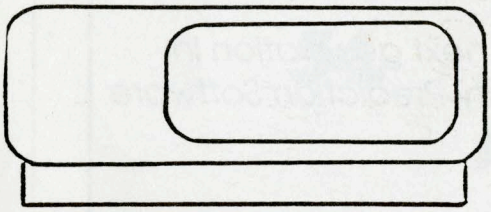
Ithaca, NY 14850

CAD/CAM RELIABILITY CALCULATION ONLY FROM MSI

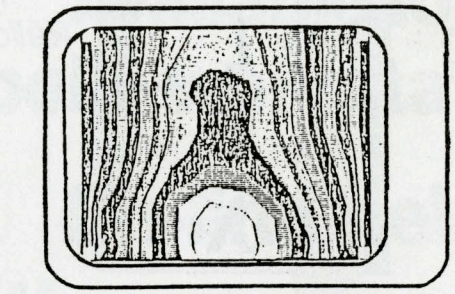


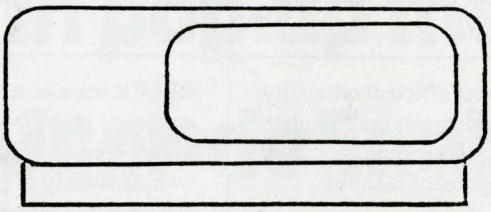


STRESS

Stress/Power

STRESS computes power and stress by circuit analysis.
-accepts CAD BOM
-overstress warning
-100 node capacity
-simulation option
-integrated with THERMAX and PREDICTOR
-device library

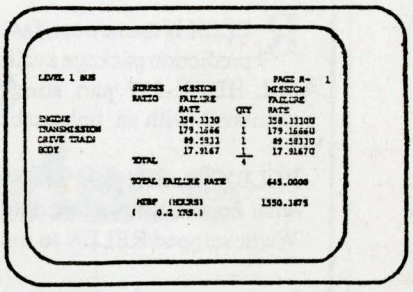


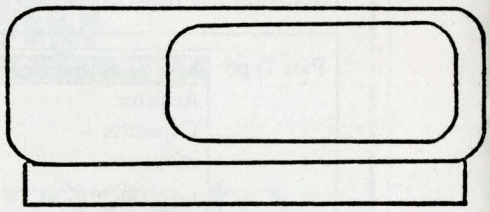


THERMAX

Thermal Analysis

THERMAX computes thermal profiles by simulation of printed circuit boards.
-treats two kinds of cooling by conduction
-device library
-color display
-integrated with STRESS and PREDICTOR





PREDICTOR

Reliability Prediction

PREDICTOR automated MIL-HDBK-217 and BELLCORE reliability prediction methods.
-multi-level evaluations
-global changes
-multi-temperatures
-multi-environments
-extensive databases
-CAD/CAM databases

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