

Reliability Society Newsletter

Editors: Gary Kushner and Mark Snyder

Vol. 35, No. 4, October 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 January Newsletter: by Oct. 25
For April Newsletter: by Jan. 25
For July Newsletter: by Apr. 25
For October Newsletter: by July 25

Associate Editors: Gary Kushner
499 Brigham St.
Marlboro, MA 01752

Mark Snyder
Digital Equipment Corporation
6 Tech Drive (AET1-1/7)
Andover, MA 01810

Chapter News

Boston

We have started up our new year with a successful September meeting held at the Hanscom AFB Officers Club. The topic was "Comparison of Bellcore and MIL-HDBK-217 Reliability Prediction Methods." The speaker was Mr. Don Dawes of CODEX Corporation.

We are also looking forward to our annual Fall Lecture Series scheduled to begin this month. The subject is the mathematics of reliability.

Cleveland

The Cleveland Chapter held the following meetings during the '88-89 year:

Date
9/22/88 PhaVonic Switching Gaul

10/20/88 Application of High Temperature Superconductors
11/30/88 Mid-year Social Albergattie
3/15/89 Space Station Power System Diedrich
4/6/89 Robotic Devices Bream

The Chapter officers for the current year are:

Chairman: V. R. Lalli, NASA LeRC
Vice-Chairman: A. M. Peabody, John Fluke, Inc.
Secretary: Prof. C. W. Thomas, Case Inst. of Tech.

The first meeting was held on September 27, 1989. The topic was Neural Networks.

1253459 SM
PAUL GOTTFRIED
9251 THREE OAKS DR
SILVER SPRING
MD 20901
07N ***
IEG29

3

Denver

The Denver Chapter held its 7th Annual Software Reliability Symposium at Ford Aerospace in Colorado Springs, CO. This was an all day symposium and the proceedings are published. Sixty people were in attendance.

The monthly software reliability meetings continue, whereby, we meet an afternoon each month.

Dallas

The Dallas Chapter is now official. This Chapter of the IEEE Reliability Society was established within the Dallas Section and was approved by IEEE. The effective establishment date of the Chapter is February 15, 1989. Officers and Committee Chairmen are:

Chairman:	Lou Boudreaux	(214) 575-5687
Vice-Chairman:	Dennis Hoffman	(214) 575-5205
Secretary/Treasurer:	Julie England	(214) 995-4616
Program Committee:	Bill Grimes	(214) 480-2592
Membership Committee:	Joe Ruff	(214) 995-0110
Ft. Worth Section Coord.:	Charles Watson	(214) 462-5509

In the short period that the Chapter has been functioning, several meetings have been held with presentations on diverse topics. Dennis Hoffman (TI) presented a "National Perspective of R&M in CAE." Jim Brennan (TI) and Sherman Burton (TI) presented "Warranties — What's a Contractor To Do?," and Dr. John Halpin (AF/ASD) presented his "Avionics Integrity Program (AVIP), An Executive Overview." An early August meeting is planned for Dr. Dimitri Keccioglu (University of Arizona) to address the Chapter on "Stress Strength Approach to Mechanical and Electrical Reliability Determination."

Reliability and maintainability engineers in the Dallas area are urged to join and participate in the activities. Get involved and help us grow.

Tokyo

The Tokyo Chapter wishes to inform the membership that as of January 1, 1987 the chapter has elected new officers. They are as follows:

Chairman:	Masayoshi Furuya
Vice-Chairman:	Yoshihisa Suzuki
Secretary and Treasurer:	Seishiro Hatakeyama

Santa Clara Valley

The Reliability Society—Santa Clara Valley section held its first meeting of the year, Tuesday, September 19th at 7:00 pm at Apple Computer.

This was the first meeting of the society in quite a long time and was a perfect time to see old friends and associates. (No need to wait for IRPS to roll around to see associates.)

In addition to announcing the details of coming meetings and seminars, the new volunteer officers for this year were introduced. Chairman Art Rawers; Treasurer, Bashar Hallaj; and Secretary, Richard Mann.

After a short business meeting, Mr. Rich Blish, of IN-TEL, gave a short talk about IC packaging titled "Achilles had several heels . . . or how IC packages fail." The presentation included separate discussions of each package failure mechanism together with root cause and antidotes, concentrating on surface mount packages. A lively discussion followed since as both customers and vendors shared their learning experiences with PLCC's and QFP's.

The society announced that a one day short course will be held October 7th on Wafer Level Reliability. The course will be taught by Mr. Tim Turner. The location of the course is planned to be at Apple Computer, DeAnza #3 building in the auditorium. Contact the IEEE Santa Clara Valley office for more details (415) 327-6622.

Reliability Society Officers

PRESIDENT

Bernhard A. Bang
Westinghouse Electric Corp.
P.O. Box 1521
MS-3G07
Baltimore, MD 21203

VP MEMBERSHIP

Al Tamburrino
RADC
RADC/RBRP
Griffiss AFB, NY 13441-5700

VP TECH. OPERATIONS

Sam Keene
IBM
P.O. Box 1900
Dept. TR4, Bldg. 002
Boulder, CO 80302

SECRETARY

Richard Kuwalski
ARINC Research
2551 Riva Rd.
Annapolis, MD 21401

JR. PAST PRESIDENT

T. L. Fagan
ManTech Int. Corp.
2121 Eisenhower Dr.
Alexandria, VA 22314

VP MEETINGS

Anthony Coppola
Rome Air Dev. Ctr.
RADC/RBET
Griffiss AFB, NY 13441-5700

VP PUBLICATIONS

Paul Gottfried
9251 Three Oaks Dr.
Silver Springs, MD 20901

TREASURER

T. Weir
Evaluation Associates, Inc.
GSB Building
1 Belmont Ave.
Bala Cynwyd, PA 19004

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.

Reliability Society Chapter Chairmen

BALTIMORE

Neville Jacobs
10 Calypso Ct.
Pikesville, MD 21209

DALLAS

Dennis Hoffman

MOHAWK VALLEY

Jack Bart
RADC/Att. RB
Griffiss AFB, NY 13441-5700

PHILADELPHIA

Fulvio E. Oliveto
920 Snyder Ave.
Philadelphia, PA 19148

BINGHAMTON

Thomas D. Gaska
1010 Elmwood Dr.
Endwell, NY 13760

DENVER

Juan Hernandez
National Systems & Research
3075 Squaw Valley
Colorado Springs, CO 80918

MONTREAL

Francis Dupuis
Hydro Quebec
75 West Dorchester, #801-5
Montreal, QC,
Canada H2Z 1A4

SANTA CLARA VALLEY/ SAN FRANCISCO/ OAKLAND/EAST BAY

Art Rawers
International Micro-
electronics Products
2830 N. First St.
San Jose, CA 95134

BOSTON

Donald Simpson
M/S 60
GTE Government Systems
1 Research Dr.
Westboro, MA 01581

FLORIDA WEST COAST

J. N. Rutlege
E Systems, Inc.
ECI Division
P.O. Box 12248 MS-19
1501 72nd St. North
St. Petersburg, FL 33710

OTTAWA/ONTARIO

Rejean Arseneau
Nat'l Res. Council of Canada
Division of Electrical Engineering
Montreal Rd., Bldg. M-50
Ottawa, Ont. Canada K1A 0R8

TOKYO

Prof. Masayoshi Furuya
Dept. of Systems Engineering
Tokyo Denki University
Hatoyama, Saitama, 350-03
Japan

CHICAGO

Michael I. O. Ero
AT&T Bell Laboratories
1200 E.
Warrenville, IL 60566

John Thornberry
13350 U.S. South
Clearwater, FL 33516

NEW YORK/LONG ISLAND

Vic Bonardi
Grumman Aerospace Co.
B85-01
Bethpage, NY 11714

TRI CITIES

Pete Montague
105 Travelers Way
Bristol, TN 37620

CLEVELAND

V. R. Lalli
NASA LRC
21000 Brookpark Rd.
MS 501-4
Cleveland, OH 44135

LOS ANGELES COUNCIL

John Bush
432 Via Almar
Palos Verdes Estates, CA 90274

NORTHERN NEW JERSEY

Raymond W. Sears Jr.
13 Garabrandt St.
Mendham, NJ 07945

WASHINGTON/NORTHERN VIRGINIA

William E. Breslyn
3203-11 University Blvd. West
Kensington, MD 20895

RS Newsletter Advertising

We have recently received several inquiries regarding advertising rates for the Newsletter. Rates are as follows:

\$400.00 per full page
\$200.00 per half page
\$100.00 per quarter page

Inputs may be "camera ready" but should be of the actual size. A good clean copy is sufficient and should also be of actual size.

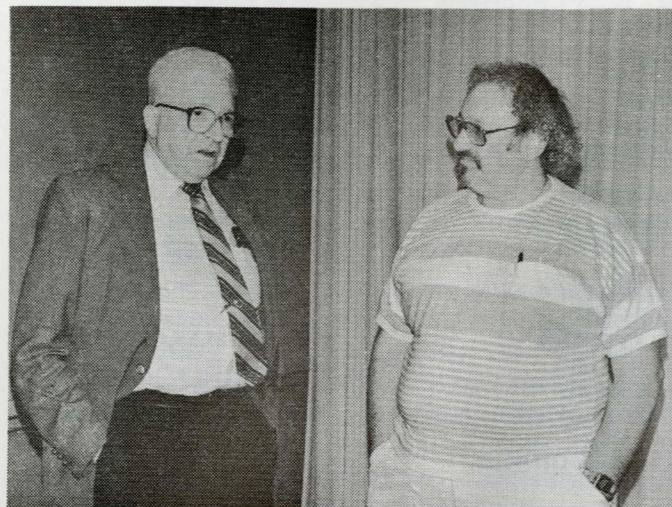
Advertisements should be sent to either editor in accordance with our publication deadlines. PAYMENT SHOULD BE INCLUDED WITH INPUTS, payable to: IEEE Reliability Society.

July RS ADCOM Meeting

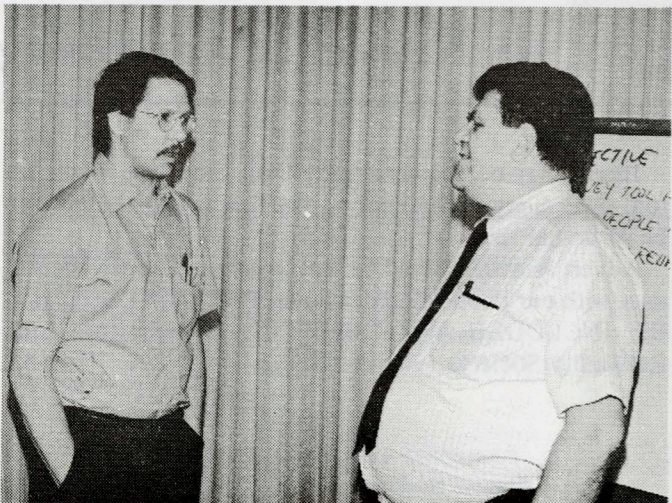
The Reliability AdCom met in July in Baltimore to discuss current chapter business and review/discuss the future direction of the Reliability chapter. The following pictures depict some of your officers.



Bernhard Bang; Chairman of Reliability ADCOM



Arthur Goldsmith, Ph.D., PE, Division VI Director, (Left) talks to Alan Plait, Senior Past Chairman (Right).



Michael Pecht, Ph.D., Transactions Editor (left) talks to Tom Weir, Treasurer.



Paul Gottfried, VP Publications (Left) sits next to Tom Weir, Treasurer.

Technical Topics

The Reliability Society wants to identify key topics of interest to its members. The Society wants to increase its initiative in key technical areas via developing tutorials, workshops, conferences, special issues in the transactions, etc., in focus areas. Your suggestions are requested. Please mail or phone Dr. Samuel Keene, VP Technical Operations, with any inputs you may have. Call: (303) 924-7711. Or write to him at:

IBM
Dept. TR4/Bldg 002-1
PO Box 9023
Boulder, CO 80302

We would appreciate hearing from you.

Literature Available

Copies of the following items are available for the cost of packaging and postage from:

Joseph P. Malizia
R.R. #1 Box 1645
Woolwich, Maine 04579
(207) 443-2711

1985 Volume R-34 #1 thru #5
1986 Volume R-35 #1 thru #5
1987 Volume R-36 #1 thru #5
1988 Volume R-37 #1 thru #5
1989 Volume R-38 #1

- Annual R & M Symposium 1982-83-87-88-89
- Rel. Physics Annual Proceedings 1986-87-88
- IEEE Transactions on Reliability
1984 Volume R-33 #4 & #5

- IEEE Transactions on Semiconductor Mfg.
Volume 1 #1 thru #4
Volume 2 #1



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**

<ul style="list-style-type: none"> Wafer-level tests Test structures Accelerated stress Test combinations Statistical process control 	<ul style="list-style-type: none"> Modeling Screening Evaluation of field failures Burn-in effectiveness and strategy 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

Reliability Society Newsletter

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:

<p>Walter H. Schroen General Chairman, 1990 IRPS Texas Instruments MS 3613 13020 Floyd Road P.O. Box 655012 Dallas, TX 75243 USA Tel. 214-995-3183 FAX 214-995-5112</p>	<p>Asia</p> <p>Dr. Eiji Takeda IRPS Publicity Committee Hitachi Ltd. P.O. Box 2 Kokubunji, Tokyo 185 Japan Tel. 0423-23-1111</p>	<p>Europe</p> <p>Dr. Wolfgang Gerling IRPS Publicity Committee Siemens AG Balanstr, 73 D-8000 Munich 80 Federal Republic of Germany Tel. 089 4144-2825</p>
---	--	--

FROM CONCEPT TO DEPLOYMENT . . .

The Computer-Aided Engineering TOOL-KIT

A Single Source for all the CAE Tools

- Electronic Mail • Computer-Aided Design • Reliability
- Maintainability • Project Records • Testability
- Safety/Risk Assessment • Availability • Logistics
- Report Generation • Configuration Management
- Failure Mode and Effects Analysis



Management Sciences, Inc.

Phone (505) 255-8611
Telex 9109975519 MSI
FAX: (505) 268-6696

6022 Constitution Ave. N.E.
Albuquerque, N.M. 87110 USA

Workshop Announcement



IEEE

Reliability
Society

Third Annual WORKSHOP RELIABILITY AND MAINTAINABILITY in COMPUTER-AIDED ENGINEERING

SEPTEMBER 26-28, 1989 • XEROX TRAINING CENTER • LEESBURG, VIRGINIA

The IEEE Reliability Society in conjunction with the Computer Society is sponsoring a Workshop aimed at assuring that Reliability and Maintainability (R&M) needs are addressed when the capabilities of engineering workstations are being defined. These CAE capabilities are needed by the design engineering staff to design-in R&M requirements during the design process and by the R&M specialist for independent analyses/reviews.

The targeted participants for this workshop are **engineering/design automation managers** who have the responsibility for providing the needed capabilities within their respective companies, **R&M engineers/design engineers** who can define user CAE needs, and **CAE/CAD vendors** who can develop and make available to industry these R&M capabilities.

This workshop will focus on what has been done in the implementation of R&M in CAE and the identification of existing new techniques and tools with high potential payoff. Maximum audience involvement will be encouraged to identify these barriers to R&M in CAE and to define solutions.

The anticipated participants and presenters will be from diverse backgrounds including academia, the CAE tool vendors, defense contractors, commercial industry, R&M engineering and design engineering. All will have a common goal—improving R&M in CAE. This workshop, as a result, has a high potential for big payoffs.

ADVANCEMENTS IN R&M CAE

First Day:

The first day of the workshop will focus on:

What has been accomplished in implementing R&M in CAE* since the first workshop?

What recent breakthroughs have occurred in R&M CAE* tool development?

What barriers are still present that must be overcome to integrate R&M and CAE?

*For this workshop, the definition of R&M CAE encompasses any design analyses (system, electrical, mechanical, thermal, software, reliability, maintainability, producibility, and testability) that assures R&M attributes within the product design and/or that are necessary to satisfy contractual requirements.

NEW APPROACHES

Second Day:

The second day will focus on the new CAE technologies where they are being used today and where they can be applied to removing the barriers that still exist which prevent effective development of R&M in CAE. The sessions include discussions by researchers and tool developers on integrating tool frameworks, the potential use of artificial intelligence including expert system, design synthesis tools and product description language. The participants will emphasize how these potential new tools could be applied to improve the R&M characteristics of products during the design process.

WHAT CAN WE DO NOW?

Third Day:

The third and final day will provide an opportunity for all attendees to actively address what needs to be done immediately. Working groups will address the critical issues such as how to transfer R&M CAE technology developed under DoD contracts to industry; what R&M CAE capabilities should be developed by DoD funded or cooperative efforts; how should reference data be generated, acquired, formatted and made available; and how best can the R&M community define for the CAE industry the details of what is needed.

ATTENDANCE LIMITED—REGISTER EARLY

NAME _____

TITLE _____

FIRM _____

ADDRESS _____

CITY _____

STATE _____ ZIP CODE _____

BUSINESS TELEPHONE _____

Please note that attendance will be limited.

Early registration is strongly recommended.

Payment must be received by 6 September 1989.

The workshop fee is \$450 and includes lodging (3 nights), all meals, proceedings, workshop attendance, and coffee/refreshment breaks.

The Xerox Training Center provides single rooms only.

Please send registration and payment to:

R&M — CAE Workshop
c/o J.W. Thomas
STEMCO
8730 Georgia Avenue, Suite 600
Silver Spring, MD 20910
Phone: (301) 585-0421

Make checks payable to: IEEE—CAE Workshop

Call for Papers

Probabilistic Safety Assessment and Management (PSAM)

An International Conference Devoted to the Advancement of System-based Methods for the Design and Operation of Technological Systems and Processes

Sponsored by the Society for Risk Analysis

February 4-7, 1991 · The Beverly Hilton · Beverly Hills, California, USA

SCOPE

The purpose of PSAM is to provide a forum for the presentation of scientific papers covering both methodology and applications of system-based approaches to the design and safe operation of technological systems and processes. These include nuclear plants, chemical and petroleum facilities, defense systems, aerospace systems, and the treatment and disposal of hazardous wastes.

The following is a list of topics within the scope of the meeting:

1. Safety management and decision making.
2. Risk-based regulation.
3. Qualitative and quantitative design objectives.
4. Evaluation of alternate technologies and processes.
5. Probabilistic and non-probabilistic models for safety assessment.
6. Uncertainty analysis.
7. Uncertainties in physical and chemical phenomenology.
8. Expert judgment in safety studies.
9. Human reliability.
10. Risk-based methods for improving operator training.
11. Computerized control systems and operator aids.
12. Artificial intelligence in support of safety management.
13. Software system safety.
14. Implications of advances in computer power.
15. Earthquakes, fires, tornadoes, and natural phenomena.
16. Multi-hazard analysis, e.g., fires following earthquakes.
17. Vulnerability and safeguards analysis.
18. Aging of systems, structures, and components.
19. Reliability-based design.
20. Accident management.
21. Communicating the results of risk assessment and management to peers, decision makers, and the public.

INSTRUCTIONS FOR SUMMARY SUBMISSION

Four copies of a summary (800-1200 words; typed, single-spaced) should be submitted to the General Chairman not later than Friday, April 6, 1990. Summaries should contain a title and include all authors' names, affiliations, and telephone, Telex, and FAX numbers. Authors should indicate the primary and one alternate category with which their papers are most closely identified using the numbering scheme in the Scope section of this announcement. Full papers will be due August 15, 1990.

GENERAL CHAIRMAN

Professor George Apostolakis
Mechanical, Aerospace, and Nuclear Engineering Dept.
University of California
405 Hilgard Avenue
Los Angeles, CA 90024-1597 USA
Telephone: (213) 825-1300
FAX: (213) 825-0761
TELEX: 3716012 UCLA LSA

Short Courses

SHORT COURSE

"RELIABILITY OF REPAIRABLE SYSTEMS: ANALYSIS AND APPLICATIONS"

DATES: OCTOBER 31-NOVEMBER 3, 1989 (TUESDAY thru FRIDAY, with an
EARLY CONCLUSION, FRIDAY PM)

LOCATION: CENTER FOR PROFESSIONAL DEVELOPMENT,
UNIVERSITY COLLEGE,
THE UNIVERSITY OF MARYLAND
UNIVERSITY BLVD. at ADELPHI ROAD
COLLEGE PARK, MARYLAND-20742-1668
(800-888-8682, x7157 FOR THE COURSE, x7303 FOR
LODGING AT THE CENTER)

OVERVIEW: This short course primarily covers effective and "correct" analysis (using probability and statistics) of repairable systems reliability. To do this, a quite thorough review of relevant techniques for both repairable systems and non-repairable parts and / or systems is provided. Random variables, processes vs. distributions, basic and advanced probabilistic models, improvement vs. deterioration, identically distributed data, trend testing, etc., are clearly delineated, probably for your first time ! Learn how to avoid critical mistakes in analysis still pushed in much of the current reliability literature and in other reliability courses.

Secondarily, a separate nearly parallel track will cover the current status of governmental and commercial R & M management trends and directions. Why have R & M 2000 and Willoughby's Documents been created? What happened in over 35 years of prior reliability practice? Directly related will be sessions on "relative" analytical techniques (graphical Weibull, FMEA's, practical use of fault trees, and effective technical design reviews) and "relative" reliability testing (screening, longer run process control, and reliability development growth vs. qualification/demonstration testing)...all designed to I.D. and fix problems during R & D.

FEE: \$1035.00, includes extensive course Notes of over 600 pages, plus, the text "Reliability of Repairable Systems" by Ascher and Feingold, 1984

CEU's: 2.8 (Certificate of Completion)

OBJECTIVES: Learn how to pick and choose the tools and techniques that will work for you. Join an interactive and meaningful reliability course before 1989 is over !

CONTACTS

(for technical details):

Harold "Harry" Ascher, M.S. (IEEE, ORSA)
202-767-4873 (ofc)
301-762-4779 (home)

Allan S. Golant, MBA, P.E. (ASQC, IIE, TIMS)
213-849-3815

CONTACTS

(for course registration):

Richard Jaffeson/Mona Czupak
800-888-8682, x7206

SHORT COURSE

THE 27TH ANNUAL RELIABILITY ENGINEERING AND MANAGEMENT INSTITUTE

November 13-17, 1989

in

Tucson, Arizona

Objective: This institute covers Reliability Engineering and Management concepts, Reliability Engineering Theory and Practice; Mechanical Reliability Prediction; Reliability Testing and Demonstration; Environmental Stress Screening; Software Reliability; Maintainability Engineering; a Complete Industry Product Assurance Program in Action, and Data Banks; Reliability, Maintainability, Product Assurance and Quality Management; Cradle-to-Grave Approaches to the Implementation of Reliability Engineering in Industry; Fault Tolerant Computer Design for High Reliability and Availability; The Taguchi and Classical Methods for The Design of Experiments; Fault Trees; FAMECA'S; Life Cycle Costing; Testing Techniques for High Quality and Reliability; Reliability Growth Testing for Reducing Time to Market; The Challenges of Reliability Engineering in Our Industry and Government and Techniques to Conquer Them.

Numerous Practical applications of these methodologies will be presented.

Sponsored by: The University of Arizona, College of Engineering and Mines, Tucson, Arizona, and 15 Leading Corporations.

Cost: \$895.00; includes the extensive Proceedings and lunch Monday through Friday.

Continuing Education Units: 3.0 Units

For Technical Information: Dr. Dimitri Kececioglu, Director
Reliability Engineering and Management Institute
The University of Arizona
Building #16, Room 200-B
Tucson, Arizona 85721-0663
(602) 621-2495

For Registration Information: Special Professional Education
Harvill Building, Box 9
University of Arizona
Tucson, Arizona 85721-0663
(602) 621-3054, (602) 621-1443, (602) 621-5104

Conference Calendar

DATE	CONFERENCE	PLACE	CONTACT
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. 5 - 7	IEEE International Conference on Microelectronic Test Structures	San Diego, CA	Michael A. Mitchell Honeywell, Inc. M/S MN14-3C12 12001 State Highway 55 Plymouth, MN 55441 (612) 541-2428
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
1991			
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
1992			
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
1993			
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

Step into the Future with RELEX

Looking for Something Innovative?

Look no further. RELEX is the newest, easiest to use reliability prediction package available. RELEX was designed and developed to achieve one important goal: to produce a quality, user-friendly prediction package.

Take a look at just a few of RELEX's outstanding advantages and impressive features designed to meet your needs. Then contact Innovative Software Designs to step into the future with RELEX, the next generation in reliability prediction software.

Advanced Data Entry

RELEX has an unbeatable, flexible data entry system. RELEX not only introduces a new approach to data entry, but provides you with a choice of several input formats.

Using RELEX's data entry system, a list of all possible choices automatically pops up when data is needed. All you

Part Type	<input type="text"/>
	Microelectronic Device
	Semiconductor
	Resistor
	Capacitor
	...

need to do is press a key to make a selection. Or, if you prefer, you can interface RELEX directly to your CAD or database application to input data. You can even create input files using your favorite word processor or editor. RELEX

easily interfaces to standard word processing, database, and spreadsheet packages including dBASE, Lotus 1-2-3, Paradox, WordPerfect, Microsoft Excel and others.

Data entry is made even easier with several additional features. RELEX provides on-line context sensitive help, data validations, and default value assignments. Along with the ability to create your own parts databases, RELEX includes an extensive dictionary of standard parts. Function key operations allow you to quickly scan parts in your database, search for similar parts, duplicate part data, edit data, and more.

Unique Calculations and Report Generation

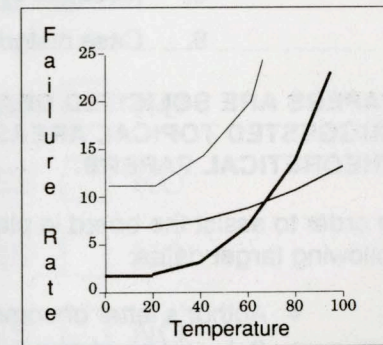
Calculations are fast and accurate. You can compute failure rate, MTBF, and mission reliability. You can easily run trade studies, perform system modeling, make global changes, and check derating limits. You can even get an *instant pi factor* display as you are entering data!

Outstanding Features of RELEX

- User-Friendly and Easy to Use
- Various Data Entry Formats
- CAD and Database Interfaces
- On-line Context Sensitive Help
- Extensive Parts Database
- Instant Pi Factors
- User Definable Reports
- Graphical Capabilities
- ISD Quality
- And much, much more ...

MIL-HDBK-217E Pi Factors	
Part Number :	54LS00
PI e :	9.00000
PI l :	1.00000
PI q :	2.00000
PI t :	0.10131
PI v :	1.00000
C1 :	0.01000
C2 :	0.00366
Failure Rate :	0.067845

Outputting with RELEX has been advanced to new levels. You can design your own report format, or use supplied formats. You can preview your report, sort your output, and set up your printer. You can even graph failure rate versus temperature.



The Quality Commitment

With RELEX, we have produced a reliability prediction package which achieves the high quality standards we have at ISD. You will be amazed at how easy RELEX is to understand. You will appreciate how fast you can learn to use the package. And you will be most impressed with RELEX's flexibility and features. Contact Innovative Software Designs to learn more.



Innovative Software Designs, Inc.

One Kimball Ridge Court ■ Baltimore, MD 21228

(301) 747-8543

RELEX and ISD are trademarks of Innovative Software Designs, Inc. Other brand and product names are trademarks or registered trademarks of their respective holders.

CALL FOR PAPERS

IEEE TRANSACTIONS ON RELIABILITY

SPECIAL ISSUE DEVOTED TO EXPERIMENTAL EVALUATION OF COMPUTER SYSTEMS RELIABILITY

The editorial board of the *IEEE Transactions on Reliability* is planning a special issue of papers devoted to experimental evaluation of computer systems reliability. The basic objective is to provide a literary forum for the exchange of information among computer system design engineers and planners, computer systems analysts, computer reliability and maintainability specialists, and other computer engineering professionals.

Invitation is extended to authors of previously unpublished papers dealing with specifics of the following suggested topical areas:

1. Design of experiments for computer reliability
2. Field measurements in support of experiments
3. Fault-Injection experiments
4. Design and experimental use or test beds
5. Experimental methods in predicting system reliability
6. Correlation between field measurements and simulation
7. Design/development of test provisions for reliability validation
8. Issues of system integration and reliability testing
9. Case histories

PAPERS ARE SOLICITED DEALING WITH PARTICULARS RATHER THAN GENERALITIES OF SUGGESTED TOPICAL AREAS. PREFERENCE WILL BE GIVEN TO DESIGN FOCUSED PAPERS OVER THEORETICAL PAPERS.

In order to assist the board in planning the special issue, cooperation of prospective authors is solicited with the following target dates:

- Author's letter of commitment — 1 November 1989
- Submission of manuscripts (4 copies) — 15 January 1990
- Submission of revised manuscript — 30 April 1990

Letters of commitment containing brief description of paper essence or letters of inquiry should be sent to guest editors:

Dr. Ram Chillarege
T.J. Watson Research Ctr.
P.O. Box 704
Yorktown Heights, N.Y. 10598

(914) 789-7375
(914) 789-5016 FAX

Dr. Daniel P. Siewiorek
School of Computer Science
Carnegie Mellon University
Pittsburgh, Pa 15213

(412) 268-2570
(412) 268-7455

We're
not
happy
with

MIL-HDBK-217E



The Boston Reliability Chapter's Technology Development RMA Workshop held a special focus meeting to discuss MIL-HDBK-217E. Participants presented data comparing predictions with field experience. We concluded that the quality factor for commercial ICs is too pessimistic - by perhaps an order of magnitude.

What's Your Opinion? PRO or CON

Is the quality factor for commercial IC's too pessimistic?

YES NO

Have you data to support your opinion?

YES NO

May your data be published without restriction?

YES NO

May your data be published with restrictions?

YES NO

We want to hear from supporters of MIL-HDBK-217 as well as detractors. We will publish the results of this questionnaire. Please provide additional comments on a separate sheet.

Name: _____

Organization: _____

Address: _____

Telephone: _____

MAIL TO:

Boston IEEE Reliability Chapter
c/o Avery Hevesh
13 Angela Road
Framingham, MA 01701

★ ★
Get Ready Now and
Save More Than 50%

★ ★ SPECIAL ★ ★ ★ ★ ★ ★ ★ ★

CALS Preparedness Package

RELIABILITY, MAINTAINABILITY, AND LIFE-CYCLE
COST ANALYSIS COMPLETE WITH CAE/CAD/CAM
SYSTEM INTERFACE

Here's a \$45,000 value – yours for only
\$20,000!!!

Team up with SEA™ to get ready for CALS
and enjoy significant savings!

We want to make it easy for you to address
the challenges that the CALS initiative will bring.
That's why SEA has integrated three powerful
analysis programs – *Reliability, Maintainability,*
and *Life-Cycle Cost* – and packaged them with
our programmable RAMCAD™ CAE/CAD/CAM
interface software. The result: SEA's new CALS
Preparedness Package.

Need to integrate SEA's predictive analysis
solutions with your concurrent engineering
system? The CALS Preparedness Package is the
answer. Our programmable RAMCAD interface
lets you quickly and easily link SEA software with
existing computer-aided engineering systems to
protect and leverage your investment.

SEA has the software, systems, and support
you need to get ready for CALS. And, for a
limited* time, you can license the CALS
Preparedness Package for only \$20,000. This
special offer can save you *more than 50%!*

To learn more, call SEA today, or clip and mail
the handy coupon.



SYSTEMS EFFECTIVENESS ASSOCIATES, INC.

20 Vernon Street
Norwood, MA 02062

Tel: 617-762-9252
Fax: 617-769-9422

* Offer valid for purchase orders received
by December 31, 1989. SEA CALS
Preparedness Package includes software
compatible with DOMAIN®, UNIX®, and
VMS™ operating systems.

DOMAIN is a registered trademark of Apollo Computer
Corporation.
RAMCAD and SEA are trademarks of Systems Effectiveness
Associates, Inc.
UNIX is a registered trademark of AT&T.
VMS is a trademark of Digital Equipment Corporation.

YES! I need to get ready for CALS. Please:

- Have an SEA representative call me.
- Arrange a demonstration for me.
- Send me more specific information.

Name: _____

Title: _____

Company: _____

Address: _____

City: _____ State: _____ ZIP: _____

Phone: (____) _____ Ext. _____