



Reliability Society Newsletter

Editors: Gary Kushner and Mark Snyder
Vol. 33, No. 3, July 1987 (USPS 460-200)

Software Paper Wins R&M Symposium Best Paper Award

The P. K. McElroy award for best paper of the 1986 Annual Reliability and Maintainability Symposium was presented to Lt. Colonel Edward Koss, USAF, for his paper "Developing Reliable Space-Flight Software." The presentation was made at the 1987 Symposium banquet on January 28, 1987, at the Dunfey City Line Hotel, Philadelphia.

The P. K. McElroy award is presented annually for the best paper of the previous year's symposium, considering both the written paper and its presentation. It is named in honor of the late P. K. McElroy who was responsible for producing the symposium proceedings for twenty years.

Col. Koss is currently stationed at the Air Force Systems Command Electronic Systems Division (ESD), Bedford, MA, where he is the assistant program director for the Air Force GRANITE SENTRY project to update command and control systems installed in Cheyenne Mountain, Colorado, and the Air Force director of the software center operated jointly by ESD and the MITRE corporation. He was previously assigned to the ESD Space Defense Initiative (SDI) office.

From 1981 to 1985 he was the director of Space Computer Resources at the Air Force Space Division, Los Angeles. He holds a BS in Mathematics, MBA in Business, and a PhD in Finance. He has published 53 articles and four books on computer management, international affairs and finance.

The award-winning paper discusses the core software engineering tasks directly related to developing reliable space software. It stresses the paramount importance of the requirements definition phase, and recommends more emphasis on this phase than has been historically allocated. One suggestion made is the use of Independent Verification and Validation for requirements definition and design phases in addition to its more common use in software test phases.

The 1988 Annual Reliability and Maintainability Symposium will be held in Los Angeles, January 26-8, 1988. The winner of the 1987 P. K. McElroy award will be announced at the symposium banquet on January 27, 1988. General Chairman for the event is Dr. Ralph Dudley, Raychem Corp., 300 Constitution Drive, Menlo Park, CA, 94025-1164; phone: (415) 361-2327.

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 For January Newsletter: by Oct. 15
 For April Newsletter: by Jan. 15
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Chapter Activities

Philadelphia Chapter

The last three months were successful for the Philadelphia Chapter.

On January 20, 1987 two talks were presented. One was "the Tax Reform Act of 1986" by Jack N. Brown - Arthur Young and Company, and the second talk was "The Economics of Custom Telecommunications VLSI" by Roy F. Privett - Hitech Associates.

February 24, 1987 had two talks, one was on "Career Choices (prospects for a Rewarding Lifetime Career in Electrical/Electronics Engineering) by Merrill W. Buckley, Jr. - RCA, Moorestown, NJ and the second was "Quality/Reliability and the Planning Process" by Charles A. Cianfrani - Fischer and Porter.

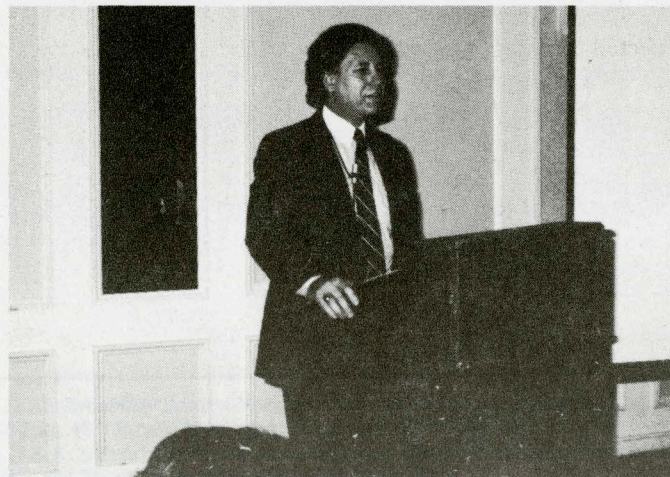
April 21, 1987 had two more talks, the first was by Dr. Fred Sterzer - SRI International/David Sarnoff Research Center, Princeton, NJ and was entitled "Microwave Cancer Therapy" and the second talk was "Advances in Digital Processing of Random Signals - Spectral Estimation" by Dr. Leonard Chin - General Atronics Corporation.

Fulvio E. Oliveto
Chairman, Philadelphia Chapter

Central New England Council

The 1986-1987 Season has successfully concluded and the 1987-1988 chapter year has begun. The new chapter officers for this year are A. (Jake) Bajakian, Raytheon Coporation, Chairman; Jane Ferguson, Haemonetics, Vice-chairman; Vivian Thorsen, Raytheon Corporation, Secretary; and Norm Smith, Digital Equipment Corporation, Treasurer.

The Central New England Council Reliability Chapter is actively looking for volunteers to help in the administrative activities of the chapter, please contact Jake Bajakian at Raytheon Sudbury (617) 440-2782 if interested.



The March meeting was presented by Mr. Rich Stratton, Vice President of engineering at Systems Effectiveness Associates (SEA) who spoke on the trends for R&M software becoming integrated with CAD/CAE software.

The 25th annual all-day Spring Seminar was held on Thursday, April 23, 1987 at the Sheraton Tara in Framingham, MA. Mr. E. Carrubba gave an inspiring Keynote addressing the commercial and military trends from his expert view.

There were eight papers presented on a wide variety of topics from mechanical reliability through "Designing Serviceable LANs." One of the papers discussed "The Role of Failure in the Design Process" by Mr. Gordon Cawood.



The seminar ran smoothly this year, thanks to the hard work by this year's program chairman Vivian Thorsen and the seminar chairman Jake Bajakian.



The opportunity to share professional opinions was excellent and the participation is always appreciated.

Gene Bridgers
Chairman, Central New England Council

Highlights of Software Reliability Technical Committee in 1986

January

Myron Lipow, who is the most active principal of this committee, prepared a synopsis of "Software Reliability/Availability/Maintainability Issues." This paper gives the reader an up-to-date basis for understanding these issues, included are:

- 1) Reliability, Availability and Maintainability Requirements
- 2) Relationship to Software Quality
- 3) Sources and Types of Errors
- 4) Methods for Developing Reliable Software
- 5) Reliability Assessment
- 6) Maintainability Assessment
- 7) Cost Factors

Also contained with the fourteen page paper is a glossary page and two pages of references. LA IEEE Video Tape Exchange reduced its costs of video tapes to \$20/two hour tape and \$5 for exchange. A considerable portion of the tape library pertains to software and reliability and associated subjects.

February through April

Evaluation criteria prepared by the Department of Defense for performing industry core audits included twenty one questions on Reliability and Maintainability Management. Responses to eight of these questions by committee members related to computer software.

April

M. Lipow and E. Branyon were appointed as co-chairmen of the Software Reliability Subcommittee of the EIA G-34 Computer Resources Committee. M. Lipow compiled 109 pertinent abstracts with a summary of some eighteen that were directly relevant to projects of current interest for which results were reported. These may be of value to CODSIA Task Group 20-85 that M. Lipow is also supporting.

June

A panel on Software Reliability for an EIA G33/G34 workshop in Seattle in September was planned to cover Software Reliability terms, requirement, methodology for producing and measuring reliable software and relating these to existing standards. At this June meeting software reliability metrics and impact of V and V were reviewed.

A seminar on Reliable Local Area Networks, with much discussion on the software issues, was held in Los Angeles. Prominent personalities in the field, including Drs. Vermuri, Sastry, Rubin, Templeton and Skelton, gave presentations which were all recorded for the Video Tape Exchange.

August

A proposed view of the "Reliability Impact and Interface with Software and DOD-STD-2167/2168" was offered by the EIA G-41 Reliability Committee. Considering the extent of software reliability educational material that has been generated over the past ten years, it was surprising to see

the old "software doesn't fail arguments" with a new excuse to blame it on the "rules," per the author of this EIA position document. A suitable minimal response to the EIA request for review solicited, by Myron Lipow. Also, Myron provided his own approach for dealing with new software standards via a paper "New Directions for Software, DOD-STD-2167 and 2168." In this paper many reasonable arguments are offered that indicate major weakness of the new government specifications. Also, specific approaches are suggested for more effectively dealing with the issue of how to better effect standards for software design and implementation. In addition, the need to bring the software development into closer coordination with the relevant hardware and system development effort must be addressed if these new standards are to prove useful.

September

An EIA G-34/G-34 Workshop was held in Seattle, which included a Sub Panel on Software Reliability. At this session Myron Lipow explained some fundamental concepts and the proposed IEEE Standards S/W Reliability Measures (P-982) and S/W Errors, Faults and Failures (P-1044). Also from this panel there were a number of recommendations made for changes to existing DOD documents, such as MIL-STD-785, DOD-STD-1679, DOD-STD-2167&2168, etc. In addition a charter and plan of action for the EIA G-34 Software Reliability Sub Committee was reviewed. A response to the Corrubba "position paper" was framed by Myron Lipow via a G-34 coordinated set of comments, which were generous in their brevity.

October

A short tutorial on Software Reliability was presented by the undersigned, as part of a short summary course on reliability by Kambea Engineering. The latter organization is headed by Kam Wong, past recipient of an R&M Symposium best paper award.

November

Another draft of the IEEE Software Reliability Measures Standard, P982 and associated Guide on Application of Software Reliability Metrics, P982.1 was prepared. It is expected that this draft copy will be distributed for review and acceptance in 1987.

December

Myron Lipow and Erwin Book prepared an article on "Implications of R&M 2000 in Software" upon the invitation of Thad Regulinski. This document summarizes the activity of the government and industry in their efforts related to Software Reliability and points to the necessity of appropriate initiatives for application of R&M 2000. Particular attention is called to the use of ADA Programming Support Environment (APSE) for accomplishment of many Software Reliability, as well as Productivity Objectives.

What's Happening?

A Review of Assurance Developments for the Future

With all the activities in the Assurance Technologies in recent times, a look at where the community stands and where it is headed, is in order. The commercial world of communications, power, computer graphics, and others is aware of clients who do not stand still for field failures or call backs. The military (and government, in general) has been aware of such problems and has developed a variety of initiatives (such as R&M 2000) to help solve them. We still need Assurance and especially its basics designed into products up front. So, what's happening "out there?"

1988 ANNUAL RELIABILITY AND MAINTAINABILITY SYMPOSIUM

to be held at the

BILTMORE HOTEL

LOS ANGELES, CA USA

1988 JANUARY 26-28

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


System 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
Logistics Support
International Programs

INDUSTRY APPLICATIONS AND LESSONS LEARNED

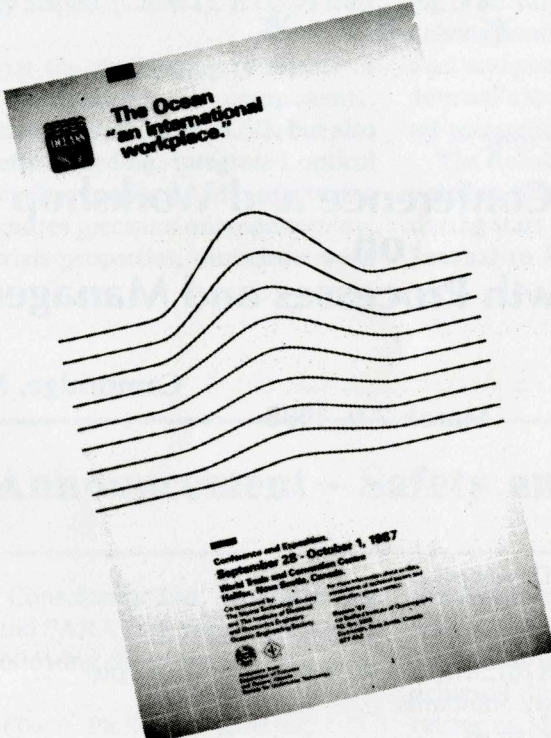
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**Meeting Announcement
and
Call for Papers**



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- MIL-STD-781D/MIL-HDBK-781; MIL-HDBK-189 Growth Concepts
- Influence of Other Military Standards
- R&M 2000/Templates Interfaces
- Mathematical/Statistical Principles
- Environmental Stress Levels
- Management Tools and Concepts

Nationally recognized shapers of reliability policy will be in attendance. Only a selected few papers will be presented at the conference. Plan now to join this select group. Abstracts should be submitted prior to June 1, 1987. Selected authors will be notified by July 15, 1987 and draft papers will be required by September 1, 1987.

Abstracts should be submitted to:

Dr. Larry Crow, Technical Program Chairman
AT&T Bell Laboratories
Whippany Road
Whippany, New Jersey 07981
201/386-4682



Institute of Environmental Sciences

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IEEE Journal of Semiconductor Manufacturing

Plans are being developed for a new IEEE Journal of Semiconductor Manufacturing, jointly sponsored by the IEEE Solid-State Circuits Council (SSCC), the Electron Device Society (EDS), and the Components, Hybrids and Manufacturing Technology Society (CHMT). It could start publishing in early 1988.

This Journal will address the challenging problems of manufacturing complex microelectronic components, especially very large scale integrated circuits (VLSI), but also thin-film heads for magnetic recording, integrated optical components, and other similar products. Manufacturing these products typically requires precision micropatterning, precision control of materials properties, ultraclean work

environments, and complex interactions of chemical, physical, electrical and mechanical processes. An integrated application of interdisciplinary skills is essential for success.

Particularly sought for this Journal will be papers describing practical engineering techniques for solving problems involving interactions among facility, equipment, process, product and people issues in the context of manufacturing. The Journal's spectrum of coverage will range from fundamental to applied.

The Reliability Society AdCom, at the April 1987 meeting, voted to financially and editorially support this publication during start-up. This action will provide distribution of the Journal to RS membership.

Announcement - Safety and Reliability Consultants

Safety and Reliability Consultants Ltd, incorporating HELP (Consultants) Ltd and SARA Ltd, wish to announce the appointment of the following directors:

A. R. Churchley	B. Sc. (Tech), Ph.D., C.Eng., M. Inst.E., F.Sa.R.S	Director, Systems Reliability
P. A. Dunn	F.C.A	Financial and Administrative Director
G. H. Helsby	B.Sc.(Hons), M.Sa.R.S	Director, Safe- ty Assessment
J. Mather	B.Sc. (Hons)	Director, Nuclear Safety Assessment

tive role in the day-to-day management of the Group's affairs during the last 2 years in a planned transition phase. Their aim is to continue the successful pattern of growth achieved during the term of Mr. E. S. London, who now retires as Managing Director. Selwyn London will not be severing his connection with the Group, but will continue in an advisory capacity during his retirement.

Hazards Evaluation and Loss Prevention Consultants Ltd (HELP) and Safety, Availability and Reliability Assessments (SARA) Ltd have an established reputation in their fields - hazard identification and evaluation, safety and reliability quantification - in many areas of industry and the new Directors are confident that this will provide a firm basis for future expansion.

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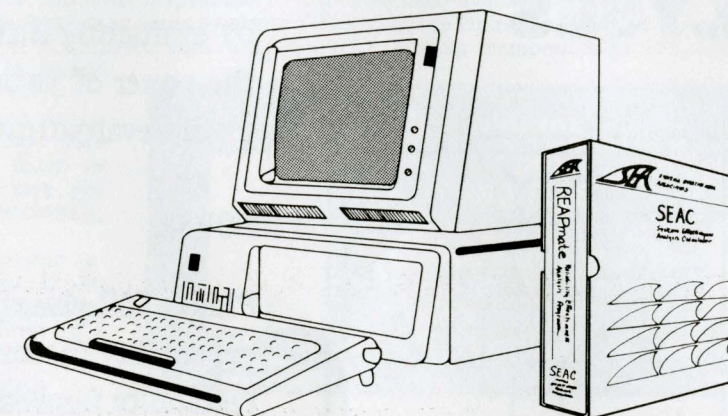
The new Directors have been taking an increasingly ac-

Conference Calendar

DATE	CONFERENCE	PLACE	CONTACT
1987			
Oct. 6-7	Product Assurance Forum '87	Dover, NJ	Sid Markowitz Registration Chairman U.S. Army Picatinny Arsenal Bldg. 62 Dover, NJ 07801-5001 (202) 724-2378
Oct. 13-16	IV International Conference on Reliability and Exploitation of Computer Systems Relcomex '87	Wroctaw, Poland	Prof. Wojciech Zamojski Relcomex '87 Wroctaw Technical University Institute of Engineering Cybernetics Janiszewskiego Str 11/17 50-372 Wroctaw, Poland Tel. 21-26-77/
Oct. 19-21	International Symposium on Physical and Failure Analysis of Integrated Circuits	Singapore	Daniel S. H. Chan Electrical Engineering Dept. National University of Singapore Kent Ridge, Singapore 0511 Republic of Singapore Telex: RS33943 UNISPO
Nov. 3-5	AUTOTESTCON '87	San Francisco, CA	Mr. Ted Parker, Chairman AUTTESTCON Power-One Switching Products 833 Flynn Road Camarillo, CA 93010-8702 (805) 482-0757
1988			
Jan. 26-28	Annual Reliability and Maintainability Symposium	Los Angeles, CA	Al Plait Mantech Support Technology, Inc. 2320 Mill Road Alexandria, VA 22314
Mar. 7-9	National Conference and Workshop on Reliability Growth	Cambridge, MA	Dr. Larry Crow Technical Program Chr. AT&T Bell Laboratories Whippany Road Whippany, NJ 07981 (201) 386-4682
Apr. 12-14	1988 International Reliability Physics Symposium	Monterey, CA	H. C. Jones Westinghouse Corp. Baltimore, MD (301) 765-7387

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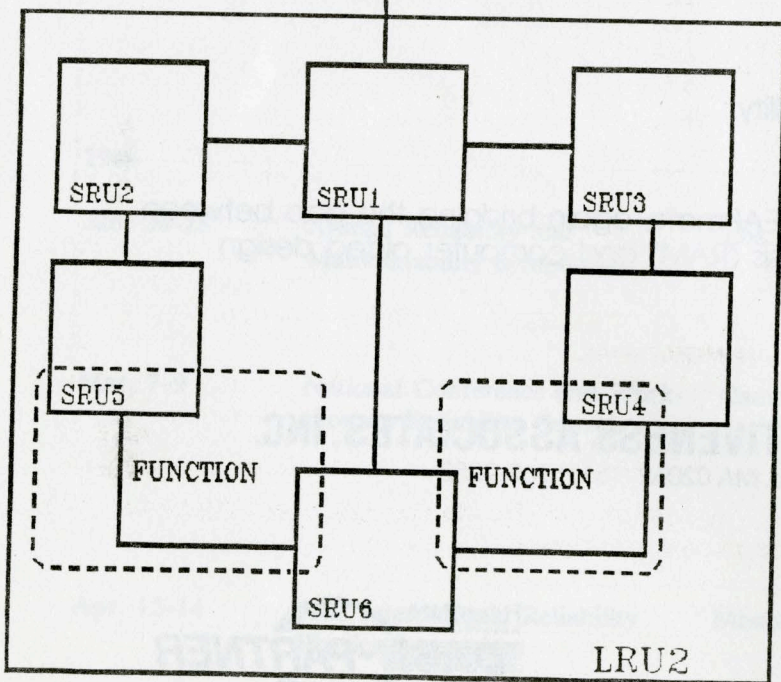
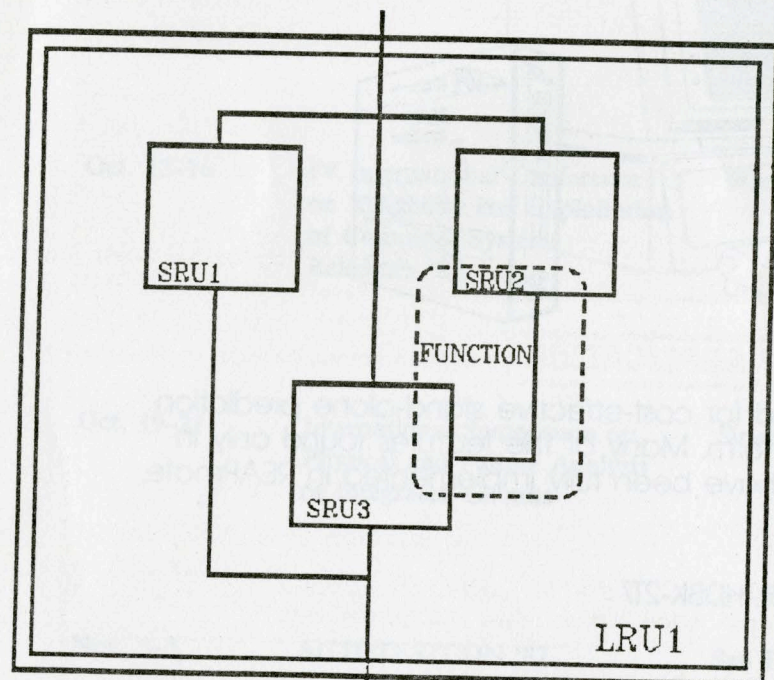
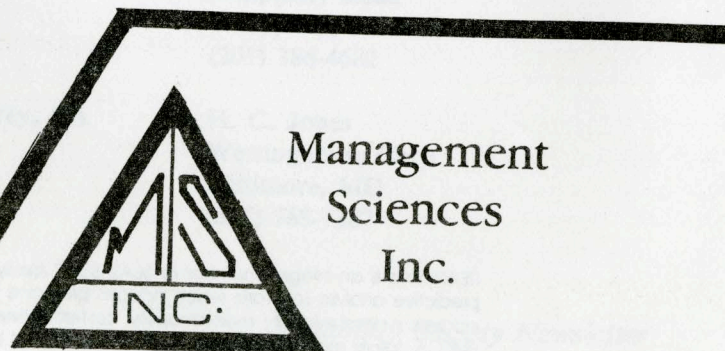
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- Annual Reliability and Maintainability Symposium
- International Reliability Physics Symposium.

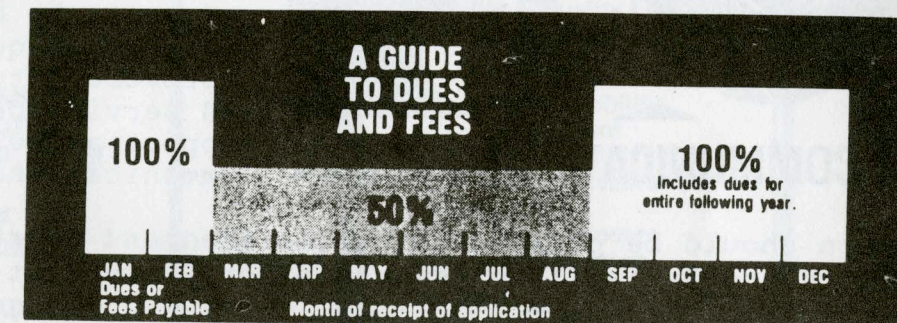
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Active local Reliability Society chapters in many locations throughout the United States offer opportunities for your personal professional participation and growth. Association with other Reliability Society members helps you to exchange information and to learn how others are solving them.

Your membership entitles you to reduced registration fees for activities sponsored or cosponsored by the IEEE or Reliability Society. This could save you more than the cost of annual membership, if you are very active.

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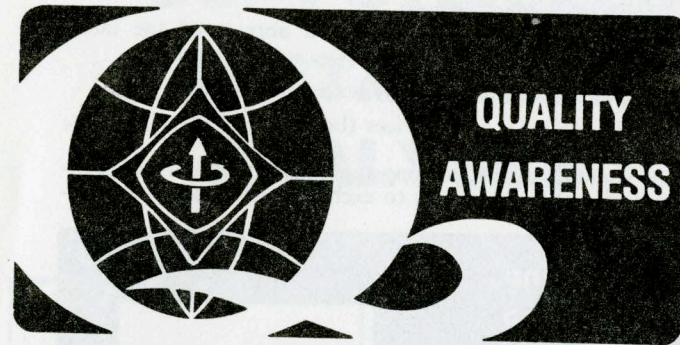
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This Issue of the IEEE JOURNAL on SELECTED AREAS IN COMMUNICATION is sponsored by the Quality Assurance Management Committee. The objective of this issue is to provide a literary forum for planners, designers, manufacturers, service organizations and users to better understand the concepts of quality and quality improvement to both new and old product and service development, evolution and support as well as to the Communications Community.

Papers should be previously unpublished and address the areas of Quality and Reliability Assurance for Communication areas such as -

- o Customer Related Performance Measurements
- o Handling of Engineering Complaints. Product Change Notices and Software Patch Administration
- o Life Cycle Cost of Ownership
- o Customer/Designer/Marketing Interface
- o Feedback Mechanisms from the Field
- o Quality Improvement Programs
- o Verification against Requirements
- o Verification for Compatibility
- o Reliability (Hardware and Software)
- o Maintainability
- o Human and Administrative Factors and Quality in Ordering, Engineering, Installation and Operation
- o Quality Assurance Management

Practical papers or theoretical papers with applications are preferred.

Prospective authors should prepare a 600-word summary of their proposed paper by August 3, 1987 and forward it to one of the guest editors:

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The following dates should be respected:

- o Summary due: August 3, 1987
- o Commitment notification: September 7, 1987
- o First draft due: November 20, 1987
- o Acceptance notification: February 1, 1988
- o Final paper due: April 8, 1988
- o Publication: 4th Quarter 1988

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