

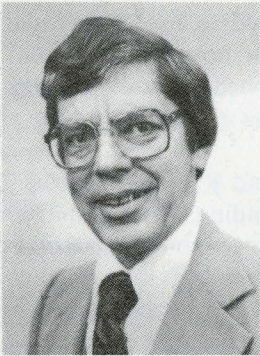
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# Reliability Society Newsletter

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Editor: Anthony Coppola  
Vol. 27, No. 4, September 1981 (USPS 460-200)

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## President's Report

There are currently two vacancies on the Reliability Society AdCom for the term which expires at the end of 1982. In accordance with the Bylaws, I have appointed two of our members to fill these vacancies; Gus Constantinides and Howard Kennedy. Gus is Chairman of our Standards Committee and has faithfully served us in this capacity. Howard has served for many years on the Management Committee of the R&M Symposium and is General Chairman for the January 1982 Symposium. Both of these outstanding individuals bring a wealth of experience to the AdCom, and I am delighted that they have agreed to serve.

Speaking of vacancies on AdCom, our Bylaws provide for the election of six new members each year to serve three-year terms. Nominations are provided by the Nominating Committee through solicitation of the membership as was done in the July Newsletter. Candidates can also be nominated by petition. Election is then accomplished by vote of the AdCom. It could be argued that this process is not democratic since the general membership does not elect the AdCom.

A vote of the general membership could be implemented and is done in some societies. This would allow each member to participate in the election of the body which governs the Society. Although I am not aware of past abuses, this change would eliminate any possibility of election by the "buddy system."

Conversely, such a general election would be costly to distribute information on all candidates and to prepare and distribute ballots, taking funds from member services such as our outstanding publications. It would also be more difficult to communicate each candidate's qualifications. The current system seems to be working well, and I have not received any complaints from members.

Does the membership desire a change to the Bylaws to provide for a general election or do you prefer the age-old maintenance policy "if it isn't broken, don't fix it?" Please give me your opinion by telephone (607) 751-3729 or by letter, 102A353, IBM Corporation, Owego, NY 13827.

*C.M. Bird*  
President

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## Readers Contributions Wanted

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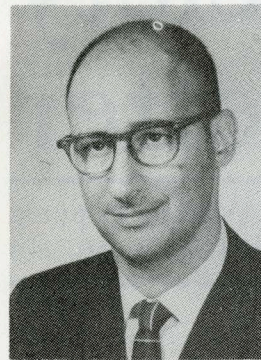
We hope you find this newsletter useful as a source of information. You can also use it as a forum for communicating with the Reliability Society ADCOM or with the Reliability Community in general. If you'd like to announce a meeting, compliment or criticize the Newsletter Editor or the Reliability Society ADCOM, suggest an idea, make an observation, or just share a joke, please let us hear from you. All contributions for the January 1982 issue must be received by November 1, 1981. Otherwise they will appear in the April 1982 issue.

Also needed are contributions to the Status of the Reliability Technology 1981. The April 1981 issue of this Newsletter contained a report on the Status of the Reliability Technology 1980. We hope you found it useful. Your contributions are sought for the 1981 report. They could include any new developments in Reliability or Maintainability, trends you perceive, noteworthy accomplishments or failures, and unresolved problems. All inputs welcome, but must be received by 1 November 1981.

Send all contributions to: Anthony Coppola, Editor, RADC/RBET, Griffiss AFB, NY 13441.

Send form 3579 to IEEE, 445 Hoes Lane, Piscataway, NJ 08854.

## The Editor's Corner



*Anthony Coppola*

An attempt to rectify the latter problem is the RADC Technical Report "Bayesian Reliability Testing Made Practical" just off the presses. In addition, RADC is responsible for preparing a military standard on Bayesian Reliability Testing in 1982.

The RADC report will be made available through NTIS and DTIC. In the interim those interested may request copies from RADC. The address is:

RADC/RBET  
Griffiss AFB, NY 13441

As both the responsible official for preparing the standard and Editor of this Newsletter, I would like to hear from anyone who has used, or tried to use, a Bayesian Reliability Test. Please let me know how you made out. Your comments will not be published without your expressed consent. Send to the address above, or call me at (315) 330-4726.

A note to those planning to attend RAMS in January: The Reliability Society will be holding an awards luncheon. The date has not been announced, but it has usually been held during the Tuesday noon break. It is an excellent opportunity to meet your ADCOM and honor those who have made outstanding contributions to R&M engineering. Watch for the date in the January Newsletter, and plan to attend.

The Reliability Community has been talking about using Bayesian techniques for reliability demonstration for at least fifteen years. However, Bayesian reliability testing has apparently remained in the realm of the theoreticians rather than the application engineers. Part of the reason for this has been the promulgation of questionable approaches (e.g., the term "subjective prior" still gives me the shudders). Another reason has been the absence of an understandable, believable, and practical guideline.

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## Chapter Activities



Dr. J. F. McCarthy, Director of NASA Lewis Research Center, delivering the keynote address at CECON '80. His participation was arranged by the Cleveland Chapter of the Reliability Society. (NASA photo provided by V. Lalli).



Mr. Joseph J. Naresky (center) receives mementos from Robt. Nevin, Chairman, Mohawk Valley Section, IEEE, (left), and Chas. Plotkin, Chairman, Utica Section ASQC. Mr. Naresky addressed a meeting cosponsored by the Mohawk Valley Chapter of the Reliability Society and the Utica Section ASQC on May 6, 1981.

Chapter Chairmen: Keep those pictures coming.



1981-82 officers of the Washington DC/Northern Virginia Chapter are (from left) A. L. Kelley, Program Chairman, C. W. Hamby, Chapter Chairman, and H. N. Hartt, Vice-Chairman. (Photo courtesy of Paul Koskos).



David Geiser, outgoing Chairman of the Mohawk Valley Chapter, discusses three generations of Reliability Design Handbooks with Joseph J. Naresky, incoming Chairman. Naresky holds the *Reliability Design Handbook* published in 1976. On the table are *Reliability Factors for Ground Electronic Equipment*, published in 1956, and a copy printed in Chinese. The third generation is now being created by Mr. Naresky for RADC.

## Chapter Reports

### Washington DC/Northern Virginia

The results of the election of officers for the Washington DC/Northern Virginia Chapter of the Reliability Society for the year beginning July 1, 1981 are as follows:

Chairman: C. William Hamby  
 Executive Vice Chairman: Henry N. Hartt  
 Program Vice Chairman: Albert L. Kelley  
 Secretary: Ruth G. Smith

#### Scheduled Meetings for FY-1981 are:

- 1) 17 Sep. 80 Speaker: Mr. Willis J. Willoughby, Jr.  
Deputy Chief of Naval Material
- 2) 15 Oct. 80 "Risk Assessment of Engineered Systems"  
Speaker: Jerry B. Fussell
- 3) 19 Nov. 80 "Reliability from a Nuclear System Safety Perspective"  
Speaker: Jerry D. Griffith
- 4) 10 Dec. 80 1) "Necessity for "Testing-in" Hardware Reliability"  
Speaker: Henry J. Caruso  
2) "A Data Information System for RIW Contracts"  
Speaker: Anthony J. Glaser
- 5) 14 Jan. 81 1) "Modified Musa Theoretic Software Reliability"
- 6) 12 Feb. 81 Joint Meeting with: Baltimore IEEE Reliability Chapter and Chesapeake Chapter of the IES  
1) "Recent Initiations in the Navy Environmental Stress Screening Programs"  
Speaker: Douglas D. Patterson  
2) "Army Implementation of DoD Directive 5000.40"  
Speaker: Arthur H. Nordstrom, Jr.
- 7) 18 Mar. 81 "Spacings versus Interarrival Time"  
Speaker: Mr. Harold Ascher
- 8) 15 Apr. 81 1) "Effects of Fine Airborne Particles on Equipment Reliability"  
Speaker: Claude F. Veraa, PE  
2) "An Indicator of the Reliability of Analytical Design and Initial Manufacturing Process"  
Speaker: M. V. Bremerman
- 9) 13 May 81 "A Pragmatic Approach to Transit System Reliability"  
Speaker: Art Luhrs
- 10) 11 Jun. 81 Annual Chapter Social/Technical Meeting  
Subject/"The Space Shuttle"

Speaker: Dr. H. B. Chenoweth  
 2) "Growth Test Time-Key to Effective Test Planning"

Speaker: David Koo

6) 12 Feb. 81 Joint Meeting with: Baltimore IEEE Reliability Chapter and Chesapeake Chapter of the IES

1) "Recent Initiations in the Navy Environmental Stress Screening Programs"

Speaker: Douglas D. Patterson  
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### Mohawk Valley

Mr. Joseph J. Naresky, IIT Research Institute, has been elected Chairman of the Mohawk Valley Chapter for the 1981-1982 term. He succeeds Mr. David Geiser, General Electric.

The last meeting of the Chapter was a joint meeting with the Utica Section, ASQC, held May 6, 1981 in Utica, NY. It featured a discussion by Mr. Naresky on the Reliability Design Handbook now in preparation by IITRI for the Rome Air Development Center.

### Los Angeles

1981-1982 Officers of the Los Angeles Chapter are:

Chairman: K. Wong

Vice Chairman, Finance & Membership: I. Doshay

Vice Chairman, Technical Programs: S. Lehr

Vice Chairman, Technical Courses: M. Lipow

Vice Chairman, Annual Seminar: H. Rue

Vice Chairman, Publicity and Meeting Arrangements: D. Segel

#### Meetings held during 1980-1981

Date	Topic
14 Oct. 1980	Reliable High Speed Digital Packaging
13 Nov. 1980	Japanese vs. American Devices
22 Jun. 1981	Non-catastrophic Degradation of IC's
25 Feb. 1981	Packaging Techniques for the 80's; Chip Carriers vs. Tape Carriers
17 Mar. 1981	Reliability of Thin Plated Contacts in an Office Environment
25 Apr. 1981	Electronic-Component Screening Seminar
22/23 May 81	Hardware/Software Reliability Mini-Course

The Los Angeles Chapter is considering supporting a National Seminar on Software Reliability in the October 1982 time frame.

### Santa Clara Valley

The increased interest in reliability since 1980 has been reflected in the activity of the Santa Clara Valley Reliability Chapter. The policy of the chapter has been to provide area members with well presented educational talks and seminars on current subjects. A key to success is respect of members' time by careful selection of topics and speakers. Typically, speakers are included in a planning luncheon where audience expectations and technical content are explicitly discussed.

The board works as a team to present a calendar which usually features a half or full day course and several after dinner events. Full day courses are a nice way to treat a subject which needs more intensive attention than one evening allows. Also, such courses can give the treasury some cushion needed to plan monthly talks comfortably. The chapter has twice sponsored a three day seminar on "Accelerated Testing" by Bud Trapp and Stew Peck.

The 1980-1981 topics listed were well attended: Six Statistical Models, Paul Baird (about 60 attendees); CAD/Reliability, Merrill Brooksby (about 120 attendees); Planning Experiments for Maximum Results, Fred Khorasani (about 120 attendees); and Statistical Methods, Dr. Edwards Deming (450 people attended!) (Co-sponsored).

After a free month for the International Reliability Physics Symposium, a half day course on bulk and surface analysis was presented (arranged by Giorgio Riga). Area companies supported well the half workday course with about 75 attendees (a \$10.00 fee was charged).

1981-1982 Officers are:

Dave Burgess, Chairman (HP)

Earl Fuller, Vice-Chairman (National Semiconductor)

Paul Wesling, Secretary (Amdahl)

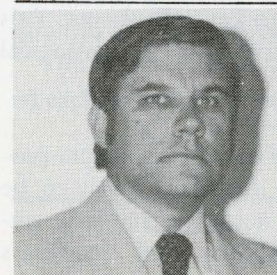
Ajit Goel, Treasurer (Zymos)

Paul Baird, Prog. Chairman Systems (HP)

Giorgio Riga, Prog. Chairman Components (Fairchild)

## Maintainability Matters

Richard A. Kowalski



With this issue, we begin a series of "profiles" of technical, industrial, and professional organizations that are concerned with maintainability matters. We welcome reader suggestions for future profiles. Please call Dr. Richard Kowalski at (301) 266-4841.

### The Avionics Maintenance Conference (AMC)

The Avionics Maintenance Conference is an informal industry organization serving the needs of the air transport industry in matters of avionics maintenance. Its objectives are promotion of improved aviation electronic (avionics) systems and equipment reliability and performance. It is the medium for the exchange of information and ideas between and among users, repair shops, installers, suppliers, manufacturers, and designers of avionic systems and components as a professional approach to maintainability and maintenance practices.

The objectives of AMC are effected through industry conferences, informal task groups to study problems of

mutual industry concern, and publication of a monthly maintenance newsletter, *Plane Talk*, to exchange maintenance information, publicize pertinent industry activities, maintenance regulations, findings of its task groups, etc.

AMC policies are developed and accepted in actions taken by participating representatives at the annual conference. Each new rule or change is published in the annual conference report.

A nine-member Steering Group administers AMC activities. Steering Group members are selected from various segments of the air transport industry to provide the best possible cross-section of views of carrier sizes, types of equipment, and operational environments.

ARINC provides the Secretariat for the Conference. This includes a permanent Secretary and funds necessary for housekeeping, conferences, and publications. For further information contact Rick Charles, Assistant Secretary - AMC, ARINC, 2551 Riva Road, Annapolis, MD 21401.

## 2. Software Numbers?

The following item was an editorial in the January 1981 issue of the AMC newsletter, *Plane Talk*. The first part is a summary of an article by Henry Walton which appeared in the October 1980 issue of Western Airlines' Maintenance Information Letter. The second part is the *Plane Talk* editor's observations.

"More and more of our avionics "black boxes" are computers. Most use microprocessors, which are controlled by programs stored in a memory. Many programs are "nonvolatile," which means they are not erased as a result of power interruptions in normal operation. Some memory devices are "programmable" in that they may be removed from the computer, erased by ultraviolet light, and reprogrammed in the shop. In other cases, permanent memory (ROM) is used. These programs, residing in memory as either "software" or "firmware" (depending on implementation), are algorithmic instruction sets that tell the computer what to do, step-by-step, through its entire operation.

"In recognizing the importance of avionics software, the FAA has asked that it be specified in certification of the equipment and the aircraft.

"The avionics industry replied by inventing "software" part numbers which will have the same importance as hardware part numbers.

"It has normally been possible to identify the "fit and function" of everything on the aircraft by part numbers, except certain avionics equipment. Many avionics vendors have traditionally minimized the importance of part numbers and emphasized model numbers. Model numbers have always lacked standardization and definition. "Software" numbers will give us avionics "black boxes" which are NOT interchangeable.

"Within Western Airlines, the Procurement Department is responsible for changing new part numbers from vendors into our Class and Serial numbers. Class and Serial numbers are truly "fit and function" numbers.

"When Procurement gets a group of "black boxes"

which all have the same part number and model number, they have no way of knowing, from the numbers, that some of the black boxes are for the DC-10 and some are for the 727/737. Someone from the Avionics Department must notify them in each case.

"Mechanics have a similar problem when they realize that part numbers and serial numbers on units removed cannot be used when ordering replacement parts. They must be able to identify the software inside the hardware. Interchangeability of units is a function of "hardware" and "software" part numbers. Model numbers and/or part numbers alone are not meaningful.

"Until "software" part numbers are fully implemented, we will live with an increasingly serious problem."

"The validity of Henry Walton's concern is demonstrated in the work of the Radio Technical Commission for Aeronautics (RTCA) Special Committee 145. The following is an extract from the draft document being prepared by RTCA SC-145, *Recommended Practices for Software-Based Airborne Equipment*, dated, December 17, 1980:

Each unit must be identified on the outside with a part number. The addition of software does not change this requirement but the identification must then unambiguously describe both hardware and software. In addition, the modification status must also be identified....

The work of RTCA Special Committees generally results in the preparation of RTCA Minimum Operational Performance Standards (MOPS). RTCA MOPS are the standards referenced by FAA in the preparation of TSOs."

## 3. DoD Moves to Improve the Acquisition Process

In March 1981, Deputy Secretary of Defense, Frank C. Carlucci, directed a 30-day assessment of the defense acquisition system. The objectives of this effort were to reduce cost, make the acquisition process more efficient, increase the stability of programs, and decrease the acquisition time for military hardware. More than 20 specific recommendations were made and major changes in acquisition philosophy and in the acquisition process are being planned and implemented. The acquisition decisions are detailed in an April 30, 1981, memorandum from the Deputy Secretary. Specific recommendations relating to maintainability are summarized below:

### *Preplanned Product Improvement*

Most systems should be partitioned for performance growth using sequential upgrades to key subsystems. This would reduce development risks and best use technological advances.

### *Improve System Support and Readiness*

Establish readiness objectives for each development program to include estimates of the readiness levels to be achieved at early fielding and at maturity. Increase emphasis on "designed-in" reliability and readiness capabilities. Ask that some force elements be targeted for a major improvement in designed-in support capability to be less dependent on a support tail.

### *Provide Adequate Front-end Funding for Test Hardware*

Provide sufficient test hardware to meet subsystem,

system, and software engineers' needs to engineer and test development of the hardware. Use parallel testing to reduce overall schedule time.

### *Contractor Incentives to Improve Reliability and Support*

Acquisition strategies should identify approaches which provide incentives for contractor to meet reliability and maintainability goals and to reduce maintenance manpower skill levels.

Improvements should be developed in the method of

projecting critical maintenance manpower skill limitations and in translating these into design constraints and objectives for RFPs and specifications.

### *Develop and Use Standard Operations and Support Systems*

Identify and develop standard subsystems and support systems or their technology to meet projected weapon system needs. Support a program of weapon system R&D to put diagnostic, repair, and logistic technology on the shelf.

## Announcements

### Reliability and Maintainability Program Cost Study

The Engineering Branch of the Rome Air Development Center (RADC) is performing an in-the-house study of reliability and maintainability program costs for electronic systems and equipment. The objective of the study is to develop general guidance in estimating and assessing reliability and maintainability program costs on the basis of the tasks defined in MIL-STD-785 (Reliability Program for Systems and Equipment Development and Production) and MIL-STD-480 (Maintainability Program for Systems and Equipment Development and Production). This guidance is intended to be structured in such a way that visibility can be provided of the cost ramifications engendered by the tailoring of each task, so that the Air Force and other and other services can intelligently and effectively scope and tailor R&M program plans.

Comments and contributions to the study are invited by RADC. For further information contact: Mr. Jerome Kliion, RADC/RBET, Griffiss AFB, NY 13441, (315) 330-4726.

### Professional Communication Society Offers Special Transactions Issues

The March 1980 issue of the *IEEE Transactions on Professional Communication* features a variety of articles on "Public Speaking for Engineers and Scientists." Twenty papers provide an introduction to speech organization, practice, and delivery; technical presentations; extemporaneous speaking and interviewing; visual aids; voice quality; and persuasion.

The March 1981 issue of the *PSC Transactions* is devoted exclusively to the subject of making instructional infor-

mation more usable. It includes articles that address the topics of task analysis, document design, information testing, and readability as they pertain to the instructional materials provided to users of modern systems, equipment, and devices. For example, one article addresses the process of writing information to fit the user's purposes. Another article describes the application of both graphics and typography to improve the usability of instructional materials, and includes an 85-item bibliography. Another author promotes the merits of involving users in the editing process during development of an instruction manual. Several essays outlining the uses and abuses of various readability formulas are also included.

Copies of both special issues are available from Robert M. Woelfle, CBN No. 1; E-Systems, Inc.; P.O. Box 1056; Greenville, TX 75401. The price is \$5.00 per copy in any quantity, and checks should be made payable to the IEEE Professional Communication Society.

### MRAP/SRAP Program

The management of the Microcircuit/Semiconductor Reliability Assessment Program commonly referred to as MRAP/SRAP has been transferred to the Reliability Analysis Center. This program, initiated by RADC, is a means by which the electronics community might keep current on MIL-M-38510 and MIL-S-19500 detail specification (slash sheet) activity from the time a microcircuit or semiconductor device is selected as a potential part candidate to its inclusion in the Qualified Products List. The Reliability Analysis Center will publish this information in a single loose-leaf volume which will be up-dated every three months. To obtain information on becoming a user contact: RADC/RBRAC, ATTN: J. Wilbur, Griffiss AFB, NY 13441.

## Conferences and Symposia

### RELCOMET '81

The second International Conference on Reliability and Exploration of Computer Systems (RELCOMET '81) was

held in Ksiaz Castle, Poland on 23-25 September 1981. It was sponsored by the Association of Polish Electrical Engineers.

## IC-QC Workshop

October 22-23, 1981, Durham, North Carolina

The Electronics Division of the American Society for Quality Control is co-sponsoring the IC-QC Workshop in Durham, NC, October 22-23, 1981.

The IC-QC Workshop is designed to address the Quality Control concerns of commercial users of integrated circuits. It provides a forum for IC manufacturers and users to discuss their common problems and formulate resolutions. The program includes formal lectures which provide useful information and help generate discussions in the workshop sessions where frank and honest dialogues on scheduled topics are encouraged.

For further information contact: Dr. Ralph A. Evans, IC-QC 804 Vickers Avenue, Durham, NC 27701, USA. Telephone number (919) 688-6207.

## EASCON '81

"The EASCON '81 exhibition program reflects a broad range of technology exemplary of industry and representative of the technological progress it will continue to our country in the 1980's and beyond," said EASCON '81 Exhibits Chairman, Albert F. Arant, Assistant Manager of Communications, Hughes Aircraft Company.

The 1981 Electronics and Aerospace Systems Conference (EASCON) has arranged for a major exhibition to be displayed at its annual conference, November 16-19, at the Washington Hilton Hotel. The theme of the exhibitor, paralleling that of the conference, will be "Government-Industry Interchange". The exhibition, which will include displays from many of the electronics and aerospace industries, is being arranged by Horizon House-Microwave, Inc., of Dedham, MA.

Also, EASCON '81 General Chairman, Dr. Delbert D. Smith, Sr. Vice President, Corporate Affairs, COMSAT Corporation, is pleased to announce that the Honorable Harrison H. Schmitt, United States Senator from New Mexico and former astronaut, will serve as Honorary Chairman; Lt. General Hillman Dickinson, Director for Command Control and Joint Chiefs of Staff, will serve as the Military Liaison Chairman; and Dr. Anthony J. Calio, Associate Administrator for Space Terrestrial Applications, will serve as Government Liaison Chairman.

## Electron Devices Society

The Annual Technical Meeting of the Electron Devices Society will be held at the Washington Hilton Hotel, Washington, DC, December 7-9, 1981.

For further information contact: Melissa Widerkehr, 1981 IEDM, 1629 K Street, N.W., Suite 700, Washington, DC, 20006. 202/296-8100.

## National Conference on Quality and Reliability

December 27-30, 1981

Indian Institute of Technology, Bombay

Contact: Professor M. N. Gopalan, NCQR-81, Dept of Mathematics, IIT, Bombay - 400 076.

## 1982 Annual Reliability and Maintainability Symposium

January 26-28, 1982

Biltmore Hotel

Los Angeles, CA

**Theme: Increasing Productivity—Assurance Technologies' Contributions.**

The topic of Productivity continues to be a major concern to all elements of our society. The need for more effective and efficient operations in industrial, commercial, and government activities clearly implies the requirement for more reliable and maintainable systems.

The 1981 Symposium addressed the 'role' of the Assurance Technologies in improving Productivity. At the 1982 Symposium in Los Angeles, we shall concentrate on the 'contributions' made to increase Productivity.

For information contact: H. J. Kennedy, RAMS General Chairman, Evaluation Research Corp., 8330 Old Courthouse Road, Suite 200, Vienna, VA 22180.

## Waste Management '82

March 8-11, 1982

Tucson, Arizona

Waste Management '82 will be held March 8-11, 1982, at the Tucson Community Center, Tucson, AZ. The conference is sponsored by the University of Arizona and the U.S. Department of Energy. The conference, which is one of a continuing series of symposia on waste management held annually in Tucson, will have sessions of both invited and contributed papers on waste management demonstrations and update, applications of nuclear waste management techniques and systems to nonradioactive hazardous waste management, low-level waste disposal sites, low-level waste processing, low-level waste management, international programs and policies, progress in resolving political and social issues, ocean disposal of low-level waste, risk and safety assessment, and workshops on successful informational presentations, closing and decontamination of nuclear facilities, political considerations in criteria and regulations, and waste generation from important energy production methods.

For information contact: M. E. Wacks, Department of Nuclear and Energy Engineering, The University of Arizona, Tucson, AZ, 85721.

## 1982 International Reliability Physics Symposium

March 30-April 1, 1982

Town & Country Hotel

San Diego, California

The Twentieth Annual Symposium, cosponsored by the

IEEE Reliability and Electron Devices Societies, emphasizes device reliability as the dominating influence in the development of new VLSI technologies and circuit designs. With the awareness that today many technology decisions are based on the trade-off of one reliability physics concern vs. another reliability concern, the 1982 Symposium will emphasize the reliability physics of LSI and VLSI devices from design through processing, packaging, and testing.

For information contact: Dr. Murray H. Woods, General Chairman, 1982 International Reliability Physics Symposium, Intel Corporation, 3065 Bowers Avenue, Santa Clara, CA 95051, (Mail Stop SCII-C241), Tel: (408) 987-8802.

## EUROCON '82

Reliability in Electrical and Electronic Components and Systems

June 14-18, 1982

Copenhagen, Denmark

Besides Technical Papers, this Conference will feature an exhibition and a tutorial refresher course on Reliability.

For information contact: Conference Office DIEU,

The IEEE Transactions on Reliability has a continuing need for practical papers. Examples are:

1. Case histories.
2. Reliability techniques which were actually found to be useful on a job, and those which were not useful or were too expensive.
3. How you set realistic R&M requirements for a system or equipment.
4. What kinds of reliability testing were actually cost-effective.
5. Use of reliability data from the field instead of from special reliability tests. Comparison of field data with reliability tests.
6. Comments on the worth of standards such as the many international or US military standards on reliability.
7. Ideas, from experience, on the major obstacles to setting and achieving worthwhile reliability requirements in commercial, military or other fields.
8. Where to find information. For example, a list of trade and professional journals of value to electronics reliability and quality control practitioners.
9. Information summaries. For example, annotated lists of computer programs for analyzing electronic circuits or for generating fault trees; tell what the programs do, how big a computer they need, and where they are available.

Send submissions or ideas to Ralph A. Evans, Editor, IEEE Transactions on Reliability, 804 Vickers Ave, Durham, NC 27701.

Technical University of Denmark, Bldg 208, DK-2800 Lyngby, Denmark.

## Ninth Annual Engineering Conference on Reliability for the Electric Power Industry

June 16-18, 1982

Hershey Motor Lodge and Convention Center  
Hershey, PA.

General Chairman: Robert W. Filipovits

Exhibits: Robert A. Donia

Technical Papers: John F. Sipics

Arrangements: Duffy Brown, c/o Pennsylvania Power & Light Co., Two North Ninth Street, Allentown, PA 18101, (215) 770 5151.

Sponsors: IEEE-Reliability Society, American Society of Quality Control—Reliability Division, Edison Electric Institute, American Society of Mechanical Engineers, System Safety Society, American Institute of Industrial Engineers, American Nuclear Society, Electric Power Research Institute, and Society of Reliability Engineers.

Abstracts of Papers less than 600 words, should be submitted no later than Nov. 2, 1981 to John F. Sipics, c/o PP&L.

## Call for Papers

CALL FOR PAPERS



**Theme:** New Needs — New Concepts — New Applications

**Purpose:** To explore applications of Reliability, Availability and Maintainability to components and systems of the electric power industry.

**Topics:** Papers may discuss both components and systems, and should focus on either Generation (including nuclear), Transmission or Distribution. Subjects to be addressed include:

**Reliability • Maintainability • Availability**  
**Human Factors/Safety Factors • Quality Assurance**  
**Data Collection/Processing • Economics Factors**  
**Failure Analysis/Fault Trees • Environmental Factors**

We encourage papers which discuss actual applications or case histories.

**Submissions:** Detailed abstracts of papers, less than 600 words, should be submitted no later than Nov. 2, 1981, to:

John Sipics, N-2  
Pennsylvania Power & Light Co.  
Two N. Ninth St.  
Allentown, PA 18101

Authors of papers selected for presentation will be notified and sent instructions for final manuscript preparation by Dec. 18, 1981. Final papers are due Feb. 1, 1982.

June 16-18, 1982 • Hershey Lodge • Hershey, Pa.

Hosted by Pennsylvania Power & Light Co.

## Welcome to New Members

The names and addresses of new members, from April 1981 through June 1981 are listed below. For USA members, they are listed by alphabetical order of their state. For members outside the USA, they are listed by alphabetical order of their country's English name.

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The Edwards Medal is presented by the American Society for Quality Control to the individual who has demonstrated the most outstanding leadership in the application of modern quality control methods, especially through the organization and administration of such work.

The award was made at the 35th Annual Quality Congress and Exposition in San Francisco, May 27-29, 1981.

Also honored at the event were Dr. Gerald H. Han, Manager of the Statistic Program at General Electric Corporate Research and Development, and Dr. Josef Schmee, Professor and Director of the Institute of Administrative Management at Union college. Drs. Han and Schmee

shared the ASQC 1980 Brumbough Award for their coauthored paper "Regression Estimates versus Separate Estimation at Individual Test Conditions" published in January 1980 *Journal of Quality Technology*. The award is presented annually by ASQC for the published paper judged to have made the largest single contribution to the development of Industrial Quality Control.

Another ASQC Award, the 1980 Shewhart Medal was presented to John Mandel, Statistical Consultant for the National Bureau of Standards, for his outstanding contributions to the science and technologies of quality control and his leadership in the field of modern quality control.

*Richard C. Tardiff*

## Three Poems

### The First Progress Report

We've had the job a month now  
And think that you will find  
We have a lot of reasons  
To be a month behind.

When you gave us the contract  
You multiplied our cares;  
We had to stick it in with  
Two other big nightmares.

This should be no deterrent  
The progress will be fine  
When everyone stops laughing  
They'll start on the design.

The man who did the runout  
Erred and was moved up higher  
Our forecasts now look better  
'Cause we have a bigger liar.

### In the Mean Time Between Failures

*(Tune: In The Gloaming)*

In the-mean-time-between-failures,  
In equipment yet untried;  
Thru the mean-time-between-failures,  
Estimators glibly glide.

Any number you should require  
We will prophesy with pride.  
If you ever have a failure  
You will never prove we lied.

### The Last Revision

When we finished model one  
And the testing was all done  
Under almost all conditions;  
Except temperature, vibration,  
Voltage profile, and position;  
All we needed for precision  
Was to make one last revision.

When she started overheating  
Had another all-day meeting  
All the reasons to compile.  
Sent a copy to the user,  
Fifteen copies for the file.  
The result was a decision  
To put in one last revision.  
Said our able project leader,  
To the boys out there who need'er,  
"The computer's working swell  
If you just ignore the smell.  
For that funny acting spell  
We will get our lab technician  
To install the last revision."

Of her aptitudes we'll boast  
When we ship her to the coast  
And install her in the nose cup.  
And when the missile goes up,  
We sure hope the rocket blows up;  
She stopped doing long division  
When we made that last revision.

*Our thanks to Mr. Tardiff*

## Training Courses

### The 19th Annual Reliability Engineering and Management Institute

PLACE: Ramada Inn, 404 North Freeway,  
Tucson, AZ

PRESENTED BY: University of Arizona, College of  
Engineering, and Honeywell Infor-  
mation Systems, Large Information  
Systems Division, Phoenix, AZ

DATES: November 9-13, 1981

OBJECTIVE: Emphasis will be on reliability  
engineering theory and practice;  
mechanical reliability prediction;  
reliability testing and demonstra-  
tion, reliability data sources, main-  
tainability engineering, and life cycle  
costing; product liability; reliability  
and maintainability management,  
life-cycle costing.

The Institute is designed for

engineers and managers in reli-  
ability, product assurance, QC,  
manufacturing, sales and service;  
other engineers, statisticians,  
government and industry represen-  
tatives, plus college and university  
teachers. Undergraduate college  
mathematics or its equivalent is  
necessary to qualify for and benefit  
from the Institute. Knowledge of  
statistics and probability is  
desirable.

FEE: \$650.00

CONTINUING EDUCATION UNITS: 2.8

TECHNICAL QUESTIONS, CONTACT: Dr. Dimitri  
Kececioglu, Reliability Engineering and Management  
Institute, Aerospace and Mechanical Engineering Depart-  
ment, Building 16, The University of Arizona, Tucson, AZ  
85721. Phone: (602) 626-3901 or (602) 626-3054.

## Naomi McAfee Honored by ASQC



Naomi J. McAfee, Manager of Design Assurance in the Defense and Electronics Systems Center of Westinghouse Electric Corp., Baltimore, Maryland, has been awarded the 1980 Edwards Medal for her outstanding leadership and achievements in the application and advancement of the profession in the management and science of reliability, maintainability, system safety, and quality control in the aerospace industry, and for her significant contributions to the American Society for Quality Control and other professional societies.

Ms. McAfee has been with Westinghouse for 25 years in a variety of management roles including: Executive Assistant to the General Manager-Systems and Technology Divisions, where she assisted in the operations and management of the Aerospace, Command and Control,

Oceanic and Systems Development Divisions; and Director of Corporate Strategic Resources on the staff of the Vice President-Strategic Resources.

She received her B.S. degree in Physics in 1956 from Western Kentucky State College. Ms. McAfee is a past President of the Society of Women Engineers, and is a current member of the Advisory Committee to the School of Engineering at Clarkson College of Technology in Potsdam, New York. She is a member of the Advisory committee to the School of Engineering and Applied Science at Princeton University, and a member of the Industrial and Professional Advisory Council of the College of Engineering at Pennsylvania State University. Ms. McAfee serves as Vice President of Technical Operations of the IEEE Reliability Society and is Past President of the Federation of Organizations for Professional Women.

She is a Fellow of the Society of Women Engineers, and the American Society for Quality Control. She is also a senior member of the IEEE Association of Women in Science. Ms. McAfee is listed in "Who's Who of American Women," "Who's Who in the East," "Who's Who in Finance and Industry," and "Who's Who in Engineering." She received the ASQC Electronics Division Award for "Outstanding Service" in January 1977.

## Japanese Methods for Productivity and Quality Conducted by

Dr. W. Edwards Deming

Dr. Deming is an internationally known consultant in statistical methods whose work in Japan greatly assisted in creating a revolution in quality and economical production. The courses will be held November 16-19, 1981, in Cincinnati, and December 7-10, 1981, in Atlanta.

The fee for this course is \$795. This includes lecture notes and supplies. Make checks and purchase orders payable to GWU, Continuing Engineering Education. Participants may delay payment until arrival. Tentative or final registration should be made as soon as practicable. Contact: Continuing Engineering Education Program, George Washington University, Washington, DC 20052, (202) 676-6106, the toll free number (800) 424-9773, or TELEX 64374 (International).

## IEEE Announces Publication of 96-Page Catalog of Continuing Education Courses

A catalog describing 212 continuing education courses for engineers has been published by the Educational Activities Board of the Institute of Electrical and Electronics Engineers, Inc. (IEEE). All courses have originated with,

or have been contracted by, the IEEE as a service to its members.

Featuring descriptions of 177 "live" short courses of one, two, and three days' duration, the catalog also describes 18 individualized home-study programs—both interactive and self-study—and 17 video-taped courses for group instruction.

All courses are applications-oriented and cover the state-of-the-art in a broad range of topical electrical/electronics technologies, as well as business and management subjects.

Titled IEEE CONTINUING EDUCATION COURSES - 1981/82, the catalog outlines the many options available for short course sponsorship by such entities as IEEE technical and geographical units, universities and conferences, and by corporations for in-house training. The Institute's program for awarding Continuing Education Achievement Units (CEAU's) is also described.

The IEEE continuing education program is a major part of the Institute's educational mission, which is to provide its members and other engineers with ongoing opportunities to upgrade and broaden their knowledge and to become more productive in their work.

To obtain a copy of the new catalog, contact: Continuing Education Department, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. Telephone: (201) 981-0060, Extensions 175/177.

## Volunteers Needed

### RAMS Workers

The Annual Reliability and Maintainability Symposium (RAMS) is managed by a Committee of volunteers nominated by the sponsoring societies. The IEEE Reliability Society will need a supply of workers for future symposiums, and would like to hear from those interested.

The 1982 Symposium Committee has been at work since January 1981. Volunteers will be needed for the 1983 and future symposiums. The 1983 Committee will start work in January 1982. Committee members will be expected to attend planning meetings held at the Symposium site as well as the Symposium itself. Planning meetings are held in March, June, September, and November of the year before the symposium. The 1983 Symposium will be held in Orlando, Florida, and the 1984 gathering on the West Coast. Those interested in participating as IEEE representatives, please contact: Carl M. Bird, IBM Corporation, 102 A 353, Owego, NY 13827. (607) 751-3729.

### Special Papers Chairman

Needed is a practical-minded and persistent individual with broad contacts to solicit more practical papers for the IEEE Transactions on Reliability (see Call for Papers for type of material desired). Special letterhead provided. Duties require incumbent to be alert to developments with practical paper potential and bug potential contributors for submissions. Contact A. Coppola, RADC/RBET, Griffiss AFB, NY 13441.

### Newsletter Editor

For this newsletter. Duties are to gather information and provide in legible form to IEEE Headquarters by established due dates for printing. Plentiful supply of Reliability Society Stationary provided. Contact A. Coppola, RADC/RBET, Griffiss AFB, NY 13441.

## Our Advertising Policy

As a service to Reliability Society Members we will run positions wanted advertisements by individual members free of charge. Other advertisements (e.g., recruiting ads, consultant listings, business solicitations, etc.) will be charged at the rate of \$50 for a quarter page or less, \$125 for a half page and \$200 for a full page. Calls for papers, announcements of conferences and most news releases are not considered advertising and will be run free of charge as long as they are of interest to the members of the Reliability Society.

Please note that there is a 60-day lead time for publication. See the following chart.

To Make the Issue Scheduled for:	Material must be in by the end of:
January	October
April	January
July	April
October	July

All inputs should be addressed to: Anthony Coppola, Editor, Reliability Society Newsletter, RADC/RBET, Griffiss AFB, NY 13441.

## Quality Pays Nuclear Test Laboratory Accreditation Program

Multinational firms will continue to increase their market shares only if they succeed in achieving high levels of quality in their products, declared Dr. Armand V. Feigenbaum, Chairman of the International Academy for Quality during the 35th Annual Quality Congress and Exposition sponsored by the American Society for Quality Control held in San Francisco, May 27-29, 1981.

Dr. Feigenbaum asserted that while certain corporations and industries are deepening their market penetration because they have turned the concept of quality into a major strategic resource, others are losing ground because they have sought to meet long-term quality goals "with the fireworks of one-time quality-promotion programs or with dusting off the application of a few classical quality techniques."

To compete effectively, business must recognize that quality has become "the single most important force" in the battle for world markets, and that quality is no longer determined by the producer, but by the customer, said Dr. Feigenbaum.

Yet many enterprises are incapable of responding to those challenges, he continued, because some 80 to 90 percent of the quality problems that need correcting lie beyond the capabilities of traditional quality control programs.

It is a myth that "higher quality levels must cost more and somehow make production more difficult," he insisted. Even in modern, well-organized plants there exist wasted facilities that may account for as much as 40 percent of productive capacity—to rework parts, test rejects or replace recalled parts or products. Higher quality achieved through assertive, corporate-wide quality programs that convert the wasted facilities into profitable output has actually reduced costs by eliminating waste and raising productivity.

"Our experience with major international firms demonstrates that return on investment from corporate-wide quality programs can consistently exceed the return on other more traditional forms of investment and that enhanced quality not only reduces costs, but can substantially improve profits," he said.

"The days when price could dictate market share are over," said Dr. Feigenbaum. "Corporations, industries and even nations must recognize that we've entered the age of quality—and those that don't will be left behind in the marketplace."

Dr. Feigenbaum is President of General Systems Co., Inc., Pittsfield, MA. The company is a pioneer in the development and implementation of total quality systems that integrate man, machine and information to achieve their objectives. The company serves industrial, commercial and government customers in the U.S. and throughout the world.

The Institute of Electrical and Electronics Engineers (IEEE) has approved a program to accredit independent laboratories performing qualification testing of safety-related equipment utilized in nuclear power generating facilities licensed by the United States Nuclear Regulatory Commission (NRC). Most such equipment is electrical and control equipment.

The action follows a resolution by the IEEE Board of Directors in response to a request by the NRC. Over the past decade the IEEE has assumed lead responsibility for the development of qualification standards for such equipment.

In an address to the IEEE Board, Dr. Richard De Young, Deputy Director for the NRC Office of Inspection and Enforcement, stated that the accreditation program is needed to foster greater uniformity and quality in testing the performance of safety-related nuclear power plant equipment. Over the past few years, the NRC has become actively engaged in verifying the adequacy of the environmental qualification of safety-related equipment used in nuclear power plants. Their effort has resulted in the development of new criteria, intensified reviews, in-depth inspections, and the initiation of new program activities designed to improve standards and provide greater consistency, uniformity, and control of safety-related nuclear equipment qualification programs.

At a follow-up meeting between NRC and IEEE staffs and their legal counsels, preliminary details of an agreement have been worked out. Notice is expected in the Federal Register of a program to be instituted in January 1982 with accreditation becoming mandatory in January 1983. This provides a one-year period for laboratories engaged in qualification testing of such equipment to become accredited under the IEEE program in time to meet the NRC requirements. With the participation of NRC, the IEEE is developing a standard covering the detailed requirement to be satisfied by laboratories that are to be accredited.

The IEEE Standards Board will establish a Committee on Audit and Accreditation to administer the program. In addition, a Committee on Accreditation Requirements is being formed under IEEE's Technical Activities Board. Both committees will be composed of IEEE volunteers with representation from the NRC.

The Institute will be conducting seminars for laboratory personnel to explain the new accreditation program. Scheduled for the fall of 1981 in San Francisco, Washington DC, and New Orleans, the seminar will be described in a brochure available from the IEEE by July 15, 1981.

Requests regarding participation in this program should be addressed to: Sava I. Sherr, Staff Director of Standards, 345 East 47th Street, New York, NY 10017.



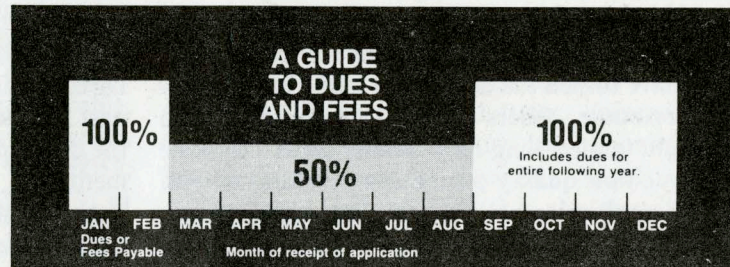
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