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# Reliability Society Newsletter

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Editors: Gary Kushner and Mark Snyder

Vol. 37, No. 3, July 1991 (USPS 460-200)

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## Message from the President

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I have just returned from our quarterly Adcom meeting. The Spring meeting is always held in conjunction with the International Reliability Physics Symposium (IRPS). IRPS has been a very successful symposium every year. The Reliability Society jointly sponsors this meeting with the IEEE Election Devices Society.

At our Adcom meeting we plan the society sponsored conferences. There are three of them now. We review new R&M technology and address sundry administrative issues. I particularly enjoy the technical operations presentations. These presentations cover state of the art developments, specifications, and concerns on varied topics such as prediction, modeling human reliability, mechanical reliability and Computer Aided Logistics (CALs). If there is a topical area on which you would like to work with at the national level, please advise our VP, Technical Operations, Mr. Joe Gruessing. His address is on the back of the front cover. The Technical Operations area

is the seed bed of committee work, conferences, bulletin boards, technical reports, etc.

NASA headquarters has expressed interest in having the Reliability Society provide some technical inputs into R&M requirements formulation for the Space Station program. I will have full details in July. If you have some interest in participation, please let me know.

I have been asked to head up an IEEE Quality Council that will have participation from 2/3 of the 36 IEEE societies. This is an embryonic activity and I will let you know about our direction in future newsletters.

I appreciate each of you. You are our "reason for being." I would welcome you submitting any brief technical topics for possible inclusion in the newsletter. One of my desires is to increase the technical value of the newsletter to our membership.

My best regards, as always.

Dr. Samuel Keene

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## Farewell Message From Departing Editors

As the Reliability Society Newsletter is turned over to Bruce Bream as new editor, we would like to take a moment to thank the Reliability Society membership and the AdCom members for their support during the seven years we have been associate editors of the publication. We truly hope that the Newsletter has been a valuable component of Reliability Society communications and that it has adequately met your needs. It was indeed our pleasure to make this contribution to the Society. We look forward to new challenges within the Society and the profession and trust that the many friendships created over the years will endure.

Sincerely,  
Gary Kushner  
Mark Snyder

## New Reliability Society Newsletter Editor

The IEEE is pleased to announce the new editor of the this publication. Effective as of this issue, the editor of the Reliability Society Newsletter is Bruce Bream. His appointment to this position was confirmed by AdCom vote at the April 1991 meeting. Bruce is currently a reliability engineer for the NASA Lewis Research Center in Cleveland, Ohio. He has 11 years experience in reliability engineering with medical diagnostic systems, military contractors and the space program. His position at NASA involves reliability and maintainability assessment of the Space Station Freedom Electric Power System. His current focus is on computer simulation of maintenance resource demands. He received a bachelor's degree in Physics from Kent State University in 1973 and a Master's in Business Administration from Case Western Reserve University in 1988. He has been a member of the IEEE Reliability Society since 1982 and is an ASQC certified reliability and quality engineer (CRE/CQE). His hobbies include amateur radio, computers, flying, skiing and hiking. In his spare time he serves on a volunteer fire department and is looking forward to his new assignment as Newsletter editor.

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### Reliability Society Newsletter Inputs

All RS newsletter inputs should be sent to Bruce Bream, Editor per the following schedule:

For January Newsletter:	by October 25
For April Newsletter:	by January 25
For July Newsletter:	by April 25
For October Newsletter:	by August 5

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## Chapter Activities

### Boston

With the summer approaching rapidly, the Boston Chapter's schedule is winding down while everyone involved takes a well-deserved vacation. The Lecture Series on Environmental Stress Screening (ESS) in late March and early April, while drawing only about 15 people, was very well received by all. The small turnout actually proved favorable because Gene Bridgers, our distinguished lecturer, was able to tailor his program nightly to cover areas of particular interest to the participants.

Technology Development Workshops continue making monthly progress on a guidebook to ESS issues and implementation. Interest levels have remained surprisingly high as the real work of writing has started.

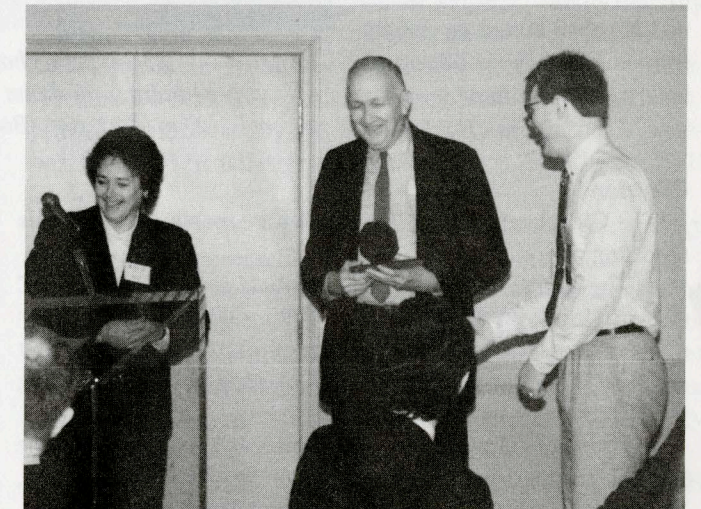
The 29th Annual All-Day Reliability Seminar in April came off wonderfully. Willis J. Willoughby, Jr., Director of Product Integrity for the U.S. Navy, gave a very inspiring keynote address that brought to life our seminar theme of "Staying Competitive in the 90's: Reliability, Maintainability, and Quality for a Changing World." The 60+ attendees heard an address fraught with sobering forecasts of U.S. illiteracy, workforce deskilling, and global competitive inadequacy in contrast to an increasing demanding and educated world-wise consumer. It's a myth to think the U.S. can become a service economy without U.S.-made products to service!

Eight other papers rounded out the day's events, all of which reinforced Mr. Willoughby's keynote. In addition, three other

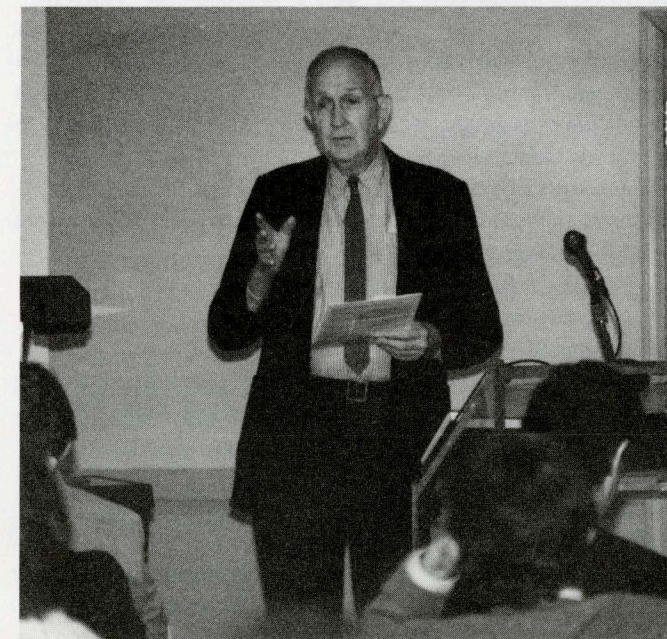
papers were accepted for publication in the proceedings but could not be presented due to time constraints.

In May, the chapter continued its social traditions by sponsoring an evening performance of "Steel Magnolias" on stage at the Nickerson Theater for members and guests. The performance was superb, and a good time was had by all.

Our monthly meeting program which ended in March (due to the April seminar), continues in September with a talk on Software Reliability Testing by Alex Elentukh of Codex Cor-



*Presentation to Mr. Willoughby by Boston chairman Don Markuson and Seminar chairman Anita Cederholm.*



*Willis J. Willoughby presents Keynote address to the Boston Chapter 29th Annual Spring Reliability Seminar 1991.*



*Henry Goodman receives handshake from Boston chairman Donald Markuson for his paper "Strife Testing, A Method of Enhancing Reliability Growth."*

poration. This talk should be a good lead-in to the Fall Lecture Series on Software Reliability starting in October.

This month rings in our new officer slate with Gary Kushner of Digital Equipment Corp. at the helm, Ruth Evans of NEC as Vice Chair, Mike Johnson of RELEX (Mass.) as Secretary, and Anita Cederholm of Codex as Treasurer.

Thanks go to the past year's chapter officers and committee members who exemplified the words diligence and teamwork. Particular thanks, however, go to the membership we serve that have supported us despite economic ills. We hope you all have a great summer!



*Boston chapter officers conclude the seminar business. (L-R) Anita Cederholm (seminar chairman), Jim Kalemba (program chairman), Don Markuson (Boston chapter chairman), and Ruth Evans (treasurer)*

#### Cleveland

The Cleveland Chapter has had 4 more meetings during this reporting period.

1. The annual mid-year social was held at the NASA Le RC Guerin House on December 17, 1990. Old friends and new members got together for an evening of relaxation, a cold buffet and 411. No speakers were used. Pool, ping-pong and dancing were enjoyed by many.

2. This meeting was on Fiber Optic Applications from the IEEE Learning Channel. Three experts: Dr. Tetsuhiko Ikegami, Dr. Pever Kaiser and Dr. M.K. Barnaski talked about:

- a. Technologies for Fiber Optic Applications
- b. Fiber to the Home and Factory
- c. Building Blocks for the Information Age

3. We tried something new for our following meeting. Ruth and Bob English, retired well-known people in our area, took us on a marvelous Photo Essay of New Zealand. The material was excellent, informative and very well composed. All in attendance enjoyed the meeting.

4. NASA Le RC is celebrating its 50th anniversary. Our fourth meeting participated in this activity. Tom Hinshaw talked to us about what it was like to live in space. The Visitors' Information Center auditorium allows for special effects that are very impressive. The hall was well filled. Some may even want to try it.

Vince Lalli has been assigned to the Technical Program committee of RAMS.

Bruce Bream will be helping with the editing activities of the R S Newsletter.

All in all, here in Cleveland, we are having fun serving our members and look forward to expanded activities in the future.

Regards,

Vince Lalli  
Chairman  
Cleveland Chapter

#### Dallas

The Dallas Chapter has had a full and successful year. Eight technical meetings were held on a wide variety of topics ranging from IC packaging criteria to Software Reliability to Concurrent Engineering to Super Conducting Super Collider Magnet Reliability. The Software Reliability meeting presented by Ralph Brettschneider of Motorola (Schaumburg, Illinois) had a standing room only crowd of nearly one hundred people, including many from the local SQA community. Our last meeting was held in May and concerned Solder Joint Reliability of Fielded Equipment (a joint DOD/Industry study) and was presented by Jerry Coleman, Texas Instruments/Defense Systems and Electronics Group.

Lou Boudreaux, our local chapter's leader in getting our chapter established and Chairman since the formation, was recognized for his contributions at the Dallas IEEE Section Awards Banquet by the local Reliability Society. Our thanks to Lou for his outstanding service.

The results of our election of new chapter officers for 1991-1992 was provided at the April meeting and the new officers were introduced:

- Dennis Hoffman, Chairman
- Julie England, Vice Chairman
- Charles Watson, Secretary/Treasurer

We are looking forward to another great year with expanding participation by our Dallas Reliability/Maintainability community.

#### Los Angeles Chapter - Oct '90 Through Mar '91

We have had 3 technical meetings:

1. 10/90 - C.E. Mandel of Screening Systems spoke on New ESS (Environmental Stress Screening) Finding and Techniques.
2. 11/90 - Dr. Glenn Ducat of Southern California Edison Co. spoke on the Latest Advances in the Electric Car.

3. 1/24/91 - Kam Wong of Kambea Corp. spoke on the New Approach to Failure Rate Predictions.

4. 2/28/91 - Tyrone Jackson of TRW spoke on Sneak Circuit Analysis in a Concurrent Engineering Environment, and Jeff Sohar spoke of the PC based SCA software tool they developed called SCAT.

5. 3/28/91 - Chuch Weisbin of JPL spoke on the latest research on Robotics, and Prof. Lea of Brunel University spoke on the Associated String Processor (ASP) - A Massively Parallel Computing Technology.

A one day mini-course was conducted on Thermal Effects on Space Hardware. Mark Gable of Gable Corp., and Lan Stratton of Hughes Aircraft lectured on the rationale for packaging design and evaluation and thermal modeling.

Upcoming meetings/minicourses include:

1. 4/14/91 - 4/16/91: Tyrone Jackson is leading a minicourse on TQM Process and Product Improvement Discoveries. Topics will include TQM Lessons Learned by R. Lockwood (Space Systems Div.), Variability Reduction by R. Engelhart (Hughes Aircraft), Cycle Time Management by A. Doggett (Hughes Aircraft), Quality Function Deployment by P. Wahl (Hughes Aircraft), Taguchi Methods by S. Sugihara (Hughes Aircraft), Statistical Process Control by R. Saber (Hughes Aircraft), Technical Risk Assessment by C. Orr (TRW), Concurrent Engineering by A. Edwards (Edwards Assoc.), and Mysteries of EMC Exposed by A. Rivera (Hughes Aircraft).
2. 4/25/91 - Larry Stern will speak on Software Project Management.
3. 5/30/91 - Dave Williams of TRW will lecture and demonstrate the latest in Computer Generated Music.
4. 6/27/91 - R. Englehard of Hughes Aircraft will discuss Design of Experiments/Taguchi Methods.
5. 7/25/91 - R. Marloth of Hughes Aircraft will lecture on the latest development of Synthetic Aperture Radar.

Our Bulletin Board is very active with over 400 subscribed members. Membership is free. We offer meeting information, Jobline, E-Mail, Video Tape Exchange information, Shareware and Demos. Phone # is (818) 768-7644, 300-2400 Baud.

Loretta Arellano  
Los Angeles Chapter Chair

#### Philadelphia Chapter

In response to the Society's Newsletter for the Chapter's activities, below are the meetings held for February and April. If you require additional information feel free to contact me.

February 14, 1991 — The new "Gold Bath" — An IEEE Reliability Handbook For The Design of Reliable Industrial and Commercial Power Systems, Charles R. Heising

February 19, 1991 — Machine Learning Techniques, John M. Carter; Dependable Systems: Concepts, Techniques and Application, Hatanwala G. Chandrasiri

April 16, 1991 — Neural Computations, Sung T. Kim; Parametric and Non Parametric Schemes for Discrete Time Signal Discrimination, Joseph S. Haimerl

Fulvio E. Oliveto,  
Chairperson  
Philadelphia Chapter

#### Switzerland

The inaugural meeting of the Switzerland section Reliability Chapter was held in Zurich on January 28, 1991. It was supported by a petition signed by 70% of the 30 Reliability Society members of the IEEE Switzerland section. The Committee members:

- Chairman: Alessandro Birolini
- Vice-Chairman: Gian Anton Zardini
- Secretary: Mauro Ciappa
- Treasurer: Pierre Louis Boyer
- Member: Federico Bonzanigo
- Member: Ralph Brinkmann
- Member: Robert Leemann

The Chapter activities for 1991 are:

— presentations on February 11: Failure sequences in power reactors (Dr. L. Miteff, ETH Zurich), June 10: Emission microscopy (Dr. J. Kolzer, Siemens, Munich), June 17: Reliability of binary systems (Dr. B. Gerlach, Humboldt Univ., Berlin) and November 11: Computer program for reliability and availability computation of very large systems (R. Bernet, ETH Zurich).

— Courses on September 2-4: R&M of electronic systems (Prof. A. Birolini, ETH Zurich), September 9-10: VLSI-characterization and testability (W. Buchel, ETH Zurich), and September 11-12: VLSI failure mechanism/analysis (M. Ciappa, ETH Zurich).

— Conference on September 26: Surface mount technology (impact on longterm reliability).

The Chapter cooperates with the Reliability Laboratory at the Swiss Federal Institute of Technology (ETH) Zurich (18 researchers, 4 Mi US\$ equipment, 30 industrial partners, activities on: Fault-Tolerant Structures Testability, Failure Mechanisms, Test and Screening Strategies, Computer-Aided Reliability Availability Analyses, Stochastic Processes for Reliability).

Contact: Professor A. Birolini, Reliability Laboratory, ETH Zurich, Tel +41 1 256 5148, Fax +41 1 251 21 72.

#### Twin Cities Reliability and Fault Tolerant Society

The group is concerned with all aspects of product reliability from system to components and both hardware and software. Failure analysis methods and procedures are a part of the regular docket.

We also explore how people have been using the results of reliability studies and failure analyses to drive corrective actions. Reliability is not a passive exercise.

Practical examples of reliability engineering and application are the rule for our activities. Too often "reliability" has been perceived as an excuse for presenting hirsute mathematical models that have limited practical application or insufficient detail to allow implementation. This is not the case for our society.

We hold short tutorials on critical aspects of reliability that will allow non-reliability specialists to evaluate the value of the reliability inputs they are receiving. Examples of this include: "What to Look for in Supplier Reliability Reports," "What a Complete Failure Analysis Report Should Include," "Is your Burn-in Program Effective?" and "Reliability Testing in the 90s."

Regular attendees at our meetings understand how system reliability requirements are developed, how system requirements are translated into requirements for subsystems and components, how to verify performance against requirements, and what methods are available to improve reliability.

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## Annual RELIABILITY AND MAINTAINABILITY Symposium

1992 January 21-23

Riviera Hotel

Las Vegas, Nevada USA

### Assurance Technologies – Discovering New Horizons

Share your knowledge and expertise with your colleagues at the world's premiere forum for the assurance technologies.

Telecomputing, industrial globalization, technology transfer, and multinational joint ventures are just a few of the activities which will be accelerated in the new world economy. Corporate as well as governmental procurements and R&D decisions in a world economy will be significantly influenced by issues such as best value, market share, concurrent engineering, and product quality. The assurance technologies must be prepared to adapt to this changing competitive environment. The development of pioneering assurance techniques or modification of proven ones must address cost-effective solutions to meet these contemporary challenges. To encourage your colleagues to expand their horizons, your paper should advance our knowledge of pioneering assurance methods or enhance our understanding of established techniques. Papers stressing application to real-world challenges will receive priority consideration. Papers in the following categories or types of subjects are solicited:

#### TECHNOLOGY

CAD/CAM/CAT/CALS  
Design to Life-Cycle Cost  
Modeling & Simulation Methods  
Software Tools: R&M and Safety  
R&M Test & Demonstration  
Reliability Growth  
Screening and Failure Analysis  
FMEA and FMHEA  
Built-In-Test & Testability  
Worst-Case Analysis and Prediction  
Fault Trees & Diagraphing Techniques  
Repair/Maintenance Methodologies  
R&M Cost-Benefit Analyses  
Software Safety and R&M  
Environmental Testing  
Sneak Circuit Analysis

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System Effectiveness  
R&M Contracting Management  
R&M Requirements  
Trend Analysis and Risk Management  
Database Management  
R&M Cost-Benefit Tradeoffs  
Testing Effectiveness  
Warranties/Guarantees  
Logistics Support  
Multinational & International Programs  
Reliability-Growth Management  
Product-Assurance Management  
Safety Management  
Training and Education

#### INDUSTRY APPLICATIONS AND LESSONS LEARNED

Aerospace & Defense  
Electric Power & Other Utilities  
Oil & Other Resource Industries  
Mechanical/Structures Equipment  
Transportation Methods and Systems  
Microelectronics  
Computer Hardware & Peripherals  
Software and Smartware  
Robotics and Artificial Intelligence  
Consumer Products  
Medical and Biotechnology  
Communication Systems  
Office Automation & Database Systems  
Electrical & Electronic Systems  
Telecomputing and Networks  
Chemical and Agrichemical Systems

#### The P.K. McElroy Award

The P.K. McElroy Award recognizes the best combination of the technical paper and its presentation. All submitted papers are graded by the Program Committee. The top contenders are selected and their presentations at the *Symposium* are monitored by a group of past General Chairman. The author(s) of the winning paper is recognized at the next *Symposium* and receives a plaque, a \$1000 honorarium, and gratis registration.

RAMS is a nonprofit symposium sponsored by the following Societies:

ASQC ■ IIE ■ IEEE ■ SOLE ■ IES ■ AIAA ■ SSS ■ SRE

For contact information see Conference Calendar.

## Reliability Standard on Industrial and Commercial Power Systems

IEEE Standard No. 493-1990 "Recommended Practice for Design of Reliable Industrial and Commercial Power Systems" has just come off the press. This 350 page revision to the 1980 "Gold Book" contains considerable new equipment reliability data. IEEE Survey data from industrial/commercial installations include: power transformers, rectifier transformers, circuit breakers, motors, motor starters, disconnect switches, switchgear bus, bus duct, open wire, cable, cable joints, cable terminations, generators in continuous service, and emergency and standby generators. Other surveys include: Diesel and gas turbine generating units 600-

1,800 kW, electric utility data on underground cable, splices, terminations, and high voltage circuit breakers above 63 kV.

Chapters include planning and design, examples of reliability analysis, economic evaluation of reliability, electrical preventive maintenance, improving reliability of an existing plant, and emergency and standby power. IEEE members can obtain copies of IEEE Std. 493-1990 for \$32.20 from the IEEE Standards Office, 445 Hoes Lane, Piscataway, N.J. 08855-1331 (\$46.00 for non members).

C. R. Heising April 3, 1991

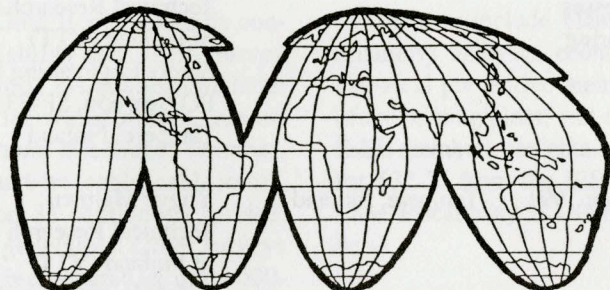
## Conference Calendar

DATE	CONFERENCE	PLACE	CONTACT
<b>1991</b> Aug. 26-30	8th Reliability in Electronics Symposium (Relectronic '91)	Budapest, Hungary	Dr. Albert Balogh Scientific Society for Telecommunication H-1372 Budapest P.O. Box 451 Hungary
Sep. 24-26	1991 IEEE Autotestcon	Anaheim, CA	Robert C. Rassa Mantech Advance Systems International 150 S. Los Robles Ave. Suite 350 Pasadena, CA 91101
Sep. 30-Oct 3	Fifth Annual IEEE Reliability Society Workshop on R&M CAE in Concurrent Engineering	Ellicott City, MD	Henry Hartt - Publicity VITRO Corporation Suite 300 West Wing 600 Maryland Avenue Washington, DC 20024 (202) 646-6339 (202) 646-6398 (Fax)

## Conference Calendar (continued)

			Bill Thomas - Registration STEMCO 8730 Georgia Avenue Suite 600 Silver Spring, MD 20910 (301) 585-0421 (301) 589-3260 (Fax)
Oct. 1-2	Reliability and Safety of Processes and Manufacturing Systems	Tampere, Finland	Yngve Malmen Technical Research Centre of Finland (VTT) Safety Engineering Lab. PO Box 656, SF-33101 Tampere, Finland +358 31 163 276 (Phone) 22313 ttctr sf (Telex) +358 31 163 495 (Fax)
Oct. 1-3	SRE Symposium 1991	Tampere, Finland	Yngve Malmen Technical Research Centre of Finland (VTT) Safety Engineering Lab. PO Box 656, SF-33101 Tampere, Finland +358 31 163 276 (Phone) 22313 ttctr sf (Telex) +358 31 163 495 (Fax)
Nov. 11-15	Third International Symposium on the Physical and Failure Analysis of Integrated Circuits	Singapore	IPFA 91 Technical Program IEEE Singapore Section 16A Science Park Drive #03-03 The Pascal Singapore Science Park Singapore 0511 Tele: 773-0056 Fax: 773-0054
Dec. 20	International Conference on Safety	Tokyo, Japan	Dr. Y. Suzuki Tokyo Metropolitan Institute of Technology 6-6 Asahigaoka, Hino-City Tokyo 191 Japan
<b>1992</b> Jan. 21-23	1992 Annual Reliability and Maintainability Symposium	Las Vegas, NV	Program Chairman Dr. R.J. Lumas Lockheed Space Operations Operations MS LSO 291 1100 Lockheed Way Titusville, Florida 32780 (407) 867-5921 Fax (407) 867-2131
			PUBLICITY L.M. Rabon, Jr. (703) 664-1003 (703) 664-2502
<b>Call for Papers</b> Jun. 10-12	European Safety and Reliability 92	Copenhagen, Denmark	Kurt E. Petersen Systems Analysis Dept. RISO National Laboratory PO Box 49 DK-4000 Roskilde Denmark Tel: +45-42 37 12 12 X3082 Fax: +45-46 75 71 01

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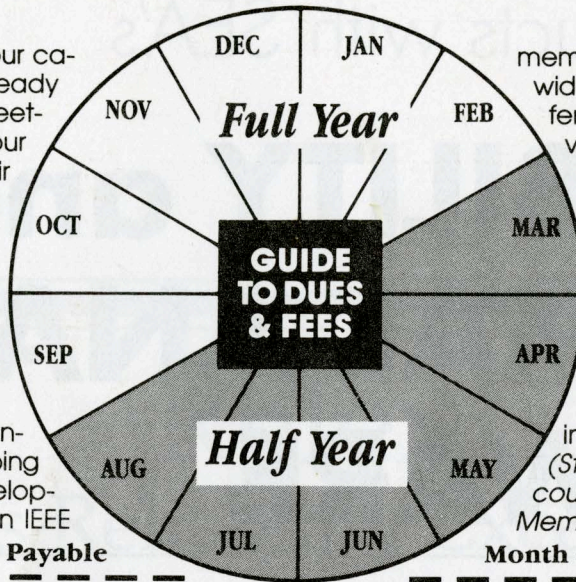
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