bility Society Newsletter

Editors: Gary Kushner and Mark Snyder

Vol. 36, No. 3, July 1990 (USPS 460-220)

Chapter News

Boston

The Boston Reliability Chapter has continued their busy schedule with a monthly dinner meeting, a Spring Lecture Series, and the 28th Annual Boston Reliability Chapter All Day Seminar.

The February monthly meeting was held at the Hanscom Air Force Base NCO Club and featured a full course dinner followed by an excellent talk, "Mobil Solar Energy Corp's Approach to Product Reliability Testing." The guest speaker was Mr. Moneer Azzam of Mobil Solar Energy Corporation, Billerica, MA. Moneer described how Mobile Solar Energy Corp. is developing cost effective photovoltaic products for the US electrical utility industry and the role that the Mobile Product Reliability Group has in fulfilling that task. There were 36 people in attendance at this meeting.

In March, the Chapter sponsored a Spring Lecture Series, "Reliability Mathematics—Practical Use Techniques," which was taught in four sessions over a four week period. This lecture series used the tools and techniques developed during the Fall Lecture Series to extend math skills in the evaluation of data, design of tests, and reliability analysis of systems. Sixteen participants enrolled in this learning experience.

The April activity was the 28th Annual Boston Reliability Chapter All Day Seminar held at the Sheraton Tara in Framingham, MA. Seven technical papers were presented at this one day event, which was enjoyed by over seventy participants.

Future Chapter activities include a Reliability Technology Development (TD) Workshop meeting in May and a Boston Harbor Cruise and Clambake Luncheon for members and their guests in June.

We are also pleased to announce the results of our election of new chapter officers for 1990-1991 who were introduced at the conclusion of the All Day Seminar in April:

Chairman:	Don Markuson, Prime Computer
Vice-Chairman:	Gary Kushner, Digital Equipment Corp.
Secretary:	Mark Snyder, Digital Equipment Corp.
Treasurer:	Ruth Evans, Data General

Cleveland

The Cleveland Chapter has had three more good meetings during this reporting period:

1) Our third meeting was the annual mid-year social held at the NASA LeRC Guerin House on December 5, 1989. As usual, it was very well attended. Old friends and new members got together for an evening of relaxation, cold buffet, and fun. There was no guest speaker. Pool, ping-pong, and dancing were enjoyed by many. The social was jointly sponsored by NASA LeRC and the composite chapter of R-7, IM-9, AES-10, IE-13, and EMB-18.

2) Our 4th meeting was on Expert Systems: Integration with Database. This meeting was from the IEEE Learning Channel videoconference seminars via satellite. Three experts—Dr. Harry Tennant, T. J. Laffey, and Dr. John Mylopoulas talked about:

A. The Challenge of Expert Systems
B. Expert Systems and Database
C. Integrating Knowledge-based Systems

3) Our 5th meeting was on NASA's Voyager II. This meeting was part of our Distinguished Lecturer Program in Cleveland. Mr. Charles Lawrence, a systems engineer from Centerior Service Company, discussed some unique features of the Voyager II project. Their use of redundancy, design freeze time, and software work-arounds was a special treat for our chapter.

Continued on page 4.

RS Newsletter Inputs

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

For January Newsletter:	by Oct. 25
For April Newsletter:	by Jan. 25
For July Newsletter:	by Apr. 25
For October Newsletter:	by July 25

* Material may be FAXed to Gary Kushner at (508) 467-6796 [please be sure to say Attn: Gary Kushner at x6765.]
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Chapter News continued from Cover.

Our last meeting was on May 2, 1990 with the Learning Channel's Rapid Development of Software.

We hope to get someone from our chapter assigned to a RAMS committee. The home study course is being handled locally by our chapter. All in all, here in Cleveland we are having fun serving our members and look forward to expanded activities in the future.

Denver

The meeting on March 21st featured Scott Mastie of IBM-Boulder. Over 30 individuals representing a host of front-range companies attended. Thanks to Scott for presenting and to Dave Posey/Guarantee National for hosting the meeting.

On April 25th, Dale Butler of Martin Marietta discussed the application of Quality Function Deployment in the early stages of systems development. This was held at the Guarantee National's offices in Englewood.

It is interesting to note that G.O.A.L. (a Massachusetts organization) has a QFD research committee which is currently translating a Japanese report dealing with QFD for software. For more information, contact G.O.A.L. at (508)685-3900.

Also on April 25th, Wally Miceli of IBM-Boulder briefly discussed the notion that fixing problems is only part of the solution. The remainder of the solution involves distributing the fixes and validating their correctness in multiple environments.

On June 1st, Ford Aerospace on Colorado Springs hosted the 8th Annual Software Reliability Symposium. The theme of this symposium is ''Automated Tools for Software Reliability.''

Future meeting topics include ''Structured Rapid Prototyping,'' ''Integrated Software Modeling,'' and ''Software Metrics.''

Los Angeles

The Los Angeles Chapter is pleased to report the following activities through March 1990:

There were two technical presentations held:

February—Computing Challenges of SDI
March—What's Wrong with Reliability Predictions

The following technical presentations are planned:

April—Futurebus +
May—Satellite Vulnerability, Radiation Effects vs. Electronics
June—Blueline Control Room, Lecture and Tour
July—The Awful Truth about Thermal Analysis and Its Effects on Reliability
August—Concurrent Engineering
September—ASIC/VHSIC Possibilities
October—New ESS Findings and Techniques

One mini-course is planned for May 11 and 12:

Improving the process for Hardware/Software Systems.

One tutorial is planned for August:

Thermal Design and Testing of Space Flight Systems.

A new opportunity will soon be available for our over 325 bulletin board subscribers: Software demos for reliability prediction programs and other reliability software tools. Two vendors have already agreed to provide us with their demos and user manuals.

Philadelphia

The Philadelphia Chapter is pleased to report the following meetings:

January 16, 1990
The Exciting Aspect of Speech
—Dr. Robert Yantorno
The Social Impact of Automated Manufacturing
—Mr. Alan Bennett
February 20, 1990
Are You Missing Out on Thousands of Tax Dollars Credits?
—Mr. John B. Picone
Space Station Freedom
—Mr. William Wolfe
April 17, 1990
Social Implications of Technology
—Mr. George Stubbs
Amorphores Metals in Electrical Engineering Present and Future
—Dr. Ryusuke Hasegawa

Washington/Northern Virginia

The 200 members of the Washington/Northern Virginia (WASH/NoVa) Chapter celebrated the end the meeting year by attending the annual crab feast hosted by the National Capital Chapter of the Institute of Environmental Sciences. Before taking part in the battle of the blue crab, the WASH/NoVa members heard eight technical talks:

The University of Maryland Reliability Program
presented by Dr. Marvin Rousch, Director of the Reliability Center at the university
NASA's Reliability Program for the Space Shuttle
Ronald Broadhurst, Goddard Space Flight Center
Good Data In, Garbage Out
Harold Ascher, US Naval Research Laboratory
NASA's Trend Analysis Program
Peter Rutledge, NASA Headquarters
PI Factors Revisited
William J. Geary, Westinghouse
''EXACT,'' A Product Assurance Expert System for SOWs
Ms. Lydia Carrasquillo, US Army RDE Center, Fort

Continued on next page.

Continued from previous page.

Belvoir, VA.
Fault Tolerance
''SMART,'' System M, A, and R Tracking
Edward Ronseville, Computer Sciences Corp.

The chapter also sponsored a seminar titled ''Software Quality Assurance'' that was presented by Michael W. Smith, President and founder of Software Quality International.

Members of the Society traveling to the Washington, DC are cordially invited to any meeting that may be held during your stay in the area. Please contact any officer of the chapter for information.

1991 **1991** **1991**

Annual RELIABILITY AND MAINTAINABILITY Symposium

1991 January 29-31 **Orlando Marriott** **Orlando, Florida USA**

Product Assurance—Return On Investment

Share your knowledge and expertise with your colleagues
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Commercial-product management addresses the concern of development and production costs with an eye on the net profit to the company. Decisions on funding of all tasks, including Product Assurance, must consider return on investment—both short term and long term.

Similarly, defense-product management has the same cost concerns. Tailoring of Product Assurance tasks is viewed from a cost-effectiveness standpoint. Our discipline's ability to quantify our contributions in terms of return on investment—again, both short and long term—is mandatory.

Papers in the following types of subjects are expected:

TECHNOLOGY
CAD/CAM/CAT/CALS
Design to Life-Cycle Cost
Modeling & Simulation Methods
Software: R&M and Safety
R&M Test & Demonstration
Reliability Growth
Screening
Failure Analysis
Built-In-Test & Testability
Hazard Analysis
Fault Trees
Repair/Maintenance
R&M Analyses
Software Tools
Environmental Testing

MANAGEMENT
CAD/CAM/CAT/CALS
Design to Life-Cycle Cost
System Effectiveness
R&M Contracting & Management
R&M Requirements
Risk Management
Database Management
R&M Cost-Benefit Tradeoffs
Testing Effectiveness
Warranties/Guarantees
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International Programs
Reliability-Growth Management
Product-Assurance Management
Safety Management
Logistics & Support

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Electric Power & Other Utilities
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Transportation
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Computer Hardware & Peripherals
Software
Robotics
Consumer Products
Medical Systems
Communication Systems
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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 Chairmen. 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:

ASME ASQC IIE IEEE SOLE IES AIAA SSS SRE

Short Course Announcement

Title: **"Reliability of Repairable Systems: Analysis and Applications"**
Dates: **November 13 thru November 16, 1990**
(Tuesday thru Friday, with Friday concluding at 2:30 pm)

Location: Center for Professional Development
University College,
The University of Maryland,
University Blvd. at Adelphi Rd.,
College Park, Maryland-20742-1668
(800-888-8682, x7230 or x7206 for the course, x7303 for lodging)

Overview: This short course covers effective and *correct* analysis of repairable systems reliability in its primary track. Reliability theory and practice have largely focused on non-repairable items, and techniques for such items have been applied—incorrectly—to repairable systems!! To resolve this problem, a quite thorough review of relevant techniques for both repairable systems and non-repairable parts and/or systems is provided. Random variables, processes vs. distributions, basic and advanced probabilistic models, improvement/growth vs. deterioration, identically distributed data, trend testing, etc., are clearly delineated, probably for your *first time*!! Learn how to avoid critical mistakes in analysis still pushed in much of the current reliability literature *and* in other reliability courses.

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

Fee: $1035.00, includes extensive course notes (over 600 pages), plus the text "Reliability of Repairable Systems" by Ascher and Feingold, 1984

CEU's: 2.8 (Certificate on completion)

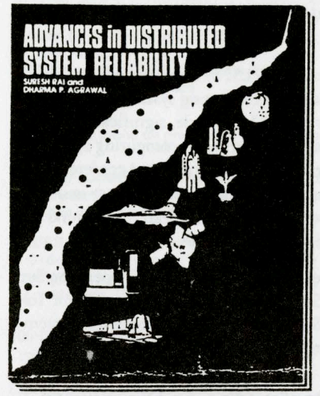
Objectives: Learn how to pick and choose the tools and techniques that will work for you. Join an interactive and meaningful reliability course before 1990 is over!!

Contacts (for technical details): Harold "Harry" Ascher, M.S. (IEEE, ASA, SRE)
202-767-4873 (ofc)
301-762-4779 (home)

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

Contacts (for course registration): Richard Jaffeson/Valarie Smith
800-888-8682, x7206

Books Available



Coming Soon!

Advances in Distributed System Reliability
by Suresh Rai and Dharma P. Agrawal

A CS Press Tutorial

352 pages. January 1990. Casebound. ISBN 0-8186-8907-2.
Book No. 1907. U.S. Price $48.00.

Recent advances in VLSI circuitry have had tremendous impact on implementing a fairly complex process on a single chip. This development has led to increased use of stand-alone workstations connected in the form of a powerful distributed system. Potential benefits offered by such distributed systems include better cost performance resulting from exploiting parallelism in most of the algorithms, enhanced fault tolerance, a high degree of modularity, increased system throughput, and efficient sharing of resources.

In this tutorial text, the authors focus on the reliability issues in such systems because the computation of system reliability metrics has become an integral part of the system designer's task. All of the three broad distributed system categories—namely closely coupled, loosely coupled, and barely coupled types—are considered.

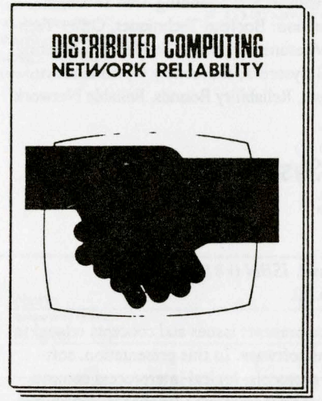
The text begins with an introduction to the topic and provides a critical assessment of current network models useful for evaluating reliability. (The reader may also want to refer to the companion tutorial text, Distributed Computing Network Reliability, for a preliminary discussion and introductory comments on reliability issues.)

The following key features are addressed:
- multiprocessor and multiterminal reliability;
- multimode and dependent-failure analysis;
- performability analysis;
- task-based reliability and software reliability.

The objective of this tutorial is to provide a literacy forum for exchanging information among planners and design engineers of parallel and distributed computing networks, computer systems analysts, specialists in computer reliability and maintainability, and other computer engineering professionals. The tutorial emphasizes the importance of such a close interaction and the impact of reliability on parallel/distributed computing networks. It also covers traditional strategies for performability evaluation and case studies.

The tutorial is written for system designers, application engineers, scientists, researchers working in universities or with government agencies/organizations, and students who would like to know more about the reliability of parallel and distributed computing networks. Some background in computer communications, switching theory, and probability is assumed.

Sections: Introduction; Multiprocessor System Reliability; Multiterminal Reliability Evaluation; Multimode, and Dependent-Failure Analysis; Performability Analysis; Conclusion: Task Based Reliability; Software Reliability; Case Studies; Bibliography.



Coming Soon! A Companion to Advances in Distributed System Reliability!

Distributed Computing Network Reliability
by Suresh Rai and Dharma P. Agrawal

A CS Press Tutorial

368 pages. January 1990. Casebound. ISBN 0-8186-8908-0.
Book No. 1908. U.S. Price $48.00.

Advances in computer network technology and better cost/computing tradeoffs achieved with microprocessors have led to the increasing popularity of distributed computing systems. The systems' parallel operation allows high throughput, but as their design has become more complex, it has become more important to be able to measure their relative fault resistance.

One method is to compute the probability that a network will perform satisfactorily under stated conditions and is termed the reliability of networks. From a reliability point of view, a distributed system is seen as a collection of resources (computers, programs, datafiles, etc.) connected in an arbitrary communications network and controlled by the system.

The text examines this network, by concentrating on such issues as:
- reliability or vulnerability measures/methods related to the connection of nodes;
- bounds on the reliability of a network;

- relationship between reliability analysis problems and NP completeness;
- synthesis of reliable networks.

Six chapters, some of them divided into subchapters, address these matters. They are organized to maintain continuity, through smooth transition from one subject to another and each consists of three to six papers illustrating the conceptual and research issues of a subject. Each chapter has introductory remarks that should be useful to both novice and advanced readers. A bibliography of relevant journals, books, and research papers is included as a guide to more specialized material in each area discussed.

This tutorial is intended for system designers, application engineers, scientists, researchers working in various universities or with government agencies/organizations, and students who would like to know more about reliability of parallel and distributed computing networks. Some background in computer communications, switching theory, and probability is assumed.

Sections: Introduction; Path, Cutset, and Spanning Tree Enumeration; Terminal Reliability Evaluation: Boolean Techniques, Other Techniques; Constrained Reliability Measures: Capacity Consideration, Routing Consideration, k-out-of-n—G Systems; Reliability Optimization; Conclusion: Complexity Analysis, Reliability Bounds, Reliable Network Synthesis; Bibliography.

Reliable Distributed System Software
by John A. Stanković

A CS Press Tutorial

400 pages. July 1985. Softbound. ISBN 0-8186-0570-7.
Book No. 570. U.S. Price $36.00.

This tutorial text organizes and presents issues and concepts related to reliability in distributed systems software. In this presentation, software includes communication protocols, logical interprocess communication (IPC) support, distributed programming languages, distributed operating systems, and distributed databases. This tutorial text attempts to cover the broad spectrum of reliability techniques used in distributed system software including distributed operating systems.

The reader of this text can expect to learn what reliability is, what reliability techniques are used in the different areas of distributed system software, and how reliability techniques can be better applied across all areas of distributed systems software (especially in the distributed operating system area).

Sections: Introduction; Distributed Systems Software Issues; Reliable Interprocess Communication; Decentralized Control; Structuring Distributed Systems for Reliability, Relocatability, Small Protection Domains, Object Based Systems; Software Reliability Techniques; Reliable Distributed Databases; Case Studies of Reliable Systems; Bibliography.

Eighth International Conference on Distributed Computing Systems (ICDCS)

A CS Press Proceedings

586 pages. June 1988. Softbound. ISBN 0-8186-0865-X.
Book No. 865. U.S. Price $80.00.

Encompasses the technical issues associated with the specification, design, implementation. evaluation and operation of distributed computing systems.

Workshop on the Future Trends of Distributed Computing Systems in the 1990s

A CS Press Proceedings

530 pages. October 1988. Softbound. ISBN 0-8186-0897-2.
Book No. 897. U.S. Price $90.00.

Because of the rapid development of VLSI technology and the major decrease in hardware cost, distributed computing systems have become increasingly cost effective. During the last decade, significant progress has been made in the development in distributed computing systems and their applications. In contrast to large international conferences in this area, the purpose of this workshop is to encourage more in-depth discussion based on the perspectives of various researchers around the world and to project the future trends in the '90s.

Sections: Distributed Computer Networks; Distributed Operating Systems; Distributed Computing System Software Engineering; Fault Tolerant Distributed Computing Systems; Distributed Computer System Architecture; Distributed Database Systems.

Ninth International Conference on Distributed Computing Systems

A CS Press Proceedings

644 pages. June 1989. Softbound. ISBN 0-8186-1953-8.
Book No. 1953. U.S. Price $100.00.

This proceedings of the 9th International Conference on Distributed Computing Systems, consisting of 72 papers representing eight countries, focuses on the integration of the elements required to bring a distributed system from the research phase to the operation and maintenance stage.

Responding to the diversity of interests in distributed computing, the following major areas are covered: Models and Algorithms; Languages and Tools; Applications and Experimental Systems; Performance; Management, Allocation, and Control of Resources; Data Base Systems; Operating Systems; Architectures; Fault Tolerance; Communications and Protocols; and Software Development.

Seventh Symposium on Reliable Distributed Systems

A CS Press Proceedings

223 pages. October 1988. Softbound. ISBN 0-8186-0875-7.
Book No. 875. U.S. Price $50.00.

This proceedings concentrates on the reliability in distributed computer systems (not multiprocessors), and distributed software while emphasizing the causes, strategies, and techniques.

Ninth Real-Time Systems Symposium

A CS Press Proceedings

312 pages. December 1988. Softbound. ISBN 0-8186-0894-3.
Book No. 894. U.S. Price $60.00.

Explores the theory and techniques for designing real-time systems including case studies on the control of parallel and distributed processors, sensors, and output devices to meet real-time constraints.

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Conference Calendar

DATE	CONFERENCE	PLACE	CONTACT
1990			
Nov. 26–29	The 8th International Conference of the Israel Society for Quality Assurance	Jerusalem, Israel	Marcel Friedman Chairman—Reliability Society Chairman IEEE Israel Section P.O. Box 413 Rishon Le Zion, Israel 70103
CALL FOR PAPERS			
June 12–15	17th Inter-RAM	Hershey, PA	Roy R. Fray Technical Program Chrmn. SAIC, Suite 1250 160 Spear St. San Francisco, CA 94105 (415) 855-2441
1991			
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Jan. 29–31	Annual Reliability and Maintainability Symposium	Orlando, FL	Program Chairman Dr. R. J. Lumas Lockheed Space Operations Operations MS LSO 291 1100 Lockheed Way Titusville, FL 32780 (407) 867-5921 Fax (407) 867-2131 Publicity L. M. Rabon, Jr. (703) 664-1003 (703) 664-2502 General Information Ed Anderson 1411 Jefferson Davis Highway JP-1 Suite 920 Arlington, VA 22202 (703) 920-6083 (703) 920-6084
Apr. 8–11	1991 International Reliability Physics Symposium	Las Vegas, NV	Registration IEEE-IRPS P.O. Box 308 Westmoreland, NY 13490 (315) 339-3971 Fax (315) 336-9134
Apr. 18–20	11th Advances in Reliability Technology Symposium	Liverpool, England	Mrs. Ruth Cambell 11th Advances in Reliability Technology Symposium National Centre of System Reliability Ukaea, Wigshaw Ln. Culteth, Warrington WA3 4NE UK Tel. (0925) 31 244 X424 Fax (0925) 766 681
Apr. 19	28th Annual Spring Reliability Seminar	Framingham, MA	Information: Sid Gorman Raytheon Company (508) 440-4149
Apr. 24–25	Tri-Service RAMCAD Group 6th Technical Interchange Meeting	Arlington, VA	Contact: 6th RAMCAD TIM Committee C/O Washington, DC Chapter of Sole P.O. Box 2645 Arlington, VA 22202 (703) 664-5771
Jun. 5–8	International Symposium on Reliability and Maintainability	Tokyo, Japan	ISR&M 1990 Tokyo Union of Japanese Scientists and Engineers 5-10-11 Sendagaya, Shibuya-Ku, Tokyo 151 Japan 03-352-2231 Fax 03-225-1813
Jun. 18–22	7th International Conference on Reliability and Maintainability	Brest, France	Secretariat for the 7th Conference CNET Division Lab/IFE BP 40 22301 Lannion Cedex France 96 052430 Fax 96 052372
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

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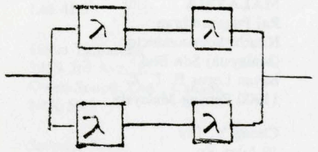
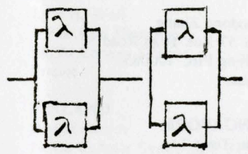
Which Redundant Configuration Has the Higher Reliability?

Dr. Samuel Keene
Vice President, Technical Operations



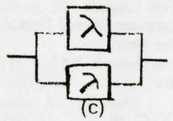
(a)
Parallel String Configuration



(b) Quad Configuration

Configurations (a) and (b) shown above both use redundancy to enhance reliability of the subsystem. The redundant blocks shown are identical in both configurations; only the manner of interconnection varies. It will be shown that one of the configurations has better reliability than the other.

Consider first the simple parallel redundant configuration shown as (c) below:



(c)
Parallel Redundant Configuration

The probability of failure of this configuration, termed Q, is the probability both legs fail, that is,

$$Q = (1-R)^2, \text{ where } R \text{ is the reliability of each leg of (c).} \quad [1]$$

$$Q = 1 - 2R + R^2 = 1 - 2e^{-\lambda t} + e^{-2\lambda t} \text{ (assuming the failure rate } \lambda \text{ to be of constant value).} \quad [2]$$

$$Q = 1 - R \quad [3]$$

$$R = 2e^{-\lambda t} - e^{-2\lambda t} \quad [4]$$

Mean time between failures, Θ, will be

$$\Theta = \int_0^\infty R(t)dt \quad [5]$$

$$\Theta = \frac{2}{\lambda} - \frac{1}{2\lambda} \quad [6]$$

$$\Theta = \frac{3}{2}\lambda \quad [7]$$

Applying (7) to configuration (a) and replacing λ with 2λ, as appropriate for the reliability of a serial string, we get

$$\Theta_a = \frac{3}{2(2\lambda)} \quad [8]$$

$$\Theta_a = \frac{3}{4\lambda} \quad [9]$$

Similarly for configuration (b), it is equivalent to two configuration (c)s in series (multiplying the reliabilities). Starting with equation (4):

$$R_b = (2e^{-\lambda t} - e^{-2\lambda t})(2e^{-\lambda t} - e^{-2\lambda t}) \quad [10]$$

$$R_b = 4e^{-2\lambda t} - 4e^{-3\lambda t} + e^{-4\lambda t} \quad [11]$$

$$\Theta_b = \int_0^\infty R^b(t)dt \quad [12]$$

$$\Theta_b = \frac{4}{2\lambda} - \frac{4}{3\lambda} + \frac{1}{4\lambda} \quad [13]$$

$$\Theta_b = \frac{11}{12\lambda} \quad [14]$$

Comparing the results of parallel strings versus the quad, a versus b, equations (9) and (14), it can be seen that the quad provides better redundancy and, therefore, higher reliability. This is confirmed by logic, as the quad configuration can sustain a double failure and still operate, whereas a double failure in the parallel strings will surely bring down that configuration.

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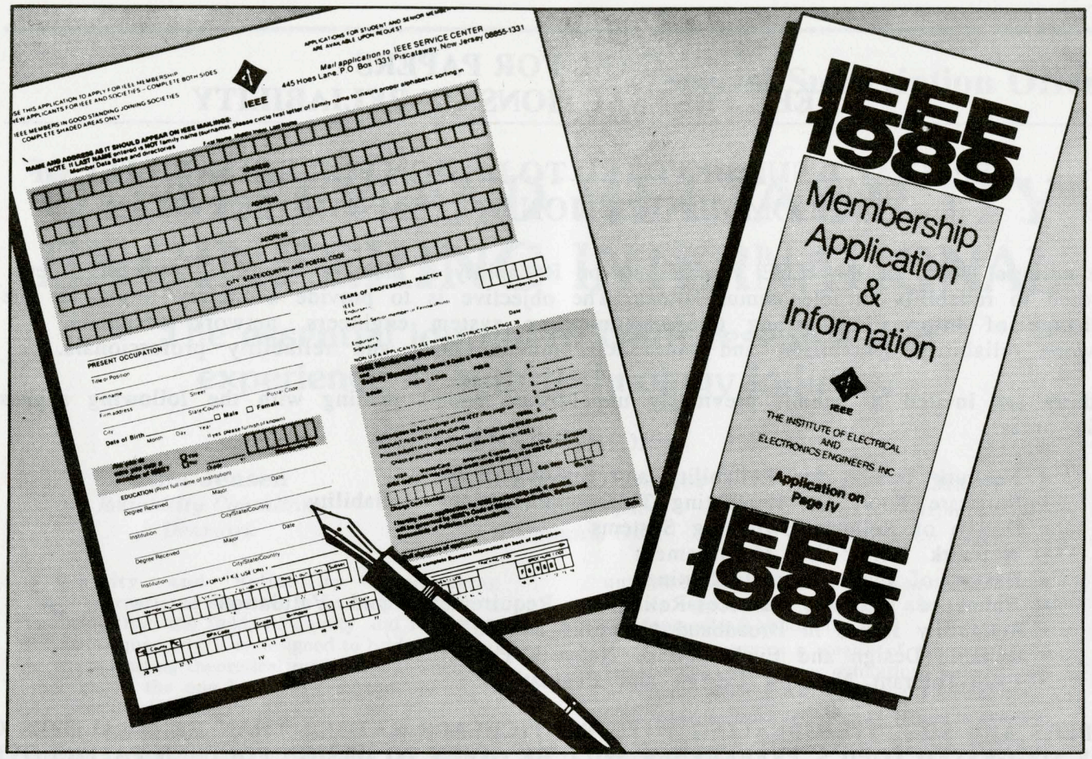

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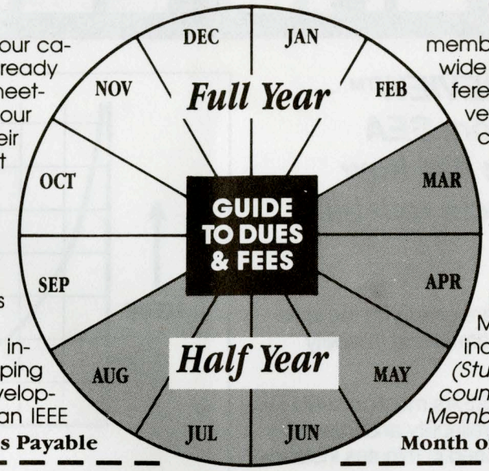

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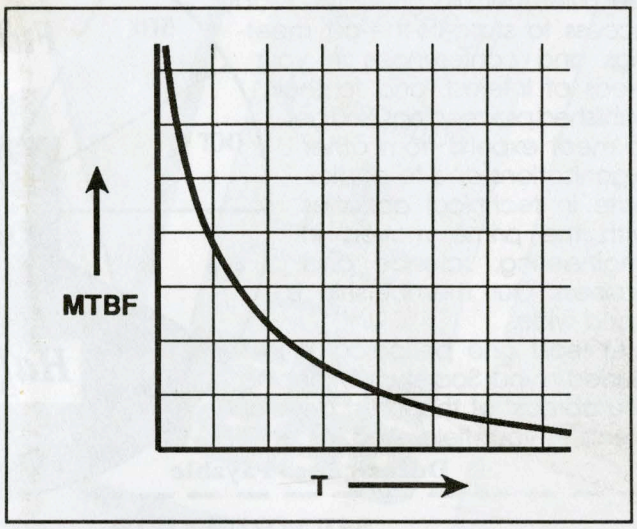

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