IEEE
Reliability Society
NEWSLETTER

Vol. 38, No. 1, January 1992 (USPS 460-200)

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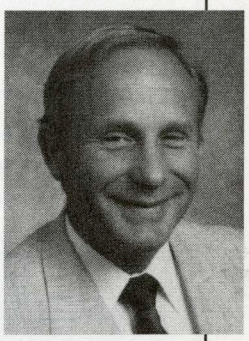
Editor:
Bruce Bream

Message from the President



I have received correspondence from some of you and I want you to know that it is good to hear from you. The Tokyo chapter recently held their first reliability symposium. They sent me a copy of their proceeding. I am proud of initiatives like this.

RAMS

I will be at the Reliability and Maintainability symposium in January in Las Vegas. I will have a paper to present and will be giving a tutorial on software reliability. The executive group of the reliability society will meet in an Adcom meeting. This will be held Monday afternoon prior to the commencement of the symposium. It will start at 1:00 pm and run till 5:00 pm. Any of you who want are welcome to join us. A meeting notice will be posted with the hotel events.

Publications

The reliability society has a close-in financial problem in this area and a long range plan. The close in financial problem comes from mailing all the conference proceedings to our members. The cost of mailing the transactions, newsletter, RAMS, and IRPS proceedings runs approximately $55.00 per member. The compares to $10.00 for 1992 dues (we do have significant off setting revenue from selling our transactions to non-members, such as libraries).

We plan to solve this in a way that will remain supportive of our members publications needs. We want to better deliver to each member the publications that member uses. In 1993, members can personalize their publication choices. A tailored set of publications will be provided with the members dues. The other publications will be attractively priced for those want all of them.

For 1992, we need to tailor our proceedings delivery in order to achieve a balanced budget. To this end, the reliability physics proceedings, IRPS, will be sent to our members who are receiving

(continued on page 5)

Editor's Column

Our newsletter provides a place for the sharing of knowledge in our specialty, Reliability and Maintainability. I'm glad to see that we have something new to share with you this issue. You will find the new due date schedule gives us a couple more weeks to accept copy before presses. There are a number of new call for papers that have been received in the last quarter. The IEEE Technical Activities Board has a new video about planning successful meetings that is available to chapters. I encourage you to discover what is offered by the bulletin boards listed in our newsletter. The Statistics Bulletin Board has a number of programs available for download. Many are available in the source language to alleviate the concern over importing a computer virus. As I mentioned in October, we provide a means to exchange ideas. A new section "Reliability Forum" allows you to present your views on R&M topics. I received a letter from Kam Wong related to a paper he presented at the 1990 RAMS (90RM047). I encourage you to respond to the issue presented or write on another topic.

Bruce Bream
Editor, IEEE Reliability Society Newsletter

Reliability Society Newsletter Inputs

All RS newsletter inputs should be sent to:

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Cleveland, OH 44135
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The schedule for submittals is:

Newsletter	Due Date
January	November 19
April	February 20
July	May 21
October	August 20

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RELIABILITY SOCIETY OFFICERS

Reliability Forum

This section provides a means for members to express their views on R&M topics of interest to the entire R&M community. Contributions are welcomed by the editor. Authors may send letters either by mail or Email. A daytime phone and complete mailing address must be provided. RSNL reserves the right to edit the content of letters received.

The Exponential Law

The year was 1954. A paper was presented at the IRE Annual Meeting in New York showing mathematically that under a continuous replacement-upon-failure procedure, the long term steadstate failure rate of a system containing a group of parts having the same failure density function is a constant. This assertion holds true for any failure density distribution, Gaussian or otherwise. At steady-state, the age distribution of the parts in the system has the shape of one minus the cumulative failure distribution. This mathematical proof further strengthened the Exponential Law being touted as the law governing the failure characteristics of electronics. Sorry to say that I was a co-author of that paper as later on I realized that very few, if any, electronic equipment ever reach steady-state. In most cases the mission time is not long enough to ensure the mixing of failures to result in a random process. At that time I was also collecting failure data on a group of computers. Soon after 1954 I had enough data to plot a curve of subminiature electron tube failure rate versus tube age for the first thousand hours of operation. One thousand hours was almost reaching the end of life for the subminiature tubes. The curve showed a slight downward slope indicating that the failure rate was decreasing. Since it was a slight slope I attributed it to statistical variation.

After my exposure to the Exponential Law I was troubled by the lack of physical basis for the existence of that law. When I started to investigate failures data after environmental stress screening, I found that the concept of the Exponential Law simply did not fit in. Then I began to look at failure data related to equipment and part ages. It turned out that some data generated as far back as 1961 showed complete non-conformance to the Exponential Law. The best data was collected by Pettinato and McLaughlin on the testing of 20 sets of AVR-200 transistorized communication sets. They presented a paper on the findings at the 1961 National Symposium of Reliability and Quality. Based on that set of data I plotted the failure rate curves that clearly show the failure rates were not constant. Other analyses on failure data for satellites and microcircuits have shown a decreasing failure rate.

Until a few years ago I had been more or less going along with the majority of the reliability practitioners using the Exponential Law primarily because the workplace inertia made the Exponential Law paradigm too hard to change. I think now is the time to make some changes. How about you? The readers of this Newsletter would like to hear from you.

If you would like to talk about this subject feel free to contact me, Kam L. Wong (Mr.), Kambea Industries, 1130 Ronda Drive, Manhattan Beach, CA, 90266, U.S.A., Tel: (213)372-4533.

Kam L. Wong

RELIABILITY BOOKSHELF

RELIABILITY ENGINEERING HANDBOOK, Vol. 1 and Vol. 2
Dimitri Kececioglu, PhD, P.E.
Department of Aerospace and Mechanical Engineering
The University of Arizona
ISBN 0-13-772294-X (v. 1)
ISBN 0-13-772302-4 (v. 2)
Prentice Hall
Englewood Cliffs, NJ 07632
1991

This two volume set is a collection of works from Dimitri's development and teaching of the University of Arizona Reliability Engineering Program. It is written for use as a text for introductory reliability courses. It serves this purpose well since it is filled with a good mix of worked examples, use of distributions, and equation derivations. The combination of these contributes to the need for two volumes. Although the index in each book is not as complete as would be expected, the detailed contents pages are a good place to look for topics. The first volume mostly deals with data and distributions while volume two mostly deals with system analysis issues.

Chapter Activities

IDEAS FOR MEETINGS

Have you thought of renting a video for your next meeting? Videotapes are available from a couple of sources. Our Los Angeles section has a tremendous video library on Engineering and R&M topics. The index can even be viewed on their electronic bulletin board. The IEEE Technical Activities Board (TAB) also has videos available for loan at no charge to IEEE chapters. One of these is "Planning Successful Chapter Meetings". This video outlines the basics of putting together an interesting and well attended meeting. It includes information on selecting a subject and format, finding good speakers, planning social aspects of the meeting and publicity. For information on this TAB video call Alicia Tomaszewski at (908)562-3905.

Boston

The Boston Section is having a successful year to date. The October monthly meeting held at the Hanscom Air Force Base NCO club on October 9th was well attended as we all listened to Mike Kozell from Data General speak on ESS. This session like the others was well attended by our membership.

The Fall Lecture series on "Software Reliability Measurement, and Modeling" authored by Drs. Michael Elbert and David Heimann was well received. The lectures were held at GTE labs and was highly successful. Our special thanks to GTE labs for allowing the lecture series to be held on their premises. We are in the planning stages for our Spring Lecture series on Stress Screening to be held in March and April.

Regards,

Gary Kushner
Boston Chapter Chairperson

Cleveland

The Cleveland Chapter has had two good meetings. Our first meeting was on careers and educational resources. This meeting was in celebration of NASA Lewis Research Center's 50th anniversary. The auditorium at the Visitor's Center showed 140 younger people are interested in career development. The importance of education and training was explained very nicely by Lewis Speaker Bureau member Sandra M. Walters. Our second meeting was on Software Testing and Reliability. This meeting was from the IEEE Learning Channel Videoconference Seminars via satellite. Our chapter has worked on a special project for the 1992 RAMS. Ten members (J. Reagan, C. Yeh, E. Zampino, D. Hoffman, B. Bream, J. Dorcey, J. Lyons, D. Garman, E. Sprague and V. Lalli) graded 184 papers for the Technical Program Committee. We organized 2 sessions: 3C-Design Practices and 6C-Future Role of R&M Assurance in Space Flight Exploration. Thanks a lot for your help. All-in-all here in Cleveland we are having fun serving our members and look forward to expanded activities in the future.

Sincerely,

Vince Lalli
Chairman, Cleveland Chapter

Dallas

The Dallas IEEE Reliability Society Chapter was founded in 1989 by Louis Boudreaux and has grown in many ways. Lou is an employee of Texas Instruments, Defense Systems and Electronics Group. He sensed a need from fellow employees and others in the reliability technical community for a forum to achieve the following: a) communications among technologists in this field, b) an opportunity to network with others working this technology in the local community, and c) a vehicle for technology updates.

This year the local Dallas chapter got it's first set of new administrators. Louis had been the presiding officer for three years. Dennis Hoffman progressed from vice-chairperson to chairperson, thus turning over a new leaf in the history of the Dallas organization. Lou's efforts are much appreciated. Without his drive the Dallas chapter would not exist. Every new organization needs a leader with a lot of vitality and energy to make it happen and keep it fueled for the first several years. Lou was recognized at the IEEE Dallas section banquet by the IEEE Reliability Society local chapter for his outstanding service and dedication. Lou has set a fine example of voluntary leadership.

The toughest challenge of the organization has primarily fallen to the membership committee leader. As you may have found in your chapters, typically one company in the local area participates in the majority. Our challenge has been to get multi-company and joint-society participation. Multi-company participation is a challenge because not all companies encourage professional society participation and demands on personal time are great. We have worked membership drives through varying our meeting content broadly, mailing out announcements to key individuals outside the primary company that participates and 'cold calling' local companies for names of interested parties. The solution that seems to work is targeting the meetings and speakers to serve the audience.

An equally challenging task is managing the variety and scope of the programs. The program committee leader uses inputs from many members to form the roster of speakers each year. Mid-course adjustments may have to be made to the program plans as opportunities arise such as potential speakers visiting industry in our area. We take advantage of a broad spectrum of speakers from industry, government, and academia.

If you are working in the reliability or maintainability field in the Dallas metroplex area, please get involved with your local chapter. We're here to serve you!

Julie England
Dallas Chapter Vice-Chairperson

Los Angeles

The Los Angeles Chapter had three technical meetings during the last couple of months:

In July, Rudy Marloth of Hughes Aircraft lectured on the latest development of Synthetic Array Radar System (ASARS). Rudy currently works on ASARS and showed actual photos generated by the system.

In August, Bill Zeller of Hughes Aircraft discussed the survey of the field of brain machines. The purposes and benefits were discussed.

In September, we held a joint meeting with the LA Chapter of the SSIT and the Power Society. Two speakers from Southern California Edison discussed Alternate Energy Sources and Low Frequency EM Fields. The first speaker was Ron Luxa and discussed various forms of energy. The second speaker was Norm DeHaven and he discussed the dangers and/or safety of EM Fields.

Upcoming meetings include:

In October, a speaker from Anamarctic will be speaking on the latest developments of Wafer Scale Integration.

In November, Dave Franklin of Hughes Aircraft will discuss Failure Analysis and Risk Assessment.

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

Our Videotape Exchange program continues to be popular. Currently we have over 100 videotapes available. Information on the latest can be viewed and downloaded through our bulletin board.

Loretta Arellano
Los Angeles Chapter Chair

Mohawk Valley

We are hosting our second annual conference in June 1992. The theme of this years conference is Command, Control, Communications, and Intelligence (C3I) Technology. A session on Quality and Reliability will be included.

Charles Messenger
Chairman

Washington/ North Virginia

Our chapter completed another successful year culminating in a third place in the National section activities contest. We're looking forward to another great year with several tours and a series of excellent speakers.

Terry Logee
Chairman

Message from the President

(continued from front cover)

the semiconductor manufacturing transactions. That is approximately 1200 members. The remaining 2800 members will be sent the RAMS proceedings. We believe this will best satisfy your desires in a cost effective manner. If this arrangement is a severe inconvenience, please contact Paul Gottfried and we will try to accommodate your needs.

We apologize for any inconvenience to you by this action. Our reserves had dropped dangerously low and some action was deemed imperative. We hope in the future to better meet you publication needs, in a cost effective manner, without routinely mailing you things you don't care about.

Sincerely,

Dr. Samuel J. Keene
President, Reliability Society

Electronic Bulletin Boards

Los Angeles Chapter
(818) 768-7644
300-2400 Baud (8N1)

Free Membership
(400+ members)

Meeting information, Jobline, Email, Video Tape Exchange Information, Shareware an Demos

Statistics Bulletin Board System
(316) 265-3036
1200-2400 Baud (8N1)

Free Membership

Statistics, Reliability

Conference Calendar

DATE	CONFERENCE	PLACE

1992

Jan 21-23 — 1992 Annual Reliability and Maintainability Symposium — Las Vegas, NV

Contact: Dr. R.J. Lumas, Lockheed Space Operations, MS LSO 291, 110 Lockheed Way, Titusville, FL 32780, Tel: (407) 867-5921 Fax: (407) 867-2131

Feb 3-5 — SEMI-THERM
Thermal characterization of devices, components, and systems, reliability screening and testing — Austin, TX

Contact: Mr. Bob Simons, IBM Corporation, Dept. b02, Building 701, Poughkeepsie, NY 12602, Tel: (914) 435-1650 Fax: (914) 432-9805

Mar 30-Apr 2 — 1992 International Reliability Physics Symposium — San Diego, CA

Contact: **USA**: Harry A. Schafft, General Chairman, 1992 IRPS
NIST, Bldg. 225, Rm. B360, Gaithersburg, MD 20899
Tel: (301)975-2234 Fax: (301)948-4081
Asia: Dr. Eiji Takeda, IRPS Pubilicity Committee
Hitachi Ltd., P.O. Box 2, Kokubunji, Tokyo 185, Japan
Tel: (81) 423-23-1111 x3325 Fax: (81) 423-27-7699
Europe: Dr. Wolfgang Gerling, IRPS Pubilicity Committee
Siemens AG, Balanstr. 73, D-8000 Munich 80, Germany
Tel: (49) 89 4144-2825 Fax: (49) 89 4144-3828

April 23 — 30th Annual All-Day Seminar
Reliability Engineering: Alternative Techniques for Today's Business Environment — Boston, MA

Contact: Jim Kalemba, 6 Ohio Road, Tyngsboro, MA 01879-2365

May 18-20 — 42nd Electronic Components & Technology Conference — San Diego, CA

Contact: Iwona Turlik, Microelectronics Center of N.C., 3021 Cornwallis Road, Research Triangle Park, NC 27709
Tel: (919) 248-1847 Fax: (919) 248-1455

Jun 10-12 — European Safety and Reliability 92 — Copenhagen, Denmark

Contact: Kurt 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

CALLS FOR PAPERS

1992

May 3-6 — Custom Integrated Circuits Conference — Boston, MA
Abstracts due November 7, 1991

Contact: Mrs. Roberta Kaspar, Technical Program Coordinator, CICC '92
1597 Ridge Road West, Suite 101C, Rochester, NY 14615-2514
Tel: (716) 865-7164

Jun 15-18 — COMPASS - 7th Annual Conference on Computer Assurance — Gaithersburg, MD

Authors requested to send five single-sided copies of their papers (not exceeding 7,500 words) to the program chair by January 10, 1992. Acceptance notification will be by March 7, 1992 with camera-ready papers due April 1, 1992.

Conference Information: Robert Ayers, ARINC Research Corporation, 2551 Riva Road, Annapolis, MD 21401, Tel: (301)266-4741, Fax: (301)266-4040

Program Chair: Dr. Edgar H. Sibley, Dept. of Information & Software Systems Engineering, George Mason University 4400 University Drive, Fairfax, VA 22030-4444, Tel: (703)993-1640, Email: esibley@gmuvax.gmu.edu

(Editor's note: Papers will be accepted past the January 10 deadline.)

Aug. 25-28 — International Reliability Availability Maintainability Conference for the Electric Power Industry — Philadelphia, PA

Papers are solicited on generation, transmission, and distribution, including application, modeling, design, and manufacture.

Prospective authors should submit 300-500 word abstracts by February 15, 1992. Authors will be notified of acceptance by March 15. Completed papers will be due by April 15, 1992.

Send abstracts to: Mr. Dev Raheja, Technology Management Inc., 9811 Mallard Drive, Suite 213, Laurel, MD 20708, Tel: (301)792-0710

Program Information: Mr. Bob Filipovits, Pennsylvania Power & Light, 1005 Brookside Road, Allentown, PA 18106, Tel: (215)398-5158

Oct 7-9
Papers due March 1, 1992 — 3rd International Symposium on Software Reliability Engineering — Research Triangle Park, NC

Contact: John C. Munson, Division of Computer Science, University of West Florida, Pensacola, FL 32514, Tel: (904) 474-2989
jmunson@dcs119.dcsnod.uwf.edu

1992 — IEEE Transactions on Reliability
Special Issue on Fault-Tolerant Software

(See full page description in this issue of RSNL)

1993

Sep 29-Oct 1 — 16th International Symposium on Computer Performance Modeling, Measurement and Evaluation — Rome, Italy

Contact: **North America:** Dr. Stephen S. Lavenberg IBM T.J.Watson Research Ctr., P.O. Box 704, Yorktown Heights, NY 10598, Tel: (914) 784-7573
Europe & Others: Prof. Giuseppe Iazeolla, University of Rome II, Electronic Engineering Dept., Viale della Ricerca Scienrifica, 1-00173 - Roma - Italy, Tel: 39-6-79794486

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600 Maryland Avenue, SW
Suite 300W
Washington, DC 20024-2520
Tel: (202)646-6337
Fax: (202)646-6398

COMPASS

CALL FOR PAPERS

Seventh Annual Conference on Computer Assurance

The Seventh Annual Conference on Computer Assurance (COMPASS), sponsored by the Institute of Electrical and Electronic Engineers and IEEE Aerospace and Electronic Systems Society, in cooperation with the British Computer Society, will be held at the National Institute for Standards and Technology in Gaithersburg, Maryland, USA, June 15-18, 1992. The purpose of this conference is to bridge the gap between emerging technology for computer assurance from research laboratories into industrial computer systems development. Papers may present original research on theoretical aspects and applications of technology to assured computing, or may be reports detailing experiments, evaluations, and open problems in the use of new technologies for computer assurance. Typical but not exclusive topics of interest include:

- Models and modelling (process, mathematical, and requirements models)
- Formal approaches (proofs of correspondence, formal specifications, and IV&V)
- Experiences with assurance (illustrative examples from communications, energy, financial, medical, military, transportation, and other types of systems)

PAPER SUBMISSION:
Authors are requested to send five single-sided copies of their papers (not exceeding 7,500 words) to the program chair by **January 10, 1992.** If available, an electronic mail address for the contact author should be included. Papers submitted simultaneously to another conference with published proceedings are disqualified. Papers will be refereed by the Program Committee and will be returned with comments. Accepted papers will be published in the proceedings.

IMPORTANT DATES:

Papers due:	January 10, 1992
Notification of acceptance:	March 7, 1992
Camera-ready paper due:	April 1, 1992
Conference:	June 15-18, 1992

Additional information about the COMPASS '92 can be obtained from the General Chair. All inquiries concerning paper submissions should be addressed to the Program Chair.

GENERAL CHAIR:
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2551 Riva Road
Annapolis, MD 21401 USA
voice: (301)266-4741
fax: (301)266-4040

PROGRAM CHAIR:
Dr. Edgar H. Sibley
Department of Information and Software Systems Engineering
George Mason University
4400 University Drive
Fairfax, VA 22030-4444
(703)993-1640, or esibley@gmuvax.gmu.edu

CALL FOR PAPERS
IEEE TRANSACTIONS ON RELIABILITY

SPECIAL ISSUE ON
FAULT-TOLERANT SOFTWARE

The Editorial Board of the IEEE Transactions on Reliability is planning a special issue of papers on Fault-Tolerant Software Techniques and Systems. The objective is to provide a literary forum for the exchange of information among software/hardware computer specialists, design engineers, system analysts, computer reliability/maintainability specialists, and other computer engineering professionals.

Authors are invited to submit previously unpublished papers dealing with the following suggested topics:

- Fault-Tolerant Software Architecture
- Design Techniques for Fault-Tolerant Software
- Software Design Diversity
- Experimental Analysis of Fault-Tolerant Software
- Reliability, Dependability, and Performability Evaluation of Software Fault-Tolerant Systems
- Fault-Tolerant Software System Applications
- Case Studies

Papers are solicited dealing with particulars rather than generalities of the suggested topics. Preference will be given to practical papers over purely theoretical papers.

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

- Author's letter of commitment (including a brief summary) - 31 December 1991
- Submission of manuscripts (6 copies) - 30 April 1992
  The first page of the manuscript should include the author's address, affiliation, telephone and FAX numbers.
- Submission of final revised manuscripts - 1 September 1992.

Letters of inquiry, letters of commitment, and manuscripts for submission, should be sent to one of the Guest Editors:

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EECS Dept.
University of Michigan
Ann Arbor, MI 48109
Phone: (313) 763-0037
FAX: (313) 763-1503
E-mail jfm@eecs.umich.edu

Dr. Hoang Pham
Idaho National Engineering Laboratory
EG&G Idaho, Inc.
P.O. Box 1625, M/S 2406
Idaho Falls, ID 83415
Phone: (208) 526-9274
FAX: (208) 526-2930

RELIABILITY SOCIETY 30TH ANNUAL ALL DAY SEMINAR

BOSTON IEEE RELIABILITY CHAPTER
THURSDAY, APRIL 23, 1992
SHERATON TARA, ROUTE 9, FRAMINGHAM, MA

"Reliability Engineering: Alternative Techniques For Today's Business Environment"

In today's business environment where sales have slowed and present budgets are tight, many companies are approaching reliability in different ways. These companies still want to produce a reliable product but have been driven to optimize the cost effectiveness of their reliability programs. This has led to new techniques and approaches for achieving high reliability for less cost. This year's seminar seeks to present these new techniques over a diverse product range.

PAPERS TO BE PRESENTED WILL BE IN THE FOLLOWING AREAS:

Reliability Predictions •		• Automotive
Warranties •		• Military
Software Reliability •		• Medical
Reliability Growth •	**AS THEY RELATE TO:**	• Commercial Aircraft
FMECA •		• Consumer Electronics
CAD/CAE •		• Computers
Stress Screening •		• Aerospace

REGISTRATION FEES: (fees include seminar, lunch, and dinner).
Prior to March 28, 1992: $150 IEEE members, $175 non-members
After March 28, 1992: $175 IEEE members, $200 non-members
NOTE: A $25 rebate issued to non-members who join the IEEE within a reasonable time.

Make checks payable to: Reliability Chapter of Boston IEEE Section
Mail checks and registration form to: Jim Kalemba
6 Ohio Road
Tyngsboro, MA 01879-2365

30th ANNUAL ALL DAY RELIABILITY SEMINAR REGISTRATION FORM

Name _____ Company/Affiliation _____

Address _____ Town/City _____

State/Zip _____ Phone # _____

Amount Paid _____ Date _____ IEEE Number _____

Seminar Proceedings available after April 23th for $15 each. Call (617) 455-3394 for further information.

CALL FOR PAPERS

1992
Nov 4-6

IASTED

International Association of Science and Technology for Development

International Conference on Reliability, Quality Control and Risk Assessment

Washington, D.C.

Survey papers and case studies are solicited on:

- Reliability
- Human Factors
- Risk Analysis
- Quality Costs
- Testing
- Fault Tolerance
- Simulation
- Software Safety
- Modeling
- Availability and Maintainability

Submit 3 copies (15 double spaced pages max.) by **May 1, 1992**.
Notification of acceptance/rejection by June 30, 1992.
Camera-ready papers due September 15, 1992.

Dr. Hoang Pham
Program Chairman
Idaho National Engineering Laboratory
P.O. Box 1605, M/S 2406
Idaho Falls, ID 83415
Tel: (208)526-9274
Fax: (208)526-2930

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