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Editor:  
Dave Franklin  
Associate Editor:  
John Healy  
Business Manager:  
Bob Gauger

## President's Message

### Your Society's Leadership

As Ken LaSala announced in the January Newsletter, your Society has a new slate of officers for 2001. I am very honored to have been elected your President and to have a great group of officers and AdCom members to assist me in administrating our Society within the IEEE framework. Your and my officers are:



Ann Campbell - *VP Membership*  
Koichi Inoue - *VP Technical Operations*  
Robert Loomis - *VP Publications*  
Jeff Voas - *VP Meetings*  
Richard Kowalski - *Treasurer*  
William Tonti - *Secretary*  
Ken LaSala - *Jr. Past President*  
Loretta Arellano - *Sr. Past President*

I am pleased that each one agreed to serve and with the talent and experience that each one brings.

To provide you with a little background on your new president, I have been an IEEE member for over 35 years, beginning as a student member while in college. I have BS and MS degrees in Electrical Engineering. I started my professional career as a Reliability Engineer and have been associated with Reliability Engineering ever since. My background is primarily associated with developing and producing defense avionics and the engineering practices to improve reliability and availability throughout the life cycle. I also have industrial and commercial electronic products' experience mixed in. I have been involved with all phases of a product's life from advanced development through field operation, and in architecting how products should be developed and the engineering automation to support the product development process.

Likewise, each one of your officers has distinguished backgrounds and interesting experiences, and they, in composite, cover a wide range of Reliability Engineering expertise. Like you, they are improving and enhancing the reliability of products and practices that in turn benefit each of us either directly or indirectly in the products we buy, use, and rely on in our daily lives.

### Participate

The Reliability Society is your Society. Get involved. Participate. There are plenty of ways and areas to match your interests. You can become involved in

continued on page 3

# Editor's Column ■ ■ ■ ■

## Certification

Only two answers to date on the certification questions please send your opinions before non-reliability engineers make the decision for us.

1. Should reliability engineers be certified?
  - a. Yes, and with a little work to update the ASQ certification works fine.
  - b. No, the current certification programs do not take the possibility of multiple solutions into account. To pass the test thinking outside the box is not allowed.
2. Should companies certify their reliability engineering processes to a maturity level as is done with software?
  - a. Yes, same or very similar format as CMM. We are working to understand the elements within an organization the lead to highly reliable product design and are taking CMM and Crosby's work (among others) as models

Thanks for your responses.

**Dave Franklin**  
Editor

## RELIABILITY SOCIETY OFFICERS

### President

Dennis Hoffman (Dhoffman44@aol.com)

### Vice President - Membership

A. N. Campbell (ancampbe@sandia.gov)

### Vice President - Publications

Dr. Robert J. Loomis, Jr  
(r.j.loomis@ieee.org)

### Vice President - Meetings

Jeff Voas (jmvoas@cigital.com)

### Vice President - Technical Operations

K. Inoue (inoue.k@ieee.org)

### Secretary

William R. Tonti wtonti@ieee.org

### Treasurer

R. A. Kowalski (dkowalsk@arinc.com)

## STANDING COMMITTEES

### Standards and Definitions

T. Brogan  
(Thomas\_L\_Brogan@res.raytheon.com)

Y. Lord

(Yvonne\_Lord@mail.northgrum.com)

### Meetings Organization

Jeff Voas (jmvoas@cigital.com)

### General Membership

A. N. Campbell (ancampbe@sandia.gov)

### Chapters

L. Arellano (l.arellano@ieee.org)

### Academic Education Committee

M. Abramo (m.t.abramo@ieee.org)

### Professional Development

M. Abramo (m.t.abramo@ieee.org)

### Constitution and Bylaws

K. P. LaSala (k.lasala@ieee.org)

### Nominations and Awards

K. P. LaSala (k.lasala@ieee.org)

### Fellows

T. L. Regulinski  
(regulinski@ece.arizona.edu)

### Finance

R. A. Kowalski (dkowalsk@arinc.com)

### Historian

A. Plait (aplait@ieee.org)

### Academic Education

Dr. Robert J. Loomis, Jr

(r.j.loomis@ieee.org)

## TECHNICAL OPERATIONS

### Vice President

K. Inoue (inoue.k@ieee.org)

## Reliability Society Newsletter Inputs

All RS newsletter inputs should be sent to:

Editor: Dave Franklin  
300 North Oak Hills Drive, Oak Park, CA 91377  
Tel: +1 818 586 9683  
E-mail: d.l.franklin@ieee.org

Business Manager: Bob Gauger  
r.gauger@ieee.org

Associate Editor: John Healy  
jhealy@telcordia.com

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Newsletter	Due Date
January	October 8
April	January 8
July	April 8
October	July 8

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**TECHNOLOGY COMMITTEES  
(12 committees)**

**CAD/CAE**

K. Janasak (kjanasak@raytheon.com)

**Human Interface Technology**

K. P. LaSala (k.lasala@ieee.org)

**International Reliability**

J. P. Rooney (jprooney@foxboro.com)

**Mechanical Reliability**

R. L. Doyle (r.doyle@ieee.org)

P. Hetherington

(Phetherington@IITRI.ORG)

**Microelectronic Technologies**

A.N. Campbell

(ancampbe@sandia.gov)

T. A. Rost (t-rost@ti.com)

**Reliability Design**

M. Roush (roush@eng.umd.edu)

**Reliability Methodology**

C. K. Hansen (c.k.hansen@ieee.org)

**System Safety**

Y. Sato (yoshi@ipc.tosho-u.ac.jp)

**Software Reliability**

S. J. Keene (s.keene@ieee.org)

**Standards & Definitions**

Y. Lord

(Yvonne\_Lord@mail.northgrum.com)

T. L. Brogan

(Thomas\_L\_Brogan@res.raytheon.com)

**Testing & Screening**

H. A. Chan (hachan@att.com)

**Warranty**

**SYSTEMS COMMITTEES**

**(8 committees)**

**Aerospace & Defense Systems**

D. L. Franklin (d.l.franklin@ieee.org)

**Automotive Systems**

C. Aladekugbe

(Clement.Aladekugbe@carrier.utc.com)

B. Dodson

(bryan.dodson@contiteves.com)

**Consumer Electronics**

Fred Schenkelberg (fms@hp.com)

**Energy Systems**

M. Lively (MbeLively@aol.com)

J. Zamanali (jzamanali@lucent.com)

**Industrial Systems**

H. Yajima (yajima@sdl.hitachi.co.jp)

**Information Technology &**

**Communications**

J. Healy (jhealy@telcordia.com)

**Medical Systems**

Vacant

**Sensor Systems**

Vacant



President's Message

Continued from page 1

your local chapter, establish a chapter in your area, get involved in one of the Technical Operations committees, help develop IEEE reliability standards and best practices, or run for election as an AdCom member. Get involved and ex-

ercise your technical and administrative skills. If you are not sure how to get involved, contact your local chapter officers or your national officers. They will be more than happy to answer your questions and to guide you.

Have a great year,

**Dennis Hoffman**  
**dennis.r.hoffman@lmco.com**



# Chapter Activities

## Baltimore

**Walter E Willing**

## Binghamton

**Jefferson D Bronfeld**

## Boston Chapter

The Boston Chapter is wrapping up another busy year.

Since our last report, we had three consecutive monthly meetings covering different reliability prediction approaches. In January, Joe Dzekevich of 3Com Corporation discussed a networked version of the RELEX software tool that has been implemented at 3Com. In February, David Tong of Helix Technology Corporation reviewed the new PRISM methodology developed by the Reliability Analysis Center. Lastly, in March, Gene Bridgers of Sycamore Networks presented his parts count approach using the MTBF Calculator from MTBF Tools.

We held our second lecture series of the year in late March and early April. Joe Dzekevich and Gene Bridgers, who delivered a successful Fall Lecture Series on "Weibull Analysis," teamed together again to provide a three-evening Spring Lecture Series on "Design of Experiments Featuring the Fusion One Tool."

Our April monthly meeting is being hosted by Dana Crowe of M/A-Com, who will guide us on a tour of his facility, focusing on their World Class Environmental Testing and Analytical Physics Laboratories.

Finally, our capstone event is the "38th Annual Spring Reliability Symposium," which will be held on May 16 at the Holiday Inn in Boxborough, MA. This year's theme is "Reliability and Safety," and Dr. William Goble, author of the book "Control System Safety Evaluation and Reliability," will be the keynote speaker. John Rooney, the Program Chair, has organized a full day of speakers on a variety of interesting topics. We hope to see you there!

For more information on Boston Chapter activities, please visit our web

site at <http://www.channel1.com/users/ieec/home.html>.

**Jeff Clark**  
**Chair, Boston Chapter**  
**jeclark@channel1.com**

## Central New England

**Jeffery A Clark**

## Chicago

**Frank D Straka**

## Cleveland Chapter

In October, Pete McCallum gave us an overview of the BASE Program. Pete showed how the Base Programs fit into the NASA hierarchy of enterprises and programs. In general, the Base Programs fund the more basic, fundamental research, while focused programs (such as the former High Speed Research Program) develop engine or airframe demonstrations. The Base Programs at Glenn are investigating a broad array of technologies in multiple disciplines, including materials and structures, instrumentation and controls, and all aspects of turbo machinery. Revolutionary technologies in the Base include things like pulse detonation engines, and rocket-based combined cycle systems. Pete has been at GRC for over 10 years, and for the last year has been the Acting Manger of Base Programs.

Our November meeting was given by Leo Burkhart. He talked about the GAP Program. He explained that the GAP Project has designed and built two demonstrators general aviation light aircraft engines in a short four-year period. A diesel engine which burns jet fuel, will cost half as much as current piston engines, and have very low noise and emissions was developed in partnership with Teledyne Continental Motors. A low cost, very efficient turbofan engine was developed in partnership with Williams International. The turbofan engine is the first small turbine engine that is cost competitive with piston engines and is making jet powered general aviation aircraft an affordable reality for the first time in

the history of general aviation. The first aircraft that has been enabled by this engine, the Eclipse 500 six-passenger twinjet, has already been publicly announced and scheduled for first delivery in mid 2003. This aircraft will cost less than some current high-end single engine piston and turboprop aircraft.

Leo has work at GRC for 33 years. He started at Lewis in the Solid Rocket Branch. Since then he has been a research engineer for the PSL altitude test facilities as a member of the Air breathing Engine Division, an analyst and supervisor in the Propulsion Systems Analysis Office, and is currently a Project Manager in the Subsonic Systems Office. GAP was closed out in 2000 and Leo is currently managing the Revolutionary Aero propulsion Concepts (RAC) Project that is part of the GRC base research Aerospace Propulsion and Power Program.

Our January meeting was arranged by Luke Wilkins, Tour Chair. The Winter Tour went to the Cleveland Justice Center. The tour included a visit to the Cleveland Crime Unit, the Police Museum, and the City Jail. The tour left Glenn Research Center at 1:15 PM from the Hanger Parking Lot. We used a bus to carry 40 people on the tour. The bus got us to the Justice Center by 2:00 PM. The Mayor and Criminal Court Rooms were busy hearing cases. We listened to a few cases. It came through loud and clear, this is not the place to be- avoid legal procedures whenever possible. The Police Museum had a well-organized display of past events that had occurred in Cleveland. Some very significant drug busts were made in Cleveland recovering up to 2 tons of drugs. The Jail is a good place to not to go. Conditions are intentionally hard on the prisoners in hopes that they will get the message to obey the law. We left the Justice Center during rush hour and managed to get back to Glenn Research Center by 5:00 PM. It was an informative tour that will not be forgotten soon.

Our March meeting was on the Civil War History. Mr. Cass Kuhl, Facilities Engineer at Glenn Research Center, gave

us an interesting talk on the military leaders at the Battle of Gettysburg, fought July 1, 2, & 3, 1863. The Confederate Army of Northern Virginia had won the first day's conflict under its famous commander, General Robert E. Lee. The Union Army of the Potomac was under the competent leadership of General George G. Meade. On the second day, Meade's III Corps commander, Daniel Sickles, disobeyed orders and advance his 11,000 men out of position. This nearly cost the Union army to be outflanked and did cost Sickles his leg. Sickles, a congressman from New York (and murderer of Francis Scott Key's son) had the bones of the leg put on display in Washington, DC and frequently visited them to show that he was a hero of the battle. The final day's fight resulted in the disastrous Confederate Pickett-Pettigrew-Trimble charge against the center of the Union Army's line. His talk was very informative and helped us all to understand the complex nature of the largest battle ever fought on this continent.

The '01 RAMS was a big success. We plan to support '02 RAMS on the Management Committee, with papers, and tutorial suggestions.

We have been invited to put together a proposal to bring AUTOTESTCON to Cleveland in 2004. The proposal is being prepared as a joint effort between our Chapter, the Section, and the Cleveland Convention Center.

Overall, here in Cleveland we are having fun staying active and trying to serve the needs of our members.

**Vincent Lalli, Chair**  
**Vincent.R.Lalli@lerc.nasa.gov**

## CINCINNATI Chapter

## Dallas Chapter

**Lon E Chase**  
**l-chase1@raytheon.com**

## Denver/Pikes Peak

**Samuel J Keene**

## Japan Chapter

**Shuichi Fukuda, Chair**  
**Chair, Japan Chapter**  
**fukuda@tmit.ac.jp**

## Los Angeles Chapter

Our March meeting was held in conjunction with the San Fernando Valley Section meeting. Dr. Mohammad M. Mojarradi, presented an overview of "NASA's System on a Chip Technology Program". He reviewed the Jet Propulsion Laboratories/Center for Integrated Space Microsystems JPL/CISM program goals and the system on a chip, SOAC, program objectives. A discussion of SOAC technology directions included: Integration technology, Sensors, Power management, and power sources. Also included was an overview of the Revolutionary Computing

Dr. Mojarradi is a specialist in integrated high voltage sensors and high voltage mixed mode integrated circuit design. He received his Ph.D. in Electrical Engineering from UCLA in 1986. He has more than 18 years of industrial experience in his field. Dr. Mojarradi recently joined the System-On-A-Chip program at the Jet Propulsion Laboratory. Prior to this work he was an associate professor at the Washington State University and the manager of the high voltage integrated circuit group at the Xerox Microelectronics Center in El Segundo California.

Dr. Mojarradi currently holds 22 patents in his field. Mojarradi's current work is focused on developing power management and distribution circuits for system on-a-chip applications using VLSI compatible high voltage transistors. These types of transistors offer the potential for design of high voltage interface circuits that could coexist with the conventional low voltage circuits.

**David L Franklin**  
**d.l.franklin@ieee.org**

## Twin Cities

## Minnesota Chapter

**Submitted by James McLinn,**

**Past Chapter chair,**

**for Norb Santoski Chapter chair**

**JMREL@AOL.com**

## Mohawk Valley

**Vacant**

## North-Central-Southern Italy

**Fausto Fantini**

## Ottawa

**Wahab Almuhtadi**

## Philadelphia Chapter

### 19 September 2000

#### **Part 1. THE POWER OF NEGATIVE THINKING - William J. Altier**

Hardly a week goes by without a major media story about a serious unexpected problem ranging from the foreseen but ignored such as the Challenger spacecraft explosion to unforeseen new product failures or new manufacturing operation debacles. Why do these things happen? Why don't people do a better job of anticipating them and thus be able to prevent them? A major reason is simply that too many people have an aversion to negative thinking. In *The Power of Negative Thinking*, Bill Altier brings to light examples of major blunders which, if the people involved had spent a little time thinking about what could go wrong, the blunders could have been prevented. He proceeded to show how asking a few simple questions can increase their power of negative thinking, thus decreasing the unanticipated negative effects of their actions. Negative thinking can be a powerful contributor to organizational effectiveness if and when its role and process are understood, appreciated, and applied. In the absence of this understanding and appreciation, it becomes something to be abhorred by those who prefer to bury their heads in the sand. The talk concluded with: (1) an appreciation of the value of negative thinking; and, (2) an awareness of a specific thinking process you can use to identify and prevent potential problems.

#### **Part 2. ADVANCED MATERIAL HANDLING SYSTEM FOR FUTURE NAVY SHIPS - E. J. Crawford**

The U.S. Navy vision for future ships is an all-electric, open-architecture, au-



brainstem/spinal cord disorders/injuries and methods of their treatment.

**Fulvio E Oliveto**  
**Philadelphia Section**  
**609-722-3147**

## San Diego Chapter

### **FIRST RELIABILITY SOCIETY CHAPTER MEETING IN SAN DIEGO**

The San Diego Chapter of the IEEE Reliability Society held its first meeting after becoming an official chapter in July 2000. The meeting was held on 21 Aug at the Wyndam Garden Hotel in San Diego. Food was served, a formal presentation was made and election of officers followed. The meeting was attended by 12 members and guests.

The presentation was "Elements of Design Evaluation and Qualification Testing" by Henk Posters, Medtronic (Retired). The presentation focused on design evaluation, qualification, and validation test practices. It gave an overview of the requirements for developing and executing sound test plans, including some of the statistical and quality tools needed.

Our speaker's background is very impressive. He is a Registered Professional Quality Engineer. He retired from Medtronic, a leading manufacturer of implanted medical devices, after 30 years of

service. Prior to his retirement he held director level positions in Manufacturing Operations and Product Assurance in the United States and Europe. Mr. Posters is a member of the IEEE Reliability Society. He is an ASQ Certified Quality Engineer and Reliability Engineer. He holds a BS degree in Electrical Engineering and an MBA in Manufacturing Management.

Officers Elected after the meeting for the period August 2000 through December 2001 were:

*Chapter Chairman:* Michael V. Frank  
sfainc@Pacbell.Net

*Vice Chairman:* Frode Odegard  
frode@odegard.com

*Program Chairman:* Lowell Smith  
lowells3@juno.com

*Promotion Chairman:* Tony Spurgin  
a-jspurgin@home.com

*Secretary:* Richard L. Doyle  
ddoyle@cts.com

*Webmaster:* Frode L. Odegard  
frode@odegard.com

*Treasurer:* Henry Posters  
hposters@hotmail.com

See our chapter web site, at <http://www.odegard.com/rssd> for current meeting activities.

**R.L. Doyle, Secretary**  
**IN REPLY**  
**(858) 459-6504**  
**REFER TO RLD:00801**  
**r.doyle@ieee.org**

## Santa Clara Valley

**Vacant**

## Singapore Chapter

### **(ED/Reliability/CPMT Joint Chapter)**

**Chapter Chair:**  
**Dr. Ong Soon Huat,**  
**email:**

**SOON.HUAT.ONG@NSC.COM**

**Report by: YC Ng,**  
**Secretary of Singapore**  
**REL/CPMT/ED Chapter.**

## South Plains

**Michael E Parten**

## Switzerland

**Mauro Ciappa**  
**Switzerland Chapter Chair**  
**email:**

## Toronto

**Walter W Zessner**

## Washington DC, No VA

**Kenneth P La Sala**

## **Reliability Society AdCom Candidates Sought for 2002/2003/2004 Term**

The IEEE Reliability Society is seeking candidates for serving on its Administrative Committee (AdCom) for the three-year term that spans 2002/2003/2004. The candidates should be members of the IEEE Reliability Society and have both technical and management experience. Serving on the AdCom requires attending the quarterly AdCom meetings and participating in one or more of the following areas of activity:

- Technical Operations,
- Meetings,
- Membership,
- Publications.

Additional information about these areas of activity can be found in the Reliability Society Constitution and By Laws at <http://ewh.ieee.org/soc/rs>.

If you are interested in becoming an AdCom member, please have either your employer supervisor/manager or an IEEE officer (e.g. chapter chair, society officer, section or region chair) nominate you. With their nominating message, please include the information shown below. Please send nominations to Ken LaSala, Junior Past President at not later than 15 July 2001:

- Your full contact information: name, mail address, telephone number, FAX number, e-mail address.
- A concise professional biography that summarizes your technical and management experience and your educational background. The biography should be 350 words or less.
- A short statement of what you can contribute to the Reliability Society.
- A short statement that identifies in which Reliability Society activity area you would like to participate.

The submission date for nominations is firm. Your information will be for-

warded to our Nominations Committee, which will consider it for inclusion in our 2001 AdCom election ballot. Self-nominations will be considered, although pri-

ority will be given to those nominated as described above.

If you know other people who you believe would be good candidates for the

AdCom, please encourage them to have their nominations submitted.

## IEEE Reliability Society AdCom Meeting

**Philadelphia, PA  
January 20, 2001**

### Attendees:

Marsha Abramo \*, Loretta Arellano \*, Ann Campbell \*, Dick Doyle \*, Ralph Evans, Tom Fagan, Joseph Fragola \*, Dave Franklin \*, Ted Freeman \*, Suichi Fukuda \*, Bob Gauger \*, Christian Hansen \*, John Healy \*, Dennis Hoffman, Koichi Inoue \*, Keith Janasak, Lori Kaufman \*, Dick Kowalski \*, Sam Keene \*, Way Kuo \*, Ken Lasala \*, Bob Loomis \*, Val Monshaw, Fulivo E. Oliveto, Hiroshi Tajimn, Bill Tonti \*, Jeff Voas \*, Mladen Vouh, Peter Weisner (\* = Voting RS AdCom member)

The meeting was called to order at 8:30AM by Dennis Hoffman. The class of 2003 was introduced: They included Dick Doyle, Dennis Hoffman, Suichi Fukuda, Bob Gauger, Christian Hansen, And Ted Freeman (by appointment) who will replace Pat Hetherington.

The ADCOM officers were then introduced. Dennis Hoffman President, Koichi Inoue VP Tech Ops, Bob Loomis VP Publications, Jeff Voas VP Meetings, Ann Campbell, VP Membership. Appointments pending are William Tonti as Secretary, Dick Kowalski as Treasurer, Way Kuo as Transactions on Reliability Senior Editor, Dave Franklin as Newsletter editor. All appointees were approved by the ADCOM.

The ADCOM at large then recognized Tom Fagen, past RS president, and our RS representative to the RAMS Board of Directors.

### Society Overview:

Dennis Hoffman

We have 3,000 members worldwide, healthy finances, an active technical program, support conferences of interest to our membership, publications: Transactions on Reliability, Transactions on

Semiconductor Manufacturing, the Newsletter, and collaboration with several councils

AdCom has four meetings a year, 18 elected members for 3 year terms at large, plus ex-officio members with and without a vote. The election process begins with the nominating committee or by nominating petition from Society membership.

Dennis made the point RS provides approximately twice the return by way of membership benefits as compared to the cost of joining RS. A detailed overview of the organizational structure followed. This will be available on the RS homepage, <http://www.ewh.ieee.org/spc/rs>.

The 10/21/2000 meeting were minutes Approval:

### Presidents report:

Dennis Hoffman

TAB (Technical Activities Board), would like better ties between industry and IEEE, to help boost membership. Initiatives of TAB: Financial Model, TAB Organization, New Prod Dev, Membership, Relationships, and to Foster New Technology. RS would like to know specifically what the TAB strategy is comprised of, and how RS will plug into this.

### TAB review:

Ken LaSala:

Membership is decreasing approximately 5%/year. Remediation requires the attraction of younger members. He also discussed how our current operations conflicts with the interests of such potential members.

Tech Ops issues raised. In general we made good progress in this area. However RS needs to become involved with emerging technologies. RS requires more paper for publications on emerging technologies. Standards or guides for emerging technologies are needed. (with rapid

deployment). We need to avoid the "same old stuff". Sam Keene posed a discussion on global security. John Healy said that he would provide a list of places to peruse this information.

Publication issues discussed. RS should use the website to provide useful information. (i.e. change it's view from an administrative perspective). He is investigating how the RS handles papers with participation in IEEE councils.

Meetings ideas raised. Joe Fragola made the comment that RS should "internationalize" with the European (e.g.) conferences.

### EXCOM meeting Highlights

Dennis Hoffman

Discussions included reversing declining membership. More emphasis is required on emerging technologies. IEEE Publications proliferation is depleting RS resources. RS AdCom representation is needed in S/W and IT areas. Members need an understanding of both the IEEE and RS AdCom. The RS Bylaws and Constitution requires an update. (not very extensive. I.e. field of interest is complete, however senior VP duties requires a formal description.). The EXCOM did not produce a simple mission statement for AdCom to adopt.

### Treasurers Report

Dick Kowalski

Dick distributed a hardcopy report. For the 2002 budget was approved.

### Meetings (future AdCom locations)

Jeff Voas

Hong Kong ISSRE Nov., Singapore (to support a chapter or IPFA) July 9-13, Taiwan, Hawaii – NanoTechnology 10/30. The AdCom decided to meet in Singapore in 2001. The July 2001 meet-







ing will be held in San Diego is the prime site as a new chapter has been formed.

RS technical support was approved for the Nanotechnology Workshop and the -Accelerated Stress Testing (AST) conferences. High Assurance Systems (HASE) requested fiscal support, AdCom approved technical support but took financial support under advisement and will vote on that option at a later time.

### **Publications**

Bob Loomis

### **Transactions on Reliability:**

Way Kuo

One year ago we were short on papers. This is not the case today, however IEEE headquarters is moving slow on accepted papers. In the past this process took a total of 3 weeks. With electronic publishing, as implemented today, it takes 8 weeks to complete. This is not acceptable to RS.

Way Kuo is using a semi edited IEEE service. Conversion of Transactions on Reliability database to a modern relational database was approved.

### **Newsletter**

Dave Franklin

Jan. newsletter received at IEEE 1/02/00. Andrea Watson is Dave's IEEE rep and contact. Advertising is improving 4pages of paid ads versus 2 pages last year, due to Bob Gauger's efforts!). Dave will transfer advertising billing to Bob Gauger.

### **Web Site Report:**

Bob Loomis

The present webmaster is not able to maintain the present website. Bob needs a new technical webmaster to step up to the open challenge.

### **Semiconductor Manufacturing:**

Marsha Abramo

Marsha has taken over for Tim Rost. Marsha attended a TAB periodicals review as a means to get on board. Areas of concern Marsha, as a member of the steering committee, is working on:

- Complete lineage of revisions:
- Recommendation: Authors to detail this.
- Assoc. Editors must work in their field.
- The structure and role of steering committee:
- Guidance and influence of EIC and editorial board.
- Periodic e-mail on budget matters and sponsors.

No face to face meetings were held with steering committee. Open ended, presently the steering committee chair and EIC make most decisions. Marsha would like to involve the entire steering

committee and editorial staff. Marsha contacted Dave Hodges (steering comm. chair) with respect to future meetings etc. Thus far none are planned. Bob Loomis suggested a periodic steering committee meeting take place even as a telecon. Bob has taken this as an action item

## **T-DMR**

Ann Campbell:

- W. Tonti actively working with the EIC.
- On Line peer review in place 10/00.

Approximately 12 papers received, some contributed, some invited. IEEE Explorer also requires an update to handle the revenue stream of advertisers. There is an agreement to post papers on the web one week after acceptance. Ann Campbell will organize periodic meetings of steering committee.

## **Technical and Financial Sponsorship request:**

Mladen Vouk requested and the AdCom approved for RS to technically sponsor SRE (Software Reliability Working Group) and financially sponsor it once.

## **IEEE Education**

Video Status: Sam Keene

Software videos: The ensemble has broken even. AdCom agreed to support a software fault tolerance video and to permit a 50% co sponsorship by the Computer Society. AdCom approved RS purchase two of each videos we presently do not own (one PAL, one NTSC) to update the RS library. Sam Keene will negotiate the cost of the videos.

## **IEEE current Initiatives: New ways to deliver education.**

Peter Wiesner

We discussed lifelong education and expand PDI (Prof Dev. Institute) educational content, Linking PDI to IEEE Xplore, Career Navigator. The plan is to initiate overview courses and link them with Xplore. Societies need to be involved.

Bob Loomis pointed out that good human interface engineering is needed in distance learning, and is also required for video courses. Peter realizes marketing IEEE products is a problem. Ted Freeman opened discussion to video-tape the local

chapter presentations. Replies of Dick Doyle and Peter Wiesner suggested that these are the draws of which professional videos are made, and that it is very difficult to produce a low cost quality copy. Dennis Hoffman asked, "How do we capture the lost presentations?" Peter suggested an AV capture of a powerpoint presentation. Lauri Kaufman suggested some will not be able to comply with this as the speakers may violate a copyright. Ted Freeman and Peter Wiesner to work on producing a low cost reliability seminar series, using the Dallas Chapter speakers as a pilot vehicle

## **Transactions on Reliability:**

Ralph Evans

Publication is running 3 months behind schedule based on the time it takes the IEEE for conversion to SGML their publishing language. Associate editors generally are running behind schedule. In an effort to devote more time to the transactions, Ralph has retired from the RAMS publication activity. The 2000 September issue will be delivered to IEEE headquarters by 1/31/2001. The 2001 Transactions have enough papers to fulfill all of 2001 issues. (There is currently no shortage of papers).

Production problems are caused several electronic publishing issues. Word is incompatible across continents and versions. Figures in EPS have many versions and problems.

Approximately 25% of the papers are outside of the U.S. Special sections have been moved "later on" versus Way Kuo's original plan. All 4 2001 issues will be delivered to IEEE on time. Ralph recommended we increase the page count in 2002. Dick Kowalski affirmed the increase, the request is to be made in April of the preceding year. Bob Gauger volunteered to take over the Transaction advertisements on pages 3 and 4.

## **Technical Operations**

Koichi Inoue

This is the fourth report covering 10/00 to present. A new chairperson was appointed, Fred Schenkelberg, who will handle Consumer Electronics. There are three tech ops chair positions vacant: Warranty, Medical Systems, Sensor Systems.

The Tech Ops Roster revised and distributed on 1/16/2001. Bob Loomis to place this on the RS website. Tech Ops committee report compiled by Christian Hansen is completed and will be in the January issue of the RS newsletter published by Dave Franklin. The distribution list for the reliability analysis standards working groupst is public. It can be found at <http://grouper.ieee.org/groups/reliability/wg1413/index.html>. A review of the tech ops manual is now in process.

Council Sponsorship: Are we obtaining reasonable benefits for our members by participating? Result: Koichi recommends keeping support for confirmed liaisons, and he requires more time to decide on both questionable and uncertain liaison representatives. AdCom approved support for the Nanotechnology Council.

## **Membership**

Ann Campbell

- Goal: To increase membership.
- Method: Distribute a survey to all RS members.

As former VP of Membership Marsha Abramo has completed a draft of the above mentioned Reliability Society survey. John Healy has reviewed this first draft. If any one else would like to comment, please e-mail and discuss proposed updates with Marsha. The plan is to move forward and distribute the survey to the RS community by 3/2001. Ann would like to have a distribution list of the Reliability Society members. Approval was given to Ann Campbell to give a single prize to a randomly selected member of the pool of Reliability Society members who complete the membership survey.

- PACE, Ann Campbell reviewed the importance of PACE.
- RS Logo, the initiative was revived by Ann Campbell

## **Chapters**

Loretta Arellano

The Madrid chapter presentation and follow-up by Loretta are presently being pursued. The UK and RI are interested in forming a joint chapter and there will be a Jan 30 meeting to kick off the joint chapter.

At Loretta Arrellano request AdCom agreed to fund and support an annual Chapters Congress concurrent with the July AdCom, funds include \$500 airfare,

and two nights hotel maximum per participant. The purpose is to present Chapters lessons learned, an IEEE overview, and expose them to AdCOM.

Loretta sent out nominating cards for engineer of the year. This resulted in a much larger pool of candidates to review. Congratulations to Scott Abrams who is the engineer of the year.

### **Long Range planning:**

Dick Doyle

Dick has a complete the revised listing of the AdCom e-mail list.

### **Past presidents is this Monday.**

Changes to the constitution will be considered. The Field of interest is completed. (We will not vote on this today). Bylaws to be reviewed at the next meeting.

### **Future Meetings:**

Dennis Hoffman:

A form for motions requesting AdCOM money requests will be placed on the www by Dick Kowalski. AdCOM members are asked to download the form and prepare it for presentation during the AdCOM meeting.

### **New Business**

Ken Lasala

The IEC TC 56(International Electro Technical Commission, Technical Committee) would like to offer the RS organizational membership. The membership fee is approximately \$250/yr. The benefit to RS is that we would be able to send drafts and comment on voting copies of the IEC reliability standards documents. AdCom approved the RS to organizationally join the IEC TC 56 US Technical Advisory Group for Year 2001.

### **Financial Closeout Statement of the actions for the Jan 2001**

#### **AdCOM:**

Dick Kowalski:

This meetings approved motions authorized an additional funds to the 2001 budget.

## **Annual TechOps Meeting**

The annual TechOps meeting was held at Philadelphia Marriott on January 21, 2001, in conjunction with the RS AdCom

meeting and 2001 RAMS. We had 24 participants in the meeting, of which 13 are chairs of the TechOps Technical Committees, and the rest are RS AdCom members and guests.

The meeting was called to order at 8:30 AM. After self-introduction by the participants, (1) the former President, Ken LaSala, spoke about the state of the RS, opportunities for the RS with new technologies, and having Tech Ops contribute more directly into our Pubs area, (2) the Vice-President of TechOps, Koichi Inoue, gave a summary of TechOps Activities in the year 2000, (3) the Chairs made presentations on their year-end activity reports for 2000 and on plans for 2001 of their Technical Committees, (4) the Vice-President of TechOps gave his plan for 2001 and his policy to operate overall TechOps, and (5) the new President, Dennis Hoffman, gave his message to the participants, which concluded the meeting. Meeting adjourned at 12:30 PM.

## **Summary of TechOps Activities in 2000**

Below is the simplified Summary of TechOps Activities in 2000, which was presented to the Annual TechOps meeting, January 21, 2001 at Philadelphia Marriott. For the individual activity reports and plans for 2001 of the Technical Committees, see the separate reports to follow.

1. Four TechOps Status Reports were presented at the four AdCom meetings:
  - 1) AdCom meeting in San Jose, April 8, 2000
  - 2) AdCom meeting in Burlington, July 15, 2000
  - 3) AdCom meeting in Madrid, October 21, 2000
  - 4) AdCom meeting in Philadelphia, January 21, 2001.
2. Inputs to the Newsletter:
  - 1) Vol. 46, No. 3, April 2000: Tech-Ops Technical Committees Reorganized
  - 2) Vol. 46, No. 4, July 2000: TechOps Technical Committees Reorganized –Part 2
  - 3) Vol. 46, No. 5, October 2000: TechOps Technical Committees Reorganized –Part3

- 4) Vol. 46, No. 5, October 2000: Technical Operations Semiannual Report
- 5) Vol. 46, No. 5, October 2000: Committee Reports.

### **3. Chairs Appointed and Left:**

The six chairs have been newly appointed:

- 1) Keith Janasak (CAD/CAM), Raytheon Electronic Systems, who replaced the former Chair Dennis Hoffman and who was the Co-Chair of the Committee.
- 2) Clement Aladekugbe (Automotive Systems), Carrier Corporation. The name “Automotive Systems” is used instead of “Transportation Systems” by the request of the Chair.
- 3) Hiroshi Yajima (Industrial Systems), Systems Development Laboratory, Hitachi, Ltd., and Visiting Professor, Tokyo Institute of Technology.
- 4) John Healy (Information Technology & Communications Committee), Chief Scientist, Network Reliability, Telcordia Technologies, who replaced Hank Wolf.
- 5) Dave Franklin (Aerospace & Defense Systems).
- 6) Fred Schenkelberg (Consumer Electronics), ESTC Product Reliability Team, Hewlett-Packard Company.

Unfortunately, we lost the two chairs:

- 1) Hank Wolf  
Information Technology & Communications)
- 2) William A. Zeller (Warranty)

Presently the vacant chair positions are three:

- 1) Warranty
- 2) Medical Systems
- 3) Sensor Systems
- 4) TechOps Roster and TechOps Mailing List:
- 5) The TechOps Rosters have been revised as needed and distributed among TechOps chairs and AdCom members. The mailing list for RS TechOps has been created with the latest TechOps roster. The list has been and will be updated as necessary.
4. The Annual TechOps Report on “The Status of Reliability Engineering Technology 2001” was published in the Newsletter, Vol. 47, No. 1, January 2001.

**Koichi Inoue**

VP TechOps  
inoue.k@ieee.org

## TechOps TC Activity Reports and Plans for 2001

### TECHNOLOGY COMMITTEES:

#### CAD/CAE:

Chair: Keith Janasak  
(kjanasak@raytheon.com)

Committee Members: Dennis Hoffman, Ken Lasala, Michael Tortorella, David Followell and David Barber Jr.

#### 2000 Activity Report:

The Reliability CAD/CAE Tech Ops Committee's objective is to stay current on today's R&M CAE tools and tomorrow's emerging R&M CAE direction. Members attend related conferences and work with R&M CAE vendors and academia to stay on the forefront of this technology domain. Information is communicated to practicing R&M engineers primarily through RAMS' CAE Track, which includes an Innovative R&M CAE Solutions session along with vendor tool demonstrations. This year's activity focused on planning and supporting the R&M CAE Track for RAMS 2001. Eleven invited panelists and moderators were identified to participate in the two R&M CAE Track sessions, along with many of the RAMS 2001 exhibitors. Track participants will be able to gain a better insight into the emerging R&M CAE methodologies, tools, and how they can be applied to solve real-world problems. Handouts of the Panelists' presentation material will be consolidated and available to the participants.

#### 2001 Activity Plans:

Pending approval of the RAMS Program Committee, the CAD/CAE Tech Ops Committee plans to continue to evolve the RAMS R&M CAE Track for RAMS 2002. Expanded panels and workshop formats will be considered based on participant feedback. Track presentation documentation will be provided. R&M Tool information will be provided for consolidation into the INCOSE Tools Database Working Group.

#### Human Interface Technology:

Chair: Kenneth P. LaSala  
(k.lasala@ieee.org)

Committee Members: Jay Crowley, Lucia Vilela Leite Filgueiras, Helen M. Gigley, Richard S. Ullman, Lori Kaufman, Ronald D. Kaye, Yi Hong, Ned Criscimagna, Takehisa Kohda and Catherine M. Burns.

#### Activity Report for 2000:

Human Interface Committee activities for 2000 consisted of assembling the HIT Committee contribution to the Reliability Society Annual Technical Report, some preliminary discussions of the approach to the human reliability standard, and informal discussions of activities for 2001. One issue of a committee newsletter was published. The committee chair also prepared a Human Reliability tutorial for the 2001 Reliability and Maintainability Symposium (RAMS). A short form of the tutorial was given at the Reliability Society-sponsored workshops in Burlington, VT in July and in Madrid, Spain in October. A synopsis of the HFES human factors conference was submitted to the Reliability Society Newsletter and published. The committee noted that there were some sales of its IEEE human reliability video tutorial during 2000.

#### Activity Plans for 2001:

For 2001, the committee is considering producing a Draft Human Reliability Standard, and Updating the committee Web site, also the evaluation of proposal and possible technical support of a conference in China. The human reliability standard is a continuing project, as is the work on the committee's Web site. During 2000, our committee member from the Peoples' Republic of China proposed holding a human reliability conference in China. During our annual committee meeting on 24 January 2001 at RAMS, the committee will develop details for the above three projects and consider new projects that the committee members might want to propose.

#### International Reliability:

Chair: John P. Rooney  
(jprooney@adelphia.net)

No report was submitted to the VP TechOps.

#### Mechanical Reliability:

Co-Chair: Richard L. Doyle  
(r.doyle@ieee.org)

Co-Chair: Pat Hetherington  
(phetherington@iitri.org)

Committee Members: James D. Raze, Douglas Holzhauser, Chuck Hamstra, Ken Blemel, Bruce Blackford, David Weis, Mike Pecht and N. Bernstein.

#### Activity report for the year 2000:

As you know, the Mechanical Reliability Committee is a small and very specialized committee. However, the functions that it performs are very important in the overall failure rate of electrical systems. In an attempt to provide major accomplishments, the following tasks were completed during the last year.

1. Prepared a presentation for the Madrid, Spain ADCOM meeting. The presentation was on Micro-electromechanical Reliability, MEMS.
2. Provided an input to the the 2001 Annual Technology Report.
3. In cooperation with other Technical Operations committees, provided a MEMS video tutorial.
4. In cooperation with other Technical Operations committees, provided a MEMS seminar in Burlington, VT.

#### Activity plans for the year 2001:

Publish a summary of our activities in the newsletter.

Establish a procedure for holding an annual meeting of all committee members to discuss: 1) Strengths and weaknesses of our committee, 2) How they can improve their input to us by reporting what they are doing, 3) Establishing better communications and more interaction between committee members (Email) and 4) Send out a letter to committee members requesting that they become more active in our Committee.

#### Expected results from the activity:

- Tutorial (Video)
- Tutorials (at Nano 2001, Power Supply 2001)
- Newsletter Articles (1 every 6 months)
- Newsletter Announcements (1 per year)

#### Microelectronic Technologies:

Co-Chair: Ann N. Campbell  
(ancampbe@sandia.gov)

Co-Chair: Timothy A. Rost  
(t-rost@ti.com)

Committee Members: Marsha Abramo, Alan Street, Bill Tonti and Bud Trapp.

**Year 2000 Activities:**

The committee was formed in early 2000. Our goal is to provide a vehicle for the Reliability Society Membership to keep abreast of developments in this rapidly-changing field. We plan to accomplish this goal by publishing a series of technology articles in the Reliability Society Newsletter (one or more per issue) on a range of topics relevant to the reliability of microelectronics and related microtechnologies. While our focus is primarily the reliability, we also propose article to introduce new and emerging microtechnologies.

The committee held a face-to-face meeting during the July AdCom meeting in Burlington, VT. We agreed to develop a series of articles on the following topics, which will appear in the RS Newsletter during 2001:

- Integration of logic and DRAMS,
- Electrostatic Discharge protection for high frequency devices,
- Reliability and packaging issues/new microelectronic materials,
- Failure Analysis and reliability of RF components,
- MEMS Reliability.

**Year 2001 Activity Plan:**

- The 5 technology reports listed above will be completed and will be submitted to the RS Newsletter for publication at the rate of 1 or more articles per issue.
- The committee will meet face-to-face at least once during the year, and will plan the next series of topics for publication in 2002.
- With this issue of the Reliability Society Newsletter, the Microelectronics Technology Committee begins presenting a series of short technical articles on topics of current interest in the area of microelectronics and microsystems reliability. If you have suggestions for future topics, please send them to Ann Campbell at [ancampbe@sandia.gov](mailto:ancampbe@sandia.gov).

We welcome member input on microelectronics technology topics of interest. Please send your suggestions for articles to Ann Campbell at [ancampbe@sandia.gov](mailto:ancampbe@sandia.gov). You are welcome to volun-

teer to serve on the committee and/or to submit an article.

**Reliability Design:**

Chair: Marvin Roush  
([roush@eng.umd.edu](mailto:roush@eng.umd.edu))

No report was submitted to the VP TechOps.

**Reliability Methodology:**

Chair: Christian K. Hansen  
([c.k.Hansen@ieee.org](mailto:c.k.Hansen@ieee.org))

a) I will attempt to recruit new members for the committee.

b) I agree to serve as editor of the annual report on the Status of Reliability Engineering Technology 2002. The completion of this report is contingent upon receiving sufficient input from the other RS Technical committee chairs. Input will also be solicited from the Reliability Society Officers, from members of the Reliability Society and other professionals in the reliability field willing to contribute. In April 2001, I plan to send out a request to all Tech Ops chairs, and ask for their commitment to contribute to this report. A commitment to contribute means that they will contribute. I will also ask each contributor to provide a brief list of topics that he/she anticipates covering. This will allow me plan ahead, and seek information on topics not covered by the Tech Ops committees. I anticipate a deadline of submissions to be in August, with a target publications date of January 2002.

c) I will participate in reviewing and revising new and existing standards in the area of reliability methodology through the participation in IEC WG2 International working group and the ASQ National Z1 committee on dependability.

d) I will participate in the annual Technical Operations Meetings and quarterly AdCom meetings (except possibly the AdCom meeting in Singapore due to limited travel funding).

e) I plan to prepare a paper for presentation at the Annual Reliability and Maintainability Symposium (RAMS) 2002. I will also be willing to participate on a panel or organizing/moderating paper sessions if requested.

f) I will give presentations on general or specific reliability topics on (other) appropriate occasions if requested. My name is listed on the RS Speaker's list.

g) I will contribute articles for the RS Newsletter (time permitting).

**System Safety:**

Chair: Yoshinobu Sato  
([yoshi@ipc.tosho-u.ac.jp](mailto:yoshi@ipc.tosho-u.ac.jp))

Committee Members: Toshiyuki Inagaki, Takehisa Koda, Koichi Suyama and Koichi Inoue.

**Activity Report in 2000:**

Distance warning systems (DWS) are commercialized in the car markets whereas emergency braking systems (EBS) stay still in the talking stage. Since the statistics are not sufficient to discuss the hazard-controllability or functional safety of the DWS and EBS, the technical committee took a reasonable share in estimating deductively how the collision risk is reduced with them. Safety integrity levels of DWS and EBS are also specified in accordance with "Functional safety of electrical/electronic/programmable electronic safety-related systems", IEC 61508.

**Plans for 2001:**

Advanced highway cruise support systems (AHS) covering advanced safety vehicles are now under consideration. In 2001, typical hazards newly introduced in these systems are identified and risks generated by the hazards are estimated. Also the functional safety of the AHS for conventional hazards is analyzed in order to evaluate how the overall system risks are reduced. The expected results appear in transactions papers and standards/guides.

**Software Reliability:**

Chair: Samuel J. Keene, Jr.

Committee Members: Jon Peterson, Craig Hyde and Norm Schneidewind.

**Activity report for the year 2000:**

- Liaison, management, and program committee support for the International Software Symposium on Software Reliability.
- Dr. Keene has two papers published for the ISSRE Symposium
- Hyde, Keene and Peterson presented a paper on software reliability modeling.
- Dr. Keene published two additional related papers this year.
- Participate on the Software Reliability Working Engineering Group associated with ISSRE.

- Dr. Keene gave an invited lecture on Six Sigma and Development Quality in Tokyo and a lecture on Software Reliability in Kyoto, Japan, at the invitation of the Tokyo IEEE Reliability Chapter.

Activity plans for the year 2001:

- Support the 2001 ISSRE symposium from a management, program and RS liaison stand point.
- Investigating opportunities for RS to sponsor a new symposium on safety critical software systems.
- Investigating RS support and participation in the Software Reliability Engineering Working Group, associated with ISSRE.

### Standards & Definitions:

Co-Chair: Yvonne Lord

(Yvonne\_Lord@mail.northgrum.com)

Co-Chair: Thomas L. Brogan

(Thomas\_L\_Brogan@res.raytheon.com)

Activity Report (Year 2000):

The Standards & Definitions Committee was involved in two standards projects during 2000. The status as well as other committee activity is summarized below:

#### 3-1) SCC 37 Reliability Prediction IEEE 1413.1 Guide

This project, sponsored by the IEEE Standards Board SCC-37 is intended to provide available methods that assist in the development of a prediction satisfying the attributes of the IEEE 1413 standard "Methodology for Reliability Prediction and Assessment of Electronic Systems and Equipment's" published in 1998. Specifically the Guides intent is to provide:

- A process for reliability prediction
- Methods and models to predict reliability for electronic components and systems
- Clear definitions and descriptions of reliability metrics
- Criteria for reliability prediction methods and models to make risk informed decisions on their use

The active committee members supported by an extended team have been holding either monthly telecons or face to face meetings at various sites. The active committee members include the follow-

ing individuals (shown with company affiliations): Michael Pecht, PE (Committee Chair), Jerry Cartwright, Dan Donahoe (Committee Technical Editor), Gary Buchanan, Vladimir Crk, Jon Elerath, Jeff Harms, Tyrone Jackson, Ari Jain, Jack Sherman, Alan Wood and Lou Gullo.

As indicated earlier in this report the committee continues to hold monthly telecons or face to face meetings. A schedule for 2001 is included as part of the November 30, 2000 teleconference minutes and can be found at <http://grouper.ieee.org/groups/reliability/wg1413/index.html>

Key dates on this schedule include submitting the Draft Guide for review during July 2001 with a planned submission of the document for Balloting in December 2001. The current outline of the Guide (October 2000) is shown below. Many of the sections have been completed with the committee refining the inputs as part of their monthly sessions.

#### Current Guide Outline (October 2000)

##### Section 1 Introduction

##### Section 2 Background

- 2.1 Business Goals-Program View and System Life Cycle
- 2.2 Basic Concept & Definitions
- 2.3 Reliability Prediction Inputs
  - 2.3.1 Reliability Prediction Metrics and Goals
    - 2.3.1.1 Constant Rate Metrics
    - 2.3.1.2 Probability of Success Metrics
    - 2.3.1.3 Availability and Maintainability Metrics
    - 2.3.1.4 Reliability Goals and Requirements
  - 2.3.2 System Architecture and Environment

##### Section 3 Reliability Prediction Methods

- 3.1 Predictions Based on Empirical Data
  - 3.1.1 Field Data Analysis
  - 3.1.2 Test Data Analysis
    - 3.1.2.1 Non-accelerated
    - 3.1.2.2 Accelerated Humidity, Thermal Cycling & Vibration
  - 3.1.3 Similarity Analysis
  - 3.1.4 Reliability Growth
- 3.2 Predictions based on Damage Simulation

##### 3.3 Predictions based on Handbooks

###### 3.3.1 Military Handbook 217

###### 3.3.2 Bleacher

##### 3.4 Assessment of Methods Based on IEEE 1413 Criteria

##### 3.5 Combining Methods to Predict Reliability

##### 3.6 Reliability Predictions for Non Failure Metrics

#### Section 4 System Reliability Prediction Methods

##### 4.1 Reliability Block Diagram

###### 4.1.1 Series System

###### 4.1.2 Parallel System

###### 4.1.3 Stand-by System

###### 4.1.4 (k, n) Systems

###### 4.1.5 Complex System

###### 4.1.5.1 Complete Enumeration Method

###### 4.1.5.2 Conditional Probability Method

###### 4.1.5.3 Cut-set Methodology

##### 4.2 Fault Tree Analysis

##### 4.3 Reliability of Repairable Systems

##### 4.4 Monte Carlo Simulation

#### Section 5 Summary

##### 3-2) Administrative Withdrawal of Project Authorization Requests ( PAR's)

The following Project PAR's were administratively withdrawn due to inactivity at the 21 September 2000 IEEE-SA Standards Board Meeting.

- IEEE - P1468 – Standard for Customer specified Performance Based Reliability Test Requirements ( Statistical Test Design Not Specified)
- IEEE – P1469 – Guide for Producers to Develop Statistical Test Designs for Customer Specified Reliability Test Requirements
- IEEE – P1470 – Guide for Customer Evaluation of Producer Developed Statistical Reliability Test Designs

The following Project PAR was administratively withdrawn at the request of the Working Group Chair (Dr. Paul Ellner) at the December 7, 2000 IEEE-SA Standards Board Meeting.

- IEEE – P1467 – Guide for Reliability Growth Management and Assessment of Nonhomogeneous Poisson Failure and Failure Mode Processes

Plans for 2001:

Continue to support and monitor the progress of the IEEE SCC 37 on Reliability Prediction (1413.1 Working Group).

Expected Product – Submittal of Draft Guide for Balloting.

### Testing & Screening:

Chair: H. Anthony Chan  
(h.a.chan@ieee.org)

A following tutorial was taped on September 1, 2000.

“Accelerated Stress Testing,” presented by T. Paul Parker, Lucent Technologies; H. Anthony Chan, AT&T Labs; Charles Felkins, Storage Technology; Anthony Oates, Lucent Technologies technically edited by Samuel Keene, Seagate Technology. The website addresses of the tutorial are at:

- CD-ROM: <http://shop.ieee.org/store/product.asp?prodno=EC133>
- Video in NTCS format: <http://shop.ieee.org/store/product.asp?prodno=HV7061>
- Video in PAL format: <http://shop.ieee.org/store/product.asp?prodno=HV7062>

Thanks to Sam for all the work.

The following handbook has just completed the very tedious proof-reading stage during September 2000 to February 2001.

- “Accelerated Stress Testing Handbook: Guide for Achieving Quality Products”, editors: H. A. Chan (AT&T Labs; Hong Kong Polytechnic University) and P. J. Englert (Lucent Technologies) <http://shop.ieee.org/store/product.asp?prodno=PC5873>

IEEE Press is sending it to printing shortly. Reliability Society was asked by IEEE Press to review the draft a couple years ago. The editors like to thank the reviewers for valuable suggestions. Unfortunately it is priced at \$94 for IEEE members probably because the book is quite thick (384 pages). Corporate discounts are available though. All royalty proceeds due the editors and authors from this book are donated to Missionaries of Charity, founded by the late Mother Teresa of Calcutta, for the benefit of their work in the continuation of serving the needs of the poor.

The following tutorials on the subject of this technical committee were presented at RAMS 2001:

- P. Vassiliou and A. Mettas (ReliaSoft Corp.), “Accelerated Life-Testing”
- H. A. Chan and T. P. Parker, “Product Reliability through Stress Testing”
- The IEEE Workshop on Accelerated Stress Testing for 2000 {<http://www.ewh.ieee.org/soc/cpmt/tc7/ast2000/index.html>} as held on October 2-4, 2000 at Boulder. The next workshop will be held on September 24-26, 2001 at Seattle. The announcement and the call for abstract is posted at {<http://www.ewh.ieee.org/soc/cpmt/tc7/ast2001/index.html>} This workshop is technically cosponsored by IEEE RS.

### Warranty:

Chair: William A. Zeller (left the position)

No report was submitted to the VP TechOps.

### SYSTEM COMMITTEES:

#### Aerospace & Defense Systems:

Chair: David Franklin (d.l.franklin@ieee.org)

The committee is investigating the need and efficacy for certification of reliability engineers and possibly the reliability engineering process (similar to the maturity models used for software and systems engineering).

We are also investigating the need for the application/benefits of software reliability methodologies in the aerospace industry. We will derive the questions and ask the Tech Ops methods committees to provide the answers.

The goals for 2001 are to continue these activities and gain at least two additional committee members.

#### Automotive Systems:

Co-Chair: Clement Aladekugbe (clement.aladekugbe@carrier.utc.com)

Co-Chair: Bryan Dodson (bdodson@visreon.com)

Committee Members: Richard Ajayi and Zung Lee

Activities and planned activities for 2000 and 2001:

- Encourage all team members to be certified reliability engineer and six sigma black belt,
- Attend IEEE and Reliability local chapter meetings,
- Attended 2000 and 2001 Auto Shows,
- Conduct projects on automotive quality, reliability and automotive technology development,
- Conduct monthly meetings via teleconferencing, video conferencing and internet,
- Work with automotive companies on reliability research and technology.

### Consumer Electronics:

Chair: Fred Schenkelberg  
(fms@hp.com)

Committee Members: Please contact Fred Schenkelberg (fms@hp.com) if you'd like to join this committee.

Activity Report for 2000: none

Activity Plan for 2001:

- Start committee, encourage and recruit members, and conduct monthly teleconference meetings.
- Submit one or two short articles to RS Newsletter.
- Establish connection with Consumer Electronics Association, specifically the safety and compliance group.
- Establish connection with NEMI roadmapping effort of consumer electronics and reliability.
- Determine and publish expected lifetimes of existing and emerging consumer electronic products. Conduct analysis on data to make projections of expected product lifetime in 2005.
- Identify and evaluate reliability challenges facing the consumer electronics industry. Provide white paper(s) that define issues and potential solutions.

*Possible projects for the committee may include:*

- Explore improved component, sub-assembly and system reliability reporting. (Break free of exponential distribution assumption.) Work towards standards on reliability definitions, determination and reporting.



- Understand and document cracked ceramic capacitor failures. Document in white paper and/or articles preventative and detection methods.
- Design for reliability for consumer electronics.
- Define reliability goals for new and emerging electronic appliances.

### Energy Systems:

Chair: Mark Lively  
(MbeLively@aol.com)

Activity report for the year 2000:

Participated in the meetings (up to 5 each year) and teleconferences of the

Energy Policy Committee of the IEEE-USA.

On a personal basis, I Published articles in Public Utilities Fortnightly and National Regulatory Research Institute Quarterly Bulletin and Made a presentation on reliability and pricing issues to the California Power Exchange Blue Ribbon Panel.

Activity plans for the year 2001:

Continued participation in the Energy Policy Committee of the IEEE-USA.

Work with RS data base manager to identify members interested in being on the Energy Reliability Committee with me.

Personally, Speaking to the IEEE Caracas chapter on the California experiment in changing the regulation of electricity (late April). This includes the creation of course outline and leader material and publication of additional articles, including one on seam management, how to deal financially with the interconnection between adjacent electric utilities.

### Industrial Systems:

Chair: Hiroshi Yajima  
(yajima@sdl.hitachi.co.jp)

Committee Members: Tetsuo Shirao and Hiroshi Ujita

Activity report for the year 2000:

- Start up committee,
- Selection of committee member,
- Set up of committee objective,
- Decision of committee activity,

- Articles for ATR (Annual Technology Report).

Activity plans for the year 2001:

- Survey of reliability technology at specific plant industries,
- Survey of reliability status and trend at plant industry,
- Selection of new committee member

Expected results

Annual committee reports

Information Technology & Communications:

Chair: John Healy  
(jhealy@telcordia.com)

No report was submitted to the VP TechOps.

### Medical System:

Vacant

### Sensor Systems:

Vacant

## IEEE Reliability Society ADCOM Agenda April 28, 2001

8:00 Continental Breakfast

8:30 Call to Order, D. Hoffman

8:30-8:40 Agree to Agenda, D. Hoffman

8:40-8:50 Minutes Approval, B. Tonti

8:50-9:20 President's Report, D. Hoffman

- Review of Action Items in Minutes from Last Meeting
- President's Remarks
- Advisory Board/Strategic Planning
- Feb. TAB Meeting Report (10 Min), L. Arellano

9:20-10:00 Secretary's Report, B. Tonti

- ADCOM Roster Update / Make Edits
- Requested Article on RS for Spectrum, by IEEE Educational Activities' Outreach
- Web Based Roster System Request

10:00-10:20 Break

10:20-10:50 Treasurer's Report, R. Kowalski

- FY00 Results
- FY01 Actuals vs Budget
- FY02 Budget Planning

- VP Meetings Credit Card Action Status

10:50-11:20 Meetings Report, J. Voas

- AdCom Meetings Plan
- Conference closeouts and budget approvals
- Significant events
- Sponsorship for Reliability Conference in China, K. LaSala
- Motion to approve

11:20-12:00 Publications Report, R. Loomis

- Transactions report, W. Kuo
- Evans Project Status, W. Kuo
- Newsletter report, D. Franklin
- Web site update status, R. Loomis
- IEEE Web Workshop Report, S. Fukuda
- T-SM Report, M. Abramo
- T-MDR Report, A. Campbell

12:00-1:00 Lunch

1:00-1:10 Publications Report (Con't), R. Loomis

- Video Program Status, S. Keene

1:10-2:00 Membership Report, A. Campbell

- Membership Action Plan, A. Campbell
- Member Survey Status, A. Campbell
- Logo Status, A. Campbell
- IEEE Membership Development Retreat Report, J. Healey
- Chapters / Chapter Visits, L. Arellano
- Chapters' Congress Plan, L. Arellano
- RS contact for Div VI activities for Sections Congress 2002
- Program Committee, L. Arellano
- Videotaping Chapter Meeting Presentation
- Test Case — Dallas RS Chapter, T. Freeman

2:00-2:40 Technical Operations Report, K. Inoue

- Technical Operations status / Committee significant events, K. Inoue
- Standards, Y. Lord, T. Brogan

- Council and Liaison Report
  - Sensors, K. LaSala
  - ITS Report, A. Campbell
  - Nanotechnology, A. Campbell
  - RS join the IEC TC 56 US TAG, K. LaSala
- 2:40-3:00 Junior Past President's Report, K. LaSala
  - By-laws and constitution revision progress, K. LaSala
- 3:00-3:20 Break
- 3:20-3:50 Senior Past President's Report, L. Arellano
- 3:50-4:10 Old Business
- 4:10-4:20 New Business
  - IEEE-USA organization is looking for nominations for officers
- 4:20-5:00 Other Topics
- 5:00 Adjourn

## SOLICITATION OF MANUSCRIPTS FOR IEEE POTENTIALS MAGAZINE

The IEEE Potentials Magazine is soliciting manuscripts for all aspects of Electrical, Electronic, Computer Engineering, and Computer Science. The IEEE Potentials Magazine goes to all student members of the IEEE (USA and Canada), presently about 45,000. The level of the article is addressed to the undergraduate student and has several objectives:

- Interesting the student in a topic for further study
- Explaining technology advances in an area

- A forum for technical ideas
- Articles of interest technically

It should be stressed that the article should not try to mystify the student, but to enable the student to learn more about technical material that the student may or may not become acquainted with in their formal course work.

The length of the article can be no more than 10 manuscript pages (8 1/2-11) reduced by the number of figures. Shorter papers are also acceptable. The manuscripts are reviewed by students, faculty,

researchers in the area and then a decision is made as whether to publish or not.

If interested contact, Dr. George W. Zobrist, Professor Emeritus, Associate Editor, IEEE Potentials Magazine, Department of Computer Science, 1870 Miner Circle, University of Missouri-Rolla, Rolla, Missouri 65409.

PHONE: 573-341-4492

FAX: 573-341-4501

EMAIL: zobrist@umr.edu

FURTHER INFORMATION CAN BE FOUND AT: [HTTP://WWW.CS.UMR.EDU/POTENTIALS](http://WWW.CS.UMR.EDU/POTENTIALS)

## International Standards 2000 IEEE Microelectronics Reliability and Qualification Workshop

The 3rd Annual IEEE Microelectronics Reliability and Qualification Workshop (MRQW), sponsored by the IEEE Reliability Society and the IEEE Components, Packaging, and Manufacturing Society, was held on Oct. 31st – Nov. 1st, 2000 at the Hilton in Glendale, CA. Organized by Founder and General Chair Dr. Sammy Kayali and Technical Program Chair Dr. John F. Conley, Jr., both of the NASA Jet Propulsion Lab (JPL), the workshop was a success. Over eighty people attended and participation was truly international, with authors and attendees representing eleven countries, twenty-three companies, fourteen universities, and thirteen government agencies.

The small size of the workshop encouraged extensive interaction among participants, detailed technical discussions, and excellent question and answer sessions during and after the presentations. The final technical program consisted of twenty-eight oral, five invited, and nine poster presentations. The keynote address was delivered by Dr. Leon Alkalai (Director of JPL's Center for Integrated Space Microsystems) and was entitled, "NASA's Deep Space Exploration: From Astronomical Units to Angstroms." Other invited speakers included Dr. Eric Vogel of NIST who gave an excellent presentation entitled, "Issues in High-k Gate Dielectrics for Future MOS Devices," Prof. Carl Thompson of MIT, "Cir-

cuit-Level and Layout-Specific Interconnect Reliability Assessments," Dr. Phil Canfield of Conexant, "Yield and Reliability Challenges in the Migration from DARPA GaAs Pilot Line to High Volume GaAs HBT Process Line," and Prof. Allesandro Paccagnella of the Universita di Padova who gave an informative presentation on "Radiation Effects in Ultra-thin MOS Gate Oxides."

Local Arrangements Chair, Dr. Joanne Wellman (JPL), coordinated the meeting facilities and activities, including continental breakfasts, two lunches, and an evening reception. Communications Chair, Peter Schrock (JPL) coordinated the paper submission process and the A/V part of the program. The Work-

shop Proceedings was prepared Mr. Schrock (JPL), Yvette Berumen (JPL), and Dr. Leif Sheik (JPL). Exhibits / Publicity Chair, Jim Weiler (JPL) organized the Industrial Exhibition, four companies exhibited. The Workshop webpage was maintained by Manuel Gallegos.

The MRQ workshop focuses on the latest results as well as work in progress in all areas of microelectronics device reliability and qualification methodologies. More information can be found at <http://parts.jpl.nasa.gov/workshop/home.htm>.

**Dr. John F. Conley, Jr.**  
**Technical Program Chair, MRQW**  
**2000**  
**NASA JPL**  
**California Institute of Technology**  
**Pasadena, CA 91109**  
[john.f.conley@jpl.nasa.gov](mailto:john.f.conley@jpl.nasa.gov)

## Meeting Notices

### FPL'2001

**Call for Papers**  
**Call for Tutorials**  
**Call for Exhibitors,**  
**Industrial Papers**  
**27 - 29 August 2001**  
**Belfast, Northern Ireland**

#### FPL 2001:

11th International Conference on Field Programmable Logic and Applications

Conference theme: Technology, tools and applications with a particular emphasis on DSP, networking and Telecommunications

**Paper deadline: 9 March 2001.**  
**Notification of Acceptance:**  
**14 May 2001**

The proceedings will be published by Springer Verlag - within the LNCS series (Lecture Notes on Computer Science). See: <http://link.springer.de/series/lncs/>

General Chair: Roger Woods, Queen's University of Belfast, [r.woods@qub.ac.uk](mailto:r.woods@qub.ac.uk). Program Chair: Gordon Brebner, University of Edinburgh, [g.brebner@ed.ac.uk](mailto:g.brebner@ed.ac.uk)

For further details, see the conference web page on: <http://www.ee.qub.ac.uk/dsp/fpl2001>

Authors are invited to submit PDF of their paper (10 pages maximum) by March 9, 2001 via E-mail to [fpl2001@qub.ac.uk](mailto:fpl2001@qub.ac.uk). For guidelines, see Web site <http://www.springer.de/comp/>

## Obituary

*It is with deep regret that we inform you of the passing of a leader in our field:*

### D. Stewart Peck

Stewart Peck was born on October 19, 1918 in Grand Rapids, Michigan the son of Arthur and Ruby Peck. Mr. Peck received his BSEE and MSEE degrees from the University of Michigan in 1939 and 1940. He began his career at General Electric Company. In 1947 he joined the Bell Telephone Laboratories, Allentown, PA. He retired from Bell Labs in 1980.

Mr. Peck died on January 9, 2001 in Chelsea, Michigan. Services were held on January 13th in Chelsea. Donations are being received at the Ann Arbor Hospice, 2366 Oak Valley Drive, Ann Arbor, MI 48103.

Mr. Peck became the Department Head in charge of the semiconductor reliability group when it was formed in 1958.

His leadership promoted the active use of accelerated testing, including 24-hour life acceptance tests at 280°C.

This activity promoted the use of accelerated stress by vendors, through the purchase specifications. For accurate evaluation, he prepared nomographs and graph papers to facilitate the use of the lognormal life distribution and the Arrhenius relationship for accelerated temperature.

The new procedures, based on the lognormal distribution, were used on all Bell System devices, providing confidence in the techniques. They have been used in all mechanisms found, such as ionic contamination, chemical and electrolytic corrosions, electromigration, and oxide breakdown. He has taught this topic to hundreds of engineers worldwide for over 20 years.

Mr. Peck has been active in the IEEE. He was a member of the Board of Directors of the International Reliability Physics Symposium (IRPS) representing the Reliability Society, and was General Chairman of the 1972 IRPS.

In 1979 Mr. Peck received an Award from the IRPS, "In recognition of his pioneering efforts in the field of Reliability Physics and on behalf of this Symposium."

Mr. Peck is a Life Fellow of the IEEE. He was an associate of Technology Associates, 1978-99. He is an author many papers and the Accelerated Testing Handbook (Editions: 1978, 1987, & 1991.)

His children, Donald Peck and Priscilla Peck Dunn, three grandchildren, and two great-grandchildren survive him.

# Technical Magazine Section

## Device and Product Design

William R. Tonti and Wayne Ellis

IBM Microelectronics

Burlington, VT

Process optimization techniques are employed in the design of present state of the art bulk silicon DRAM technology, contributor William Tonti reports. Numerous issues influence a MOSFETs in-line process and field reliability. Assuring a stable IC design is a great challenge, and has many concerns with today's small feature size. Some of these are investigated using present DRAM technology.

Inclusion of process tolerances and lifetime shifts during the design of a DRAM transfer device greatly influences the MOSFETs performance and reliability operating point. Given an appropriate relationship for each occurrence a statistical design methodology insures product stability. The device off-current ( $I_{so}$ ) and on-current ( $I_{on}$ ) trade-off are the primary design goals of a given technology. Simple scaling (i.e.  $I_{on} \propto (T_{ox} / L)V_t$ ,  $I_{so} \propto Ae^{-v_t/B}$ ) shows  $L$  and  $T_{ox}$  can be used to improve drive current. If nothing else is done, then  $V_t$  and subsequently  $I_{so}$  suffers. Well doping may be increased to compensate for the reduction in  $T_{ox}$  and  $L$ . This adjustment could lead to a large increase in base  $V_t$  tolerance, source to substrate sensitivity, and substrate hot carrier problems if not implemented in a manner, which mini-

mizes these adverse effects. There exists an optimum doping profile which satisfies the above conditions, Dr. Tonti reports. Today's state-of-the-art isolation technology is box shaped, and commonly implemented as a trench filled with SiO<sub>2</sub>. This isolation tends to have a parasitic parallel device gated at the isolation edges. In some cases  $I_{so}$  may be defined by the number of edges in a design rather than the total device width. Edge degradation therefore becomes a mechanism to be investigated in this type of isolation technology. Wafer-level burn-in and module-level burn-in test methodologies are important early life screens used to improve the overall yield by replacing circuit reliability failures with known good spare elements.

Contributor Wayne Ellis reports on the issue of *Functional Reliability* addressed in the realm of high performance DRAM product design and development. Insights into defects, their distribution and activation energies have been applied to the design methodologies for today's advanced DRAM products. These methods seek to reduce product sensitivities to the most common defect species, such as use of redundant elements for the DRAM array and use of relaxed design ground rules for the support circuits where the

concept of a redundant element is more problematic in its implementation, Dr. Ellis explains, however, the concern for the support circuits is moderated by at least two complimentary effects. The first is that the density of defects falls off as  $x^{-3}$  as defect size increases above the minimum printable dimension of the lithographic tools in the fabricator. The second effect is the increasing amount of defect induced leakage current needed to disrupt operation of the more robust support circuits.

Functional reliability issues relate to such electrical issues as noises in the chip power/ gnd grid, precision timing circuits and delay stability in the presence of process parametric variations. Another aspect is how device scaling and the required reduction of internal operating voltages is affected by the external operating/interface voltages defined by international standards bodies such as JEDEC. This dictates that the internal operating voltages and resulting device design point must be developed with consideration of external voltage and the electrical impedance characteristics of product package and the on-chip voltage regulation system and power grid.