Reliability Society

N E W S L E T T E R http://www.ieee.org/society/rs

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C O N T E N T S

Editor:
Dave Franklin
Associate Editor:
Dr. Robert J. Loomis, Jr.

President's Message

Increased Benefits With Your Reliability Society Membership!!!

As a member of the IEEE, your 1999 Reliability Society membership fee will be a flat $20! With your Reliability Society membership, you will now receive four publications:

- The annual Proceedings of the Reliability and Maintainability Symposium (RAMS)
- The annual Proceedings of the International Reliability Physics Symposium (IRPS)
- The quarterly Transactions on Reliability
- The quarterly Transactions on Semiconductor Manufacturing

In addition, you will receive the quarterly Reliability Society Newsletter plus on-line access to selected Electronic Device Society (EDS) periodicals via OPeRA - Reference associated article concerning OPeRA in this Newsletter.

Your Society is at work for YOU!

Please pass the word so that all Reliability Engineering professionals can benefit from membership in your Society.

Loretta Arellano
Reliability Society President
and
Your Elected Reliability Society Ad Com Members

Editor's Column

Call to Act

There is a new Council under the IEEE Technical Activities Board (TAB) on Intelligent Transportation Systems or ITS. The Reliability Society is a member of this Council. Our Society President, Loretta Arellano, and Vice President of Meetings, O. D. "Bud" Trapp, represent the Reliability Society on this Council.

At the TAB meeting in Detroit in June, there was review of the needs for participation by IEEE members to make this Council succeed. One of the KEY areas is Standards. (In the INSTITUTE, July 1998 issue, there is a front page article discussing the increased interest in "IEEE standards development".)

It would seem that members of the Reliability Society with their long history of contributions to the reliability of space systems, that there would be interested members who could make major contributions to

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Reliability Society Newsletter Inputs

All RS newsletter inputs should be sent to:

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The schedule for submittals is:

Newsletter	Due Date
January	November 19
April	February 26
July	May 28
October	August 27

ADVERTISING RATES

All copy that contains graphics or special fonts must be camera-ready or delivered on computer disk and be received by the due dates indicated.

Ad Size	One Time	2-3	4+
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Quarter Page	$205	190	180
Eighth Page	$120	110	100

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RELIABILITY SOCIETY OFFICERS

Chapter Activities

Boston Chapter

Our 36th Annual Spring Reliability Symposium was held on April 23, 1998 at the Boxborough Holiday Inn and was opened with an introduction by Program Chair Joe Dzekevich of 3Com. Jeff Clark, last years Spring Reliability Symposium Program Chair, presented last year's Best Paper award to Dick Bentz of Mitre Corporation for "Experience Report for the Software Reliability Program on a Military Acquisition and Development". Eleven papers were presented at the symposium with attendance of 54 people who enjoyed the opportunity to see what other professionals are doing and to share ideas and experience. Below is a brief description of each presentation.

Building-In Reliability by Keith Burgess

The semi-conductor industry is experiencing shrinking product life cycles and increasing reliability requirements. Simulation is becoming more important as a tool to build-in reliability because sample sizes needed to demonstrate highly reliable components become unmanageable. For example, 10 failures per billion hours (FITS) require 14,800 samples to achieve a 60% confidence level. Pushing reliability deeper into the R&D and design stages of product development is essential to achieve the required reliability. Management practices include fishbone diagrams with cross-functional teams to evaluate tradeoffs; communications, including the use of the intranet for data transmission; and cross-training on reliability issues. Building-in reliability is the only way to achieve the reliability goals in the semiconductor industry.

Modeling Reliability Growth Late in Development by Dr. Jeffrey Clark

Reliability is often overlooked during early development. The AMSAA model is difficult to apply in these conditions. A failure-discounting model, developed by L. H. Crow was more useful. With additional parameters, an extended Crow model was applied to a revision of the Advanced Warning and Control System (AWACS). The model was extended by adding 1) time dependence, 2) inherent failure rates, and 3) implicitly fixed failure modes (e.g., software bugs that got fixed due to a fix for an unrelated problem). The Extended Crow Model showed that demonstrated reliability followed projected reliability fairly well for both software and hardware failures.

Markov Modeling and SHARPE – Our Experience by Dr. Michael Elbert

System reliability modeling must include different levels of failures. As examples, a system may be up but some users are experiencing downtime or the system may have reduced capacity; or a system may have tolerable downtime. The model should also cover both hard failures as well as intermittent failures. The Markov Reward Model can be used to meet these requirements. The SHARPE tool allows the Markov model to be computed and provides the reliability and availability expectations.

Client Server System Availability Assessment by Dinesh Kumar

The Social Security Administration is upgrading their network infrastructure and needed an availability assessment. Server paths, redundancies, alternatives, failures, manual or automatic changeovers, and recoveries were among the characteristics that had to be defined to establish the client-server availability assessment. The SHARPE tool, using the Reliability Block Diagram method, was used to evaluate the availability. The installed base is now large enough now to begin validating the expectations.

Paranoid Programming - Techniques for Constructing Robust Software by Dr. Rick Harper

Five 9's reliability, including everything! Five minutes of downtime per year! Software faults are the leading cause of failure in fault tolerant systems. Software programmers should be paranoid about adding enhancements without adversely affecting the code. General principles for developing robust software include 1) defining success criteria for safety, what must never happen, and liveness, what must always happen; 2) understanding the environment, expected failure modes, and acceptable error handling; 3) selecting proactive or reactive techniques, 4) defining error containment boundaries, 5) defining error manifestation boundaries and detection mechanisms, 6) defining error handling actions, and 7) testing all error detection and recovery codes.

A Database and Its Implementation for Software Quality Problem Reports by Dr. David Heimann

Microsoft Access was used to develop a database for quality defects. The need came about to improve software quality assurance, where various manually generated tracking mechanisms were used. The Access database was developed to reduce the time to create the database, view the data and then generate reports, while also having with wide availability. The tracking database is focused on the project, where a defect is a deviation by a project activity. Fundamentally, the database is used to create quality defect reports and to track them to closure.

Accelerated Life Testing: Methodology and Software by Dr. Martin Schatzoff

A software bug prevented demonstration of a computer program, which was intended to evaluate accelerated life test data. In the example presented, the Arrhenius model was used to obtain the acceleration factors. The data was shown to have a Weibull distribution when the shape parameter was constrained to be parallel. Tests for Equality and Lack of Fit confirmed the graphical analysis. The life of the product was then projected.

Troubleshooting Under HALT Temperature Extremes Using Thermal Isolation Techniques by Brian Palmer

HALT testing is designed to test to failure. If the first failure occurs due to temperature relatively early in the test plan, methods can be used to isolate the failures so that testing can continue, sav-

ing much time and sometimes helping isolate the cause of the problem.

When failures occur in the cold, add resistors onto or next to the suspected component with epoxy. Embed a thermocouple as close as possible to the suspected component. Cover the epoxy and resistors with kapton tape to prevent the high airflow from cooling the component. You may want to put the kapton down first if you want to get the resistors off after the test. During your test, apply voltage across the resistor to heat the component.

At elevated temperatures, you apply the same concept except heat up resistors first and then raise the temperature of the chamber. If your suspected component has the problem, it will be at a higher temperature and fail first.

Field Proven MTBFs
by John Peter Rooney

Tracking shipments, tracking returns, knowing the life cycle process of your product and making a few assumptions can help measure field performance. In the case presented, products are given a unique barcode. Products are assumed to be operating 24 hours a day (even spares are usually hot stored), 365 days a year. Shipping times are assumed to average 30 days. After eliminating clerical error, customer refusals, and other non-functional problems from returns, the field MTBF can be calculated.

The case presented showed three interesting points. 1) When a problem shows up, it affects MTBF drastically as compare to return rates. In the case presented, an increase of 1.5-% points in the return rate resulted in a decrease of 20 years in MTBF. 2) As the number of products in field grows and the "Tyranny of Large Numbers" causes the MTBF to grow without corrective actions. 3) Customers have difficulty understanding MTBF; so do not try to confuse them further by providing confidence limits on the MTBF.

Estimating Reliability of Silver Plated Wire Wrap Reliability
by John Savi

Silver plated wire wrapping is a reliable connection; it is even rated better than a reflowed solder joint according to MIL STD 217. But, it does have an Achilles heal: active sulfur. In many industrial environments, sulfur is in the air and mixes with the silver to make silver-sulfide. Reliability evaluation of the field performance includes the techniques of visual examination, verification of sulfur, measurement of the plating, flexibility/brittleness testing and strip force testing. The result of the evaluation categorizes the connections as in the useful-life or wear-out stages. The sulfur must be removed from the environment, as the connections will eventually fail. Knowing the stage of the life can help users determine the best course of actions from monitoring the equipment for intermittent operation to having spares on-hand.

Managing Quality and Reliability Data
by Jack Olivieri

Setting up a database is not without its challenges. Obstacles to overcome include data transfer problems, changes to the data sources (e.g. MRP), developing useful reports and training of users. After establishing the basic requirements, Paradox was chosen as the software package to setup and implement a data collection/reporting system. The power of the system comes at the reporting level. Users have the ability to get field-returned data in standardized reports, of they can create custom reports.

At the conclusion of the seminar, each presenter was presented with a certificate.

Dr. Harry Saraidaridis, Lucent Technologies, the Symposium Chair, is giving a certificate of appreciation to Dr. Jeffrey Clark, The MITRE Corporation, for presenting "Modeling Reliability Growth Late in Development". Based on the evaluation forms Jeff's paper won the best paper award this year. Congratulations Jeff and many thanks for an excellent paper well prepared and well presented!!

A special Chapter Appreciation Award was presented to Don Markuson, Peritus Software Services, our Treasurer and Steering Committee Chair (and two times past Chair, among other previous roles) for continued devotion and outstanding contribution to the success of our chapter.

The Technology Development activity continued with two meetings:

On April 29th Lockheed Martin in Lexington was an excellent host for 16 people who had a vivid discussion on ATE (Accelerated Environmental Test). It was led by Gene Bridgers who started the evening with a presentation of the HALT/HASS program that was applied on a COTS product for the Bradley Fighting Vehicle.

On May 20th we visited the AET facility of 3Com corporation in Marlborough, MA. It started with an excellent presentation of Joe Dzekevich of the HALT process, benefits, steps and results. The second part was a tour of the AET facility by Bob Denaro, the HALT/HASS Manager with a very interesting explanation on the AET Chambers and the special fixturing capability that was developed by the group.

Finally, I would like to announce the elected officers slate for the next year:

Chair:

Giora Kedem, 3Com Corporation

Vice Chair:

Jim Fahy, Bay Networks

Secretary:

Jeff Clark, The MITRE Corporation

Treasurer:

Don Markuson, Peritus Software Services

Steve Dukich our Publicity Chair and our local newsletter editor prepared this write-up for our local Boston Chapter Newsletter. I thank him for his initiative, dedication and for making my task of submitting it to the Reliability Newsletter much easier.

Giora Kedem,
Chair, Boston Chapter
Giora_Kedem@3com.com

Cleveland Chapter

For information contact:

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

Dallas Chapter

The Dallas Chapter is gearing up for another successful program year. We

have a year under our belts and veteran officers returning to the helm. The Dallas Chapter officers are:

- Timothy Rost, Texas Instruments, Inc., Chair
- Rich Dell, Raytheon TI Systems, Vice Chair
- David Hannaman, Texas Instruments, Inc., Program Chair
- Ted Freeman, Membership Chair
- Thomas Yohe, Alcatel, Treasurer
- Lon Chase, Raytheon TI Systems, Secretary

I would like to thank these and past officers for their efforts in building this society to where we are today and wish them success during this next program year.

The meetings for this chapter are normally held on the 3rd Tuesday of each month. We cover a wide range of reliability topics with special attention given to the areas of semiconductor, telecommunication, and software reliability given the businesses in this area. The September program will be given by Pat Williams, Facilities Manager of TI Semiconductor Dallas East Building Complex. His program is titled "Sustainable Differentiation Through Facilities Reliability" and should be interesting to all reliability engineers.

If you have a need to be in the Dallas area and would be interested in getting on our speakers calendar, please contact me. It should be cooling down here soon (lower than 100F) and we do have a modest budget to help with travel expenses.

Best Regards,
Tim Rost, Chair
Phone: (972) 995-9035
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Los Angeles Chapter

For information contact:

David L Franklin
Vice Chair
d.l.franklin@ieee.org

Philadelphia Chapter

For information contact

Fulvio E Oliveto
Philadelphia Section
609-722-3147

Singapore Chapter

(ED/Reliability/CPMT Joint Chapter)

See Call for papers section of this newsletter.

For information contact

Daniel Chan, Chairman,
Singapore Reliability/ED/
CPMT Chapter
elecshd@nus.edu

Switzerland Chapter

The Switzerland Chapter will host the October AdCom meeting and has organized a tutorial in conjunction with the meeting. The program and the registration form for the tutorial, which will take place in Zurich on Oct 12, 1998, is available on the homepage of the IEEE Section Switzerland:

http://www.zuv.ee.ethz.ch/IEEE/ieee.html

Mauro Ciappa
Switzerland Chapter Chair
email: ciappa@iis.ee.ethz.ch

Tokyo Chapter

A bit of great news today! Mr. Richard L. Doyle, Jr. Past President of our Society, has kindly accepted our invitation and he will come visit the Tokyo Chapter this fall with the supports of IEEE Tokyo Section, IEEE Reliability Society and Kyoto University. He will give us two Special Lectures on "Thermal Analysis of Electronics"; the one in Tokyo on 20th of October, 1998 at Tokyo University of Mercantile Marine and the other in Kyoto on 23rd of October at Kyoto University. On 20th of October, prior to the Special Lecture, a General Assembly Meeting of Tokyo Chapter will take place, and after the Special Lecture, we will also have a welcome and get-acquainted party. Everyone will be welcome to join these great events.

As you know, the Tokyo Chapter has operated its own web site in Kyoto University since October 15th, last year, as the third one in all 23 chapters. Since its creation, about half year has passed, so a large-scale renovation was made to include the newest information on the Tokyo Chapter and its related topics on June 25th. Your revisits are quite welcome to URL: http://yang.kuaero.kyoto-u.ac.jp http://yang.kuaero.kyoto-u.ac.jp, our home page. Your comments and suggestions are also quite welcome.

Koichi Inoue
Chairman
inoue@vib.kuaero.kyoto-u.ac.jp

Call for New Reliability Society Logo

The IEEE Reliability Society is re-opening its logo contest this year. We are looking for a logo design that effectively conveys what the reliability discipline is all about as the 21st century approaches. The Reliability Society ADCOM Logo Subcommittee will evaluate all logos received and the winner will receive a $500 award. Our intent is to unveil the new logo at the 50 year anniversary banquet at the '99 RAMS in Wash, DC in Jan. '99.

General Guidelines:

- The logo should not contain too many words – it does not have to include "IEEE Reliability".
- Keep in mind the logo will be "shrunk" when it appears on letterhead and other publications.
- The logo should be simple and "eye catching".
- The winning logo will become the property of the IEEE.

Submittal Procedure:

Please mail a hard copy of the logo with diskette to ADCOM member Philip Tsung at:

21055 E. Ft. Bowie Dr.
Walnut, CA 91789

If your design is in IBM compatible format, you can e-mail the logo to Phil at pwtsung@aol.com.

Deadline for receipt is Nov. 30, '98.

Any questions, please call Phil during the day at 626-968-3000 Ext. 239.

Let the contest begin !!!

AdCom Meeting Minutes

Hilton, Reno
March 29, 1998

Attendees: L. Arellano, K. LaSala, S. Keene, O. Trapp, A. Rawers, M. Abramo, P. Gottfried, D. Doyle, B. Thomas, D. Franklin, T. Rost, Y. Lord, E. Takada, A. Street, B. Gauger, M. Buckley, K. Inoue, B. Thomas, T. Brogan, M. Ciappa, and P. Tsung,

President Loretta Arellano opened the meeting at 9:00 AM, and the minutes of the January 17, 1998 AdCom meeting were approved.

The treasurer's report was presented by President Arellano in the absence of Dick Kowalski. The Society continues to do excellently.

B. Trapp presented the meetings report and planned upcoming meetings. AdCom meetings will be as follows:

Sat. August 8,1998	Minneapolis. Minn.,
Sat. October 3, 1998	Zurich,
Sun. January 17, 1999	D.C.,
Sun. March 21, 1999	San Diego
Summer 1999	Denver
Fall 1999	Japan,
Jan 2000	Los Angeles,
Sun April 29, 2000	San Diego

Publications, the January newsletter came out 6 weeks late. The April newsletter edition is due out by end of April. When submitting articles to Dave Franklin, make sure he knows the submittal is for the newsletter and not just general correspondence. Dave will send back acknowledgment to the one who submits the article.

Paul Gottfried, VP Publications, said the Transactions is facing a shortfall of adequate papers being submitted to the Journal. There is also a desire on the part of IRPS to have an avenue to publish their papers in a recognized journal. There may be a mutually beneficial opportunity here.

Ken LaSala presented the Tech Ops report. Tom Brogran and Yvonne Lord are leading the Standards & Definitions efforts. Tim Rost takes over Physics of Failure/Reliability Physics committee.

A preference was stated to have Adcom ballots be sent out by IEEE headquarters.

A survey of attendee's was performed to collect ideas for both long term and short term projects. Below is a listing of the comments. (No order of preference is implied by this listing).

Suggested Educational Initiatives

Provide more RS chapters with assistance to have as minimum 3 dynamic educational speakers per year

Training of RS members to make Chapters active. The training would be at IRPS (workshop or tutorial) or RAMS or any RS Conference.

Produce more Educational videos (Possibly tutorials from IRPS/RAMS/IRW)

Publish a college level text book on reliability.

Identity and develop a progression of courses, lectures, and videos much as you would find in a 4-yr college curriculum.

Promote education that avoids exposes one-sided views (e.g. Mil - 217 or Rel. Physics)

Have the Rel. Soc. Wed Site: list specific educational opportunities, short courses, degree programs in Reliability diciplines.

Sponsor tutorial video series focused on introductory and basic instruction. Example, a Semiconductor reliability series with topics addressing metal systems reliability and modeling, oxide reliability testing and models, package reliability, product defect analysis methods, problem solving techniques, etc.

Document in form of tapes MS, or PhD courses:

(a) statistics

(b) failure physics (characterization, techniques, metrology)

Continuous Education:

- standardization (existing, evolution)
- device procurement policies

Give low cost seminars to sections (for members, that their company's will not support for them)

Low cost videos on the broad topics within RAM home education for non specialists

Tutorials at conferences

Train members of ADCOM on new areas being taught in universities.

Provide universities with a list of tutorials available to them from our ADCOM (Technology road show to universities).

Provide the training road show to chapter.

Generate material (text, etc.) on reliability mathematics, possibly something in the area of semiconductors, maybe a general textbook.

Work with ABET to infuse reliability into undergraduate engineering course syllabi and curricula.

A Web page catalog of reliability courses and programs with their sources.

Sponsor plant tours for undergraduate and graduate students.

IEEE and other societies have many fragmented sources of information and databases on reliability, standards and education. (see Bob Gauger). Provide a coordinated reference for this information particularly the IEEE societies. RADC tool kit has many good references.

Provide references for expert consultants in local areas.

Continue with Video's on key topics (acceleration. testing)

Web based training for various R topics.

Video training similar to universities.

Investigate the use of the "supernet" for the World Wide Education.

DVD containing all past IRPS Proceedings.

Live broadcasts of IRPS and IRW over the Internet.

IRPS Tutorials available for free on the Internet / Supernet

Moral and ethical standards for engineers

Marutic management

E-mail / usenet newsgroup on semiconductor reliability discussions alternatively a forum on the RS web site

A tutorial programs

Maintain a web page of reliability related seminars / courses etc.

Create a list of technical experts in various reliability topics.

Study the development of a reliability certification program to certify in different areas component, software, system reliability, and course activity credit to maintain certification. Define the mini-

mum education and experience required to be called a Reliability Engineer.

On the WEB, would like pointer to particular focus area specialists, (e.g. LCD reliability and HALT / HASS testing)

Set up a continuing education program

Chapter Awards Luncheon

1st Place Chapter	Boston
2nd place Chapter	Dallas
3rd place Chapter	Philadelphia

IRPS and the Reliability Society representatives: Loretta Arellano, Bud Trapp, and Ken LaSala met with IRPS representatives to build a better working relationship that organization. IRPS General Chair, Ann Campbell, addressed the Society's Adcom meeting and spoke with a new optimism. The 1999 IRPS will be co-sponsored by the Reliability Society on a 50-50 basis with EDS.

Motions

AdCom approved giving all four publications: Reliability Transactions, RAMS, IRPS, and Semiconductor Manufacturing, beginning in 1999, to all member. Dennis will coordinate the impact of this change with the IEEE.

Sam Keene will work with Jeff Voas on Reliability Society sponsorship with authority to spend $1,000 as seed money for the a new conference and the Reliability Society will provide free publicity

IEEE headquarters will send out Adcom ballots and the IEEE will count the ballots.

Spend up to $300 each to recognize Tom Weir and John Adams for their long and meritorious service

Support Adcom member's travel expenses to attend Adcom meetings to the following extent: Cover up to $300.00 toward unreimbursed expenses to attend one meeting in a calendar year. Cover up to $1,000.00 of unreimbursed expenses to attend two or more Adcom meetings in a year especially in light of the societies international meetings. All expenses to be submitted in accordance with IEEE regulations.

October Adcom meeting to be held on Saturday October 10 with the tutorials to be given on Monday October 14.in Zurich.

Approve up $2,000.00 to support the travel of a requested distinguished speaker to put on a seminar with the Tokyo chapter in 1998

Purchase a digital camera up to $800.00 for newsletter pictures.

Action Items

Dennis Hoffman will coordinate the publications change, to deliver all publications to all members.

Ken LaSala will monitor and assure the quality of discussion on the Reliability Web Page Discussion forum

Information

Denise Pribula presented an overview of the IEEE process for creation of standards.

Dick Doyle is a candidate for Division VI Director

The Reliability Society will invite the IEEE Member Services director or Travel/Conferences or Educational Activities, to present at our Adcom meetings.

Bud Trapp will attend EDS Best Practices workshop in San Francisco

RS Logo

Submittals will be limited to IEEE Reliability Society members and their families.

A committee will select a logo and adopt it by the January 1999 50-year anniversary dinner.

The meeting adjourned at 5:15 PM. Sam Keene kept time at this meeting and the meeting flowed better.

IEEE Reliability Society Technical Operations Report

For April 1 - June 30, 1998

Committee: Reliability Prediction

Committee Chair: Dr. Sam Keene, *s.keene@ieee.org*

RAC has published the draft version of the report on "The New Reliability Assessment Method." This method captures "lessons learned" and establishes a framework for process and improvement. The reliability prediction is then scaled in accordance with the developer's applied process capability initiatives. This model will work best when it is tailored by a company's own development experience. There will also be an automated version of the model released, which will take a lot of the tedium out. This model integrates hardware and software reliability predictions. Once it is completed, it may be considered for release as an IEEE standard. Other options are under consideration also.

Committee: Emerging (New) Technologies/Components

Committee Chair: Mr. Dave Franklin, franklindl@aol.com

No activity. Candidates for a co-chair or membership on the committee should contact Dave Franklin or Ken LaSala.

Committee: CAE, Concurrent Engineering (CE)

Committee Chair: Mr. Dennis R. Hoffman, dhoffman@ti.com

Have been working with the RAMS Program Committee, of which I am a member, to establish a CAE Workshop tract similar to those conducted for the last several years. Will continue the all day Monday session, extend the Tuesday exhibitor session to basically three quarters of a day to handle more of the exhibitors, and the Innovative CAE half day session on Wednesday. Over the next month or so we must get all of the speakers identified and get them to write their papers for the RAMS Proceedings. Don Nilson will be leaving our committee after many years of support as his job function changed. He is going to identify his replacement from Lockheed Martin as he wants them to stay involved. Ken LaSala joined the committee some time back and I don't know if I acknowledged that fact. Welcome aboard. Committee remains the same except for the changes identified above.

Committee: Software Reliability

Committee Chairs: Mr. Irv Doshay, *i.doshay@ieee.org*

Dr. Sam Keene, *s.keene@ieee.org*

No Activity.

Committee: Definitions and Standards

Committee Chairs:

Co-Chair: Yvonne Lord, *Lord. Yvonne@postal.essd.northgrum.com*

Co-Chair: Tom Brogan,

Thomas_L_Brogan@res.raytheon.com

Reporting Period: April 1 - June 30, 1998.

Special Note:

Yvonne Lord from Northrop Grumman and Tom Brogan from Raytheon Systems Company were officially appointed as the new co-chairs for the Reliability Society Definitions and Standards Committee. The appointment took place at the 29 March 98 Adcom meeting in Reno Nevada. Tom and Yvonne replace Joe Caroli and Rick

Wells who did an outstanding job during their tenure.

Meetings Attended:

Both Yvonne Lord and Tom Brogan attended the April 3,1998 RMS partnership meeting as observers. It was recommended that professional society committee reports on standards activity become a formal part of each meeting. Dr. Russ Vacante took the recommendation under advisement.

Yvonne Lord attended the May 20,1998 P1467 working group meeting at the Aberdeen Proving Ground in Maryland. Dr. Paul Ellner has replaced Patrick O'Neil as the working Group Chair effective May 1998. While dormant for some time as a result of some re-organizations at AMSAA the group is enthusiastic about continuing with the document .It also appears that much of the content that was intended for the P1469 document will be incorporated as part of the P1467 Growth Management document. We have asked that Dr. Ellner provide the DSC co-chairs with a plan and schedule for completion of the document as well as an updated roster.

Yvonne Lord attended the IEEE Standards Board meeting on June 24,1998 in Detroit Michigan. The P1332 (Standard Reliability Program for the Development and Production of Electronic Systems and Equipment) was approved by RevCom subject to the removal of a sentence in the last paragraph of clause 4. The Working Group Chair (Dr. Michael Pecht) agreed and the document has been forwarded to the standards publications department. The vote at RevCom was as follows; 7 approve, 2 disapprove, 0 abstentions.

Activities Planned for Next Quarter:

DSC co-chairs plan on sending all WG Chairs a request to provide a plan and schedule for upcoming meetings as well as target dates for document completion. In addition we will be asking that WG rosters be updated to reflect the current make-up of the Working Groups.

An opportunity exist to possibly join forces with the IEST in the generation of a combined Reliability Growth and testing document. The IEST is currently working with ANSI to obtain approval as a standards generating body. The DSC co-chairs plan to discuss this further with the Standards Board to obtain the rules of the road for a joint venture.

The P1468 (Standard for Customer Specified Performance Based Reliability Test Requirements) and P1470 (Guide for Customer Evaluation of Producer Developed Statistical Reliability Test Designs) have essentially been inactive over the last year.

Jane Krolewski the WG Chair was reassigned at AMSAA and no longer has the time to support this activity. The DSC co- chairs will assess the need to continue with these documents and make recommendations to the ADCOM.

The DSC co-chairs plan to discuss with Dr. Michael Pecht, WG chair his vision of the P1413 (Reliability Prediction Standard). The last meeting of this Working Group was held on May 7,1998 and resulted in a new draft of the document which was sent out for internal review. The reviews have been mixed and the document may not match the intent of the original PAR. The DSC co-chairs will make recommendations to the ADCOM regarding future direction.

Committee: Advanced Reliability Techniques and R&D

Committee Chair: Dr. Christian K. Hansen, Chair., *chansen@ewu.edu*

Reporting Period: April 1 - June 30, 1998.

News Items

Christian Hansen has been promoted to the rank of Associate Professor with tenure in the Mathematics Department of EWU.

Christian Hansen has been appointed to the editorial board of *Quality and Reliability Engineering International*. Responsibilities will include serving as editor on a new "Quality and Reliability Web Sites Review" news column to appear 3-4 times per year in the journal.

Finn Jensen is Conference General Chairman of ESREF 98, the 9th **European Symposium on Reliability of Electron Devices, Failure Physics and Analysis, to be held October 5-9, 1998 in Copenhagen, Denmark. A special issue of *Microelectronics Reliability* has been denoted to papers of this conference. Christian Hansen is on the list of invited speakers. More details on the conference are available from their web site www.iae.dtu.dk/esref98.**

Current Issues and Activities

Annual Reliability Engineering Technology Status Report

The original plan to solicit input by June 30, 1998 has been put behind schedule in order to give time to prepare a suitable format of input that allows/encourages parts of the report to be published in the IEEE Spectrum. A suggested format for input is attached to this report. Pending your approval of this format, the committee suggests that input be solicited by late July or early August. A first draft would be circulated for comments by mid or late August, with anticipated publication in the January Issue of the Reliability Society Newsletter and/or the January Technology Forecast and Analysis issue of the IEEE Spectrum.

Research Activities

Christian Hansen is working this summer on a funded research project "Statistical Analysis of Spatial Data from an Inte-gra-ted Cir-cuit Manufacturing Process." Preliminary results have been reported in the invited paper "Use of wafer maps in integrated circuit manufacturing" to be presented at ESREF 98 in Copenhagen.

Activities Planned for Next Quarter

Compile the Annual Reliability Technology Status Report. Participate in ESREF 98.

Committee: Human Performance Reliability

Committee Chair: Dr. Kenneth P. LaSala, *k.p.lasala@ieee.org*

Committee activities during the period from April 1, 1998 to June 30, 1998 consisted of the following:

- On May 6-7, 1998 the Committee met to plan the Committee's Web page, to review the IEC human reliability guide, and to discuss activities related to the HPR video. The meeting resulted in an outline for the Web page, an intent to develop a short IEC standard (if the IEC accepts our proposal) or an IEEE standard, and some discussion of

translating the video into other languages and formats.

- On May 11-14, 1998, a Committee representative attended the meeting of the U.S. Department of Defense Human Factors Technical Advisory Group as the IEEE Reliability Society representative. The meeting addressed recent human factors developments in the U.S. DOD, NASA, FAA, and other agencies.
- On May 19, one of the committee members provided the U.S. DOD representative with a recommended inclusion to the methods section of the new MIL-H-46855. The inclusion addressed human reliability and human errors analyses, which were not included in the original draft.
- In June, we provided IEEE Transactions (A. Coppola, special editor) a draft of a brief history of human performance reliability.

Committee membership remained stable.

Committee: Computers, Information Systems & Telecommunications
Committee Chair: Mr. Hank Wolf, *hwolf@VMS1.gmu.edu*

No report filed

Committee: Energy Systems Reliability & Energy Technology Assessments
Committee Chair: Mark Lively, *MbeLively@aol.com*

No report filed

Committee: Health Care and Medical Reliability
Committee Chair: Mr. John R. Adams, *j.r.adams@ieee.org*

Mr. Robert J. Schlentz, *approach@minn.net*

No report filed

IEEE and Abet Seek Program Evaluators to Ensure Quality of Engineering Programs

PISCATAWAY, NJ, June 18, 1998 — The IEEE Educational Activities Board is now accepting applications for program evaluators for engineering and engineering technology programs at U.S. colleges and universities. The application deadline is October 30, 1998. Candidates sought are engineering professionals from industrial, government and academic sectors.

The goal of prospective evaluators is to assess the quality of engineering education. Selected applicants attend a one-day training session, sponsored by the IEEE, that explains the IEEE/ABET accreditation process. Following training, evaluators are prepared to assist with program evaluations that take place each fall and generally run for two to three days.

Nomination packages are available from: Accreditation Administrator, IEEE Educational Activities, 445 Hoes Lane, Piscataway, NJ, USA 08855-1331; tel:732.562.5484; e-mail: "accreditation@ieee.org" or via the World Wide Web; for engineering: http://www.ieee.org/eab/accredit/eval1.html; for engineering technology: http://www.ieee.Org/eab/accredit/eval2.html

Committee: International Reliability
Committee Chair: John Peter Rooney, *jprooney@foxboro.com*

No report filed

Committee: Physics of Failure/Reliability Physics
Committee Chair: Dr. Timothy A. Rost, *t-rost@ti.com*

No report filed

Committee: Mechanical Reliability
Committee Chair: Mr. Dick Doyle, *r.doyle@ieee.org*

No report filed

Committee: Nuclear Reliability
Committee Chair: Mr. Jalal Zamanali, *jzamanali@lucent.com*

Reporting Period: April 1 - June 30, 1998.

No report filed

Committee: Quality Assurance Technology
Committee Chair: Mr. Puran Luthra, *luthrap@admiral.umsl.edu*

No report filed

Committee: Testing and Screening
Committee Chair: Mr. H. Anthony Chan, *h.a.chan@ieee.org*
Mr. Bill Wallace, *cwall31664@aol.com*

No report filed

Committee: Speakers Bureau
Committee Chair: Ms. Marsha Abramo, *mabramo@btvmanvm.vnet.ibm.com*

No report filed

"Developing Software for Safety Critical Systems"

New Video

Presented by Mike DeWalt, FAA, National Resource Specialist; John F.Besnard, Raytheon Systems Company; and Dr. Jeffrey Voas, Reliable Software Technologies; Dr. Samuel J. Keene, IEEE Reliability Society Past President, served as program moderator and technical editor. The vidio is sponsored by the IEEE Reliability Society and IEEE Educational Activities.

In many industries, the scope of software usage has taken on significant roles. We can't make toast, watch TV, or start our cars without involving software of some kind. In the aviation community, for instance, software has gone from controlling simple measurement devices to being involved in almost every function on board an aircraft - from computer controlled toilets to fly-by-wire control

systems and cockpit management. As software plays this dramatically larger role in all aspects of our lives, we realize it can have a safety critical thread that may mean a matter of life or death. To site an example, the Therac 25 X-Ray machine's control software went afoul hurting, even killing, several people. This potentially damaging capability is of great concern. Regulatory agencies are working to set standards to assure safe software and prevent its potential negative safety impacts to people and systems. This tutorial addresses developing and assuring software for safety critical systems. Three experts in the field individually provide their knowledge on the subject and then join together in open forums for further discussion.

Presentation by Mike DeWalt:

Due to the safety critical nature of much of their software, the industry and aviation regulatory community needed to develop an effective means of evaluating software in safety critical applications. You will learn that basic system design principles for safety critical systems still apply. You will also be shown how the evaluation standard for the international aviation community (RTCA DO-178B/EUROCAE ED-12B) is applied within this system context to achieve an acceptably high level of confidence in the software. This portion of the tutorial should provide the student with enough information to explore potential solutions applying high integrity standards to their own applications where system failures are not an option.

Presentation by John Besnard:

The temptation to use pre-existing, commercially available software in your next system can be very tempting. After all, it's already written, it's field proven, and it's well documented. What can go wrong? Have you considered how to integrate this square peg in your round system? What do you do with product upgrades? This part of the presentation will reveal proven techniques that will smooth out the corners for you.

Presentation by Jeffrey Voas:

Software safety assessment is the vital final phase in developing safety-critical systems. Without assurance that a software system can handle anomalous events, the system developer is left to wonder whether they have achieved their safety goals. This talk will address unique "stressing" methods to assure your software has been hardened to the point that it is unlikely to produce hazardous outputs.

From this video you will learn

- Examples of safety critical software issues and problems
- The effect of regulation on the safety of airborne transportation
- What process and tools steps can be taken to assure safe software
- New advanced techniques for software safety assessment

This video is ideal for those involved in product development that has significant software content or is used in an application that has potential safety impact to people or equipment. The principles behind software safety assurance also apply to business and enterprise critical systems, particularly, financial and banking systems. This video will help system engineers, software developers, managers and entrepreneurs who are delivering these products. Some basic understanding of software languages and/or programming concepts would be helpful in viewing this video.

Accompanying the full video course are hard copies of the visuals and the text, Software Fault Injection: Inoculating Programs Against Errors (John Wiley & Sons, Inc., 1998), by Jeffrey M. Voas and Gary McGraw. The viewer may earn 0.25 Continuing Education Units (CEUs) for this tutorial and a certificate of achievement upon successful completion of the exam.

This 1998 tutorial consists of 2 VHS tapes and runs for 2 hours, 29 minutes.

John F. Besnard (Presenter) is the Test Director for Raytheon in Fullerton, California. As such he is responsible for process definitions and technical performance for all software test activities. He is a member of the RTCA SC-190 committee whose charter is to provide clarification on the usage of RTCA/DO-178B. John is assigned to the COTS subteam. He got his BA in Mathematics from UCLA in 1970 and MBA from California State University, Long Beach in 1980. John taught Operations Management at CSULB and has authored several technical papers on Operations Management.

Mike DeWalt (Presenter) is the National Resource Specialist for aircraft software for the FAA. He provides a technical focal point for software technology related to aircraft certification, for R&D, certification problems, policy and guidance. He was secretary of RTCA SC-167 subcommittee that created the current guidelines for software, DO-178B. Mike has been involved in developing technical techniques to handle the regulatory acceptance of new software technology. He is also secretary for the newly formed RTCA SC-190/EUROCAE WG-52. Mike has been involved with software avionics and certification for 26 years including military and commercial aviation as well as working for airframe manufac-

COTS Prediction Guide Initiative

Commercial off the shelf equipment (COTS) is an increasingly larger portion of today's systems. COTS potentially offers a faster time to market, lower cost and a reliability advantage. The Path Finder probe to Mars was COTS based. It was economical successful!

I am interested in identifying reliability interested in cooperatively developing a COTS Reliability Prediction Guide. My goal is to develop a one page guide for each identified COTS type. This would include disk drives, monitors, modems, tape drives, RF receivers, etc., any equipment that is popularly used. The data sheet would be a reference for these devices providing:

- Product variations
- Application rationale (eg. when do you use a switching supply vs. a linear supply)
- Failure rate and its source
- Significant application factors that impact reliability, e.g. the Temperature sensitivity, mounting technique
- Predominant failure modes
- Any wear out characteristics
- Any special considerations

Please contact me at my email address below stating your interest in participating. I want to complete this activity and release our results as an IEEE standard, all within the next 3-6 months.

Sam Keene
skeene@mail.hac.com

turers and avionics suppliers. He has been with the FAA for over 12 years. He has also served on an advisory panel of experts to evaluate and recommend any change to the current software assurance approaches of the Nuclear Regulatory Commission. He has a BSEE and Masters in Software Engineering as well as a commercial pilot's license.

Dr. Jeffrey Voas (Presenter) is a Co-founder and Chief Scientist of Reliable Software Technologies (RST). He is currently the principal investigator on research initiatives for DARPA, the National Institute of Standards and Technology, and the US Army. Voas currently leads the Research Division at RST. Voas has also recently served as a Principle Investigator on efforts for NASA, National Science Foundation, and the USAF. He has published over 90 refereed journal and conference papers. Voas has co-authored two Wiley books: (1) Software Assessment: Reliability, Safety, Testability (1995) and (2) Software Fault Injection: Inoculating Programs Against Errors (1998). Voas is a member of IEEE and received a Ph.D. in computer science from the College of William & Mary in 1990.

Dr. Samuel J. Keene (Host & Technical Editor) is an IEEE Fellow and a past president of the IEEE Reliability Society. The IEEE recognized him as the 1995 Reliability Engineer of the Year. He has authored over 100 papers and book chapters. He is a consulting engineer, an educator and researcher in the field of reliability and assurance sciences.

To order the video, use IEEE product number: NTCS number: HV7016, PAL number: HV7017. IEEE Member price, $399.00. List price: $449.00. Order from the IEEE Customer Service, 445 Hoes Lane, PO Box 1331, Piscataway, NJ 08855-1331, USA. Make checks payable to IEEE. For single sales, call 1-800-678-IEEE; for company or institutional sales, call 1-800-701-IEEE; or fax 32-981-9667.

Please add the following shipping and handling charges: for orders totaling $1.00 to $50.00, add $4.00; $50.01 to $75.00, add $5.00; $75.01 to $100.00, add $6.00; $100.01 to $200.00, add $8.00; over $200.00, add $15.00. Call for overseas Air Freight charges. Credit card orders (MasterCard, Visa, American Express, and Diner's Club) are accepted.

Call for Papers

IEEE, 7th International Symposium on the Physical and Failure Analysis of Integrated Circuits (IPFA '99)

5 - 9 July 1999, Singapore

The 7th International Symposium on the Physical and Failure Analysis of Integrated Circuits (IPFA '99) is organised by the IEEE Reliability/CPMT/ED Singapore Chapter in cooperation with the Centre for Integrated Circuit Failure Analysis and Reliability (CICFAR) of the National University of Singapore (NUS) and the Institute of Microelectronics (IME). The Symposium is technically co-sponsored by the IEEE Electron Device Society.

The Symposium will be devoted to the fundamental understanding of the physical mechanisms of device failures and issues related to device reliability, especially those related to advanced process technologies. The Technical Committee is inviting papers related to original research work in the following or related areas:

- Advanced Failure Analysis Techniques
- Physical, chemical and electrical analysis techniques for fault isolation and failure identification
- Novel techniques including optical beam, electron beam, ion beam and scanning probe techniques
- Dielectrics and Hot-Carrier Reliability
- Time dependent dielectric breakdown
- Oxide degradation mechanisms and modeling
- Plasma induced damages - characterization techniques, mechanism and modeling
- Tunnel oxides in non-volatile memories
- Hot-carrier effects - measurement techniques and modeling
- Practical Issues in Building-in Reliability
- Reliability engineering emphasizing design and process aspects
- Process control in wafer processing and reliability
- Assembly related issues in device reliability
- Packaging and Metalization Related Failure Mechanisms
- Electromigration studies and modeling
- Multi-level interconnection and related issues
- MCM, BGA, TAB and other advanced packaging related failure mechanisms
- Package stress modeling and characterization
- EOS/ESD and CMOS Latchup
- Effect of ESD on specific devices and new protection structures
- Latent damages and damage interpretation
- ESD modeling and measurement techniques
- CMOS latchup characterization and modeling
- Reliability and Failure Analysis in Specialist Devices
- Power semiconductor devices
- Optoelectronic devices
- Compound semiconductors
- Micro electro-mechanical systems (MEMS)
- Passive/Hybrid components

Submission Guidelines

Prospective authors are requested to submit fifteen (15) copies of a two-page summary (inclusive of figures, photographs and references) and a 50-word abstract to the Technical Program Chair (c/o IPFA '99 Secretariat, Kent Ridge Post Office, P.O. Box 1129, Singapore 911105) by 1 December 1998. The sum-

mary should state clearly and concisely the specific results of the work, why the results are important and how the results relate to previously reported work. Your work must be original and previously unpublished. Your submission should contain the name, affiliation, address, telephone number, fax number and email address of each author. The category of submission from the listed areas should also be stated clearly in your submission. Please note that all submissions must be in English.

Authors of papers that have been accepted for presentation will be notified by 15 February 1999. Upon notification of acceptance, authors will be supplied with mats for the manuscript preparation together with the guidelines for the paper preparation and presentation. The final camera-ready manuscripts (to be submitted by 15 April 1999) must conform strictly to the manuscript preparation guidelines before they can be published in the Symposium Proceedings and presented at the symposium.

Web Site: http://cicfar.ee.nus.sg/ipfa/ipfa99.html

General Chair:
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Institute of Microelectronics (IME)
11 Science Park Road
Singapore 117685
Tel: (65) 770-5439
Fax: (65) 774-5747
Email: radha@ime.org.sg

Technical Program Chair
Wai Kin CHIM
National University of Singapore (NUS)
Dept of Electrical Engineering
10 Kent Ridge Crescent
Singapore 119260
Tel: (65) 874-6287
Fax: (65) 743-2523
Email: elecwk@nus.edu.sg

New IEEE Video on

"Concurrent Engineering Perspectives: Concepts to Success"

This video is presented by Dr. Samuel Keene, Performance Technology; Nick Krull, Storage Technology Corp.; and Donald Reinertsen, Reinertsen and Associates. Dennis Hoffman, Texas Instruments, Systems Group, served as technical editor. The video is sponsored by the IEEE Reliability Society and IEEE Educational Activities organization.

Concurrent engineering is a synergistic approach to product development in a process-oriented engineering environment. Concepts and methods are introduced that will help you avoid pitfalls and speed your robust products to the marketplace. In this video, you'll learn about these high impact development concepts and methods, currently in practice within industry today. Top experts in concurrent engineering have designed this course to deliver practical information in a way that will enable you to apply these techniques immediately. This video will help you realize shorter product development cycle times, make speedier program decisions, maintain program focus, and keep diversions at bay.

Dr. Samuel Keene, a Fellow of IEEE with broad industrial experience, is extensively published and is an international presenter and consultant in the fields of improved development, assurance, and product optimization strategies.

Nick Krull is an Advisory Engineer at StorageTek Corp. Nick shares his first hand experiences on the IBM Proprinter development team. This IBM team reduced manufacturing time from 30 minutes to 2 minutes, increased reliability fourfold, and reduced parts count by 50%.

Don Reinertsen is President of Reinertsen & Associates, a consulting firm specializing in product development process, management effectiveness, and efficiencies. He is the co-author of the successful book, Developing Products in Half the Time, which has sold over 50,000 copies.

From this video you will learn:
- Concepts of concurrent engineering for Integrated Product Development (IPD)
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- Product development "lessons learned" that you can apply immediately

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E-Mail: customer.service@ieee.org

Visit the IEEE Educational Activities Home Page on the Web at http://www. ieee.org/eab/

IEEE - Networking the World

CALCE Consortium Roadmaps

The CALCE Consortium has developed eight roadmaps covering all Consortium projects until the year 2000. For the benefit of the electronics industry, we have posted these roadmaps at our web site. Attached to each roadmap are descriptions of the 1999 proposed projects. We welcome you to visit these roadmaps on the CALCE web site. We also welcome your comments on the research undertaken by the Consortium.

The eight roadmaps and their associated URLs are:

- Products & Systems Reliability
  http://www.calce.umd.edu/general/roadmaps/roadmap1/page1.htm

- Components: Parts Analysis, Selection, and Management http://www.Calce.umd.edu/general/roadmaps/roadmap2/page1.htm
- Components: Reliability Analysis http://www.calce.umd.edu/general/roadmaps/roadmap3/page1.htm
- Thermal Management http://www.Calce.umd.edu/general/roadmaps/roadmap4/page1.htm
- Accelerated Test and Virtual Qualification http://www.calce.umd.Edu/general/roadmaps/roadmap5/page1.htm
- Permanent Interconnects http://www.calce.umd.edu/general/roadmaps/roadmap6/page1.htm
- Separable Interconnects (Contacts and Connectors) http://www.calce.Umd.edu/general/roadmaps/roadmap7/page1.htm
- PWB and Higher Assemblies http://www.calce.umd.edu/general/roadmaps/roadmap8/page1.htm

Please forward this message and the URLs to your colleagues who are interested in electronic packaging research and development. For further information about CALCE Consortium and how to become associated with its research efforts, please contact Ms. Joan Lee at joanyuan@calce.umd.edu.

Please note that these roadmaps can only be visited through the URLs listed here and these are not available through the CALCE web page for people who are not members of the CALCE Consortium.

Thank you,
Michael G. Pecht
Professor and Director

PACE Report

Recommended WEB Surfing

In this issue, I will share with you some of my recommended IEEE web sites. I hope you add them to your hot list and check them out every few weeks.

As a Reliability Society member, you will find it helpful to check the society web page at (http://www.ieee.org/society. org/rs). Our curator, Dr. Robert Loomis has added some very useful features to this site. For example, head to The Reliability Discussion Forum. This is your location to post reliability-related questions, job announcements, and responses. Check it out. See the both the questions and the answers. If you have a reliability question that has been bothering you, someone may be able to help you.

While you are at the IEEE Reliability Society home page, look under Other Reliability Society Information for Jobs/Professional Development. That will lead you to some of IEEE's top-rated references for job hunting, job fairs, and recruiting. If you want to go directly to IEEE's Job Listing Service for job hunters go to (http://www.ieee.org /jobs.html).

Employers looking to list a job opening, should go to (http://www.ieee.org/usab/EMPLOYMENT/ listform.html). Both of these are award-winning services.

One of IEEE's newest services is a biweekly publication called IEEE-USA This Week, at (http://www.ieeeusathisweek.org/). It provides articles and information on current and controversial issues, particularly those affecting your career. As it is published by IEEE-USA, some of the legislative concerns affect only our US members. Other articles, such as Y2K issues, have a world-wide concern. Then too, the IEEE USA page provides a convenient entry into Business and Consulting, Employment Services, Career and Education, PACE, and Business and Consulting. Try them all.

What are your favorites? We can add them to our list and share them with our members.

Bob Gauger,
r.gauger@ieee.org

DOE conducts 1998 Federal Technical Standards Workshop

On August 4–6, 1998, the first-ever Federal Technical Standards Workshop was held at the Loews L'Enfant Plaza Hotel in Washington, D.C. The Federal agencies and departments that sponsored the workshop included the Department of Energy (DOE – workshop host), the National Institute of Standards and Technology (NIST), the Environmental Protection Agency (EPA), the National Aeronautics and Space Administration (NASA), and the Food and Drug Administration (FDA). In addition, the Partnership in Reliability, Maintainability, and Supportability (RMS) Standards (frequently referred to as the "RMS Partnership"), a communication-educational consortium of professional societies, industrial associations, and government agencies working together to help implement acquisition/standardization reform, served as a cosponsoring entity for the workshop.

The theme for this workshop was *Standards Management—A World of Change and Opportunities*. The workshop's goal was to further the implementation of the National Technology Transfer and Advancement Act of 1995 (Public Law 104-113) through the sharing of standards management success stories, "lessons learned," and emerging initiatives within the Executive Branch of the Federal Government. The target audience for this workshop included Federal agency and department and contractor personnel and representatives of standards developing organizations that either use technical standards in their work for the Federal Government or participate in standards writing and management activities in support of the missions and programs of Federal agencies and departments. As with previous standards workshops sponsored by the DOE, views on the technical subject areas under the workshop theme were pro-

vided by agency Standards Executives and standards program managers, voluntary standards organizations, and the private sector.

Workshop sessions included the following:

- Standards Management - A World of Change
- Standards Management - A World of Opportunities
- OMB Circular A-119 Implementation
- Strategic Standardization
- RMS Partnership/Acquisition reform

Each session consisted of panel members who expressed their views on the session theme. This was followed by a question-and-answer session and discourse related to the theme. One important observation that was made was that the Federal Government involvement in standards projects appeared to be decreasing for several reasons: diminishing numbers, loss of expertise, low priority assigned to standards work, and lack of funding for participation. Although high level OMB, department, and agency standardization officials were present, no clear remedies were offered for the decreasing Government involvement.. Also it was noted that the U.S. standards program was being overtaken in several areas by an aggressive ISO/IEC program. Some attenders sought more cohesion and less competition in the U.S. program.

Many of the issues raised in this workshop are likely to surface again in the forthcoming NIST/ANSI-sponsored conference entitled *Toward A National Standards Strategy To Meet Global Needs* in Washington DC on September 23, 1998. This one-day conference consists of several roundtable discussions on: *Identifying U.S. Needs for Domestic, Regional, and International Standardization, Getting the Best of U.S. Technology into Standards, and Funding the Process.* Important results from this conference will be provided in a subsequent Newsletter.

Ken LaSala,
VP Technical Operations

IEEE Educational Activities Video

Concurrent Engineering Perspectives: Concepts to Success

Presented by Dr. Samuel Keene, Performance Technology; Nick Krull, Storage Technology Corp.; and Donald Reinertsen, Reinertsen and Associates; Dennis Hoffman, Texas Instruments, Systems Group, served as technical editor

Sponsored by the IEEE Reliability Society and IEEE Educational Activities

Concurrent engineering is a synergistic approach to product development in a process-oriented engineering environment. Concepts and methods are introduced that will help you avoid pitfalls and speed your robust products to the marketplace. In this video, you'll learn about these high impact development concepts and methods, currently in practice within industry today. Top experts in concurrent engineering have designed this course to deliver practical information in a way that will enable you to apply these techniques immediately. This video will help you realize shorter product development cycle times, make speedier program decisions, maintain program focus, and keep diversions at bay.

Presented by:

Dr. Samuel Keene, a Fellow of IEEE with broad industrial experience, is extensively published and is an international presenter and consultant in the fields of improved development, assurance, and product optimization strategies.

Nick Krull is an Advisory Engineer at StorageTek Corp. Nick shares his first hand experiences on the IBM Proprinter development team. This IBM team reduced manufacturing time from 30 minutes to 2 minutes, increased reliability fourfold, and reduced parts count by 50%.

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From this video you will learn ...

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- Development tools that save both time and project resources
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Visit the IEEE Educational Activities Career & Training Web Site: http://www/ieee.org/eab

IEEE Symposium on Application-Specific Systems and Software Engineering Technology, ASSET'99

Richardson, Texas
March 24-27, 1999

Preliminary topics are:

Experiences in software design, development, and validation for telecommunication, embedded, multimedia, wireless, and mobile systems.

Specialized systems and software engineering techniques, including specification, design, and development techniques for telecommunication, embedded, and transaction processing systems.

- Integrated system design and assessment techniques that consider multiple systems requirements, such as security, real-time, reliability, availability, survivability, etc.
- Techniques and algorithms in network security, real-time communication, network management, telecontrol, and high speed networks.
- Application-specific CASE tools.
- Simulation environments for integrated design and assessment.
- Quality of service analysis for various applications.
- Application-specific performance modeling and evaluation techniques.
- Application-specific verification, validation, and assessment techniques.

The symposium webpage has the following:
URL: asset99.utdallas.edu

2nd Electronics Packaging Technology Conference (EPTC'98)

8-10 December 1998

Raffles City Convention Centre, The Westin Stamford & Westin Plaza, Singapore

Organised by: The IEEE Reliability/CPMT/ED Singapore Chapter, Technically Co-Sponsored by: IEEE CPMT Society In Cooperation With: ASME, IMAPS, Centre for IC Failure Analysis & Reliability, Gintic Institute of Manufacturing Technology, Institute of Materials Research and Engineering, Institute of Microelectronics, Nanyang Technological University, and the National University of Singapore.

Following the great success of the inaugural Electronics Packaging Technology Conference (EPTC) in 1997 in which over 200 participated, the Second EPTC will be held in Singapore on 8-10 December 1998.

The main objective is to provide a forum for package development engineers, scientists and researchers to present their findings and innovations, and to exchange ideas in electronic packaging technology. This conference is organized by the Reliability/CPMT/ED Chapter of the IEEE Singapore Section. The organizers aim to establish EPTC as a major electronics packaging conference in the South East Asian region where the bulk of the world's electronics packaging activities is taking place. It is hoped that the Conference will engender useful interactions between electronics packaging engineers, scientists and researchers from all over the world.

CONFERENCE TOPICS

- Single Chip Packaging: PEM, QFP, BGA, CSP, TAB, COB, COG, LOC, flip chip, ultra-thin packages.
- Multi-Chip Packaging: MCMs, known good die, direct chip attach,
- 3-D and hybrid packaging.
- Packaging of Electronic Systems.
- Materials and Processing: material properties, characterization and processing techniques. Plastic encapsulation.
- Modeling and Simulation: thermomechanical modeling, computer simulation, design tools.
- Assembly and Manufacturing: assembly issues, manufacturing processes and equipment, yield.
- Interconnection Technology: wirebonding, TAB, flip chip, fine-pitch, conductive polymers.
- Reliability: failure analysis, reliability testing and data analysis, accelerated models, pop-corning, effect of moisture, solder joint reliability.
- Thermal Management: air cooling, liquid cooling, cooling of high-power devices, heat spreaders, heat sinks, cooling of electronic equipment.

EPTC'98 Secretariat
CTMA Pte Ltd
425A Race Course Road
Singapore 218671
Tel: (65) 2998992
Fax: (65) 2998983
Email: ctmapl@singnet.com.sg
http://cicfar.ee.nus.sg/eptc98.html

Third International Congress in Quality and Reliability

Paris - France
March 25-26 1999

Today, every company must take into account two essential values of our society: Quality and Reliability. The congress takes place at the forefront of progress, as it emphasizes the latest results of research, and their implementation in the Quality and Reliability fields. It is a prime opportunity for professionals and academics to share views. This year, it also focuses on international participation. The congress will cover the following topics:

- Optimization and control of industrial processes
- Quality management and control, human factors
- Systems reliability (product, software...)
- Quality, health and safety, and environment
- Quality and Reliability: Case studies

This congress is organized by: L'Ecole Nationale Supérieure d'Arts et Métiers, Laboratoire Conception de Produits Nouveaux, Le Réseau Universitaire Français pour l'Enseignement et la Recherche en Qualité.

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New Self-study Course from IEEE Helps Improve Understanding of Motor Drive Technology

PISCATAWAY, NJ, April 28, 1998 - A high demand for adjustable speed drive (ASD) systems in utility, industrial, and commercial sectors has created an increase in a wide variety of drive applications. This increase in the many drive options poses a potential concern about a lack of sufficient understanding of drive technologies, their benefits, and applications including emerging power quality issues.

To help engineers better understand the capabilities of motor drive technologies, The Institute of Electrical and Electronics Engineers Inc. is offering a self-study course on ASD. This continuing education course, authored by Wayne L. Stebbins, an electrical engineer at Hoechst Celanese, presents general guidelines for the proper selection of ASD systems. "Knowing and understanding these guidelines will help engineers select ASDs that can perform to their optimal level in a specific application," says Mr. Stebbins.

Among many objectives, the course teaches the following:

- AC motor fundamentals
- ASDs used in commercial, industrial, and electric utility applications
- successful ASD installations
- ASD application fundamentals
- power quality issues
- ASD project implementation

This course consists of a 13-chapter study guide, a 400-page textbook, and an optional ASD master software. A final examination follows the course. Those who successfully complete the course will be awarded eight Continuing Education Units (CEUs) and the IEEE Certificate of Achievement.

To order this self-study course, use the following product numbers:

Including Software HL5741;
Member price: $359;
List price: $499.

Without Software HL5750;
Member price: $299;
List price: $399.

Order from the IEEE Customer Service, 445 Hoes Lane, PO Box 1331, Piscataway, NJ 08855-1331. Make checks payable to IEEE. For single sales, call 1-800-678-IEEE; for company or institutional sales, call 1-800-701-IEEE; or fax 732-981-9667.

Please add the following shipping and handling charges: for orders totaling $1.00 to $50.00, add $4.00; $50.01 to $75.00, add $5.00; $75.01 to $100.00, add $6.00; $100.01 to $200.00, add $8.00; over $200.00, add $15.00. Call for overseas Air Freight charges. Credit card orders (MasterCard, Visa, American Express, and Diner's Club) are accepted.

The IEEE is the world's largest technical professional society, serving the interests of more than 315,000 members in the information and electrotechnology communities in approximately 150 countries. In keeping with its "Networking the World" slogan, the IEEE helps to foster technological innovation, enable members' careers and promote worldwide professional community.

Editor's Column

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What are Intelligent Transportation Systems? At the present, these include ground transportation systems; cars, trucks, buses, trains, subways, intermodal surface transportation, and their interaction with the road or rail bed and with each other, etc. There is some likely hood that ships and airplanes may eventually be included, also. The automotive industry is currently strongly involved in ITS, worldwide.

This is a call to act. If you are interested, please send an Email expressing your interest and summarizing your background to Bud Trapp at "o.trapp@ieee.org". Please do it today! Thank you.

Bud Trapp
VP Meeting,
RS Representative to ITS Council
I look forward to your responses.

Your participation and ideas are always encouraged and welcomed by the Society. Become active, help lead the way into the next milenium.

Dave Franklin
Editor

To All Members of the IEEE Reliability Society

You are invited to attend our
50th Anniversary Celebration

which will be held
6:00 pm,
Sunday 17 January 1999

at the
Washington Hilton and Towers
Florida & Connecticut Avenues
Washington, D.C.

Reliability and Maintainability Symposium

You may not be admitted without a reservation

The deadline for reservations is 15 December 1998,

To RSVP, Contact
Alan O. Plait, Chairman
Anniversary Celebration Committee
8550 Park Shore Lane
Sarasota, FL 34238-3316
(941) 923-8550
or
aplait@ieee.org