## Reliability Society

### N E W S L E T T E R

July 1995

### President's Report

As history repeats itself, the Reliability Society continues to perform very well. The areas of improvement, thanks to my predecessors, have been identified in the 5 year audit of our reliability society by TAB. This audit shows that more of our members advance to Fellow grade and that we are very active in technical activities, chapter activities and in our conferences. They also stated that our Transactions and newsletter are outstanding and that our finances are in good shape.

Dr. Tom Weir (Junior Past President) is heading up our long range planing committee. He has contacted all of the past presidents (living) and has invited them to be on this committee. This committee should insure future success of our society.

Fast growth areas in our society are the Standards Committee and the CD-ROM area. Conferences are considering CD-ROM as an alternate for their Proceedings and Tutorials.

To report on our AdCom group, we had our second meeting of the year on 3 April in Las Vegas in conjunction with IRPS conference. We had excellent attendance with voting members being 3 over quorum. This is getting to be standard for our meetings. Only a few years ago, we were concerned with not having a quorum. The major agenda item was a guest from IEEE Headquarters, Mr. Bob Wagermann who presented the activities of TAB and took several action items. He was very responsive in answering questions posed by our members.

Standards appear to be a major area of participation by the Reliability Society. I would like to thank Mike Cushing, Ken Lasala, and Dev Raheja for their active participation with special recognition to Mike Cushing for his outstanding work supporting the rewrite of MIL-STD-785.

The conferences are doing quite well. Both IRPS and RAMS had excellent attendance this year, particularly IRPS which was past the break even point before the doors opened on the first day. As you might know, IRPS is wholly owned by IEEE, 50% by our Reliability Society and 50% by the Electron Devices Society. So we are extremely pleased with its success. The RAMS conference is a combined activity of 9 different Societies, where IEEE is only one of the nine and the Reliability society is the only society of IEEE participating in this conference. This gives our society a chance to cooperate with major societies outside of IEEE. The RAMS conference has been successful in spinning off several important subgroups, including project Aries, where both Dennis Hoffman and Tony Coppola have been a major force in these activities. Both are Current members of AdCom. This conference and its committees continue to work with various government agencies along with working together with all of the different societies.

The first in a series of Reliability video tutorials was recorded in April at the AT&T recording studio. I wish to thank those who participated or assisted in the filming. The three speakers are outstanding leaders in the field of software reliability. They are Dr. Sam Keene (Senior Past President of our Reliability Society), John Musa, and Ted Keller. We look forward to this video tutorial receiving very wide distribution because of its important and timely subject matter. The title is "Developing Reliable Software in

the Shortest Cycle Time". This is an emerging technology and is extremely important for both commercial industry and military products. We rely on software to operate and control many of our advanced systems, surpassing hardware in importance in some equipment. We hope with the success of this video tutorial, to have other tutorials on various reliability topics. The areas that we will consider include projects at Rome Labs, University of Maryland, University of Arizona, Mechanical Reliability, etc.

The Technical Activities Board has held two meetings this year, which I have attended. The first was in Calgary, Canada in February and then the second in Washington, DC in June. These were very successful meetings where all societies share their concerns and tell of their successes. Thanks to Junior Past President Dr. Tom Weir, I was appointed to three major committees. These are the Design and Manufacturing Engineering (DME) Committee, the Products Council and the Competitiveness Committee of the Technology Council to USAB. We also have a close working relationship with the Regional Activity Board (RAB) and the Standards Board along with the Educational Activities Board and Headquarters staff.

Major concerns with the New Products Council include developing a CD-ROM capability for all IEEE materials, including Standards, Periodicals, Transactions, and Conference Proceedings.

As you can see, there are a lot of activities and these activities need your support. We look forward to anyone wishing to help, to offer support in areas of your interest by contacting either myself or any of the Vice Presidents. We are particularly looking for support for our standards activities and also with the technical activities committees.

Richard L. Doyle (r.doyle@ieee.org)
President, Reliability Society

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**Editor's Column**

There's nothing like a good challenge to foster innovation. With the retreat of military standards and an emphasis on commercial sector there is a great opportunity to revitalize and refocus RM&QA. The IEEE Reliability Society is involved in a number of committees that are rewriting the book. This is an excellent time for those of you that have seen the good and bad sides of MIL-STDs to get involved in improving the process. There is no better place to apply principles of TQM than to the changing directions in the RM&QA standards field. There are lessons that we have all learned about the most effective way to improve products. There are a number of ways that these changes are occurring: The draft of a new IEEE Reliability Program Standard under development (see Dr. Michael Pecht), NASA is in the process of documenting their Reliability Preferred Practices, IEEE is working on a Maintainability Standard (see Dev Raheja), SAE has a reliability handbook for the automotive and aerospace industries, both NASA and the USAF are documenting lessons learned upon completion of programs, and a Tri-Service PAT (Aries Project) is working on design knowledge capture (see Dennis Hoffman). Efforts like these need to be encouraged and rewarded so that the results can be disseminated for the benefit of all. The world's current standard of living is the direct result of innovations and improvements like those presently underway.

Bruce Bream (bruce.bream@lerc.nasa.gov)
Editor

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**Newsletter Inputs**

All Reliabilty Society Newsletter inputs should be sent to the editor at:

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**Newsletter Input Due Dates**

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

**Chapter Activities**

**Boston Chapter**

The Boston Section Reliability Chapter finished the '94-'95 season with some very successful events. On April 20th, we held our 33rd Annual Spring Reliability Symposium in Framingham, MA. Nine papers were presented under the topic of "Application of Reliability Tools", followed by a social hour and dinner. Thirty-eight people (including fifteen non-IEEE members) attended the symposium and rated it an average of 8.2 out of 10.

At our monthly meeting on May 17th, Mr. Jeff Lampert of Waters Corp. made an excellent presentation on "Surfing the Internet", and included a demonstration showing how to use it not only for entertainment, but to get reliability and IEEE information as well.

We participated in the Electro '95 exhibit in Boston this past June, a major annual IEEE-sponsored electronics show, with an afternoon session focused on "Reliability Engineering as a Business Initiative".

We are alive and well (and busy!) in Boston!
Brian McQuillan (McQuillian.Brian@mail.ndhm.gtegsc.com)
Chapter Chairperson

**Cleveland Chapter**

The Cleveland Chapter had three meetings during the reporting period. Our February meeting was on the Living Trust. Robert Yurich, Consultant, explained: How to avoid costs of Probate, reduce estate taxes, functions of the Pour Over Will & Living Will, durable Power of Attorney, perils of Joint Survivor ownership and what happens if you become incompetent. A timely, well received topic with a lot of interest.

Our March meeting was on the Role of the Department of Commerce. Mary Good, Under Secretary for Technology, explained the role of the Department of Commerce in technology now that the cold war has ended. Many changes are being made

to get things done faster, better and without cost. Many projects are being prioritized. Progress is being made on their Journey to Excellence. A joint meeting with the NASA Lewis Awareness Office was a great idea.

Our April meeting was on NASA and the Information Superhighway. Lynn Boukalik, Computer Specialist, explained: Internet addressing, Listserv, Telnet, File Transfer Protocol, Gopher, Usenet and Mosaic. Many organizations are developing Homepages for use on the World Wide Web. All of the NASA Centers are participating. A very good meeting was well attended.

Kelly Clunn, Cleveland Convention Bureau, has submitted a proposal to the RAMS Site Selection Committee in an effort to bring the RAMS to Cleveland in 2000. Val Monshaw received the proposal for evaluation by the committee. We in Cleveland feel that we are ready to host this great activity.

The Technical Committee for the Cuyahoga County Joint Engineering Technical Council (JETEC) has organized the Symposium for "Interdisciplinary Integration of Aerospace and Manufacturing in Northern Ohio." The program is being printed and should be released soon.

All-in-all here in Cleveland we are having fun staying active and trying to serve our members.

Sincerely,
Vince Lalli, Chairperson (vincent.r.lalli@lerc.nasa.gov)
Cleveland Chapter

**Dallas Chapter**

The Dallas Reliability Society continued to host excellent presentations at its monthly meetings. These diverse discussions included: Bob Stoddard, Affiliate to the Software Engineering Institute, speaking about research and industry considerations in software reliability; Dr. Leigh Ann Files of Texas Instruments presenting "Process and Device Characterization Using Scanning Probe Microscopy"; Jim Horton, Director of Defense/Commercial Convergence at Texas Instruments, who discussed industry's response to the Perry Directive; Dr. Marvin Roush, Unversity of Maryland, who presented a software tool used in human factors risk analyses and University of Maryland's MS/PhD in Reliability Engineering program, and Phil Pierce, SEMATECH's Director of Total Quality, who presented "Semiconductor Manufacturing Equipment Reliability: An Industry Key to Capital Productivity." The society is making plans for the following year. Tentative subjects include hardware measurements in telecommunications, process equipment reliability, plastic encapsulated microcircuits reliability, and integrated circuit process reliability.

Regards,
Joe Childs
Secretary/Treasurer
Dallas IEEE Reliability Society

**Los Angeles Chapter**

In April we heard Mr. John D Kenyon spoke about DirectPCTM (TM Hughes Network Systems), a new software delivery system. The system uses normal modem communications for interactive communications and commands, with satellite transmission for "bulk" data transfer via small dish satellite receiver powered directly from the PC. Of specific interest to reliability attendees were the several delivery assurance options are available. Send now and resend later if not acknowledged, send now with error correction (feedback via modem), or send with error correction and redundant transmission. Examples would be text, data, and software programs respectively. Mr. Kenyon is the Engineering Vice President of Hughes Network Systems.

In June we will hear David G. Kay , University of California, Irvine discuss Intellectual Property Issues in Computing. Later in June we will hear Marc Franklin, Home Video Productions tell us the about Advances in Desk Top Video Production.

Our bulletin board is still very active and can be reached at 818-768-7644 (300 - 9600 baud). Most presentations are recorded on video, copies are available to members and affiliates through our Video Exchange Program. A full listing of available titles may be downloaded from the bulletin board, for information on obtaining copies contact the LA chapter chairman.

David Franklin (franklindl@aol.com)
Chairperson

**Philadelphia Chapter**

18 April 95 - Assessing your NPD (New Product Development) Process: Is Your New Product "Time to Market" Meeting Your Needs?, Mr. Stu Levy; Methodologies For Re-Engineering Your NPD Process, Mr. Arnie Wolfman.

16 May 95 - Professional Vitality Through Life Long Learning: Is a Culture Change Needed?, Dr. Ken Laker; The Drexel Electric Minibus Improvement Project, Dr. Finley Shapiro.

Fulvio E. Oliveto
Philadelphia Section

**Washington/Northern Virginia Chapter**

The Washington DC/Northern VA Chapter meeting on April 19 featured an interactive presentation on Virtual Reality by chapter member Henry Hartt. This session included coverage of the basic concepts and some historical background and then moved to current thrusts in the exciting field of virtual reality. Activities in a number of fields including surgery, manufacturing, training, and maintenance were covered in discussions, brief video clips and some hands-on demonstrations of inexpensive software for personal computers. Potential applications to the assurance world and the reliability engineer's part in this growing field were presented from the viewpoint of maintenance, design for maintainability, and the need for high reliability devices to support critical applications such as surgery in the a virtual environment. A recommended reading list was provided along with addresses of interesting sources on the Internet's World Wide Web.

Henry Hartt (hhartt@vitro.hq.nasa.gov)

**April AdCom Meeting**

The IEEE Reliability Society AdCom Meeting was held in Las Vegas, Nevada on April 3, 1995. The meeting was called to order by Dick Doyle; the agenda was reviewed and accepted. The Secretary's report stated that the minutes were approved as mailed. The Treasurer stated there was a $112k surplus for 1994 as compared to an estimated $39.4 budgeted surplus. Bob Wangemann, IEEE staff member gave an overview of the IEEE organization and membership breakdown. He also discussed CD ROM being marketed in '96, and the potential to put the conference proceedings on it; an informal vote showed preference for CD-ROM over paper.

The vice-presidents' reports are as follows: Dennis Hoffman presented a schedule of meetings for the upcoming year. Dinners will be served and name tags are being considered for the meetings. **The IEEE AdCom meeting will be held on Sunday instead of Monday at RAMS on 21 January 1996.** Joe Gruessing will coordinate and report the status of associate

editors being members of the IEEE. Dave Erhart will discuss the '94 IRW proceedings/overview at the July AdCom meeting. Loretta Arellano statused CAE/CE and its relation to RAMS and discussed medical/safety issues as regards to standards and IEEE involvement. The mechanical reliability group will hold a future meeting. AdCom nominations were put forth. Mike Cushing expects the reliability standard draft to be finished within the next month. New reliability prediction techniques are being looked at; IRPS wants to be involved. A motion to sign MOA based on society participation PASSED. It was suggested that the IEEE standards briefing should be scheduled when the AdCom meeting is held in Piscataway.

OId Business: IRPS has over 550 registered participants and is expecting over 800. This will be the second most successful IRPS. The International Reliability Physics Foundation is marketing the proceedings and tutorials. At this point business was concluded and the meeting was adjourned.

Larry J. Phaller
Secretary - IEEE Reliability Society

**New Reliability Standards to be Developed**

We recently obtained approval from the IEEE Standards Board to begin development of an IEEE Reliability Prediction Standard. A Working Group is being formed. Anyone interested in contributing should contact the Working Group Chair:

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Electronic Packaging Research Center
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We are also beginning the development of an IEEE Maintainability Program Standard. A Maintainability Program Standard Working Group will be formed in the near future. Anyone interested in contributing should contact the Working Group Chair:

Dev Raheja
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Laurel, MD 20708 USA
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There is a great deal of change occurring in US military standards today. I believe the IEEE Reliability Society should pursue the development of standards which encourage use of the latest reliability and maintainability technologies. I would like to hear from anyone who has a bold vision for a new standard and is willing to make the commitment to see the project through. The two new projects mentioned above are excellent examples of vision and commitment. My contact information is:

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**Telecommunication Challenges**

Washington D.C. Data - June 1,1995

System Reliability takes on a new meaning when one considers telecommunications in today's multi-provider world. Not only telephone companies, but cable companies and even utilities are considering or offering telecommunication services, sometimes in alliance and sometimes in competition with the other providers. Though technology appears not to be the limiting factor, challenges do remain open, such as system administration with a hundred thousand simultaneous users; fault detection across the network when networks used can be public, private or virtual; use of intelligent agents to perform network browsing; or creation of parallel processor information retrieval engines to use when accessing multimedia databases. Where does Reliability fit in?

How does one measure availability when voice, video, data, text and graphics can travel between two observers by copper, fiber, coax, and even wireless. Alternate routes and technology can assure the message, or at least part of it, getting through. (Note, after the recent California earthquake, the telephone lines were down, but people were 'talking' with residents by e-mail within twelve hours, and an electronic bulletin board was set up in 24 hours so that relatives could have someone check on their relations if at all possible and critical information about 'safing' emergency situations could be provided.) Since more than one modality can be used in a given activity as when TV is combined with computer collaboration in a teleconferencing session, what constitutes a failure and how does one address it during design and also during operations?

The Computer Science and Telecommunications Board of the National Research Council/National Academy of Sciences is looking for RMSA expertise to address such issues and to document their studies, experience and opinions. The documents are then analyzed and integrated into publications issued by the National Academy Press. Announced near term activities looking for expertise include:

- High Performance Computing and Communications Crisis Management Applications that stretch existing computing and communications capabilities. June 12-13,1995 in Irvine, California
- Evolution and assessment of issues in Untethered Communications
- Mobile Computing
- Information System Trustworthiness and Securing the Information Infrastructure.

I plan to submit a list of names of people with Reliability, Maintainability, Safety or Availability credentials willing to participate these activities to the CSTB in early July. Contact me at hwolf@vms1.gmu.edu for comments, questions and adding your name to the list.

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**The ARIES Project**

The Aries Project has completed its feasibility phase. As an overview refresher, the Aries Project is a rule-based design knowledge acquisition study to identify a data capture approach and data structure definition by a cross-industry, multiple-discipline team of volunteers. The feasibility phase of the project was sponsored by a Tri-Service Process Action Team (PAT) and

by the Reliability and Maintainability Symposium (RAMS) Board of Directors. Ton Fagan, ITT Defense and Electronics, served as the Executive Champion and Liaison to the RAMS Board of Directors. Dr. Karen J. Richter, Institute for Defense Analyses (IDA), was the Project Manager, and Dennis Hoffman, Texas Instruments, Defense Systems and Electronics Group, acted as the Team Leader.

The feasibility phase Team held its final meeting at IDA in late May 1995 to finalize its report. This report documents the Team's activities and defines the data capture techniques, the data structure format, sample rules, the lessons learned, and recommended future actions. This feasibility study will officially close out at the end of June 1995.

The Aries Project Team has elected to continue their efforts by collecting and compiling design rules and design practices (applicable for use by the electronics industry -- both defense and commercial) in the analog and digital design areas, utilizing the approach determined during the feasibility study. A portion of the Team met at IEEE Headquarters to solicit IEEE sponsorship for these continuing efforts, and for IEEE to be the technical support organization for the Aries Project's Design Practice Technical Reports. Since the Aries Project deals with electronic design practices, the IEEE was positive about their involvement, however, many details must be worked and the IEEE Society agreements must be obtained. The Aries Project and the IEEE are proceeding under the assumption that the relationship will be formulated. The initial technical report will be ready to be supplied to the sponsor in late 3Q95, and will cover analog and digital design rules and practices, in an electronic data base format.

Much work is required to cover all the rest of the aspects of electronic design (layout, RF, HV, etc.) and to maintain currency of captured practices. Future work in being considered to be conducted over the Internet to allow Team membership expansion and to minimize travel-related expenses. If you are a design team member, participate and assist in capturing the best practices to aid your design team as well as help populate CAE tools that support rule-based design. If you are interested in getting involved and participating by contributing to this effort, please contact Dennis Hoffman at(214)995-6003, or at E-mail, dhoffman@msg.itg.ti.com.

**Ancient Standards**

History repeats itself in many different ways. One way is through major inventions in fields like communications and transportation. These inventions include the alphabet, printing press, Radio, etc. and make our communicating with others much simpler. Of coarse the development of better communication systems is of major interest to IEEE and its members. Also of interest are advancements in transportation, power, computers and other related fields. This article takes a brief look into the past to see if we might develop better standards using some of the knowledge previously learned.

Ancient measurement standards were developed to insure consistency, accuracy and repeatability for each parameter to be measured. These standards were developed so that people could work together on a project.

Before 3000 years BCE (Before Common Era) or approximately 5000 years ago there were established standards of measure of length, time, weight, volume, and possibly money. These standards as expected were relatively simple. However, they had one thing in common. They were all counted the same way with the same numbering system. This observation is based on remnants of measures from the past that are available today.

Although as time goes on these remnants become more obscure.

A basic counting system was developed for these standards. This counting established an early form of mathematics including numbers and fractions. Ancient standards were based on a counting system which was not 10s and 100s, although they had those divisions available as documented in ancient pyramids approximately 2500 BCE. These ancient standards were developed using fourths or counting to four, and sixths or counting to six. They would alternate between fours and sixes and fours and sixes. This would eliminate the possibility of confusing two adjacent units, since one would have a different range than the other.

The first and most documented measure is distance or length. This ancient standard of measure is called the cubit. The smallest whole division starts with the digit and each one is the width of a finger. There are four of these. Four digits make one palm or one hand. and six palms make a cubit (approximately 18 inches). Four cubits make one double step (e.g. right foot to right foot). There were larger measurers like the stadium (approximately 600 ft. or 100 steps), four stadiums is almost 1/2 mile.

Time is another measure that follows this same counting system and is aligned with this ancient standard. To illustrate, we start with the 1/4 hour. You might say why does a clock chime on the 1/4 hour. Because this was a typical division of time. Four quarter hours make one hour. Then six hours make one quarter of a day. These six hour measurements were important as they described the measure between sunrise and noon, sunset, and midnight. These exact times vary depending on the season and the latitude but were good approximations for their simple sundials of that time. Now this day was multiplied into 6 days to the next measure (week). Obviously 7 days equals one week. However this may have been a changed about 3000 BCE. We suspect this because the cubit was changed from 6 palms to 7 palms (20.6 inches) during that same time period. The proof of the change is in the royal cubit (7 palms) which was used during the construction of the great pyramid of Giza/Egypt. The 7 segments were counted 0, 1, 11, 111, etc. The 0 was for the Sun (round). The 1 was for the Moon (crescent). These establish the days of the week, Sunday, Monday, Tuesday (for two ones) and some of the other days. Notice that zero is the first day of the week. However the old 4,6,4,6 ratio remained for many of the already established standards, and this ratio provided a common product of 24.

The next measure is that of volume. Four quarts make a gallon in the US and 6 gallons times 7 makes a 42 gallon barrel (oil). Going to the English measure, there are 6 standard bottles of wine make up an Imperial gallon and 4 Pecks in a Bushel.

Next are measurers of weight. We have the Troy ounce and twelve of these ounces make a Troy pound. But the measure of Troy ounces in the original standard may have been 6 ounces make a measure and 4 of these makes 24 Troy ounces which is 2 Troy pounds. Three Troy pounds is approximately one kilogram. Which is the current measure of weight in most of the world today. This Troy ounce was also a measure of precious metals including gold and silver and still is used today. Also, 24 karat gold is 100% pure gold.

Lastly we have money. If we go back to the ancient money of England, we have the Farling which is 1/4 of a pence. We have the three pence and the 6 pence. Which creates the standard measure. And 4 times 6 pence equaled a standard value (Florin) equivalent to two shillings.

Generally this simplified counting system was used for all types of measures. People were taught this system of measures with a learning stick. Therefore, a person using a learning stick such as the cubit stick would learn all of the measures of length, time, weight, volume, and money. Examples of these learning sticks are

in the history museums in London and Turin. These are highly pictographic since they were used before the alphabet was invented.

The cubit stick shows that the digit was further subdivided into quarter digits and even down to 1/16 digit. These measures are still in use today in our common 12 inch ruler. It contains inches which are subdivided down to 1/4 inch, 1/16 inch or even 1/32 or 1/64 of an inch. A 24 inch rule would have been an equivalent measure based on 4 inches times 6 palms. However over a long period of time these were blended into measures of 12. This is a later standard and includes: 12 inches to the foot, 12 pence to the shilling or 12 Troy ounces to the pound.

Over the years these standards have changed. It seems as though countries are always in the process of adopting new standards. Changes were even occurring in ancient times. Some are major changes or Paradigm shifts, like switching from 6 to 7 days in a week, or like switching from an English system to a Metric system. Other changes just provide more accuracy or more consistency or cover areas that were not previously covered. Standards will continue to change to fit the needs of developing societies.

What allows us to make accurate measurements and establish standards are good measuring instruments. These have varied over time but have always been considered extremely important. In general a large measure will have more repeatability and will be more accurate than a short or small measure. For example, a 300 foot measure will be more accurate than a 1 millimeter measure when measuring 300 feet or more. The smaller measure is hard to duplicate a thousand or million times to match the 300 foot measure. By having standards, one can use a sample space to determine the whole space. Using proper statistical values, one may even predict future measurements or events based on the past measurements. The user knows what is to be measured and will measure it relative to some given basis (standard) and may also compare it with other measures. In other words everything is relative to some given standard.

These measures were important for developing societies. The success of these ancient standards seems to have stayed through the millennia. Some still remain, like time. Some have changed slightly and some have lasted until recently like the pence-shilling money base which only in recent times has changed to a decimal standard.

We have learned from history to keep standards simple, consistent, and have a broad spectrum of applications. Standards should have common elements and support other standards. They have always been acknowledged at the highest levels of authority and it is expected that standards will continue to evolve this way. IEEE will continue to be a leader in standards. So as we continue to grow in supporting standards we look for your continued support also.

Richard L. Doyle (r.doyle@ieee.org)
President, Reliability Society

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**Getting Ideas Out!**

Samuel J. Keene, Ph.D. (keenestkwwhdq@ccsvm.stortek.com)
Sr. Past President, IEEE Reliability Society

When I teach courses, I use a new brainstorming technique. Called Hoshin by the Japanese, it requires no capital equipment. It is portable and user friendly. It requires no special facilities or scheduling.

It is conducted as follows. First a problem is posited to a

brainstorming team. Each member gets a pad of yellow stickies to write down ideas, one idea to a sticky. When someone thinks all of his/her ideas are noted, that person goes up to a white board or wall and places the stickies in a random pattern. No talking is allowed during this process.

After everyone has posted ideas, team members cluster similar ideas together. Still no talking allowed. consensus is not always immediate, and ideas may be rearranged into other cluster. Shuttling ideas between clusters could be an unstable, non-closing process. In theory, ideas could be continually swapped. In practice, a continually improving process takes place until there is little to be gained from another shuttling.

After the team is happy with the clustering of ideas each team member takes a cluster to organize and present the contents. As a result, a number of organized ideas are developed, and everyone is heard.

You could take this technique a further step. The team ideas seen in their entirety may trigger another set of ideas. These too can be added. This process often opens ways of thinking or leads to approaches not previously conceived. An analogy is a crossword puzzle. The clue "rut" could mean feeling low, a through in the road or the mating of elk.

Besides this two-step discovery process, the other great thing about Hoshin is that everybody's ideas are captured. Too often we may thing the view we offer in meetings is not heads. When that happens, our feelings are hurt. We mull over the idea while tuning out the ongoing meeting. Then we reintroduce our idea, often with no better receptivity than before. Hoshin precludes this from happening and leaves all team members with a sense of contribution and participation.

Carrying this still another step, I participated in a particularly effective meeting that lasted 70 minutes. Of the 15 folks present, 13 participated. It felt harmonious. After the meeting, I began asking participants why the meeting went so well. One said they were a "team": that worked together for two years. Even the two members who had held back said they felt OK about the meeting progress. I also noted there were no loud, dominating experts present. Such people can smash the initiative of others.

Getting ideas out also has important applications to reliability. The number one cause of software maintenance in the field is attributable to changes in product requirements. This is called perfective maintenance. There is indication that the same is true for hardware maintenance. So flushing out a fuller spectrum of requirements (product ideas) in the beginning will promote a more stable and therefore a more reliable product. The Hoshin technique can be a valuable tool for reliability engineers desir

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**Eastern Europe Library Project**

Written by Michael S. Adler

The inspiration for the Eastern Europe Library project was a series of meetings held by Electron Devices Society officers and its chapters in Eastern Europe. The chapters noted a problem facing them based on a lack of complete libraries of technical journals going back a reasonable time. At best, they had very limited coverage and at worst, none. In many ways, the situation since independence had gotten worse since government sponsored subscriptions has lapsed.

As a result of these inputs, the concept of an IEEE sponsored program to provide complete libraries of our technical journals took root. The RAB/TAB Transnational Committee sponsored the project with both RAB (Region 8) and TAB sharing

responsibilities. Specifically, Region 8 would identify candidate libraries and provide microfiche readers (if necessary) and the Technical Societies would provide the funds to provide the microfiche copies of their journals. In this regard, this project represents an all too rare jointRAB/TAB undertaking.

The current status is that 15 libraries in the newly independent countries and Russia have been identified by Region 8. The selection criterion was that the libraries have regional significance and be open to everyone desiring access. In addition, 20 of the 36 Societies have agreed to fund printing of their journals (Transactions at a minimum plus additional journals at the option of the Society.) Also, two inter-society journals have also agreed to participate.

The plan is to provide ten years of back issues and three years of issues going forward. This should provide the needed technical history as well as seeding the future. The hope is that the libraries will be able to fund subscriptions for years beyond the 13 years funded by the Societies.

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**Seminars**

**The Reliability Challenge**

29 September 1995, Regent's College, London, England

Contact: Finn Jensen, Reliability Consultancy ApS, Pile Alle 11, DK-2840 Holte, Denmark, Tel: +45 4242 2865, Fax: +45 4541 0065

**The 33rd Annual Reliability Engineering and Management Institute**

13-17 November 1995, Hotel Park Tucson, Tucson, AZ USA

Contact: Dr. Dimitri Kececioglu, The University of Arizona, Building #16, Room 200-B, Tucson, AZ 85721-0663, Tel: (602)621-2495, Fax: (602)621-8191

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**Speaker's Bureau**

The Reliability Society is preparing a Speakers List for local chapters use. Would like to be a speaker at a Reliability chapter meeting? Usually without honorarium and without paid travel expenses although the dinner before the an evening meeting may be provided. We hope that for many of you the answer is YES. This is a wonderful way to GROW professionally.

Information needed about you and your talk(s):

Your name, address - including e-mail, a short biography (no more than one page), Title of Presentation(s) offered, one page Abstract of each talk, two references of places you have given this talk and another paper, and names of three persons, with telephone and e-mail address, who have heard you give presentations or papers.

The talk duration should be approximately 45 minutes with an additional 5-10 minutes for questions.

Please send your talk information to:

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