

The ESD Association newsletter, for everyone with an interest in the understanding and control of electrostatic discharge.



THRESHOLD™

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News bits

Download call for papers

The 2006 EOS/ESD Symposium call for papers is available in PDF format from the ESDA website at www.esda.org. See page 4 of this issue for more information.

ESDA Research Grant for 2005-2006

Earlier this year the ESD Association announced a research grant competition with the intent to fund promising ESD research. See page 6 of this issue for more information.

ESD On Campus Program

The "ESD on Campus" program is a new educational outreach effort to provide technical lectures on electrostatic discharge (ESD) to undergraduate students, graduate students, and faculty. See page 9 of this issue for more information.

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Celebrating Achievement

There are always individuals who, in their achievements, go above and beyond the call of duty. The ESD Association annually recognizes those individuals who have made a lasting impact on the Association or industry.

Portions of the award presentations, which took place at the EOS/ESD Symposium in Anaheim, California this past September, are included here to share the achievements of this year's award winners.

Stanley Weitz-Industry Pioneer Award

Comments and presentation by Stephen Halperin

The Industry Pioneer Award is presented to individuals who have made major contributions in the development of EOS/ESD theory, products, standards or other related fields of interest. The recipient of the Industry Pioneer Award does not have to be a member of the ESD Association. The Industry Pioneer Award is presented at the Association's Annual General Meeting.

This year's Industry Pioneer Award honors Stanley Weitz, President of Electrotech Systems. Stan is being recognized as an industry pioneer for his support of standards and apparatus development.

Stanley Weitz earned his BSEE from Purdue University in 1961, and conducted graduate work at the University of Pennsylvania and Penn State University. He has worked for the US Navy in Advanced Airborne Antisubmarine development, and industry in the evolution of Automotive Diagnostic Systems.

In 1976, Stan purchased Electrotech Systems which manufactured an electrostatic voltmeter and an early version of an electrostatic decay system based on their voltmeter. As the US Navy became concerned about ESD losses in the 1970's, the electronics industry became more in-

terested in electrostatic instruments and test methods. Consequently, the demand for material testing, ESD knowledge, stan-



Steve Halperin (right) presents the Industry Pioneer Award to Stan Weitz, accompanied by his wife, Joyce (left)

standards and equipment began to grow. During this period, Stan worked with Mr. Irv Custis who was the government's prime mover on the development of material evaluation using Static Decay test methods, which eventually became FTS, Method 4046, and a required test for military packaging materials. Until Stan's involvement, Static Decay testing could only be performed using a variety of separate components assembled locally by the operator, or laboratory.

As the test methodology evolved, Stan refined the only commercially available system to simplify application of the test method, and through his company made the test apparatus available to those who needed it.

As the Electronics Industries Associations Packaging committee Task Force expanded the use of resistance measurement for material classification, Stan provided the reference fixture for round robin testing of their new Appendix H procedure. While several modifications were made to the procedure, over the years it evolved

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Association news

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Celebrating achievement

to become ANSI/ESD S11.11 and ANSI/ESD S11.12, today's reference for material classification. Stan's assistance in apparatus design was invaluable to the committee in their measurement and standards development.

Over the years, Stan has participated in and supported several Standards producing bodies including the American Society for Test and Measure in their early work on Static Decay; the Society of Automotive Engineers in their development of new Fuel System standards using resistance measurement techniques; and the National Fire Protection Association in their

work in Static Decay. Stan has also served on three ESD Association Standards Working Groups including Packaging, Gloves, and he chaired the Seating Committee.

In addition to operating ETS, over the years Stan has worked as an Independent Consultant and supported the development of the ESD Association. Stan and his wife Joyce reside near Philadelphia, and have participated in every ESD Symposium since 1979. I should add that Joyce is also an ESDA pioneer; she was the originator of the Symposium's spouses program, and is responsible for socializing and humanizing our technical event.



Tim Maloney (left) presents the Industry Contribution Award to Charvaka Duvvury of Texas Instruments. See page 7 for award details.

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Standards

Update on standards activity

Jessica Berry, Program Administrator

September 2005 Standards Meeting Series

The ESD Association Standards Committee (STDCOM) and standards working groups (WG) held their September meeting series at the Anaheim Marriot, in Anaheim, CA on September 8-11, 2005.

STDCOM approved three new documents for publication:

ANSI/ESD SP15.1-2005 Standard Practice for In-Use Resistance Testing of Gloves and Finger Cots.

DSP5.1.1-2005 Draft Standard Practice for Human Body Model (HBM) and Machine Model (MM) Alternative Test Method: Supply Pin Ganging Component Level.

DSP5.1.2-2005 Draft Standard Practice for Human Body Model (HBM) and Machine Model (MM) Alternative Test Method: Split Signal Pin - Component Level.

September 2005 Working Group Activities

Garments-WG2 is proceeding with the rewrite of ANSI/ESD STM2.1-1997. The new document will continue to be based on resistance requirements but will introduce a new classification for garments that can be grounded. In addition, a system test will be included for garments that are used as part of the wrist strap grounding path.

Ionization-WG3 will submit STM3.1-2005 to STDCOM for review and final approval in February. The WG also reviewed SP3.3 and decided to change some formatting and add instrument illustrations before submittal to STDCOM. The WG also discussed the possibility of starting work on a Spot Ionizer TR. Committee members are gathering information on current testing procedures used by industry.

Worksurface-WG4 is conducting a five year review of STM4.2-1998. There have been no industry comments since the document was released. The Committee suggests re-affirming the document. It is being targeted for review in 2006.

Human Body Model-WG5.1 discussed proposed changes to STM5.1-2001 for the five year review. A new Work-In-Process (WIP) document with updates was reviewed and presented at the meeting. The committee discussed testing no connect pins. The WG will have follow up discussions.

Machine Model-WG5.2 has reconvened the WG to address the upcoming five-year document review. Several issues and improvements were identified by committee members, including representative waveforms, load requirement and correlation

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From the president

2005 Accomplishments

Thank you ESD Association!



Ed Weggeland

In December I complete my second and last term as President of our Association, and wish to thank all of you for the opportunity to serve.

Who would have thought in 1979 at the Stouffer Hotel adjacent to the old Denver

Airport that our Association would evolve into its significant global position today? I did!

I was in Denver in '79 because I was a packaging specialist and did a lot of business with the military and the mil-spec contractor industry - electronic weapon system protection type packaging. During the Denver EOS/ESD Symposium I learned about "electronics" and the problems of static discharge to electronic guidance weapon systems. Along with about 100 other "colleagues", I knew that we all had been given a mission.

In the mid eighties, a friend of mine mentioned to his colleague, an active volunteer in our Association, that I might be in a position to contribute skills, time and en-

ergy to developing a high performance standard development organization. Steve Halperin asked me to become more active at the standards management level and still stay involved on working groups where my experience and knowledge contributed to industry standards.

From a relatively small group of dedicated "volunteers", the standards organization grew to over a hundred active participants, the Symposium grew in stature, and tutorials were created to provide education to our industry colleagues.

Fast forward: 2005, approaching 2006 - 27 years!

Years ago I was asked, "why do you do so much volunteering for the ESD Association?" My response, "because this industry has been very good to me professionally and personally". Our "static" industry has provided me a rewarding career and many satisfactions. My volunteer service is my way of repaying in some small way, for what our association and the industry have contributed to my life and career.

My volunteer service is my way of repaying in some small way, for what our association and the industry have contributed to my life and career.

Within our association are my closest friends and colleagues. My employer, SCC, Inc. deserves a word of appreciation for allowing me to be active in ESDA by supporting my participation at all meetings and the time required in-between meetings for me to perform in my roles.

A brief glimpse of our 2005 accomplishments:

- Creation and publication of the ESDA's Technology/sensitivity roadmap.
- Increased attendance at Symposium and Tutorials.
- First Program Manager Certification Exam
- S20.20 and Program Manager seminars conducted in Manila, Penang, Bangkok and Singapore.
- Device Design seminar conducted in Munich, Germany
- First ESDA Web based training sessions.

Throughout my years of service to ESDA I have been thrilled to observe the growth and development of so many individuals within our organization. Please accept my sincere thanks for allowing me to participate in our Association, our industry and supporting me as your President for the past 2 years. "It has truly been my pleasure". ▲

Association news

ESDA elects directors, officers

Election results were reported during the annual ESD Association annual meeting and business luncheon at the 2005 EOS/ESD Symposium, in Anaheim, California. Elected to the Board of Directors, by the ESD Association members, for a three year

term of January 1, 2006, to December 31, 2008, were: Tim Jarrett, Guidant Corporation; Dale Parkin, IBM; Leo G. Henry, ESD/TLP Consulting; and Dave Swenson, Affinity Static Control Consulting.

The Board of Directors also elected of-

ficers for a one year term of January 1, 2006, to December 31, 2006. The following officers were elected: Kay Adams, Tech Wear Inc., President; Dave Swenson, Affinity Static Control Consulting, Senior Vice President; and Dale Parkin, IBM, Vice President. ▲

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Call for papers

28th Annual EOS/ESD Symposium

Tucson, Arizona, USA, September 10-5, 2006

The ESD Association in cooperation with the IEEE is sponsoring the 28th Annual Symposium dealing with Electrical Overstress (EOS) and Electrostatic Discharge (ESD) effects. The Symposium will be devoted to the understanding of issues related to electrical transients and electrical overstress, and the application of this knowledge to the solution of problems in consumer, industrial and military applications, including electronic components and manufacturing, as well as in systems, subsystems and equipment.

Submission guidelines

Technical Papers

The Technical Program Committee solicits paper contributions, which include data and analysis, which advance the state-of-the-art knowledge, enhance or review the general knowledge, or discuss new topics related to EOS/ESD.

Abstracts

Authors must submit a 50-word abstract and 4 page (maximum) summary of their work.

The summary must clearly state the purpose, results (e.g., data, diagrams, photographs, etc.), and conclusions of the work. Summaries must also include references to prior publications and state how the work enhances existing knowledge. Authors must designate the appropriate area related to their work and submission.

Electronic Submissions

Abstract and paper submissions shall be made electronically via e-mail to info@esda.org. The required file format is

pdf (Adobe Acrobat®), one single pdf file for each submission. Paper presentations at the Symposium will be in electronic PowerPoint® format.

Paper Acceptance

The Technical Program Committee will accept unpublished papers for review with the understanding that the author will not publish the work prior to presentation at the Symposium. Accepted papers published in any form prior to presentation at the Symposium may result in the paper being withdrawn from the Symposium Proceedings. Authors must obtain appropriate company and government clearances prior to submitting their abstracts.

Awards and Recognition

Awards are presented annually for the Best Presentation (selected by Symposium attendees) and the Best Paper (selected by the Technical Program Committee). The Best Paper is considered for presentation at the RCJ EOS/ESD Symposium in Japan. A Best Student Paper Award will also be presented. Eligible student contributions should be marked as such by the authors at the time of abstract submission.

Deadlines

The submission deadline is Friday, January 13, 2006. Late *submissions will not be accepted*. The *final submission* deadline for the finished papers will be Friday, June 9, 2006. Final papers will be limited to a maximum of 10 pages -guidelines will be provided after acceptance of the paper.▲

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Update on standards activity

to real world events. Most of these issues will require detailed investigation and as such will be considered for future revision. Committee members will provide data and submit proposals for discussion and consideration at the February meeting series.

CDM Device Testing-WG5.3.1 The WG reviewed presentations on same device, different testers, and different failure levels. Work continued on CDM5.3.1 document which is due for ANSI review in 2006.

Transient Latch Up (TLU) Device Testing-WG5.4 showed test hardware in the exhibit hall during Symposium. The committee has planned a round of testing to determine the over all pre-variance of TLU. This testing will be followed by characterization of failed devices and Round Robin Testing. Discussions on Latch Up were held including that on portable devices.

Transmission Line Pulse-WG5.5 reviewed the TLP Standard Practice and TLP Technical Report. A presentation was given on the VF TLP testing of products. TLP Round Robin testing status was discussed. The committee is to send their comments and changes on draft documents for February 2006 meeting series review.

Flooring-WG7 reviewed TR on flooring. Projected time frame for completion is 45 to 60 days.

Footwear-WG9 is conducting a 5 year review of STM9.1-2001. WG9 will become active to review this document for any changes that may be needed. The WG will also review ANSI Z41 to better comprehend any changes the committee has made to their document.

Handlers-WG10 discussed Discharge Current Measurement Target, test methods, and preliminary data taken to this point with a number of members from Device and CDM Groups. Received sug-

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Symposium

2005 EOS/ESD Symposium Workshop Wrap-up

Rick Rodrigo, Simco

The Silicon Technology Scaling and ESD Reliability Workshop (A.1) moderated by Robert Gauthier, IBM, had excellent attendance at almost 80 attendees. The workshop started with an overview of the potential next generation devices that might be offered in 32nm and beyond technologies and a brief handout prepared by industry leaders was presented. Discussion and presentation then transitioned into the challenges these new device structures will bring for ESD. Challenges from ESD in 65nm and 45nm SOI and bulk CMOS were discussed. The workshop wrapped up with a review of the ongoing S20.20 work and how this might relate to the ESD specifications in the future. Hot topics included: next generation devices and their implications for ESD, where did 2KV HBM come from and why are we still trying to meet it with S20.20 rolling out, interest in knowing High-K oxide breakdown results, opinions on when the next generation devices will be rolling out, how SOI and bulk CMOS ESD results are scaling and what the future outlook is. Overall, this workshop was well received.

TLP Application for Design and Characterization: Can we use TLP in a different way? (A.2), moderated by Vesselin Vassilev, Texas Instruments, had over 40 attendees. TLP testing methods for the needs of ESD design and characterization on device and IC level were reviewed. Can we use a TLP system to generate CDM ESD stress failure signatures? What are the applications of the very fast TLP method? How do we successfully use TLP data in industrial environment? What needs to be improved in the TLP systems and interpretation of results? These were the main thrilling topics covered at this workshop.

ESD Control and Design for Extremely Sensitive Class 0 Devices (A.3), moderated by Albert Wallash, Hitachi GST, had almost 60 attendees. With a focus on MR heads, it provided discussion on ESD con-

trol and design solutions that can apply to any extremely ESD sensitive device. Special examples and discussion of ESD control solutions for magnetic recording heads, with a CDM failure voltage around 1V, were highlighted.

The Automated Equipment, ESD and Grounding Issues workshop (A.4), moderated by Donn Bellmore, Universal Instruments, was well attended and the following issues were discussed: measuring grounds and ground paths, types of materials used to control discharges to ground, the pros and cons of ionization in automated equipment and, of course, material evaluations. Donn brought a variety of instruments and materials to provide attend-

ees with true hands-on demonstrations. Instrumentation was a hot topic; discussions included appropriate instrumentation to use and how to get accurate results from the instrumentation.

The On-Chip ESD Protection workshop (B.1), moderated by Natarajan Mahadeva lyer, IMEC Belgium, had super attendance with over 100 attendees. The fundamental stages in developing on-chip ESD protection was revisited with a brief handout prepared by industry leaders. ESD protection in RF circuits in sub-65nm CMOS technology and what the practical expectations for these applications was discussed. The importance of suitable chip design in light of scaled down technolo-

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Annual Report of Directors EOS/ESD Association, Inc.

The following is a summary of the financial position and operating results for the periods indicated:

	Jan.-Aug. 2005 (unaudited)	2004 (audited)	2003 (audited)
Total Assets	\$1,058,116	\$817,434	\$723,858
Total Liabilities	(\$6,447)	(\$57,021)	(\$66,406)
Net Assets Unrestricted	\$1,051,669	\$760,413	\$657,452

	Jan.-Aug. 2005 (unaudited)	2004 (audited)
Operating Income	\$790,412	\$865,222
Functional Expenses	\$509,569	\$752,463
Increase (Decrease) Net Assets	\$280,843	\$112,759

*Note: The unaudited January through August does not include 2005 Symposium/Tutorial program expenses.

The following is the Association membership numbers for the periods indicated. All membership lists are database stored at the Headquarters office, including all address information.

	Jan.-Aug. 2005	2004	2003
Total Membership	1454	1390	1342

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Symposium

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2005 EOS/ESD Symposium Workshop Wrap-up

gies was highlighted. High frequency ESD protection, the challenge of providing ESD protection as operating frequencies increase, was discussed. Present and future challenges in implementing full chip ESD protection was reviewed. Overall, this workshop was well received.

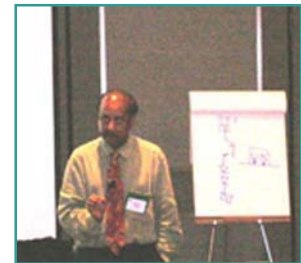
System Level ESD Considerations (B.2), moderated by Jon Barth, of Barth Electronics, was well attended. Thanks to Jon for taking over as moderator for this workshop; he provided coverage at the last minute to ensure that the workshop would be offered. The workshop provided the participants with real life discussion of the latest developments in the field of system level ESD. This was a truly discussion-driven workshop.

The ESD Auditing workshop (B.3), moderated by Ted Dangelmayer, of Dangelmayer Associates, was well attended and used an old auditing video to stimulate interaction with attendees and produced many great questions. Attendees had an opportunity to find inconsistencies in the old video with current S20.20 practice. Highlighting changes in common practice helped improve understanding of S20.20 as well as identifying common auditing pitfalls.

Cleanroom /ESD guidelines /Ionization (B.4), moderated by Tom Albano, ITT Industries, Space Systems was well attended and provided a vigorous exchange between expert panel members and the audience participants. Cleanroom particulate control regarding processes of mate-

rials and abrasion were discussed. Materials, packaging, equipment and test questions were also discussed with a concentration of questions and responses related to ionization and cleanroom applications.

All in all, the 2005 EOS/ESD Symposium provided an excellent forum for a valuable series of workshops on the various aspects of ESD awareness, measurement and control.▲



Charvaka Duvvury

Association news

ESDA Research Grant for 2005-2006

Charvaka Duvvury, Texas Instruments Inc., ESDA Academic Liason

Earlier this year the ESD Association announced a research grant competition with the intent to fund promising ESD research. The criterion for selection of the winner was to be a proposal that would advance the understanding of ESD knowledge and the work could be in any field of ESD including device/design, materials, test methods, or factory control methods. The stipulated grant money to be awarded was \$10K for one year of research work until September 30th, 2006.

I am pleased to note that we have received 10 excellent research proposals from USA, Canada, France, Belgium, and Taiwan.

The topics of these proposals varied from studies of ESD effects on the most advanced upcoming devices to the science of understanding static generation. These proposals were all reviewed for their research goals by the respective Board

members within the specific fields of their expertise. Another main criterion for evaluating these projects was that the work should reflect the ESD Technology Roadmap. This roadmap was recently shown at the ESD Symposium opening and can currently be found on the ESDA web site.

I am indeed very pleased to announce that the winner of the 2005 ESDA Research Grant is Professor Kaustav Banerjee from the University of California at Santa Barbara. Their research topic is entitled, "Electrothermal Engineering of Multi-Gate CMOS Devices for Improving Robustness under ESD Conditions". Multi-Gate devices, also called MUGFETs, are the latest transistors for taking the technology into the next level of nanometer range. These devices, while considered to be promising for future application in integrated circuits, can be very sensitive to ESD which

is a major cause of concern. The details of this structure and its performance under ESD conditions can be found in the recently published paper by Christian Russ et al. in the 2005 Symposium. The proposal by Prof. Banerjee's group aims to understand the thermal effects in these transistors through device simulations and thereby establish optimum device design for improved ESD capability. We wish them best of luck in this endeavor.

I would like to take this opportunity to offer my thanks to all the researchers for kindly taking the time and interest to submit their proposals to the ESDA. We have learned a lot and are encouraged to note that ESD research has taken on an even greater prominent role in the academic institutions. We hope that this is also a reflection of the ESD Roadmap for continued interest in ESD for the years to come.▲

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Association news

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Celebrating Achievement

Texas Instruments-Industry Contribution Award

Comments and presentation by Tim Maloney

The ESD Association Industry Contribution Award is presented in recognition of consistent and superior service to the ESD Association through continuing education, technical innovation, and unwavering support of their employees that provide countless volunteer hours.

Beyond their financial support, Texas Instruments has also consistently supported the Association through volunteer work of all kinds, contributing to education with tutorial instructors, reporting on technical innovation at the Symposium, providing useful studies to standards committees, and countless other voluntary tasks. Accordingly, we are introducing the Industry Contribution Award, presented this year to Texas Instruments, Inc.



Donn Bellmore (left) presents the Technical Program Committee Award to Eugene Worley (right).

Horst Geiser-Unheralded Volunteer Award

The Unheralded Volunteer Award is presented to an individual whose dedication to the Association has lasted for more than ten years. Ed Weggeland presented this

award to Horst Gieser. It is interesting to note, Horst danced to the to the front of the room to receive his award after being asked a series of questions including, 'Please remain standing if... you travel from outside of North America to attend ESDA meetings, and 'if you like salsa dancing'.

Eugene Worley-Technical Program Committee Award

The ESD Association Technical Program Committee Award honors an individual for outstanding contribution to the Technical Program Committee. Donn Bellmore, Technical Program Chair, presented this award to Eugene Worley.

Koen Verhaege - Outstanding Contributions Award

The Outstanding Contributions Award is awarded to an individual who has made a major contribution to either the development or the operation of the ESD Association or has had a significant impact in the field of EOS/ESD. Potential candidates for the Outstanding Contributions Award are not required to be members of the ESD Association. The final selection is approved by EXCOM. Charvaka Duvvury presented this award to Koen Verhaege of Sarnoff Europe, Belgium.

Cheryl Checketts - David F. Barber Sr. Memorial Award

The David Barber Sr. Memorial Award is presented to an individual who has made a significant contribution to the development, organization, management and growth of the EOS/ESD Symposium. The candidate for this award is chosen by the Symposium Business Unit Manager and current General Chair. This award was presented by Charvaka Duvvury, General Chair EOS/ESD 2005 Symposium, to Cheryl Checketts of General Dynamics.

John T. Kinnear - Joel P. Weidendorf Memorial Award

The Joel Weidendorf Memorial Standards Award is presented to an individual who has made a significant contribution to the development of ESD Association Standards. This year's award was presented to John T. Kinnear by Ronald Gibson, Standards Chairman.



Carl Newberg (right) presents the Friendship Award

Symposium Paper Awards

Other awards included Best Paper, Best Student Paper, and Best Presentation. A special presentation by Carl Newberg highlighted the Best Paper 2004 RCJ, ESD Symposium, Japan, at our 2005 Symposium. This Friendship Award recognized A Study of Relation Between a Power Supply ESD and Parasitic Capacitance, written by T. Suzuki, J. Iwahori, T. Morita, H. Takaoka, T. Nomura, K. Hashimoto, S. Ichino Fujitsu VLSI Limited.

The Technical Program Committee awarded the Best Student Paper to Study of CDM Specific Effects for a Smart Power Input Protection Structure, written by M. Etherton, NQu, J. Willemen, W. Wilkening, S. Mettler, M. Dissegna, R. Stella, L. Zullino, A. Andreini, H. Gieser, H. Wolf, W. Fichtner Swiss Federal Institute of Technology.

The Technical Program Committee recognized ESD Protection for a 5.5 GHz LNA

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Association news

Celebrating Achievement

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in 90nm RF CMOS-Implementation Concepts, Constraints and Solutions, as the Best Paper Award.

The Best Presentation was selected as a result of an attendee questionnaire. The award went to M.G. Khazhinsky, J.W. Miller, M. Stockinger, and J.C. Weldon of Freescale Semiconductor, Inc. for their presentation Engineering Single NMOS and PMOS Output Buffers for Maximum Failure Voltage in Advanced CMOS Technologies .▲

Symposium

2005 ESD Symposium

Charvaka Duvvury, 2005 ESD Symposium General Chair

I am very pleased to report that the ESD Symposium this year has been a success thanks to all of the volunteers that put in many hours of work preparing for it and diligently working through the meeting.

The Symposium was attended by nearly 400 people which is more than a 10% increase from last year. With the participation from several first-time attendees, it surely is a reflection of the growing importance of the Symposium. From tutorials to technical sessions, and from workshops to exhibits, the attendee's surveys indicated a general satisfaction. These surveys also help us to improve the Symposium for the next year and beyond.

One particular highlight for the conference this year is worth mentioning. The presentation of the ESD Technology Roadmap. This roadmap that was put together by the ESDA Board projects what is

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Standards

Update on Standards activity

Continued from page 4

gestions on test methods and testing the new target. Consensus of the group was the test method should be able to correlate back to existing standards. This would work well for comparing two systems.

A demonstration of a test method of measuring fields through the board path of a handler was given and preliminary data was discussed. Committee review and comment on 10.1-2000. Targeting February meeting series to finish review of this document.

Packaging-WG11 reviewed retention test method and presented test results. Committee discussed that charge placed on a cup or CPM is not removed by grounding; another method is needed. A revised Test Method was reviewed. The committee is having lab tests conducted on a revised testing method.

System Level-WG14 gave a presentation discussing the use of TLP tester to simulate other ESD events. There was some discussion of the data and usefulness in system level testing and cable discharge events. Since actual measurements of CDE events was not possible prior to this meeting, we again discussed the need for such work before the metrology document can be published. Some measurements will be given by the February meeting series.

Gloves-WG15 discussed the topic of charge generation. The group decided that this issue is too important to table. Material test methods were reviewed from ADV11.2. The group suggested that using charge generation tests will be more valuable than only material tests. Three types of tests will be initially tried. Group members volunteered to do the three tests and

report results in February 2006.

Workstations-WG53 reviewed the changes made during the last meeting and additions written since then. Made clarifications in the wording to most of the document with exceptions of the packag-



ing section. The two appendixes were added since last meeting and it was felt they both needed some work which we are going to do by email in order to be able to submit to TAS.

Flooring/Footwear-WG97.1 is conducting a five year review of STM97.1-1999. The Committee suggested reaffirmation with a TAS review for grammatical changes. There have been no industry comments on this document in five years.

Flooring/Footwear-WG97.2 is conducting a five year review of STM97.2-1999. Committee suggested reaffirmation with a TAS review for grammatical changes. There have been no industry comments on this document for the last five years. ▲

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Education

ESD On Campus Program

by Steven H. Voldman, IBM Microelectronics

The "ESD on Campus" program is a new educational outreach effort, to provide technical lectures on electrostatic discharge (ESD) to undergraduate students, graduate students, and faculty. This new program was initiated in 2004 by the International Education Committee (ICE) and approved by the ESDA Board of Directors. What is the objective of the ESD on Campus program?



Steven H. Voldman

What is the objective of the ESD on Campus program?

- Increase the awareness of ESD as a technical profession.
- Provide knowledge of programs and services of the ESD Association.
- Promote interest of undergraduate and graduate students in the field of ESD.
- Promote research and development in the field of ESD.
- Establish relationships with faculty and departments.

How is this effort different than prior years? In this program, a key objective is to reach out to new campuses that had the opportunity of lectures in ESD in prior years. A key goal is to expand the number of colleges and universities. Secondly, it is to include more lecturers which includes many members of the ESDA BoD and executive committees. Third, the total funding budget has been increased to provide this new initiative. Fourth, the visits are made as "side-trips" to reduce total cost per visit. In this fashion, we can reach new students, new faculty, and new regions around United States, Canada, and internationally.

In the first Spring Semester of 2005, the ESD on Campus program planned two campus trips in the first semester.

- University of Illinois Urbana-Champaign (UIUC)
- University of Wisconsin-Milwaukee (UWM)

The visit to the University of Illinois Urbana-Champaign was focused on the ESD research group of Professor Elyse Rosenbaum and the Electrical Engineering (EE) department. The ESD on Campus visit included an afternoon meeting new faculty of the Electrical Engineering department, a three hour visit with students working on ESD protection, a technical lec-

ture and ESDA literature packages. The interest ranged from RF devices to TLP machines.

The visit to the University of Wisconsin-Milwaukee (UWM) was focused on the Mechanical Engineering, Electrical Engineering, and Physics Department. The host was Professor Xiaoling He of Mechanical Engineering. The ESD on Campus visit included a visit with faculty, the Department Chairman of Mechanical Engineering, the Dean of the UWM Engineering School and an ESD technical lecture. The interests of this university range from corona discharge, interconnects, low-k materials and nano-structures. Additionally, from this visit an ESD research proposal was submitted for the ESDA University Research grant.

Additionally, more ESD on Campus university visits are planned as side-trips in the travels to other ESD symposia around the world.

This Fall Semester, the ESD on Campus will be providing lectures in the U.S. and internationally. The first visit was to National Taiwan University of Science and Technology (NTUST) with Professor S.L. Jang. A lecture, entitled "ESD in the Nanoelectronic Era" was provided to 200 students and faculty. In a second visit, a second talk on ESD in RF devices was given to 150 students at National Taiwan University (NTU), Taipei with host faculty member, Professor Jean-Fu Kiang.

With the new ESD on Campus program, the ESD BoD hope to visit many new colleges and university campuses to increase the interest in ESD in the U.S., Canada, and the world. ▲

Symposium

2005 ESD Symposium

Continued from page 8

in store for future achievable ESD levels with the invariably severe constraints coming from the technology advances for high performance electronics. While pointing out the challenges faced in developing more innovative protection methods, the

roadmap also points to the need for stricter implementation of ESD controls in the factory. The details can be found at the ESDA web site.

I would like to take this opportunity to thank all the people who attended the Sym-

posium to make it a success. Please be sure to attend the 2006 ESD Symposium to be held from September 10th through the 14th in Tucson, Arizona. Our 2006 General Chair, Carl Newberg, will be giving more details in the months to come. ▲

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Standards

February 2006 Meeting Schedule

Tucson, Arizona

Westin La Paloma

ESD Association Preliminary Standards Meeting Schedule February 23-28, 2006

Thursday, February 23

TAS 8:00-5:00

Friday, February 24

TAS 8:00-5:00

WG-3, Ionization 8:00-Noon

WG-97.1 & 97.2, 8:00-Noon

WG-5, Device Testing 8:00-5:00

WG-10, Handlers 1:00-5:00

Saturday, February 25

TAS 8:00-5:00

WG-53, Workstations 8:00-Noon

WG-9, Footwear 8:00-Noon

WG-5, Device Testing 8:00-5:00

WG-11, Packaging 1:00-3:00

WG-2, Garments 3:00-5:00

WG Chair Meeting 8:00-Noon

ESDA Mixer- All Invited 6:30-7:30

Sunday, February 26

TAS 8:00-5:00

WG-7, Flooring 8:00-Noon

WG-14, ESD Simulators 8:00-Noon

WG-15, Gloves 8:00-Noon

STDCOM 1:00-4:00

Nominations 4:00-5:00

Program Manage Council 4:00-6:00

EXCom/AAC 6:00-9:00

Monday, February 27

Human Resources 8:00-Noon

Technical Program 8:00-4:00

Marketing and Comm. 10:00-Noon

Steering Committee 2:00-5:00

Tuesday, February 28

BoD 8:00-5:00

Association news

New Volunteer Spotlight

October's volunteer spotlight is Eugene Chase. Chase is currently a member of WG 53, chairman of WG-15, ESD Gloves and Finger Cots, and a member of STDCOM. Chase was a member of WG11, during development of ESD ADV II.2, Tribo Charge Testing. He also served as an alternate on WG-11 for Stan Weitz, President of ETS, Inc. Chase was a member of WG-97 during the development of ESD STM 97.1, Flooring Materials and Footwear-Resistance Measurement in Combination with a Person. He was also chair during development of ESD STM 97.2, Flooring Materials and Footwear-Voltage Measurement in Combination with a Person. Chase was a member of the 1988 ESDA Technical Program Committee, and also served from 1993 through 1996. Chase was Registration Chairman for the 1987 EOS/ESD Symposium. In addition, Chase has given five papers at the EOS/ESD Symposium, as well as, over seventy talks, articles or published papers.

Chase is currently an ESD Technical Consultant for Electro-Tech Systems, Inc. and a NARTE Electrostatic Discharge Certified Control Engineer (NCE). His present work involves ESD and EMI problem solving, training, and sales of ESD measurement and ESD protective items. His previous position was in the Electromagnetic Compatibility and Power Department at Bellcore (Telcordia Technologies). His former work involved

writing Bellcore Generic Requirements for the ESD concerns of the Clients (telephone companies), the development of new test standards for these requirements, serving as the chairman of a Bellcore (Client) ESD Team. Previous experience includes ultra-fast optics research, preparation of superconducting thin films by UV laser deposition, and deposition and characterization of

other complicated multi-element film systems. As a member of the Device Reliability Research District, his work included electrostatic discharge (ESD) research, consulting on Bellcore ESD Training Videos, ESD procedures and practices for the Bell operating companies, consultation with Quality Assurance on vendor problems, field failures, failure rates, and failure mode analysis on component field failures. Chase did reliability and ESD studies on GaAs FETs and MODFETs.

Prior to divestiture, Chase was a member of the Integrated Circuit Customer Service Laboratory, Device Evaluation and Reliability Studies Group at Bell Laboratories. His group was instrumental in alerting Western Electric, now Lucent Technologies, to the hazards of electrostatic discharge. Chase did qualification of a number of complicated ICs including a codec, analog switches, crosspoint switches, EPROMS, and microprocessor peripheral timers. He also completed a large in-situ infant



Eugene Chase, Volunteer

Continued on page 11

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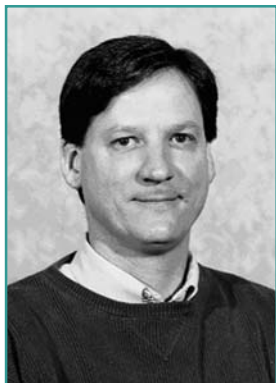
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Association news

And the survey says...

by Tim Jarrett, Guidant Corporation



Tim Jarrett

Each month Threshold™ provides a column to address the many questions and comments expressed by Association members in their responses to an email survey conducted by the ESD Association's Human Resources Business Unit.

The primary goal of the ESDA is to serve our members. This survey provides an excellent source of direction in our quest to serve the membership.

This survey was distributed by email in August 2003. The ESD Association sincerely thanks those members who took the time to send in their comments.

Survey question: What products or services can the ESD Association provide to help you in your ESD duties?

Member comment:

The ESD Association is currently doing a great job and there are not many areas that are not covered. As a company distributing static control products, it would help us to be better aware of companies that are producing these products if there are regular articles highlighting these companies and the innovative products they have designed for ESD control.

ESDA Response:**ESDA Response:**

Thank you for your supportive comments. As interesting as it might be for the staff of the ESD Association to write regular articles highlighting new and innovative products, it's not in the association's charter, sorry. However, the ESDA web site does provide a buyer's guide section. Click on Buyer's Guide on the left hand column of the home page and you will be asked to select your interest by product or company. You can even select your geographical preference! This service can be accessed at www.esda.org.

Member comment:

I would like to see documentation to help convince Management of the real value of effective ESD control. Anecdotal accounts, as well as statistical evidence could prove helpful in justifying the expense involved.

ESDA Response:

Introduce your management the new ESD Association publication, Electrostatic Discharge (ESD) Technology Roadmap. You can find this on the association's web site, www.esda.org. This publication is enlightening and should help to trigger your management's interest of the real value of effective ESD control. In it you will find, "In order to achieve the performance and density numbers required by industry, the devices have become more sensitive to ESD events since the late 1990's. The current trend, that is expected to continue, is circuit performance at the expense of ESD protection levels."▲

Association news

Continued from page 10

Volunteer Spotlight

mortality latent electrostatic discharge study on high-voltage gated diode crosspoint switches. Prior work included development of a high resolution page scanner for micrographics, extensive studies of laser machined thin films for micrographics, and development of anti-reflective coatings for high-power GaAs lasers.

Chase is happily married with four grown children and four grandchildren. He and his wife Betty are involved in a local Baptist Church, where Betty is Assistant Treasurer and Chase contributes sounds from his trombone during worship. Both Chase and his wife are active in the Gideons International. Chase is also active in a group called the "Tuesday Singers" where he plays his trombone at nursing homes once a week. For recreation, Chase has several varied interests, including jogging, cycling, golf, woodworking and model trains.

Benefits of being an ESDA volunteer according to Chase, "Working with the great people that are volunteers with ESDA has been the highlight of my tenure. There are so many talented contributors particularly in the WG-15, ESD Gloves and Finger Cots Work Group and WG-53, Workstations Work Group. Without the friendships and working relationships, I think I would have retired long ago. I continue to learn a lot from so many. Being the chair of a work group has its very frustrating times and it's very exciting times. Now we are very close to having an ESD Glove and Finger Cot Standard Practice that seemed to take forever, but will be an excellent document thanks to so many for their contributions."▲

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www.electrostatics.org

The Electrostatic Society of America (ESA) is devoted to the advancement of electrostatics, encompassing a wide breadth of areas including MEMS, biological and industrial applications

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Calendar

November 2005

November 6-10, 2005

ISTFA 2005

McEnery Convention Center
San Jose, CA

www.istfa.org

3 IEEE—ESD-SCV Meeting/Seminar

2nd Tuesday of each month
Email: ieee-esd-scv@nsc.com

December 2005

December 2, 2005

Early Bird Registration Deadline - Pan Pacific Microelectronics Symposium

Hapuna Prince Hotel,
Waikoloa Beach, HI
www.smta.org

December 7, 2005

New SMTA Mini-Conference on Compying with RoHS: Real-World Examples

Richardson Hotel,
Richardson, TX
www.smta.org

December 7-9, 2005

SEMICON Japan 2005

Makuhari Messe
(Nippon Convention Center), Japan
www.semi.org

February 2006

February 23-28, 2006

ESD Association

Preliminary Standards Meeting

Westin La Paloma
Tucson, Arizona

March 2006

March 8-10, 2006

Philippine Electrostatic Discharge Forum

Bellevue Hotel,
Alabang City Philippines
www.esdphilippines.com

ESDA Certification Courses:

March 9th & 10th

ANSI/ESD S20.20

Program Development and Assessment

March 9th

How To's of In-Plant ESD Auditing and
Evaluation Measurements

March 10th

Packaging Principles for the Program Manager

March 10th

ESD Standards Basics for EPA

June 2006

June 8-13, 2006

ESD Association

Preliminary Standards Meeting

Palm Springs Riviera
Palm Springs, CA

September 2006

September 10-14, 2006

ESD Association

Annual Symposium

Westin LaPaloma
Tucson, Arizona

Threshold

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September/October	Aug. 1
November/December	Oct. 1
January/February	Nov. 19
March/April	Feb. 1
May/June	April 1
July/August	June 1

Threshold Institutional Listings

Space in the Threshold Institutional Listings, which appear at the bottom of newsletter pages, can be purchased for \$600.00 for six consecutive issues. Larger contributions are welcome. No agency fee is granted for soliciting such contributions. Inquiries, or contributions made payable to the ESD Association, should be sent to

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