

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



# THRESHOLD™

Volume 21, No. 6

January/February 2006

## News bits

### Call for ESDA Board of Directors nominations

The ESD Association is requesting nominations for the board of directors. See page 5 for more information.

**Next online courses:** With our first online course successfully completed, we are ready to offer more. Grounding and Electrostatic Discharge Effects in Integrated Circuit Chip Technologies will be our next topics to be offered. See page 5 for more information.

### 2006 education seminars in Philippines

The Philippines will host program manager seminars this March. See page 2 for more information.

### 2006 Symposium abstract deadline fast approaching

The 2006 EOS/ESD Symposium is not that far away. Anyone still interested in submitting a paper for consideration must send an abstract by January 13. See page 4 for more information.

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## Program Manager exam results

The first Certified Professional-Program Manager exam was held on Friday, September 16 at the 2005 EOS/ESD Symposium in Anaheim, California. The program was designed by the ESD Association and the test is developed and graded by the Program Manager Certification Council. After successfully completing the required elements: an official file on record with ESDA Headquarters, minimum prerequisite courses, in-depth examination, and a continuing education requirement, the ESD Association is pleased to confer Professional Certification status (for ESD Program Managers) to the following individuals: Kevin Duncan, Seagate Technology; Carl Newberg, River's Edge Technical Service, Inc.; Douglas Miller, Sandia National Laboratories; Thomas Larson, Trek, Inc.; Timothy A. Prass, Raytheon; and Robert Perry, Seagate Technology.

The impact of the ESD Control Program Standard ANSI/ESD S20.20-1999: Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices) on the global industry has been extraordinary. The ESD Association's Board of Directors recognizes the need to offer a certification program for individuals that are involved in designing, implementing, managing and auditing ESD control programs in their facilities. The ESD Certified Professional-Program Manager certification program was announced in 2003 to serve that purpose. In addition, the needs of the technical community for certification of various technical specialists are apparent. The ESD Association is pleased to now offer an ESD Certified Professional-Device/ Design certification program as well.

The following courses are offered ev-

ery year at Symposium and at other times throughout the year. If an attendee completed these courses in 2003 or after, they may be applied to the Program Manager Certification.

Please watch the ESD Association website at [www.esda.org](http://www.esda.org) for announcements regarding these exciting and important new offerings.

### Program Manager Certification Seminars and Tutorials

- ESD Program Development and Assessment (ANSI/ESD S20.20 Seminar) (2 day course)
- ESD Basics for the Program Manager (full-day course)
- Air Ionization: Issues and Answers (half-day course)
- How To's of In-Plant ESD Auditing and Evaluation Measurements (full-day course)
- Packaging Principles for the Program Manager (half-day course)
- ESD Standards Overview for the Program Manager (half-day course)
- Device Technology and FA Overview (half-day course)
- Electrostatic Calculations for the ESD Engineer (half-day course)
- Cleanrooms Considerations for the Program Manager (half-day course)
- System Level ESD/EMI: Testing to IEC and Other Standards (half-day course)

To obtain additional information about professional certification or the 2006 EOS/ESD Symposium, please contact the ESD Association: Phone:315-339-6937, Fax:315-339-6793, Email: [info@esda.org](mailto:info@esda.org), [www.esda.org](http://www.esda.org).

## Certification

# Program manager certification core courses to be offered in Asia

The ASEMEP Electrostatic Discharge Council (AEC), the first chapter of the Electrostatic Discharge Association (ESDA) in Asia, is again holding the Philippine Electrostatic Discharge Forum on March 9 and 10, 2006, at the Bellevue Hotel, Alabang City, Philippines. This event is sponsored by the Philippines local ESDA chapter and the Association of Semiconductor and Electronics Manufacturing Engineers of the Philippines (ASEMEP).

The objectives of the Philippine Electrostatic Discharge Forum are to promote awareness and understanding of ESD and showcase the trends and developments in ESD detection and control. International



Stephen A. Halperin

and local delegates involved in ESD control within and outside the semiconductor and electronics industries in Asia are expected to attend the forum.

Suppliers to the industry will showcase test and audit equipment, ESD and cleanroom garments, ESD control equipment, ESD control accessories, ESD safe materials, publications, and training materials. Currently, this is the only event focused on the ESD market in the Philippines.



Ron Gibson

This year the forum will include four ESD Association tutorials on March 9 and 10: ESD Basics, How To's of In-Plant ESD Auditing and Evaluation Measurements, Program Development and Packaging Principles. This year's instructors include: Ron Gibson, Celestica International Inc., John Kinnear, IBM, and Stephen Halperin, Stephen Halperin & Associates, Ltd. All of the courses are required for ESD Certified Professional-Program Manager certification. The cost of each course

*Continued on page 4*

## Symposium

# Tucson, Arizona, to host 2006 EOS/ESD Symposium

2006 will find the EOS/ESD Symposium in Tucson, Arizona. The Westin La Paloma Resort and Spa will host the 28th annual EOS/ESD Symposium.

Attendees will be able to attend symposium and find accommodations at the Westin which features 31 meeting rooms and 59,000 sq. ft. of flexible indoor meeting space including covered decks and foyers plus stunning outdoor venues. The 18,000 square foot ballroom is one of the largest in the Southwest.

There are 18 additional meeting rooms, including two hospitality suites and two boardrooms. The building décor is Southwest Mission Revival displaying the signature Spanish arch throughout the property.



Westin La Paloma

The resort is in the center of an area full of business and outdoor recreation. Located in the base of the Santa Catalina Mountains, The Westin is surrounded by lush greens and desert fairways of their 27 hole Jack Nicklaus designed golf course. The facility also includes ten tennis courts, five pools, three whirlpools, and a Health Club. Sand and water volleyball, jogging and hiking paths are also available.

The Westin also offers an eclectic mix of unique shops and boutiques on site at their Retail Shopping Center. A complimentary shuttle is available from their front drive to the neighboring La Encantada Shopping Center as well for a bigger variety in shop-

This year's Symposium continues to be the best source for ESD information and solutions. This year's steering committee consists of: Carl Newburg, General Chair; Donn Bellmore, Vice General Chair; Gianluca Bosselli, Technical Program Chair; Vessellin Vassilev, Workshops Chair; Sarah Smith, AV Chair; Rick Rodrigo, AV Assistant; Cheryl Checketts, Arrangements Chair; Raivo Leeto, Registration Chair; and David E. Swenson; Exhibitor Liaison.



Resort -- Front view

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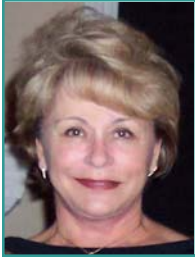
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Tel: 909-627-8178 Fax: 909-627-7449 [www.descoindustries.com](http://www.descoindustries.com)  
ESD CONTROL PRODUCTS: Charleswater, CMG, Desco, EMIT, Menda, ESD Systems.com, Protoktive Pak, Semtronics, Statguard Flooring

## From the president

# Are you being served?



Kay Adams

Stepping into the role as your President gave me a fresh perspective on the ESDA's two-pronged mission, which is to "Become Known, Serve Industry".

The programs and activities of the ESDA have been designed with that goal in mind and fulfill that mission well. During the last year, we were successful in delivering educational opportunities globally, which included testing and certification for Program Manager and Facility Certification. We had a successful Symposium, which provided workshops, education, technical papers and

ESD products for your review. The Symposium for 2006, under the direction of the General Chair, Carl Newberg, promises to continue the tradition of excellence by spotlighting current topics to help you gain even more ESD knowledge. The continuing development and review of our Standards provides you with current and accurate testing methods.

Have you downloaded the Technology Roadmap from [www.esda.org](http://www.esda.org)? I encourage you to review this important document, which will give you insight into the

ESD Association's view of the challenges we will all face in the future.

All of this work is accomplished thanks to the hard work of our many volunteers. I am pleased to serve with the new officers for 2006; Dave Swenson, Sr. VP, Dale Parkin, VP, Donn Bellmore, Treasurer, and Michele McSwain as Secretary.

Heading up each of our business units are Ron Gibson, Standards, Dave Swenson, Professional Education, Craig Zander, Marketing & Communication, and Tim Jarrett, Human Resources.

Are you being served? I welcome your suggestions on how the ESDA can serve you.

Wishing you all a very happy and prosperous 2006.▲

## Association news

# Website updates

### Volunteer Spotlight

Be sure to check out this month's Volunteer Spotlight, Raivo Leeto. Volunteer Spotlight can be viewed at [www.esda.org](http://www.esda.org)

### Buyer's Guide

The ESDA Buyer's Guide is a useful tool for anyone searching for ESD control products, solutions, training, and consulting. The Buyer's Guide can be searched by product, company name, or geographic location. Visit our website to view over 50 companies whose information is conveniently available online to ESDA website users.

### Education

The demand for education and certification is growing. The ESD Association is planning an ambitious year of education in North America and Asia. A preliminary 2006 education schedule is available online at [www.esda.org](http://www.esda.org). The schedule includes courses available, locations, dates, and instructors. See page 10 of this newsletter for a current listing of courses, locations, and dates. The schedule is subject to change so call the ESD Association at 315-339-6937 for the latest updates.

### Website changes

Association members who use the ESDA website regularly may have noticed some design changes. The website is currently

being updated to help improve its usefulness. The education page, now includes a magazine contribution section. Visit this page to read contributions in *Conformity* and *Circuits Assembly* magazine written by ESDA volunteers.

One topic that is continuing to cause confusion is the new registration pop-up window. We apologize for the inconvenience this window may have caused, though all problems are usually resolved quickly. The next time you are accessing the free downloads please note that you will be prompted to enter a username and password. All users, including members who have created a username and password in the

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### Conductive Containers, Inc.

4500 Quebec Ave. North, New Hope, MN 55428

Tel: 1-800-FARADAY Fax: 763-537-1738 [www.corstat.com](http://www.corstat.com)

Manufacturer of CORSTAT conductive corrugated products and ESD safe thermoformed plastic designs for shipping, storage & handling.

### 3M

Electronic Solutions Division

Tel: 1-800-328-1368 [www.3M.com/electronics](http://www.3M.com/electronics)

Manufacturer of static control permanent flooring, wrist/heel straps, static shielding bags, & testing/monitoring equipment

## Symposium

# Call for papers

## 28<sup>th</sup> Annual EOS/ESD Symposium

Tucson, Arizona, USA, September 10-15, 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 that 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](mailto: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. ▲**

## Association news

*Continued from page 3*

### Website updates

members only section, must register in this area to access free downloads.

### 2006 Call for papers

2006 EOS/ESD Symposium has issued the annual call for papers. Visit us online and download guidelines and a complete topic listing.

Any questions or comments can be directed to [info@esda.org](mailto:info@esda.org).

## Certification

*Continued from page 2*

### Program manager certification

is \$475.00 or \$850.00 for both.

For more information about the forum, visit [www.esdphilippines.com](http://www.esdphilippines.com). To register for the ESDA tutorials download a registration form in PDF format at [www.esda.org/upcomingcourses.html](http://www.esda.org/upcomingcourses.html), visit [www.esdphilippines.com](http://www.esdphilippines.com), or call the association at 315-339-6937.



John Kinnear

View the new Philippines brochure online at [www.esda.org](http://www.esda.org).

#### VPI

3123 S. 9th St., P.O. Box 451, Sheboygan, WI 53082-0451  
Tel: 800-874-4240 Fax: 920-458-1368  
Email: [floor@vpiflooring.com](mailto:floor@vpiflooring.com)  
[www.vpiflooring.com](http://www.vpiflooring.com)  
Manufacturer of static control flooring

#### TREK, INC.

11601 Maple Ridge Road, Medina, NY 14103  
Tel: 585-798-3140 Fax: 585-798-3106  
Web: [www.trekinc.com](http://www.trekinc.com)  
Designer and manufacturer of instrumentation and sensors for measuring surface voltage, ionizer performance, and surface resistivity

## Association

# Nominees for Board of Directors Election 2007

Each year, the Constitution and Bylaws of the ESD Association require the membership to elect four Members at Large to the Board of Directors (BoD). Members are elected to three-year terms.

The Association's Human Resources Committee is required to prepare a slate of candidates to fill the four BoD positions, which will be vacated on December 31, 2006. In order to be on the slate: 1) a potential candidate can be nominated by the Human Resources Committee, or 2) a member can submit a petition for a nominee which contains 25 identifiable current ESD Association member signatures along with their membership numbers. (Please contact the ESD Association office if petition signees do not have their membership numbers available. Petitions must be submitted with signature and membership numbers.)

The requirements for acceptance as a nominee are as follows:

## Requirements

1. Must be an ESD Association member in good standing.
2. Must have full management support to attend four BoD meetings per year for three years, documented in a letter to the Association. Please note: For all elected Board Members, good attendance at all BoD meetings is a requirement. Two absences in the same year may be considered cause for dismissal (see Bylaws section 3.2).
3. Must submit a statement of the nominee's vision for the ESD Association and a statement of the nominee's qualifi-

cations, not to exceed 100 words each.

4. Must submit a photograph suitable for publication.

5. The candidate must understand that elected BoD members will have a job responsibility, typically to manage one of the Business Unit Functions (Meeting Planning, Membership, Certification, Education, Academia Outreach, International, Threshold, Web Site, Standards, Symposium, Industry Liaison, and Volunteer Recognition).

## Call to members

This letter is a call to the Association membership for nominations by petition to that slate. Petitions (no faxes!) must be received no later than February 17, 2006 at Association Headquarters: ESD Association, 7900 Turin Road, Bldg. 3, Rome, NY 13440-2069. Accepted nominees will be notified as to the schedule for submitting the additional documentation required in items 2, 3, and 4 above.

## Ballots

Ballots will be sent to the general membership by May 1st and must be returned postmarked no later than July 1st. The results of the election will be announced at the Annual Meeting during the 2006 EOS/ESD Symposium in Tucson, AZ.

Please do your part to help elect the best-qualified BoD possible. The Human Resources Committee is responsible for ensuring that all candidates placed on the ballot are properly qualified and have met all requirements. ▲

## Education

# Online Courses offered

Continuing to offer education as often and as conveniently as possible, the ESD Association has scheduled two online tutorials for February and March. On February 7th the topic is Grounding for the Electrostatic Protected Area. The online course runs for approximately one hour.

Grounding is perhaps the single most important technical aspect in establishing an electrostatic protected area or EPA. The ESD Association standard for grounding, ANSI/ESD S6.1-2005 Grounding, is a major revision of the previous 1999 document. The new standard provides considerable guidance on setting-up and maintaining a reliable work area grounding system for personnel, equipment, tools, and fixtures in the factory as well as field service applications. The new standard provides users with updated definitions, specifications, guidance and suggestions not found anywhere else.

This web-based training session will provide an overview of the new standard and how to properly use the information in setting-up an EPA. In addition, the session will help answer the following questions:

- ▲ What grounding or bonding method is appropriate for my work area?
- ▲ What measurements are needed to assure that my grounding system is OK?
- ▲ What are the new terms and definitions that I need to know about?
- ▲ What are the proper ways to ground personnel in the workplace?
- ▲ How can I safely handle ESD susceptible items when a ground point is not available?

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## Your Ad Can Appear Here

Contact ESD Association for details  
7900 Turin Rd., Building 3, Rome, NY 13440-2069  
Tel: 315-339-6937 Fax: 315-339-6793 info@esda.org

## ACL Staticide

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www.aclstaticide.com  
Cleanroom products, topical antistats, floor finishes and coatings,  
static detection meters, monitors, computer cleaning products

**Education**

*Continued from page 5*

**Online Courses offered**

The cost of this tutorial is \$95.00 for association members and \$140.00 for non-members. To register for this course go to the Register for Upcoming Courses link, [www.esda.org/upcomingcourses.html](http://www.esda.org/upcomingcourses.html), on the ESDA website and download the PDF registration form.

**About the Instructor**

David E. Swenson retired from 3M after 35 years, most of which was involved with electrostatic considerations. He and his wife formed Affinity Static Control Consulting, LLC in March 2003. He has been a member of the ESD Association since 1984 and has served in many capacities, including Senior Vice President in 1996 and 1997 and President in 1998 and 1999. He is a 5 term elected Director of the ESD Association and currently serves through 2008. In addition, Dave was elected Senior Vice President of the Association for 2006. He has authored and co-authored numerous technical papers related to grounding, ionization, packaging materials, test methods for ESD control materials and ESD control program implementation, presented in numerous forums around the world. He is a member of the ESD Association Standards Committee, Technology and Administration Support (TAS) committee, ANSI/ESD S20.20 Task Force, and is Chairman of the Grounding Working Group. In addition, Dave is a past Technical Advisor and subject Technical

Expert to the International Electrotechnical Commission (IEC) Technical Committee 101 - Electrostatics (served 8 years) and is a current member of the Electrostatic Society of America.

**May 4th online course**

On May 4th the online course being offered is Electrostatic Discharge Effects in Integrated Circuit Chip Technologies.

This seminar introduces the phenomenon known as electro-static discharge (or ESD) and what it means to the reliability of semiconductor integrated circuit (IC) chips. Specifically, the seminar will describe the threat of ESD that comes in various forms when the IC chip packages are handled at production and test areas, review the concepts of ESD protection designs that can be built-in at the package pins, and outline the recent advances in the electronic industry technology and the severe impact that they continue to have on the ESD protection methods.

**What is learned**

- ▲ Introduction to the nature of ESD and the impact on electronic industry
- ▲ ESD stress test models to simulate the practical ESD threat
- ▲ The physics of ESD damage in the transistors
- ▲ Basic understanding of effective ESD protection at the IC pin packages

- ▲ New developments in the semiconductor technologies and the impact on ESD reliability
- ▲ The road map for ESD technology into the year 2010 and beyond and the future challenges

**About the Instructor**

Charvaka Duvvury is a Texas Instruments Fellow working in the Silicon Technology Development Group. His current work is on development and company wide support on ESD for the deep submicron CMOS technologies. Charvaka has made numerous international presentations on ESD phenomena and protection design, and is a course organizer for the UC Berkeley Extension Course on ESD. He joined Texas Instruments in 1977. He has published over 85 papers in technical journals and conferences and holds 50 patents with several pending. He is a recipient of the Outstanding Contributions Award from the EOS/ESD Symposium (1990), Outstanding Mentor Award from the SRC (1994), several Best Paper awards from the EOS/ESD Symposium and Outstanding Paper Award from the International Reliability Physics Symposium. He has been very active in the EOS/ESD Symposium where he was the Technical Program Chairman of the 1992 Symposium and was the General Chairman of the 1994 ESD Symposium. Currently he is a member of the ESD Association Board of Directors, promoting university education and research in ESD.

| Date                                 | Time      | Cost                                  | Location |
|--------------------------------------|-----------|---------------------------------------|----------|
| <b>Grounding</b><br>February 7, 2006 | 2:00 EST  | \$95.00 member<br>\$140.00 non-member | Online   |
| <b>ESD Effects</b><br>May 4, 2006    | 12:00 EST |                                       | Online   |

|                        |                                     |                               |
|------------------------|-------------------------------------|-------------------------------|
| <b>ESD ASSOCIATION</b> | 315-339-6937 ph<br>315-339-6793 fax | info@esda.org<br>www.esda.org |
|------------------------|-------------------------------------|-------------------------------|

|   |  |
|---|--|
| <p><b>Wolfgang Warmbier</b><br/>Untere Giesswiesen 21, D-78247 Hilzingen, Germany<br/>Tel: 49-7731-86880 Fax: 49-7731-868832<br/>www.warmbier.com<br/>ISO 9002 certified for advice, supply and manufacturing of static control materials and systems</p> | <p><b>Monroe Electronics</b><br/>100 Housel Avenue, Lyndonville, NY 14098<br/>Tel: 585-765-2254 Fax: 585-765-9330<br/>Email: electrostatics@monroe-electronics.com<br/>www.monroe-electronics.com<br/>Full line manufacturer of static measurement equipment</p> |
|---|--|

## Education

## ESD in Asia - The Sun Never Sets for ESD

by Dr. Steven H. Voldman, IEEE Fellow



Steven H. Voldman

As the sun was setting on the September EOS/ESD 2005 Symposium in Anaheim California, the ESD conferences were preparing to open in Asia.

This year, on October 15th, the International Conference

on Electromagnetic Applications and Compatibility (ICEMAC 2005) opened at the Exhibit Hall of the World Trade Center in Taipei, Taiwan under the shadow of one of the world's largest lightning rods, Taipei 101. At ICEMAC, there are four technical "towers"; Electromagnetic Compatibility (EMC), Antennas and Propagation (AP), Microwave Theory and Techniques (MTT), and lastly, Electrostatic Discharge (ESD). This year, Professor Dau-Chyrh Chang provided a plenary talk which was followed by two keynote talks - "Power Integrity and EMC Design for High Speed Computer Packages," by Professor Tzong-Lin Wu and a second Keynote talk, "Electrostatic Discharge in the Nano-electronic Era," by Dr. S. Voldman. The ICEMAC Symposium is filled with students, graduate students, and many faculty members representing more than ten universities from Taiwan, (e.g. National Taiwan University and National Taiwan University of Science and Technology).

Within a few short weeks after the ICEMAC Symposium, the annual Reliability Conference of Japan (RCJ) was held in Japan. At this Symposia, the Best Paper

from the EOS/ESD Symposium in Anaheim was presented. The RCJ-ESDA relationship continues with the annual paper exchange.

Within a few days, on November 14, 2005, the Taiwan Electrostatic Discharge Conference (T-ESDC) was held in Hsinchu, Taiwan. The Taiwan ESD conference opened with a one-day tutorial program including tutorial classes in ESD phenomena and measurements, system level ESD design, ionization, latchup physics, transient induced latchup and computer aided design of ESD protection circuits. The Taiwan ESD Conference had two Keynote speakers; a first talk "Outlook on ESD Protection Approaches for the Emerging RF and High Speed ICs in Nanoscale Technology Nodes," was given by Mr. Koen Verhaege, and a second Keynote talk "Preparing for Industry Trends - Class 0 ESD Devices," was given by G. Theodore Dangelmayr. The T-ESDC had two full sessions on latchup, two sessions on RF ESD protection design, a single session on system level ESD, on-chip protection and factory-level protection. Technical papers included such paper topics as RF LNA design, to RF structures under pads (SUPS), Gallium Nitride ESD, SCRs, cable discharge events, to latchup. This year there were a higher percentage of papers from outside of Taiwan, including papers from Y. Huh, E. Gebreselasie, K. Shrier, A. Steinman, L. Levit, and S. Voldman.

That is not all; plans are already underway for the 3rd annual ESD Forum in the Philippines for March 2006! ▲

## Association news

## Volunteer Spotlight



Raivo Leeto, Volunteer

January's spotlight is Raivo Leeto who joined the ESDA in 1995. Leeto volunteered to help Henry White, Registration Chair in 1996, at the EOS/ESD Symposium. He then became Registration Chair in 1997. Leeto has continued in that position each year and accepted the position again for 2006. Leeto gives countless hours to the Symposium every year and is an asset to the team. Leeto received the Unheralded Volunteer Award for his service in 2001.

Leeto holds a BS in EET and is also a Narte Certified ESD technologist.

For recreation, Leeto and his wife Holly, enjoy horseback riding and own three horses.

Benefits of being an ESDA volunteer According to Leeto, "working within the ESDA has enabled me to meet many people in the ESD field". Leeto enjoys the camaraderie of participating in the EOS/ESD Symposium. ▲

### Static Solutions Inc.

331 Boston Post Rd.-East, Marlboro, MA 01752 USA

Tel: 508-480-0700 Fax: 508-485-3353 [www.staticsolutions.com](http://www.staticsolutions.com)

Worldwide manufacturer of patented ESD Cleanroom products, including Ohm-Stat™ combination/resistivity meters, Ohm-Shield™ coatings/floor finishes/paints, Ohm-Cide™ EPA cleaners, Stat-o-Flex™ Class Zero wriststrap, and Ultimat™ Class Zero out-gassing rubber.

### Saint-Gobain Advanced Ceramics

1225 Aeroplaaza Drive, Colorado Springs, CO 80916

Tel: 719-637-8714 Fax: 719-380-5591 [Stanley.C.Smith@saint-gobain.com](mailto:Stanley.C.Smith@saint-gobain.com)

Manufacturer of Cerastat™ ESD ceramics products to customers' prints: tools, fixtures, wear parts for data storage and other electronic industries

**Symposium**

## Exhibit at the 2006 EOS/ESD Symposium

At least 30 exhibitors have already committed to the 2006 EOS/ESD Symposium. There is still good space available. To reserve your space and for information on exhibiting contact Lisa Pimpinella, ESD Association, 7900 Turin Road, Building 3, Rome, NY 13440; phone, 315-339-6937; or fax, 315-339-6793.

Below is a list of the current exhibitors:  
3M

- ACL, Inc.
- Associated/ACC
- Barth Electronics, Inc.
- Botron Co., Inc.
- CCI-Conductive Containers, Inc.
- Century Container
- Credence Technologies, Inc.
- Desco Industries
- Dou Yee Enterprises, Ltd.
- Electro-Tech Systems, Inc.
- Electronic Polymers, Inc.
- FLEXCO
- H.C. Starck, Inc.
- HANWA Electronic
- Hyperion Catalysis
- ION Systems
- ITW Richmond Technology
- Kreha Corporation of America
- Monroe Electronics
- Noveon Static Control
- Oryx Instruments
- PRF Industrial, LLC
- RTP Company
- SCC
- SIMCO an ITW Co.
- Static Solutions
- STATICO
- Stephen Halperin & Assoc./Prostat Corp.
- TDI, International, Inc.
- Tech Wear Inc.
- Thermo Electron Corp.
- Trek Inc.
- Vidaro Corp.

**Certification**

## Earn an ESD Association professional certification- Device/Design

### Advance your career

Two Electrostatic Discharge (ESD) training classes will be held at the Westin La Paloma Hotel in Tucson, Arizona on Thursday February 23, 2006. The half day courses cover RF On-Chip Design and Device Testing-Component Level. Classes will run from 8:00 AM to 5:00 PM with lunch and refreshments provided.

**On-Chip ESD Protection in RF Technologies:** 8:00 AM - Noon. In this half day course, ESD protection in radio frequency (RF) technologies is discussed. The tutorial covers ESD protection in RF CMOS, BiCMOS silicon germanium, gallium arsenide, and RF silicon-on-insulator-(SOI). The tutorial will focus on device physics, technology, ESD layout design, ESD circuits and design systems. Also, HBM, MM, and TLP measurements of RF ESD technologies and RF circuits will be shown.

**Device Testing-Component Level : HBM, CDM, MM and TLP:** 1:00 PM - 5:00 PM. This half day course addresses the basics of HBM, CDM, MM, and TLP ESD stress testing of the ESD protection structures of ICs. The differences between these models will be emphasized, and then used to show how the different circuit parasitics affect the waveforms from each model-type simulator. The importance of doing ESD testing as an integral part of a high quality component development and qualification efforts will be stressed. Since industry-wide TLP testing is fairly new, the tutorial will cover constant impedance and constant current TLP testing; and the TLP I-V characteristic plots including the snap-back trigger voltages and currents. The evolution of the leakage current as it relates to the failure point will be emphasized, as well as the comparisons and

correlations between HBM and TLP testing. Standards issues and test procedures will be discussed, and some comparisons will be made between the ESDA and JEDEC standards.

### About the instructors

Steven H.Voldman is an IEEE Fellow for "contributions in ESD protection in CMOS, Silicon On Insulator and Silicon Germanium Technology." He is on the ESDA's Board of Directors, is presently a member of IBM's BiCMOS RF Silicon Germanium (SiGe) and RF CMOS development team.

Leo G. Henry of Electronic Polymers Inc., is an IEEE member. He is on the ESDA's Board of Directors and is the National Tutorial Program Chair, a Standards Work-

*Continued on page 11*



Download the latest Device/Design course flyer at [www.esda.org](http://www.esda.org).

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## ESD On Campus Program

by Steven H. Voldman, IBM Microelectronics



Steven H. Voldman

The "ESD on Campus" program has been accelerating our ability to reach out to new engineering faculty and students as well as to increase their interest in the field of electrostatic discharge (ESD). The ESD on Campus is a new university oriented educational outreach effort, through the ESDA Education Committee, to provide technical lectures on electrostatic discharge (ESD) to undergraduate students, graduate students, and faculty. 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.

The ESD Association Board of Directors is mobilizing to prepare for the expansion of this program. What initiatives are underway?

- Establishing lists of faculty, colleges and universities around the world.
- Establishing literature packages on the services, standards, programs and resources of the ESD Association.
- Establishing educational resource packages for universities.
- Allocating a solid budget line item and planning funding of university visits.

In this program, a key objective is to reach out to new campuses that have not had an ESD lecture and provide technical exchange with students, faculty, department heads and university administration. A key goal is to expand the number of colleges and universities. Secondly, it is to include more lecturers which include 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 2005, in the first spring and fall semester, five trips were funded for lectures:

- University of Illinois Urbana-Champaign (UIUC)
- University of Wisconsin-Milwaukee (UWM)
- University of Alberta (Edmonton, Canada)
- National Taiwan University (NTU)
- National Taiwan University of Science and Technology (NTUST)

What was the cost? For four of the university visits, the average cost of the visit was \$200 per campus visit. What happens on these visits? As an example, in the visit to National Taiwan University of Science and Technology (NTUST), a lecture entitled "ESD in the Nano-electronic 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. Another plus is meeting faculty and department heads of engineering.

What are the plans for the spring semester of 2006? Lectures are being planned today to visit universities in Illinois, Texas, and California. Plans are also being made for the following international locations: Philippines, Malaysia, Taiwan, Korea and China. What universities? Tentatively, Illinois Institute of Technology, University of Manila, Korea University, Korea University of Science and Technology (KAIST), and others. This is being done during business travels or conference attendance. Many of the ESD BoD will spend an extra day of their time to visit campuses in the US and abroad. In this fashion, we can keep our expenses down and visit many more universities far beyond what was achieved in the past. With the new ESD on Campus program, the ESD BoD hopes to visit many new colleges and university campuses to increase the interest in ESD in the U.S., Canada, Europe and Asia.

So, an exciting year is ahead of us! Let's see if we can fulfill our goals!▲

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**Standards**

**February 2006 Meeting Schedule**

**Tucson, Arizona** Westin La Paloma

Thursday, February 23

Tutorials

On-Chip ESD Protection in RF Technologies 8:00 - Noon

Device Testing-Component

Level: HBM, CDM, MM and TLP

1:00 - 5:00

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

**Certification**

**2006 education schedule**

The ESD Association has an ambitious year of education opportunities planned. Below is a listing of courses currently scheduled, including two online tutorials delivered through Centra software. Most of the courses listed below are requirements for ESD Certified Professional-Program Manager or ESD Certified Professional-Device/Design certification. For more informa-

tion on the courses in the Philippines, see page 2 of this newsletter. The full schedule, including instructor listings, is available online. This schedule is subject to change and will be updated throughout the year. Check the website, [www.esda.org](http://www.esda.org), or contact the ESD Association for the latest schedule.

| Course topic  | Location        | Date        |
|---|-----------------|-------------|
| Grounding for the Electrostatic Protected Area                          | Centra (online) | February 7  |
| On-Chip ESD Protection in RF Technologies                               | Tucson, Arizona | February 23 |
| Device Testing-Component Level : HBM, CDM, MM and TLP                   | Tucson, Arizona | February 23 |
| How To's of In Plant ESD Auditing and Evaluation Measurements           | Philippines     | March 9     |
| Standards Basics for EPA  | Philippines     | March 10    |
| ESD Packaging Principles  | Philippines     | March 10    |
| ESD Program Development and Assessment                                  | Philippines     | March 9-10  |
| Cleanroom Considerations  | Austin, TX      | March 28    |
| Air ionization: Issues and Answers                                      | Austin, TX      | March 28    |
| ESD Device/ Design Seminar  | Rome, NY        | May 1-2     |
| Electrostatic Discharge Effects in Integrated Circuit Chip Technologies | Centra (online) | May 4       |
| How To's of In Plant ESD Auditing and Evaluation Measurements           | MA              | May 10      |
| ESD Device/ Design Seminar  | Munich, Germany | May 22-23   |

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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.

**Survey question:**

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

**Member comment:**

Obtaining Professional Certification will very much help in my work career.

**ESDA Response:**

The ESD Association now has a wonderful Professional Certification program. The first Program Manager exam was held at

the 2005 EOS/ESD Symposium. Six individuals have now earned Professional Certification for the ESD Program Manager. More information about this program and the recipients of this new certification program are located on the ESDA web site [www.esda.org](http://www.esda.org).

**Member comment:**

The association would provide great benefit to both companies and consultants by providing more information on consulting services that are available.

**ESDA Response:**

The ESD Association publishes a list of Consultants in our Buyer's Guide, located on the Web Site [www.esda.org](http://www.esda.org).

**Member comment:**

Reintroduce the tutorial (multi-day training) at our local chapters.

**ESDA Response:**

Again for 2006, the ESD Association is laying out plans to co-sponsor (with several of our Local ESD Chapters), regional tutorials that are designed to support individuals who are actively pursuing Professional Certification. Please look for upcoming information posted in the Threshold and on our web site, [www.esda.org](http://www.esda.org).▲

## Certification

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## Advance your career Device/Design

ing Group Chair, TAS member and a member of the Standards Committee. Henry is also an independent ESD-TLP engineering consultant, specializing in Teaching and Testing.

Please watch the ESD Association website at [www.esda.org](http://www.esda.org) for announcements regarding these exciting and important new offerings.

**Device/Design Certification Tutorials**

- ESD On-Chip Protection in Advanced Technologies
- System Level ESD/EMI Testing to IEC and other Standards
- On-Chip ESD Protection in RF Technologies
- SPICE-Based ESD Protection Design Utilizing Diodes and Active MOSFET Rail Clamp Circuits
- EOS/ESD Failure Models and Mechanisms
- Circuit Modeling and Simulation for On-Chip Protection
- Latchup Physics and Design
- Troubleshooting On-Chip ESD Failures
- Transmission Line Pulse Measurements: Parametric Analyzer for ESD On-Chip Protection
- CDM and Characterization
- Impact of CMOS Technology Scaling on ESD HCPH.
- Device Testing-IC Component Level: HBM, CDM, MM, and TLP. ▲

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**Calendar****January 2006**

January 8-11, 2006

**Industry Strategy Symposium**The Ritz Carlton  
Half Moon Bay, California

www.semi.org

January 9, 2006

**ESD Association****Technology Roadmap**3M Innovation Center  
Austin, TX  
www.centxesdassoc.homestead.com

January 18-20, 2006

**Internecon World Japan 2006**Tokyo Big Sight  
Tokyo, Japan  
www.nepcon.jp/english**February 2006**

February 4-8, 2006

**ISSCC 2006**San Francisco Marriot Hotel  
San Francisco, CA  
www.iscc.org**February 2006**

February 23-28, 2006

**ESD Association  
Preliminary Symposium  
and Standards Meeting**Westin La Paloma  
Tucson, Arizona  
www.esda.org**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

**May 2006**

10-11, 2006

**NEPCON ELECTRO**Boston Convention & Exhibition Center  
Boston, MA

www.nepconeast.com

**June 2006**

June 8-13, 2006

**ESD Association  
Preliminary Symposium  
and Standards Meeting**Palm Springs Riviera  
Palm Springs, CA  
www.esda.org**September 2006**

September 10-14, 2006

**ESD Association  
Annual Symposium**Westin LaPaloma  
Tucson, Arizona  
www.esda.org**Threshold**

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**Threshold<sup>TM</sup> Publication Schedule**

| Issue             | Deadlines |
|-------------------|-----------|
| 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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