

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



THRESHOLD™

Volume 21, No. 1

January/February 2005

News bits

Call for ESDA Board of Directors nominations

The ESD Association is requesting nominations for the board of directors. See page 9 for more information.

Next online course: grounding

With our first online course successfully completed, we are ready to offer another. Grounding will be the next topic to be offered. Watch the website for more information.

2005 education seminars in Asia

Bangkok, Penang, Singapore, and the Philippines will host program manager seminars this March. See page 2 for more information.

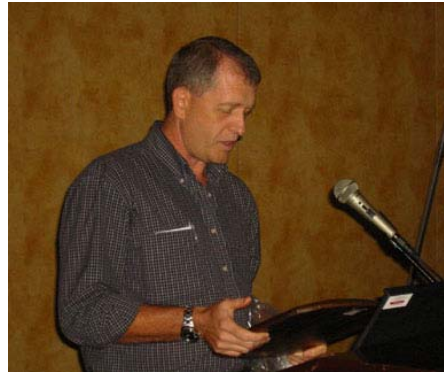
2005 Symposium abstract deadline fast approaching

The 2005 EOS/ESD Symposium is not that far away. Anyone still interested in submitting a paper for consideration must send an abstract by January 10. See page 4 for more information.

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Thanking ESDA volunteers



Award presenter ESD Association Treasurer and Standards Committee Chair Ron Gibson

Symposium wouldn't be complete without the effort of the ESDA volunteers, nor would it be symposium without taking some time to thank those volunteers.

At the 2004 EOS/ESD Symposium in Grapevine, Texas, ESD Association volunteers were honored for their hard work and dedication at the 5th annual Volunteer Recognition Dinner. Attended by approximately 100 volunteers and guests, the dinner was a time for volunteers to relax and appreciate the work they accomplish year round. Dale Parkin, volunteer recognition chairman was there to help kick off the festivities.

"From the early days of barn-raising, when neighbors came from near and far to help to today's modern volunteers, volunteerism is deeply rooted in our history. We don't exactly raise barns, but we do make a dramatic difference in our industry and the association through volunteering."

Several volunteers received awards for their contributions to the Association. Stephen A. Halperin received the International Council on Education (ICE) Recognition Award, Kay Adams received the President's Award, David E. Swenson earned the Joel P. Weidendorf Memorial

Award, Marti Farris was this year's Unheralded Volunteer, Tim Jarrett was recognized for help behind the scenes of symposium, and Gianluca Boselli received an award for Outstanding Contribution to the Technical Program Committee, part of the symposium effort.

The ICE Recognition Award, presented by Joe Bernier was given to Stephen A. Halperin for contributions, leadership, and achievements in the field of EOS/ESD education.

The ESD Association President's Award was presented by the association president, Ed Weggeland, to Kay Adams in recognition of significant contributions, leadership, and management that has enhanced the ability of the association to serve industry.



Award recipient Kay Adams and ESD Association President Ed Weggeland

The Joel P. Weidendorf Memorial Award, which recognizes achievement in the field of EOS/ESD Standards development, was presented by Ron Gibson to David E. Swenson.

The Unheralded Volunteer Award is given to an individual who has consistently given of his or her time and effort to the ESD Association. This year Marti Farris was recognized for her more than nine years of

Association news

Continued from page 1

Thanking ESDA volunteers

service behind the scenes.



Award recipient Dave Swenson

John Kinnear, general chairman of the 2004 symposium, presented an award of recognition to Tim Jarrett for his dedica-

tion to symposium behind the scenes.

The recognition for Outstanding Contribution to the Technical Program Commit-



Award recipient Tim Jarrett and 2004 EOS/ESD Symposium General Chair John Kinnear

tee was awarded to Gianluca Boselli by Technical Program Chair Carl Newberg.

Volunteer groups support the association in a variety of areas, including the following:

- Standards
- Symposium
- International Council on Education (ICE)
- Certification
- Human Resources
- Marketing and Communication
- Board of Directors

We thank all of our volunteers for their commitment and dedication!

Certification

Program manager certification core courses to be offered in Asia

This March the ESD Association again offers education opportunities in Asia. Four cities in Asia will host program manager certification related courses: Manila, Philippines; Bangkok, Thailand; Penang, Malaysia; and Singapore.

Course offerings include the following:

- ESD Basics
- ESD Auditing and Evaluation Measurements
- ESD Program Development and Assessment
- Packaging Principles for the Program Manager
- ESD Standards Basics for EPA

The demand for knowledgeable ESD

program managers is growing. Qualified ESD personnel are needed to design, implement, and manage today's ANSI/ESD S20.20 control programs, to protect sensitive devices and assemblies. Organizations and facilities with qualified ESD personnel on staff are better prepared for S20.20 facility certification.

This event is designed to educate and train professional ESD program managers. The courses offered during this seminar are required courses to obtain the ESD Association's ESD Certified Professional-Program Manager certification. Completion of each of these courses results in educational units toward professional certification. Although other tutorials and seminars are also necessary to fulfill the certifi-

cation requirements, these programs are critical to understanding ESD fundamentals, program development and certification, and the ongoing process of verifying performance of a program's technical ESD controls.

Courses will be taught by Ron Gibson, Celestica International, Inc.; Stephen A. Halperin, Stephen Halperin & Associates, Ltd.; and John Kinnear, IBM.

The following are brief descriptions of course content.

ESD Basics

This tutorial consists of three sections.

continued on page 9

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From the President

Heading into 2005



Ed Weggeland

We are into 2005 with expanded plans and programs to serve our industry.

The planning process for the 2005 EOS/ESD Symposium continues under the leadership of Chark a Duvvury our General Chair,

assisted by Carl Newberg, Vice General Chair, and Donn Bellmore, Technical Program Committee Chair. The Steering Committee members are already active covering arrangements, logistics, audio/visual requirements, and publicity. The expanded September 2005 National Tutorial Program is being led by Leo G. Henry.

Our ESD Certified Professional-Program Manager certification plans for 2005 offer all required courses throughout North

America and Asia, so program completion and testing can be accomplished by individuals within two years or less. We are organizing a series of program manager seminars in Asia for March 2005 to take place in Manila, Philippines; Bangkok, Thailand; Penang, Malaysia; and Singapore.

During the December board meetings held at headquarters in Rome, NY, the ESD Association Board of Directors elected Kay Adams as Senior Vice President for 2005. Our current Senior Vice President, Mark Kelly has been promoted to a new assignment within his company, Delphi, and had to step down. We all wish him the best for his future within our industry.

At the December 2004 board of directors meetings we reviewed 2004 results and discussed improvements in our organization and proposed 2005 activities and budgets in detail.

My wish is that all have a happy and prosperous 2005.

Calendar

January 2005

January 10, 2005

Northeast Chapter

General Membership Meeting

<http://nechapter-esda.org>

January 18, 2005

Silicon Valley EOS/ESD Society

General Membership Meeting

Silicon Valley Ramada Inn, 1217 Wildwood Avenue, Sunnyvale, California

www.esdsiva.org

January 24, 2005

Texas ESD Association

Orientation to Program Manager

www.centxesdassoc.homestead.com

January 26, 2005

Online Tutorial--Grounding

ESD Association

www.esda.org

January 28, 2005

Southwest ESD Association

General Membership Meeting

Topic--ESD Garments

www.swesd.org

February 2005

February 2-4, 2005

SEMICON Korea

www.semi.org

February 10-15, 2005

ESD Association February Standards and Committee Meetings

Anaheim Marriott hotel, Anaheim, California

www.esda.org

February 15, 2005

Silicon Valley EOS/ESD Society

General Membership Meeting

Silicon Valley Ramada Inn, 1217 Wildwood Avenue, Sunnyvale, California

www.esdsiva.org

Association news

Website updates

New products

Several 2004 EOS/ESD Symposium presentation sessions, including presentation visuals and audio, are now available in CD-ROM format. Presentations are available by session. The price for each session for an association member is \$65.00, non-members pay \$95.00.

Available sessions

- 1A MR Heads-Processing
- 1B RFIC and Novel Protection Devices
- 3A Tester--Device Effects

- 4A Factory and Materials
- 5A Novel TLP Testers
- 5B Magnetic Recording Heads

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. In 2004 the Buyer's Guide contin-

Continued on page 6

Conductive Containers, Inc.

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3M

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

Symposium

Abstract deadline January 10, 2005

27th Annual EOS/ESD Symposium Anaheim, California, USA, September 11-16, 2005

The 27th Annual EOS/ESD Symposium is now issuing a call for papers for the 2005 Symposium in Anaheim, California. Symposium is 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. This includes electronic components and manufacturing, as well as in systems, subsystems, and equipment.

Submission guidelines

Technical Papers

The Technical Program Committee solicits paper contributions that 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 a 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 email to info@esda.org. The required file format is

PDF (Adobe Acrobat®)—**one PDF file for each submission**. Paper presentations at the Symposium will be in electronic PowerPoint® format.

Paper acceptance

The Technical Program Committee accepts papers with the understanding that the author will not publish the work prior to presentation at the Symposium, and will enforce this policy by withdrawing papers if necessary. 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 Monday, January 10, 2005. Late submissions will not be accepted.

The final submission deadline for the finished papers is Friday, May 27, 2005. Final papers will be limited to a maximum of 10 pages. Guidelines will be provided after acceptance of the paper.

Download guidelines and a complete topic listing at
www.esda.org

ESD Association

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Association

New Senior Vice President

The ESD Association Senior Vice President, Mark Kelly, has been promoted to a new assignment within his company, Delphi. As a result he has had to step down as Senior Vice President of the Association. We thank him for his service and wish him the best for the future.

During the December board meetings, held at headquarters in Rome, NY, the ESD Association Board of Directors elected Kay Adams as Senior Vice President for 2005.

Kay Adams is the owner and founder of Tech Wear, Inc. and has served on the ESD Association Board of Directors for six years in the roles of board member, secretary, treasurer, and Human Resources Business Unit Manager.

VPI

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Manufacturer of static control flooring

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Web: www.trekinc.com
Designer and manufacturer of instrumentation and sensors for measuring surface voltage, ionizer performance, and surface resistivity

Certification

Preliminary 2005 education schedule

The ESD Association has an ambitious year of education opportunities planned. Below is a listing of courses currently scheduled, including another online tutorial delivered through Centra software. Most of the courses listed below are requirements for ESD Certified Professional-Pro-

gram Manager or ESD Certified Professional-Device/Design certification. See page 6 of this newsletter for a complete listing of the required courses for certification. For more information on the courses in Asia 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, or contact the ESD Association for the latest schedule.

Course topic	Location	Date	Designation*	Status
Grounding Basics	Centra (online)	TBD	General Interest	Tentative
Cleanroom Considerations	Anaheim, CA	February 10	Program Manager	Confirmed
Air ionization: Issues and Answers	Anaheim, CA	February 10	Program Manager	Confirmed
ESD Basics	Philippines	March 10	Program Manager	Confirmed
ESD Survey and Evaluation Measurements	Philippines	March 11	Program Manager	Confirmed
ESD Basics	Bangkok	March 14	Program Manager	Tentative
ESD Survey and Evaluation Measurements	Bangkok	March 15	Program Manager	Tentative
ESD Basics	Penang	March 17	Program Manager	Tentative
ESD Survey and Evaluation Measurements	Penang	March 18	Program Manager	Tentative
ESD Basics	Singapore	March 21	Program Manager	Tentative
ESD Survey and Evaluation Measurements	Singapore	March 22	Program Manager	Tentative
ESD Standards	Singapore	March 23	Program Manager	Tentative
ESD Packaging Principles	Singapore	March 23	Program Manager	Tentative
ESD Program Development and Assessment	Bangkok	March 14-15	Program Manager	Tentative
ESD Program Development and Assessment	Penang	March 17-18	Program Manager	Tentative
ESD Program Development and Assessment	Singapore	March 21-22	Program Manager	Tentative
ESD Survey and Evaluation Measurements	Austin, TX	April	Program Manager	Tentative
ESD Program Development and Assessment	Minneapolis, MN	May	Program Manager	Tentative
ESD Device/Design Seminar	Rome, NY	May	Device/Design	Tentative
ESD Device/Design Seminar	Munich, Germany	June 27-28	Device/Design	Tentative
ESD Basics	Anaheim, CA	June	Program Manager	Tentative
ESD Survey and Evaluation Measurements	Anaheim, CA	June	Program Manager	Tentative
ESD Standards	Reno, NV	June	Program Manager	Tentative
ESD Packaging Principles	Reno, NV	June	Program Manager	Tentative
Device Technology and FA Overview	Austin, TX	June	Program Manager	Tentative
Electrostatic Calculations	Mexico	August	Program Manager	Tentative
ESD Packaging Principles	Austin, TX	October	Program Manager	Tentative

* Course is a requirement of this certification program

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Certification

Advance your career

Earn an ESD Association professional certification

The ESD Association now offers Professional Certification for ESD Control Program Managers and for Device/Design Technical specialists.

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.

Requirements for certification will include, as a minimum, attending required prerequisite tutorials, and passing a final exam.

Many of the prerequisite courses are available in the 2005 Symposium tutorial program (list of required courses follows) and additional courses are in development.

Please watch the ESD Association website at 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)

- ESD Basics for the Program Manager
- Air Ionization: Issues and Answers
- How To's of In-Plant ESD Survey and Evaluation Measurements
- Packaging Principles for the Program Manager
- ESD Standards Basics for EPA
- Device Technology and FA Overview
- Electrostatic Calculations for the ESD Engineer
- Cleanrooms Considerations for the Program Manager

Device/Design Certification Tutorials

- ESD On-Chip Protection in Advanced Technologies
- System Level ESD/EMI (Part 1 & 2)
- 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 Protection Design

To obtain additional information about professional certification or the 2005 EOS/ESD Symposium, please contact the ESD Association:

Phone: 315-339-6937

Fax: 315-339-6793

Email: info@esda.org

www.esda.org

Association

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Website updates

ued to grow in value and added eight new companies to the listings, for a total of 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, Europe, and Asia. A preliminary 2005 education schedule is now available online at www.esda.org. The schedule includes courses available, locations, dates, and instructors. See page 5 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 Threshold newsletter section, the education, and the volunteer activities section are sporting new looks and new navigation. In the near future, the standards and publications areas will undergo extensive improvements.

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

Any questions or comments can be directed to info@esda.org.

Wolfgang Warmbier

Untere Giesswiesen 21, D-78247 Hilzingen, Germany

Tel: 49-7731-86880 Fax: 49-7731-868832

www.warmbier.com

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Email: electrostatics@monroe-electronics.com

www.monroe-electronics.com

Full line manufacturer of static measurement equipment

So what is real HBM and why aren't we more concerned?

Part II



Leo G. Henry

Previously, in the November/December 2004 issue of Threshold, I detailed a historical perspective of the development of the HBM standard from 1979 to 2001. Based on published

data, I was able to demonstrate that the rise-time and peak current from real humans were quite different from those found in all existing HBM standards.

In 2002 high speed scopes were used to collect over 300 additional measurements of real HBM discharges from 12 real humans (from 1 kV to 6 kV).¹ This data was compared to the existing HBM test standard.² The faster rise-time scopes (2.25 GHz to 156 psec) more accurately captured the very fast waveforms from real humans. The results show that the higher peak currents had the fastest rise-times and the lower peak currents had the slower rise-times. It seems then that the HBM 10% to 90% (2 to 10 nsec) rise-time specification is not representative of the real world, that is, the real human ESD event.³ Since the measured data showed that real human ESD events have much faster rise-times than the range in the standards (2 to 10 nsec), the importance of simulating the real HBM waveform may well become critical, as protection designs continue to evolve.

Since none of the existing HBM standards have a dV/dt specification for the

pulse below the 10% position, it can be argued that the standard does not effectively represent the real discharge from a real human. It is further argued that this incomplete specification can lead to mis-correlation between testers because this initial voltage waveform, or a dV/dt value is not specified in any of the HBM standards. In measuring initial front rise (IFR) voltage from real humans (up to 15 V), which is below the standard's 10% position on the leading edge of the waveform, the authors were able to show that the different HBM

added.

In 2003, the authors collected additional data to determine the impact on the current discharge waveform from higher humidity air and non-uniformity of the electric field in the spark gap.⁵ The high-speed characteristics of the pulse measurement were also improved by using a 6 GHz (60 psec rise-time) scope to record the current waveform pulse from real humans. Fifty additional data points were collected from several humans to demonstrate this improvement. Increasing the air humidity

from 10 to 34% caused the spark resistance to increase because water vapor has a quenching effect on ionization. The resulting peak currents were reduced with corresponding slower rise-times. The effect of the non-uniform field (NUF), where the finger touches sharp points like the leads of a device, decreases the peak current considerably and slows the rise-time. However, one should not lose sight of the fact that the voltage across the device under test (DUT) in these conditions is longer in duration, because the current is de-

creased, so both the current through the DUT and the voltage across it lasts much longer.

Because the existing HBM standards specify the current pulse rate of rise (dI/dt) and the peak current, and because the dV/dt is a rate of voltage rise, the authors re-named the 2002 IFR (the 0 to 15 V ramp) to the initial voltage rise (IVR).⁶ This was to better reflect and emphasize the voltage

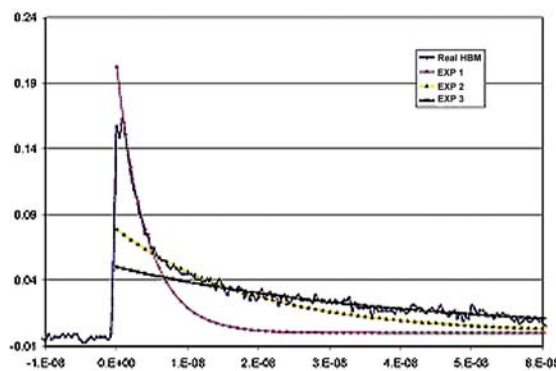


Figure 1. Multiple exponent decay regions of real HBM

testers had different IFR rates.⁴ They were also able to show that the IFRs are much different and faster than the 10 to 90% rates of current rise-time waveform in the standard. They made an assumption that the dV/dt was somehow related to the dI/dt . Because actual measurements of IFR rates of real HBM are sub-nanosecond, HBM tester specifications to simulate this same IFR rate must be considered and

Continued on page 8

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From the Threshold Chair

Continued from page 7

Real HBM

rate of rise and its impact on turn-on of the protection circuitry. This is because it has been reported that it is possible for devices with the different dV/dt , that is, the different IVRs (for example, 0 to 5 V, 0 to 10 V and 0 to 15 V), to affect the V_{t1} position on the current-voltage (I-V) device curve.

Real HBM events also have constantly increasing rates of exponential decay (see Figure 1) because the resistance in the spark increases as the current through it decreases throughout the discharge event. The real HBM rate of decay is initially much faster but becomes much slower than that specified in the existing HBM standards. Real HBM events have very narrow peak currents, (I_p) which are significantly different from that in the standard. Real HBM events in humid conditions decreased the peak current and slowed the spark formation resulting in longer current decay times than those specified in the standard.⁶

Summary

Based on the above data, it is easy to speculate that the same peak current from a real HBM event and the existing HBM simulator will not produce the same energy in the device. The specification for dV/dt parameter should be added to the standard because it represents a real HBM parameter that is directly related to the turn-on (V_{t1}) device conditions. Recall that V_{t1} is also referred to as the voltage at the first breakdown (snap-back) of the device. It has also been reported by other researchers that this V_{t1} turn-on position can influence the failure position, I_{t2} , the current at the second breakdown (snap-back) of the device.

This analysis is not exhaustive but it clearly demonstrates that there is need to pursue the real threat parameters in the real HBM ESD event from the standards perspective. We continue to emphasize

the need to move to an HBM ESD standard that simulates the real human ESD event more closely than the existing standards if future testing is to more successfully simulate the real world.

As usual, if you have questions and need details on this tidbit, please do not hesitate to send me email (leogesd@pacbell.net). I would like to thank Jon Barth and J.R. Richner for their review of this article.

Notes

1. Barth et al., "Correlation, Considerations II: Real HBM to HBM Testers," Electrical Overstress/Electrostatic Discharge Symposium Proceedings 2002 (Rome, New York: ESD Association, 2002) 155-162.

2. Barth et al., "Measurements of HBM Events—Simulators Should Simulate," Electrical Overstress/Electrostatic Discharge Symposium Proceedings 1996 (Rome, New York: ESD Association, 1996) 211-222.

3. Barth et al. "Real HBM-The dV/dt Threat," Electrical Overstress/Electrostatic Discharge Symposium Proceedings 2003 (Rome, New York: ESD Association, 2003) 179-187; The Journal of Electrostatics, Vol. 62, (Elsevier Publishing, 2004)195-209; Jon Barth and John Richner, "Correlation Considerations: Real HBM to TLP and HBM Testers," Electrical Overstress/Electrostatic Discharge Symposium Proceedings 2001 (Rome, New York: ESD Association, 2001) 453-460; Barth et al., "Correlation, Considerations II: Real HBM to HBM Testers," Electrical Overstress/Electrostatic Discharge Symposium Proceedings 2002 (Rome, New York: ESD Association, 2002) 155-162.

4. ANSI/ESD STM5.1-2001 Electrostatic

Continued on page 12

Symposium

Preliminary Schedule Symposium Week 2005

Friday, September 9, 2005

Standards Meetings

Saturday, September 10, 2005

Standards Meetings

Sunday, September 11, 2005

Registration Opens

Standards Meetings

ANSI/ESD S20.20 Seminar, Part 1
ESD Tutorials

Monday, September 12, 2005

Registration

ANSI/ESD S20.20 Seminar, Part 2
ESD Tutorials

Welcome Reception

Exhibits (PM. only)

Tuesday, September 13, 2005

Registration

Awards Breakfast

Exhibits

Technical Sessions

Association Luncheon and Annual
Meeting

Professional and Technical Women's
Reception

Wednesday, September 14, 2005

Registration

Technical Sessions

Exhibits

Workshops

Thursday, September 15, 2005

Registration

Technical Sessions

Tutorials

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Symposium

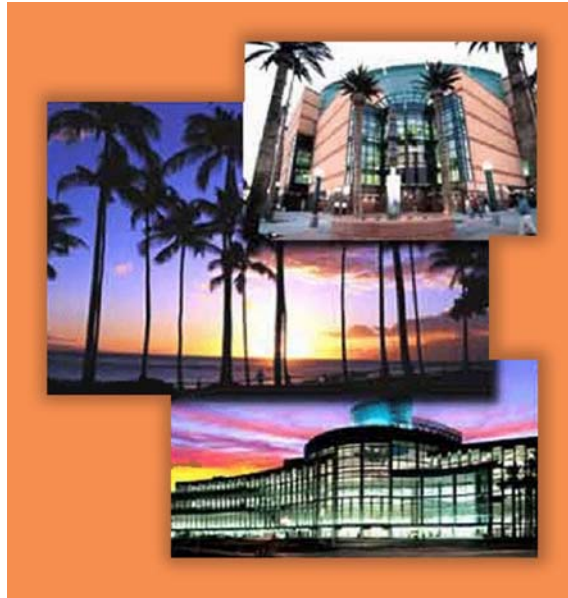
Anaheim, California, to host 2005 EOS/ESD Symposium

2005 will find the EOS/ESD Symposium in sunny California. The Anaheim Marriott Hotel will host the 27th annual EOS/ESD Symposium.

Attendees will be able to attend symposium and find accommodations at the Anaheim Marriott, which features 31 meeting rooms and 54,000 sq. ft. of total meeting and banquet space. The hotel lobby has been recently renovated to add elegance, drama, and character through details in architecture, decor, and even furniture.

The Anaheim Marriott is in the heart of an area full of business and recreation. Only two blocks from Disneyland Park, Disney's California Adventure, and Downtown Disney, you are also not far from natural beauty to be found at places such as the Bolsa Chica

Ecological Reserve, the Arden canyon, and Crystal Cove State Park.



Association

Call for board of director nominations

The ESD Association is requesting nominations for the Board of Directors (BoD). Each year, the Constitution and Bylaws of the Association require the membership to elect four Members at Large to the 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, 2005. The candidates may be nominated by the Committee or a member may submit a petition for a nominee. Petitions must contain 25 identifiable signatures and membership numbers of current ESD Association members, and must be received

by mail no later than February 18, 2005 at Association Headquarters: ESD Association, 7900 Turin Road, Bldg. 3, Rome, NY 13440-2069. (Faxed petitions will not be accepted.)

Ballots will be sent to the general membership by May 1, 2005, and must be returned before July 1, 2005. The results of the election will be announced at the Annual Meeting during the 2005 EOS/ESD Symposium in Anaheim, California.

Further information is available from the ESD Association, 7900 Turin Road, Bldg. 3, Rome, NY 13440; phone: 315-339-6937; fax: 315-339-6793; email: info@esda.org.

Certification

Continued from page 2

Program manager certification core courses to be offered in Asia

Section A defines the causes of ESD and critical elements related to charge generation, material characteristics, and electrostatic phenomenon. Section B explains and demonstrates the four critical device failure models. Section C provides an overview of device protection during handling and product assembly, a summary of ESD control elements, and a fundamental overview of S20.20 program requirements. This full day course is required for those in-plant auditors and program managers who are working toward professional ESD certification.

ESD Auditing & Evaluation Measurements

This program was designed to support S20.20 in-plant verification requirements. It reviews the evaluation and audit measurement procedures for S20.20 ESD Controls listed in the S20.20 document, Table 1-ESD Control Program Technical Requirements Summary.

These recommended measurement procedures confirm the proper operation and use of ESD control products and materials selected as part of a facility's S20.20 ESD control program. This course is an ESDA certification requirement for in-plant auditors and program managers who are working toward professional ESD certification.

ESD Program Development and Assessment

This seminar provides instruction on designing and implementing an ESD control program based on ANSI/ESD S20.20. The course provides participants with the tools and techniques to prepare for an ESD facility audit.

Continued on page 11

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Symposium

February Meeting Schedule



ESD Association

Standards and Association Committee Meetings

February 10-15, 2005

**Marriott Anaheim
Anaheim, California**

Thursday, February 10

Tutorial Program	8:00-5:00
TAS	8:00-5:00

Friday, February 11

TAS	7:00-5:00
WG-3, Ionization	8:00-Noon
WG6, Grounding	8:00-Noon
WG-5, Device Testing	8:00-5:00
WG-10, Handlers	1:00-5:00

Saturday, February 12

TAS	7:00-5:00
WG-53, Workstations	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	5:30-6:30
ESDA Mixer - all invited	6:30-7:30

Sunday, February 13

TAS	7:00-5:00
ICE Education	8:00-Noon
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
Technical Liaison	5:00-6:00

Monday, February 14

Human Resources	8:00-Noon
Technical Program	8:00-4:00
Marketing & Communication	10:00-Noon
Steering Committee	2:00-4:00
Steering/ICE Committees	4:00-5:00

Tuesday, February 15

Board of Directors	8:00-5:00
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Exhibit at the 2005 EOS/ESD Symposium

There is still good space available, but it's going fast. Exhibitor information is available online at www.esda.org/exhibits.html. To reserve your space or 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.
ESD Consulting Group, Inc.
ESD TLP Consulting & Testing
Electro-Tech Systems, Inc.
Electronic Polymers, Inc.
FLEXCO
Global Technology Leader, Inc.
Hyperion Catalysis
ION Systems
ITW Richmond Technology
Kreha Corporation of America
MEFAS Inc.
Monroe Electronics
Noveon Static Control
Novx Corporation
Oryx Instruments
SCC
SIMCO an ITW Co.
Static Solutions
STATICO
Stephen Halperin & Assoc./Prostat Corp.
Tech Wear Inc.
Thermo Electron Corp.
Trek Inc.
Uniglobe Kisco, Inc
Vidaro Corp.

Publications

A2C2
Circuits Assembly
Compliance Engineering
Evaluation Engineering
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For more information, www.vermason.com

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Association news

And the survey says...

Each month *Threshold*TM 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.

Structured in a question and answer format, this column presents questions, comments, and requests chosen from the survey responses and provides answers to those questions, which are supplied by the Association.

The primary goal of the ESDA is to serve our members in any way possible. The survey responses received serve as an excellent source of direction in our quest to serve the membership.

As many of you know, 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:

I am pretty new to the ESD field, working on teaching myself. I cannot think of any products or services that would help me at this time. I use the ESD Association web site to expand my knowledge of ESD practices and tools. Everything has been great so far. I initially joined for the discounts on the standards to save the company I work

for money, but have found more information and use through reading about what is going on in the field.

ESDA response:

The next step that may be helpful is to look into the ESDA certification programs. The education provided by the association is an invaluable way to continue to grow in the understanding of ESD and ESD control. The ESD Association offers a professional certification for ESD control program managers, called ESD Certified Professional-Program Manager certification. This program is intended for individuals that are involved in designing, implementing, managing, and auditing ESD control programs in their facilities. In addition to the benefits of certification for your career, the courses offered by the association provide necessary information about ESD control in the following areas:

- ESD Program Development & Assessment (based on ANSI/ESD S20.20)
- ESD Basics for the Program Manager
- Air Ionization: Issues and Answers
- How To's of In-Plant ESD Survey and Evaluation Measurements
- Packaging Principles for the Program Manager
- ESD Standards Basics for EPA
- Device Technology and FA Overview
- Electrostatic Calculations for the ESD Engineer
- Cleanrooms Considerations for the Program Manager

Association news

January Volunteer Spotlight

At the beginning of each month, take a moment to learn more about the faces behind the ESD Association at www.esda.org/csp.html. January's Spotlight is Richard Rodrigo.

Certification

Continued from page 9

Program manager certification core courses to be offered

Packaging Principles for the Program Manager

Shipping electronic parts within a factory, to another factory, distributor, or to an end-user has always been an area of uncertainty within the manufacturing process. To provide clear-cut information on what type of controlled packaging should be used in any situation, the ESD Association has recently released a comprehensive revision of the obsolete industry standard EIA 541-1988. The new document, ANSI/ESD S541-2003, is the focus of this session. It provides information and guidance, as well as material specifications, to assist in the design and implementation of a packaging plan for use within an ANSI/ESD

Continued on page 12

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From the Threshold Chair Certification

Continued from page 8

Real HBM

Discharge Sensitivity Testing-Human Body Model (HBM) Component Level (Rome, New York: ESD Association, 2001)

5. Barth et al., "Correlation, Considerations II: Real HBM to HBM Testers," Electrical Overstress/Electrostatic Discharge Symposium Proceedings 2002 (Rome, New York: ESD Association, 2002) 155-162;

6. Ibid; H. Hyatt, "The Resistive Phase of an Air Discharge and the Formation of Fast Risettime ESD Pulses," Electrical Overstress/Electrostatic Discharge Symposium Proceedings 1992 (Rome, New York: ESD Association, 1992) 55-67.

Continued from page 11

Program manager certification core courses to be offered in Asia

S20.20 based ESD control program. Current and newly released test method standards suitable for packaging material evaluation will be described. Course credit applies to the ESD Certified Professional-Program Manager certification curriculum.

ESD Standards Basics for EPA

The ESD Association's introduction of the ESD Certified Professional-Program Manager certification curriculum has created a need to modify the standards tutorial that has been presented for a number of years. This new standards tutorial provides an

overview of all the standards, grouped into common test method types based on measurement probe and test instruments. A common methodology is used in this tutorial to cover the requirements, applications and specifications for each standard and standard test method.

See page 5 for dates and locations. Contact the ESD Association, at 315-339-6937 or visit our website, www.esda.org, for more information or to register.

Threshold

*Threshold*TM is published six times a year by the ESD Association, a not-for-profit corporation. It strives for the advancement of theory and practice of electrical overstress avoidance and of allied arts and sciences and the maintenance of a high professional standing among its members and others.

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



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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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