EOS/ESD Association, Inc.
Setting the Global Standards for Static Control!

THRESHOLD™

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

Volume 29, No. 3 May/June 2013

In this issue

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WWW.ESDA.ORG

Registration is now open for the 35th Annual EOS/ESD Symposium!

Register for the 35th Annual EOS/ESD Symposium September 8-13, 2013 at the Rio All Suites Hotel in Las Vegas, NV, USA. Benchmark your company's operation against the practices of other companies. Solve business challenges in controlling ESD by networking with other ESD professionals and industry experts to learn best practices and technology advances for ESD Control.

The EOS/ESD Symposium offers the unique opportunity to get a complete overview about latest progress in electrical overstress and electrostatic discharge protection technology. This special event combines frontier research with advanced tutorials, technical presentations, exhibits of ESD control products and services, workshops, authors' corners, two "Year in Review" sessions of factory and device standards, exhibitors "Showcase" of ESD technologies, giving a maximum value-added to the attendees. Highlights of the Symposium include:

- **40 Tutorials to keep you current, among which are the following new tutorials:**
  - An Overview of Integrated Circuit ESD: ESD Threat, Testing, Design Concepts, & Debugging
  - ESD Design in HV Technologies
  - Waveforms and the Safe Handling of Devices
  - Contamination & ESD Issues in Flat Panel Display Manufacturing Process
  - Costly Controversial ESD Myths
- **Technical Sessions with over 50 engaging ESD Presentations including:**
  - On-Chip Protection in Emerging CMOS Technologies, Design for CMOS, Protection for High Voltage Applications
  - Analysis of Factory Processes, Properties of Materials
  - ESD Device Physics, System-Level Design, Electronic Design Automation, System-Level Characterization Cases, RF and High Voltage Design
  - Transient Test Techniques and Modeling of ESD Testers
- **Workshops for captivating discussions on:**
  - Effective Strategies for ESD Design Team Organization and SoC Support
  - HBM and CDM Correlation to Field Returns and Manufacturing Rejects
  - System Level ESD Protection – On-Chip or On-Board?
  - Transient Latch-up
  - EOS Mitigation – What is the Best Strategy to Get Rid of EOS Failures
  - 3D/TSV

Register Online at www.esda.org/onlineregistrations.html

From the President

ESD Association President;
Leo G Henry, Ph.D

Meet the hardworking staff members at the ESDA Headquarters in Rome, New York

Greetings,

In this May-June issue of Threshold, I wish to talk about two of the four staff members at the EOS/ESD Association, Inc. (ESDA) headquarters in Rome, NY. They are two of the most hardworking administrators in the ESDA family who represent us, the Association members.

Terry Finn, the Marketing and Communications Programs Manager, has been with the EOS/ESD Association for five years. Terry is responsible for the administrative activities of the M&C Business Unit. She is the Editor of Threshold, the ESD Association's bi-monthly newsletter. In addition, we can thank her for writing, or helping to write, some of the articles which appear regularly in the newsletter: Volunteer Spotlight, Sparks Local Chapters, meeting notices, Q&A, calendar of events/ announcements, Photo Corner, etc. She also writes many of the additional special articles pertaining to ESD and news of value to ESDA members.

As the M&C Administrator, Terry develops all of the Associations promotional materials, namely: IEW, EOS/ESD Symposium, and Factory Symposium programs, exhibit directories, and exhibitor kits; the call for papers/presentations; the regional tutorial flyers, the online training catalog; the press catalogs, and a multitude of flyers for ESDA services and programs. She also designs and maintains all electronic email promotions for ESD events.

As the webmaster, Terry does a great job maintaining the ESDA website. She has had to learn HTML coding and some scripting language to be able to assist in maintaining the site and keep up with its development, and it must be noted that she has developed it to the professional look that it now has.

Terry schedules and coordinates with the volunteering members, the submission of magazine articles and columns for publication in external technical magazines. She is also responsible for press releases regarding the various news items that need to be publicized. She also does what we call promotional barters with other conferences, organizations, and publishers, coordinating the exchange of promotional items such as booth spaces, magazines and website ads, etc. One such barter was made with the International Symposium for Testing and Failure Analysis (ISTFA) where they exhibited at our EOS/ESD September 2012 symposium, and we had a booth at their conference in November 2012. These barters are a great way to promote the Association and help us to become known. As the Online training coordinator, she schedules, coordinates, and monitors not only the presentation and attendance of online training webinars, but also the archived training materials for future use. I have instructed many online courses with her as the coordinator, and she knows her stuff. Terry also works on strategic marketing analysis and planning which allows us to explore new avenues of interest for which to develop new programs. In her "spare time" Terry also assists in the soliciting and planning EOS/ESD Symposium exhibitors, photographs events and ESDA groups, develops videos for the website, produces Certification Certificates, BoD Business cards, etc.

One of the perks of working for the ESDA is that you get to improve on whatever education you already have. So far, all three of the full time staff members at the ESDA headquarters (HQ) are actively enrolled in continuing education programs at major universities. Terry is currently enrolled in the University of California at Berkeley's Certificate Program in Marketing. She has completed three semester-long online classes; Introduction to Marketing, Marketing Research: Concepts and Techniques, and Strategic Marketing. All sound quite impressive. She is currently enrolled in Social Media and other Innovative Technologies, and has two additional courses after that to complete the program. Prior to joining the ESDA her primary job focus was on graphic design, so she decided to improve on her market analysis and planning skills. This program will help her to develop future marketing strategies for the association and stay on top of newer internet and Web 2.0 marketing solutions. So you see, Terry is helping the ESDA to "Set the Global Standards for Static Control"!

Continued on page 3

From the President cont.

Christina Earl, our Standards Program Manager, has been with the EOS/ESD Association, Inc. for four and a half years. Christina is responsible for the administrative activities of the Standards Business Unit, including, but not limited to, maintenance of the STDCOM, TAS, and WG membership rosters; agendas, meeting minutes, action items, action item database, and ensuring all documentation is filed at HQ for STDCOM, TAS, and WG chair meetings; preparing all necessary ANSI forms for approval of ESD Association standards documents as American National Standards; managing conformance to the ESDA style guide document format and enhancing the format of documents; and managing document binders and development checklists to ensure that all documentation required by ANSI and the ESDA Standards Manual during the development process of a document is archived. Those of us who work with Christina to fulfill the ANSI requirements will attest to the fact that it requires real hard work to stay current.

Christina creates support documents, distributes documents, and sends reminders for vote-by-mail and industry review to ensure compliance with the Standards Manual and ANSI requirements; she manages adjudication of comments from STDCOM vote-by-mail and industry review; assists the Standards BUM in preparing annual standards development budgets, site management, and meeting schedules; maintenance, revisions, and distribution of the Standards Manual, confidentiality policy, anti-trust policy, and patent policy; tracking patent disclosures and maintaining a spreadsheet and binder of all relevant patent information to ESDA documents; reviewing the ANSI Essential Requirements and filing a yearly compliance form that the current ESDA procedures are in accordance with the most current version of the ANSI manual; and preparing for the five-year ANSI audit, responding to the auditor on-site, responding to the written audit report, and submitting revised Standards Manual if required by the audit report. Hopefully, this detail will help us understand and appreciate the level of focus and attention to details that the position requires.

In addition to supporting the Standards Business Unit, Christina is also responsible for processing customer orders and memberships; managing the workshop handouts and master presentation for the annual International Electronics Workshop (IEW); managing the professional certification program registrations and course completions; managing the national tutorial program notes submission and publication, including printing customized notes for each attendee; managing the submission, compilation, and publication of both the annual EOS/ESD Symposium and Asia Factory Symposium proceedings; managing the set-up of the online system and registrations for all ESDA sponsored events; and managing the balloting process and online voting system for the annual board of directors election; as well as a variety of other administrative tasks in the office. Ultimately, Christina has shown exemplary commitment and dedication to ESDA and so she is helping the ESDA to "Set the Global Standards for Static Control"!

Christina is currently enrolled (part-time) at Empire State College and is pursuing a bachelor's degree in Business, Management, and Economics with a concentration in Business Administration. She began her studies in August 2010 and will complete them in May 2014. The Business Administration concentration offers the broadest array of traditional academic and business disciplines including economics, accounting, communication skills, information management, understanding people in an organizational context, marketing, management, business law, legal environment of business, finance, ethical and social responsibility, understanding organizations within broader contexts, quantitative skills, technical areas such as computer applications and management information systems, and international, global and ethical issues confronting contemporary societies.

Hopefully, having read all of that, you can see how valuable Christina is. The knowledge and skills that both Christina and Terry will gain from their continuing education will support their growth and leadership within ESDA for many years to come and will definitely help the ESDA to "Set the Global Standards for Static Control"!

Then there is Lisa Pimpinella, Director of Operations, our fearless leader at HQ, and our newest employee Carol Davis, who joined our team in March 2013, I will defer until the next issue to "sing their praises" for participating in the goal of making the ESDA a place to stay involved, once you have volunteered.

Until next time,

Bhappi & Try to Stay Focused

Leo G

Association

ESD Research Council (ERC) Research Grant

We are pleased to announce that this year, 2013, with approval of the Board of Directors, the ESDA has initiated a new program called ESD Research Council (ERC). The ERC consists of key donating sponsor members from the industry and also representing the ESDA from the Advanced Topics Group. A total funding amount of $40K is available for one selected research topic that has potential to advance the ESD technology.

This year, the ERC Funding Committee (IBM, Cisco, Samsung and the ESDA) has selected the four advanced research (AR) topics as areas of key interest. These are shown as AR1 to AR4 in the table below. Out of these, one project will be approved for the $40K funding. We are inviting research proposals with details on any of the listed topics.

We feel that this is an important recognition by the ESDA Board and the funding companies on the value of university work. The awarded sum may be used to subsidize any other research grant work. However, along with publication of the work we expect an appropriate acknowledgement of the ESDA and the sponsoring industry members. The publication can be at a future IEW or at the ESD Symposium. Alternately, it could be a written technical report (TR).

If you have been active in ESD education and ESD research we personally invite you to submit a proposal. For proposal submission information and a brief description about the expected outcome for each project contact the ESD Association at info@esda.org.

AR1: Semiconductor ESD "Walking Wounded" Reliability

AR2: Modeling/Simulation Infra Setup for EOS Phenomena and Extraction of Key Parameters to Improve EOS Immunity at On-Chip

AR3: Simplified ESD CDM Circuit Simulation

AR4: Characterization of Discrete Components for System Efficient ESD Design (SEED)

Please select one topic for your Advanced Research Proposal

Continued on page 5

ERC Research Grant

2013 ERC Advanced ESD Research Proposal Details

Who Should Apply?
Any academic professor or researcher who may wish to conduct exploratory work in ESD.

Which Research Topics?
Select the topic of your interest from the four listed recommendations (AR1, AR2, AR3, or AR4).

What is the Grant Value?
The advanced research grant would be $40,000 U.S. for one-year. The grant money could be used in conjunction with any other sponsored research grant for ESD work.

What is Expected?
The outcome of the research should advance the fundamental understanding of ESD knowledge as outlined in the research topic attachments.

When is the Grant Period?
The winner will be announced during September 2013. The research work for this grant must be completed by December 31st, 2014.

What are the Restrictions?
The granted money should be solely used for ESD research. Only one proposal per investigator allowed. The completed work must be first published at a future ESDA conference (see below).

What is Expected for Publication of the Funded Research Work?
We request that the completed work to be first published either at the 2015 IEW or at the 2015 ESD Symposium. Alternately, it can be published as a Technical Report (TR) by December 31st, 2014. Publication in a technical journal after this event is allowed.

What is the First Step?
Please send an email to info@esda.org by May 10th, 2013, indicating your intent to apply for the Advanced Research Grant. This is optional but helps us to track the level of interest.

How is the Application Made?
A clear outline of the title, purpose, approach, and the expected outcome of the work must be included. Normally the application is expected to include a 500-word summary on how the proposed work would advance the understanding of ESD.

When is the Deadline to Submit the Application?
All final applications must be received by June 28th, 2013 to be considered. Please send the proposals to the ESD Association (info@esda.org).

Whom to Contact for Questions?
For any clarification on the AR topics please send an email to ESDA (info@esda.org). The ERC Committee will address them with a prompt response.

2013 ERC Advanced ESD Research Proposal Format

Principal Researcher(s):
{Name of Professor/Researcher}

Affiliation:
{Name of University or Research Institute}

Proposal Title:
{A short descriptive title}

Abstract: (50-word abstract is optional)
{Summarizing the essence of the work}

Background:
{Background to the problem being addressed}

Purpose:
{Motivation for the work and the intended purpose}
{What will this work accomplish?}

Approach:
{Research proposal steps}
{Experiments or simulations to be done}
{Type of data to be collected}

Expected outcome:
{What will the results prove?}
{How will these fill a gap in ESD understanding?}
{How may these lead to further work or establish new ideas?}

Please limit the proposal to a maximum of 3 pages with figures. The proposal must contain a minimum 500-word summary. Thank you!

Q&A

How static control garments are used and how they are tested needs to be defined in the organization's ESD Control Program Plan.

Q Recent audits at Electronic Assembly Manufactures conducted by Missile Defense Agency (MDA) revealed a new behavior in our supply chain. Some of our suppliers are citing the ANSI/ESD S20.20 that there are no requirements to use smocks in ESD designated areas regardless of ESD class of parts or electronic assemblies being handled or in close proximity. The ANSI standard is silent on the use of smocks. Was it the committee's intention not to require the use of smocks in ESD areas? Can you expound on the committee's expectation (requirement) with respect to protection of product from personnel clothing and how this was conveyed to the industry in the standard?

In addition, some suppliers were found to use smocks in lunch, bathroom, and other areas which may degrade or contaminate the smocks. Lastly, some suppliers did not have smock test, monitoring, or cleaning processes to ensure smocks remain effective while in use. The above practices are not deemed acceptable, but we have no standard to cite, just known best practices. We welcome your thoughts.

A It is the intent of the ANSI/ESD S20.20 Standard to provide the basis for an ESD control program. There are certain requirements listed along with a number of options for implementing the requirements. It is expected that the users of the S20.20 Standard (just like the users of MIL STD 1686) develop their own written ESD Control Program Plan and define the necessary ESD control technical elements that are required to meet their defined Plan. If a company sees some necessity for using an ESD control garment, then they are expected to list them. S20.20 actually has stated requirements for garments, if the organization chooses to use garments. However, it is necessary to understand that S20.20 does not consider garments as a hard requirement. Effective ESD control programs have been implemented in many places without the use of an ESD control rated garment.

How garments are used and worn, where they are worn, and how they are tested need to be defined in the organization's ESD Control Program Plan. Then, if they are in violation of what they have stated, they should be cited for being out of compliance. If an organization is using ESD control garments, they need to determine how and where they will be worn and how often to clean and test. It would seem from the way your question is stated that the organizations (suppliers) do not have a properly defined ESD Control Program Plan and that is what they should be cited on first. They would need to have their Plan well thought out, detailed properly and inserted into their Quality Management System. There are numerous consultants listed in our Buyer's Guide that have considerable experience in preparing ESD Control Program Plans that some of your suppliers seem to need.

As mentioned, the use of smocks is not considered mandatory unless specifically identified in an organization's ESD Control Program Plan. As mentioned above, the reason they are not mandated is that experience has shown that a very effective ESD control program can be designed and maintained without the use of smocks. If smocks and other ESD control garments are listed, then there are requirements to show how they were qualified for use, how they are tested, how they are cleaned, where they are required for use and not to be used. You could contact some of the consultants listed in the Buyer's Guide to get opinions on your questions. You might also find it useful to attend some of the ESD Association meetings to meet some of the experts in person. Our next meeting will be in St. Louis in June. Information is on our web site. Of particular importance is the Symposium in September. You might find it useful to participate in the Tutorial program where you can receive much more detailed information.

The response given is a service to industry; the ESDA is not responsible for content. The users of this information need to determine the suitability of the response.

TRANSFORMING TECHNOLOGIES, LLC
3719 King Road, Toledo, OH 43617
Tel: 419-841-9552 • Fax: 419-841-3241
Email: info@transforming-technologies.com
www.transforming-technologies.com
Manufacturer of static control products

DANGELMAYER ASSOCIATES, L.L.C.
14 Butternut Lane, Gloucester, MA 01930
Tel: 978-282-8888 • Fax: 978-282-4884
Email: ted@dangelmayer.com • www.dangelmayer.com
ESD & EOS Consulting Services: No Product Sales!
S20.20 Programs, Training, Auditing, CDM, CBE, Class 0, Cleanrooms

ESDA Spotlight

ESDA Spotlight Steven Voldman

"The ESD Association and the Symposium led to my personal growth and professional success throughout my career."

Steven Voldman received his B.S. in Engineering Science from the University of Buffalo, his first M.S. in Electrical Engineering (EE) Degree from Massachusetts Institute of Technology (MIT), a second degree, The EE Degree from MIT, and a second M.S. in Engineering Physics, and a PhD EE from the University of Vermont under IBM's Resident Study Fellow program.

Steven was a member of the semiconductor development of IBM for 25 years. He was a member of the IBM's Bipolar SRAM, CMOS DRAM, CMOS logic, Silicon on Insulator (SOI), BiCMOS and Silicon Germanium, RF CMOS, RF SOI, smart power technology development and image processing technology teams. In 2007, Steven joined the Qimonda Corporation as a member of their DRAM development team responsible for ESD and latch-up design manuals, and ESD design. In 2008, Steven was a full time ESD consultant for the Taiwan Semiconductor Manufacturing Corporation (TSMC) From 2009 to 2011, He became a senior principal engineer at Intersil Corporation working on analog, power, and RF applications in RF CMOS, RF Silicon Germanium, and SOI. In 2013, Steven began working as a consultant on sub-28 nm technology for Samsung Electronics Inc. in Dongtan, South Korea.

Steven is a past member of the ESDA Board of Directors; ESD Symposium Chairman 2001 and 2009; ESD Device Testing Standards, ESD WG 5.5, TLP Founder and Chairman, ESD on Campus founder and chairman, ESD Student Chapter founder

In the ESD Association, Steven initiated the "ESD on Campus" program which was established to bring ESD lectures and interaction to university faculty and students internationally; the ESD On Campus program has reached over 40 universities in the United States, Singapore, Taiwan, Malaysia, Philippines, Thailand, South Korea, India, and China.

Steven has written over 150 technical papers and authored seven books on ESD. He is a recipient of over 245 US patents and provides tutorials and lectures supporting ESD design and latchup.

Steve is married with two children. Annie, his wife, is an actuary and runs her own business; His son Aaron is a graduate of Brandeis University and founded the Student Peace Alliance (SPA) in Washington D.C. and is presently in Pardes Institute in Jerusalem. Steven's daughter, Rachel graduated from University California Santa Barbara (UCSB) with a focus on languages.

Steven enjoys writing books, travelling, teaching, and inventing. He plays a ram's horn for New Year's celebrations and spends time running, spinning, and doing ashtanga and hatha yoga.

"The ESD Association and the Symposium led to my personal growth and professional success throughout my career."

ESDA Standards

June 10-16, 2013 ESD Association Meeting Series,
Hilton St. Louis Frontenac, Saint Louis, Missouri

Monday, June 10

ESD Device Design Essentials Seminar Day 1 (Registration required)	8:00 - 5:00
Essentials for ESD Programs Seminar Day 1 (Registration required)	8:00 - 5:00

Tuesday, June 11

ESD Device Design Essentials Seminar Day 1 (Registration required)	8:00 - 5:00
Essentials for ESD Programs Seminar Day 1 (Registration required)	8:00 - 5:00
Education	8:00 - 5:00

Wednesday, June 12

TAS	7:00 - 5:00
ESD EDA	8:00 - 12:00
Steering Committee	1:00 - 5:00
ExCom	6:00 - 9:00

Thursday, June 13

Board of Directors	8:00 - 5:00

Friday, June 14

TAS	8:00 - 5:00
WG-20.21, Aerospace	8:00 - 12:00
WG-3, Ionization	8:00 - 12:00
JWG, Device Testing (CDM)	8:00 - 12:00
WG-15, Gloves	11:00 - 12:00
WG-20.20, S20.20	1:00 - 4:30
WG-13, Handtools	1:00 - 4:00

Friday, June 14 continued

JWG, Device Testing (HBM)	1:00 - 4:00
EOS Best Practices Task Group	4:30 - 5:30
Hospitality Suite	5:30 - 6:30

Saturday, June 15

WG-53, Compliance Verification	8:00 - 12:00
WG-2, Garments	8:00 - 12:00
WG-4, Worksurfaces, WG-9, Footwear & WG-97, Flooring Systems	8:00 - 12:00
WG-5.4, Device Testing (TLU)	8:00 - 10:00
WG-5.6, Device Testing (HMM)	10:00 - 12:00
Awards Committee	12:00 - 1:00
Membership & Volunteer Activities	1:00 - 3:00
ESD in Explosive Atmospheres	1:00 - 3:30
WG-11, Packaging & WG-1, Wrist Straps	1:00 - 4:00
WG-5.5, Device Testing (TLP)	1:00 - 4:00
WG-6, Grouding	3:30 - 5:30
WG-5.0, Device Testing	4:00 - 5:30
WG Chair Meeting	5:30 - 6:30
Mixer	6:30 - 7:30

Sunday, June 16

WG-17, Process Assessment	8:00 - 12:00
WG-10, Handlers	8:00 - 10:00
WG-14, System Level ESD	9:00 - 12:00
MAR/STDCOM	1:00 - 4:00

You are invited!

Please join us at the June meeting series

Hospitality Suite, Friday, June 14th from 5:30-6:30 PM

Mixer, Saturday, June 15th from 6:30-7:30 PM

New volunteers, guests, and seasoned volunteers will have the opportunity to visit and get to know each other, encouraging new friendships and increased volunteer involvement.

Come and be part of the ESDA family, hear some stories, and join the camaraderie!

Hilton St. Louis Frontenac
1335 South Lindbergh Blvd.
Saint Louis, Missouri 63131
Toll Free 1-800-325-7800
Phone 1-314-993-1100 (ask for reservations)

Group Code: EDA
Room Rates; Single/Double: $125 per night
On-Line Link:
www.hilton.com/en/hi/groups/personalized/S/STLFHHF-EDA-20130607/index.jhtml

ESD DEVICE DESIGN ESSENTIALS

June 10-11, 2013

Hilton St. Louis Frontenac, 1335 S Lindbergh Blvd, Saint Louis, Missouri
Lunch and refreshments provided

ESD DEVICE DESIGN ESSENTIALS

JUNE 10-11, 2013

Instructors: Gianluca Boselli, Texas Instruments; Michael G. Khazhinsky, Silicon Labs

This two-day seminar consists of concentrated versions of 12 ESDA tutorials which comprise the ESDA Device Design Certification Program.

- ESD On-Chip Protection in Advanced Technologies
- SPICE-Based ESD Protection Design Utilizing Diodes and Active MOSFET Rail Clamp Circuits
- EOS/ESD Failure Models and Mechanisms
- On-Chip ESD Protection in RF Technologies
- Charged Device Model Phenomena, Design and Modeling
- Latch-up Physics and Design
- Circuit Modeling and Simulation for On-Chip Protection
- Troubleshooting On-Chip ESD Failures
- Device Testing--IC Component Level: HBM, CDM, MM, and TLP
- Impact of Technology Scaling on Components High Current Phenomena and Implications for Robust ESD Design
- Transmission Line Pulse (TLP) Basics and Applications
- System Level ESD/EMI: Testing to IEC and other Standards

Increased device performance has created sensitivity to ESD events.

Learn how design sensitivity trends affect ESD control practices.

Be proactive! Get engaged! Learn from industry professionals to experience device protection technologies and limitations.

DAY 1 JUNE 10

PART I (8:00 AM- 12:00 PM)
This part reviews the fundamentals of ESD testing, high-current physics, and ESD modeling. The focus is on device-level (HBM, CDM, MM, TLP) and system level testing, impact of technology scaling on ESD high current phenomena, as well as circuit modeling and simulation for on-chip protection.

PART II (1:00 PM-5:00 PM)
The principles from part I are then applied to ESD Protection Design. This part describes ESD on-chip protection in advanced technologies, SPICE-based ESD protection design utilizing diodes, and active MOSFET rail clamp circuits.

DAY 2 JUNE 11

PART III (8:00 AM- 12:00 PM)
This part describes special ESD design cases, including Charged Device Model (CDM) phenomena and design, on-chip ESD protection in RF Technologies, and latch-up physics and design.

PART IV (1:00 PM-5:00 PM)
The final section discusses EOS/ESD failure models and mechanisms. The seminar concludes with practical examples for trouble-shooting of on-chip ESD failures.

Register Online at www.esda.org/onlineregistrations.html

ESSENTIALS FOR ESD PROGRAMS

FACTORY: TECHNOLOGIES • CONTROLS • PROCEDURES

June 10-11, 2013

Hilton St. Louis Frontenac, 1335 S Lindbergh Blvd, Saint Louis, Missouri
Lunch and refreshments provided

ESSENTIALS FOR ESD PROGRAMS
FACTORY: TECHNOLOGIES • CONTROLS • PROCEDURES

JUNE 10-11, 2013

Instructors: Leo G. Henry, ESD/TLP Consultants, L.L.C.; Carl Newberg, MicroStat Laboratories; Terry Welsher, Dangelmayer Associates L.L.C.

This two-day seminar consists of concentrated versions of the 10 ESDA tutorials which comprise the ESDA Program Manager (PrM) Certification Program:

- ESD Basics for the Program Manager
- Ionization and Answers for the Program Manager
- Packaging Principles for the Program Manager
- System Level ESD/EMI: Testing to IEC and other Standards
- Cleanroom Considerations for the Program Manager
- How To's of In-Plant ESD Survey and Evaluation Measurements
- Device Technology and Failure Analysis Overview
- Electrostatic Calculations for the Program Manager and the ESD Engineer
- ESD Standards Overview for the Program Manager
- ESD Program Development & Assessment (ANSI/ESD S20.20 Seminar)

A casual approach to ESD control is no longer effective. Make sure you have people with the right knowledge to maintain product yields at the highest levels.

This seminar offers a broad exposure to the essentials of ESD programs. Learn a comprehensive set of factory technologies and procedures designed for managers, technicians, and specialists desiring ESD control program training and information.

Key concepts and information from the above courses have been selected for this two-day seminar. Many of the demonstrations and videos from ESD Basics Tutorial are included in this seminar. Examples of electrostatics and ESD calculations are included where appropriate throughout the seminar.

DAY 1 JUNE 10

PART I (8:00 AM-Noon)
This section reviews the fundamentals of electrostatics, charge flow, electric field and voltage. The concept of capacitance and the fundamental relationship, Q = CV, is introduced and explored with demonstrations and videos. The practical application of these concepts to the measurement of resistance, fields and voltages, and the relevant standards are reviewed and demonstrated.

PART II (1:00 PM-5:00)
The principles from Part I are then applied to grounding principles and standards, measurement of charge, standard models for ESD (i.e., human-body model and charged device model), and static induction with demonstrations and videos. Very simple and basic ESD protection circuit concepts and relevant failure analysis techniques are introduced and reviewed.

DAY 2 JUNE 11

PART III (8:00 AM-Noon)
Key ESD technical areas are reviewed such as air ionization, ESD-safe packaging, cleanroom principles and electrostatic attraction. Standards relevant to these areas are described.

PART IV (1:00 PM-5:00)
The final section includes charge generation test methods, additional ESDA standards, system-level ESD standards and testing, practical auditing techniques and strategies, and ESD event detection. The tutorial concludes with a review of ESD Protected-Areas (EPAs), ESD Program Management and the application of ANSI/ESD S20.20.

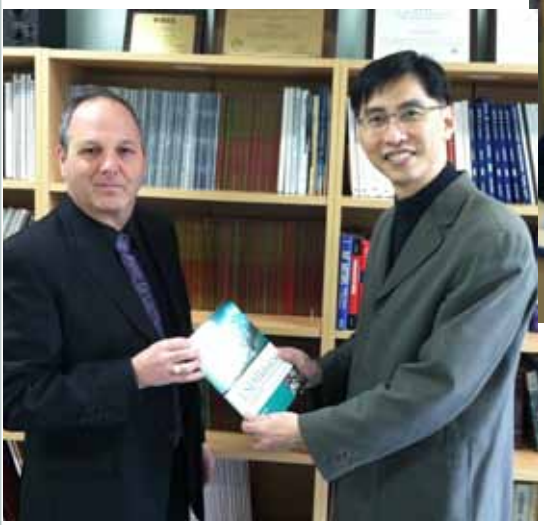
This course serves as a refresher class to those taking the PrM Certification exam. In addition, the course can be used as preparation for those interested in taking the iNARTE Engineering or Technician Certification exam, which will be offered on the day following this two-day course.

Register Online at www.esda.org/onlineregistrations.html

ESD On-Campus

ESD on Campus visits Korea University

Seoul, Korea



An nyong ha seo!

Korea - from Korean BBQ, Kimchi to K-Pop

An nyong ha seo! The ESD on Campus program visited the Korea University in Seoul for the first time in 2013. Seoul, Korea is alive at night; the small neighborhood of Itaewon is filled with young and old who are trying different cuisines from the US, Thailand, India, Malaysia, Greece, and even Italy. Intermixed with the international food is Korean BBQ, Kimchi, and some Korean Pop (K-Pop) music.

At Korea University, there were four faculty members who joined us to greet the guests. I was accompanied by Joshua Yoo – the President of the ESDA Korean Chapter. The student crowd surprised the faculty by filling the room with no available extra seats.

Korea University has 15,000 students, with 5000 graduate students. The University has three campuses. The engineering and science departments are all clustered in a common area on one of the more modern campuses. Korea University is the "Harvard of Korea" carrying the crimson red for its campus color.

The invitation for the talk was received from our host Professor Jae-Sung Rieh of the electrical engineering program. Professor Jae-Sung Rieh, was my co-worker in IBM's Silicon Germanium development program in Burlington, Vermont in the 1990s. We met in Shanghai in 2006, and again in Xian,China in 2012, where we discussed that a visit was to happen someday. At this Korea University, work in the area of Terahertz (THz) transistors is very active with faculty who graduated from top US universities such as California Tech. The ESD lecture was well received and was followed by a traditional Korean meal with a few faculty members, as well as our new ESDA Korean Local chapter head.

An nyong ha seo!

Kam sa ham ni da!

Dr. Steven H Voldman

ESD on Campus Chairman

Association News

ESDA Board Member Talks at the IEEE Consultants Network of Long Island

Robert Ashton, Ph.D.

The North Atlantic winds were biting as ESDA Board of Directors member Robert Ashton stood on the heaving deck of the Susan Ann in early March as it plowed through the waves toward its destination. The predictions of even worse weather ahead were all too real and things might not improve when the ship reached land. Snow was predicted and there was a long drive before reaching the meeting site. The message had to get out, however, and this was a group of engineers who know little about ESD or EOS so much was at stake. This meeting had been delayed before by even worse weather and could not be put off again.

Well, maybe it wasn't quite that dramatic but there are definite seeds of truth. The ferry Susan Ann was making one of its several times daily crossing of Long Island Sound between New London, Connecticut and Orient Point, New York but the service was halted later in the day due to high winds. The forecast of snow was also real, with several inches predicted, and the meeting had been postponed before due to the aftermath of Hurricane Sandy. The full story, however, began 6 months earlier with a phone call from William Siegel, President of Crownlite Manufacturing, to ESDA headquarters.

Mr. Siegel was helping another company deal with a reliability problem with high intensity light emitting diodes (LEDs) in a fast food display application. It was suspected that ESD might be the cause of a high failure rate. He explained to ESDA headquarters that the lighting industry was making a transition between traditional light sources such as incandescent and florescent illumination to an increased dependence on LEDs. LEDs require the use of electrical control and driver circuitry that lighting engineers have not typically used and they could be sensitive to ESD and other stresses that had not previously been of concern. Mr. Siegel asked if ESDA could provide a speaker on ESD for the Institute of Electrical and Electronics Engineers (IEEE) Consultants Network of Long Island since he wanted to know more about ESD and he suspected others in the group would be interested as well. This request was discussed among several members of the ESDA board of directors. Most of the board members who discussed this decided that this was a system level, rather than a factory control, request and Robert Ashton agreed to make the presentation. After discussions with Mr. Siegel a presentation in early November was agreed upon.

As part of the preparation for the talk Mr. Siegel sent some sample failed units to Robert for evaluation. After examination and measurements of the samples Robert thought that the failures may very well have been due to electrical overstress (EOS) rather than ESD and he expanded the subject matter of his talk to include EOS. The original date of November 7 was just over a week after Hurricane Sandy and since much of Long Island was still without power and gas was in short supply the presentation was moved to March 6. In the end the March 6 date worked out quite well. The predicted snow was not as heavy as expected and there was a good turnout of between 30 and 40 people for the talk at Briarcliffe College in Bethpage, NY. A number of the attendees received IEEE continuing education credit as part of maintaining their professional engineer's certification.

The IEEE Consulting Network of Long Island includes electrical, electronic, mechanical and software engineers with expertise in over sixty-five categories of technology and business. All are members of IEEE. Mr. Siegel began the discussion by explaining the LED reliability problem he was investigating. With such a wide range of background and interests, Robert continued with a broad discussion of ESD including its cause, how it affects electronic circuits, how it is dealt with by a combination of ESD prevention and product robustness and an overview of test methods and standards for both components and systems. Robert then discussed how ESD could affect LED products and showed transmission line pulse (TLP) measurements of several commercially available LEDs and how many LEDs include built in ESD protection. Robert continued his discussion with an overview of EOS and EOS test methods. He concluded by telling the group about the ESDA, its professional meetings including the EOS/ESD Symposium and the International ESD Workshop, tutorial programs and standards writing activity.

Industry Council

The Industry Council on ESD Target levels: Impact on IC Qualification

The Industry Council on ESD Target Levels, since its inception in 2006, has been making a strong influence on the IC industry for ESD qualification processes. The original ESD qualification requirements were established some 35 years ago and their relevance has progressively subsided due to a number of changing scenarios. These include, on the one hand the much improved factory control methods, and on the other hand to the ever increasing demand for higher performance circuits with their low tolerance to the associated loading capacitance from the ESD networks. Taking into account these factors, the Industry Council, as it is now commonly known, has established interim safe and practical ESD levels that are not only necessary but are imperative for the progression of advanced semiconductor technologies.

This strong impact from the Council can only have resulted from the credibility of its members. These associates represent more than 50 member companies that include IC manufacturers, leading ESD factory control experts, OEMs, and experienced ESD consultants. The success of the Council in establishing a ***new order for ESD qualification*** depended on systematic collection of data involving several corporations that have been willing to share. This unprecedented approach is unique in the industry and represents a way of the future when dealing with the confluence of technology demands to the constrictions coming from reliability requirements. Convincing the industry as a whole requires acceptance from the Standards bodies such as JEDEC and the ESDA. Working closely with these organizations, the Council has documented the basis for these changes in component ESD levels through two published white papers [1,2].

"Industry Council Members During the 2008 ESD Symposium in Tucson"

The most important aspect is that as long as realistic requirements for manufacturing and field reliability are realized, and that necessary advancements are globally implemented to meet these standards, the Council has shown that a win-win situation is always possible for both the customer and the supplier of semiconductor devices.

The Council realized that the system reliability, rather than just the component reliability, has more far reaching effects. After launching the second phase into System Level ESD robustness studies the Council generated two additional white papers on the subject [3,4]. This required engaging a new set of world experts including representatives from the automotive systems. The objective of these documents was first to eliminate the prevailing confusion in the industry about system level ESD and the misunderstanding that often follows this between the OEM and the supplier. The second objective was to clarify what is important for system ESD and to introduce a new concept called ***system-efficient-ESD-design*** (SEED). The Council now aims to spread the implementation of SEED through the standardization of characterization and modelling of PCB discrete and IC components and a simulation tool-based optimization approach of the board design. This will affect a wide field of electronics industry ranging from discrete and IC suppliers, to EDA tool vendors to system designers. As a result, SEED will enable new and more efficient system level ESD protection designs.

Finally, the Council has most recently embarked on the topic of IC and system failures from electrical overstress (EOS). Although EOS has been a constant bane of field and application failures, not much attention has been paid in the industry to address these issues with any sense of urgency. This has been mostly due to the complexity of these failures which might arise from a myriad of root causes at every level from field testing to customer applications. Without in-depth studies on these phenomena, a clear direction to solve ***EOS as a massive and persistent problem*** cannot be determined. The Council has now initiated these studies through extensive data collection from all over the industry. It is expected that this process will take well into early 2014 and during the second half of that year a white paper is targeted to be completed and published. The most important goal is to provide ***a definitive guide to minimize the unnecessary EOS failures*** in the semiconductor industry.

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Industry Council cont.

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In conclusion, what started as a consortium of a few IC suppliers trying to identify the practical means to address the pervasive ESD component qualification difficulties has evolved into a fully recognized organization that can help the industry to move along to address ***the semiconductor electronics technology roadmap in parallel with the necessary but realistic ESD roadmap.***

Anyone wishing to participate and contribute to the Council's activities or take part in the EOS Survey are invited to contact the Chairmen (harald.gossner@industrycouncil.org / cduvvury@industrycouncil.org).

Many of the documents from the Council are available on the web site: www.esdindustrycouncil.org. References [1,2] are also available translated into Japanese on the Council web site.

References

[1] White Paper 1, "A Case for Lowering Component Level HBM / MM ESD Specifications and Requirements". www.esda.org/documents/WhitePaper1_HBM_MM_2010.pd, alternately known as JEP155.

[2] White Paper 2, "A Case for Lowering Component Level CDM ESD Specifications and Requirements". www.esda.org/documents/IndustryCouncilWhitePaper2.pdf, alternately known as JEP157.

[3] White Paper 3 Part I, "System Level ESD: Common Misconceptions and Recommended Basic Approaches," www.esda.org/documents/IndustryCouncilWhitePaper3.pdf, alternately known as JEP161.

[4] White Paper 3 Part II, "Implementation of Effective Robust Designs," www.esda.org/documents/IndustryCouncilWhitePaper3_PII.pdf, alternately known as JEP162.

ESD On-Campus

ESD on Campus 2013 Update

ESD on Campus program continues to expand into new regions of the world. This year, the ESD on Campus program provided lectures to both India in January, and South Korea in March.

In the end of 2012, the ESD on Campus program formed the ESD on Campus committee from industry and universities. The role of the committee is to help define the visits of the ESD on Campus lectures, establish contacts to new regions, and grow university contacts. The committee combines members of the ESD Association education department, ESDA Board of Directors (BoD), and representatives from Thailand, Japan, Korea, Germany, Singapore, Taiwan, China, and the US.

We look to the future to expand our ESD on Campus program!

Best regards,
Dr. Steven H. Voldman
ESD on Campus Chairman

The ESDA On-Campus Committee:

Dr. Steven H Voldman
ESD on Campus Chairman - US

Leo G Henry
ESDA President - US

Charvaka Duvvury
ESDA Board of Directors - US

Prof Augusto Tazzoli
CMU University - US

Kathy Muhonen
Education Liaison – US

Gianluca Boselli
ESDA Board of Directors – US

Prof Ming-Dou Ker
National Chiao Tung University - Taiwan

Mirko Scholz
University - Europe

Prof Albert Wang
University California Riverside - US

Prof. Zhi Wei Liu
UESTC Chengdu - China

Prof Supavadee Aramvith
Chulalongkorn University – Thailand

Harald Gossner
ESDA Board of Directors - Germany

Dr. Weng Hong Lai
SIMTech A*Star - Singapore

Joshua Yoo
ESDA Korea Chapter President- Korea

Prof Jo Chiranut Sa-ngiamsak
Khoen Kaen University KKU - Thailand

Dr. Takayoshi Ohtsu
Suzuka National College of Technology - Japan

Association

2014 Board of Directors Nominations

ESD Association Members Can Cast Votes Before July 1, 2013

Nominations are placed and ESD Association members have been sent a link to this year's online voting system. Select up to four nominees to serve on the ESD Association Board of Directors for the three-year term beginning January 1, 2014. Members may cast "write-in" votes by typing the name(s) of a person(s) in the "write-in" box.

The following individuals are seeking a seat on the Board of Directors for the next term:

Brett Carn

Brett Carn initially joined Intel Corporation in 1999 and is a Principal Engineer in the Corporate Quality Network. He has actively worked in the field of device level ESD at Intel. In that role, he oversees component level ESD testing across all Intel sites as well as defining internal test specifications. Additionally, Brett contributes to ESD layout rules, sets the ESD goals for all Intel products and leads post silicon ESD debug on a variety of products. Prior to joining Intel, he worked for Lattice Semiconductor for 13 years where he started working on ESD in the early 1990s. For Lattice, Brett defined the initial component ESD layout rules for the company as well as handling all ESD qualification testing and product debug. Since 2007, Brett has been a member of the Industry Council on ESD Target Levels and has helped author several whitepapers as well as been the lead editor on the last three whitepapers. Brett received his B.S. in Electrical Engineering from Portland State University in 1986.

Vision

This is an interesting time in the ESD Industry. We have made great progress in getting alignment across the Industry on HBM and CDM target levels but there is still more work to do. We are just starting to recognize the importance of aligning the Industry on the importance of EOS and putting new focus on addressing the EOS side of the EOS/ESD Association. I am committed to ensuring these efforts continue and that we continue to look at new ways to increase awareness and define a joint direction between the system manufacturer and their suppliers regarding EOS. In addition, great strides have been made as the ESDA and JEDEC have merged their individual HBM specifications, we need to move our focus to close on merging our CDM specifications. More than that, we need to look at opportunities to improve on our CDM testing methodology. As an ESDA board member, I would like to keep this focus as we move into advanced technologies where accuracy in the test method will become even more critical as our goals are reduced.

Cheryl Checketts

Cheryl has been working in the ESD field for 20 years and been part of the ESDA since the beginning. This includes several standards working groups and the Standards Committee, as well as the Symposium Steering Committee. She is currently the chairperson for the WG53 – Compliance Verification working group and the Symposium arrangements chair.

Cheryl spent 19 years at General Dynamics running the ESD Lab, performing all of the materials acceptance testing, auditing for adherence to the ESD Control Plan, troubleshooting problems, and doing periodic testing throughout two divisions. Currently, she is the ESD Consultant for R&R Lotions/Rich Sales Co. She is both ESD and EMC iNARTE certified.

Vision

My hope is to help expand the ESDA to other industries and countries. I believe in maintaining the highest standards that the ESDA has always adhered to, in education and technical materials, while working to expand the scope of the association to perpetuate, educate, and practice these standards. I will listen to and put into practice, the ideas of other members of the ESDA and other industry technicians. I strive to incorporate my years in the field and personal dedication to further these hopes. I am always looking to leverage this dedication to play a key role in expanding the ESD standards outside of the electronic industry. Breathing new life into the ESDA to promote further interest, and promote continued growth of the industry. Now more than ever I wish to see it's advancement in the industry.

Reinhold Gaertner

Reinhold studied physics at the Technical University of Munich and joined Siemens Semiconductors in 1996 which is now Infineon Technologies. As senior principal engineer he has corporate responsibility for the ESD control measures at Infineon manufacturing sites worldwide. He is also involved in problem solving at customer production. Additionally he provides the technical guidance for Infineon's corporate ESD device qualification and ESD system level testing.

He has been a member of the ESDA since 1990 and is active in device testing and also handling standardization. Since 2012, Reinhold has been a member of the technical advisory and support committee (TAS). He also served on the annual EOS/ESD Symposium technical program committee for many years. Since 1991, he has also been an active member of the German ESD Association (currently acting as vice president). Since 1995 he has represented Germany in the IEC standardization committee TC101 Electrostatics (currently acting as convenor for the working group dealing with handling issues).

Reinhold is author/co-author of more than

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Association

30 papers on ESD handling, as well as ESD device/system level testing. He regularly gives courses on ESD control measures. Reinhold is currently on the ESDA Board of Directors (since 2011) acting as business unit manager for the International Factory Symposium. In 2009, he received the ESD Association Outstanding Contribution Award.

Vision

The ESD Association has done a great job in bringing knowledge about ESD protective measures into the factories, especially of US based companies. But now more and more companies are shifting their production sites to Asia. Production people might not be allowed to travel from Asia to the US for receiving all the latest information about how to prevent the sensitive devices from failing during production. Therefore, the ESDA needs to bring the knowledge to Asia by organizing respective events in the region together with local experts.

On the other side, the ESDA has not only the abbreviation for ESD in its name but also the one for EOS (Electrical Overstress), a topic that´s probably affecting the industry even more. But so far the communication between supplier and OEM about EOS issues is even more challenging than with ESD topics. This can be improved with my focus.

Michael Hopkins

Michael has over 35 years of experience with EMC and ESD as an employee of Thermo Fisher Scientific working with the KeyTek product lines, EM Test USA as general manager for US operations, Amber Precision Instruments and is currently an independent consultant. He has worked closely with manufacturers and laboratories world-wide, providing training, applications help, and assistance with the development of interpretation of test standards. He is the author of several papers and articles on ESD and other system level EMC phenomena, and has participated in numerous national and international seminars as author, speaker, and panelist. Michael has served with several committees developing standards for industry including IEC as a former working group convenor, the ESD Association, IEEE, SAE, and has been a member of the U.S. Technical Advisory Group for EMC for the development and maintenance of basic EMC standards for over 10 years.

Vision

The vision I see for the ESDA's future will continue to include all its current activities – standards development and maintenance, seminars, symposia, workshops and training – but it will also be forward looking toward new emerging industry requirements. One of these areas is between device level testing and the requirements of system level designers, each of which has its own set of standards and requirements that are beginning to be felt by the other. We've already seen the need for development of procedures and guidance that crosses over between traditionally independent disciplines and this will likely continue: HMM (human metal model) where system level test standards are being applied to semiconductor devices, TLP (transient latch-up) where latch-up is caused by ESD or EOS events to operating systems, and most recently, board scanning technologies for determining ESD sensitive components and circuits in operating systems and subsystems. Additional new activities can only broaden the scope of the organization and draw additional participation from industry.

As new requirements evolve, whether at the factory, during handling or at the system level, ESDA will step up and seize the opportunity as an agent for developing cooperation and coordination between disciplines.

Wolfgang Stadler

Wolfgang received his diploma degree in physics in 1991 and in 1995 the PhD degree from the Physics department of the Technical University Munich. In 1995, he joined the semiconductor division of Siemens, which became Infineon Technologies. His focus was on development of ESD protection concepts in CMOS technologies and on innovative ESD topics. In 2003, he became responsible for the experimental characterization of I/O cells. He was coordinator of several European and German ESD funding projects.

In 2011 he joined Intel Mobile Communications (IMC). At IMC he is now responsible for ESD/latch-up testing and qualification, for ESD control programs, and ESD fab support. Additionally, he is teaching electronics at the University of Applied Science in Munich.

Wolfgang holds several patents in ESD-related topics. He is author or co-author of more than 90 technical papers and has co-authored a book on ESD simulation. He received several best paper awards and gives regular courses on ESD device testing and ESD control measures. He is an active member of the German ESD Association and the ESDA working groups related to device and system level testing and process assessment. Since 2011, he has been the committee chair of the ESDA working group 5.4 on transient latch-up.

Vision

For decades the ESD Association has defined standards with high technical quality, which enable the industry to produce ESD robust devices and prevent the user of electronic equipment from ESD hazards. The technical expertise of the ESDA and its members is spread to the ESD community by an excellent education program.

However, the world of ESD is continuously changing. New stress types (e.g., EOS) are getting relevant and have to be addressed; the complexity of today's integrated circuits demands new test and qualification methodologies. Furthermore, during the last years, different ESD areas, which have been almost strictly divided a decade ago, are coming closer together. Integrated circuits and system design, sensitivity of ICs and ESD control measures in assembly and testing – those areas influence each other and ask for common technical solutions.

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Association

Thus, for ESD experts, it is becoming more and more important to have a good understanding of all aspects of ESD, which requires appropriate education. Finally, harmonization with other standardization bodies is highly beneficial for the industry.

For me it is extremely important that the ESDA meets the continuous changes in order to serve industry during the next decades. I am fully committed to supporting this road.

David E. Swenson

David E. Swenson retired in 2003 after 35 years of service from 3M. While at 3M he had responsibility for new packaging material development and application, training of 3M personnel worldwide and providing application assistance to users of static control products globally with particular emphasis on Asia Pacific and Japan. Dave and his wife Geri established a new company, Affinity Static Control Consulting, L.L.C. in 2003.

Dave has been a member of the ESD Association since 1984 and has served in many capacities including 1997 Symposium General Chair and president of the Association in 1998 and 1999. He was reelected to the Association's Board of Directors for a 4th term running from 2006-2008 and was elected president for 2008 and 2009. Dave was presented with the highest award of the ESD Association, the "Outstanding Contributions Award" in 2002 and the Standards Committee "Joel P. Weidendorf Memorial Award" in 2004. He is a member of the Standards Committee, the Technical and Administrative Support Committee, and the ANSI/ESD S20.20 Standard working group. Dave also serves as treasurer and information liaison for the Texas Local Chapter of the ESD Association, is a member of the Electrostatic Society of America, and is a US Expert to IEC TC101 - Electrostatics. He is the convener of Joint Working Group 13 between TC40 (Capacitors and Resistors) and TC101.

Vision

It is my belief that paying attention to history is very important when planning for the future. The ESD Association has a rich history of achievement and service to industry that must be reviewed from time to time so that the mistakes of the past are not repeated. This is a very challenging undertaking in a volunteer organization since the people that provide leadership change. While having new people take the lead in an organization brings in new ideas and most often a fresh perspective, having a few "old hands" around to offer guidance seems to be increasingly important so that past mistakes are not made again. It is easy to get into a "go-to-loop" in a volunteer organization so it is my intent, if elected, to offer the hindsight of history to the operation of the Board of Directors. In addition, the perspective of the supplier community is under represented at the moment on the current Board. A balance between end-user and supplier is needed in the management of the Association. That balance is missing today so I would like to help once again.

Joshua (Yong Hoon) Yoo

Joshua (Yong Hoon) Yoo has worked in the static control industry since 1994, providing ionization systems and test equipment, technical support, and auditing services of manufacturing processes. He worked for MKS Korea as a senior applied technologist. In 2003, Joshua started his own company, Core Insight, Inc., for advanced static control products and services based in Korea. Joshua has been a member of the ESD Association since 2000 and is an active member of the SEMI ESD taskforce. He serves global electronic companies for static related yield impact improvements and quality and reliability issues. He has studied micro contamination and ESD control issues in the flat panel display (FPD) industry. He wrote and presented the paper "Comparing Room Ionization Technologies in FPD Manufacturing" at the 2012 EOS/ESD Symposium in Tucson, AZ. He invented alternative room ionization technology for the FPD industry for both contamination and ESD control. Joshua holds four patents for ionization technologies and contamination control systems. He is the leader of ESDA's FPD ad hoc working group and is currently gathering technical information for preparing a flat panel display stress testing standard within this group. He is also a member of the ionization working group. Joshua has been an instructor of the two-day seminar 'Essentials for ESD Programs' in Asia locations. He serves as an Asia publicity chair for the 2013 International ESD Workshop. Joshua is an iNARTE certified ESD engineer and an ESD Association certified program manager. In 2011, he founded the Korea Local Chapter of the ESD Association and is currently president. With his effort, the Korea Local Chapter is one of the most active local chapters.

Vision

Joshua (Yong Hoon) Yoo has a vision for ESDA to be more globalized in activities and within the organization. He believes that ESDA needs to be leading the industry internationally and widely expand industry areas, such as flat panel display, optical device, LED, etc. Also, ESDA needs to be more global with localized activities in areas like BRICS (Brazil, Russia, India, and China) and many other Southeast Asia countries. ESDA can educate and publish updated and new standards in these regions. These areas and countries are more important in manufacturing, but are also increasing in the consumer market as well. Joshua wants to serve industry and believes ESDA can meet these demands to make it a better place.

Calendar of Events

2013 Activities

★May 7, 2013-ONLINE TRAINING
Latchup Testing and Troubleshooting

May 9, 2013 4-5:30 pm
Texas Local Chapter
Dell Briefing Center Tour
Round Rock Campus, Austin, TX

May 14-16, 2013-Regional Tutorial
Northeast Local Chapter Regional Tutorial Program
★★ESD Basics for the Program Manager
★★How To's of In-Plant ESD Auditing & Evaluation Measurements
Electrical Overstress in Manufacturing and Test
Advanced ESD/EMI/EOS Auditing Techniques
Teradyne Conference, North Reading, MA

May 20-23, 2013
7th Annual International Electrostatic Discharge Workshop (IEW)
Airlie Conference Center, Warrenton, VA, USA

★May 30, 2013-ONLINE TRAINING
VF-TLP, An Introduction to Capabilities and Applications

★June 6, 2013-ONLINE TRAINING
HMM – System Level Testing of Components

June 10-11, 2013
•ESD Device Design Essentials-2 Day Seminar
•Essentials for ESD Programs-2 Day Seminar
Hilton St. Louis Frontenac, Saint Louis, Missouri

June 12-16, 2013
ESD Association Meeting Series
Hilton St. Louis Frontenac, Saint Louis, Missouri

July 9, 2013-ONLINE TRAINING
★★ESD Standards Overview for the Program Manager ***Part 1***

July 30, 2013-ONLINE TRAINING
★★ESD Standards Overview for the Program Manager ***Part 2***

August 13, 2013-ONLINE TRAINING
★★ESD Standards Overview for the Program Manager ***Part 3***

Sept 8-13, 2013
35th Annual EOS/ESD Symposium
Rio All Suites, Las Vegas, NV, USA

October 28-November 1, 2013
•Essentials for ESD Programs
Factory: Technologies • Controls • Procedures
•EOS/ESD Symposium for Factory Issues
Traders Hotel, Magazine Road, George Town, 10300 Penang, Malaysia

★★ESD Certified Program Manager Course
★ESD Certified Device Stress Testing Course

Registration for onsite Tutorials available online at www.esda.org/onlineregistrations

Photo Corner

Some behind the scenes photos from the 2012 Factory Symposium in Asia

Coming soon!

October 28-November 1, 2013

•Essentials for ESD Programs

•EOS/ESD Symposium for Factory Issues

Traders Hotel, Magazine Road, George Town, 10300 Penang, Malaysia

Editorial Deadlines

Threshold™ 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.

Threshold™ Publication Schedule

Issue	Deadlines
January/February	Nov. 19
March/April	Feb. 1
May/June	April 1
July/August	June 1
September/October	Aug. 1
November/December	Oct. 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. Listings will also appear in the online calendar. 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:
ESD Association, 7900 Turin Rd., Bldg. 3, Rome, NY 13440-2069 Tel: (315) 339-6937, Fax: (315) 339-6793, e-mail: info@esda.org.