

News bits

ESDA introduces S20.20 documentation review program

The ESD Association has announced an ESD program documentation review service based on ANSI/ESD S20.20.

For a fee of \$1,500 (US), members of the ESD Association's facility certification committee will review a company's ESD program documentation and compare it to the requirements listed in ANSI/ESD S20.20. A report will be issued that discusses the areas that need to be improved in order for the documentation to be compliant with ANSI/ESD S20.20.

This new service is ideal for any company that is preparing for facility certification based on ANSI/ESD S20.20. For more information, e-mail Association headquarters at info@esda.org.

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Symposium to celebrate 25 years of information and technology

In its 25-year history, the EOS/ESD Symposium will have presented nearly 1,000 technical papers by 2,500 authors, published 7,500 pages of proceedings, and offered a myriad of tutorials and workshops—all cause for celebration.

What better place to celebrate than in Las Vegas, Nevada, as the 25th anniversary Symposium returns to the Riviera Hotel and Casino September 21-25, 2003, for five days of research, technology, education, and peer networking, all packaged into the premier international event on electrostatic discharge and electrical over-stress.

It's comprehensive

Tutorials, workshops, and technical papers cover the latest information, research, and technology in electrostatic discharge and electrical over-stress. With topics ranging from the basics of ESD and on-chip protection to the newest developments in the emerging fields of RF ESD design

and transmission line pulsing, the Symposium offers something for everyone.

It's concentrated

Fifty-four technical papers presenting the world's leading research and technology, 19 tutorials from basic to advanced, eight workshops for peer exchange of ideas and information, and nearly 100 exhibit spaces are concentrated into a single time frame at a single location.

It's customizable

Organized and programmed in three technical tracks, attendees will be able to customize their Symposium experience along specific areas of interest: *ESD Test, Failure Analysis, and Systems; Factory, Materials, and ESD Control*; and *Design and Device Technology*.

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Symposium to celebrate 25 years of information and technology

It's cost-effective

With so much ESD education and technology concentrated into a single week, the Symposium is a cost-effective way for attendees to focus on new developments or to gain basic background on ESD. This year's fee structure includes additional savings for attendees who participate in the entire five-day program.

It's time to get certified

New this year are a number of educational programs supporting the recently announced ESDC Program Manager Certification program. In addition, individu-

als interested in the NARTE ESDC certification program will be able to take the NARTE certification exams on Friday, September 26. Special tutorials during the week will help applicants prepare for the examinations.

It's a celebration

The legacy of the EOS/ESD Symposium is also one that deserves to be feted. And, what better location than Las Vegas to celebrate. On Tuesday evening, September 23, Symposium attendees will gather at the *Top of the Riv* for a gala celebration. The special and auspicious evening includes

dinner, the annual ESD Association membership meeting, awards, and a very special entertainment review called the *History of ESD Part 1*.

For the detailed program, visit the Association's web site, www.esda.org.

The Symposium is sponsored by the ESD Association in cooperation with the IEEE. It is technically co-sponsored by the Electron Devices Society. The general chair is Joseph Bernier, Intersil Corporation. The vice general chair is John Kinnear, Jr., IBM. The technical program chair is Christian Russ, Infineon Technologies.

EOS/ESD Symposium and Exhibits Program and Schedule Summary

September 21-25, 2003, Riviera Hotel, Las Vegas NV

(Program Subject to Change)

Saturday, September 20

Registration Opens

Sunday, September 21

Registration

ANSI/ESD S20.20 Seminar, Part 1

Tutorials

Monday, September 22

Registration

ANSI/ESD S20.20 Seminar, Part 2

Tutorials

Welcome Reception (Exhibit Hall)

Exhibits Open

Tuesday, September 23

Registration

Awards Breakfast

Plenary Session, *High Performance IC Package Design and Electrical Reliability*

Exhibits Open

Technical Sessions

Advanced Power Clamps for On-Chip Protection

Trends in ESD Testing

On-Chip Protection Strategies, Physics, and Modeling

Discharge Phenomena in Theory and Practice

Professional and Technical Women's Reception

25th Anniversary Gala (Dinner and Entertainment)

Wednesday, September 24

Registration

Technical Sessions

RFIC and Novel Protection Devices

Factory and Materials

Exhibits Open

Workshops

Thursday, September 25

Registration

Technical Sessions

Characterization of On-Chip Protection

Magnetic Recording Heads

Tutorials

Friday, September 26

NARTE ESDC Technician Exam

NARTE ESDC Engineer Exam



Technical reports are there. . .on-line. . . and free to members



Leo G. Henry

Several weeks ago I was “a bit alarmed” when an ESDA member called me to ask if the ESDA intends to publish any documents on transient latch-up. This member, fortunately or unfortunately,

has never participated in any of the standards device testing working groups. In any case, I directed him to visit the ESDA’s website, www.esda.org, where he could find and download the document that was published as Technical Report #9 *Transient Induced Latch-Up* in 2000, almost three years ago. He did not know that the TR existed. No, I did not ask him if he knew that we had many TRs, nor did I ask if he had ever visited the members’ section of the ESDA’s website.

Then a week or so ago, at one of the device testing working group teleconferences (TLP to be exact), we decided that it would be better to write a technical report before we completed our next standard document. This prompted one of the WG members to ask if our technical reports were being ordered and read. This was a valid and timely question in light of my earlier encounter with the ESDA member. The question is relevant because TRs represent pure data, results, analyses, summaries, and conclusions in a detailed manner not found in standard documents.

“Why am I really writing about this?” you ask. Well, it is our job to attempt to fix “things” that appear to be deficient. Since 1999 when the first TR (*Can Static Electricity Be Measured?* by Niels Jonassen) was published, both working groups (WGs) and individuals have produced a total of 16 technical reports. The most recent one, *Voltage and Energy Susceptible Device Concepts, Including Latency Consid-*

erations by Ben Baumgartner, was published earlier this year. A friendly question: Have any of you read this one? Did you even know that it existed? It is very thought-provoking and definitely worth the read.

Here is the real question, members: Did you know that ALL the TRs, except the *ESD Handbook*, only cost \$10 each. It gets better. Did you know that, like S20.20, ALL TRs, except the *ESD Handbook*, can be downloaded for free from the ESDA Web site, but from the For Members section only? How about that? A member benefit that provides free technical education.

So, the next question is, “Are the TRs being downloaded in large quantities like S20.20?” Not really, but they should be. We can all help in this respect by going *now* to the member section (www.esda.org) and checking to see if any of the TRs apply to what we do. I’ll even make it easy for you by including a list of the technical reports at the end of my column.

I guarantee that each of you will find at least three. Please download one, read it, then tell a colleague. Make a habit of it. Return for more education until you have read most, if not all, of them. I have, and the information is really good. My opinion of course.

But do remember, the downloaded TRs are free to ESDA members. Hardcopies cost \$10.00.

Until next time
Bhappy

LEOG

ESDA Association Technical Reports

ESD TR01-99: *Can Static Electricity be Measured?*

ESD TR02-99: *High Resistance Ohmmeters – Voltage Measurements*

ESD TR03-99: *ESD Glove & Finger Cots*

ESD TR04-99: *EOS Safe Soldering Iron Requirements*

ESD TR 05-00: *Consideration for Developing ESD Garment Specification*

ESD TR 06-00: *Static Electricity Hazards of Triboelectrically Charged Garments*

SD TR 07-00: *Calculation of Uncertainty Associated with Measurement of Electrostatic Discharge (ESD) Current*

SD TR 08-00: *Socket Device Model (SDM) Tester*

SD TR 09-00: *Transient Induced Latch-Up (TLU)*

ESD TR 10-01: *Machine Model (MM) Electrostatic Discharge (ESD) Investigation–Reduction in Pulse Number and Delay Time*

ESD TR 11-01: *Electrostatic Guidelines and Considerations for Cleanrooms and Clean Manufacturing*

ESD TR 12-01: *Survey of Constant (Continuous) Monitors for Wrist Straps*

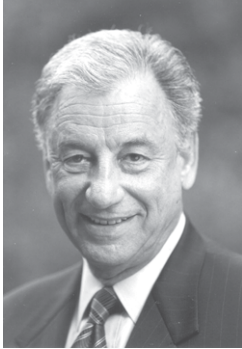
ESD TR 13-02: *Alternate Techniques for Measuring Ionizer Offset Voltage and Discharge Time*

ESD TR 14-02: *Measurement and ESD Control Issues for Automated Equipment Handling of ESD Sensitive Devices below 100 Volts*

ESD TR 15-02: *Survey of Static Control Worksurfaces and Grounding Mechanisms*

ESD TR 16-03: *Voltage and Energy Susceptible Device Concepts, Including Latency Considerations*

Why successful managers support ESD control programs



Steve Halperin

Every manager worth their salt *wants* to eliminate problems; improve productivity, quality and profits; look good; and be personally successful. A *sharp manager* understands the industry, knows its trends,

and has a keen focus on the company's relative position and where the organization needs to be. The *successful manager* recognizes opportunity, effectively utilizes available resources, and executes a winning plan to take their organization from where it is to where it should be. This is the manager who makes things happen, because he/she understands that performance and positive results are what count.

Successful managers in electronics industries understand that they must address every issue that impacts their ability to deliver reliable products in a timely, profitable manner. Any opportunity to attract customers

The average electronics company spends 6.5% of their gross revenues to support ESD losses.

must be recognized and acted upon, and any way to beat the competition to available business is an absolute must. Controlling ESD impact in today's competitive market provides successful managers with one of their most important and effective tools.

ESD costs money and requires everyone's participation

We recently discussed losses in the typical electronics firm. The average electronics company spends 6.5% of their gross revenues to support ESD losses, and many

organizations spend in excess of 10 percent of gross revenues to resolve their complex ESD issues. ESD impacts productivity, quality, delivery, warranty, repair, and customer satisfaction — and is one of the most detrimental squanderers of company profitability. ESD permeates the entire organization; a single ESD problem crosses every departmental line leaving a trail of confusion and finger pointing into the customer's executive offices. Successful managers know how to avoid this.

Successful managers install balanced ESD control programs to meet their organization's specific needs, and they can accomplish this using ANSI/ESD S20.20 as their primary guideline. They know their primary control elements include:

- Management's commitment and support
- Understanding their process and device sensitivity
- Having a defined facility ESD control plan
- Minimizing charge caused by the flow of people, materials and devices through the environment
- Selection and use of effective ESD control products
- Training and communication
- Program verification—daily checks and periodic audits

They engage all organizational aspects of the ESD program and understand the roles of all employees, including:

- Management who make the ESD commitment and the financial decisions
- ESD committee that defines, implements, modifies and maintains the ESD plan as necessary

- Supervisors who provide daily assurance that control objectives are met and who provide feedback regarding effectiveness
- Plant personnel who must consistently use and practice ESD control

The successful manager knows that everyone is responsible for effective ESD control and disseminates responsibility with commensurate authority to make it a reality.

ESD control is profitable

The successful manager knows that the cost of an ESD event is only 5 to 10 percent material loss, i.e., the cost of damaged devices or assemblies. The other 90+ percent is rework, labor, burden and over-

For every dollar invested in an effective ESD control program the company sees a 5:1 return on investment within six months.

head, warranty service, replacement, freight, management support, and other costs. In other words, the successful manager knows that all of these costs are built into the corporate operating budget. The average manager only addresses these issues when the company is over budget; the successful manager understands that these costs can be reduced through effective ESD control and can *reduce the operational budget*.

For every dollar invested in an effective ESD control program, the company sees a 5:1 return on investment within six months. For every dollar saved in their standard operating budget, the average company gains approximately \$0.66 in after tax profit. Successful managers know this is a good investment.

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From the president

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Why successful managers support ESD control programs

ESD industry trends

The electronics industry is facing several challenging factors, including extreme cost competition and reduced sales. To acquire new customers and keep existing ones requires productivity, product quality, and reliability at competitive costs. ESD control is one of the few operational elements that can strongly impact each of these factors. For this reason, several military organizations, government agencies, and major corporations have geared up their ESD control efforts using S20.20 as their guide and many are going for full certification.

Among these organizations are the US Air Force, IBM, NASA, Celestica, Lucent, and others. Some of them are notifying their suppliers that in the near term, preferred suppliers will be S20.20 certified. This further challenges the competitive spirit of many organizations and their management. As a result, international organizations such as the IEC are investigating adoption of standards technically equivalent to S20.20 to support their constituents in the competitive international marketplace.

Certification opportunities and the competition

In the two years that S20.20 certification has been available, the ESDA has trained 90 international ISO registrar lead assessors who have certified approximately 37 corporate facilities. In this



period, the Department of Defense has awarded several thousand contracts requiring S20.20 compliance. In a recent discussion with one small S20.20 certified organization, they attributed their surprising growth in a "down market" to their S20.20 certification. They said, "Without our S20.20 certification, some of these large customers would never give us a second look".

The bottom line

The successful manager knows that his/her company must stay ahead of the competition and be productive with reliable products at the lowest cost and maximum profit, which simply leads to growth and corporate success. This is the manager who knows that ESD control is one of the most useful tools in meeting the objective of success.

Calendar of events

September 2003

ESD Northwest Membership Meeting: September 9, 2003, topic and location to be determined; www.esdnw.org

Midwest Chapter ESD Association Membership Meeting: September 9, 2003, ESD Instrumentation; Sheraton Chicago Northwest Hotel, Arlington Heights, IL; www.midwestesd.org

Texas ESD Association Seminar: September 12, 2003, Fundamentals of ESD Training; Sematech, Austin, TX; www.centxesdassoc.homestead.com

North Central ESD Association Chapter Meeting: September 15, 2003; Central Container Corporation, Brooklyn Park, MN; topic to be determined; www.esdnorthcentral.org

Silicon Valley EOS/ESD Society Membership Meeting: September 16, 2003; topic to be determined; Ramada Inn, Sunnyvale, CA; www.esdsiva.org

ESDA Standards and Committee Meetings: September 19-21, 2003; Riviera Hotel, Las Vegas, NV; www.esda.org

EOS/ESD Symposium: September 21-25, 2003; Riviera Hotel, Las Vegas, NV; www.esda.org

NARTE ESDC Certification Exams: September 26, 2003; Riviera Hotel, Las Vegas, NV; www.esda.org

October 2003

Midwest Chapter ESD Association Membership Meeting: October 8, 2003, topic and location to be determined; www.midwestesd.org

Silicon Valley EOS/ESD Society Membership Meeting: October 12, 2003; topic to be determined; Ramada Inn, Sunnyvale, CA; www.esdsiva.org

ESD Impact and Control Workshop: October 16, 2003; Sematech, Austin, TX; www.centxesdassoc.homestead.com

November 2003

ESD Northwest Membership Meeting: November 11, 2003, topic and location to be determined; www.esdnw.org

Midwest Chapter ESD Association Membership Meeting: November 12, 2003, topic and location to be determined; www.midwestesd.org

Silicon Valley EOS/ESD Society Membership Meeting: November 18, 2003; topic to be determined; Ramada Inn, Sunnyvale, CA; www.esdsiva.org

Standards

New draft standard practices available for purchase

Four new draft standard practices, approved by the ESDA standards committee in June, are now available for purchase from ESD headquarters. The drafts are \$25 for ESDA members and \$37.50 for non-members. As drafts, these documents are released for industry review and are subject to change before being released as full standards. The four draft documents are:

ESD DSP5.5: Transmission Line Pulse (TLP)-Component Level, which covers the techniques for transmission line pulse testing of semiconductor components.

ESD DSP5.3.2: Socketed Device Model (SDM)-Component Level, which defines a method on how to perform component level socketed device model ESD tests and how to verify the operational state of the ESD simulator test equipment.

ESD DSP14.1: System Level Electrostatic Discharge (ESD) Simulator Verification, Part I-Discharge Current, which defines a time-domain measurement technique for verifying compliance with discharge current specifications given in system-level ESD standards.

ESD DSP5.4: Transient Latch-Up Testing-Component Level Supply Transient Stimulation, which establishes a procedure for testing, evaluating, and characterizing the transient-induced latch-up (TLU) sensitivity of CMOS (complementary metal oxide semiconductor), bipolar, and BiCMOS (Bipolar-CMOS) devices typically requiring less than 30 volts for operation.

Contact Association headquarters at info@esda.org for more information on purchasing any of these documents.

September Meeting Schedule

ESD Association
Standards and Association Committee Meetings
September 19-25, 2003
Riviera Hotel, Las Vegas, NV

Friday, September 19, 2003

8:00 AM - 5:00 PM	Standards Working Group 5, Device Testing
8:00 AM - Noon	Standards Working Group 3, Ionization
1:00 PM - 5:00 PM	Standards Working Group 10, Handlers
6:00 PM - 8:30 PM	Symposium Steering Committee 2003/ Symposium Steering Committee 2004/ International Council on Education

Saturday, September 20, 2003

8:00 AM - 5:00 PM	Standards Working Group 5, Device Testing
8:00 AM - Noon	Standards Working Group 53, Workstations
8:00 AM - Noon	Standards Working Group 55, Cleanrooms
1:00 PM - 3:00 PM	Standards Working Group 11, Packaging
1:00 PM - 5:00 PM	Standards Working Group 15, Gloves
1:00 PM - 5:00 PM	Standards Working Group 6, Grounding
5:30 PM - 6:30 PM	Working Group Chair Meeting with TAS

Sunday, September 21, 2003

8:00 AM - 10:00 AM	Standards Working Group 14, ESD Simulators
8:00 AM - Noon	Standards Working Group 7 Flooring
8:00 AM - 10:00 AM	Local Chapters Committee
10:00 AM - Noon	Human Resources Committee
1:00 PM - 3:00 PM	Standards Committee
4:00 PM - 5:00 PM	Technical Liaison Committee
5:30 PM - 8:30 PM	Board of Directors

Thursday, September 25, 2003

4:30 PM	Board of Directors Wrap-Up
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Latch-up—it's back!

Steven Voldman, IEEE Fellow
IBM Microelectronics



Steve Voldman

It has been a long time since latch-up was a concern in semiconductor technologies, but with the aggressive scaling of integrated electronic technology and the motion toward high level integration, it has once again returned. Destructive latch-up represents the inability to control an integrated circuit leading to chip or system failure. Latch-up immunity is a *fundamental goal*, but today the ability to achieve the goal is getting more difficult. With the rapid proliferation of multiple power supplies, integration of digital and analog devices, and relentless design rule scaling, CMOS latch-up susceptibility is back!

How did we get here?

Let's review a little history of latch-up. MOSFETs were first introduced as n-channel MOSFET devices. The primary reason was due to the early problems of development of a p-channel MOSFET transistor. NMOS technology and logic integrated circuits were developed without the PMOS device, leading to circuits that were burning power in standby mode. CMOS, combining NMOS and PMOS on the same wafer, offered the promise of low-power logic circuits. Finally, when the PMOS device was ready for technology integration, CMOS provided a promising solution.

According to W. Morris, CMOS was invented by RCA and was manufactured for the first time by Al Medwin at RCA's technology center in Somerville, New Jersey. RCA called this technology COSMOS, which stood for **Complementary Symme-**

try **Metal-Oxide Silicon**, and is what we know today as CMOS. Although the commercial sector was hesitant to implement the usage of CMOS for many years, military and space applications saw great opportunities due to low-power logic.

One of the primary problems in space radiation environments was the initiation of "CMOS latch-up". Where the space applications needed a low power solution, the circuitry needed to be reliable to withstand radiation environments of gamma dose, protons, neutrons and other single event upsets (SEU). In the 1960's Kinoshito, Poll and Leavy, Denehy, Holmes-Seidle, and Leipold focused on the initiation of CMOS latch-up in radiation environments.

What about commercial semiconductors?

Gregory and Shafer, L. J. Gallace, and H.L. Pujol, and Barnes of Sandia Laboratories focused on CMOS latch-up as an impediment to mainstream integration of CMOS. Their publications developed relationships to explain the triggering of latch-up conditions and experimental work. As CMOS headed to being a mainstream technology, it became important to understand the physics of latch-up to a higher degree. Electrical characterization, physical modeling, and analysis of basic structures increased.

D.B. Estreich, in his Stanford PhD thesis, focused on the modeling and analysis of latch-up, leading to progress in the area of analytical development and increased interest in commercial use.

In parallel, the early work of Ron Troutman addressed the physics and modeling of CMOS latch-up to a higher level of understanding suitable for process and device engineers to begin the effort to address the process, design layout and quantification for semiconductor manufacturers. IEEE Fellow Ron Troutman started his career focusing on MOSFET sub-threshold characteristics, hot electrons, and devices, but finally got hooked

on CMOS latch-up and made it a CMOS latch-up crusade encompassing dc test techniques, transient latch-up, alpha particle induced latch-up, latch-up test structure, latch-up benchmark structures, IEEE standard development, physical models, guard ring models, substrate models, and transmission line models. Troutman was responsible for the manufacturing implementation of the first MeV implanted retrograde well in a 0.8 μm CMOS technology in manufacturing facility using an MeV high energy implanter in 1983.

The CMOS latch-up revolution has begun!

For mainstream implementation of CMOS, it was necessary to understand guard ring structure, guard ring efficiency, the role of the substrate, substrate model development, semiconductor device models, and transient latch-up. Takacs, Fang and J.L. Moll, and Genda Hu produced significant improvements from device simulation of CMOS latch-up. Hans Zappe, as an MIT student under Ron Troutman, focused on the development of physical models for transient latch-up. Model sophistication increased with the work of Hargrove and Troutman with the development of the first substrate transmission line model of the parasitic pnpn junction in 1986.

Latch-up development continued with the implementation of retrograde wells into manufacturing and its integration into DRAM and logic technologies. Continuing the work of Troutman, Voldman addressed CMOS latch-up retrograde well design optimization (1986), transient latch-up as a function of retrograde well design (1986), n-well compensation effects by p-/p+ substrate wafers in a LO-COS technology (1988), as well as CMOS latch-up in shallow trench isolation (STI) (1992). In parallel with this effort, Ajith Amerasekera and Charavaka Duvvury continued to evaluate the implications of CMOS latch-up as technology was scaled

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Latch-up—it's back!

into 0.35 μm technology. With the introduction of the p+ substrate, MeV retrograde well implanters, STI technology, and dual well technology, the latch-up concerns were thought to be long gone and buried. The CMOS latch-up problem was cured, never to be an issue again!

Well, scaling and shifts in the marketplace proved us wrong again! With the increased focus on cost, density, foundry compatibility, mixed signal products, RF technology, high level integration SOC, scaling of STI isolation, p- substrates, and physical limitations of implantation, the environment has significantly shifted in CMOS integration. Today, advanced CMOS is primarily on low-doped substrate wafers. Double and triple well technologies require the optimization and synthesis of wells and isolation structures to provide the optimum CMOS latch-up tolerance. With the growth of RF CMOS, and BiCMOS silicon germanium (SiGe) technologies, low-doped substrates for noise coupling and high Q passive elements are critical at GHz applications. With multiple well implants, implant dose and scattering issues, voltage conditions, MS chips, the ability to provide a latch-up robust technology for CMOS or BiCMOS has once again become a challenge. Where it was believed that CMOS latch-up would not be an issue as a result of process solutions, model development, simulation, and circuit solutions, it unfortunately remains an issue today!

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Our backbone and lifeblood

by Ed Weggeland
Senior Vice President

The backbone of our organization is our membership.

The lifeblood of the organization is our past, present and future volunteers.

- Starting with our founders who had the vision of bringing ESD technology to industry by initiating and maintaining an annual Symposium
- Establishing the first ESD standards development organization
- Providing education through seminars and tutorials
- Organizing and populating all support activities such as our newsletter *Threshold*, academia outreach, ESD fellowship, certification programs, industry liaison, member services, human resources, business, technical, and marketing and communications groups.

All volunteers supporting our ESDA can attest to their commitment to all of our activities, sharing what time, energy, and resources they have to make the ESDA a success—three full meeting series each year, year in and year out, planning and making arrangements, developing and implementing valuable programs for our members and industry.

Many of our activity volunteers travel extensively and deliver our messages, products, and services to countries and markets such as Japan with the RCJ organization, Hong Kong, China, Singapore, Philippines, Thailand, Taiwan, and throughout the European Communities. They deliver information and training on ANSI/ESD S20.20, standards, seminars, and tutorials. They interact with local and

regional organizations having interest in the mitigation of ESD.

It takes many, many volunteers to continue in our quest of being the worldwide provider of ESD prevention technology and programs. I send heart-felt thanks to all our volunteers, both past and present.



Ed Weggeland

Let's not forget who takes care of all these volunteers and administers their projects, our headquarters staff: Lisa Pimpinella, team leader and project manager; Tammy Muldoon, project manager; and Terri DeMario, marketing and communications.

The future looms brightly for our industry, OEMs, contract manufacturers, and material and service providers.

Electronic technology will move at even a faster rate of development than we have witnessed in the past. Globalization is a reality with our domestic developments coming to productive fruition in many foreign countries. Technology and production will continue to disregard all geographical boundaries. The major world markets will continue to mature and will be added to by the new countries joining trade blocks. Major markets today can be described as North America, the European Community and Southeast Asia and Japan. The future market additions being the People's Republic of China, India, and the Eastern European countries.

We, as consumers, will continue to demand or require more powerful electronic helpers, which are already part of our life styles—smaller, faster, more convenient communications, hard and software, data acquisition, and leisure time activities.

Through all of this rapid acceleration of technology and convenience, we the

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Volunteers help at the Symposium in a number of ways, from evaluating technical papers to helping organize the many audio visual needs.

Association news

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Our backbone and lifeblood

people maintain our quest for world peace and prosperity for all people.

What is in the future: next year, the next decade? Or is the future right here, right now? You are the future...of our industry and Association. As an Association, we have met many challenges in the past and present, never wavering from our commitment to achieve our goals of product and service delivery. And we will continue to do so into the future.

All of you are our ESDA and industry backbone. You distinguished scientists, engineers, designers, technicians, teachers, trainers, managers, consultants, specialists, suppliers, and material and program developers are our lifeblood and our future.

Our future is made up of individual members and participants and is driven by our core of dedicated volunteers, striving to deliver what our customers require in the form of ESD technology, education, programs, and solutions.

Can you help our industry by volunteering to actively participate in achieving our 5-year plan goals?

- Develop ESDA personnel training and certification programs that focus on electronic device and system design technology and device and system manufacturing, use, and maintenance.
- Expand Symposium week to include more professional seminars and training for domestic as well as international individuals.
- Develop and deliver all our programs into foreign locations that can benefit from our products and services.
- Expand our membership and human resources to knowledgeable staff committees and activities to meet the operational needs for the future.

Here are just some of the activities and areas where you could make a difference for the ESDA, the industry, and yourselves:

- Technical programs
- Symposium arrangements
- Education, seminars and tutorials
- Standards development
- Liaison with other organizations
- Member Services and volunteer recruiting
- Marketing and communications
- Local chapter support
- Certification program development and delivery
- Training programs—speaker, lecturer
- Corporate sponsorship program sales

It is my hope that more new volunteers will identify themselves and step forward for service.



Standards volunteers meet, test, evaluate, and write as they prepare the many ESD standards that are now recognized world wide.

Institutional Listings

<p>Howell Packaging, Division of F.M. Howell & Company P.O. Box 286, Elmira, NY 14902 Tel: 607-734-6291 Fax: 607-734-8667 Designers & Manufacturers of ESD Protective Packaging, Paperboard & Thermoformed Plastic, In-House Testing</p>	<p>Julie Industries, Inc. 355 Middlesex Avenue, Wilmington, MA 01887-0783 Tel: 978-988-8802 Fax: 978-988-8803 E-mail: questions@julieindustries.com StaticSmart™ products including carpet, rubber & polymeric flooring, personnel grounding products & materials, ESD workstations, chairs</p>
<p>DESCO 3651 Walnut Avenue, Chino, CA 91710 Tel: 909-627-8178 Fax: 909-627-7449 www.desco.com Manufacturer of ESD control products including wrist straps, mats, foot grounders, ionizers, shielding bags, floor finish & more</p>	<p>Conductive Containers, Inc. 4500 Quebec Ave. North, New Hope, MN 55428 Tel: 1-800-FARADAY Fax: 763-537-1738 www.corstat.com Manufacturer of CORSTAT and ESD protective plastic materials for shipping, storage and in-plant handling</p>
<p>3M Electronic and Interconnect Solutions Division Tel: 1-800-328-1368 www.3M.com/eisd Manufacturer of static control permanent flooring, wrist/heel straps, static shielding bags, & testing/monitoring equipment</p>	<p>Technical Coating International, Inc. 150 Backhoe Road, Leland, NC 28451 Tel: 910-371-0860 Fax: 910-371-0929 www.tcinc.com Manufacturer of ESD Films, Foil Laminates, and Specialty Structures (Barrier, Opaque, Transparent, & Recyclable)</p>
<p>VPI 3123 S. 9th St., P.O. Box 451, Sheboygan, WI 53082-0451 Tel: 800-874-4240 Fax: 920-458-1368 E-mail: marketing@vpiflooring.com www.vpiflooring.com Manufacturer of ESD Control Solid Vinyl Floor Tile</p>	<p>Trek, Inc. 11601 Maple Ridge Road, Medina, NY 14103 Tel: 585-798-3140 Fax: 585-798-3106 Manufacturer and designer of instrumentation and sensors for measuring surface voltage, ionizer performance, and surface resistivity</p>
<p>Kenflex Corporation 460 NE Hemlock, Suite A, Redmond, OR 97756 Tel: 541-923-4765 Fax: 541-923-4190 kenflex@coinet.com Manufactures FLEXCELL®, FLEXSTAND®, FLEXTOTE® circuit board transport and protection units, also on Web. For additional information: www.kenflex.com</p>	<p>ACL Staticide 1960 E. Devon Avenue, Elk Grove Village, IL 60007 Tel: 847-981-9212 Fax: 847-981-9278 www.aclstaticide.com Cleanroom products, topical antistats, floor finishes and coatings, static detection meters, monitors, computer cleaning products</p>
<p>ESD SYSTEMS.com 432 Northboro Rd. Central, Marlboro, MA 01752-1823 Tel: 508-485-7390 Fax: 508-480-0257 www.esdsystems.com A full line of ESD control products: wrist straps/foot grounders/mats/ ionizers/floor finish/shielding bags/smocks/testers & more</p>	<p>Wolfgang Warmbier Untere Giesswiesen 21, D-78247 Hilzingen, Germany Tel: 49-7731-86880 Fax: 49-7731-868832 www.warmbier.com ISO 9002 certified for advice, supply and manufacturing of static control materials and systems</p>
<p>Monroe Electronics 100 Housel Avenue, Lyndonville, NY 14098 Tel: 585-765-2254 Fax: 585-765-9330 E-mail: electrostatics@monroe-electronics.com www.monroe-electronics.com Full line manufacturer of static measurement equipment</p>	<p>Static Solutions 331 Boston Post Rd., E., Marlboro, MA 01752 Tel: 508-480-0700 Fax: 508-485-3353 www.staticsolutions.com Manufacturer of patented ESD, Maintenance, Clean Room, Hospital Products, Monitors, Testers, Metal Wrist Bands—"Stat-O-Flex", coatings and more. Value Priced.</p>
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<p>Saint-Gobain Advanced Ceramics 1225 Aeroplaza Drive, Colorado Springs, CO 80916 Tel: 719-637-8737 Fax: 719-380-5591 E-mail: william.ilsch@saint-gobain.com Manufacturer of Cerastat™ ESD ceramics products to customers' prints: tools, fixtures, wear parts for data storage & other electronic industries</p>	<p>RMV ESD Consulting & Testing Services Certified; DVBE; NARTE Certified ESD Engineer on Staff www.esdrmv.com Tel: 925-673-0225 ESD Program Leadership and Supplier Materials Evaluation Comprehensive ESD Audits and On-Site Seminars/Employee Training Member, American Council of Independent Labs</p>
<p>Tek Stil Concepts, Inc. P.O. Box 67, Haddonfield, NJ 08033 Tel: 800/603-0848 856/428-4464 Fax: 856/429-6532 www.tekstilconcepts.com E-mail: info@tekstilconcepts.com ESD dissipative and conductive vinyl sheet and tile, ESD carpet tile, ESD high traction safety floor tile</p>	<p>ProLine 12 Rogers Rd., Haverhill, MA 01835 Tel: 800-739-9067 Fax: 975-374-4885 www.1proline.com E-mail: Bench@1proline.com Manufactures ESD modular and ergonomic workstations</p>

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Institutional Listings

<p style="text-align: center;">Ion Systems</p> <p>1005 Parker Street, Berkeley, CA 94710 Tel: 510-548-3640 800-367-2452 Fax: 510-548-0417 www.ion.com Ion Systems is the world's leading provider of electrostatics management products and services.</p>	<p style="text-align: center;">PROTEKTIVE PAK</p> <p>14040 Central Ave., Chino, CA 91710 Tel: 909-627-2578 Fax: 909-363-7331 www.protektivepak.com Corrugated paper and plastic containers, tape, labels, and bags for ESD protected handling of electronic devices and components</p>
<p style="text-align: center;">Barth Electronics, Inc.</p> <p>1589 Foothill Drive, Boulder City, NV 89005 Tel: 702-293-1576 www.barthelectronics.com ESD Test Equipment, including AdVanTage TLPTM. Setting the standard for measurement & true ESD simulation.</p>	<p style="text-align: center;">Molded Fiber Glass Tray Co.</p> <p>6175 US Highway 6, Linesville, PA 16424 Tel: 814-683-4500 Fax: 814-683-4504 www.info@mfgtray.com Manufacturer of static dissipative trays and containers for static protection</p>
<p style="text-align: center;">rubberbands.net</p> <p>PO Box 75267, Colorado Springs, CO 80970 Tel/Fax: 719-683-2419 www.rubberbands.net Electronic Grade Rubber Bands, mfd. in the USA, vacuum-sealed antistatic, dissipative, conductive with distributors worldwide.</p>	<p style="text-align: center;">Vermason Ltd.</p> <p>1 Avenue One, Letchworth, Herts., SG6 2HB, England Tel: +44 1462 672005 Fax: +44 1462 670440 sales@vermason.co.uk Manufacturer of ESD products. For more information, www.vermason.co.uk</p>
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Threshold

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