2012 ESD Workshop

July 24, 25, 26, & 27

Beyond S2020: Class 0 Best Practices

&

Advanced ESD Measurements

New Topics, Two Invited Speakers, and 4th Day!

(CDM = Charged Device Model; Class 0= Ultra-Sensitive Components: EOS = Electrical Overstress)

ESD Dream Team
www.dangelmayer.com

Two Invited Speakers:

Dave Long - Staticworx
"ESD Flooring Safety and Walking Voltage Test Methods for S20.20"

Mark Hogsett – Simco-Ion
"A Process Monitoring Breakthrough In-Situ CDM Event Simulation (New Technology)"

Hands-on ESD Workshop with the Dream Team:
Basic and Advanced Principles

Intended For Professionals Who:

- **Have Achieved Basic Knowledge Of ESD**
- **Desire Roadmap For Today's Advanced Technologies**
- **Need A Better Understanding of CDM, CBE, Class 0, and S20.20**

What You Will Learn:

- **The Latest ESD Trends**
- **Class 0 Fundamentals & Advanced Concepts**
- **CDM, CBE & Class 0 Counter Measures**
- **Hands-On CDM & Class 0 Test Methods**
- **Auditing Skills & Class Exercises**
- **99.9% of ESD Failures are CDM – Not HBM or MM**
- **Most FA Experts Misdiagnose CBE as EOS**
- **How to Implement Sound ESD S20.20 Programs**
- **Class 0 Advanced Measurement Techniques**

Workshop Agenda

Day 1: Tuesday, July 24, 2012

8:00

- **Introductions – Beyond S20.20**

Ted Dangelmayer President

AM

- **The Latest ESD Trends – Wafers, Devices, Boards, & Systems – *Terry Welsher***

Break

- **ESD Basics – *Terry Welsher & Ted Dangelmayer***
  - **With Emphasis on CDM & Class 0**
  - **Why CDM & Class 0 are Not Well Understood**
  - **CDM vs. HBM**
    - **Discharge Characteristics**
    - **Limitations of Designed-in-Protection**
    - **Why MM Unnecessary**
  - **Demonstrations and Videos**
  - **FMA: Differentiation Among the 3 Models**

Terry Welsher Sr. Vice President

12:00

- **Lunch**

PM

- **ESD Basics (Continued)**
- **Break**
- **ESD Basics (Continued)**

Larry Fromm Director

5:00

- **Adjourn**

5:30

- **Evening: Complimentary Seaside Dinner**

Workshop Agenda

Day 2: Wednesday, July 27, 2011

8:00 – **Auditing Measurement Pitfalls** – ***Ginger Hansel***

AM

- Common Measurement Pitfalls
  - Field Meters
  - Voltmeters
  - Resistance Meters
  - Event Detectors
- **Hands-on – Class Exercises**
  - Resistance Measurements
  - Event Detection
- **Break**
  - **Invited Speaker: Dave Long – Staticworx**

"ESD Flooring Safety & Walking Voltage Test Methods for S20.20"

12:00 – **Lunch – Annisquam Yacht Club**

PM

- **ESDA TR53 Test Methods & Troubleshooting – *Carl Newberg***
  - Grounding / Bonding Systems
  - Worksurfaces
  - Wrist Straps
  - Constant Monitors
  - Footwear
  - Flooring
  - Personnel Grounding with Garment
  - Garments
  - Air Ionizers
  - Seating
  - Mobile Equipment (Carts)
  - Packaging
- **Break**
- **CDM Compliance Verification – *Ted Dangelmayer***
  - Common Findings
  - Personnel Compliance

5:00 – Adjourn

6:30 – **Sunset River Cruse**

Ginger Hansel Director

Carl Newberg Director

Workshop Agenda

Day 3: Thursday, July 26, 2012

8:00

- **Ionization for Class 0 – *Arnie Steinman***
  - **Class 0 Considerations**
  - **Ionizer Choices vs. Applications**

AM

- **Hands-on – Class Exercises**
  - **Fieldmeter vs. Voltmeter**
  - **Ionizers**
- **Break**

- **Advancements in CBE (Charged Board Event) & CDE (Cable Discharge Event) – *Terry Welsher***

12:00

- **Lunch**

PM

How Do You Know Your Program is Working? – *Arnie Steinman*

ESD Programs for a Lab Environment – *Ted Dangelmayer*

- **Break**

Packaging S541 Standard Review - Pros and Cons – *Ginger Hansel – Carl Newberg*

Dollar Impact of Overkill
Shielding- Clamshell Testing

Open Discussion

5:00

- **Adjourn**

Arnie Steinman Director

Latest Advances in ESD Event Measurements Including Class 0 Applications

Day 4: Friday, July 27, 2012

8:00

Overview - Advanced Measurements – *Terry Welsher*

- Current Probe
- Contact Voltmeter
- Event Detection – Antenna Comparisons
  - Oscilloscope vs. Detectors
- Standards Overview
  - Process Assessments
  - Handler Measurements
- Gemini Observatory Class 000 Case Study
  - CCD Handling & Installation

Terry Welsher Sr. Vice President

Correlating Event Amplitudes with Device Sensitivity – *Terry Welsher*

- **Break**

- **Invited Speaker - *Mark Hogsett* of Simco-Ion**

"A Process Monitoring Breakthrough In-Situ CDM Event Simulation (New Technology)"–

12:00 PM

- **Lunch**

Hands-on – Class Exercises

- Oscilloscope Current Probe Measurements
- Contact Voltmeter Measurements
- Event Detection – compare to advanced equipment

- **Break**

Class 00 (Sub 125V Controls) - *Carl Newberg – update with IEW seminar*

- Ultra-Sensitive Device/Board Controls
- Avoiding High Failure Rates (up to 100%)

- **Open Discussion**
- **Adjourn**

5:00

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55 minute train ride from Boston
1.25 hr. drive from Manchester, NH airport

Vicki Dangelmayer

Vice President of Business Development

Abstract:
A Process Monitoring Breakthrough
In-Situ CDM Event Simulation (New Technology)

By
Mark Hogsett – Simco-Ion

The Simco-Ion CDM Event Simulator was co-designed with Intel to allow ESD detectors to be calibrated inside the tools and processes where CDM events occur. This simulation tool allows calibrated CDM events of different magnitudes to be produced at the point where production devices are most vulnerable and where ESD monitoring sensors are located. This approach allows the highest level of handling safety for sensitive devices.

Devices are usually characterized for failure thresholds in formal test beds and machines designed to simulate discharges on the various device input and output connections. This information is used to assess baseline risk during all phases of device manufacture and system integration. Using this device failure threshold information in conjunction with the CDM Event Simulator, the manufacturing process itself can be calibrated to the CDM risk model.

Many applications in semiconductor, disk-drive, FPD, automated IC handling and a host of other manufacturing processes handle sensitive product in locations where direct discharges can occur. Simulating CDM events at the point of monitoring has posed challenges when attempting to use actual charged devices. Part of this difficulty concerns repeatability of the discharge events themselves. Other difficulties exist due to conditions imposed upon the radiated waveform by the materials and configuration of the process point itself. The CDM Event Simulator was developed to alleviate these problems by providing a repeatable CDM calibration event at the process point which takes into account uncharacterized location conditions.

Dangelmayer ASSOCIATES, L.L.C.
Trusted ESD Programs Since 1978

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Beyond S2020: Class 0 Best Practices & Advanced ESD Measurements

(CDM = Charged Device Model; Class 0= Ultra-Sensitive Components: EOS = Electrical Overstress)

14 Butternut Lane, Gloucester, MA 01930

REGISTRATION FORM

Workshop includes continental breakfast and lunch each day, and dinner on Day 1.
Please select one fee:
_____ For Days 1, 2, 3: $1,785 per person. Register by June 30, 2012 for $1,635
_____ For Days 1, 2, 3, 4: $2,380 per person. Register by June 30, 2012 for $2,180

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Thank you!
Vicki Dangelmayer

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Detach and retain for your records

2012 ESD Dream Team Workshop:
Days 1, 2, 3: $1,785.00 ($1,635.00 by June 30, 2012)
Days 1, 2, 3, 4: $2,380 per person. ($2,180.00 by June 30, 2012)

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