



# ESD Workshop - Today's Challenges!

*CDM, CBE, Class 0 and S20.20*

[www.dangelmayer.com](http://www.dangelmayer.com)



## ESD Dream Team

Dangelmayer Associates



**Ted Dangelmayer**  
President & CEO

**Terry Welsher**  
Vice President  
Former AT&T Bell Labs Director

**Ginger Hansel**

**Dear Attendee,**

Please join us for this highly interactive workshop and hands on class exercises with five of our expert team members. We are pleased to include a keynote presentation on the "Charged Board Event (CBE) - A Growing Industry Concern" by Andrew Olney, Quality Director, Analog Devices

**Intended For Professionals Who:**

- Have Achieved Basic Knowledge Of ESD
- Desire Roadmap For ESD Programs
- Need A Better Understanding of CDM and S20.20, Class 0, and CBE

**What You Will Learn:**

- Charged Device Model & Class 0 Basics

## Director

Former Motorola Global ESD  
Program Manager

## Larry Fromm

### Director

Former HP & Finisar Global  
ESD Program Manager

## Carl Newberg

### Director

- ESDA S20.20 Instructor
- Certified ESD Program  
Manager
- ESD Book Author

## Arnie Steinman

Foremost Ionization Authority

## Al Wallash

Foremost MR/GMR/TMR  
Head Authority

## Min-Chung Jon

- \* ESD Materials Expert
- \* Resolved Industry Wide Tape  
& Reel Issues

## Lou DeChiaro

Foremost Authority:

- \* Device FMA & EOS/ESD  
Differentiation
- \* Optoelectronic - Lasers
- \* CDM/HBM Device Design
- \* Circuit Board Design
- \* System Design Hardening
- \* ESD Modeling

## Vicki Dangelmayer

Vice President Sales

- Today's ESD Trends
- 99% of ESD Failures are CDM- Not HBM
- CDM, CBE, & Class 0 Test Methods
- FA Experts Misdiagnose CBE as EOS
- 50% of EOS failures are ESD at Board Level
- How to Develop, Implement, and Tailor S20.20 ESD Programs

**Ted Dangelmayer**

## Day 1: Wednesday, July 22, 2009

8:00 am Introductions - Industry Trends

- **Key Note Speech:**

"Charged Board Event:  
A Growing Industry Concern!"

by

**Andrew Olney**

**Quality Director, Analog Devices**

- Laboratory Test Results
  - Damage Failure Analysis Photos
  - Damage Looks Like EOS!
    - Commonly Misdiagnosed as EOS
  - Impact on the Industry
- **ESD Basics - Dr. Terry Welsher**
    - Emphasis on CDM & Class 0
    - Why CDM is not Well Understood
    - CDM vs. HBM Discharge Characteristics
    - Limitations of Designed-in-Protection
    - Why MM is Unnecessary
    - Demonstrations & Videos
    - FMA Differentiation Among 3 Models

### Lunch

- ESD Basics (Continued)
- Common Pitfalls of ESD Test Equipment  
- Ginger Hansel

## Adjourn

Evening: Complimentary Seaside Dinner

## Day 2: Thursday, July 23, 2009

8:00 am

- **Hands-on - Measurement Techniques  
- Led by the Dream Team**
  - Auditing Measurement Equipment Usage
  - Proper Use of Key Instruments
  - EMI/ESD Event Detection
  - Class Exercises
    - Induction; Resistances; Event Detection; Ionizers
  
- **Ionization for Class 0 - Arnie Steinman**
  - Class 0 Considerations
  - Ionizer Choices vs. Applications

## Lunch

- **Class 00 (Sub 125V Controls) - Carl Newberg**
  - MR Head Lessons Learned
  - Ultra-Sensitive Device/Board Controls
  - Avoiding High Failure Rates (up to 100%)
  
- **Tailoring S20.20, for CDM and Class 0- Larry Fromm**
  - Implementing S20.20
  - Changes with Issue 2
  - Strengths and Technical Gaps

## Open Discussion

Adjourn

## **Location:**

**Dangelmayer Associates  
14 Butternut Lane  
Cape Ann, Gloucester, MA**

**America's 1st Fishing Port & Movie Venue  
("The Perfect Storm" and "The Proposal")**



**Local Sightseeing and Accommodations:  
[www.cape-ann.com](http://www.cape-ann.com)**

**Major hotels w/i 30 minutes of Gloucester:**  
**Peabody Marriott 978-977-9700**  
**Comfort Inn, Peabody 978-777-1700**  
**Courtyard Marriott, Danvers 978-777-8630**

### **Transportation**

**45 minute drive from Boston's Logan airport**  
**55 minute train ride from Boston**  
**1.25 hr. drive from Manchester, NH airport**

# REGISTRATION FORM

Dangelmayer Associates  
14 Butternut Lane  
Gloucester, MA 01930

Two day Workshop includes two lunches, two continental breakfasts, one dinner. Fee: \$995.00 per person. Register by June 30, 2009 and deduct \$50.

## Registration Information

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Company: \_\_\_\_\_  
Mail Stop: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_ Zip: \_\_\_\_\_  
Phone: work \_\_\_\_\_  
home \_\_\_\_\_  
E-mail: \_\_\_\_\_  
Fax: \_\_\_\_\_  
Preferred method of contact: Phone \_\_\_\_\_  
E-mail: \_\_\_\_\_ Fax: \_\_\_\_\_

Credit Card \_\_ Visa \_\_ Master Card \_\_ Amex  
Card # \_\_\_\_\_ Expiration \_\_\_\_\_  
Security Code \_\_\_\_\_  
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Name on Card \_\_\_\_\_

Please make check payable to: For Accommodations,  
go to [www.cape-ann.com](http://www.cape-ann.com)  
Dangelmayer Associates Peabody Marriott 978-977-9700  
Mail to: Comfort Inn 978-777-1700  
14 Butternut Lane Danvers Marriott  
Gloucester, MA 01930 Courtyard 978-777-8630

Thank you! Seating is limited!  
Vicki Dangelmayer Complete your registration today!  
Vice President of Sales

**vicki@dangelmayer.com**

**978-283-5156**

**www.dangelmayer.com**

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**Contact: Vicki Dangelmayer; vicki@dangelmayer.com; 978-283-5156**

**Detach and retain for your records**

**2009 ESD Dream Team Workshop \$995.00**

**(\$945.00 by June 30, 2009):**

**Date paid:\_\_\_\_\_ Check #:\_\_\_\_\_ Amount:\_\_\_\_\_**

**Received from: \_\_\_\_\_**

**Company name: \_\_\_\_\_**

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**Gloucester, MA 01930**