

ESD ASSOCIATION TUTORIALS AND iNARTE CERTIFICATION EXAM

DECEMBER 12, 2011

ESD Association Standards Overview

8:30 a.m. - 12:00 p.m.

David E. Swenson, *Affinity Static Control Consulting, L.L.C.*

The ESD Association's introduction of the program manager certification curriculum has created a need to modify the standards tutorial that has been presented for a number of years, mainly to help individuals prepare for the iNARTE engineering and technician exams. Currently, many of the ESDA standards and standard test methods are discussed in-depth in the individual tutorials related to the specific subject matter. This standards tutorial provides an overview of all the standards, grouped into common test types, based on measurement probe and test instruments. A common methodology is used in this tutorial to cover the requirements, applications and specifications for each standard and standard test method.

Note: This class is part of the Program Manager Certification curriculum. More details on the Professional Certification Programs offered by ESDA are on our website at www.esda.org/certification.html.

Electrostatic Standards Overview – Outside of ESDA

1:00 p.m. - 4:30 p.m.

David E. Swenson, *Affinity Static Control Consulting, L.L.C.*

Leo G. Henry Ph.D., *ESD/TLP Consultants, L.L.C.*

The ESDA ESD Standards Overview course, that has been offered for years, mentions other related standards organizations, but only briefly, and not with the detail required to thoroughly answer any proposed questions from other documents. Most of these other documents have had an impact on the field of electrostatics. This new course provides more details on related standards and other publications to help prepare students interested in pursuing iNARTE certified ESD engineer or iNARTE certified ESD technician designations, and the course may also help the ESD certified professional program manager. These other standards developing organizations include: the National Fire Protection Association (NFPA), Semiconductor Equipment and Material International (SEMI), US Military, ASTM, JEDEC, Electronic Industry Alliance (EIA – operations terminated), IEEE, IEC, JEITA, ANSI and AEC. Standards, test methods, and related information produced by these other global entities are discussed. The requirements, specifications, applications, instrumentation, and basic procedures/methods will be covered and differences, where relevant, will be pointed out. The student attending this tutorial will have an understanding of the other organizations and their documents and what is important about them in the field of electrostatics.

ESDA TUTORIALS

SINGAPORE DECEMBER 12-14, 2011

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ESD ASSOCIATION TUTORIALS AND INARTE CERTIFICATION EXAM

DECEMBER 13, 2011

System Level ESD/EMI: Testing to IEC & Other Standards

8:30 a.m. - 12:00 p.m.

Leo G. Henry Ph.D., *ESD/TLP Consultants, L.L.C.*

This tutorial is intended to help those tasked with testing products to IEC and other system level ESD standards by providing additional information on IEC 61000-4-2, the most widely used standard, and highlighting the harmonization and differences among IEC, ANSI, Telcordia, and some automotive ESD standards. We will answer common questions regarding test set-ups, test points and procedures, and address key issues, including: 1) Differences between “verification” and “calibration” and when is each required; the influence of ESDA WG14 (TR) on IEC and how it affects the calibration and verification procedures. 2) Test set-up requirements, the test environment, ground connections, and return paths and ground plane effects. 3) Testing procedures with demonstration on actual products, how the tester affects test results, and problems with test result variations due to simulator influences. 4) What points need to be tested and why, guidance on determining “operator accessible” points and ports, exempted points and ports, and what to do around connectors and connector pins. 5) ANSI and other ESD standards, the drive toward harmonization with IEC, why standards will probably never be the same as IEC, and the scope of different standards. This system level ESD tutorial will cover several facets of ESD as applied to electronic systems.

Note: This class is part of the Program Manager Certification curriculum. More details on the Professional Certification Programs offered by ESDA are on our website at www.esda.org/certification.html.

Electrostatic Calculations for the Program Manager and the ESD Engineer

1:00 p.m. - 4:30 p.m.

Leo G. Henry Ph.D., *ESD/TLP Consultants, L.L.C.*

This tutorial focuses on the basic calculations and techniques of use to the program manager and the ESD engineer. The content is at the introductory college pre-calculus and introductory college physics level set in the context of electrostatic discharge and its effects. It is suggested that the student gain some familiarity with these subjects prior to the tutorial. Topics covered include the electric force, the electric field and Coulombs law, electric potential, and voltage. Gauss' Law is discussed as it relates to the electric field, induction, and the Faraday cup. The capacitance in $Q = CV$ is used to explain charge sharing. RC decay is discussed as it relates to ESD discharge from humans, devices, wrist straps, and materials. After completing this course, the attendee should leave with a proper understanding of the differences among the calculations for peak current, power, energy, and threshold voltage for a simple device.

Note: This class is part of the Program Manager Certification curriculum. More details on the Professional Certification Programs offered by ESDA are on our website at www.esda.org/certification.html.



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ESD ASSOCIATION TUTORIALS AND iNARTE CERTIFICATION EXAM

ESDA TUTORIALS

INSTRUCTORS

David E. Swenson retired from 3M in 2003 after 35 years of service. 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. He is currently President Emeritus for 2011. 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 serving on the Technology and Administrative Support Team and the ANSI/ESD S20.20 Standard Task Team. Dave is Chair of the Grounding Work Group. Dave also serves as Treasurer and Information Liaison of the Texas Chapter of the ESD Association. He is a member of the Electrostatic Society of America and the Institute of Physics in the United Kingdom.

Leo G. Henry is presently an ESD/TLP consulting engineer. He has worked in the electronics industry for almost 27 years and in the field of Electrostatic Discharge (ESD) for over 21 years. Over the years, LeoG has worked in several engineering capacities/positions for several major companies, having spent his first 14 "electronic" years" at Advanced Micro Devices as a Member of the Engineering Technical Staff. Leo G. received both his B.Sc. and M.Sc. degrees in Physics from the University of the West Indies. He minored in chemistry and physics. He received both his M.S. and Ph.D. degrees in Materials Science and Engineering from the University of California (UC Berkeley, CA, USA). Dr. Henry has taught Physics, Materials Science, EOS, ESD, TLP and Failure Analysis Principles at Universities and at Symposiums/Conferences and local societies. Dr. Henry has also presented papers at conferences and published (co-authored) many papers in the same fields mentioned above. Dr. Henry teaches several ESD classes in both the Program Manager, Device Design Certification disciplines, and iNARTE ESD Certification disciplines. Dr. Henry is a senior member of the IEEE, a member of ASM/EDFAS/FA and BoD member of SiVa, the SiVa EOS/ESD society. Leo G. has served many years on the ESDA's ESD Symposium Technical Program Committee (1996- present), IEW, Device Design Certification Committee, member and chair of several ESD Working Groups, and is a member of the Association's Technical Advisory and Support (TAS) committee for Standards. He has been an elected member (since 1995-2000 & 2002-2008, 2011-13) of the Board of Directors of the ESDA. He was VP for 2 years (2008 & 2009) and has been Sr. VP (2010 & 2011) with responsibilities for Facilities Certification, Marketing & Communication, Human Resources and the ESDA HQ. Dr. Henry is a member of the Industry Council on ESD.



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ESD ASSOCIATION TUTORIALS AND iNARTE CERTIFICATION EXAM

iNARTE CERTIFICATION EXAM DECEMBER 14, 2011 • 8:00 A.M. - 5:00 P.M.

iNARTE offers Certification to both ESD Engineers and Technicians. This is an internationally recognized, independent validation of professional excellence, according to the guidelines of ISO 17024. There are no required tutorials or courses to be completed prior to attempting the iNARTE Certification exam. Applicants must complete an application form and include the iNARTE application/exam fee with their registration. Application forms will be available at each course location and may also be downloaded in advance at the iNARTE web site <http://www.narte.org/d/esdapp.pdf>. All information on the requirements for iNARTE Certification may be found at <http://www.narte.org/h/esd.asp>. You may also contact iNARTE by email at Lawrence@inarte.us.

The iNARTE ESD Certification exams are open book. Computers and Calculators are allowed. We do not guarantee to provide power or internet connection; but if available at the examination room, candidates may connect. Applicants should note the following:

Bring these items with you:

Standards
Tutorial notes
Reference books
Calculator
Computer

Not allowed:

Talking on cell phones
Talking or sharing of reference materials
Using an email or internet connection to confer with another person

Engineer or Technician? Engineers know the math and the physics of electrostatic discharge control. Technicians know the instruments and test setups. Engineers need good writing and verbal skills. Technicians need to know the pitfalls of real measurements.

REQUIREMENTS FOR CERTIFICATION AS AN ESDC ENGINEER

9 years of engineering experience*, or equivalent based on a combination of education and ESDC work experience, which demonstrated competence in ESDC engineering.

Satisfactory performance on a written exam in ESDC engineering fundamentals as administered by iNARTE.

Equivalencies granted for study at schools approved by iNARTE are based on the schedule below. Engineering teaching experience may qualify the applicant for up to two years of experience equivalency.

Education	Curriculum	Equivalency
1-4 years undergraduate study without degree	Engineering	1 year of each year of study; maximum of 4 years
BS	Engineering of physical science	4 years
BSET	Engineering technology	2 years
BS/BA	Other than above	2 years
Postgraduate study	Engineering or physical science	Up to one year

REQUIREMENTS FOR CERTIFICATION AS AN ESDC TECHNICIAN

6 years of technician experience*, or equivalent based on a combination of education and ESDC work experience, which demonstrated competence as an ESDC technician.

Satisfactory performance on a written exam in ESD technology as administered by iNARTE.

Two years of experience may be granted for graduation from an iNARTE-approved school in a curriculum that includes an electronics technology or applied electronics course. The teaching of electronics or engineering technology may qualify the applicant for up to two years of experience equivalency.



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December 12, 2011

- ESD Association Standards Overview
- Electrostatic Standards Overview – Outside of ESDA

December 13, 2011

- System Level ESD/EMI: Testing to IEC & Other Standards
- Electrostatic Calculations for the Program Manager and the ESD Engineer

December 14, 2011

- iNARTE Engineer Exam
- iNARTE Technician Exam

FEES

On or before Nov. 1, 2011

After Nov. 1, 2011

Dec 12 & 13 classes only

850 SGD • \$690 USD

950 SGD • \$800 USD

iNARTE Application and Exam

450 SGD • \$365 USD

550 SGD • \$450 USD

Both Days classes and Exam

1100 SGD • \$893 USD

1300 SGD • \$1000 USD

Registration Information

For credit card payments:

Register online at:

ESD Association

<http://esda.org/onlineregistrations.html>

Phone: +1 (315) 339-6937

For all other forms of payment Contact:

Mr. Yohan GOH, Phone: **+65 9221 1456**

Mr. NG Cheong Giap, Phone: **+65 9105 5253**

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Payment is required at time of registration.

Amount enclosed \$ _____

Cash Check Wire Transfer Credit Card

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American Express® Discover®

Credit card number: _____ Expiration date: _____

Name on card: _____ Security code: _____

Cardholder's signature: _____

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