September 2026 Standards Summary Session

Additional Information

- For more information on the Standards Business Unit and the standards development process, please visit https://www.esda.org/standards/standards-working-groups/#references > Standards Development Presentation.

- A recording of today's session and a copy of these slides will be posted on our website https://www.esda.org/standards/standards-working-groups/#references > Standards Activity Summaries.

- For more information on recent WG activities, please visit https://www.esda.org/standards/standards-working-groups > Committees Drop Down Menu.

WG 1 –Wrist Straps

Currently published documents

- ANSI/ESD S1.1-2021 Wrist Straps
- ESD TR1.0-01-01 - Survey of Constant Monitors for Wrist Straps

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Reviewed updates to S1.1.
  - Moving the mechanical tests to the Normative Annex
  - Initial changes to the discussion on the 2-wire system
  - Moving required equipment into its own section rather than listing it within each section
  - Need to add the boilerplate using 10/100 volt for the resistance meter
  - Updating to the any new boilerplate language when available
  - Verification of the resistance meter and the wrist strap fixture will be added to the Annex

- Dual Wire Systems
  - The group discussed dual wire systems.
  - Developing a figure showing the testing points on a dual wire system.
  - Updating the language to better match how the test needs to happen

- Decided to re-start the TR on continuous monitors because we have 6 volunteers. Draft TR sent to the volunteers.

WG 2 – Garments

Currently published documents

- ANSI/ESD STM2.1-2018 Garments
- ESD TR2.0-01-00 - Consideration for Developing ESD Garment Specifications
- ESD TR2.0-02-00 - Static Electricity Hazards of Triboelectrically Charged Garments

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Reviewed and adjudicated DSTM2.1 TAS comments
  - Chair to make remaining updates to DSTM2.1, circulate with WG, and then resubmit to TAS by EOY
- Discussed buried (core) conductor garments
  - Team agreed to form task team, assess top 5 industries/characteristics, and start to develop work statement for potential TR
  - Barnet Corporation has agreed to provide 5 different garments made from buried conductor fibers so we can begin evaluation
  - ESDA has purchased additional standards (EN1149-1, 3, and 5) to support this work
- Discussed dual conductor garments
  - Team decided to parking lot this effort for now to focus on buried (core) conductor work

WG 3 - Ionization

Published Documents

- ANSI/ESD STM3.1-2024 - Ionization
- ANSI/ESD SP3.3-2026 - Periodic Verification of Air Ionizers
- ANSI/ESD SP3.4-2026 - Periodic Verification of Air Ionizers Using a Small Test Fixture
- ANSI/ESD SP3.5-2020 - Air Assist Bar Ionizers, Soft X-Ray (Photon) Ionizers, Room Ionization Alternatives, and Non-Airflow Alpha Ionizers

Summary of discussions/activities/document reviews during the most recent WG meeting:

- Reviewed offset voltage round-robin data when the first 30-seconds were ignored, which showed a much better distribution of data between labs & instruments
- Discussed some of the test method changes based on the modification of the data collection
- Decisions are needed regarding offset voltage test with respect to sampling rate and collection methods (how to collect data and also how long to wait after the plate is grounded before data collection starts)
- Online follow-up meeting will be held soon to decide on repeating round-robin and also revision of the documented test method

WG 4 – Worksurface

Currently published documents

- ANSI/ESD STM4.1-2026 - Worksurfaces – Resistance Measurements
- ESD TR4.0-01-02 - Survey of Worksurfaces and Grounding Mechanisms

Summary of discussions/activities/document reviews during the most recent WG meeting.

- TR (Technical Report) on Conveyors – Resistance Measurement, provides test methods for evaluating conveyors where protection of ESD susceptible items is required.
- This document covers belt, wire-mesh, edge type, wheel or roller, ball-transfer, and inter-section conveyor measurements, including verification procedures, equipment, figures, and mitigation guidance.
  - Voltage measurements are out of scope for this release and may be considered for later revision.
- Each conveyor type includes introduction, potential risk, measurement equipment, preparation, verification, test procedures, figures, and mitigation.
- Working Group reviewed the comments from their review of the document. Next step is to submit to TAS and then move it forward for publishing.

WG 5 – Device Testing

Currently published documents

- ANSI/ESD SP5.0-2023 - Reporting ESD Withstand Levels on Datasheets

Summary of discussions/activities/document reviews during the most recent WG meeting.

- 5yr review of WIP5.0
  - All TAS comments were addressed in the meeting
  - Document was on hold until survey comments from JEDEC JEP178 were received
  - No new comments from the JEDEC survey besides the request to ensure that ANSI/ESD SP5.0 and JEP178 are aligned
  - Document now being prepped for STDCOM vote
- JS-001/JS-002 Alignment Discussions
  - Significant time spent discussing improved alignment between ANSI/ESDA/JEDEC JS-001 and JS-002
  - WG agreed that terms (where common), equipment section, and safety sections should be better aligned
  - WG spent time aligning on the definition of common terms
- TR5.0-01
  - No update in the meeting
  - Offline meeting held at the meeting series to finalize chapter leads and begin writing

JWG HBM (Cont. on next slide)

Currently published documents

- ANSI/ESDA/JEDEC JS001-2024 - Human Body Model (HBM) – Device Level
- ESD JTR001-01-25 – User Guide of ANSI/ESDA/JEDEC JS-001 Human Body Model Testing of Integrated Circuits
- ANSI/ESD SP5.1.3-2022 - Human Body Model (HBM) – A Method for Randomly Selecting Pin Pairs
- ANSI/ESD SP5.1.4-2024 – Random Supply Sampling (two-channel tester)

Summary of discussions/activities/document reviews during the most recent WG meeting.

- In general: preparation of JS-001 for a new revision. There are more than 1000 changes to JS-001 2024, including significant changes to pin group definitions and the determination of associated supplies – which are needed for testing to table 2A .
- Discussion on comments on WIPJS-001 raied a lot of small points but had a few common themes:
  - Definition of no-connect pins (see below)
  - Associated supplies for pins without obvious associated supplies (see below)
  - Definition and subsequent treatment of 'shorted' non-supply pins for the N+1 pin combination of table 2B
  - Several 'boilerplate' issues to align JS-001 and JS-002, such as how to define a passing device, definitions of equipment etc. These are now delegated to WG5.0.

JWG HBM Cont.

- Several ‘boilerplate’ issues to align JS-001 and JS-002, such as how to define a passing device, definitions of equipment etc. These are now delegated to WG5.0.
- Removal of legacy test equipment like analog oscilloscopes.

- Review of our treatment of NC pins
  - Previous work (Kunz et al) highlights reasons for not stressing NC pins for HBM
  - The definition of NC pins was discussed, including whether WLCSP packages can ever have NC pins (because all bumps are necessarily connected to the die)
  - The treatment of ‘isolated’ thermal pads was also discussed, including different levels of ‘isolation’.
  - Sometimes it is impossible to avoid stressing an open circuit pin combination
- Review of associated supplies for pins without obvious associated supplies
  - Related to the NC pin discussion because some pins which are functional parts of a device are not connected to the die, or don’t have obvious supply pins.
  - The discussions from June were continued with useful outcomes.
- Parking Lot items
  - The list of these is growing, especially in relation to JTR-001 which will need to be kept in sync with JS-001.

JWG CDM (Cont. on next slide)

Currently published documents

- ANSI/ESDA/JEDEC JS-002-2025 – Charged Device Model (CDM) – Device Level
- ESDA/JEDEC JTR002-01-25 – CDM User Guide
- ANSI/ESD SP5.3.3-2018 – Low Impedance Contact CDM (LICCDM)
- ANSI/ESD SP5.3.4-2022 – Capacitively Coupled Transmission Line Pulsing as an Alternative CDM Characterization Method
- ESD TR5.3.1-01-18 - Contact Charged Device Model (CCDM) Versus Field Induced CDM (FICDM) A Case Study

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Q100 harmonization status:
  - Regular meetings scheduled (scope CDM/HBM/LU). Focus first on CDM (3 zap vs 1 zap)

JWG CDM Cont.

- TR 5.3.1-02-2X - Charged Device Model (CDM) Testing of Bare Die and 2.5D / 3D Interfaces:
  - Comments addressed so far; revised document will be sent ot to the WG
  - Document planned to be sent to TAS by the end of October
- LI-CCDM Round Robin
  - Measured data identified parameters for equipment verification
  - New verification procedure needs to be developed
  - Stress test of single device
- CC-TLP Round Robin:
  - Test of single device finished (paper at EOS/ESD Symposium presented)
  - Important test parameters identified for an improved verification procedure
  - Writing team formed for the STM document
- Full review of JS-002 (CDM Standard):

  Data presented on basing test goal on fundamental limits and on impact of test parameters on peak current

  Results will be taken into account for the revision of the standard

WG 5.4 – Transient Latch-up (TLU) (Cont. on next slide)

Currently published documents

- ANSI/ESD STM5.4.1-2022, Transient Latch-up – Device Level
- ESD TR5.4-01-00, Transient Induced Lacth-up (TLU)
- ESD TR5.4-03-11, Transient Latch-up Testing – Component Level - Supply Transient Stimulation
- ESD TR5.4-04-13, Transient Latch-up Testing

Summary of discussions/activities/document reviews:

- Continued the five-year review of SP5.4.1-2022 and reaffirmed its industry relevance for TLU characterization, while recognizing limited use and practical implementation challenges
- Confirmed that SP5.4.1 should remain a Standard Practice (SP) rather than become a standardized qualification method because transient conditions vary widely

WG 5.4 – Transient Latch-up (TLU) Cont.

- Reviewed technical comments addressing the JESD78 revision reference, terminology and test intent, relationships among sections, and descriptions of applied stresses
- Identified required updates to the document flowchart and protection-circuit figures and agreed to begin revising the document based on comments already received
- Agreed to circulate the original document to additional WG members who were not included in the initial review and provide a four-week comment period
- Planned to consolidate the additional feedback and continue the revision; no expected submission date is established at this stage, and the ANSI ten-year deadline is 2032

WG 5.5 – Transmission Line Pulse (TLP) (Cont. on next slide)

Currently published documents

- ANSI/ESD STM5.5.1-2022, the standard test method for (VF-)TLP
- ESDTR5.5-04-23, the user and application guide for (VF-)TLP
- ESDTR5.5-05-20, technical report on transient analysis with TLP
- 3 older technical reports

Summary of discussions/activities/document reviews:

- TR5.5-06-26 (Statistical Applications of TLP)
  - Discussed TAS comments ☐ Process all TAS comments and add foreword
  - Discussed selected technical WG comments ☐ Process all WG comments
  - Document is in good shape and targets submission for publication by end of 2026

WG 5.5 – Transmission Line Pulse (TLP) Cont.

- SP5.5.3 (Transient Analysis with VF-TLP)
  - Discussed selected WG comments ☐ Process all WG comments
  - Presentation ‘de-embedding of cables in VF-TLP set-up’
  - De-embedding can have significant impact on first transient
  - Short text on need for de-embedding for transient analysis to be added to SP
  - Draft to be finished with these comments for 1st TAS review by end of 2026
- STM5.5.1 (TLP Standard Test Method document) 5-year review
  - Discussed selected WG comments to illustrate the wide variation in type of comments
  - Several comments need discussion to determine if revision is needed
  - First step is to categorize and prioritize all comments.
  - Next steps will only be taken after the two documents mentioned above have moved to the next stage.

WG 7 - Flooring

Currently published documents

- ANSI/ESD STM7.1-2020 – Flooring Systems – Resistive Characterization
- ESD TR7.0-01-23 – Protective Flooring Systems

Summary of discussions/activities/document reviews during the most recent WG meeting.

- STM 7.1 5-Year Revision
  - Adjudicated Industry Review Comments on STM 7.1. STM7.1
  - Document Ready Sent Back to ESDA HQ for Publication
- Flooring Systems FAQ
  - Began Discussions to Develop an FAQ Regarding Flooring Systems
  - Reviewed a List of Commonly Asked Questions from the ESDA Forum
  - Identified 2 Volunteers to Draft Answers to Current List
  - Will Review Draft Answers at March Meeting
  - Options for Using the FAQ include:
    - Incorporating into TR7.0
    - Posted on the ESDA Website
    - Included in Training

WG 9 – Footwear (Cont. on next slide)

Currently published documents

- ANSI/ESD STM9.1-2022 – Flooring Systems – Resistive Characterization

Summary of discussions/activities/document reviews during the most recent WG meeting.

- WG 9 – Footwear met on 24 September 2026 in Frisco, TX with 21 attendees. Michael Zwicknagl chaired his first meeting as the new chair; Dale Parkin was recognised for his long tenure and his technical contributions to STM9.1 and SP9.2.
- The chair presented a consolidated five-year review comment list for ESD WIP9.1-202x: 34 comments, 13 high, 17 medium and 4 low priority. These comments have been consolidated between Adrianna and Michael not with the group. Approximately ten comments were adjudicated in detail.
- A measurement demonstration compared inner electrodes (metal-mesh sleeve versus cotton shot sock), German and US aluminum foil, applied load, and 48 versus 72 hours of conditioning, at room climate and at 12 % RH. Results moved by several decades with humidity and with the contact interface, and again when a person was included in the circuit.

WG 9 – Footwear Cont.

- Gaps identified in the current method: no electrode verification for footwear, no accuracy requirement for the instrument, counter-electrode size and isolation unspecified, sock and aluminum foil materials unspecified, and no reporting rule for readings outside the instrument range.
- The group discussed the difference between the 1×10^8 ohm limit in IEC 61340-5-1 and the 1×10^9 ohm limit in ANSI/ESD S20.20 and concluded that harmonization is unlikely in the short term because the values are embedded in different standards organization's, safety assumptions and existing footwear testers.
- The principal open question is how the shoe-only test correlates with person-in-shoe and walking performance – resistance is only one part of triboelectric behavior.
- Next steps: retrieve and analyze the historical round-robin data, update the document to the current boilerplate in parallel, issue the document to the WG members for their comments, and hold a virtual meeting to continue the adjudication.

WG 11- Packaging (Cont. on next slide)

Currently published documents:

- ANSI/ESD S11.4-2022 – Bags
- ANSI/ESD STM11.11-2022 – Surface Resistance
- ANSI/ESD STM11.12-2021 – Volume Resistance
- ANSI/ESD STM11.13-2021 – Two-Point Probe
- ANSI/ESD S541-2026 – Packaging
- ANSI/ESD STM11.31-2018 – Bags – Discharge Shielding

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Review of STM11.13 – Two-Point Probe and presentation by Advantek regarding a few issues related to the difficulties in making measurements and reporting requirements. STM11.13 in committee review and will be ready for TAS by the end of 2026.
- Adjudicated STDCOM comments on STM 11.31 – Bags - Shielding. Document to be cleaned up and sent for final review by Dec. 1.

WG 11- Packaging Cont.

- Presentations by 3 members regarding measurements of various concentric ring electrodes and a few parallel bar electrodes. There are a considerable number of variations that need to be discussed. May lead to additional controlled testing.
- STM11.11 and 11.12 opened for 5-year review. Members from DESCO will take the lead in starting the review process
- ADV11.2 – Triboelectrification is being reviewed for update. Document released in 1995 and as an Advisory it has not been updated. Team leader has been assigned (volunteer) and other members have committed to conduct a literature search on the subject. Reports due in March.

WG 12 – Seating (Cont. on next slide)

Currently published documents

- ANSI/ESD STM12.1 “Seating – Resistance Measurements” (2019)

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Work on ANSI/ESD DSTM12.1-2026 “Seating – Resistance Measurements”.
  - Discussed and approved changes in the document when updating to the latest boilerplates and template for Annex A “Verification Procedure of Measurement Set-up”.
  - Next steps: Update the document, send to ESDA Operations for STDCOM VBM (WG Chair).
- Identify topics to be addressed in the next revision of ANSI/ESD STM12.1 or further seating-related work

WG 12 – Seating Cont.

- WG 12 discussed and approved suggestions for editorial and technical changes in Annex A “Verification Procedure of Measurement Set-up”
  - Clarify the need for resistance measurements of all components of a chair.
  - Consider extending the scope to a lower resistance (metal chairs).
  - Consider adding floor creepers or other “seating objects”.
  - Give guidance on the measurement of the backrest – use commercially available clamps
  - Add a note on the use of drag chains.
- The next face-to-face meeting will be in September 2027.

WG 13 – Hand Tools (Cont. on Next Slide)

Currently published documents

- ANSI/ESD S13.1-2019 - Electrical Soldering/Desoldering Hand Tools
- ESD TR13.0-01-99 - EOS Safe Soldering Iron Requirements

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Work on ANSI/ESD S13.1 “Electrical Soldering/Desoldering Hand Tools”:
  - All comments for the WG reviews have been adjudicated before the meeting
  - Adding impedance measurements was put in the parking lot items for possible inclusion in the next revision
  - The document will be submitted to TAS for review (September 2026)

WG 13 – Hand Tools (Cont. on Next Slide)

- Work on ESDA TR13.0-02 "Resistance Measurements of Unpowered Hand Tools"
  - WG reviewed the current status of the document
  - The definition of an "unpowered hand tool," such as a tweezer, was agreed on ("An unpowered hand tool is a manually operated tool that performs work through direct human force, with no integrated mechanical, electrical, pneumatic, hydraulic, or combustion-powered drive system.")
  - Three test methods will be described in the document:
    - Resistance point-to-point of the tool tip contacting the ESD-sensitive item
    - Resistance tip-to-handle
    - System resistance from the tool tip through the handle and the operator to ground while the operator is wearing a wrist strap
  - A Writing Team was formed; will meet between the Meeting Series to define outline and assign sections to volunteers
  - Target date for an updated version: mid-January 2027
- Discussion of a new TR on "battery-operated hand tools"
  - WG agreed that there is a need for another TR addressing alternate power hand tools (battery, pneumatic)
  - An online meeting will be scheduled before the end of the year with the WG to create a scope and an outline for the new TR

WG 15 – Gloves

Currently published documents

- ANSI/ESD STM15.1-2019 - Methods for Resistance Measurement of Gloves and Finger Cots
- ESD TR15.0-01-99 - ESD Glove and Finger Cots

Summary of discussions/activities/document reviews during the most recent WG meeting.

- The WG adjudicated the comments from the Industry Review on ANSI/ESD STM15.1 “Methods for the Resistance Testing of Gloves and Finger Cots”
  - All critical comments have been addressed in the WG meeting; most of the editorial comments have been addressed before the meeting
  - The Industry Review comments resulted only in editorial changes; no technical changes have been made in the document at this stage
  - Next steps: Close on document update and return for publication in October 2026
- There are no parking-lot items left at the moment; WG will possibly go dormant (final decision pending)

WG 17 – Process Assessment (Cont. on next slide)

Currently published documents

- ANSI/ESD SP17.1-2026, "Process Assessment Techniques"
- ESD TR17.0-01-15, "For ESD Process Assessment Methodologies in Electronic Production Lines – Best Practices Used in Industry"

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Work on ANSI/ESD SP17.1 "Process Assessment":
  - Revision 2 of ANSI/ESD SP17.1 was published in May 2026
  - Parking lot items for Revision 3 have been discussed. There is consensus to address all parking lot items in the next revision.
  - Presentation by Infineon Technologies/Aumovio/Gärtner & Stadler ESD Consulting on ESD risks in processes with boards included: The outcome of the study will be used to improve parts of ANSI/ESD SP17.1 (Section 6)
  - Recent findings of damage due to electrostatic fields without contact with a conductive item need to be assessed and brought in as a new risk assessment in the document.
  - Next steps: Find experts for the contributions; start working on updating the document

WG 17 – Process Assessment Cont.

- Work on ANSI/ESD SP17.2 “Process Assessment of Electrical Disturbances”
  - Focus of first part of document: “Grounding”; further parts will follow in next revisions
  - Document will follow the flow of ANSI/ESD SP17.1
  - Writing Team will meet between Meeting Series to define outline and assign sections to volunteers
- Work on ESD TR17.0-02 “ESD Event Detection”
  - Presentation by Infineon Technologies on ESD event detection yielded important results on the use of antennas and oscilloscopes for different ESD events
  - Parts of Infineon’s presentation will go into the corresponding sections of the document.
  - Next step: Preparing document for WG review by January 2027
- Work on ESD TR17.0-03 “ANSI/ESD SP17.1 Handbook” Last missing contribution is being worked on, expected by the end of June 2026
  - 10+ process steps identified that will be addressed in the document
  - Next steps: Submit all contributions to WG Chairs by the end of 2026; compile the
  - document and discuss in the March 2027 meeting.

WG 18 – EDA (Cont. on next slide)

Currently published documents

- ESD TR18.0-01-25 ESDA Technical Report for ESD Electronic Design Automation Checks (update released in January 2026)
- ESD TR18.0-02-20 ESDA Technical Report for Latch-Up Electronic Design Automation

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Bi-weekly virtual meetings
- Ongoing activities
  - Tutorial for ESD Verification with EDA tools
- Cooperations:
- SIG on 3D Integration → WG18 focus on continuous alignment
- SIG on AI → WG18 focus on alignment and potential active contribution to the White Paper
- ESD roadmap → WG18 contribution in new Roadmap

WG 18 – EDA (Cont. on next slide)

TUTORIAL for ESD Verification with EDA tools – Scope, target, format

- Scope (based on TR18.0-01-25)
  - Key ESD aspects that must be verified during design
  - Overview and insight in commonly used ESD EDA checking methodologies
  - End-to-end design flow: technology enablement → product validation
- Target
  - EDA experts new to ESD
- Format
  - Online tutorial with audio-supported slides
  - Duration ~ 2 hours
  - It won’t belong to any official certification program

WG 18 – EDA (Cont.)

TUTORIAL for ESD Verification with EDA tools – Outline & Status

Outline

- 1 Introduction to ESD
- 2 ESD checks throughout the IC design flow
- 3 Schematic-based static topological ESD checks
- 4 Layout-based ESD checks
- 5 Upper hierarchies verifications
  - 5a Package-level ESD
  - 5b System-level ESD checks
- 6 Other methods
  - 6a SPICE
  - 6b TCAD

Status

- 70% completed, goal to complete first draft by end 2026

WG 19 – High Reliability

Currently published documents

- ESD TR19.0-01-22 Protection of High-Reliability Electrical and Electronic Parts, Assemblies, and Equipment (Excluding Electrically Initiated Explosive Devices)

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Initial part of the meeting was used to discuss status of the comment resolutions and draft of the document.
  - The tiger team dispositioned several comments via virtual meetings all summer but there were some comments that required either clarification from the commenter, or they decided were best to allow the committee to make the final decision.
  - Once all comments have been dispositioned the writing team will work on the final draft.
- The rest of the meeting was used to review draft comments.
  - Focus of comments started with the comments that needed to go back to the committee followed by those that we wanted to speak with the commenter.
  - All committee comments dispositioned, but there are still comments that remain that we will meet virtually to disposition.

WG 20 – ESD Control

Currently published documents

- ANSI/ESD S20.20-2021 - Development of an Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies, and Equipment (Excluding Electrically Initiated Explosive Devices)
- ESD TR20.20-2025 – ESD Handbook

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Discussion of comments. This was the second comments
- Submitted to TAS by end of October
- Put several items into parking lot as consensus was not reached
  - Change the scope of CDM sensitivity
  - Gloves and Finger cots

WG 26 – System Level ESD Models (Cont. on next slide)

Currently published documents

- ESD TR26.0-01-23 – Behavioral IC Modeling to Perform System Level ESD Simulations – General Description and Trends
- ESD TR26.0-02-24 – Quasistatic Model Definition – Building Model

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Update on simulations (MST)
  - Discussion about some details of the simulation
  - Check if medium board is correctly modelled
- Update on LAAS simulation method
  - Some questions to Fabrice: how does the method work, is the adaptation of model parameters wrt current done automatically in the model
  - Invite Fabrice for a virtual meeting so that he can present the method in more detail and answer questions

WG 26 – System Level ESD Models Cont.

- Discussion: is a comparison of models for the two applications needed for the document?
  - This is nice to have. At least provide a comparison for one model for both applications
  - Try to nudge model providers to simulate the other missing application
- Discussion: how to deal with limited bandwidth of contributors
  - -Introduction of deadlines
  - -general approach: collect much feedback then provide a wording proposal and finally review it
  - -organize more bandwidth (work longer, get somebody to do the work)
  - Try to implement these tips
- Friedrich presented nonlinear capacitance modelling

WG 29 – Healthcare (Cont. on next slide)

Currently published documents

- ESD TR29.0-01-24 – Guidance for Control of Electrostatic Hazards in Healthcare Facilities

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Tony Viheriakoski gave a presentation on "Trends in Electrostaic Control in Healthcare" covering documented cases and measurements in actual hospital settings, including:
  - Common Sources of Charging
  - Levels of Charge Accumulation
  - Demonstrated Effectiveness of Control Measures
- Training and Partnership Opportunities
  - Discussion on How the Group can Partner to Spread the Word in the US
  - One Suggestion to Partner with the American Society of Healthcare Engineers for Training and Presentation at Conferences

WG 29 – Healthcare Cont.

- Demonstration Testing in a Controlled Lab Setting
  - The group discussed potential lab testing to:
    - Provide data on potential ESD risk
    - Demonstrate the effectiveness of mitigation measures
    - Measurements would include body and field voltage during activities such as sitting up in a bed, standing from a chair, donning gowns and booties, opening packaging, moving carts and beds, and handling medical materials.
    - Potential mitigations would include ESD flooring, personnel grounding, ionizers, low-charging materials, and equipment grounding. Testing would compare charging before and after mitigation.
    - Open questions include how to model patient spaces realistically, whether contamination and particulate attraction should be measured, and how to obtain medical-device data when equipment is unavailable at headquarters.
    - The group will schedule a virtual meeting before the end of the year to finalize the testing plan.

WG 53 – Compliance Verification

Currently published documents

- ESD TR53-01-22 – Compliance Verification

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Reviewed technical comments for elevating TR53 to Standard Practice (ANSI/ESD SP TR53); ~149 comments total (editorial completed separately).
- Affirmed SP TR53 provides compliance-verification test methods and does not replace ANSI/ESD S20.20 program requirements.
- Agreed to keep SP TR53 and S20.20 aligned in terminology, technical content, and publication timing.
- Key technical directions: align resistance terminology with S20.20; retain 10 V and 100 V where applicable; do not prescribe lead polarity for CV.
- Clarified field-meter use (field measurement vs non-contact voltage) and added protective-earth presence checks without implying impedance testing.
- Remaining work assigned to a writing team, with coordination on garment methods (WG2); targeting TAS submission by end of December.

WG 97 – Footwear/Flooring (Cont. on next slide)

Currently published documents

- ANSI/ESD STM97.1-2025 - Footwear/Flooring System – Resistance Measurement in Combination with a Person
- ANSI/ESD STM97.2-2016 - Footwear/Flooring System – Voltage Measurement in Combination with a Person

Summary of discussions/activities/document reviews during the most recent WG meeting.

- WG97 – Two documents
  - DSTM97.2 Footwear/Flooring System Voltage Measurement in Combination with a Person.
  - ANSI/ESD STM97.1 ESD Footwear/Flooring - Resistance Measurement in Combination with a Person
- The scope of this meeting series was:
  - Reviewed 27 industry comments on DSTM97.2.
  - Revisited parked 10 industry comments and planned follow-up work for ANSI/ESD STM97.1.

WG 97 – Footwear/Flooring Cont.

- DSTM97.2 - most of the comments were put into the parking lot until after the document has been published, this is due to time constraints, technical changes will be considered and incorporated in the next revision of the document. After 97.2 is published the document will be opened up and these items will be included in the next revision.
- ANSI/ESD STM97.1 to address the 10 comments from industry review that was put in the parking lot for further review and to update 97.1 to be in line with 97.2 and to add the new updated boiler plate statements.

Manufacturing Task Team (Cont. on next slide)

Currently published documents

(no document – decisions included in other documents and ESDA Style Manual)

Summary of discussions/activities/document reviews during the most recent WG meeting.

- Discussion on suggested boilerplate changes (boilerplates will be updated accordingly):
  - Controlled test environment:
    - The controlled test environment language should require that specimens, probes, and electrodes remain in the environment; meters may remain outside if the test setup is verified under the specified environmental conditions.
  - Suggested "boilerplate" change in Scope:
    - Agreed on editorial changes.
  - Use of "static control" and "ESD" as description of ESD control items
    - The group agreed to the TAS directive to remove "static control" and "ESD" from generic ESD control item names.
  - Discussion of proposed change in boilerplate "Metal Plate":
    - Manufacturing TT agreed to leave "without being distorted" for the moment in the boilerplate text (no better specification).
  - Alignment of polarities of terminals and leads:
    - Assess removal of polarities for each document.

Manufacturing Task Team Cont.

- Discussion of test plan for environmental conditioning of specimen support surfaces:
  - John Kinnear and Brennan Pimpinella (ESDA, LLC) presented the test plan (DoE).
  - The Manufacturing TT agreed to the test plan.
  - ESDA, LLC, will report the results in the March 2027 Meeting Series.
- Reporting (and monitoring) of "environmental conditioning":
  - The group provisionally considered reporting minimum, mean, and maximum RH during conditioning, with monitoring at least hourly.
  - Discussion will be continued in next meetings.
- Accuracy and calibration capability of RH meters:
  - ESDA documents do not specify RH meter accuracy today. Wide variety of meters and accuracies.
  - Discussion will be continued in next meetings.

Our next meeting series is on March 1-5, 2027, in Riverside, CA. The general meeting schedule is available at www.esda.org under Events.