Metrics Global Technical Committee
North America (NA) Chapter
Meeting Summary and Minutes

North America SEMICON West 2018 Standards Meetings
July 11, 2018 15:00–18:00
San Francisco, California

TC Chapter Announcements
Next TC Chapter Meeting
November 7, 2018, 15:00 – 18:00
SEMI HQ, Milpitas, California

Table 1 Meeting Attendees
*Italics* indicate virtual participants

**Cochairs:** David Bouldin (Fab Consulting), Vladimir Kraz (Best ESD Technical Services), Mark Frankfurth (Cymer)
**SEMI Standards Staff:** Inna Skvortsova

<table>
<thead>
<tr>
<th>Company</th>
<th>Last</th>
<th>First</th>
<th>Company</th>
<th>Last</th>
<th>First</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fab Consulting</td>
<td>Bouldin</td>
<td>David</td>
<td>QFI-RF</td>
<td>Osselburn</td>
<td>Jay</td>
</tr>
<tr>
<td>BestESD Technical Services</td>
<td>Kraz</td>
<td>Vladimir</td>
<td>Electronics Workshop</td>
<td>Steinman</td>
<td>Arnold</td>
</tr>
<tr>
<td>Tokyo Electron</td>
<td>Mashiro</td>
<td>Supika</td>
<td>Hitachi High-Technologies</td>
<td>Enami</td>
<td>Hiromichi</td>
</tr>
<tr>
<td>Applied Materials</td>
<td>Fitzpatrick</td>
<td>Russell</td>
<td>Hitachi High-Technologies</td>
<td>Yamamoto</td>
<td>Koichi</td>
</tr>
<tr>
<td>Cymer</td>
<td>Francis</td>
<td>Gregory</td>
<td>SEMI</td>
<td>Skvortsova</td>
<td>Inna</td>
</tr>
</tbody>
</table>

Table 2 Leadership Changes

<table>
<thead>
<tr>
<th>WG/TF/SC/TC Name</th>
<th>Previous Leader</th>
<th>New Leader</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical Chamber Components (CCC) Test Methods Task Force [NEW]</td>
<td>n/a</td>
<td>Supika Mashiro (TEL)</td>
</tr>
</tbody>
</table>

Table 3 Committee Structure Changes

<table>
<thead>
<tr>
<th>Previous WG/TF/SC Name</th>
<th>New WG/TF/SC Name or Status Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>n/a</td>
<td>Critical Chamber Components (CCC) Test Methods Task Force [NEW]</td>
</tr>
</tbody>
</table>
### Table 4 Ballot Results

<table>
<thead>
<tr>
<th>Document #</th>
<th>Document Title</th>
<th>Committee Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>R6184</td>
<td>Revision to SEMI E135-0704 (Reapproved 0512), Test Method for RF Generators to</td>
<td>Approved for publication</td>
</tr>
<tr>
<td></td>
<td>Determine Transient Response for RF Power Delivery Systems Used in Semiconductor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Processing Equipment</td>
<td></td>
</tr>
</tbody>
</table>

Note 1: **Passed** ballots and line items will be submitted to the ISC Audit & Review Subcommittee for procedural review.

Note 2: **Failed** ballots and line items were returned to the originating task forces for re-work and re-balloting or abandoning.

### Table 5 Activities Approved by the GCS Prior to the Originating TC Chapter meeting

<table>
<thead>
<tr>
<th>#</th>
<th>Type</th>
<th>SC/TF/WG</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

None

### Table 6 Authorized Activities

Listing of all revised or new SNARF(s) approved by the Originating TC Chapter.

<table>
<thead>
<tr>
<th>#</th>
<th>Type</th>
<th>SC/TF/WG</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

None

Note 1: SNARFs and TFOFs are available for review on the SEMI Web site at:

http://downloads.semi.org/web/wstdsbal.nsf/TFOFSNARF

### Table 7 Authorized Ballots

<table>
<thead>
<tr>
<th>#</th>
<th>When</th>
<th>TF</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>6365</td>
<td>Cycle 7-2018</td>
<td>ESD/ESC TF</td>
<td>Line-item Revision to SEMI E78-0912, Guide to Assess and Control Electrostatic Discharge (ESD) and Electrostatic Attraction (ESA) for Equipment</td>
</tr>
<tr>
<td>6364</td>
<td>Cycle 7-2018</td>
<td>ESD/ESC TF</td>
<td>Line-item Revision to SEMI E129-09-12, Guide to Assess and Control Electrostatic Charge in a Semiconductor Manufacturing Facility</td>
</tr>
</tbody>
</table>
Table 8 SNARF(s) Granted a One-Year Extension

<table>
<thead>
<tr>
<th>#</th>
<th>TF</th>
<th>Title</th>
<th>Expiration Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 9 SNARF(s) Abolished

<table>
<thead>
<tr>
<th>#</th>
<th>TF</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 10 Standard(s) to Receive Inactive Status

<table>
<thead>
<tr>
<th>Standard Designation</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td></td>
</tr>
</tbody>
</table>

Table 11 New Action Items

<table>
<thead>
<tr>
<th>Item #</th>
<th>Assigned to</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Arnold S.)</td>
<td>To prepare and present ESDA Liaison Report at NA Fall Standards Meetings.</td>
<td></td>
</tr>
<tr>
<td>(Inna S.)</td>
<td>To connect Vladimir with Natalie Shim (SEMI KR staff) regarding PCBA activities. CLOSED</td>
<td></td>
</tr>
<tr>
<td>(Vladimir K., Arnold S., Supika M.)</td>
<td>Arnold and Vladimir to create summary/problem statement (in PPT format) to demonstrate ESDA success and how similar means can help SEMI with popularization of ESD/ESC related standard. Summary to be presented at NA Fall Standards Meetings in Nov. 2018. Supika can present this report to relevant audience at ISC Japan meeting in December 2018.</td>
<td></td>
</tr>
<tr>
<td>(David B)</td>
<td>To contact authors of SEMI E165, E150, E149 for 5 year review/revision recommendation or let documents go inactive when due by Regulations.</td>
<td></td>
</tr>
<tr>
<td>(Russell F.)</td>
<td>Contact Mitch Sakamoto for specifics on static electricity that has not yet been discussed by NA Chapter as relates to reduction of defects at component level;</td>
<td></td>
</tr>
<tr>
<td>(Dave B., Vladimir K.)</td>
<td>Contact Mitch Sakamoto to discuss his request for topics and general collaboration between NA and Japan Chapters of Metrics TC.</td>
<td></td>
</tr>
<tr>
<td>Inna S.</td>
<td>Arrange Vladimir to present at Facilities and Gases TC as a liaison to introduce recently published E176 and how it relates to Facilities and Power Quality. Request sent to SEMI Staff responsible for Facilities and Gases TC</td>
<td></td>
</tr>
</tbody>
</table>

Table 12 Previous Meeting Action Items

<table>
<thead>
<tr>
<th>Item #</th>
<th>Assigned to</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018Apr#1</td>
<td>(Inna S, Jay O., Ya-hong N.)</td>
<td>To implement changes discussed during ballot adjudication and forward redline copy to SEMI Standards staff within 10 days for Ratification ballot submission in Cycle 4-18. DONE</td>
</tr>
<tr>
<td>2018Apr#2</td>
<td>(Inna S, Jay O., Ya-hong N.)</td>
<td>Prepare Procedural Review Form (A&amp;R Form) for the ballot adjudication section during the TC meeting. DONE</td>
</tr>
<tr>
<td>2018Apr#3</td>
<td>(Inna S., Vladimir K.)</td>
<td>To continue collaboration on means to market for newly published E176. SEMI staff published article; Author of the Standard published another technical article in InCompliance magazine; Plan to explore webinars/step format in conjunction with SEMICON China.</td>
</tr>
<tr>
<td>2018Apr#4</td>
<td>(David B., Steven M., Inna S.)</td>
<td>To brainstorm on means for a marketing campaign for the new SEMI E10 Part 2 webinar on the Related Information 2 example scenario, which is in progress. OPEN</td>
</tr>
</tbody>
</table>
1 Welcome, Reminders, and Introductions

Cochair Vladimir Kraz called the meeting to order at 15:02.

After welcoming all attendees, a round of introductions followed. The SEMI meeting reminders on membership requirements, antitrust, patentable technology, and meeting guidelines were then presented and explained by Vladimir Kraz.

Attachment 01: SEMI Standards Required Elements.ppt

2 Review of Previous Meeting Minutes

The TC Chapter reviewed and approved the minutes of the previous Spring 2018 Standards meeting.

Motion: To approve minutes as written.
By / 2nd: David Bouldin (Fab Consulting) / Koichi Yamamoto (Hitachi High-Tech)
Discussion: None
Vote: 7-0 in favor. Motion passed.

Inna Skvortsova reviewed the status of the previous meeting action items.

Attachment 02: NA Metrics TC Meeting Minutes (Spring 2018).pdf

3 SEMI Standards Staff Report

Inna Skvortsova (SEMI) gave the SEMI Staff Report. Of note:

SEMI Global 2018 Calendar of Events
- SEMICON West (July 10-12, 2018, San Francisco, California)
- SEMICON Taiwan (September 5-7, 2018, Taipei, Taiwan)
- SEMICON Europa (November 13-16, 2018, Munich, Germany)
- SEMICON Japan (December 12-14, 2017, Tokyo, Japan)

Upcoming North America Meetings
- NA Standards Fall 2018 Meetings (November 5-8, 2018, SEMI HQ, Milpitas, California)
- NA Standards Spring 2019 Meetings (April 1-4, 2019, SEMI HQ, Milpitas, California)
- SEMICON West 2019 Meetings (July 8-11, 2019, San Francisco, California)

Letter Ballot Critical Dates for NA Standards meetings
- Cycle 6-18: due July 20 / Voting Period: Aug 1 – Aug 31
- Cycle 7-18: due Aug 22 / Voting Period: Sep 5 – Oct 5


• SEMI Standards Publications
<table>
<thead>
<tr>
<th>Cycle</th>
<th>New</th>
<th>Revised</th>
<th>Reapproved</th>
<th>Withdrawn</th>
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</thead>
<tbody>
<tr>
<td>April 2018</td>
<td>0</td>
<td>9</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>May 2018</td>
<td>0</td>
<td>3</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>June 2018</td>
<td>2</td>
<td>14</td>
<td>11</td>
<td>0</td>
</tr>
</tbody>
</table>

Total SEMI Standards in portfolio: 987. Includes 236 Inactive Standards

<table>
<thead>
<tr>
<th>Cycle</th>
<th>Designation</th>
<th>Title</th>
<th>Committee</th>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 2018</td>
<td>SEMI C96</td>
<td>Test Method for Determining Density of Chemical Mechanical Polish (CMP) Slurries</td>
<td>Liquid Chemicals</td>
<td>NA</td>
</tr>
<tr>
<td>June 2018</td>
<td>SEMI D77</td>
<td>Test Method for Measurements of Dimension of Films for FPD – Contour Matching Method</td>
<td>Flat Panel Display</td>
<td>JA</td>
</tr>
</tbody>
</table>

- New Forms, Regulations & Procedure Manual
  - New version of *Regulations* (June 8, 2018)
  - New version of *Procedure Manual* (June 8, 2018)
  - New TFOF & SNARF
  - New Ballot Review Templates
  - www.semi.org/standards
  - Bottom left, under Resources!
  - Regulations & Procedure Manual Changes
    - Improvements on Rules for Handling of Patented Technology (*Regulations § 16.1-16.3*)
    - Patented Technology that might be material to the Standard is disclosed at the end stage of document development
      - Disclosed after the ballot is issued
      - Assessment for potential materiality and technical justifiability for inclusion shall be postponed to the next scheduled meeting.
    - A TF sometimes decides to use patented technology after it has started the document development project.
      - To require subsequent update of SNARF regarding use of Patented Technology and subsequent LOI process to ensure that TC Chapter agrees to the course of action recommended by the TF.
• Improvements on Rules for Handling of Copyright and Trademark (*Regulations* § 16.4)
  o Improvement on handling copyright process
  o New process for handling trademarks

  ▪ Additional Official Virtual TC Chapter Meeting Related Rules (*Regulations* ¶ 7.4.2 and § 9.5)
  • Loss of necessary infrastructure at the meeting location described in the Background Statement of the Letter Ballot
    o The necessary infrastructure (e.g., electrical power, internet connection, required software applications)
  • Procedure for Transition of Virtual Meeting (PM 4.3.6)
    o GTC Decision for Whether or Not to Adopt the Official Virtual TC Chapter Meeting

  ▪ Clarification on the Use of Editorial Changes a Standard or Safety Guideline (Regs § 8.9.5)
    • Two types, made independently from a Letter Ballot.
    • Both requires TC approval and subsequent A&R approval.
    • Type 1:
      o minor changes (i.e., corrections of obvious misspelling, formatting changes to comply with the Style Manual; corrections of capitalization, the use of italics, incorrect spacing);
    • Type 2:
      o those that introduce no change in technical content (e.g., changes to nontechnical information; insubstantial changes to existing Supplementary Materials; changes that reduce ambiguity; changes to eliminate an obvious technical content inconsistency; or adding/deleting/changing Notes or footnotes).

  ▪ Clarification on SNARF Revision vs. New SNARF (PM 2.2.6)
    • The SNARF should be revised if the Draft Document deviates technically from the scope described in the SNARF or changes in the ‘Intellectual Property Considerations’ section
    • New SNARF is required
      o expected result of activity changes from Line Item revision(s) to a major revision, or
      o scope change beyond modification of existing scope items (i.e., deleting existing or adding new scope items),
      o change of ballot type (e.g., reapproval to revision or vice versa), or
      o introduction of new Line Item(s)

• *SNARF(s) and TFOF approved* by GCS in between TC Chapter Meetings
  o None

• *SNARF 3 year status TC Chapter may grant a one-year extension:*
  o None
• **SNARFs to abolish at I&C TC meeting:**
  o None

• **Nonconforming Titles**
  o None

NOTE: Refer to Procedure Manual (PM) Appendix Table A4-1 and A4-2

• **Documents due for 5 Year Review**

<table>
<thead>
<tr>
<th>Name</th>
<th>Due for Review</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMI E135-0704</td>
<td>7/1/2017</td>
<td>Test Method for RF Generators to Determine Transient Response for RF Power Delivery Systems Used in Semiconductor Processing Equipment</td>
</tr>
<tr>
<td>SEMI E78-0912</td>
<td>9/1/2017</td>
<td>Guide to Assess and Control Electrostatic Discharge (ESD) and Electrostatic Attraction (ESA) for Equipment</td>
</tr>
<tr>
<td>SEMI E129-0912</td>
<td>9/1/2017</td>
<td>Guide to Assess and Control Electrostatic Charge in a Semiconductor Manufacturing Facility</td>
</tr>
<tr>
<td>SEMI E43-0813</td>
<td>08/21/2018</td>
<td>Guide for Electrostatic Measurements on Objects and Surfaces</td>
</tr>
<tr>
<td>SEMI E165-0813</td>
<td>8/30/2018</td>
<td>Guide for a Comprehensive Equipment Training System When Dedicated Training Equipment is not Available</td>
</tr>
<tr>
<td>SEMI E149-0314</td>
<td>3/14/2019</td>
<td>Guide for Equipment Supplier-Provided Documentation for the Acquisition and Use of Manufacturing Equipment</td>
</tr>
</tbody>
</table>

Attachment 03: SEMI Staff Report Metrics TC (July 2018).ppt

4 **Liaison Reports**

4.1 **Metrics Europe TC Chapter**

NONE. No changes since November 2016.

4.2 **Metrics Japan TC Chapter**

Report presented by Inna Skvortsova (SEMI staff). Of note:

Japan TC Chapter resumed activities after the long break.

• Leadership (change)
  o EMC Study Group – is discharged;

• Meeting Information
  o The TC Chapter has been inactive for five years and now restarted their activities.
  o Previous Meeting
    • May 18, 2018 at Japan Spring Meetings. SEMI Japan office, Tokyo
  o Next Meeting
• TC Chapter Activities
  o Ballot – NONE
  o New activities – NONE
  o Five-Year Review – NONE

• Task Force Highlights
  o The major activities in the Japanese Metrics Committee
  o To join the discussion from the North America
  o Now in RF Measurement Standards
  o May be more Standards in the future, ESD and more?
  o To be discussed for the future (from Japan TC Chair)
  o We need to consider what for the future in the Metrics framework
  o For the consideration, it is necessary to identify the framework
  o In the framework, we may see, such as Definitions of Metrics, Concepts of measurement, Measurement System, System of Measured Value, Quality of Measured Value, Quality of Measurement System, Method of Measurement, Analysis of measurement, Evaluation in the business, Evaluation in the science/technology, and more to be discussed.

Attachment 04: Metrics Japan TC Liaison (July 2018).ppt

4.3 Technical Editors Board (TEB) Report

David Bouldin (Fab Consulting) reported that TEB will resume activities in August 2018 to work on the ongoing project to revise the Style Manual.

Attachment: None

4.4 ESDA Liaison Report

None for this meeting. Update will be presented by Arnold S. at the next TC Chapter meeting after ESD Association will publish its most recent report in September 2018. Expected changes: new types of ionizers and a few new test measurement methods to be published by ESD association.

Action Item: (Arnold S.) To prepare and present ESDA Liaison Report at NA Fall Standards Meetings.

5 Ballot Review

NOTE 1: TC Chapter adjudication on ballots reviewed is detailed in the Audits & Review (A&R) Subcommittee Forms for procedural review. The A&R forms are available as attachments to these minutes. The attachment number for each balloted document is provided under each ballot review section below.

5.1 Ballot # R6184

The TC Chapter reviewed results for the Ballot # R6184, Revision to SEMI E135-0704 (Reapproved 0512), Test Method for RF Generators to Determine Transient Response for RF Power Delivery Systems Used in Semiconductor Processing Equipment.

The ballot is approved for publication. No additional action or motion is needed.
6 Subcommittee and Task Force Reports

6.1 EMC Task Force Report

Vladimir Kraz reported for the EMC Task Force. This report contained information on industry updates and review of TF current efforts:

- **Industry Update**
  - EMC / IEEE EMC Symposium, July 30 – August 3, 2018, Long Beach, CA
  - ESD / EOS/ESD Symposium and Standards, Reno, NV September 20-26, 2018, Reno, NV
    - Vladimir Kraz will be teaching ½ day Tutorials on EMI and EOS – inquire if interested
      vkraz@bested.com

- **Ballots/SNARFs**
  - None

- **Emerging Technology Review**
  - SEMI E176, as well as IRDS documents address geometries down to 7 nm. SEMI recently published technology briefs on geometries down to 3 nm
    - It would be good to have SEMI Standards leading the way rather than documenting what already happened
  - If any of our TF members have any experience with geometries smaller than 7 nm, your input would be most welcome on the subjects of all things EMI and EMC, including but not limited to:
    - Electrical overstress | Equipment precision requirements | Metrology specific needs
    | Anything else relevant

- **Upcoming Activities**
  - Promotion for SEMI E33 and E176 is needed in addition to published articles

Attachment 05: SEMI EMC Task Force Summary (July 2018)

**Action Item:** (Inna S.) To connect Vladimir with Natalie Shim (SEMI KR staff) regarding PCBA activities.

CLOSED.

6.2 ESD/ESC Task Force

Russell Fitzpatrick reported for the ESD/ESC Task Force. Of note:

- **Leadership change**
  - None

- **SNARFs proposal**
  - None

- **Ballots Adjudicated**
  - None

- **Upcoming Ballots (Cycle 7 2018)**
  - 6365 Line-item Revision to SEMI E78-0912, Guide to Assess and Control Electrostatic Discharge (ESD) and Electrostatic Attraction (ESA) for Equipment
  - 6364 Line-item Revision to SEMI E129-09-12, Guide to Assess and Control Electrostatic Charge in a Semiconductor Manufacturing Facility
• SEMI E78 and SEMI E129 are up for mandatory 5 year review
• IRDS updated ESD Guideline table to extend past 2018. E78 and E129 should be updated to reflect the change

• Upcoming Activities
  – SEMI E43-0813, Guide for Electrostatic Measurements on Objects and Surfaces
  • Due for 5 year review. TF will provide recommendation for the scope of revision by Fall 2018 Meetings.

Discussion: TC members discussed the ESDA organization success with creating training material, online webinars and face-to-face training sessions as a means for adoption of ESDA standards. Subject of accreditation has been brought up in relation to SDO’s credibility and recognition in the industry.

Action Item: (Vladimir K, Arnold S., Supika M.) Arnold and Vladimir to create summary/problem statement (in PPT format) to demonstrate ESDA success and how similar means can help SEMI with popularization of ESD/ESC related standard. Summary to be presented at NA Fall Standards Meetings in Nov. 2018. Supika can present this report to relevant audience at ISC Japan meeting in December 2018.

Attachment 06: SEMI ESD/ESC Task Force Summary (July 2018)

6.4 Equipment RAMP Metrics Task Force Report
Russell Fitzpatrick reported for the E-RAMP Metrics Task Force. Of note:
• Webinars overview of SEMI E10, E79, E58, and E116 (and how they work together) to enhance the application and correct usage of these existing Standards.
  – Overview of Metrics Global TC and Equipment Performance Standards
    • RECORDED & POSTED
  – Overview of E10
    • RECORDED & POSTED
  – Overview of E79
    • RECORDED & POSTED
  – Example Scenario and Calculations in E10, Part 1: States Transitions
    • RECORDED & POSTED
  – Sample Calculations in E10, Part 2: Fundamental Quantities and Metrics—Q2’18
    • PPT 100%, script 100%, production 95%
  – Sample Calculations in E79—On Hold
    • PPT 100%, script 0%, production 0%

• Upcoming Activities
  – SNARF for Revision to SEMI E10-0814E, Specification for Definition and Measurement of Equipment Reliability, Availability, and Maintainability (RAM) and Utilization
    • Due for 5-year review in Fall 2018
    • Potential addition of a Related Information section for recommendations on equipment group metrics

Attachment 07: SEMI Eqp RAMP TF Report (July 2018)
Action Item: (David B., Steven M., Inna S.) To brainstorm on means for a marketing campaign for the new SEMI E10 Part 2 webinar on the Related Information 2 example scenario, which is in progress.

6.4 Equipment COO Task Force Report
• No meeting / no updates.
• Co-Chair recommendation to assign “Inactive” status effective July 2018.

6.5 RF Measurements Task Force Report
Jay Osselburn presented the report for the RF Measurements Task Force. Of note:

• SNARFs proposals
  – None

• Ballots Results
  – R6184 Revision to SEMI E135-0704 (Reapproved 0512), *Test Method for RF Generators to Determine Transient Response*
    • Passed and approved for publication

• Future Activities
  – Load transient tests
  – Reliability/Availability of RF Generator/RF supply system
    • Application of E10 like metrics
  – Measurements, particularly modulation (e.g., RF measurements on modulated loads)
    • Measurement accuracy, definitions
  – Pulsing, Frequency Sweep, Arc Management
  – Issues/topics raised during revision to E135 that were not yet incorporated

Attachment 08: RF Measurements TF Report (July 2018)

7 Old Business
7.1 Standards Due for Five-Year Review.

Inna Skvortsova addressed the TC Chapter on this topic. Of note:

<table>
<thead>
<tr>
<th>Name</th>
<th>Due for Review</th>
<th>Title</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMI E135-0704</td>
<td>7/1/2017</td>
<td><em>Test Method for RF Generators to Determine Transient Response for RF Power Delivery Systems Used in Semiconductor Processing Equipment</em></td>
<td>RF Measurements TF balloted in Cycle 4-18</td>
</tr>
<tr>
<td>SEMI E78-0912</td>
<td>9/1/2017</td>
<td><em>Guide to Assess and Control Electrostatic Discharge (ESD) and Electrostatic Attraction (ESA) for Equipment</em></td>
<td>Assigned to ESD/ESC TF</td>
</tr>
<tr>
<td>SEMI E129-0912</td>
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<td><em>Guide to Assess and Control Electrostatic Charge in a Semiconductor Manufacturing Facility</em></td>
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<td>SEMI E43-0813</td>
<td>08/21/2018</td>
<td><em>Guide for Electrostatic Measurements on Objects and Surfaces</em></td>
<td>Assigned to ESD/ESC TF for review</td>
</tr>
<tr>
<td>SEMI E165-0813</td>
<td>8/30/2018</td>
<td><em>Guide for a Comprehensive Equipment Training System When Dedicated Training Equipment is not Available</em></td>
<td>TC co-Chair is reaching out to Cymer to support document review</td>
</tr>
<tr>
<td>SEMI E150-0314</td>
<td>3/14/2019</td>
<td><em>Guide for Equipment Training Best Practices</em></td>
<td>TC co-Chair is reaching out to Cymer to support document review</td>
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Action Item: (David B) To contact authors of SEMI E165, E150, E149 for 5 year review/revision recommendation or let documents go inactive when due by Regulations.

7.2 SNARFs Approaching Three-Year Review

The TC Chapter reviewed the SNARFs approaching the three-year document development period.

- No SNARFs needed extension.

8 New Business

8.1 New TFOFs Approval

- Critical Chamber Components (CCC) Test Methods Task Force
  - Task Force Leadership
    - Supika Mashiro (TEL)
  - Task Force Charter:
    - To ensure the critical chamber components (CCC) are suitable for being used for the type of production equipment and process application they are designed to be used in semiconductor device manufacturing;
    - To establish Test methods for ensuring that each critical non-process performance related characteristic of CCC is measured, recorded and reported in a uniform manner for better quality assurance and traceability in the event of process failure/defects increase.
  - Task Force Scope:
    - To develop Test Methods for measuring different type of contaminants (e.g., metals, particles, organics) on the wetted area of critical chamber components (CCC);
    - To develop Test Methods for measuring surface morphology of CCC;
    - To develop or expand existing Standards to address Test Methods for refurbished CCC parts;
    - May expand other characteristics of CCC as far as such characteristics are in common for across different process equipment types and/or models.

Motion: Move to authorize new Task for Critical Chamber Components (CCC) Test Methods under the leadership of Supika Mashiro (TEL)

By / 2nd: Supika Mashiro (TEL) / Vladimir Kraz (BestESD)

Discussion: The scope of the CCC Test Methods may be expanded, but now limited.

Vote: 6/0. Motion passed.

8.2 New SNARFs

- None

8.2 New Ballots

- Ballot #6365 for Line-item Revision to SEMI E78-0912, Guide to Assess and Control Electrostatic Discharge (ESD) and Electrostatic Attraction (ESA) for Equipment
- 6364 Line-item Revision to SEMI E129-09-12, Guide to Assess and Control Electrostatic Charge in a Semiconductor Manufacturing Facility
Motion: To authorize letter ballots # 6364 and #6365 for Cycle 7-2018 submission
By / 2nd: Russell Fitzpatrick (AMAT) / Vladimir Kraz (Best ESD)
Discussion: None.
Vote: 7-0. Motion passed.

9 Action Items Review
9.1 Previous Meeting(s) Action Items
Inna Skvortsova (SEMI) reviewed open action items. These can be found in the Previous Meeting(s) Action Items table at the beginning of these minutes.

9.2 New Action Items
Inna Skvortsova (SEMI) reviewed the new action items. These can be found in the New Action Items table at the beginning of these minutes.

Attachment 09: Metrics-Input from Japan

10 Next Meeting and Adjournment
The next meeting is scheduled for November 7, 2018 at SEMI HQ, CA. See http://www.semi.org/en/events for the current list of meeting schedules.

Having no further business, a motion was made to adjourn. Adjournment was at 17:50.

Respectfully submitted by:
Inna Skvortsova
Sr. Standards Coordinator
SEMI North America
Phone: 408-943-6996
Email: iskvortsova@semi.org

Minutes tentatively approved by:

<table>
<thead>
<tr>
<th>David Bouldin (Fab Consulting), Cochair</th>
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<tr>
<td>Vladimir Kraz (Best ESD), Cochair</td>
<td>Approved</td>
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Table 13 Index of Available Attachments

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>(Attachment 01) SEMI Standards Required Meeting Elements.ppt</td>
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<tr>
<td>(Attachment 02) NA Metrics TC Meeting Minutes (Spring 2018).pdf</td>
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<tr>
<td>(Attachment 03) SEMI Standards Staff Report Metric TC (July 2018).ppt</td>
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<td>(Attachment 04) Metrics Japan TC Liaison (July 2018)</td>
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<td>(Attachment 05) SEMI EMC Task Force Summary (July 2018)</td>
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<td>(Attachment 06) SEMI ESD Task Force Report (July 2018).ppt</td>
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<tr>
<td>(Attachment 08) RF TF Formation in NA Metrics (July 2018).ppt</td>
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<tr>
<td>(Attachment 09) Metrics - Input from Japan.ppt</td>
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#1 Due to file size and delivery issues, attachments must be downloaded separately. A .zip file containing all attachments for these minutes is available at www.semi.org. For additional information or to obtain individual attachments, please contact Inna Skvortsova at the contact information above.