

North America (N.A.) Chapter of Metrics Global Technical Committee Meeting Summary and Minutes

N.A. Standards Fall 2014 Meetings
Wednesday, November 05, 2014
2:00 PM – 5:00 PM Pacific Time
SEMI Headquarters in San Jose, California

Next N.A. Metrics TC Chapter Meeting

The next N.A. Metrics TC Chapter Meeting is tentatively scheduled for April 01, 2015 at SEMI Headquarters in San Jose, California in conjunction with the N.A. Standards Spring 2015 Meetings. See § 9 of these minutes for full tentative schedule of all N.A. Metrics Standards Meetings. Exact meeting date and details will be announced when finalized and available at <http://www.semi.org/node/54226>.

Table 1 Meeting Attendees

Cochairs: David L. Bouldin (Fab Consulting), Mark Frankfurth (Cymer)

SEMI Staff: Michael Tran

<i>Company</i>	<i>Last</i>	<i>First</i>	<i>Company</i>	<i>Last</i>	<i>First</i>
Applied Materials	Fitzpatrick	Russell	RistTex	Rist	Lance
Consultant	Busing	David	Intel	Steven	Meyer
Electronics Workshop	Steinman	Arnie			
Fab Consulting	Bouldin	David	SEMI N.A.	Tran	Michael

Note: *Italics indicates virtual participants.*

Table 2 Leadership Changes

None.

Table 3 Ballot Results

None.

Table 4 Authorized Activities

Listing of all new TFOFs, SNARFs, and other activities approved by the TC Chapter.

#	Type	TF	Details
5819	SNARF	N.A. Metrics TC Chapter	Reapproval of SEMI E114-0302E (Reapproved 0309) - <i>Test Method for RF Cable Assemblies Used in Semiconductor Processing Equipment RF Power Delivery Systems</i>
5820	SNARF	N.A. Metrics TC Chapter	Reapproval of SEMI E115-0302E (Reapproved 0309) - <i>Test Method for Determining the Load Impedance and Efficiency of Matching Networks Used in Semiconductor Processing Equipment RF Power Delivery Systems</i>

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

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

Table 5 Authorized Ballots

Listing of documents approved by the TC Chapter for letter ballot.

#	When	TF	Details
5819	Cycle 1 or 2, 2015	N.A. Metrics TC Chapter	Reapproval of SEMI E114-0302E (Reapproved 0309) - <i>Test Method for RF Cable Assemblies Used in Semiconductor Processing Equipment RF Power Delivery Systems</i>
5820	Cycle 1 or 2, 2015	N.A. Metrics TC Chapter	Reapproval of SEMI E115-0302E (Reapproved 0309) - <i>Test Method for Determining the Load Impedance and Efficiency of Matching Networks Used in Semiconductor Processing Equipment RF Power Delivery Systems</i>
5750	Cycle 1 or 2, 2015	Wait Time Waste (WTW) TF	Revision to Add a New Subordinate Standard: <i>Specification for Product Time Measurement for Material Control Systems</i> to SEMI E168-1114, <i>Specification for Product Time Measurement</i>
5751	Cycle 1 or 2, 2015	Wait Time Waste (WTW) TF	Revision to Add a New Subordinate Standard: <i>Specification for Product Time Measurement for Transport Systems</i> to SEMI E168-1114, <i>Specification for Product Time Measurement</i>

Table 6 New Actions Items

None.

Table 7 Previous Actions Items

Item #	Assigned to	Details	Status
2014Jul#01	Michael Tran	To create ballot adjudication motion template slides to help the N.A. Metrics TFs and Chapter.	OPEN
2014Jul#02	Vladimir Kraz and Michael Tran	To troubleshoot the conference calls for international participants or use another communication method with video for the next EMC TF meeting.	CLOSED
2014Jul#03	Vladimir Kraz and Michael Tran	To send new EMC TF members copies of Standards they need to effectively participate.	OPEN
2014Jul#04	Supika Mashiro	To look into an “E” document that’s related to AMHS.	OPEN
2014Jul#05	Lance Rist	To look into a possible Standards Technical Education Program (STEP) for the Wait Time Waste (WTW) documents (SEMI E168 and E168.x).	OPEN

1 Welcome, Reminders, and Introductions

1.1 David Bouldin (Fab Consulting) called the meeting to order at 2:06 PM Pacific Time. The meeting reminders on program membership requirements, antitrust issues, intellectual property issues, and holding meetings with international attendance were reviewed. Attendees introduced themselves.

Attachment: 01, SEMI Standards Required Meeting Elements

2 Review of Previous Meeting Minutes

2.1 The TC Chapter reviewed the minutes of the previous meeting from the N.A. Standards Meetings at SEMICON West 2014.

Motion: To approve the minutes of the previous meeting from the N.A. Standards Meetings at SEMICON West 2014 as written.

By / 2nd: David Busing (Consultant) / Russell Fitzpatrick (Applied Materials)

Discussion: None.

Vote: Unanimous in favor. Motion passed.

Attachment: 02, NA Metrics TC Chapter Meeting Minutes (West 2014)

3 Liaison Reports

3.1 *Europe Equipment Automation Committee*

3.1.1 Michael Tran (SEMI N.A.) reported for the Europe Equipment Automation (Metrics TC Chapter) Committee. The key items were as follows:

- Last Meeting:
 - Oct 8, 2014 – SEMICON Europa 2014 in Grenoble, France
- Next Meeting:
 - Oct 8, 2015 – SEMICON Europa 2014 in Dresden, Germany
- SEMI Europe contact, Andrea Busch, abusch@semi.org

Attachment: 03, EU Equipment Automation (Metrics) Report (Fall 2014)

3.2 *Japan Metrics TC Chapter*

3.2.1 David Bouldin (Fab Consulting) reported for the Japan Metrics TC Chapter. Supika Mashiro (Tokyo Electron) said there have been no Japan Metrics-related activities going on.

3.3 *Technical Editors Board*

3.3.1 David Bouldin (Fab Consulting) reported for the Technical Editors Board (TEB). Carolyn Busing continues on the TEB as she helped review SEMI E10 and E79. All the work of the TEB has been done through email. There is no update at the moment for the *Style Manual*, but the TEB is collecting feedback for the next update. The new revisions to the SEMI Standards *Regulations* and the *Procedure Guide* will be published at the end of the 2014 year. Please forward all feedback to David Bouldin (david.bouldin@sbcglobal.net) and Shannon Austin (saustin@semi.org).

3.4 *Technical Architects Board*

3.4.1 David Bouldin (Fab Consulting) report for the Technical Architects Board (TAB). There was no proposal to disband the TAB at the NA Regional Standards Committee (RSC).

3.5 *Electrostatic Discharge Association (ESDA) Liaison Report*

3.5.1 Arnie Steinman (Electronics Workshop) reported for the ESDA. The key items:

- ESD Industry Activities
 - ESDA and JEDEC are collaborating to release joint device test standards
 - They released The Human Body Model (HBM), which is available on the ESDA and JEDEC (www.jedec.org) Web sites
 - Possible collaboration with JEITA is being investigated
 - Work on the updated Charged Device Model (CDM) document is almost completed
- ESDA Web site (www.esda.org)

- The following documents are available for download on the ESDA Web site:
 - ANSI ESD S20.20 (*Static Control Program*)
 - *ESDA Glossary of Terms*
 - *ESD Technology Roadmap for Device ESD Sensitivity*
 - *STM 5.1– Human Body Model*
 - *STM 5.2 – Machine Model*
 - *STM 5.3.1 – Charged Device Model*
- ESD Standards meeting last held April 4-6, 2014 in Tucson, Arizona/USA
 - Next Standards meetings will be held in May 7-11, 2015 in Reno, Nevada/USA
 - Visit the ESDA Web site (www.esda.org) for more information

3.6 North America Standards Staff Report

3.6.1 Michael Tran (SEMI N.A.) gave the N.A. Standards Staff Report. The key items were as follows:

- Remaining SEMI Global Events in 2014
 - International Technology Partners Conference (ITPC)
 - November 9-12 in Big Island, Hawaii
 - Collaborative Alliance for Semiconductor Test (CAST) Workshop: Implementing Next Generation Data Logging
 - November 12-13 in San Jose, California
 - SEMI South America Semiconductor Strategy Summit
 - November 18-20 in Buenos Aires, Argentina
 - SEMICON Japan
 - December 3-5 in Tokyo
- Early SEMI Global Events in 2015
 - Industry Strategy Symposium
 - January 11-14 in Half Moon Bay, California
 - European 3D TSV Summit
 - January 19-21 in Grenoble, France
 - SEMICON Korea and LED Korea
 - February 4-6 in Seoul
 - ISS Europe
 - February 22-24 in Amsterdam, Netherlands
 - SEMICON China and FPD China
 - March 17-19 in Shanghai
 - LED Taiwan
 - March 25-28 in Taipei
- SEMI Standards Publications Statistics

- July 2014 – October 2014
 - New Standards: 8
 - Revised Standards: 29
 - Reapproved Standards: 2
 - Withdrawn Standards: 2
- Total SEMI Standards in portfolio: 917
 - Includes 108 Inactive Standards
- Upcoming N.A. Standards Meetings in 2015
 - N.A. Standards Spring 2015 Meetings
 - (Tentative) March 30 – April 2 at SEMI Headquarters in San Jose, California
 - N.A. Compound Semiconductor Materials TC Chapter Meeting at CS MANTECH 2015
 - (Tentative) May 20 in Scottsdale, Arizona
 - N.A. Standards Meetings at SEMICON West 2015
 - (Tentative) July 13-16 in San Francisco, California
- SEMI N.A. Standards staff contact: Michael Tran, mtran@semi.org

Discussion: None.

Attachment: 04, N.A. Standards Staff Report (Fall 2014)

4 Ballot Review

None.

5 Subcommittee and Task Force Reports

5.1 *Equipment Reliability, Availability, Maintainability and Productivity (RAMP) Metrics Task Force*

5.1.1 David Busing (Consultant) and Steve Meyer (Intel) reported for the Equipment RAMP Metrics TF. The TF reviewed Osram's presentation regarding implementing OEE and E10 for multi-path cluster tools. They had many useful questions and inputs.

5.1.2 The TF is currently working on SEMI E10 and SEMI E79 educational webinars. The first several webinars will be prerecorded with charged and live webinars to follow.

5.1.3 The TF has no new or updated SNARFs or ballot plans in the future.

Attachment: 05, Equipment RAMP Metrics Task Force Report (Fall 2014)

5.2 *Equipment Training and Documentation (T&D) Task Force*

5.2.1 David Bouldin (Fab Consulting) reported for the Equipment T&D TF. Of note:

- New TF business/projects for 2015
 - Develop a Simplified Technical English (STE) Standard for our industry or recommend adaptation of other industry standard
 - 450 mm (specifically for material handling such as industrial robotics)

- Development of Standard/Guide for establishing skills profiles for various levels of expertise needed for equipment maintenance activities

Attachment: 06, Equipment Training and Documentation Task Force Report (Fall 2014)

5.3 *Electromagnetic Compatibility (EMC) Task Force*

5.3.1 David Bouldin (Fab Consulting) reported for the EMC TF. The TF did not meet due to a schedule conflict and there was no update reported.

5.4 *Electrostatic Discharge / Electrostatic Charge (ESD/ESC) Task Force*

5.4.1 Arnie Steinman (Electronics Workshop) reported for the ESD/ESC TF. The TF discussed possibilities for new work and whether it should be postponed until 2016 when the documents will need to be updated. Of note:

- Issues to be addressed in the next update of E78 and E129
 - Including information in E78 and E129 on reticle sensitivity to electric fields developed for E163 – To be done earlier in the document so that it is easily accessible
 - Relationship between ESD device testing and ESD damage that occurs during manufacturing – new Related Information section presenting information about work at the ESD Association (ESDA)
 - New issues regarding Charged Board Event (CBE), Electrical Overstress (EOS), and Cable Discharge Events (CDE) - new Related Information section presenting information about work at the ESD Association (ESDA)
 - Add discharge current testing to E78 and E129 – alternative methods are being worked on by the ESDA and should be referenced
 - Can we add a recommended equipment list to E78 and E129? – A generic measurement equipment list could be added as a Related Information section
- Issues to be addressed in the next update of E163
 - Effect of equipotential bonding of extremely electrostatic sensitive (EES) items during manufacturing – more information needs to be gathered regarding experiments that confirm this phenomenon
 - Devise a test method to define damage to devices that occurs when the package becomes tribocharged, when the device is equipotentially bonded without a discharge occurring. Electric field stress on components internal to the device. No expertise or access to equipment to do this is currently available to the Task Force. Would need to happen at multiple sites to transition into a supported test method.
 - Add a Related Information section describing measurements made with the E-reticle that clarify reticle grounding issues.
- Issues to be addressed in the next update of E43
 - ESD event monitoring techniques and limitations – a section to be added to E43 at the next update
 - Partner with the EMC TF?
 - Faraday FOUP measurements – the device has turned out not to be commercially viable
 - Discharge time effects – conductors vs. insulators – a section to be added to the next E43 update
 - Add a recommended generic equipment list to E43
 - Is there equipment available to make measurements on 450 mm wafers? - Such equipment may exist, but is of limited application at present. Section in next update of E43 might address the issue

- Communicating ESD control requirements between design, device fabrication, and device manufacturing or utilization – a possible document to survey worldwide efforts to increase communication between the producers and users of semiconductor devices
- Next activities of the ESD TF
 - Participation has been low for more than two years
 - No pressing industry issues at this time requiring new documents
 - ITRS has become dormant. The TF has supplied information on electrostatic issues out to 2028.
 - All existing documents due for 5-year update in 2017-2018
 - TF to go inactive until July 2016, when it can start the review process for the existing documents E78, E129, E163, and E43.
 - Search for a new TF leader in the interim.

Attachment: 07, ESD Task Force Report (Fall 2014)

5.5 Wait Time Waste (WTW) Task Force

5.5.1 Lance Rist (RistTex) reported for the WTW TF. The TF discussed WTW applied to Automated Materials Handling Systems (AMHSs). Of note:

- There are three AMHS-type systems with three interfaces:
 - Material control system (MCS) (to factory information and control system [FICS]/manufacturing execution system [MES])
 - Transport (to MCS) – E82-based
 - Storage (to MCS) – E88-based
 - The first two will become new Standards (Document 5750 and 5751) and the third one may come later.
 - Document 5750 and 5751 approved for letter balloting in Cycle 1 or 2, 2015. See §7.2 of these minutes for details.

Attachment: 08, Wait Time Waste Task Force Report (Fall 2014)

6 Old Business

6.1 5-Year Review Update

6.1.1 The TC Chapter looked at Documents needed for five-year review:

<i>Document #</i>	<i>Document Title</i>	<i>Status</i>
SEMI E114-0302E (Reapproved 0309)	<i>Test Method for RF Cable Assemblies Used in Semiconductor Processing Equipment RF Power Delivery Systems</i>	Approved for Reapproval letter ballot in Cycle 1 or 2, 2015. See § 7 of these minutes for details.
SEMI E115-0302E (Reapproved 0309)	<i>Test Method for Determining the Load Impedance and Efficiency of Matching Networks Used in Semiconductor Processing Equipment RF Power Delivery Systems</i>	Approved for Reapproval letter ballot in Cycle 1 or 2, 2015. See § 7 of these minutes for details.

7 New Business

7.1 New SNARFs

7.1.1 The following SNARFs were submitted to the TC Chapter for approval:

#	Type	TF	Details
5819	SNARF	N.A. Metrics TC Chapter	Reapproval of SEMI E114-0302E (Reapproved 0309) - <i>Test Method for RF Cable Assemblies Used in Semiconductor Processing Equipment RF Power Delivery Systems</i>
5820	SNARF	N.A. Metrics TC Chapter	Reapproval of SEMI E115-0302E (Reapproved 0309) - <i>Test Method for Determining the Load Impedance and Efficiency of Matching Networks Used in Semiconductor Processing Equipment RF Power Delivery Systems</i>

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

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

Motion: To approve SNARF 5819.
By / 2nd: David Busing (Consultant) / Russell Fitzpatrick (Applied Materials)
Discussion: None.
Vote: Unanimous in favor. Motion passed.

Motion: To approve SNARF 5820.
By / 2nd: Russell Fitzpatrick (Applied Materials) / David Busing (Consultant)
Discussion: None.
Vote: Unanimous in favor. Motion passed.

7.2 Ballot Authorizations

Listing of documents approved by the TC Chapter for letter ballot.

#	When	TF	Details
5819	Cycle 1 or 2, 2015	N.A. Metrics TC Chapter	Reapproval of SEMI E114-0302E (Reapproved 0309) - <i>Test Method for RF Cable Assemblies Used in Semiconductor Processing Equipment RF Power Delivery Systems</i>
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5750	Cycle 1 or 2, 2015	Wait Time Waste (WTW) TF	Revision to Add a New Subordinate Standard: <i>Specification for Product Time Measurement for Material Control Systems</i> to SEMI E168-1114, <i>Specification for Product Time Measurement</i>
5751	Cycle 1 or 2, 2015	Wait Time Waste (WTW) TF	Revision to Add a New Subordinate Standard: <i>Specification for Product Time Measurement for Transport Systems</i> to SEMI E168-1114, <i>Specification for Product Time Measurement</i>

Motion: To approve the letter ballot of Document 5819 in Cycle 1 or 2, 2015.
By / 2nd: David Busing (Consultant) / Russell Fitzpatrick (Applied Materials)
Discussion: None.
Vote: Unanimous in favor. Motion passed.

Motion: To approve the letter ballot of Document 5820 in Cycle 1 or 2, 2015.
By / 2nd: David Busing (Consultant) / Russell Fitzpatrick (Applied Materials)
Discussion: None.
Vote: Unanimous in favor. Motion passed.

Motion: To approve the letter ballot of Document 5750 in Cycle 1 or 2, 2015.
By / 2nd: Lance Rist (Industry Consultant) / David Bouldin (Fab Consulting)
Discussion: None.
Vote: Unanimous in favor. Motion passed.

Motion: To approve the letter ballot of Document 5751 in Cycle 1 or 2, 2015.
By / 2nd: Lance Rist (Industry Consultant) / David Bouldin (Fab Consulting)
Discussion: None.
Vote: Unanimous in favor. Motion passed.

8 Action Item Review

8.1 *Open Action Items*

8.1.1 Michael Tran (SEMI N.A.) reviewed the open action items. These can be found in the Open Action Items table at the beginning of these minutes.

8.2 *New Action Items*

8.2.1 Michael Tran (SEMI N.A.) reviewed the new action items. These can be found in the New Action Items table at the beginning of these minutes.

9 Next Meeting and Adjournment

9.1 The next N.A. Metrics TC Chapter Standards Meetings are tentatively scheduled for March 30 – April 1, 2015 at SEMI Headquarters in San Jose, California in conjunction with the N.A. Standards Spring 2015 Meetings. Exact meeting date and details will be announced when finalized and available at <http://www.semi.org/node/54226>.

Tentative Schedule

Monday, March 30*

· Wait Time Waste (WTW) TF (3:00 PM - 6:00 PM)

Tuesday, March 31*

· Equipment T&D TF (9:00 AM – 12:00 PM Noon)
· EMC TF (5:00 PM – 7:00 PM)

Wednesday, April 1*

· Equipment RAMP Metrics TF (9:00 AM – 12:00 PM Noon)
· N.A. Metrics TC Chapter (2:00 PM – 5:00 PM)

*All times are in Pacific Time. Times and dates are subject to change without notice.

9.2 Having no further business, the N.A. Metrics TC Chapter Meeting held on November 5, 2014 in conjunction with the N.A. Standards Fall 2014 Meetings was adjourned at 4:20 PM.

Motion: To adjourn the N.A. Metrics TC Chapter Meeting held on November 5, 2014 in conjunction with the N.A. Standards Fall 2014 Meetings.

By / 2nd: David Busing (Consultant) / Russell Fitzpatrick (Applied Materials)

Discussion: None.

Vote: Unanimous in favor. Motion passed.

Respectfully submitted by:

Michael Tran
 Senior Standards Engineer
 SEMI North America
 Phone: 1-408-943-7019
 Email: mtran@semi.org

Minutes approved by:

David Bouldin (Fab Consulting), Cochair	February 24, 2015
Mark Frankfurth (Cymer), Cochair	

Table 8 Index of Available Attachments #1

#	Title	#	Title
01	SEMI Standards Required Meeting Elements	05	Equipment RAMP Metrics Task Force Report (Fall 2014)
02	NA Metrics TC Chapter Meeting Minutes (West 2014)	06	Equipment Training and Documentation Task Force Report (Fall 2014)
03	Europe Metrics Liaison Report (Fall 2014)	07	ESD Task Force Report (Fall 2014)
04	N.A. Standards Staff Report (Fall 2014)	08	Wait Time Waste Task Force Report (Fall 2014)

#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 Michael Tran at the contact information above.