

## North America Metrics TC Chapter Meeting Summary and Minutes

N.A. Standards Spring 2014 Meetings  
Wednesday, April 02, 2014  
2:00 PM – 6:00 PM PDST  
SEMI Headquarters in San Jose, California

### Next N.A. TC Chapter Meeting

The next N.A. Metrics standards meetings are tentatively scheduled for July 7 – 9, 2014 at the San Francisco Marriott Marquis Hotel in San Francisco, California in conjunction with the NA Standards SEMICON West 2014 Meetings. Exact meeting date and details will be announced when finalized and available at <http://www.semi.org/node/49446>

### 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>
BestESD Technical Services	Kraz	Vladimir	Intel	Steven	Meyer
Cymer	Frankfurth	Mark	Muratec	Yamamoto	Makoto
<i>Fab Consulting</i>	<i>Bouldin</i>	<i>David</i>	Nikon Precision	Venkat	Malathi
<i>Electronics Workshop</i>	<i>Steinman</i>	<i>Arnie</i>	SEMATECH	Ferrell	Jackie
Hitachi Kokusai	Mitsuhiro	Matsuda			
Industry Consultant	Rist	Lance	SEMI N.A.	Tran	Michael

**Note:** *Italics indicates virtual participants.*

### Table 2 Leadership Changes

None.

### Table 3 Ballot Results

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

**Failed** ballots and line items were returned to the originating task forces for re-work and re-balloting.

#	<i>Details</i>	<i>Committee Action</i>
5340	Revision to SEMI E10-0312, Specification for Definition and Measurement of Equipment Reliability, Availability, and Maintainability (RAM) and Utilization	<b>Passed</b> as balloted.
5341	Revision to SEMI E79-1106, Specification for Definition and Measurement of Equipment Productivity	<b>Passed</b> as balloted. Superclean.

### Table 4 Authorized Activities

There were no new activities.

### Table 5 Authorized Ballots

#	<i>When</i>	<i>TF</i>	<i>Details</i>
5682	Cycle 4, 2014	Wait Time Waste TF	Revision to SEMI E168-0114, Specification for Product Time Measurement
5683	Cycle 4, 2014	Wait Time Waste TF	Revision to SEMI E168.1-0114, Specification for Product Time Measurement in GEM 300 Production Equipment

### Table 6 New Action Items

There were no new action items.

### Table 7 Previous Meeting Actions Items

Item #	Assigned to	Details	Status
2013Oct#01	Jackie Ferrell	To obtain the copyright release letter for SEMATECH Document ID #: 96103186A-TF, <i>Guidelines for Manufacturing Equipment Reference Manuals</i>	CLOSED.
2013Oct#02	Michael Tran	Coordinate schedule for the next Wait Time Waste TF meetings during the NA Standards Spring 2014 Meetings	CLOSED.

## 1 Welcome, Reminders, and Introductions

1.1 Mark Frankfurth (Cymer) called the meeting to order at 2:04 PM PDT. 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 committee reviewed the minutes of the previous meetings from SEMICON West 2013 and Fall 2013.

**Motion:** To approve the minutes of the previous meetings from SEMICON West 2013 and Fall 2013 as written.

**By / 2<sup>nd</sup>:** Jackie Ferrell (SEMATECH) / Lance Rist (Industry Consultant)

**Discussion:** None.

**Vote:** 5-0 in favor. Motion passed.

**Attachment:** 02, NA Metrics TC chapter Meeting Minutes (SEMICON West 2013)

**Attachment:** 03, NA Metrics TC chapter Meeting Minutes (Fall 2013)

## 3 Liaison Reports

### 3.1 Europe Equipment Automation Committee

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

- Last Meeting:
  - Oct 9, 2013 – SEMICON Europa 2013, in Dresden, Germany
- Next Meeting:
  - Oct 2014 – SEMICON Europa 2014 in Grenoble, France
- Revision of E48 (Specification for SMIF Indexer Volume Requirement) TF
  - The TF discussed
  - Creating a SNARF for the E48 revision
  - Plans to name a TF leader soon
  - The E48 revision is to be submitted for balloting in cycle 7 or 8, 2014
- SEMI Europe contact, Andrea Busch, [abusch@semi.org](mailto:abusch@semi.org)

**Attachment:** 04, EU Equipment Automation Report (Spring 2014)

### 3.2 *Japan Metrics TC Chapter*

3.2.1 There was no report received.

### 3.3 *Technical Editors Board*

3.3.1 David Bouldin (Fab Consulting) reported for the Technical Editors Board. There were no meetings held since all the work was done through email. There is no update at the moment for the Style Manual, but the Board is collecting feedback for the next update. There are possible new revisions to the SEMI Standards *Regulations* and the *Procedure Guide* by SEMICON Japan 2014. Please forward all feedback to David bouldin ([david.bouldin@sbcglobal.net](mailto:david.bouldin@sbcglobal.net)) and Shannon Austin ([saustin@semi.org](mailto:saustin@semi.org)).

### 3.4 *Technical Architects Board*

3.4.1 Jackie Ferrell (SEMATECH) reported for the Technical Architects Board. She plans to submit a request to sunset the Technical Architects Board to the Regional Standards Committee at SEMICON West 2014.

### 3.5 *Electromagnetic Compatibility (EMC) / Electrostatic Discharge Association (ESDA) Liaison Report*

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

- EMC/ESD Industry Activities
  - The updated Charged Device Model (CDM) document is almost completed
- ESDA website ([www.esda.org](http://www.esda.org))
  - The Human Body Model (HBM) is completed and available on the ESDA and JEDEC ([www.jedec.org](http://www.jedec.org)) websites
  - The following document are available for download on the ESDA website:
    - 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 September 5-8, 2013 in Las Vegas NV, followed by the ESD Symposium September 8-12, 2013
    - Next Standards meetings (now only 2 per year) April 4-6, 2014 in Tucson AZ
      - Check the ESDA website for more information on future meetings

### 3.6 *SEMI N.A. Standards Staff Report*

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

- 2014 Global Calendar of Events
  - European 3D TSV Summit (January 21-22, Grenoble, France)

- SEMICON Korea / LED Korea (February 12-14, Seoul)
- SEMICON China (March 18-20, Shanghai)
- SEMICON Singapore (April 23-25, Marina Bay Sands)
- SEMICON Russia (May 14-15, Moscow)
- SEMI Advanced Semiconductor Manufacturing Conference [ASMC] (May 19-21, Saratoga Springs, New York)
- SEMICON West (July 8-10, San Francisco, California)
- SEMICON Taiwan (September 3-5, Taipei)
- SEMICON Europa / Plastic Electronics (October 7-9, Grenoble, France)
- SEMICON Japan (December 3-5, Tokyo)
- NA Standards Spring 2014 Meetings (March 31 – April 3)
  - Committees meeting at SEMI Headquarters (San Jose)
    - 3DS-IC | EHS | Facilities & Gases | Information & Control | Metrics | PV Materials
  - SEMI thanks Intel (Santa Clara) for hosting the PIC and Silicon Wafer meetings
- Upcoming North America Meetings (2014)
  - NA Compound Semiconductor Materials in conjunction with CS MANTECH 2014 (May 21, Denver, Colorado)
  - NA Standards Meetings at SEMICON West 2014 (July 7- 10, San Francisco, California)
  - NA Standards Fall 2014 Meetings (November 3-6, San Jose, California)
- Standards Publications Report
  - November 2013 Cycle
    - New Standards – 1, Revised Standards – 6, Reapproved Standards – 3, Withdrawn Standards – 0
  - December 2013 Cycle
    - New Standards – 2, Revised Standards – 11, Reapproved Standards – 4, Withdrawn Standards – 0
  - January 2014 Cycle
    - New Standards – 3, Revised Standards – 3, Reapproved Standards – 0, Withdrawn Standards – 1
  - February 2014 Cycle
    - New Standards – 4, Revised Standards – 5, Reapproved Standards – 0, Withdrawn Standards – 1
  - Total in portfolio – 901 (includes 99 Inactive Standards)
- Official SEMI Standards Groups
  - LinkedIn
    - <http://www.linkedin.com/groups/Official-SEMI-Standards-Group-1774298/about>
  - Twitter

- @SEMI\_standard

- SEMI N.A. Standards staff contact: Michael Tran, [mtran@semi.org](mailto:mtran@semi.org)

**Attachment:** 05, SEMI North America Standards Staff Report (Spring 2014)

#### 4 Ballot Review

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

#	Details	Committee Action
5340	Revision to SEMI E10-0312, Specification for Definition and Measurement of Equipment Reliability, Availability, and Maintainability (RAM) and Utilization	<b>Passed</b> as balloted.
5341	Revision to SEMI E79-1106, Specification for Definition and Measurement of Equipment Productivity	<b>Passed</b> as balloted. Superclean.

**Motion:** Document 5340 passed committee review as balloted and will be forwarded to the A&R SC for procedural review.

**By / 2<sup>nd</sup>:** Steve Meyer (Intel) / Jackie Ferrell (SEMATECH)

**Discussion:** None

**Vote:** 6-0 in favor. Motion passed.

**Attachment:** 06, Procedural Review form for Document 5340

**Motion:** Document 5341 passed committee review as balloted and will be forwarded to the A&R SC for procedural review.

**By / 2<sup>nd</sup>:** Steve Meyer (Intel) / Jackie Ferrell (SEMATECH)

**Discussion:** None

**Vote:** 6-0 in favor. Motion passed.

**Attachment:** 07, Procedural Review form for Document 5341

#### 5 Subcommittee and Task Force Reports

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

5.1.1 Steve Meyer (Intel) reported for the Equipment RAMP Metrics TF. The TF reviewed the ballot results for Document 5340, Revision to SEMI E10 (Equipment Reliability, Availability, and Maintainability) and Document 5341, Revision to SEMI E79 (Equipment Productivity). See §4 of these minutes for the committee adjudication details.

5.1.2 The TF will begin developing new education materials for Document 5340 and 5341. If document 5340 is approved and published, the TF plans to submit a new SNARF at the next SEMICON West meetings for additional minor revision of SEMI E10 (e.g., terminology clarity). The Chapter suggested there might low attendance for a Standards Technical Education Program at SEMICON West 2014 and suggested doing a webinar or a workshop.

**Attachment:** 08, Equipment RAMP Metrics Task Force Report (Spring 2014)

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

5.2.1 Malthi Venkat (Nikon) reported for the Equipment T&D TF. The TF announced the revisions made to SEMI E149 (Equipment Supplier-Provided Documentation for the Acquisition and Use of Manufacturing Equipment) and SEMI E150 (Equipment Training Best Practices) is pending publication. The TF will discuss possible new activities when they meet again at SEMICON West 2014.

**Attachment:** 09, Equipment Training and Documentation Task Force Report (Spring 2014)

## 5.3 *Electromagnetic Compatibility (EMC) Task Force*

5.3.1 Vladimir Kraz (BestESD Technical Services) reported for the EMC TF. The TF discussed the following items:

- Industry Activities
  - European EMC Directive Recast is nearly complete
  - ESDA Standards Meeting April 2014, in Tucson, AZ
  - The Electrical Overstress (EOS) Standards Task Force is active
    - Part of the TF focus is Electromagnetic interference caused by EOS
  - ESD Symposium: September 7-12, 2014, Tucson, AZ
  - ESD Symposium on Factory Issues: October 30-31 Munich, Germany
  - IEEE EMC Symposium: August 3-8, Raleigh, NC
- TF Discussions
  - Introductory discussion on Electromagnetic Interference (EMI) issues in FAB environment and direction of new document
  - Discussion on specifics of EMI environment on the FAB level and inside the tools
  - New representation from Asia – more to join

**Attachment:** 10, EMC Task Force Report (Spring 2014)

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

5.4.1 Arnie Steinman (Electronics Workshop) reported for the Electrostatic Discharge / Electrostatic Charge (ESD/ESC) Task Force. Some key items of note:

- Possible new activities by the TF
  - Address SEMI E78 (Electrostatic Discharge (ESD) and Electrostatic Attraction (ESA) for Equipment) issues for 300 mm and 450 mm
    - Discharge time effects – conductors vs. insulators
    - ESD event monitoring techniques and limitations
      - Refer to SEMI E43 (Electrostatic Measurements on Objects and Surfaces)?
  - Devise a test method to define damage to devices that occurs when the package becomes tribocharged, equipotentially bonded without a discharge occurring and electric field stress on components internal to the device.
- Work by others to include in future documents:

- New issues regarding Charged Board Event (CBE), Electrical Overstress (EOS), and Cable Discharge Events (CDE)
- Add discharge current testing to SEMI E78 and SEMI E129 (Electrostatic Charge in a Semiconductor Manufacturing Facility)
- Relationship between ESD device testing and ESD damage that occurs during manufacturing
- Other activities
  - Including information in SEMI E78 and SEMI E129 on reticle sensitivity to electric fields developed for SEMI E163(Extremely Electrostatic Sensitive (EES))
    - It is delayed until more data is available
  - Effect of equipotential bonding of Extremely Electrostatic Sensitive (EES) items during manufacturing
    - Discussion postponed to next meeting
  - Some questions:
    - Can we add a recommended equipment list to E43, E78, and E129?
    - Is there equipment available to make measurements on 450 mm wafers?

**Attachment:** 11, ESD/EMC Task Force Report (Spring 2014)

### 5.5 Wait Time Waste (WTW) Task Force

5.5.1 Lance Rist (Industry Consultant) and Jackie Ferrell (SEMATECH) reported for the WTW TF. The TF letter balloted Document 5682 and 5683 to revise SEMI E168 (Product Time Management) and SEMI E158.1 (Product Time Management GEM 300) for Cycle 4, 2014. Most revisions are editorial in nature and a few changes have minor technical impacts. No significant concepts will be changed.

**Attachment:** 12, Wait Time Waste Task Force Report (Spring 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 E79-1106	<i>Specification for Definition And Measurement of Equipment Productivity</i>	Document passed committee review as balloted. See § 4 for adjudication details.
SEMI E114-0302E (Reapproved 0309)	<i>Test Method for RF Cable Assemblies Used in Semiconductor Processing Equipment RF Power Delivery Systems</i>	Pending review.
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>	Pending review.

<i>Document #</i>	<i>Document Title</i>	<i>Status</i>
SEMI E149-0708	<i>Guide for Equipment Supplier-Provided Documentation for the Acquisition and Use of Manufacturing Equipment</i>	Pending publication.
SEMI E150-1107	<i>Guide for Equipment Training Best Practices</i>	Pending publication.

## 7 New Business

### 7.1 New Ballots Submission

7.1.1 The following Documents were submitted for Letter Ballot to the TC Chapter for approval:

<i>#</i>	<i>When</i>	<i>TF</i>	<i>Details</i>
5682	Cycle 4, 2014	Wait Time Waste TF	Revision to SEMI E168-0114, Specification for Product Time Measurement
5683	Cycle 4, 2014	Wait Time Waste TF	Revision to SEMI E168.1-0114, Specification for Product Time Measurement in GEM 300 Production Equipment

**Motion:** To approve the letter ballot submissions of Documents 5682 and 5683 in Cycle 4-2014.

**By / 2<sup>nd</sup>:** Jackie Ferrell (SEMATECH) / David Bouldin (Fab Consulting)

**Discussion:** None

**Vote:** 6-0 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 standards meetings are tentatively scheduled for July 7 – 9, 2014 at the San Francisco Marriott Marquis Hotel in San Francisco, California in conjunction with the NA Standards SEMICON West 2014 Meetings. Exact meeting date and details will be announced when finalized and available at <http://www.semi.org/node/49446>

### \*Tentative Schedule\*

#### Monday, July 7\*

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

#### Tuesday, July 8\*

- Equipment T&D TF (9:00 AM – 12:00 PM Noon)
- ESD/ESC TF (1:30 PM – 3:30 PM)
- EMC TF (5:00 PM – 7:00 PM)



**Wednesday, July 9\***

- 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 PST. Times and dates are subject to change without notice.

For meeting details, registration, the latest schedule, and travel information please visit

<http://www.semi.org/node/49446>

9.2 Having no further business, a motion was made to adjourn the N.A. Metrics TC Chapter meeting on April 02, 2014 in conjunction with the N.A. Standards Spring 2014 Meetings at SEMI Headquarters in San Jose, California. The meeting adjourned at 3:25 PM PDT.

**Motion:** To adjoin the NA Metrics TC Chapter Meeting in conjunction with the NA Standards Spring 2014 Meetings.

**By / 2<sup>nd</sup>:** Vladimir Kraz (BestESD Technical Services) / Steve Meyer (Intel)

**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	
Mark Frankfurth (Cymer), Cochair	

**Table 8 Index of Available Attachments #1**

#	Title	#	Title
01	SEMI Standards Required Meeting Elements	07	Procedural Review form for Document 5341
02	NA Metrics TC chapter Meeting Minutes (SEMICON West 2013)	08	Equipment RAMP Metrics Task Force Report (Spring 2014)
03	NA Metrics TC chapter Meeting Minutes (Fall 2013)	09	Equipment Training and Documentation Task Force Report (Spring 2014)
04	EU Equipment Automation Report (Spring 2014)	10	EMC Task Force Report (Spring 2014)
05	SEMI North America Standards Staff Report (Spring 2014)	11	ESD/EMC Task Force Report (Spring 2014)
06	Procedural Review form for Document 5340	12	Wait Time Waste Task Force Report (Spring 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](http://www.semi.org). For additional information or to obtain individual attachments, please contact Michael Tran at the contact information above.