North America Physical Interfaces & Carriers Committee  
Meeting Summary and Minutes  

North America Standards Spring 2014 Meetings  
Wednesday, 02 April 2014, 9:00 AM – 12:00 PM PST  
Intel Headquarters in Santa Clara, California

Next Committee Meeting
The next N.A. Physical Interfaces & Carriers 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/en/node/49446

Table 1 Meeting Attendees
Co-Chairs: Matt Fuller (Entegris) / Mutaz Haddadin (Intel)  
SEMI Staff: Michael Tran

<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>Acteon Corporation</td>
<td>Komatsu</td>
<td>Shoji</td>
<td>Shimizu Consulting</td>
<td>Shimizu</td>
<td>Yasuhiro</td>
</tr>
<tr>
<td>DPS Engineering</td>
<td>Sanders</td>
<td>Chris</td>
<td>Shin-Etsu Polymer</td>
<td>Kashimoto</td>
<td>Akira</td>
</tr>
<tr>
<td>Entegris</td>
<td>Fuller</td>
<td>Matt</td>
<td>SUMCO</td>
<td>Nakai</td>
<td>Tetsuya</td>
</tr>
<tr>
<td>Intel</td>
<td>Haddadin</td>
<td>Mutaz</td>
<td>TEL</td>
<td>Mashiro</td>
<td>Supika</td>
</tr>
<tr>
<td>Intel</td>
<td>Quinn</td>
<td>Tom</td>
<td>U.A. Associates</td>
<td>Hartsough</td>
<td>Larry</td>
</tr>
<tr>
<td>KLA-Tencor</td>
<td>Crockett</td>
<td>Alan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muratec</td>
<td>Yamamoto</td>
<td>Makoto</td>
<td>SEMI N.A.</td>
<td>Tran</td>
<td>Michael</td>
</tr>
</tbody>
</table>

*Italics indicates virtual participants

Table 2 Leadership Changes

<table>
<thead>
<tr>
<th>Group</th>
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<th>New Leader</th>
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<tbody>
<tr>
<td>NA Physical Interfaces &amp; Carriers TC Chapter</td>
<td>Mutaz Haddadin (Intel), co-chair</td>
<td>Stefan Radloff (Intel), new co-chair</td>
</tr>
<tr>
<td>International 450 mm Physical Interfaces &amp; Carriers TF</td>
<td>Mutaz Haddadin (Intel), TF Leader</td>
<td>Melvin Jung (Intel), new TF co-leader</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Document #</th>
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<tr>
<td>5676</td>
<td>Line Item Revisions to SEMI E83-0413, Specification for PGV Mechanical Docking</td>
<td>Passed as balloted.</td>
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<tr>
<td></td>
<td>Flange</td>
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</tr>
<tr>
<td></td>
<td>Line Item 1 Revision to § R1-1.10</td>
<td>Passed as balloted.</td>
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<td>5069A</td>
<td>New Standard: Specification for 450 mm Wafer Shipping System</td>
<td>Failed committee review.</td>
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Document reviewed by the committee outside of the balloting process:

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<td>5690</td>
<td>Revision to SEMI AUX023-1113, Overview Guide to SEMI Standards for 450 mm</td>
<td>Passed committee review with editorial changes</td>
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<tr>
<td></td>
<td>Wafer Systems</td>
<td></td>
</tr>
</tbody>
</table>
Table 4 Authorized Activities

<table>
<thead>
<tr>
<th>#</th>
<th>Type</th>
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<td>PIC Global</td>
<td>Reapproval of SEMI E72-0600 (Reapproved 0305), Specification and Guide for 300 mm Equipment Footprint, Height, and Weight</td>
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<td></td>
<td></td>
<td>Maintenance TF</td>
<td></td>
</tr>
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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

<table>
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Table 6 New Action Items

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<th>Assigned to</th>
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<tr>
<td>2014Apr#01</td>
<td>Michael Tran</td>
<td>Email a notice to Shoji Komatsu that SEMI E72 will be letter balloted as a reapproval ballot in Cycle 3 or 4, 2014.</td>
</tr>
<tr>
<td>2014Apr#02</td>
<td>Michael Tran</td>
<td>Send Chris Sanders SEMI E6 and SEMI E72 for 5 year reviews.</td>
</tr>
<tr>
<td>2014Apr#03</td>
<td>Larry Hartsough</td>
<td>Larry check with Shoji Komatsu regarding SEMI E92 and SEMI E110 due for 5 year review since they are owned by Japan.</td>
</tr>
<tr>
<td>2014Apr#04</td>
<td>Michael Tran</td>
<td>Email Larry Hartsough the list of documents due for 5 year reviews.</td>
</tr>
</tbody>
</table>

Table 7 Previous Meeting Actions Items

<table>
<thead>
<tr>
<th>Item #</th>
<th>Assigned to</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013Oct#01</td>
<td>Michael Tran</td>
<td>Check with Larry Hartsough whether to reapprove or leave SEMI E72 (300 mm Equipment footprint, Height, and Weight) or alone as is.</td>
</tr>
<tr>
<td>2013Oct#02</td>
<td>Michael Tran</td>
<td>Forward the new consolidated Global PIC charter to the PIC Global Coordinating Subcommittee for review and approval.</td>
</tr>
</tbody>
</table>

1 Welcome, Reminders, and Introductions

1.1 Matt Fuller (Entegris) called the meeting to order. The meeting reminders on 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 meeting.

Motion: To approve the previous meeting minutes as written.

By / 2nd: Larry Hartsough (U.A. Associates) / Chris Sanders (DPS Engineering)

Discussion: None.

Vote: 8-0 in favor. Motion passed.

Attachment: 02, N.A. PIC 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 EU contact: Andrea Busch (abusch@semi.org)

Attachment: 03, Europe Equipment Automation Committee Report (Spring 2014)

3.2 Japan Physical Interfaces & Carriers Committee

3.2.1 Michael Tran (SEMI N.A.) reported for the Japan Physical Interfaces & Carriers Committee. The key items were as follows:

- Meeting information
  - Last meeting
    - Japan Winter 2013 Meetings in conjunction with SEMICON Japan 2013 December 6, 2013 at Makuhari Messe in Chiba, Japan
  - Next meeting
    - Japan Spring 2014 Meetings on April 18, 2014 at SEMI Japan, in Tokyo, Japan

- Japan Physical Interfaces & Carriers Task Force reports
  - 450 mm AMHS Task Force
    - Doc. 5524, Revision to SEMI E156-0710, “Mechanical Specification for 450 mm AMHS Stocker to Transport Interface, with title change to Mechanical Interface Specification for 450 mm AMHS Stocker to Transport Equipment”
      - The document has been postponed until further notice
    - Doc. 5632, New Standard: “Specification for Signal Tower for 450mm AMHS”
      - The activity is under suspension.
Fiducial Mark Interoperability Task Force

- Originating Global Technical Committee:
  - Traceability / Silicon Wafer / Physical Interfaces & Carriers /Assembly & Packaging / Information & Control
- Originating TC Chapter Region/Locale:
  - Japan
- Kick off meeting was held on December 3, 2013 with 23 attendees
  - Shared current fiducial mark development status at G450C based on G450C/F450C Standard Workshop presentation
  - Discussed potential areas for Standardization
    - Recognized potential need for communication of Fiducial Mark condition/readability information but not reached any conclusion.
  - Next meeting: TBD

- International 450 mm Physical Interfaces & Carriers Task Force / International Process Module Physical Interface (IPPI) TF
  - The TF is working on Document 5626, Revision to SEMI E154 (450 mm Loadport) and SEMI E166 (450 mm Cluster Module Interface)
    - To be reviewed at PI&C Japan TC meeting on April 18, 2014
  - International Reticle SMIF Pod and LP Interoperability TF
    - The TF discussed the possibility of adding purge locations to the SMIF documents as stated in the TF charter
    - If the TF add the purge locations, a survey will be sent to the industry
  - SEMI Japan contact: Chie Yanagisawa (cyanagisawa@semi.org)

Attachment: 04, Japan Physical Interfaces & Carriers Report (Spring 2014)

3.3 SEMI N.A. Staff Report

3.3.1 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)
o SEMICON Taiwan (September 3-5, Taipei)
o SEMICON Europa / Plastic Electronics (October 7-9, Grenoble, France)
o SEMICON Japan (December 3-5, Tokyo)

- NA Standards Spring 2014 Meetings (March 31 – April 3)
  o Committees meeting at SEMI Headquarters (San Jose)
    ▪ 3DS-IC | EHS | Facilities & Gases | Information & Control | Metrics | PV Materials
  o SEMI thanks Intel (Santa Clara) for hosting the PIC and Silicon Wafer meetings

- Upcoming North America Meetings (2014)
  o NA Compound Semiconductor Materials in conjunction with CS MANTECH 2014 (May 21, Denver, Colorado)
  o NA Standards Meetings at SEMICON West 2014 (July 7-10, San Francisco, California)
  o NA Standards Fall 2014 Meetings (November 3-6, San Jose, California)

- Standards Publications Report
  o November 2013 Cycle
    ▪ New Standards – 1, Revised Standards – 6, Reapproved Standards – 3, Withdrawn Standards – 0
  o December 2013 Cycle
    ▪ New Standards – 2, Revised Standards – 11, Reapproved Standards – 4, Withdrawn Standards – 0
  o January 2014 Cycle
    ▪ New Standards – 3, Revised Standards – 3, Reapproved Standards – 0, Withdrawn Standards – 1
  o February 2014 Cycle
    ▪ New Standards – 4, Revised Standards – 5, Reapproved Standards – 0, Withdrawn Standards – 1
  o Total in portfolio – 901 (includes 99 Inactive Standards)

- SEMI Major Events in 2013
  o LinkedIn
    ▪ http://www.linkedin.com/groups/Official-SEMI-Standards-Group-1774298/about
  o Twitter
    ▪ @SEMI_standard

- SEMI N.A. Standards staff contact: Michael Tran, mtran@semi.org

Attachment: 05, SEMI 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 action below.

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<td>Line Item 1</td>
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<td>5069A</td>
<td>New Standard: Specification for 450 mm Wafer Shipping System</td>
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<tr>
<td>5690</td>
<td>Revision to SEMI AUX023-1113, Overview Guide to SEMI Standards for 450 mm Wafers</td>
<td><strong>Passed</strong> committee review with editorial changes</td>
</tr>
</tbody>
</table>

Motion: Line item 1 of Document #5676 passed committee review as balloted and will be forwarded to the A&R for procedural review.

By / 2nd: Alan Crockett (KLA-Tencor) / Larry Hartsough (U.A. Associates)

Discussion: None.

Vote: 5-0 in favor. Motion passed.

Attachment: 06, Procedural Review A&R Form for Document #5676

Motion: Document #5069A failed committee review and will be returned to the TF for rework.

By / 2nd: Supika Mashiro (TEL) / Tom Quinn (Intel)

Discussion: None.

Vote: 8-0 in favor. Motion passed.

Attachment: 07, Ballot Review Summary for Document #5069A

Motion: Document #5690 passed committee review with editorial changes and will be forwarded to the A&R for procedural review.

By / 2nd: Alan Crockett (KLA-Tencor) / Makoto Yamamoto (Muratec)

Discussion: None.

Vote: 7-0 in favor. Motion passed.

Attachment: 08, Procedural Review A&R Form for Document #5690

5 Subcommittee & Task Force Reports

5.1.1 Joint International 450 mm Physical Interfaces & Carriers Task Force (450 mm IPIC TF) / International Process Module Physical Interface Task Force (IPPI TF)

5.1.2 The TF reviewed the ballot results for the following documents:

- Document 5626, Line Item Revisions to SEMI E154-0713, Mechanical Interface Specification for 450 mm Load Port AND to SEMI E166-0513, Specification for 450 mm Cluster Module Interface: Mechanical Interface and Transport Standard for addition of EFEM Pocket
Document 5626 will be reviewed at the next Japan PIC TC Chapter meeting
- The TF will make editorial changes to clarify the wording of the increase of the wafer transfer plane height in regards to the comments received for the document

- **Document 5676, Line Item Revisions to SEMI E83-0413, Specification for PGV Mechanical Docking Flange**
  - Alan Crockett (KLA-Tencor) withdrew his reject vote because it was a mistake and it was intended for another document
  - The document passed committee review

- **Document 5690, Revision to AUX 023, Revision to SEMI AUX023-1113, Overview Guide to SEMI Standards for 450 mm Wafers**
  - Document was unanimously approved by the NA PIC TC
  - Stefan Radloff (Intel) suggested adding the 450 mm Frame Carrier and Frame Carrier Loadport documents from the Assembly & Packaging committee
    - These documents are now own by the PIC Technical Committee
    - Shoji Komatsu will add these documents in the next revision of AUX 023

**Attachment:** 09, Joint 450 mm IPIC TF and IPPI TF Report (Spring 2014)

### 5.2 International and N.A. 450 mm Shipping Box Task Force

#### 5.2.1 Tom Quinn (Intel) reported for the International and N.A. 450 mm Shipping Box Task Force. Of note:

  - The TF reviewed and discussed the ballots results of Doc. #5069A, Specification for 450 mm Wafer Shipping System
    - Primary issues with Document 5069A revolve around:
      - Front Opening Shipping Box (FOSB) functional requirements need to be removed from Doc. 5069A and documented in only one Standard (SEMI M80, Mechanical Specification for Front-Opening Shipping Box Used to Transport and Ship 450 mm Wafers)
      - Documentation of the requirements beyond the document scope of the shipping system
      - There were content that attempts to specify Business Model items that belong in customer/supplier contracts
      - TF came to a better understanding and tentative agreement on the first item
      - Additional feedback and specific wording recommendations being made on the remaining items
    - The document was failed by the committee and will be reworked at the next Japan PIC meeting

**Attachment:** 10, International and N.A. 450mm Shipping Box Task Force Report (Spring 2014)

### 5.3 Global PIC Maintenance Task Force

#### 5.3.1 The TF discussed SEMI E72, Specification and Guide for 300 mm Equipment Footprint, Height, and Weight

- SEMI E72 is long overdue for 5 year review
  - The NA Facilities and Gases TC is assisting to update SEMI E72
The committee approve SEMI E72 for reapproval ballot (Doc. #5711) while the TF work with the NA Facilities and Gases committee

Future plans and activities to update SEMI E72:

- Implementing Building Information Modeling for tool modeling and floor plans
- Future joint TF between the NA PIC TC Chapter and NA Facilities & Gases TC Chapter
- Address issues such as variations in fab layout, factory, ceiling height, moving weight, and ergonomics for the equipment
- Standardization of definitions, concepts, and interfaces with input from suppliers, vendors and end users
- Revise SEMI E6 (Semiconductor Equipment Installation) and SEMI E52 (Facilities Services) at the same time

Action Item: 2014Apr#01, Michael Tran to email a notice to Shoji Komatsu that SEMI E72 will be letter balloted as a reapproval ballot in Cycle 3 or 4, 2014.

Action Item: 2014Apr#02, Michael Tran to send Chris Sanders SEMI E6 and SEMI E72 for 5 year reviews.

5.4 International Reticle SMIF Pods and Load Ports Interoperability Task Force

5.4.1 There was no report given.

5.5 EUV Reticle Handling Task Force

5.5.1 There was no report given.

5.6 N.A. 450 mm Automated Test Die Prep Task Force

5.6.1 There was no report given.

6 Old Business

6.1 Update on SEMI E72

6.1.1 See § 5.3, Global PIC Maintenance Task Force of these minutes.

6.2 Updates for Documents Due for Five Year Reviews

<table>
<thead>
<tr>
<th>#</th>
<th>Details</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMI E110-1102</td>
<td>Guideline for Indicator Placement Zone and Switch Placement Volume of Load Port Operation Interface for 300 mm Load Ports</td>
<td>Japan review.</td>
</tr>
<tr>
<td>(Reapproved 0709)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEMI E131-0304</td>
<td>Specification for the Physical Interface of an Integrated Measurement Module (IMM) into 300 mm Tools Using Bolts-M</td>
<td>To be reviewed.</td>
</tr>
<tr>
<td>(Reapproved 0310)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEMI E15-0698E2</td>
<td>Specification for Tool Load Port</td>
<td>To be reviewed.</td>
</tr>
<tr>
<td>(Reapproved 0310)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEMI E21-94</td>
<td>Cluster Tool Module Interface: Mechanical Interface and Wafer Transport Standard</td>
<td>To be reviewed.</td>
</tr>
<tr>
<td>(Reapproved 0309)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEMI E22-0697</td>
<td>Cluster Tool Module Interface: Transport Module End Effector Exclusion Volume Standard</td>
<td>To be reviewed.</td>
</tr>
<tr>
<td>(Reapproved 0309)</td>
<td></td>
<td></td>
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</table>
### Action Item:

2014Apr#03, Larry Hartsough to check with Shoji Komatsu regarding SEMI E92 and SEMI E110 due for 5 year review since they are owned by Japan.

### Action Item:

2014Apr#04, Michael Tran to email Larry Hartsough the list of documents due for 5 year reviews.

### 7 New Business

#### 7.1 Leadership Change

7.1.1 Mutaz Haddadin (Intel) will be stepping down as the NA PI&C TC Chapter co-chair and as the TF leader of the International 450 mm Physical Interfaces & Carriers TF effective at the next NA PI&C TC Chapter meeting at SEMICON West 2014. Stefan Radloff (Intel) was nominated and approved by the committee as the new chapter co-chair pending further approval from the NA Regional Standards Committee at SEMICON West 2014. Melvin Jung (Intel) was nominated as the new TF co-leader and will be approved at the next chapter meeting.

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<td>Mutaz Haddadin (Intel), TF co-leader</td>
<td>Melvin Jung (Intel), new TF co-leader</td>
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</table>

**Motion:** To approve recommending Stefan Radloff (Intel) as the new NA PI&C TC Chapter co-chair effective at the next chapter meeting.

**By / 2nd:** Larry Hartsough (U.A. Associates) / Alan Crockett (KLA-Tencor)

**Discussion:** None

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

#### 7.2 New SNARFs

7.2.1 The following SNARFs were submitted for the committee’s approval:

<table>
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<td></td>
<td></td>
<td>Maintenance TF</td>
<td>300 mm Equipment Footprint, Height, and Weight</td>
</tr>
</tbody>
</table>

**Motion:** To approve SNARF #5711

**By / 2nd:** Larry Hartsough (U.A. Associates) / Supika Mashiro (TEL)

**Discussion:** None

**Vote:** 5-0 in favor. Motion passed.
7.3 New Ballot Submission

7.3.1 The following documents were submitted for letter ballot to the committee for approval:

<table>
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<tr>
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<td>Reapproval of SEMI E72-0600 (Reapproved 0305), Specification and Guide for 300 mm Equipment Footprint, Height, and Weight</td>
</tr>
</tbody>
</table>

Motion:   To approve Document #5711 for letter ballot in Cycle 3 or 4, 2014.
By / 2nd: Larry Hartsough (U.A. Associates) / Supika Mashiro (TEL)
Discussion: None
Vote:      5-0 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. Physical Interfaces & Carriers 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/en/node/49446

Tentative Schedule:

Monday, July 7*
- EUV Reticle Handling TF (TBD)
- Int’l Reticle SMIF Pods and Loadports Interoperability TF (TBD)

Tuesday, July 8*
- Joint Int’l 450 mm PIC TF / Int’l Process Module Physical Interface TF (10:00 AM – 12:00 PM)
- PIC Global Maintenance TF (1:00 PM – 3:00 PM)
- Int’l 450 mm Shipping Box TF (3:00 PM – 5:00 PM)

Wednesday, July 9*
- Physical Interfaces & Carriers Committee (9:00 AM – 12:00 PM Noon)

*All times are in PDT. 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/en/node/49446
9.2 Having no further business, a motion was made to adjourn the N.A. Physical Interfaces & Carriers committee meeting in conjunction with the N.A. Standards Spring 2014 Meetings at Intel Headquarters in Santa Clara, California.

Respectfully submitted by:

Michael Tran  
Senior Standards Engineer  
SEMI North America  
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Minutes approved by:

| Matt Fuller (Entegris), Co-chair | June 11,2014 |
| Mutaz Haddadin (Intel), Co-chair |

Table 8 Index of Available Attachments #1

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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 Michael Tran at the contact information above.