

NA Silicon Wafer Committee Meeting Minutes

NA Fall Standards Meetings 2013
 Tuesday, 29 October, 2013, 1:00 PM - 5:00 PM
 Intel, Santa Clara, CA

Next Committee Meeting

April 1, 2014, SEMI HQ, San Jose, CA in conjunction with NA Spring Standards Meetings. Check www.semi.org/standards for the latest update.

Attendees:

SEMI Staff

Kevin Nguyen – SEMI NA
 Hirofumi Kanno – SEMI Japan

Co-chair – Dinesh Gupta (STA)

Table 1 – Meeting Attendees

<i>Last Name</i>	<i>First Name</i>	<i>Company</i>
Bullis	Murray	Materials & Metrology*
Ferrell	Jackie	ISMI
Goldstein	Mike	Intel
Gould	Richard	Lam Research*
Gupta	Dinesh	STA
Haller	Kurt	KLA-Tencor
James	Lary	Global Semiconductor Materials
Mashiro	Supika	Tokyo Electron
Nakai	Tetsuya	SUMCO
Poduje	Noel	SMS*
Shimizu	Yasuhiro	Consultant*
Yoshise	Masanori	Yoshise Self*

*Attended via teleconference

Table 2 – Leadership Changes

None

Table 3 – Ballot Summary

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>Document #</i>	<i>Document Title</i>	<i>Committee Action</i>
5558	Revision of SEMI MF928-0305 (Reapproved 0211), Test Methods for Edge Contour of Circular Wafers and Rigid Disk Substrates	Passed as balloted
5606	Auxiliary Information: Interlaboratory Evaluation of Method 1 of SEMI MF673, Measuring Resistivity of Semiconductor Slices of Sheet Resistance of Semiconductor Films with a Noncontact Eddy-Current Gage	Approved

Table 4 – Authorized Ballots

#	When	SC/TF/WG	Details
5607	Cycle 1 for review at West	Int'l Test Methods TF	Revision of SEMI MF673-0305 (Reapproved 0611), Measuring Resistivity of Semiconductor Slices of Sheet Resistance of Semiconductor Films with a Noncontact Eddy-Current Gage
5663	Cycle 1 for review at NA Spring	Int'l ASI TF	Reapproval of SEMI M58-1109, Test Method for Evaluating DMA Based Particle Deposition Systems and Processes
5664	Cycle 1 for review at West	Int'l Terminology TF	Line Item Revision to SEMI M59-0211, Terminology for Silicon Technology
5665	Cycle 1 for review at NA Spring	Int'l Test Methods TF	Line Item Revision to SEMI MF26-0305 (Reapproved 0211), Test Method for Determining the Orientation of a Semiconductive Single Crystal to correct an error
5666	Cycle 1 for review at West	Int'l Test Methods TF	Revision of SEMI MF928-0305 (Reapproved 0211), Test Methods for Edge Contour of Circular Wafers and Rigid Disk Substrates

Table 5 – Authorized Activities

#	Type	SC/TF/WG	Details
5540	SNARF	Int'l AWG TF	SNARF was revised from New Auxiliary Information, Illustration of Flatness and Shape Metrics for Silicon Wafers To: Line Item Revision to SEMI M1-1013, Specification for Polished Single Crystal Silicon Wafers (Re: Addition of Related Information: Illustration of Flatness and Shape Metrics for Silicon Wafers)
5662	SNARF	Int'l ASI TF	Revision of SEMI M35-1107, Guide for Developing Specifications for Silicon Wafer Surface Features Detected by Automated Inspection
5663	SNARF	Int'l ASI TF	Reapproval of SEMI M58-1109, Test Method for Evaluating DMA Based Particle Deposition Systems and Processes
5664	SNARF	Int'l Terminology TF	Line Item Revision to SEMI M59-0211, Terminology for Silicon Technology
5665	SNARF	Int'l Test Methods TF	Line Item Revision to SEMI MF26-0305 (Reapproved 0211), Test Method for Determining the Orientation of a Semiconductive Single Crystal to correct an error
5666	SNARF	Int'l Test Methods TF	Revision of SEMI MF928, Test Methods for Edge Contour of Circular Wafers and Rigid Disk Substrates

Note: SNARFs and TFOFs are available for review on the SEMI Web site at:
<http://downloads.semi.org/web/wstdsbal.nsf/TFOFSNARF>

Table 6 – Previous Meeting Actions Items

None

Table 7 – New Actions Items

Item #	Assigned to	Details
1013-1	Noel Poduje (SMS)	To provide Kevin Nguyen (SEMI Staff) an ADE patent (expired?) number related to gravity correction referenced in SEMI MF1390

1. Call to Order

Dinesh Gupta called the meeting to order and welcomed everyone who attended. A round of self introduction was made. All SEMI standards meetings are subjected to SEMI Anti-Trust Reminder and Guidelines concerning Patentable Technology. SEMI Regulations now require all attendees to be members of SEMI standards. Membership enrollment is at www.semi.org/standardsmembership. Agenda was reviewed and proceed.

2. Review of Schedule for the Next Meeting (NA Spring Meetings, March 31-April 1, 2014)

The next meeting is tentatively scheduled at the SEMI HQ on March 31-April 1, 2014 in San Jose, CA in conjunction with the NA Spring Standards Meetings. Check www.semi.org/standards on the calendar of entry for the latest schedule and meeting location. Tentative schedule for the next meeting is as follows:

Monday, March 31, 2014

Int'l SOI (TF) 08:30-09:30	Int'l Annealed Wafer/ Epitaxial Wafer (TFs) 09:30-10:30	Int'l Test Methods (TF) 10:30-11:30	Int'l Terminology (TF) 11:30-12:00
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Int'l Advanced Surface Inspection (TF) 13:00-14:00	Int'l Advanced Wafer Geometry (TF) 14:00-17:30
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Tuesday, April 1, 2014

Int'l Polished Wafer (TF) 08:30-10:00	Int'l 450 mm Wafer (TF) 10:00-12:00
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Silicon Wafer (C) 13:00-17:00

3. Review and Approval of the Minutes from SEMICON West meetings, July 09, 2013 in San Francisco, CA

The meeting minutes reviewed. No change was made.

Motion: Accept the minutes of the previous meeting as submitted

By / 2nd: Mike Goldstein (Intel)/Tetsuya Nakai (SUMCO)

Discussion: None

Vote: 7/0 in favor. Motion passed

[Attachment – 1, Minutes NA SiWfr 20130709](#)

4. Liaison Reports

4.1. Europe Committee

Report was given by Kevin Nguyen. Highlights.

- Last Meeting
 - October 9-10, 2013 in conjunction with SEMICON Europa, Dresden, Germany
- Next Meeting
 - October 7-9, 2014 in conjunction with SEMICON Europa, Grenoble, France
 - (An additional Spring meeting in Europe is possible; details will be posted if confirmed)
 - Check www.semi.org/standards calendar of event for latest update
- Leadership Changes
 - Int. Advanced Surface Inspection TF
 - New Europe leader
 - Frank Riedel (Siltronic AG)

- Ballot results
 - Doc. 5503, Line Items Revision to SEMI M52-0912, Guide for Specifying Scanning Surface Inspection Systems for Silicon Wafers for the 130 nm to 11 nm Technology Generations
 - Line Item 1 - Add SEMI M80 in section 3.1 SEMI Standards and Safety Guidelines and Table 1, line 1.7 in the References column.
 - Passed superclean
 - Line Item 2 - Modify Line 1.13 in Table 1
 - Passed superclean
- Ballots approved for Cycle 7-2013
 - Doc. 5500, New Standard: Specifications for Polished Single Crystal Silicon Wafers for Gallium Nitride-On-Silicon Applications
 - Doc. 5605, Line Item Revision to SEMI M1-1013, Specifications for Polished Single Crystal Silicon Wafers (Re: Wafers for 16nm technology generation SFQR)
 - Doc. 5653, Line Item Revision of SEMI M1-1013, Specifications for Polished Single Crystal Silicon Wafers, (Re: To correct errors from previous ballot)
- Int. Advanced Wafer Geometry TF
 - Drafting doc. 5654, Line Item Revision of M49-0613, Guide for Specifying Geometry Measurements Systems for Silicon Wafers for the 130 nm to 16 nm Technology Generations edge exclusion reduction from 2 mm to 1.5 mm at 16 nm technology generation.
 - Doc. 5540, New Auxiliary Information for Illustration of Flatness and Shape Metrics for Silicon Wafers
 - under development
 - Discussion for a SNARF for: Revision to SEMI Standard M78 Guide for determining Nanotopography to add adjusting filter size and analysis area
- Int. Polished Wafer TF
 - Doc. 5500, New Standard: Specifications for Polished Single Crystal Silicon Wafers for Gallium Nitride-On-Silicon Applications
 - Issued in cycle 7-2013 for review at SEMICON Japan
 - Drafting doc. 5655, Line Item Revision of SEMI M1-1013, Specifications for Polished Single Crystal Silicon Wafers, to update 450 mm wafers edge exclusion 2 mm to 1.5 mm

[Attachment – 2, EU Si Wafer liaison report_March 2013](#)

4.2. Japan Committee

Tetsuya Nakai (SUMCO) reported. Highlights.

- Last Meeting
 - September 3, 2013 at SEMI Japan, Tokyo
- Next Meeting
 - December 5, 2013 at SEMICON Japan 2013, Makuhari Messe, Chiba, Japan
- New SNARFs/TFOFs
 - New TFOF for Fiducial Mark Interoperability Task Force
 - New SNARF for Line Item Revision of SEMI M80-0812, Mechanical Specification for Front-Opening Shipping Box Used to Transport and Ship 450 mm Wafer
 - International 450 mm Shipping Box Task Force
- 450 mm Standards Seminar in Conjunction with SEMICON Japan 2013
 - Topics
 - G450C Updates
 - Explanation for 450mm Silicon Wafer Standards (M1, M62, M74 and M76)
 - Overall Concepts of 450mm SEMI Standards
 - G88, G92 and G95 on 450mm Packaging Process
 - Explanations for 450 FOUP (E158), 450MAC(E159) and 450 FOSB (M80)
 - Explanation for 450mm Lord Port (E154, E162 and E83)
 - E166 and 450mm Process Module Physical Interface Standard Activity
 - For more details, please visit at <http://www.semiconjapan.org/en/node/2111>

[Attachment: 3, JP_SiW_NA SW_R0.1](#)

5. Staff Report

Report was given by Kevin Nguyen. Highlights:

- 2013 & 2014 Event

<i>Event Name</i>	<i>Event Details</i>
PV Taiwan	October 30 – November 1, 2013 Taipei
SEMICON Japan	December 4-6, 2013 Chiba
SEMICON Korea	February 12-14, 2014 Seoul
LED Korea	February 12-14, 2014 Seoul
SEMICON China	March 18-20, 2014 Shanghai
SEMICON Singapore	April 23-25, 2014 Marina Bay Sands
SEMICON West	July 8-10, 2014 San Francisco, California

- NA Standards 2014 Meetings
 - NA Standards Spring 2014 Meetings,
 - March 31 – April 3, 2014 [SEMI HQ in San Jose, California]
 - NA Standards Meetings at SEMICON West 2014
 - July 7-10, 2014 [San Francisco, California]
 - NA Standards Fall 2014 Meetings
 - November 3-6, 2014 [SEMI HQ in San Jose, California]
- Technical Ballot Critical Dates
 - Cycle 8, 2013
 - Ballot Submission Date: Nov 15, 2013
 - Voting Period Starts: Nov 29, 2013
 - Voting Period Ends: Dec 31, 2013
 - Cycle 1, 2014
 - Ballot Submission Date: January 3, 2014
 - Voting Period Starts: January 14, 2014
 - Voting Period Ends: February 13, 2014
 - Cycle 2, 2014
 - Ballot Submission Date January 31, 2014
 - Voting Period Starts: February 14, 2014
 - Voting Period Ends: March 17, 2014
- Publication cycle - September 2013 Cycle
 - New Standards: 3
 - Revised Standards: 2
 - Reapproved Standards: 6
 - Withdrawn Standards: 0
- Total SEMI Standards in portfolio: 892
 - Includes 98 Inactive Standards

[Attachment – 4, SEMI Staff Report \(Fall 2013\)](#)

6.0 Ballot Review

6.1 Document 5558, Revision of SEMI MF928-0305 (Reapproved 0211), Test Methods for Edge Contour of Circular Wafers and Rigid Disk Substrates

6.1.1 Document passed technical review as balloted and was forwarded to the ISC Audits and Reviews Subcommittee for procedural review. See attachment below for detail of ballot adjudication.

[Attachment – 5, 5558ProceduralReview](#)

6.2 Document 5606, New Auxiliary Information: Interlaboratory Evaluation of Method 1 of SEMI MF673, Measuring Resistivity of Semiconductor Slices of Sheet Resistance of Semiconductor Films with a Noncontact Eddy-Current Gage

6.2.1 Document was approved by the NA Silicon Wafer Chapter and was forwarded to the ISC Audits and Reviews Subcommittee for procedural review. See attachment below for detail of ballot adjudication.

[Attachment – 6, 5606ProceduralReview](#)

7.0 Task Force Reports

7.1 Int'l 450 mm Wafer TF/Mike Goldstein (Intel)

Mike Goldstein reported.

- The project objective is the selection of a fiducial mark to replace the wafer notch. The notch removal improves the wafer symmetry and the plasma processes.
- The fiducial mark is a laser scribed pattern on the back of the wafer in the edge exclusion zone
- The mark requirements are:
 - Not increase silicon wafer susceptibility to breakage due to handling or thermal treatment.
 - Enable accurate and fast wafer orientation
 - Readable through the entire IC manufacturing process
- G450C activities phase I
 - G450C collected fiducial mark design proposals from the industry, prepared bare 300mm wafers with different mark designs and 2 laser dots depth (35mm and 60 mm) and tested the mark readability.
 - The readability of the different marks on the bare wafers was good. No differences between different dots depth was observed. (not expected on bare wafers)
 - ESFQR measurements of the wafers show only a slight impact of the laser marking with no significant difference between the different marks
 - Currently the program is running some wafers through CNSE line for readability testing during process and is collecting data on defocus impact on readability (concern of wafer warpage)
 - The readability test will be performed after the completion of the process in early Nov.
 - A major area of concern is the mark removal during the wafer backside grinding. Without a notch and fiducial marks an alternative wafer precise alignment option is necessary before dicing. Member companies are reviewing options and discussing suggestions.
- Phase II plans
 - Narrow the number mark designs to 1-3 sets for second phase testing and validate detectability vs. 450mm silicon impact:
 - wafer susceptibility to breakage due to mechanical handling .
 - wafer susceptibility to breakage due to thermal treatment.
 - The design may be a hybrid of existing designs
 - Align on number of marks (3 vs. 4) and their position (900 or 1200)

For meeting minutes, please see attachment.

[Attachment – 7, 450mm notchless wafers program status and plans](#)

[Attachment – 8, 20131029FiducialMarkTFReport_r3](#)

7.2 Int'l Epitaxial Wafer TF/ Dinesh Gupta (STA)

- Dinesh reported doc. 5542, Line Items Revision to SEMI M62-0413, Specifications for Silicon Epitaxial Wafers, was submitted for cycle 5-2013 for review at SEMICON Japan. The ballot received no reject, but two comments from Murray and Nakai-san.

Tetsuya Nakai (SUMCO)

Accept with Comments

Comment 1

Line Item 1: Table R2-7, 3-2.7 Nanotopography

We recommend to change measurement area from (2mm x 2mm) to (2mm area Circle or Square).

Because it is possible to select measurement area both Circle and Square in figure 1 of measurement method SEMI M78.

- This item will be taken as a new business item at the next NA meeting

Murray Bullis (Materials & Metrology)

Accept with comments

Two items:

1. as future business 2.2 should be removed from this standard because the EDI code list has been removed from SEMI M18

- Item 1 will be taken as a new business item at the next NA meeting.

2. It is not necessary to repeat the value of the diameter because it is fully specified by citing the wafer category in the previous line. This entry is redundant.

- Item 2 was rejected by participants, thus allowing redundancy.

[Attachment – 9, MinEpiTF1013](#)

7.3 Int'l Annealed Wafer TF/Dinesh Gupta (STA)

- Dinesh Gupta reported doc. 5583, Line Items Revision to SEMI M57-0413, Specifications for Silicon Annealed Wafers, was submitted for cycle 5-2013 for review at SEMICON Japan. The ballot was superclean.

[Attachment – 10, MinAWMtg1013](#)

7.4 Int'l SOI TF/Bich-Yen Nguyen (SOITEC USA)

- Dinesh Gupta reported that the TF held its meeting. However, no report was submitted. If minutes were submitted by Bich-Yen, they will be included as attachments.

7.5 Int'l Polished Wafer TF/Murray Bullis (Materials & Metrology)

- Murray reported three documents on Cycle 7 Ballot:
 - SEMI Document 5500 New Standard: Specifications for Polished Single Crystal Silicon Wafers for Gallium Nitride-on-Silicon Applications ON THE SEMI WEBSITE; TO BE ADJUDICATED AT SEMICON® JAPAN
 - SEMI Document 5605 Line Item Revision to SEMI M1-1013 to modify Table R1-1, in order to update the SFQR specification for the 16 nm technology generation ON THE SEMI WEBSITE; TO BE ADJUDICATED AT SEMICON® JAPAN
 - SEMI Document 5653 Line Item Revision to SEMI M1-1013 to correct two errors in §6.6.3.2 of SEMI M1 that were not detected during the ballot of document 5543, line items 2 and 3 ON THE SEMI WEBSITE; TO BE ADJUDICATED AT SEMICON® JAPAN
- Disposition of Minority Report
 - The minority report on line item 4 of Document 5543 was rejected by the ISC
- Report on Document 5506
 - Document 5506 New Standard: Guide for Measuring Warp, Bow, and TTV On Low

Stiffness Wafers is being developed in the 3DS-IC Committee

- Discussion of Document 5540
 - P. Wagner is developing this document on Illustration of M1 geometry metrics in the AWG Task Force

[Attachment – 11, P W Minutes R1](#)

[Attachment – 12, Report Attachments](#)

7.6 Int'l Advanced Wafer Geometry TF/Noel Poduje (SMS)

- Minutes were presented by Noel. Highlights:
- **Ballot development.**
 - 1) Doc5540 - Auxiliary Information Document on Geometry Parameters of SEMI M1.
 - Peter presented the latest draft of the figures explaining flatness and shape metrics shown in M1. The sense of the TF is that this should be Related Information in M1 and not a separate document.

Motion: To approve revision of SNARF 5540 from an Auxiliary Information to Line Item revision to M1 to include a related information section

By / 2nd: Murray Bullis (Materials & Metrology)/Tetsuya Nakai (SUMCO)

Discussion: None

Vote: Unanimous. Motion passed
 - 2) Doc5539 - Revision to SEMI MF1390 adding Bow Measurement
 - Noel went through the proposed draft of the document, pointing out that the revision simply adds the median surface 3-point bow calculation to the warp test method. Currently the only SEMI Test Method for bow is MF534, a technique that is unusable in modern production.
 - Several points came up:
 - There is an ADE patent (expired?) related to gravity correction in this document. Noel will provide the patent number to Kevin.
- **New Business.**
 - 1) Revision to SEMI Standard M78 Guide for determining Nanotopography to add adjusting filter size and analysis area.
 - a. No action was taken on the SNARF. Discussion will continue.
 - 2) 1.5 mm EE for 450mm wafers in M49
 - a. Mike showed the changes to be made to M49 to change the EE for 450mm wafers from 2mm to 1.5mm, per the G450C recommendation. He will create a draft of the M49 revision to be presented at JA.
 - 3) Guide for Wafer Dimensional Metrology Based on Interferometric Areal Image Acquisition Technology
 - a. Although John says he is not ready to proceed with this, some discussion followed. Noel presented a brief outline of a possible document. There is a question of what kind of document this should be (Standard, Auxiliary, Related, etc.). No action at this time. Discussion will continue.
 - 4) Several AWG documents are up for 5-year review next year:
 - a. SEMI M67-1109, Practice for Determining Wafer Near-Edge Geometry from a Measured Thickness Data Array Using the ESFQR, ESFQD, and ESBIR Metrics
 - No action taken.
 - b. SEMI M68-1109, Practice for Determining Wafer Near-Edge Geometry from a Measured Height Data Array Using a Curvature Metric, ZDD

- Jaydeep said some revision needed regarding data outside FQA
- a. SEMI M70-1109, Practice for Determining Wafer-Near-Edge Geometry Using Partial Wafer Site Flatness
 - No action taken.
- For complete AWG meeting minutes and all other materials, please refer to attachments below.

[Attachment – 13, AWG SJ Fall 2013 Meeting minutes np](#)

[Attachment – 14, AWG TF attachments Oct2013](#)

7.7 Int'l Advanced Surface Inspection TF/Kurt Haller (KLA-Tencor)

- Kurt reported SEMI M35-1107, Guide for Developing Specifications for Silicon Wafer Surface Features Detected by Automated Inspection, is due for 5 year review. SNARF was presented.

Motion: To approve SNARF for revision of SEMI M35

By / 2nd: Kurt Haller (KLA-Tencor)/Mike Goldstein (Intel)

Discussion: None

Vote: 7-0 in favor. Motion passed

- Also, SEMI M58-1109, Test Method for Evaluating DMA Based Particle Deposition Systems and Processes, is due for 5 year review. The TF determined that no change is needed. The current document is still valid.

Motion: To approve SNARF for reapproval of SEMI M58

By / 2nd: Kurt Haller (KLA-Tencor)/Mike Goldstein (Intel)

Discussion: None

Vote: 6-0 in favor. Motion passed

Motion: To approve send reapproval of SEMI M58 in cycle 1-2014 for review at NA Spring meeting

By / 2nd: Kurt Haller (KLA-Tencor)/Tetsuya Nakai (SUMCO)

Discussion: Since no major change on M58 is anticipated, ballot adjudication at a non-international meeting is acceptable by all.

Vote: 7-0 in favor. Motion passed

[Attachment – 15, NA_ASI_TF_28_Oct_2013_Meeting minutes](#)

[Attachment – 16, M35_5YrReview_SNARF](#)

[Attachment – 17, M58_5YrReview_SNARF](#)

7.8 Int'l Test Methods TF/Dinesh Gupta (STA)

- Dinesh reported that document 5558, Revision of SEMI MF928-0305 (Reapproved 0211), Test Methods for Edge Contour of Circular Wafers and Rigid Disk Substrates, passed technical review. However, a comment from John Valley needs to be addressed. Also, a change to the scope to cover only those wafers whose edge profiles are specified in accordance with a SEMI Edge Profile Template (as shown in Figure 7 of both SEMI M1 and M9) is needed. A SNARF for revision of MF928 was presented.

Motion: To approve the SNARF for revision of MF928 and authorize for cycle 1-2014 for review at SEMICON West 2014

By / 2nd: Murray Bullis (Materials & Metrology)/Kurt Haller (KLA-Tencor)

Discussion: None

Vote: 7/0 in favor. Motion passed

- **New Business**

- Doc. 5607, Revision to SEMI MF673 Test Methods For Measuring Resistivity Of Semiconductor Wafers Or Sheet Resistance Of Semiconductor Films With A Noncontact Eddy Current Gauge
 - The document was reviewed. Various changes were pointed out. The document has significant changes. It was the best interest of the committee to adjudicate at an international meeting (SEMICON West 2014)

Motion: To authorize doc. 5607 for cycle 1 or 2-1014 for review at SEMICON West 2014

By / 2nd: Murray Bullis (Materials & Metrology)/Kurt Haller (KLA-Tencor)

Discussion: None

Vote: 7/0 in favor. Motion passed

- SEMI MF26-0305 (Reapproved 0211) - Test Method for Determining the Orientation of a Semiconductive Single Crystal
 - An error was found in equations 8 and 9. Change the minus signs inside the brackets to plus signs. A SNARF was presented to correct this error.

Motion: To approve the SNARF revision of MF26

By / 2nd: Murray Bullis (Materials & Metrology)/Mike Goldstein (Intel)

Discussion: None

Vote: 7/0 in favor. Motion passed

- The revision of MF26 ballot was shown to indicate these corrections.

Motion: To approve line item revisions to MF26 for cycle 1-2014 for review at NA Spring 2014 meeting.

By / 2nd: Murray Bullis (Materials & Metrology)/Mike Goldstein (Intel)

Discussion: These proposed changes are obvious and not controversial.

Adjudication of this ballot at the NA Spring meeting is acceptable by everyone.

Vote: 7/0 in favor. Motion passed

- The status of SEMI MF1535 was presented. Proposal was to prepare a Guide similar to SEMI M40, revise certain definitions in M59.
- Lastly, the remaining item from the task force report is nitrogen documents from JEITA

[Attachment – 18, MinTestMethodsMtg1013](#)

[Attachment – 19, SNARF L I MF26 revision \(correct equations\)](#)

[Attachment – 20, SNARF L I MF928 revision 131027](#)

7.9 Int'l Terminology TF/Murray Bullis (Materials and Metrology)

- Murray reported the discussion of lifetime terms that are incorrect in SEMI M59, Terminology for Silicon Technology. A proposal was made to remove 1/e lifetime (τ_e) and primary mode lifetime (τ_1) terms from SEMI M59.

Also, a second Line Item 2: Remove the phrase, “this interval is equal to the minority carrier lifetime under low level conditions,” from the end of the definition for recombination lifetime — the average time interval between the generation and recombination of hole-electron pairs in a homogeneous semiconductor in SEMI M59.

Motion: To approve the SNARF for line items revision of M59

By / 2nd: Murray Bullis (Materials & Metrology)/Tetsuya Nakai (SUMCO)

Discussion: None

Vote: 6/0 in favor. Motion passed

Motion: To submit M59 line item revision ballot in cycle 1-2014 for review at SEMICON West
By / 2nd: Murray Bullis (Materials & Metrology)/Kurt Haller (KLA-Tencor)
Discussion: None
Vote: 6/0 in favor. Motion passed

[Attachment – 21, Terminology Minutes R1](#)
[Attachment – 22, Report Attachment](#)

8.0 Old Business

None

9.0 New Business

None

10.0 Action Item Reviews

Kevin Nguyen reviewed the old action items. There were two new actions items at this meeting noted in **table 7**.

11.0 Adjourn

The meeting was adjourned at 4:00 PM.

These minutes are respectfully submitted by:

Kevin Nguyen,
 SEMI NA Standards Committee Manager
 Phone: 408-943-7997
 Email: knguyen@semi.org

Minutes approved by:

Noel Poduje (SMS) – Co-chair
 Dinesh Gupta (STA) – Co-chair

Date:
 Date: November 11, 2013

Table 8 – Index of Attachment Summary

#	Title	#	Title
1	Minutes NA SiWfr 20130709	12	Report Attachments
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3	JP SiW_NA SW_R0.1	14	AWG TF attachments Oct2013
4	SEMI Staff Report (Fall 2013)	15	NA ASI TF_28_Oct_2013_Meeting minutes
5	5558ProceduralReview	16	M35_5YrReview_SNARF
6	5606ProceduralReview	17	M58_5YrReview_SNARF
7	450mm notchless wafers program status and plans	18	MinTestMethodsMtg1013
8	20131029FiducialMarkTFReport_r3	19	SNARF L I MF26 revision (correct equations)
9	MinEpiTF1013	20	SNARF L I MF928 revision 131027
10	MinAWMtg1013	21	Terminology Minutes R1
11	P W Minutes R1	22	Report Attachment

#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 Kevin Nguyen at the contact information above