



**EHS NA TC Chapter
Meeting Summary and Minutes
NA Fall Standards Meetings
Thursday, November 10, 2016, 9:00 AM - 2:00 PM
SEMI HQ, San Jose, California**

TC Chapter Announcements

Next TC Chapter Meeting
Thursday, April 6, 2017 (9:00 AM-6:00 PM) Milpitas, CA in conjunction with the NA Spring Standards Meetings 2017. Check www.semi.org/standards for latest update.

Table 1 Meeting Attendees

Presiding Chairs: Sean Larsen (Lam Research) and Chris Evanston, PE (Salus Engineering International)

SEMI Staff: Kevin Nguyen (SEMI HQ), *Sanjay Baliga (SEMI EHS Division)*

<i>Company</i>	<i>Last</i>	<i>First</i>	<i>Company</i>	<i>Last</i>	<i>First</i>
WB Environmental Solutions	Belk	Bill	ESTEC	Mills	Ken
Lam Research	Claes	Brian	Tokyo Electron	Nambu	Mitsuju
<i>Tokyo Electron</i>	<i>Crane</i>	<i>Lauren</i>	SCREEN Semiconductor Solution	Nishimura	Takayuki
ESTEC	Ergete	Nigusu	<i>GlobalFoundries</i>	<i>Petry</i>	<i>Bill</i>
Salus Engineering International	Evanston	Chris	ASML	Planting	Bert
Nikon Precision	Greenberg	Cliff	Intertek	Rai	Sunny
SCREEN Semiconductor Solution	Imamiya	Ryosuke	<i>Safety Guru</i>	<i>Sklar</i>	<i>Eric</i>
Advanced Energy	Johnson	J.D.	MURATA MACHINERY	Tanaka	Tadamasa
Applied Materials	Karl	Ed	Tokyo Electron	Tsuru	Mark
Seagate	Layman	Curt	Salus Engineering	Visty	John
Tokyo Electron	Mashiro	Supika	SAFE TECHNO	Wakamatsu	Sadatsugu
KLA-Tencor	McDaid	Raymond			

Italics indicate virtual participants

Table 2 Task Force or Leadership Changes

<i>Group</i>	<i>Previous Leader</i>	<i>New Leader</i>
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>Document #</i>	<i>Document Title</i>	<i>Committee Action</i>
4683J	Line Item Revision to SEMI S2-0715, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment. Delayed Revisions Related to Chemical Exposure	
	Line Item 1 – Delayed Revisions Related to Chemical Exposure Criteria	Passed with technical changes. Ratification ballot will be issued in cycle 9-16.



Table 4 Authorized Activities

#	Type	SC/TF/WG	Details
6098	SNARF	NA EHS TC	Reapproval of SEMI S3, Safety Guideline for Process Liquid Heating Systems
6099	SNARF	S22 Revision Task Force	Line Item Revisions to SEMI S2, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment, and SEMI S22, Safety Guideline for the Electrical Design of Semiconductor Manufacturing Equipment

NOTE 1: 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

#	When	SC/TF/WG	Details
R4683J	Cycle 9-16	S2 Chemical Exposure Task Force	Ratification Ballot, Line Item Revision to SEMI S2-0715, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment. Delayed Revisions Related to Chemical Exposure
4975	Cycle 1 or 2-17	S6 Revision Task Force	Line Item Revision to SEMI S6, EHS Guideline for Exhaust Ventilation of Semiconductor Manufacturing Equipment
5970A	Cycle 1 or 2-17	Fire Protection Task Force	Line Item Revisions to SEMI S14, Safety Guidelines for Fire Risk Assessment and Mitigation for Semiconductor Manufacturing Equipment
6049	Cycle 9-16	S10 Revision Task Force	Line Item Revision to SEMI S10-0815E Safety Guideline for Risk Assessment and Risk Evaluation Process
6098	Cycle 1 or 2-17	NA EHS TC	Reapproval of SEMI S3, Safety Guideline for Process Liquid Heating System
6099	Cycle 1 or 2-17	S22 Revision Task Force	Line Item Revisions to SEMI S2, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment, and SEMI S22, Safety Guideline for the Electrical Design of Semiconductor Manufacturing Equipment

Table 6 New Action Items

Item #	Assigned to	Details
11102016-#1	John Visty (Salus Engineering)	To prepare the Ratification Ballot R4683J and forward to SEMI for cycle 9-16 ballot.
11102016-#2	Sean Larsen (Lam Research)	To distribute a slide on revised Regs 9.6.4 to EHS leaders.
11102016-#3	Kevin Nguyen (SEMI Staff)	To prepare S3 reapproval ballot for cycle 9-16.

Table 7 Previous Meeting Action Items

Item #	Assigned to	Details	Status
07142016-#1	Kevin Nguyen (SEMI Staff)	To report to the RSC or Regs SC that requiring EHS to hold a technical ballot on item on which it is not at liberty to make a decision is considered waste of time	Completed
07142016-#2	Kevin Nguyen (SEMI Staff)	To contact Alan Crockett and remind him that SEMI S28-1011, Safety Guideline for Robots and Load Ports Intended for Use in Semiconductor Manufacturing Equipment, is due for 5 year review.	Completed



1 Welcome, Reminders, and Introductions

1.1 Sean Larsen called the meeting to order at 9:00 AM. The meeting reminders on antitrust issues, intellectual property issues and holding meetings with international attendance were reviewed. Attendees introduced themselves.

2 Review of Previous Meeting Minutes

2.1 Minutes of the previous meeting were reviewed.

Motion: Accept the minutes as written

By / 2nd: John Visty/Bert Planting

Discussion: None

Vote: Unanimous

3 Ballots Review

3.1 Doc. 4683J, Line Item Revision to SEMI S2-0715, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment. Delayed Revisions Related to Chemical Exposure

3.1.1 Line Item 1 - Delayed Revisions Related to Chemical Exposure Criteria

3.1.1.1 The ballot passed committee review with technical changes. Refer to attachment for details. Ratification Ballot will be issued for cycle 9-2016.

Action Item #1: John Visty to prepare the Ratification Ballot and forward to SEMI for cycle 9-16 ballot.

Attachment: 4683J_ProceduralReview

Attachment: Chem Exposure TF_report-111016

4 Subcommittee & Task Force Reports

4.1 *Manufacturing Equipment Safety Subcommittee (MESSC)*

Cliff Greenberg reported. Of notes:

- Old business
 - Recommendation by MESSC to ask EHS Committee to recommend SEMI become an ANSI recognized SDO
 - Sean Larsen: Need to present to SEMI what it means to be an ANSI SDO, how and why
 - Logistical differences in adjudicating an ANSI
 - Possible replacement for NFPA 79
 - We OWN the document: (LIA owns Z136)
 - FM is also an SDO
 - Supika Mashiro said this topic is also on the ISC agenda. Not just EHS, there is also interest from the other SEMI Standards Technical Committee. Demographically, the balance of supplier and user may be an issue in order to satisfy ANSI requirement.
 - Chris Evanston may still have the white paper on ANSI issue, which was used years ago. If found, he will share with the committee.
 - Also, Supika Mashiro probably has ANSI materials and will share among EHS members.
 - OSHA has proposed to change the term “unexpected energization”, by deleting the word “unexpected”
 - re: NFPA 70e, also was discussed at ICRC: open discussion of the arc-flash ppe requirements and issues for compliance (on ICRC action list for many meeting cycles)
- New items

Attachment: 2016 Fall MESSC minutes



4.2 *S10 Revision TF*

Bert Planting reported. Of notes:

- Alignment of issues should be addressed for next ballot
 - Discussing content of an RI with an complete risk assessment including expanding severities to damage due to fire, equipment damage, facility loss and maybe loss of customer product.
 - Mark Fessler would supply example.
 - Paul Schwab will provide ergonomic related example.
- SEMI S10 can give additional guidance on important things to consider during the risk assessment.
- Set up teleconferences Nov/Dec to prepare the ballot for cycle 1 or 2 of 2017.

Attachment: S10 taskforce report SEMI Fall meetings 2016 MoM

4.3 *S6 Exhaust Ventilation Revision TF*

Glenn Holbrook was not present to report. Sean Larsen reported.

- S6, Line Item 1 - change to Flow rate definitions should be ready for cycle 1 or 2, 2017.

4.4 *S22 TF*

Sean Larsen reported. Of notes:

- Previous Actions
 - Completed the 4316 ballot effort and SNARF with the passing of the line item related to FECS
 - Took up the conversation again regarding revision of S2 and S22
- Discussions in this meeting
 - Based on the discussions we started with completely aligning the S2 and S22 interlock design criteria
 - Developed ~ 6 line item suggestions to completely align some of the interlock criteria

Motion: To approve a SNARF for Line Item Revisions to SEMI S2, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment, and SEMI S22, Safety Guideline for the Electrical Design of Semiconductor Manufacturing Equipment

By / 2nd: Chris Evanston/Bert Planting

Discussion: None

Vote: 6/0. Motion passed.

Attachment: S2 S22 SNARF Nov 2016

Attachment: S22 Report out

4.5 *Control of Hazardous Energy (CoHE) TF*

Sean Larsen reported progress of the TF. Of notes;

- Previous Actions
 - There was extensive work to generate the white paper that is being included as an Annex to the ANSI LOTO document
 - There has been some work to develop a draft that allows alternate Control of Hazardous Energy methods
- Discussions in this meeting
 - General consensus was that the effort for alternate methods would be a very long and slow one
 - There are a number of simpler fixes that are desired to section 17
- Going Forward
 - Agreement was to start up some teleconferences in early 2017 to hopefully develop some line items from the 3 topic starts to discuss at the Spring meetings

Attachment: S2 CoHE TF 10Nov2016

4.6 Energetic Materials EHS TF

No TF leader or TF representative was present. Chris Evanston would like SEMI Staff to remind leader to show up at the committee meeting and provide a progress report for future meetings.

Sean Larsen reported the TF is still going through the negatives received on SEMI Draft Document 5761A – Safety Guideline for Use Of Energetic Materials In Semiconductor R&D And Manufacturing Processes.

4.7 S8 (Ergonomics) TF

Sean Larsen reported the TF is making progress on two line items for doc. 5917, Line Item Revisions to SEMI S8, Safety Guideline for Ergonomics Engineering of Semiconductor Manufacturing Equipment. No ballot timetable was set.

4.8 Power Harmonics TF from NA Facilities TC Chapter

Sean Larsen reported Alex McEachern is working on doc. 6037 New Standard: Specification for Power Grid Harmonics Compatibility. The goal is come up with guidance on noise and emission level from a power grid. If interested, please contact Alex from Power Standards Lab or SEMI Staff.

4.9 E95 Specification for Human Interface for Semi. Manufacturing Equip. Revision TF from IC NA TC Chapter

Supika Mashiro reported there is Graphic User Interface (GUI) SNARF in the IC committee. Remote access for ipad, iphone, android devices will also be addressed in the draft. As there will be safety related information involving with the activity, she thought EHS members might be interested.

4.10 S2 Seismic Protection Liaison TF

Lauren Crane reported the TF reviews the Disapprove Comment and provides recommendations for the JP TF that were prepared in their Nov 2 meeting. Additional work in this S2 section 19 is anticipated – will need to modify the new Delayed Revision section from this ballot (expected to be published in Nov).

Motion: NA EHS Chapter to thanks the Japan EHS Chapter for collaborating with the S2 Seismic Liaison Task Force in this difficult S2 Section 19 revision work.

By / 2nd: Lauren Crane/Chris Evanston

Discussion: Sean Larsen recommended staff to mention appreciation in the NA liaison report.

Vote: 9/0. Motion passed.

Attachment: Seismic Liaison TFReport Fall 2016 r1

4.11 S23 Global TF

Lauren Crane reported. Of notes:

- Reviewed Ratification ballot results – publication of new S23 expected late Nov or early Dec.
- Reviewed queued ideas for new business. Decided to work on one next and picked that one → Providing an energy use to tons CO2 equivalent conversion factor (or factors).
- Will begin work (including new SNARF) in early Dec telecon (timing details TBD). Plan to submit SNARF to JP EHS Chapter for approval at SEMICON Japan.
- George (Joji) Hoshi will present on S23 at a SEMICON Japan Manufacturing Sustainability session. If any Committee members have information on S23 experiences they can share, please let George know – particularly if related to any of the new S23 concepts.

Attachment: S23 TFReport Fall 2016 r1

4.12 Fire Protection TF

Sean Larsen reported Matt Wyman plans to submit doc. 5970A, Line Item Revisions to SEMI S14, Safety Guidelines for Fire Risk Assessment and Mitigation for Semiconductor Manufacturing Equipment.

5 Liaison Reports

5.1 EHS Japan TC Chapter

Supika Mashiro reported: Of notes:

- Previous Meetings
 - April 19, 2016 at SEMI Japan Office
 - June 28, 2016 at SEMI Japan Office
- Next Meeting
 - December 16, 2016 at Conference Tower, Tokyo Big Site, Tokyo, Japan
- Ballot Result on April 19
 - Doc. 5972: Reapproval of SEMI S19-031, Safety Guideline for Training of Manufacturing Equipment Installation, Maintenance and Service Personnel.
 - Passed (Super Clean)
- Ballot Result on June 28
 - Doc. 5556B: Line Item Revision to SEMI S2-0715, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment, Revisions to §19 “Seismic Protection” (In Delayed Effective Date Format)
 - Passed with editorial changes and technical changes
 - Ratification Ballot R5556B was submitted in Cycle 6. Ballot approved.
 - Doc. 5947A: Revision to SEMI S23-0813, with title change from “GUIDE FOR CONSERVATION OF ENERGY, UTILITIES AND MATERIALS USED BY SEMICONDUCTOR MANUFACTURING EQUIPMENT” to “GUIDE FOR ENERGY, UTILITIES AND MATERIALS USE EFFICIENCY OF SEMICONDUCTOR MANUFACTURING EQUIPMENT”
 - Passed with editorial changes and technical changes
 - Ratification Ballot R5947A was submitted in Cycle 6. Ballot was also approved.
- STEP Planning Working Group
 - STEP/ SEMI S2 will be held on November 22 at SEMI Japan Office.

Attachment: 2016.11.10 EHS Japan_NA_R0.2

5.2 EHS Taiwan TC Chapter

Kevin Nguyen reported. Of notes:

- Next meeting
 - March 23, 2017 at SEMI Taiwan office
- Current Task Forces
 - Equipment Safety TF
 - Environmental Sustainability TF
 - Seismic TF
 - PV Safety TF
 - LED Safety TF
- EHS & Sustainability Seminar
 - Schedule: Dec. 20, 2016 (Tue)
 - Venue: No.2, Zhanyue 1st Rd., East Dist., Hsinchu City 300, Taiwan

Attachment: Taiwan EHS Standards Committee Liaison Report Nov 2016

5.3 RSC/Committee Leadership Report

Sean Larsen reported. Of notes:

- 5970 Fire Protection Ballot



- The TC decided to revisit offending editorial change, deleted it and resubmitted to A&R
 - This path had very valid grounds for being failed
 - However, the response from A&R was very interesting and troubling
 - First, the ballot was not completing the adjudication on the documented date
 - It is unclear how this fundamentally different from a ratification ballot resolving items from the first adjudication at a later date
 - Second, we were violating Robert's Rules of Order, which they are now maintaining is an undocumented part of the Standards rules for when the Regulations and Procedure Manual do not adequately address the question
 - Verbally, the A&R subcommittee continues to insist that "Safety Guidelines" to "Safety Guideline" is not an editorial change while adding two commas to "Environmental Health and Safety" is
 - Regulations
 - A revision to the *Regulations* has been approved by the ISC and is planned to be published on 11 November
 - A new version of the *Procedure Manual* to be published within a few days
 - Some changes of interest to *Regulations*
 - Ballot adjudication process
 - A&R's ongoing dislike for how we adjudicate negatives that can be resolved with an editorial change has now been formalized in a regulations change
 - 9.6.4 Decisions on Negatives — If the Reject Vote is not withdrawn as a result of negotiations, the TC Chapter must first, prior to making any editorial changes related to the Negative being adjudicated, decide whether each Negative of a valid Reject Vote is related or not related to the Letter Ballot item, and then, if it is related, whether it is persuasive or not persuasive.
 - Lauren Crane said the new policy may change how the committee perform ballot review. He would like a copy of this slide.
 - **Action Item #2:** Sean Larsen to distribute the slide on 9.6.4 among EHS leaders.
 - Some changes of interest to *Procedure Manual*
 - An approved process is being added to allow the non-confirming titles to be changed with a PIP if:
 - Standards having only one SubType
 - There are no associated changes required in the document
 - The change is to change "Specifications" to "Specification" or "Test Methods" to "Test Method"
 - Approved by at least one co-chair of the TC Chapter
 - However, the Regulations subcommittee chose to not allow "Safety Guidelines" to be changed to "Safety Guideline" by this method due to the "on-going disagreement" about whether or not this change is editorial
 - Supika Mashiro said it is not a good idea to revise the *Regulations* or *Procedure Manual* on pending dispute.
 - Eric Sklar responded that it would not be a dispute if Safety Guidelines was included in the part of the PIP process.
 - A question was raised on a scenario (changing singular to plural) where a change can be made from "Safety Guideline" to Safety Guidelines.
 - Supika Mashiro said Safety Guideline is not a Standards Subtype (e.g., Test Method, Specification...etc), and it is a type of Standards Documents. So, the title should start with Safety Guideline.
- Other Topics
 - Meeting Schedule Changes -- Got agreement to have SEMI staff to stop meeting changes (moving meetings) at 2 weeks prior to the meetings in an effort to make scheduling of other activities and flights a bit easier



- EHS has already been trying to do this, but the late change of the power harmonics TF was highlighted as the recent item of interest
- It is acknowledged that meeting cancellations may still occur after this date

Attachment: Co-Chairs Report 10Nov2016

5.4 EHS Division Liaison

Sanjay Baliga reported: Of notes

- ICRC formed a small TF to discuss specific topics, agenda, schedule for upcoming SEMICON West 2017. EHS Committee members will also be coordinated to avoid schedule conflict.
- Education (S2 and other safety guidelines) and compliance seminar planned for SEMICON China March 2017

6 SEMI Staff Report

Kevin Nguyen (SEMI) gave the SEMI Staff Report. Of notes:

- Next meetings
 - April 3-6, 2017
 - SEMI HQ in Milpitas, California
 - July 10-13, 2017
 - San Francisco, California
- 2016 Critical Dates for SEMI Standards Ballots
 - Cycle 8, 2016
 - Ballot Submission Date: October 17, 2016
 - Voting Period Starts: October 24, 2016
 - Voting Period Ends: November 23, 2016
 - Cycle 9, 2016
 - Ballot Submission Date: November 16, 2016
 - Voting Period Starts: November 30, 2016
 - Voting Period Ends: December 30, 2016
- SEMI Standards Publications
 - Total SEMI Standards in portfolio: 964
 - Includes 152 Inactive Standards
- Nonconforming Titles
 - SEMI S6-0707E - EHS Guideline for Exhaust Ventilation of Semiconductor Manufacturing Equipment
 - Replacement terms
 - Safety Guideline for... or Environmental, Health, and Safety Guideline for ...
 - SEMI S14-1016 - Safety Guidelines for Fire Risk Assessment and Mitigation for Semiconductor Manufacturing Equipment
 - Replacement term
 - Safety Guideline for....
- 5 Year Review
 - SEMI S3-1211, Safety Guideline for Process Liquid Heating Systems
 - SEMI S28-1011, Safety Guideline for Robots and Load Ports Intended for Use in Semiconductor Manufacturing Equipment

Attachment: Staff Report Oct 26 2016 for EHS



7 Old Business

7.1 SNARF Extensions (older than 3 years)

- Kevin Nguyen reported there was no SNARF requiring extension.

8 New Business

8.1 Upcoming Ballot Authorizations

8.1.1 The following ballots will be issued for cycle 9-2016, cycle 1 and 2- 2017 for review at the next NA Spring meetings.

#	When	SC/TF/WG	Details
R4683J	Cycle 9-16	S2 Chemical Exposure Task Force	Ratification Ballot, Line Item Revision to SEMI S2-0715, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment. Delayed Revisions Related to Chemical Exposure
6049	Cycle 1 or 2-17	S10 Revision Task Force	Line Item Revision to SEMI S10-0815E Safety Guideline for Risk Assessment and Risk Evaluation Process
4975	Cycle 1 or 2-17	S6 Revision Task Force	Line Item Revision to SEMI S6, EHS Guideline for Exhaust Ventilation of Semiconductor Manufacturing Equipment
6098	Cycle 9-16	NA EHS TC	Reapproval of SEMI S3-1211, Safety Guideline for Process Liquid Heating System
6099	Cycle 1 or 2-17	S22 Revision Task Force	Line Item Revisions to SEMI S2, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment, and SEMI S22, Safety Guideline for the Electrical Design of Semiconductor Manufacturing Equipment
5970A	Cycle 1 or 2-17	Fire Protection Task Force	Line Item Revisions to SEMI S14, Safety Guidelines for Fire Risk Assessment and Mitigation for Semiconductor Manufacturing Equipment

Motion: To authorize ballots shown above for cycle 9-2016, cycle 1 and 2-2017

By / 2nd: Bert Planting/Cliff Greenberg

Discussion: None

Vote: 6/0. Motion passed

Action Item #3: Kevin Nguyen to prepare S3 reapproval ballot for cycle 9-2016.

9 Next Meeting and Adjournment

9.1 The next meeting is scheduled for Thursday, April 6, 2017 the NA Spring Standards meetings at SEMI HQ in Milpitas, CA. See <http://www.semi.org/en/events> for the current list of meeting schedules. Draft schedule is shown in attachment below.

Attachment: Spring2017_Draft Schedule

9.2 Having no further business, a motion was made to adjourn. Adjournment was at 1:00 PM.

Respectfully submitted by:

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



Minutes approved by:

Sean Larsen (Lam Research)	
Chris Evanston (Salus Engineering)	Feb 22, 2017
Bert Planting (ASML)	Feb 21, 2017

Table 8 Index of Available Attachments#1

<i>Title</i>	<i>Title</i>
4683J_ProceduralReview	Seismic Liaison TFReport Fall 2016 r1
Chem Exposure TF_report-111016	S23 TFReport Fall 2016 r1
2016 Fall MESSC minutes	2016.11.10 EHS Japan_NA_R0.2
S10 taskforce report SEMI Fall meetings 2016 MoM	Taiwan EHS Standards Committee Liaison Report Nov 2016
S2 S22 SNARF Nov 2016	Co-Chairs Report 10Nov2016
S22 Report out	Staff Report Oct 26 2016 for EHS
S2 CoHE TF 10Nov2016	Spring2017_Draft Schedule

#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 [SEMI Staff Name] at the contact information above.