



## EHS NA TC Chapter Meeting Summary and Minutes

NA Spring Standards Meetings

Thursday, April 12, 2018

9:00 AM – 5:00 PM

SEMI HQ, Milpitas, California

### TC Chapter Announcements

Next TC Chapter Meeting

Thursday, July 12, 2018 San Francisco, CA in conjunction with the SEMICON West Standards Meeting 2018. Check [www.semi.org/en/standards](http://www.semi.org/en/standards) for the latest update.

### Table 1 Meeting Attendees

**Co-Chairs:** Chris Evanston (Salus Engineering International), Sean Larsen (Lam Research), Bert Planting (ASML)

**SEMI Staff:** Kevin Nguyen (SEMI HQ), Chie Yanagisawa (SEMI Japan)

<i>Company</i>	<i>Last</i>	<i>First</i>	<i>Company</i>	<i>Last</i>	<i>First</i>
Lam Research	Claes	Brian	Lam Research	Larsen	Sean
Tokyo Electron	Clifton	Brick	Tokyo Electron	Mashiro	Supika
Tokyo Electron	Crane	Lauren	KLA-Tencor	McDaid	Raymond
<i>Air Liquide</i>	<i>Dawson</i>	<i>Anita</i>	SCREEN	Nishimura	Takayuki
Salus Engineering	Evanston	Chris	ASML	Planting	Bert
Brooks Automation	Fitzgerald	Daniel	Tokyo Electron	Rivera	Kalysha
Nikon Precision	Girlea	Lucian	MURATA MACHINERY	Tominaga	Tadamasa
TUV Rheinland	Goh	Justin	Tokyo Electron	Tsuru	Mark
Nikon Precision	Greenberg	Cliff	Salus Engineering	Visty	John
Applied Materials	Karl	Ed	Seagate	Wong	Carl

*Italic* indicates remote participant

### Table 2 Leadership Changes

<i>WG/TF/SC/TC Name</i>	<i>Previous Leader</i>	<i>New Leader</i>
MESSC	Andrew Giles (ESTEC)	Kalysha Rivera(TEL)

### Table 3 Committee Structure Changes

<i>Previous WG/TF/SC Name</i>	<i>New WG/TF/SC Name or Status Change</i>
None	S2 Korean High Pressure Gas Safety TF (new)

### Table 4 Ballot Results

<i>Document #</i>	<i>Document Title</i>	<i>Committee Action</i>
5761C	<b>New Standard: Safety Guideline for Use of Energetic Materials in Semiconductor R&amp;D and Manufacturing Processes</b>	<b>Failed</b> , returned to TF for rebalot
6310	<b>Reapproval of SEMI S28-1011 Safety Guideline for Robots and Load Ports Intended for Use in Semiconductor Manufacturing Equipment</b>	<b>Failed</b> , SNARF abolished

**Table 4 Ballot Results**

<i>Document #</i>	<i>Document Title</i>	<i>Committee Action</i>
<b>R6204</b>	<b>Ratification Ballot, Line Item Revisions to SEMI S6-0707E With Title Change To: Environmental, Health, and Safety Guideline for Exhaust Ventilation of Semiconductor Manufacturing Equipment</b>	
	Line Item 3 - Update retroactive clause to refer to more versions than S6-93 and align with S2 revision	<b>Passed</b> , A&R Cycle 1-2018

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

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

**Table 5 Activities Approved by the GCS between meetings of the TC Chapter**

<i>#</i>	<i>Type</i>	<i>SC/TF/WG</i>	<i>Details</i>
None			

**Table 6 Authorized Activities**

<i>#</i>	<i>Type</i>	<i>SC/TF/WG</i>	<i>Details</i>
6354	SNARF	S2 Korean High Pressure Gas Safety TF	Line Item Revision to SEMI S2-1016b, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment
6366	SNARF	Anchorage TF	Line Item Revision to SEMI S2-1016b, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment
6372	SNARF	Seismic TF	Line Item Revision to SEMI S2-1016b, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment

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

**Table 7 Authorized Ballots**

<i>#</i>	<i>When</i>	<i>SC/TF/WG</i>	<i>Details</i>
6366	Cycle 4 or 5 -18	Anchorage TF	Line Item Revisions to SEMI S2, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment
6372	Cycle 4 or 5 -18	Seismic TF	Line Item Revisions to SEMI S2, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment
6354	Cycle 4 or 5 -18	S2 Korean High Pressure Gas Safety Task Force	Line Item Revision to SEMI S2, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment <ul style="list-style-type: none"> <li>Addition of related information</li> </ul>
6049A	Cycle 4 or 5 -18	S10 Revision TF	Line Item Revision to SEMI S10-0815E, Safety Guideline for Risk Assessment and Risk Evaluation Process
5761D	Cycle 4 or 5 -18	Energetic Materials TF	New Standard: Safety Guideline for Use of Energetic Materials in Semiconductor R&D and Manufacturing Processes



**Table 7 Authorized Ballots**

#	When	SC/TF/WG	Details
5957	Cycle 4 or 5 -18	Control of Hazardous Energy TF	Line Item Revision of S2, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment
6171	Cycle 4 or 5 -18	S2 Chemical Exposure Task Force	Line Item Revisions to SEMI S2, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment

**Table 8 SNARF(s) Granted a One-Year Extension**

#	TF	Title	Expiration Date
None			

**Table 9 SNARF(s) Abolished**

#	TF	Title
6310	S28 Revision TF	Reapproval of SEMI S28-1011 Safety Guideline for Robots and Load Ports Intended for Use in Semiconductor Manufacturing Equipment

**Table 10 Standard(s) to receive Inactive Status**

Standard Designation	Title
SEMI S28-1011	Safety Guideline for Robots and Load Ports Intended for Use in Semiconductor Manufacturing Equipment

**Table 11 New Action Items**

Item #	Assigned to	Details
April122018#1	Kevin Nguyen	To ask Dean Chang (SEMI Taiwan) to copy Lauren Crane in the loop on Taiwan Seismic TF with Japan

**Table 12 Previous Meeting Action Items**

Item #	Assigned to	Details	Status
Nov092017-#1	Kevin Nguyen (SEMI Staff)	To work with Sean Larsen and Glenn Holbrook for the S6 Ratification Ballot.	Completed
Nov092017-#2	Sean Larsen (Lam Research)	To send contact of Alex McEachern to Mark Fessler	Completed
Nov092017-#3	All TF leaders	TF has upcoming teleconferences, please send meeting information to Eric Sklar.	Completed



## 1 Welcome, Reminders, and Introductions

Bert Planting 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

The TC Chapter reviewed the minutes of the previous meeting.

**Motion:** Accept the minutes as written  
**By / 2<sup>nd</sup>:** Lauren Crane/Bert Planting  
**Discussion:** None  
**Vote:** 10-0. Motion passed

## 3 Ballot Review

**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.

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

3.1 *Doc. 5761C, New Standard: Safety Guideline for Use of Energetic Materials in Semiconductor R&D and Manufacturing Processes*

3.1.1 Doc. failed technical review (refer to negative 5 from Applied Materials). See attachment.

**Attachment:** 5761C Procedural Review rev1

3.2 *Doc. 6310, Reapproval of SEMI S28-1011 Safety Guideline for Robots and Load Ports Intended for Use in Semiconductor Manufacturing Equipment*

3.2.1 Doc. failed technical review (refer to Negative 14 Safety Guru (SG)). There was not enough vote to pass on finding SG14 not persuasive. SEMI S28-1011 will be let go inactive. See attachment below for details.

**Attachment:** 6310 Procedural Review

## 4 Liaison Reports

4.1 *Japan TC Chapter*

4.1.1 Supika Mashiro reported. Of notes:

- Last Meeting
  - 13:00-16:00, Friday, December 15, 2017  
at Conference Tower, Tokyo Big Sight, Tokyo, Japan
- Next Meeting
  - Tuesday, April 24, 2018 at Japan Standards Spring 2018 Meetings
  - SEMI Japan office, Tokyo, Japan
- Ballot Results
  - Doc. 6288, Line Item Revision to SEMI S21-1106E, SAFETY GUIDELINE FOR WORKER PROTECTION
    - Passed as balloted

**Attachment:** EHS Japan\_NATW\_20180316\_v1.0

## 4.2 Taiwan TC Chapter

### 4.2.1 Kevin Nguyen reported. Of notes:

- Last Meeting
  - March 21, 2018
  - SEMI Taiwan office, Hsinchu, Taiwan
- Next Meeting
  - October 4, 2018
  - SEMI Taiwan office, Hsinchu, Taiwan
- Equipment Safety TF
  - Robot Safety
    - Taiwan OSHA (Occupational Safety and Health Administration) announced Industrial Robots Hazard Prevention Standards” was updated by additional requirements for collaborative robots safety on Feb. 14, 2018.
    - This updated standard was adopted from ISO 10218-1 and ISO 10218-2.
    - Detailed safety guideline will be proposed by the end of year.
  - Lithium battery safety
    - Safety standard for the Thermal runaway control of lithium batteries for OHT(Overhead Hoist Transfer), AGV(Automated Guided Vehicle) or collaborative robots suggested to be proposed.
    - Theresa Suen (ITRI) will study the Lithium battery safety issue.
- Seismic TF
  - Chai Juin-Fu (NCREE) will contact with the leader of SEMI Japan Seismic Protection TF to discuss the following issue:
    - In addition to preventing the process equipment and stocker systems from sliding, rocking and overturning by adequate design of anchorages, the design requirement for the structural integrity and functionality of such equipment and systems should be considered in the SEMI Standards.
  - Lauren Crane, leader of Seismic Liaison TF, is also interested. So he should be a part of the discussion.
  - **Action Item #1** – Kevin will ask Dean Chang to get Lauren in the loop.

**Attachment: Taiwan EHS Liaison Report \_ 201803 rev1**

## 4.3 Korea High Pressure Gas Safety - SNARF & TFOF

### 4.3.1 Bert Planting presented a new Korean legislation requires for systems operated at pressures >10Bar:

- Subject to Korean government inspection & approval
- Government will grant license to operate high pressure system to Korean customer
- Testing shall be witnessed by KC inspectors (level III)
- Impact for supplier:
  - No license for customer to operate -> no machine start-up possible
- What do we want as an industry?
  - NO SEMI S2 update → every company needs to solve own compliancy issues



- Major revision of SEMI S2 → covering all major countries our industry is supplying requirements to equipment
- Adding several chapters/related info sections → covering local regulations
- Steps to take to upgrade SEMI S2
  - Containing more local requirements
    - One common SEMI S2 with country specific requirements?
    - Make SEMI S2 country specific (can third parties handle this?)
  - Sell a more common SEMI S2 by discussing with customers and country legislation to accept SEMI S2 as an acceptable standard
    - Visit customers in different countries to see what is acceptable
    - Negotiate with local authorities to accept SEMI S2 as industry safety standard and identify local authorities minimum requirements
- Discussions:
  - The activity was initiated by SK Hynix and Samsung, both reached out to SEMI for help. Chris Evanston was in Korea at the time, so he was invited for assistance.
  - Chris Evanston – If high pressure safety is covered in S2, equipment users can push back to regulators and defend that it is addressed in SEMI safety guideline. If we do not work with the end users, it could have a negative impact.
  - Brian Claes – An appendix proposal in S2 will have a significant impact, but for a related information section, he is supportive.
  - Lauren Crane – Changes in certain section of S2 can be made to address high pressure gas issue for the Korean industry. An entire new Related Information (RI) or an Appendix does not need to be created. He feels it is too early for a SNARF for either RI and or an Appendix in S2. However, he is supporting approval of a TFOF.
  - Sean Larsen – The proposal is just one page for a new Related Information, so there is not much to it.
  - Chris Evanston – He feels S2 is a US centric safety guideline. If we do not include concern from other regions, S2 will eventually be obsolete. We need to educate other regions on how standardization process works.
  - Lauren Crane – He defends that S2 is not a US centric, there are other machine directives in requirement in S2, so it is a global standard.
  - Bert Planting – Leakage requirement in S2 includes other regions, so this proposal is not new.
  - Brian Claes – The objective is to provide regulator relief for Korea, and who is going to coordinate with regulator?
    - Chris Evanston – Both SK Hynix and Samsung will do so.
  - Ed Karl – Applied Materials is facing similar challenge in the Korean market. He supports creating a TFOF and SNARF for the Korea high pressure gas safety.

**Motion:** To approve Korean High Pressure Gas Safety Task Force  
**By / 2<sup>nd</sup>:** Chris Evanston/Carl Wong  
**Discussion:** None  
**Vote:** 9-3. Motion passed



**Motion:** To approve a SNARF for Line Item Revision of S2 on Korean High Pressure Gas Safety RI  
**By / 2<sup>nd</sup>:** Chris Evanston/Carl Wong  
**Discussion:** None  
**Vote:** 8-2. Motion passed

**Attachment:** MESSC Spring 2018 minutes

**Attachment:** SNARF S2 Korean HPGS

**Attachment:** TFOF S2 Korean HPGS

## 5 Subcommittee & Task Force Reports

### 5.1 Manufacturing Equipment Safety Subcommittee (MESSC)

5.1.1 Cliff Greenberg reported. Of notes:

- MESSC has found another co-chair:

**Motion:** To approve Kalysha Rivera as the co-chair of MESSC  
**By / 2<sup>nd</sup>:** Cliff Greenberg/Sean Larsen  
**Discussion:** None  
**Vote:** 9-0. Motion passed

- Single fault failures in S2
  - S2 review/rewrite: single fault vs. likelihood of harm
    - 6.5 No reasonably foreseeable single-point failure condition or operational error should allow exposure of personnel, facilities, or the community to hazards that could result in death, significant injury, or significant equipment damage.
      - Common cause fault?
  - Is it time to update this concept?
  - Discussions:
    - Brian Claes – Why this issue is being addressed in MESSC?
    - Cliff Greenberg – MESSC is discussion forum. If there is interest, a TFOF or SNARF will be initiated by a responsible individual.
- Request that the NA EHS Committee suggest that Natalie (SEMI Korea) help with the development of an EHS Committee to start an ongoing communication
  - ASML Korea, Nikon Korea can help
  - Discussions:
    - Supika Mashiro – the proposal should come from Korean companies, not SEMI staff
    - James Amano – If any companies has an office in Korea, it would be a plus to have their regional supports.

**Attachment:** MESSC Spring 2018 minutes

## 5.2 *S10 Revision TF*

5.2.1 Bert Planting reported the TF discussed changes to severity group from line item 1 and 2 of ballot 6049, which previously failed at SEMICON West. The TF will set up teleconferences ASAP and prepare for ballot.

**Attachment: SEMI S10 Spring 2018**

## 5.3 *S2 Chemical Exposure TF*

5.3.1 John Visty reported the TF reviewed & edited proposed text to be added to 23.2 / 23.5.6 / 23.5.6.1 to address normal operations and potential O2 deficiency.

5.3.2 Inert atmospheres to control reactions with oxygen are becoming more common now. When testing for oxygen deficiency, it is recommended to use the limit of 19.5% (US OSHA). There are variation in other regions, and most have lower thread hold. The TF will plan to issue in cycle 5-18.

**Attachment: 2018 Spring Chem exposure report**

## 5.4 *S6 Revision TF*

5.4.1 John Visty reported the Ratification ballot for S6 passed and is being processed for publication, which reset the 5 year cycle. The TF also discussed possible topics to work on including:

- Liquid leak tracer gas methodology
- Gas detection / listing / reliability
- Terminology use – Volumetric flow
- Criteria for worst case leak
- Reality of RFOs

**Attachment: 2018 S6 Spring Report**

## 5.5 *Fire Protection TF*

5.5.1 Sean Larsen reported the TF was cancelled at the last minutes. Deadtime is not productive and could have been used for other meetings.

## 5.6 *S3 Revision TF*

5.6.1 No meeting. The TF was cancelled.

## 5.7 *S22 TF*

5.7.1 Chris Evanston reported the TF is at the dormant mode due to lack of interest.

## 5.8 *Control of Hazardous Energy (CoHE) TF*

5.8.1 Sean Larsen report the TF needs a technical editor. The TF will continue to work on draft

- SEMI Draft Document #5957 (Line Item Revision of S2, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment. (Re: Control of Hazardous Energy)) draft rewrite of SEMI S2 Section 17



## 5.9 S2 Anchorage TF

5.9.1 Sean Larsen reported the TF has the SNARF for approval. The SNARF (*Line Item Revision to S2 for Anchorage (Revision to Delay revision section)*) was reviewed.

**Motion:** To approve S2 SNARF

**By / 2<sup>nd</sup>:** Sean Larsen/Lauren Crane

**Discussion:** Lauren Crane – current language is in S2 delayed section? Sean Larsen – Shannon Austin, SEMI publication staff, can delay publication of S2 if this document is approved.

**Vote:** 6/0. Motion passed

**Attachment: SNARF Apr2018**

## 5.10 S8 (Ergonomics) TF

5.10.1 No TF meeting. It was cancelled.

## 5.11 S23 Revision TF

5.11.1 Lauren Crane reported:

- The TF is at sleep mode and will be restarted if new activity is arise.
- There is an interest in getting S23 to be ANSI SDO accredited. Having this done, it would help prevent Eurioe in creating their own standards. There is no conclusion yet, but Lauren seek out consensus from the task force.
- Supika Mashiro also mentioned that the ISC is discussing this topic. She also mentioned other committees are also expressed in interest.

## 5.12 S2 Seismic Protection Liaison TF

5.12.1 Lauren Crane reported TF progress:

- 4 change proposals for changes to DR information in S2
- The SNARF was reviewed in the TF and there was consensus to move forward with the SNARF and ballot as proposed.

**Motion:** To approve S2 Seismic SNARF

**By / 2<sup>nd</sup>:** Lauren Crane/John Visty

**Discussion:** None

**Vote:** 9/0. Motion passed

**Attachment: 2018 Spring S2 Seismic LTF Mtg Notes + Report Crane r1**

## 6 Leadership & Liaison Reports

### 6.1 ICRC Liaison

6.1.1 Lauren Crane reported on the ICRC. Of notes,

- Highlights from Monday's meeting

- Regulatory concerns from the meeting
- PFOA in supply chain
- Stockholm Convention – PFOA.
- EU Once and article always an article (OA5)
- Korea EASCA
- EU RoHS Recas

## 6.1.2 RSC / Committee Leadership Report

### 6.1.2.1 Sean Larsen reported. Of notes.

- Korean outreach
- Changes for Procedural Manual and Regulations
  - These are underway, but no significant impact.

## 7 SEMI Staff Report

### 7.1.1 Kevin Nguyen (SEMI) gave the SEMI Staff Report. Of note:

- SEMICON West Visitor Registration
  - West '18 Visitor Registration is now open
  - Free Expo Only Registration for STANDARDS
  - PROMO CODE : STAN2018
  - Register Today!
  - <http://www.semiconwest.org/>
- Next meeting
  - July 9-12, 2018
  - San Francisco, California
- 2017 Critical Dates for SEMI Standards Ballots
  - Cycle 4, 2018
    - Ballot Submission Date: April 20
    - Voting Period Starts: April 30
    - Voting Period Ends: May 30
  - Cycle 5, 2018
    - Ballot Submission Date: May 11
    - Voting Period Starts: May 25
    - Voting Period Ends: June 25
- SEMI Standards Publications
  - Total SEMI Standards in portfolio: 985
    - Includes 225 Inactive Standards

**Attachment: Staff Report April 2018**

## 8 Old Business

### 8.1 SNARF Extensions (older than 3 years)

#### 8.1.1 All is up to date.

## 8.2 5 year review

- SEMI S25-0213, Safety Guideline for Hydrogen Peroxide Storage & Handling Systems, is due for 5 year review. Supika Mashiro mentioned Japan TF is also reviewing other standards to ensure they are conforming with the Regulations, so they are willing to take this document if needed.

**Motion:** To hand over S25 to Japan TC Chapter for 5 year review

**By / 2<sup>nd</sup>:** Lauren Crane/Chris Evanston

**Discussion:** None

**Vote:** 11/0. Motion passed

## 9 New Business

### 9.1 Upcoming Ballot Authorizations

#	When	SC/TF/WG	Details
6366	Cycle 4 or 5 -18	Anchorage TF	Line Item Revisions to SEMI S2, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment
6372	Cycle 4 or 5 -18	Seismic TF	Line Item Revisions to SEMI S2, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment
6354	Cycle 4 or 5 -18	S2 Korean High Pressure Gas Safety TF	Line Item Revision to SEMI S2, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment <ul style="list-style-type: none"> <li>Addition of related information</li> </ul>
6049A	Cycle 4 or 5 -18	S10 Revision TF	Line Item Revision to SEMI S10-0815E, Safety Guideline for Risk Assessment and Risk Evaluation Process
5761D	Cycle 4 or 5 -18	Energetic Materials TF	New Standard: Safety Guideline for Use of Energetic Materials in Semiconductor R&D and Manufacturing Processes

**Motion:** To authorize above documents for ballots for cycle 4 and 5 of 2018.

**By / 2<sup>nd</sup>:** Sean Larsen/John Visty

**Discussion:** None

**Vote:** 10/0. Motion passed

### 9.2 West Scheduling

- The following is the draft schedule for West. Sean Larsen announced if there is any changes, please let me know before the first week of June 2018.

**Attachment:** EHS West 2018

## 10 Next Meeting and Adjournment

10.1 The next meeting is scheduled for Thursday, July 12, 2018 at San Francisco Marriott Marquis, CA. See <http://www.semi.org/en/events> for the current list of meeting schedules.



Having no further business, a motion was made to adjourn. Adjournment was at 12:00 PM.

Respectfully submitted by:

Kevin Nguyen,  
SEMI Standards Operations Manager  
Phone: 408-943-7997  
Email: [knguyen@semi.org](mailto:knguyen@semi.org)

Minutes tentatively approved by:

Sean Larsen (Lam Research)	<Date approved>
Chris Evanston (Salus Engineering International)	<Date approved>
Bert Planting (ASML)	<Date approved>

**Table 13 Index of Available Attachments<sup>#1</sup>**

<i>Title</i>	<i>Title</i>
<b>5761C Procedural Review rev1</b>	<b>SEMI S10 Spring 2018</b>
<b>6310 Procedural Review</b>	<b>2018 Spring Chem exposure report</b>
<b>EHS Japan_NATW_20180316_v1.0</b>	<b>2018 S6 Spring Report</b>
<b>Taiwan EHS Liaison Report _ 201803 rev1</b>	<b>SNARF Apr2018</b>
<b>MESSC Spring 2018 minutes</b>	<b>2018 Spring S2 Seismic LTF Mtg Notes + Report Crane r1</b>
<b>SNARF S2 Korean HPGS</b>	<b>Staff Report April 2018</b>
<b>TFOF S2 Korean HPGS</b>	<b>EHS West 2018</b>

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