



## EH&S NA TC Chapter Meeting Summary and Minutes

SEMICON West Standards Meeting  
Thursday, November 9, 2023  
9:00 AM – 3:00 PM Pacific  
SEMI HQ, Milpitas, CA

### TC Chapter Announcements

Next TC Chapter Meeting  
Thursday, March 28, 2024 in conjunction with NA Spring Meetings at the SEMI HQ, Milpitas, CA. 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)

<i>Company</i>	<i>Last</i>	<i>First</i>	<i>Company</i>	<i>Last</i>	<i>First</i>
<i>Axcelis Technologies</i>	<i>Brick</i>	<i>Clifton</i>	<b>Tokyo Electron</b>	<b>Mashiro</b>	<b>Supika</b>
<i>Brooks Automation</i>	<i>Cerretani</i>	<i>Ben</i>	<b>KLA</b>	<b>McDaid</b>	<b>Raymond</b>
<i>Lam Research</i>	<i>Crane</i>	<i>Lauren</i>	<b>SCREEN</b>	<b>Nishimura</b>	<b>Takayuki</b>
<i>Salus Engineering</i>	<i>Evanston</i>	<i>Chris</i>	<b>Tokyo Electron</b>	<b>Petraszak</b>	<b>Andrew</b>
<i>Cymer, ASML</i>	<i>Frankfurth</i>	<i>Mark</i>	<i>ASML</i>	<i>Planting</i>	<i>Bert</i>
<i>Nikon Precision</i>	<i>Girlea</i>	<i>Lucian</i>	<i>Texas Instruments</i>	<i>Schwab</i>	<i>Paul</i>
<i>Applied Materials</i>	<i>Gross</i>	<i>Ben</i>	<i>Safety Guru</i>	<i>Sklar</i>	<i>Eric</i>
<i>Applied Materials</i>	<i>Jumper</i>	<i>Steve</i>	<b>ASML</b>	<b>Sun</b>	<b>Peiyan</b>
<i>Teradyne</i>	<i>JUNGPU(JJ)</i>	<i>Kim</i>	<i>GlobalFoundries</i>	<i>Tinc</i>	<i>Lyman</i>
<i>Applied Materials</i>	<i>Kloeppe</i>	<i>Andreas</i>	<i>Muratec</i>	<i>Tominaga</i>	<i>Tadamasa</i>
<i>Lam Research</i>	<i>Larsen</i>	<i>Sean</i>			

*Italic* indicates online participant. **Bold** indicates in person participant.

### Table 2 Leadership Changes

<i>WG/TF/SC/TC Name</i>	<i>Previous Leader</i>	<i>New Leaders</i>
EPR TF	Ben Gross (Applied Materials)	Ben Gross (Applied Materials) Andreas Kloeppe (Applied Materials)

### Table 3 Committee Structure Changes

<i>Previous WG/TF/SC Name</i>	<i>New WG/TF/SC Name or Status Change</i>



**Table 4 Ballot Results**

<i>Document #</i>	<i>Document Title</i>	<i>TC Chapter Action</i> <sup>#1,#2</sup>
6884B	Line Item Revision to SEMI S2-0821Eb, Environmental, Health, And Safety Guideline For Semiconductor Manufacturing Equipment	Refer below
	Line Item 1 - Delayed Revisions related to lifting equipment and hinged loads (§§ 5.2, 18.6, and 18.7)	Failed and returned to TF for rework.
7108	Line Item Revision to SEMI S2-0821Eb, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment (Delayed Revision Related to Safety Labels)	Refer below
	Line Item 1 - Delayed Revision Related to Safety Labels	Failed and returned to TF for rework and rebalot
7109	Line Item Revisions to: <ul style="list-style-type: none"> <li>SEMI S1-0923, Safety Guideline for Equipment Safety Labels</li> <li>SEMI S2-0821Eb, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment, and</li> <li>SEMI S30 -0719E, Safety Guideline for Use of Energetic Materials in Semiconductor R&amp;D and Manufacturing Processes</li> </ul>	Refer below
	Line Item 1 - Delayed Revisions Related to Risk	Passed as balloted

#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 Ratification Ballot Results**

<i>Document #</i>	<i>Document Title</i>	<i>ISC A&amp;R Action</i> <sup>#1,#2</sup>
None		

#1 **Passed** Ratification ballots will be submitted to SEMI publication for final processing.

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

**Table 6 Activities Approved by the GCS between meetings of the TC Chapter**

<i>#</i>	<i>Type</i>	<i>SC/TF/WG</i>	<i>Details</i>
7133	SNARF	S6 Revision TF	Revision of SEMI S6, Environmental, Health, and Safety Guideline for Exhaust Ventilation of Semiconductor Manufacturing Equipment
7134	SNARF	Ergonomics TF	Revision to SEMI S8, Safety Guideline for Ergonomics Engineering of Semiconductor Manufacturing Equipment
7135	SNARF	S23 Global TF	Revision to SEMI S23, Guide for Conservation of Energy, Utilities and Materials Used by Semiconductor Manufacturing Equipment

**Table 7 Authorized Activity**

<i>#</i>	<i>Type</i>	<i>SC/TF/WG</i>	<i>Details</i> <sup>#1</sup>
7158	SNARF	S2 Mechanical TF	Line Item Revision to SEMI S2-0821Eb, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment (Section 5 and 18)
7159	SNARF	EHS Committee	Reapproval of SEMI S25-0319, Safety Guideline for Hydrogen Peroxide Storage & Handling Systems

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



**Table 8 Authorized Ballots**

#	When	TF	Details
6830	Cycle 9-23, 1-24 or 2-24	S3 Revision TF	Revision to SEMI S3-1211 (Reapproved 1017)E Safety Guideline For Process Liquid Heating Systems
6907	Cycle 9-23, 1-24 or 2-24	S7 Revision TF	Revision to SEMI S7-0515, Safety Guideline for Evaluating Personnel and Evaluating Company Qualifications
6980	Cycle 9-23, 1-24 or 2-24	Flammable Gas Task Force	Line Item Revisions to SEMI S2-0821Eb, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment (Re:Flammable gas)
7021	Cycle 9-23, 1-24 or 2-24	S2/S22 Revision TF	Line Items Revisions of S2-0821Eb Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment, and S22 Safety Guideline for the Electrical Design of Semiconductor Manufacturing Equipment
7108A	Cycle 9-23, 1-24 or 2-24	S1 Revision TF	Line Item Revision to SEMI S2-0821Eb, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment (labels)
7134	Cycle 9-23, 1-24 or 2-24	Ergonomics TF	Revision to SEMI S8-0218, Safety Guideline for Ergonomics Engineering of Semiconductor Manufacturing Equipment
7135	Cycle 9-23, 1-24 or 2-24	S23 Global TF	Revision to SEMI S23-1021E2, Guide for Conservation of Energy, Utilities and Materials Used by Semiconductor Manufacturing Equipment
7158	Cycle 9-23, 1-24 or 2-24	S2 Mechanical TF	Line Item Revision to SEMI S2-0821Eb, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment (Mechanical)

**Table 9 Granted a One-Year Extension**

#	TF	Title	Expiration Date
None			

**Table 10 SNARF(s) Abolished**

#	TF	Title
6884	S2 Mechanical TF	Line Item Revision to SEMI S2-0821Eb, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment (Mechanical)

**Table 11 Standard(s) to receive Inactive Status**

Standard Designation	Title
None	

**Table 12 New Action Items**

Item #	Assigned to	Details
Nov9-2023#1	Kevin Nguyen	To contact Natalie Shim (SEMI Staff Korea) to get discussion rolling for Korea EHS
Nov9-2023#2	Kevin Nguyen	To relay the S2 “see” to “refer to” changes to SEMI publication

**Table 13 Previous Meeting Action Items**

Item #	Assigned to	Details	Status
July13-2023#1	Sean Larsen (LAM)	To inform Liquid Chemicals co-chairs regarding 5 year review of SEMI S25-0319 Safety Guideline for Hydrogen Peroxide Storage & Handling Systems	Completed



## 1 Welcome, Reminders, and Introductions

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

## 2 Review of Previous Meeting Minutes

2.1 The TC Chapter reviewed the minutes of the previous meeting.

**Motion:** Accept the minutes as written.  
**By / 2<sup>nd</sup>:** By: Eric Sklar / Safety Guru, LLC  
Second: Lucian Girlea / Nikon Precision Inc.  
**Discussion:** None  
**Vote:** 8-0. Motion passed.

**Attachment:** EHS NA TC Minutes 07132023rev1.docx

## 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 of ballots 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 file name for each balloted document is provided under each ballot review section below.

### 3.1 *Doc. 7018, Line Item Revision to SEMI S2-0821Eb Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment (Delayed Revision Related to Safety Labels)*

#### 3.1.1 Line Item 1 - Delayed Revision Related to Safety Labels

- Voting Interest: LAM  
Reject Name: Lauren Crane (LAM)  
Negative #: LC5  
Negative Reference: 10.3.2  
Negative Text: NEGATIVE

I think the intention for this section is that it applies to all labels whether safety or not, but given context this could be easily misunderstood as meaning only “overt” safety labels.

====

Change to the effect of

“Labels (whether safety labels or other labels) that are provided:...”

However, see also LAM LC6

- **Motion:** Negative is related and persuasive. (Needs > 1/3 votes to pass.)  
Reason:  
By: Eric Sklar / Safety Guru, LLC  
Second: Lauren Crane / Lam Research  
Discussion:  
Result: 9-Y 0-N Voting Result: Pass - 100.00%



- Line item(s) [1] failed TC Chapter review and will be returned to the TF for rework and rebalot  
Reason: None.  
By: Eric Sklar / Safety Guru, LLC  
Second: Andrew Petraszak / TEL Technology Center America  
Discussion:  
Result: 9-Y 0-N Voting Result: Pass - 100.00%
- This document **failed** and returned to TF for rework and rebalot. Refer to attachment below for full details.

**Attachment: 7108(S2labels)RespComp\_tf07nov23a\_es09nov23a**

**3.2 Doc. 7109, Line Item Revisions to SEMI S1-0923, Safety Guideline for Equipment Safety Labels, SEMI S2-0821Eb, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment, and SEMI S30-0719E Safety Guideline for Use of Energetic Materials in Semiconductor R&D and Manufacturing Processes**

3.2.1 Line Item 1 - Delayed Revisions Related to Risk

- This document **passed** the TC Chapter review as balloted. Refer to attachment below for full details.
- **Attachment: 7109 A&R**

**3.3 Doc. 6884B, Line Item Revision to Line Item Revision to SEMI S2-0821, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment (Delayed Revisions related to lifting equipment and hinged loads (§§ 5.2, 18.6, and 18.7))**

3.3.1 Line Item 1 - Delayed Revisions related to lifting equipment and hinged loads (§§ 5.2, 18.6, and 18.7)

- Reject Interest: ASM  
Reject Name: Fessler, Mark (ASM)  
Negative #: ASM #1:  
Negative Text: (Glenn Holbrook) As hinge load definition was not changed as part of this revision it still only applies to hinged loads in the horizontal position. Need to be expanded to vertical hinged loads as well as we want them to have the same mechanical strength and testing as horizontal loads. (RE SEMI Standards EHS ballots voting reminder due Oct 13.msg)
  - **Motion:** Negative is related and not persuasive. (Needs  $\geq 2/3$  votes to pass.)  
Reason: Hinged loads with vertical axis are sufficiently covered by other portion of section 18  
By: Andrew Petraszak / TEL Technology Center America  
Second: Lauren Crane / Lam Research  
Discussion:  
Result: 9-Y 0-N Voting Result: Pass - 100.00%
- Reject Interest: LAM  
Reject Name: Lauren Crane (LAM)  
Negative #: LC-1  
Negative Reference: 18.6  
Negative Text: The last two bullets are not qualified with regard to who or in what context the LE is specified, as such the scope is too broad.  
  
The phrase “SME manufacturer’s” is used but there is no definition of this concept. It is therefore unclear if this is meant to mean “SME Supplier” or some other concept.
  - **Motion:** Negative is related and persuasive. (Needs  $> 1/3$  votes to pass.)  
By: Andrew Petraszak / TEL Technology Center America  
Second: Lauren Crane / Lam Research  
Discussion:  
Result: 8-Y 1-N Voting Result: Pass - 88.89%



- Final Action  
Motion: Line item 1 **failed** TC Chapter review and will be returned to the TF for rework.  
Reason:  
By: Andrew Petraszak / TEL Technology Center America  
Second: Lauren Crane / Lam Research Corporation  
Discussion:  
Result: 11-Y 0-N Voting Result: Pass - 100.00%
- Motion: Approve the new SNARF for S2 Mechanical on section 18 and 5  
By: Andrew Petraszak / TEL Technology Center America  
Second: Eric Sklar / Safety Guru, LLC  
Discussion:  
Result: 9-Y 0-N Voting Result: Pass - 100.00%. Voting Rule: Majority
- Motion: Cancel SNARF Document # 6884  
By: Eric Sklar / Safety Guru, LLC  
Second: Andrew Petraszak / TEL Technology Center America  
Discussion:  
Result: 11-Y 0-N Voting Result: Pass - 100.00%.

**Attachment: S2 Mech Report Fall 2023**

## **4 Subcommittee & Task Force Reports**

### **4.1 S3 Revision TF**

4.1.1 Andy Petraszak reported.

- TF continues working on doc. 6830, Revision to SEMI S3-1211 (Reapproved 1017)E Safety Guideline for Process Liquid Heating Systems.
  - Make any necessary changes to Appendix 1 for Liquid Heating Systems to align with the body of the standard and Appendix 2 after TF review.
  - Create new Appendix 3 for Gas Heating Systems to align with the body of the standard and Appendix 4 after TF review.
  - Update RI 1 to align with any changes in the body of the standard and Appendix 2.
  - Consider a RI for an example regarding Gas Heating Systems.
- Requested ballot authorization for either Cycle 9, Cycle 1 (2024), or Cycle 2 (2024) for a Major Revision.

**Attachment: S3 Report Fall 2023**

### **4.2 S2 Mechanical TF**

4.2.1 Andy Petraszak reported.

- Doc. 6884B, Line Item Revision to SEMI S2-0821, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment (Subject: Delayed Revisions related to lifting equipment and hinged loads (§§ 5, 18.6, and 18.7))
  - Ballot issued in cycle 7-2023 and received a total of 9 Negatives and 5 Comments.
  - **Failed** TC Chapter review.
  - Current SNARF allows modification of Sections 18.6 and 18.7 and not the other portions of Section 18.
  - Task Force abolished the current SNARF and submitted a new SNARF.



- Requesting for ballot authorization for balloting in Cycle 9-23, 1-24 or 2-24 for adjudication at the Spring meeting.

**Attachment: S2 Mech Report Fall 2023**

**4.3 Environmental Performance Rating (EPR) TF**

4.3.1 Andreas Kloppe reported:

- Achievements June – November 2023
  - Test conditions defined based on industry applications.
  - Operation modes of pumps agreed, adopt SEMI S23 definitions.
  - Definition of annual usage rates (Process / Free / Off) agreed based on SEMI S23 definition.
  - Equivalent energy usage agreed to be directly the performance indicator.
  - Calculation of equivalent energy based on SEMI S23 guidelines agreed to be used.
  - Definition of pump size segments proposed for better compatibility.
  - Definition of energy rating segments proposed.
  - Qualifying material usage as additional performance indicator postponed to a later revision.
- Next steps:
  - Agreeing on open technical details – Nov/Dec 2023.
  - Data collection / understand spectrum of pump performance (high/low efficiency) – Apr 2024
  - Start drafting standards proposal – Start end of 2023

4.3.2 Ben Gross reported there is additional TF leader (Andreas Kloppe) who has been leading the TF, so he would like to make it official. Ben submitted the revised the TFOF including changes to the TF leadership as well as update on TF's roster.

- Motion: Approve the revised EPR TFOF  
By: Lucian Girlea / Nikon Precision Inc.  
Second: Lauren Crane / Lam Research  
Discussion: additional leader is added.  
Result: 13-Y 1-N Voting Result: Pass - 92.86%. Voting Rule: Majority

**Attachment: 20231109 Environmental Performance Metric - TF Update**

**Attachment: 20231109 TFOF\_Semi-Star Amendment**

**4.4 S10 Risk Assessment TF**

4.4.1 Eric Sklar reported:

- Doc. 7109, Line-Item Revisions to SEMI S1, S2, S30 (regarding risk to buildings/facilities)
  - Balloted in Cycle 7
  - No Rejects, 1 Accept with Comment. Ballot passed TC Chapter Review.
- Further modifications of SEMI S10
  - Further work on SEMI S10 (for which we have a draft SNARF for NA EHS TCC discussion)
    - Separation of Building/Facility Risk into an RI (including redefinition of the Severity categories)



- Modification of process flow charts
    - Application of SEMI S10 to observed (as distinguished from, or in addition, to foreseen) events
    - Separation of “EHS Risk” (personnel and environment) from “Commercial Risk” (equipment)
  - Redefinition Severity categories for Equipment
  - SNARF for proposed revisions of SEMI S10
    - Major Revision SNARFs require a 2-week review period, so approval would need to be by GCS (probably in December) or at the NA EHS TCC Spring Meeting.
      - Motion: Ask the GCS to approve the SNARF at the end of the member review period if there is no objection or request for changes
- By: Eric Sklar / Safety Guru, LLC  
Second: Lucian Girlea / Nikon Precision Inc.  
Discussion:  
Result: 10-Y 0-N Voting Result: Pass - 100.00%. Voting Rule: Majority

**Attachment: S10\_SNARFdraft\_tf08nov23a\_es09nov23a**

**Attachment: S10\_Report\_es09nov23a**

#### **4.5 Flammable Gas TF**

##### 4.5.1 Bert Planting reported:

- Drafting doc. 6980, Line Item Revisions to SEMI S2-0821, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment (Re: Sections 13.7 and 23.5.5)
  - 2 Additions in Main text SEMI S2: 13.7 & 21.5.5
  - Prepare an RI with information on:
    - Select the design strategy
    - Legislation and standards information
    - Testing criteria
  - Completed flow chart to guide to safe design
    - Provide guidance for each step
    - Discuss how to deal with a “safe gas mixture” containing a flammable substance
- Plans to submit ballot for review at NA Spring meeting.
  - Sean Larsen asked if the TF plans to issue one line-item or two. Eric Sklar said he expected the ballot can be accomplished with just one line-item, he believes the ballot should be ready by cycle 2.

**Attachment: Flammable substances Fall 2023**

#### **4.6 Manufacturing Equipment Safety Subcommittee (MESSC)**

4.6.1 Lucian Girlea reported the time scheduled for MESSC was spent on the SEMI S2 Major Revision.

#### **4.7 S2 Major Revision TF**

4.7.1 Lucian Girlea reported:





- Good TF participation, (almost) weekly meetings, making progress.
- Exchanging ideas with other EHS TFs (e.g., S1, S8):
  - some new items are directed to the S2 MR TF as the proper forum to address the respective topics.
  - some concepts discussed by the S2 MR TF are being adopted by other TFs and the ideas can be implemented sooner this way.
- TF continued drafting changes affecting the entire S2
- Consider issuing an Informational Ballot to increase visibility and gather additional input.
- Submit a SNARF when anticipating a ballot ready in 6 months
  - Will require close coordination with other TF working on items affecting S2.

#### **Attachment: S2 Major Revision Task Force - SEMI 2023 Fall Notes (1)**

#### **4.8 S6 Ventilation TF**

##### 4.8.1 Eric Sklar reported:

- The Task force has been working on Doc 7133 Revision of SEMI S6-0618 - Environmental, Health, and Safety Guideline for Exhaust Ventilation of Semiconductor Manufacturing Equipment, in telecons most weeks
  - considering
    - the ballot responses (103 Technical and ~120 Editorial items) to the SEMI S6 Reapproval ballot, which was found, at SEMICon West, to have failed,
    - the requested corrections have been compiled in an annotated copy of SEMI S6 for TF consideration,
    - a few other things that have arisen during TF discussions
  - have made substantial progress
    - agreed how to address the ~120 editorial items
    - have resolved 34 of the technical items, mostly by agreeing what changes to propose in the 7133 ballot
    - have agreed in principal how to address another 23 of the technical items, but those are awaiting drafting by one of the TF Leaders
    - there are 8 items awaiting work by TF members, other than the aforementioned stuckee
    - postponed consideration of 2 items until other work has been done
  - but, the TF has yet to reach consensus on (and hasn't even discussed many of) 44 of the technical items.
- The availability of gas detectors on which SEMI S6 "allows" one to rely
  - generally, this is not a challenge for flammable gas detectors
  - for toxic gas detectors, however,
    - until recently, the S6 TF was not aware of any relevant performance standards against which gas detectors could be evaluated.
    - In recent discussions, have been examining EN45544-1,2,3,4



- appear relevant and applicable
  - not limited to specific gases
  - not known if there are detectors for the gases of interest to the semiconductor industry that have been found, by an ATL to conform to these standards, but
  - TF has been discussing taking the approach of endorsing the use of gas detectors that have been “otherwise evaluated” (to use the verbiage of SEMI S2, ¶13.4.3) to those (or, if identified, other relevant) standards.
- TF discussion 07nov23:
    - Generally endorse this approach
    - Believe that there are detectors for most of the substances of interest to our industry
    - Eric Sklar is researching availability of detectors that have been certified to, or at least comply with, such standards..
  - The different “flavors” (e.g., heat, flammable gas, toxic gas, process effluent, smoke) of exhaust
    - SEMI S6 doesn’t appear to:
      - differentiate its guidance among the “flavors”, but not all of the guidance appears reasonable for all of them
      - provide for there being more than one exhaust connection, particularly different connections for different “flavors” on a piece of SEMI
    - What does the S6 TF think we should do about this?
      - Ignore the matter, as it hasn’t been a frequently-reported problem?
      - Undertake to discuss the various “flavors” and to state, in SEMI S6 which criteria pertain to which “flavors”?
      - Something else?
    - TF discussion 07nov23:
      - LC: It is important to clarify this matter in S6. This might result in including some flavors in S6 with specific criteria and excluding other flavors from S6.
      - ES: Would prefer to include all the flavors that come to mind, even if to state, in S6 that S6 doesn’t contain criteria for them.
  - TF Plans
    - Hold weekly telecons to work on revisions.
    - No ballot is requested.

**Attachment: S6\_Report\_es09nov23a**

#### **4.9 S23 Global TF**

##### 4.9.1 Lauren Crane reported.

- The Test Method is almost complete.
- We have been developing draft data for the sections unique to a test method.
  - Apparatus
  - Test Specimens
  - Calibration and Standardization
  - Summary – Eric will do this when the document is otherwise finished.



- Most recently we have been reviewing SEMATECH “Application Guide and Total Equivalent Energy (TEE) CalcII User’s Guide” - Technology Transfer #06094783D-ENG and identifying information that we would like to include in the S23 guidance RI / Appendix.
- Request for ballot in C1-C2 2024.

**Attachment: 2023 S23 US Fall TF mtg & rpt Crane r1**

**4.10 S2 Seismic Liaison TF**

4.10.1 Lauren Crane reported.

- No meeting during Fall 2023. The TF is in sleeping mode as there was no urgent issue. The TF is planning having at least one meeting between now and SEMICON West 2024.

**4.11 Fire Protection TF**

4.11.1 Eric Sklar reported.

- Old Business
  - Adding performance criteria (Such as effectiveness, fire size to be considered) for detection and protection systems.
  - Adding design criteria (such as treatment of pyrophoric materials) for detection and protection systems.
  - Should exhaust ventilation be reduced or stopped if a fire is detected?
- New Business
  - None
- Plans
  - No work identified until the undertaking parties provide further material on the “Old Business” items.

**Attachment: FireProt\_Report\_es09nov23a**

**4.12 S1 Labels TF**

4.12.1 Eric Sklar reported.

- SEMI S1-0923 Safety Guideline for Equipment Safety Labels, has been published
  - Is a rewrite of previous version
  - Incorporates the changes approved in Doc 6931C, and its Ratification Ballot
  - This happened just in time for us to ballot our proposed SEMI S2 changes in Cycle 6
- Doc 7108, Line Item Revision to SEMI S2-0821Ea, Environmental, Health, And Safety Guideline For Semiconductor Manufacturing Equipment (Delayed Revision Related to Safety Labels)
  - 5 Rejects (ASML, TEL, Screen, Lam, and NSSL)
  - Doc 7108 failed, and returned to the Task Force for further work.
  - The TF believes it is possible to prepare the 7108A ballot by the 01 February 2024 submission deadline for Cycle 2



Attachment: 7108(S2labels)RespComp\_tf07nov23a\_es09nov23a

Attachment: S1\_Report\_es09nov23a

#### 4.13 *Energetic Materials TF*

4.13.1 Eric Sklar reported.

- SEMI S30-1023 Safety Guideline For Use Of Energetic Materials In Semiconductor R&D And Manufacturing Processes, has been published.
- Old Business
  - Topics TF believes should be addressed by a training program.
    - Improper adoption of S30
    - Cold traps accumulate material, creating a hazard that needs to be addressed.
  - Still no report of an integrated risk assessment having been done.
  - Some S30 related questions have been raised by 1 or 2 device manufacturers.
- New Business
  - S30 Conformance Reports
    - Sean Larsen: has there been any demand for the SEMI S30 conformance report yet?
    - Eric Sklar: Not aware of any, but the changes to SEMI S2 that will be effective July 2024 include normative invocation of SEMI S30, so that may well stimulate demand for S30 assessment as part of S2 assessments.
  - Eric Sklar made a presentation about S30 at a SETHA Mini-Conference, focused the features of S30 that are not typical S series documents (e.g., assignment of responsibilities to various parties, integrated risk assessment).
- Plans
  - No immediate plans for telecons, but would like a slot assigned on the schedule in case matters requiring TF discussion arise.

Attachment: EnergeticMatls\_Report\_es09nov23a

#### 4.14 *S2 Control of Hazardous Energy (CoHE) TF*

4.14.1 Eric Sklar reported, which he co-chairs with Lucian Girlea and Sean Larsen.

- Topics the TF has been discussing since the SEMICON West.
  - Which approach(es) to protecting personnel do we want SEMI S2 to pseudoprohibit/discourage/encourage/pseudomandate?
- 08 November 2023 Discussion
  - Lauren Crane's thoughts:
    - Understanding, from TF discussions is that a substantial part of the objection to traditional lockout is inconvenience
    - Can address this by attaching, to lockout, some equipment criteria (e.g., not having lockout require a degown/regown cycle) that lessen the inconvenience.
    - Support providing interlocks to protect personnel during operation and maintenance (not necessarily *instead* of lockout)



- Believe we do need to call for lockout capability as part of machine design
- For subsystems where it is feasible to disable a subsystem and still have the machine being productive, the machine design should provide subsystem-level lockout.
- Questions whether S2 should be driving lockout for things that present only Low or Very Low risk.
- S2 11.10 appears to be related to, but not exclusively about, access for which lockout is to be done. (Also, that paragraph isn't explicit about what information the "label" provides.)
- "alternative methods" (i.e., means of limiting the risk to personnel to an acceptable level that does *not* rely on physically disconnecting or blocking the hazardous energy path)
- Andy Petraszak's thoughts:
  - Find answering the matrix of questions difficult because not all hazards are "created equal", e.g., have different concerns about silane and water lines.
  - It may be appropriate to base what we pseudomandate on the level of risk posed by the particular energy source.
- Does the TF believe that the SNARF (6942) for this activity, which was approved in the NA EHS TCC meeting at SEMICon West 2022 needs to be amended or replaced?
- Task Force Plans & Requests
  - Revise/replace SNARF: TF does not, at present, see a need to do this.
  - Ballot authorization:
    - TF does not believe anything broader than refining the "readily accessible" point can be done by 01feb24.

**Attachment: S2\_CoHE\_Report\_es09nov23b**

**4.15 S12 Decontamination TF**

4.15.1 Eric Sklar reported.

- Work on SEMI S12 since SEMICon West
  - Cleared about 20 more items we had identified for discussion
  - About a dozen remain, either awaiting work by the Task Force leader or on hold pending the resolution of those items
  - Much of our time has been spent at a grosser level of abstraction that what's included in the draft, working to ensure that we clearly identify:
    - the scope, purpose, and distribution of each of the documents S12 instructs one to created and
    - which work is intended to be done prospectively (that is, as part of developing SME that conforms with SEMI S2) and which work is to be done when one has a piece of SME in hand which has been exposed to hazardous chemicals.
  - much of this work is shown in the flow charts on the next two slides.
  - Most recently, we've worked on a graphic representation of the roles of the various documents throughout the process.



- Graphic Representation of the Roles of the Documents
  - Lauren Crane gave an overview the role of S12 for SME Supplier, 1st User.etc..
- Task Force Plans & Requests
  - Ballot Authorization: No request at this time.
  - Continue work on SEMI S12 rewrite draft, but no sooner than Feb 24.

**Attachment: S12(decon)\_Report\_es09nov23a**

#### **4.16 S8 Ergonomics TF**

4.16.1 Paul Schwab reported.

- Task Force has been meeting regularly since January 2022 to work on changes to SEMI S8
- Reviewed the major revision draft ballot (SNARF # 7134, Revision to SEMI S8-0218, Safety Guideline for Ergonomics Engineering of Semiconductor Manufacturing Equipment)
- Propose submitting the ballot for Cycle 2, 2024 (ballot due 2/1/2024)
- Propose Task Force resume meeting on Fridays at 9:00 am Pacific time starting November 17<sup>th</sup>
- S8 TF Document Storage at SEMI
  - <https://connect.semi.org/communities/community-home?CommunityKey=c1526656-40a4-4245-af86-34d3ecc68624>

**Attachment: SEMI-S8\_TF\_summary\_09nov2023**

#### **4.17 S7 TF**

4.17.1 Sean Larsen reported.

- Drafting Doc. 6907, Revision to SEMI S7-0515, Safety Guideline for Evaluating Personnel and Evaluating Company Qualifications
- Reviewed the final cleaned up markups from the previous discussion
- New Topics
  - Indication of “alliance” with end users or being on their white-list (approved 3rd party list)
- Plans
  - The TF will work on preparing the ballot. The TF will aim for cycle 1 or 2 of 2024.

**Attachment: SEMI S7 TF Report**

#### **4.18 S2/S22 TF**

4.18.1 Chris Evanston reported.

- Edit the draft document.
- Plans:
  - Hold Teleconferences to Discussion
  - Prep Ballot for Cycle 1 or 2 of 2024.

#### 4.19 Other Documents of Interest

##### 4.19.1 F47 TF

- Sean Larsen mentioned F47 is continuing to have discussion on voltage sags on 3 phases vs 1 phase. Sean mentioned that he did not have a chance to attend the last meetings. Lucian Girlea chimed in and reported the TF is trying to implement stricter testing in an effort to match with the reality testing in the fab. Per Lucian, the TF will not make such testing as a normative part of the document but rather a recommendation.
- Discussion for different waveforms for the sag was reported. Sean also warned the new testing equipment is not portable and can weigh up to 600 pounds. Equipment previously conformed with F47 is now no longer acceptable. Whether a component change or firmware update is needed or testing is required more frequently or rigorously, it appears no data is given to support the root cause of the problem.

##### 4.19.2 E33 TF

- Mark Frankfurth reported SEMI E33, Guide for Semiconductor Manufacturing Equipment Electromagnetic Compatibility (EMC) Revision TF, is being urged to change the limit of Extreme Low Frequency (ELF) and Very Low Frequency (VLF) being driven by major end user. It has been a challenge to capture the reference since the IEC document is changed so frequently.
  - For VLF, Sean Larsen asked if the TF is intended to keep it that part as a normative or related information. Per Mark, the TF would like it to be mandatory, so it would be part of the document.
  - Per Mark, no creditable evidence is presented for a change in in-situ measurement.

##### 4.19.3 BIM TF

- Sean Larsen reported the Building Information Modeling (BIM) activity. The progress is slow. Eric Sklar also chimed in and said he is a TF member. Per his observation, the effort is stalled. There is only one person driving the effort, and he not has been showing up.

##### 4.19.4 PFAS Consortium

- Lauren Crane reported there is discussion from the PFAS Consortium WG for material info exchange protocol. The WG is trying to standardize ways of exchanging information up and own the supply chain in the semiconductor industry. It is still very early in the process, but the upside is that those in that WG is committed in writing a SEMI Standard.

## 5 Liaison Reports

### 5.1 ICRC Liaison

#### 5.1.1 Sean Larsen presented. The following topics were discussed:

- Report out of PFAS for various regions and states including Main, Minesota, California
- Regulations dashboard
- Alternatives for CoHE
- IEC 60204-33 maintenance activity is ongoing. If anyone is interested with that document, please contact any of the EHS leaders (Andy, Chris, Sean, Lauren, Supika).

### 5.2 Other EHS

5.2.1 No report from either Taiwan or Korea. Sean Larsen believes Korea does not have a full concept of standards development process. Prior to COVID, good discussion took place in Korea. Chris Evanston and Andy Petraszak also echoed same sentiment. Even if it is a forum, it would be great to exchange dialog since Korea has a significant end user. Kevin Nguyen will contact Natalie Shim, SEMI Korea staff, to get something going.



### 5.3 Japan EH&S TC Chapter

#### 5.3.1 Supika Mashiro reported.

- Last meeting
  - Thursday, September 7, 2023
  - SEMI Japan Office + OVTCCM (Hybrid)
- Next meeting
  - Thursday, December 14, 2023
  - Tokyo Big Sight, Tokyo, Japan + OVTCCM (Hybrid) in conjunction with SEMICON Japan
- Ballot Results
  - Doc. 7028 Reapproval of SEMI S21-0818, Safety Guideline for Worker Protection
    - Failed and work will be discontinued.
- SNARF(s) Granted a One-Year Extension
  - 6289, Revision to SEMI S18-0312, Environmental, Health And Safety Guideline For Flammable Silicon Compounds
- S23 Revision Global Task Force
  - Doc. 7135, SEMI S23-1021e - Guide for Conservation of Energy, Utilities and Materials Used by Semiconductor Manufacturing Equipment
- S18 Revision Task Force
  - TF has recruited additional members and several have indicated their willingness to participate in activities.
  - No specific activities have yet begun due to TF leader's heavy work schedule.
- Japan S2 Major Revision Liaison TF (JA-S2 revision LTF) (New!)
  - JA-S2 revision LTF is now recruiting members.
- Seismic Protection Global Task Force
  - No update

**Attachment: EHS JA TC Chapter Liaison Report\_November 2023\_R0**

#### 5.3.2 RSC/Co-chairs report

#### 5.3.3 Sean Larsen reported.

- Helpful members training slides.
- Batch of upcoming Regs and PM changes including:
  - Including quorum for a committee meeting (4 person minimum)
  - Cancelling a SNARF
  - Connect@SEMI requirement for TF and maintenance of the TF roster

### 5.4 SEMI Staff Report

#### 5.4.1 Kevin Nguyen (SEMI) reported.





- SEMI upcoming event
  - Upcoming NA Meetings
    - NA Standards Spring Meetings
      - March 25-28, 2024
      - SEMI HQ in Milpitas, California
  - SEMICON Europa
    - Nov 14-17
    - Munich, Germany
  - SEMICON Japan
    - Dec 13-15
    - Tokyo, Japan
- 2024 Critical Dates for SEMI Standards Ballots
  - <https://www.semi.org/en/collaborate/standards/ballots>
- SNARF 3-Year Status
  - Doc. 6595, Line Item Revision to SEMI S2 Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment (Adding Guidance for Materials of Construction Evaluation Related to Fire Risk Assessment)
  - The TF has no interest in renewing the SNARF. Effort was abandoned.
- New Online Ballot System
  - User Data Quality
    - Problem – User Data in SVM shows incorrect information
    - Cause – The SVM Login process has a separate User Database than the existing Online Ballot System and requires ongoing synchronization. Also affects <https://connect.semi.org>
    - Progress
      - Completed internal testing
      - Documentation and Training in development
    - Open Community Preview of the New Online Ballot System during Cycle 9, 2023
      - Committee Members to become familiar with new interface and provide feedback
    - Open New Online Ballot System for Live Ballot voting for Cycle 1, 2024
- SEMI Standards Publications
  - Total SEMI Standards in portfolio: 1,085
    - Includes 335 Inactive Standards

**Attachment: Staff Report Nov 2023 v3**

## **6 Old Business**

6.1 None

## **7 New Business**



**7.1 Publications changes to EHS docs without notice**

7.1.1 Lauren Crane reported that he ran across changes to SEMI S2 with regard to biased term “see” to “refer to”. Fundamentally, the EHS committee was not informed on these changes. And also, these changes are not indicated in SEMI S2 via sidebar. Refer to attachment below for details.

7.1.2 As reported by Lauren, some changes were made, but some instances of “see” still remain. In some sections (i.e, section 8), the term “see” appears to have imperative tone, so changing to “refer to” may alter the meaning and potentially impacting the document. Lauren expressed his desire that if such changes were made unilaterally by SEMI publication, at least it should be reviewed by the committee before such changes are made.

**Motion:** Request SEMI Staff, at the minimum, provide to a list of EHS committee members (to be provided) review drafts of unilateral changes of the S documents, and they also explain to the EHS committee why some existing instances of the word "see" remain in S2.

By: Lauren Crane / Lam Research

Second: Lucian Girlea / Nikon Precision Inc.

Discussion:

Result: 7-Y 0-N Voting Result: Pass - 100.00%. Voting Rule: Majority

**Attachment:** S2 changes see-refer Nov 2023

**7.2 Schedule display**

7.2.1 Lauren Crane raised scheduling issue. As a courtesy matter, the display schedule should match the actual meeting time. The schedule shows 6 hr, but actual time ran over. Per Eric Sklar, his argument is the Regs does not allow scheduling over 6 hr for one session, but it does not prohibit actual time from run over. Sometimes, critical discussion and ballot review lead to running over.

7.2.2 Lauren Crane suggested the chair should watch the clock and make an effort to end the meeting on time.

**7.3 5 year review**

7.3.1 None. Other than those are being taken by various task forces.

**7.4 Upcoming Ballot Authorization**

7.4.1 The following ballots are authorized for the next meeting.

#	When	TF	Details
6830	Cycle 9-23, 1-24 or 2-24	S3 Revision TF	Revision to SEMI S3-1211 (Reapproved 1017)E, Safety Guideline For Process Liquid Heating Systems
6907	Cycle 9-23, 1-24 or 2-24	S7 Revision TF	Revision to SEMI S7, Safety Guideline for Evaluating Personnel and Evaluating Company Qualifications
6980	Cycle 9-23, 1-24 or 2-24	Flammable Gas Task Force	Line Item Revisions to SEMI S2, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment (Re:Flammable gas)
7021	Cycle 9-23, 1-24 or 2-24	S2/S22 Revision TF	Line Items Revisions of S2, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment, and S22 Safety Guideline for the Electrical Design of Semiconductor Manufacturing Equipment
7108A	Cycle 9-23, 1-24 or 2-24	S1 Revision TF	Line Item Revision to SEMI S2, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment (labels)
7134	Cycle 9-23, 1-24 or 2-24	Ergonomics TF	Revision to SEMI S8, Safety Guideline for Ergonomics Engineering of Semiconductor Manufacturing Equipment
7135	Cycle 9-23, 1-24 or 2-24	S23 Global TF	Revision to SEMI S23, Guide for Conservation of Energy, Utilities and Materials Used by Semiconductor Manufacturing Equipment
7158	Cycle 9-23, 1-24 or 2-24	S2 Mechanical TF	Line Item Revision to SEMI S2, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment (Mechanical)



**Motion:** Authorize the Documents in the table above for Letter Ballot in cycle 9-2023, 1-2024 or 2-2024.

By: Eric Sklar / Safety Guru, LLC

Second: Lucian Girlea / Nikon Precision Inc.

Result: 8-Y 0-N Voting Result: Pass - 100.00%.

## 7.5 Teleconferences

- Eric Sklar presented and drafted the Google calendar for all EH&S TF teleconferences.
  - <https://calendar.google.com/calendar/u/0/embed?src=0dblgh8j8j0im0e8bt4jkbocs4@group.calendar.google.com>

## 8 Next Meeting and Adjournment

8.1 The next meeting is scheduled for Thursday, March 28, 2024 in conjunction with NA Spring Standards Meetings, SEMI HQ, Milpitas CA. Refer to <http://www.semi.org/standards> for the current list of meeting schedules.

There being no further business, a motion was made to adjourn. Adjournment was at 3:00 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 14 Index of Available Attachments<sup>#1</sup>**

<i>Title</i>	<i>Title</i>
EHS NA TC Minutes 07132023rev1.docx	2023 S23 US Fall TF mtg & rpt Crane r1
7108(S2labels)RespComp_tf07nov23a_es09nov23a	FireProt_Report_es09nov23a
7109 A&R	7108(S2labels)RespComp_tf07nov23a_es09nov23a
S2 Mech Report Fall 2023	S1_Report_es09nov23a
S3 Report Fall 2023	EnergeticMatls_Report_es09nov23a
20231109 Environmental Performance Metric - TF Update	S2_CoHE_Report_es09nov23b
20231109 TFOF_Semi-Star Amendment	S12(decon)_Report_es09nov23a
S10_SNARFdraft_tf08nov23a_es09nov23a	SEMI-S8_TF_summary_09nov2023
S10_Report_es09nov23a	SEMI S7 TF Report
Flammable substances Fall 2023	EHS JA TC Chapter Liaison Report_November 2023_R0
S2 Major Revision Task Force - SEMI 2023 Fall Notes (1)	Staff Report Nov 2023 v3
S6_Report_es09nov23a	S2 changes see-refer Nov 2023

<sup>#1</sup> 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 Kevin Nguyen at the contact information above.