

North America TC Chapter of Environmental, Health, and Safety (EH&S) Global Technical Committee

April 12, 2022

v1

Meeting Information

- Last Meeting:

- March 31, 2022
- SEMI HQ, Milpitas, CA in conjunction with NA Spring meetings

- Next Meeting:

- July 14, 2022
- Moscone Center, San Francisco, CA in conjunction with SEMICON West

<http://www.semi.org/standards>

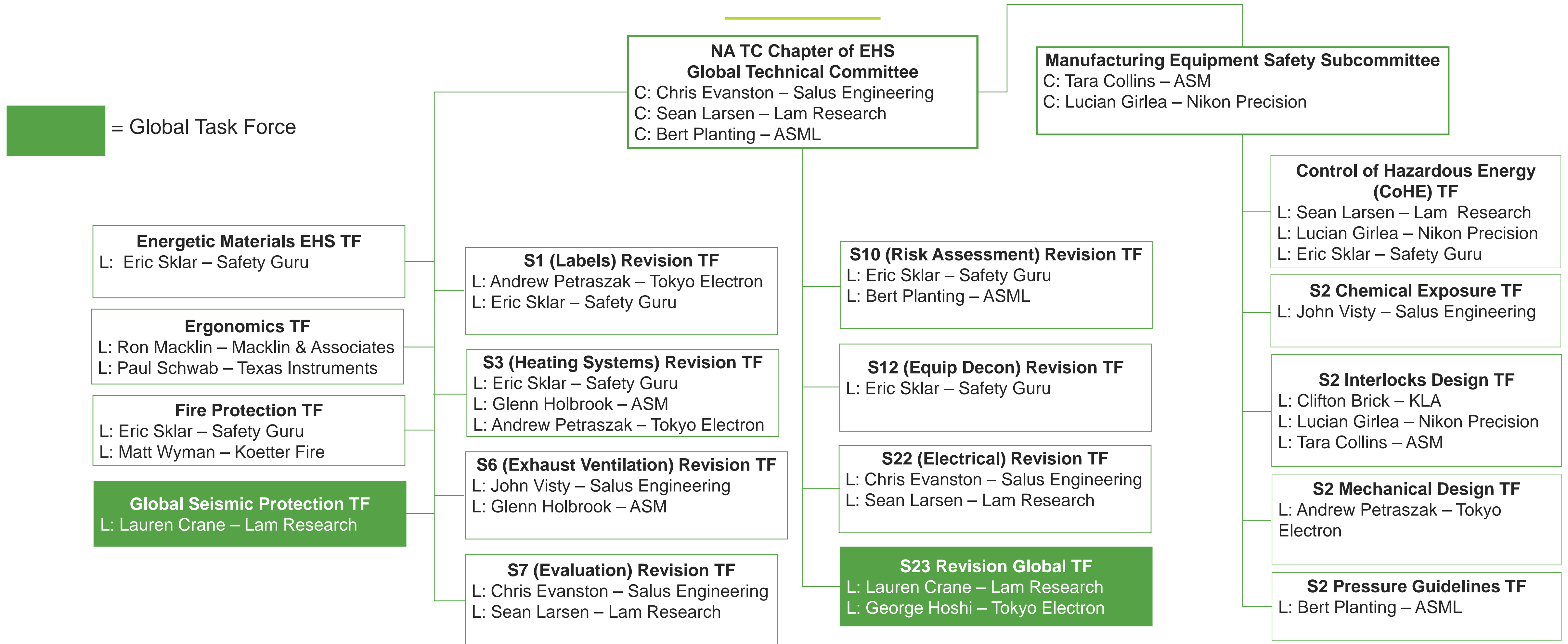
Leadership

Co-chairs

- Bert Planting (ASML)
- Chris Evanston (Salus Engineering International)
- Sean Larsen (LAM Research)

Environmental, Health & Safety (EH&S)

Global Technical Committee



Ballot Results

Doc #	Document Title	TC Chapter Action
6651C	Line Item Revision to SEMI S2, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment Line Item 1 – Delayed revision related to addition of pressure section	Passed with technical changes. Ratification ballot to be issued.
6831A	Revision of SEMI S1, Safety Guideline for Equipment Safety Labels	Failed
6885	Line Item Revision to SEMI S2, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment Line Item 1 – Delayed revision related to the invocation of SEMI S12	Failed
6887	Revision to SEMI S10, Safety Guideline for Risk Assessment and Risk Evaluation Process	Failed
6888	Revision of SEMI S12, Environmental, Health and Safety Guideline for Manufacturing Equipment Decontamination	Failed
SEMI S2-0821	Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment (Unballoted editorial changes - Clarification on section 23.5.7)	Passed

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

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

Authorized Activities

Doc #	Type	TF	Document Title/Details
None			

Note 1: SNARFs and TFOFs are available for review on the SEMI Web site at:

<http://downloads.semi.org/web/wstdsbal.nsf/TFOFSNARF>

Authorized Ballots



#	When	TF	Details
R6651C	cycle 4, or 5 -2022	S2 Pressure Guideline TF	Ratification Ballot, Line Item Revision to SEMI S2, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment (Delayed revision related to addition of pressure section)
6830	cycle 4, or 5 -2022	S3 Revision TF	Revision of SEMI S3, Safety Guideline for Process Liquid Heating Systems
6831B	cycle 4, or 5 -2022	S1 Revision TF	Revision of SEMI S1, Safety Guideline for Equipment Safety Labels
6884	cycle 4, or 5 -2022	S2 Mechanical TF	Line Item Revision to SEMI S2, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment (Mechanical)
6907	cycle 4, or 5 -2022	S7 Revision TF	Revision to SEMI S7, Safety Guideline for Evaluating Personnel and Evaluating Company Qualifications
tbd	cycle 4, or 5 -2022	S2/S22 Revision TF	Line Item Revision 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

S1 (Labels) Revision TF

- Doc. 6831A, Revision to SEMI S1-1015 Safety Guideline for Equipment Safety Labels
 - Ballot failed review and was sent back to TF for rework and reballot.

S2 Interlock Designs TF



- Triggered by concerns with S2 definitions for “fail safe” and “fault tolerant”
- Additional concerns:
 - Interpretation difficulties, unclear definitions, and S2 lack of consistency
 - An S2 compliant interlock system could not meet safety requirements
 - Situations where reliability is compared to failure mode
 - Increased risk deemed unacceptable by default
 - Unclear interlock requirements during maintenance modes
- *No specific reports of equipment failing S2 assessments or proven unsafe*
- Many of the MESSC members consider the current definitions and guidelines for safety interlock systems inadequate.
- TF meeting weekly, with very good participation.
- *Likely moving toward S2 Rewrite/Major Revision : Scope creep*
 - Inviting all other regions (e.g., Taiwan, Korea, Japan, China) to get involved.
 - Weekly or biweekly teleconferences, contact Lucian Girlea (lucian.girlea@nikon.com)

S2 Pressure Guideline TF

- Doc. 6651C, Line Item Revision to SEMI S2-0821, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment (Re: Delay Revision related to pressure guidelines)
 - Ballot **passed** with technical changes.
 - Ratification ballot will be issued in cycle 4-22.

S2 Chemical Exposure TF

- SEMI S2-0821, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment
 - Proposed editorial changes on section 23.5.7
 - 23.5.7 Chemical emissions during supplier-anticipated normal operation, maintenance, or service, when they are conducted in accordance with documents provided to the user, should not result in [exposure of personnel to breathing](#) an oxygen (O₂) deficient atmosphere. Conformance to this section can be shown by demonstrating the average oxygen concentration, for each minute of measurement, where an O₂ deficient atmosphere is possible, is equal to or greater than 19.5% in the reasonably foreseeable worst-case breathing zone(s).
 - Reason: clarification to harmonize with section 23.5 of S2
 - Editorial change was approved by the EH&S NA TC Chapter

S2 Mechanical Design TF

- Drafting doc. 6864, Line Item Revision to SEMI S2-0821, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment
 - Revise Sections 18.6 and 18.7 for better alignment and technical requirements.
 - This work may include new or updated terminology or standards references.
- Ballot was authorized for cycle 4 or 5-2022.

S3 (Heating Systems) Revision TF

- TF continues working on doc. 6830, Revision to SEMI S3-1211 (Reapproved 1017)E Safety Guideline For Process Liquid Heating Systems.
 - Complete work on the process liquid heating system tables
 - Review of the S3 revision topic list
- Ballot was authorized for cycle 4 or 5-2022.

S6 (Exhaust Ventilation) Revision TF

- Reviewed recommendation from Intel and ASM on excess flow valve
 - Teleconferences will be set up to finalize the verbiage for modifying in S6
- Discussed adding clarification on mixed gases releases/calculations into S6

S7 (Evaluation) Revision TF



- Doc. 6823, Reapproval of SEMI S7-0515, Safety Guideline for Evaluating Personnel and Evaluating Company Qualifications
 - Ballot failed. Base on the rejects received, TF plans to issue a major revision for S7 via ballot 6909.
- Doc. 6907, Revision to SEMI S7-0515, Safety Guideline for Evaluating Personnel and Evaluating Company Qualifications

S8 Ergonomics TF



- TF continues working on:
 - Drafting doc. 5996 Improvements to SEMI S8 Appendix 1 SESC:
 - Multi-person lifts (team lifting)
 - One-handed handling
 - Torque and Push/Pull knobs/lever handles
 - Update/Clarification of conformance statement in Section 3.5 of SEMI S8
 - Expansion of Display section for modern technology (HD Displays) and User interface (GUI)
 - Considerations pertaining to an Aging workforce
 - Considerations for people with special needs or disabilities
 - Product loading criteria for non-wafers cassettes, including single reticle containers (request from Shanghai Microelectronics Equip.)
 - SNARF 6309, Line Item Revision to S8-0218, Safety Guideline for Ergonomics Engineering of Semiconductor Manufacturing Equipment
 - Create a new related information section that provides ergonomics risk assessment guidance.
 - Further discussion is needed for resolution

S10 (Risk Assessment) Revision TF

- Doc. 6887, Revision to SEMI S10-1119, Safety Guideline for Risk Assessment and Risk Evaluation Process
 - Revision includes environmental risk criteria, risk assessment process.
 - Ballot failed and returned to TF for rework and reballot
- Ballot was authorized for cycle 4 or 5-2022.

S12 (Equip Decon) Revision TF

- Doc. 6888, Revision of SEMI S12-0211e, Environmental, Health and Safety Guideline for Manufacturing Equipment Decontamination
 - Ballot failed and returned to TF for rework and reballot

S22 (Electrical Design) Revision TF

- Ballot authorized for cycle 4 or 5-2022
 - Doc. tbd, Line Item Revision to SEMI S2-0821, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment, and SEMI S22-0718, Safety Guideline for the Electrical Design of Semiconductor Manufacturing Equipment

S23 Revision Global TF

- SEMI S23-1021 - Guide for Conservation of Energy, Utilities and Materials Used by Semiconductor Manufacturing Equipment
 - TF discussed splitting the document into two separate S-type documents
 - S23 Guide and
 - a new S-document as the test method.
 - The main goal is to provide for greater commonality (supplier to supplier) among S23 testing information – as a guide “comply with S23” has little meaning.

Energetic Materials EHS TF

- S30-0719E Environmental, Safety and Health Guideline for Use of Energetic Materials in Semiconductor R&D and Manufacturing Processes
 - The TF is monitoring implementation of the standard.
 - Topics discussed
 - Unreacted byproducts, such as in pump lines
 - Addition of guidance, by function (such as pump line heater blanket undertemperature), as to what interlocks should be considered
 - cold traps accumulate material, creating a hazard that needs to be addressed.

Control of Hazardous Energy (CoHE) TF



- Discussions:
- Large changes that will take more time, such as:
 - Developing appropriate criteria to allow control circuits for HEI/CoHE/LOTO
 - Addressing appropriate controls for energies that need to remain on for some types of tasks
 - OSHA requirements that are much more restrictive than the US national standard (ANSI Z244) or international standards. Do we want S2 to support equipment having to meet the OSHA requirements, or the national and international standards.
- Changes for which we can't meaningfully estimate the time required, such as:
 - Address appropriate group LOTO practices for a fab environment
 - Address whether control of energy restoration by presence (e.g. not locked but the plug is next to me) is appropriate for a generally chaotic fab environment
 - Add pretty blue labels with a lock on them next to all identified system LOTO points
 - Getting into the murky areas of ZEST and working to improve compliance

Fire Protection TF



- Ballot Development
 - Drafting doc. 6784, Line Item Revision to SEMI S2-0821, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment (Changes to materials of construction criterion in fire and smoke risk for pre-evaluation figure)
- Discussed
 - Reconsideration of proposals regarding fire detection systems
 - 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?

Manufacturing Equipment Safety Subcommittee (MESSC)



- Current Leads: Tara Collins, Lucian Girlea
 - Tara has very limited bandwidth due to work responsibilities
 - Sean Larsen volunteered as backup when Lucian Girlea is not available
- Equipment user postponing or bypassing periodic maintenance
 - The main goal is reducing equipment overall downtime
 - Impact: Can lead to new hazards or risk increase
 - Use service or commercial contracts to persuade end user to follow service requirements
- Low Voltage (LV) vs High Voltage (HV) work
 - Suggestion: Consider or require equipment design for keeping “LV” and “HV” separate doors
 - Discussing proposal
 - Add note into S2 and S22 for equipment design consideration: separate circuits to avoid the burden of donning Personal Protective Equipment (PPE) for “LV” adjustment work while in proximity to “HV” circuits.

Global Seismic Liaison TF



- A concern was raised in MESSC during the Dec 2021 Standards meetings
 - Summary: The old S2 Seismic RI, shows a step in the derivation of the horizontal force factor that is not present in the current RI, which changes the output of the general force equation from $1.32 WP$ to $.94WP$, the latter being the value in use now (and then) for anticipated horizontal force acting on the center gravity (CG) of the equipment under consideration.
- Some Taiwan EHS TC Chapter members have an interest in participating.
- Mashiro-san will reach out to Taiwan and to invite them to provide a co-leader for this Global TF.

Question?

- For more information, please contact
- Kevin Nguyen at knguyen@semi.org