Record of Line-item Letter Ballot Review by TC Chapter for Procedural Review

Region/Locale: North America
Global Technical Committee: EHS
TC Chapter Cochairs: Bert Planting (ASML), Chris Evanston (Salus Engineering), Sean Larsen (Lam Research)
Standards Staff: Kevin Nguyen

	Scheduled in Background Statement	Actual
Date	11/5/2015	11/5/2015
Location	SEMI HQ, San Jose, CA	SEMI HQ, San Jose, CA
Reason for Change of Date and/or Location (if changed)		

Note: See *Regulations* ¶ 9.5 Exception for allowable reason to change.

Document Information

I. Document Number, Title, Lists of Line Items

Document Number	Document Title
4316M	Line Item Revision to SEMI S2-0715, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment, and SEMI S22-0715, Safety Guideline for the Electrical Design of Semiconductor Manufacturing Equipment. Delayed Revision related to Fail-to-safe Equipment Control Systems (FECS)
Line Item 1	Line Item Title Clarification/Improvement of the FECS criteria

Line Item 1 Adjudication

II. Tally

Standards staff to fill in.

Voting Tally: As-cast tally after close of voting period
Note: A minimum of 60% of the Voting Interests that have TC Members within the global technical committee that issued the Letter Ballot must return Votes. (*Regulations* ¶ 9.7.1.1)

Voting Tally:

Voting Interest:	Returned Votes		Distribution		Return Rate	
Letter Ballot	56	÷	93	=	60.2%	≥60%
Intercommittee Ballot	21					
Voting Interest Reject(s)	1		Total Voters with Rejects		1	
Voting Interest Accept(s)	36					

Note: See *Regulations* § 3.2.1 for definition of Voting Interest.

III. Rejects

Voting Interest Reject 1 (Voting Interest Name: KLA-Tencor)

Voter Reject 1 (Voter: Lauren Crane (KLA-Tencor))

Negative 1

Negative	Referenced Section/ Paragraph			
		LI1B 13.3.4		
	Negative Text	Perceived Problem ====== Proposed Solution		
		Negative b) uses 'actuators', c) uses 'switch' – unless there is an intended difference, use the same term for the same thing. ==== Change c) to "resetting an EMO actuator…" or add a note to the effect of "The task force intended that 'switch' is synonymous with 'actuator' for this criterion."		
TF input (optional)				
Withdrawal (check one)			No Negative withdrawal made by Voter.	GO TO "Related" subsection
		x	Withdrawal document received by Standards staff on 11/5/2015.	GO TO "Final" subsection → (A)
Related	Motion and Reason (check one)		'Related' is mutually agreed upon. (Needs no motion.)	GO TO "Persuasive" subsection
			Negative is not related. (Needs ≥2/3 votes to pass.)	
			Reason: XXXX	
	Motion by/ 2nd by	Name (Company)/Name (Company)		
	Discussion			
	Result of Vote (check one)	XX Y-XX N; Motion passed/failed.		
			[Negative is not related.] < 2/3	GO TO "Persuasive" subsection
			2/3 ≤ [Negative is not related.]	GO TO "Final" subsection → (B)
	Motion and Reason		Negative is related and persuasive. (Needs >1/3 votes to pass.)	

Persuasive

(check one)		Negative is related and not persuasive. **(Needs ≥2/3 votes to pass.)**				
	■	Reason	XXXX			
Motion by/ 2nd by	Name (Company)/Name (Company)					
Discussion						
Result of Vote (check one)	XX **Y**-XX **N**; Motion passed/failed.					
		[Negative is related and persuasive.] > 1/3	**Is a technical change recommended? (check one)**		**Y**	**GO TO "Address by Technical Change Option" subsection**
		[Negative is related and not persuasive.] < 2/3			**N**	**GO TO "Final" subsection → (E)**
		2/3 ≤ [Negative is related and not persuasive.] < 90%	**GO TO "Final" subsection → (C)**			
		90% ≤ [Negative is related and not persuasive.]	**GO TO "Not Significant Finding Option" subsection**			

Address by Technical Change Option

Technical Change Recommendations

Original section/paragraph number and at least one full sentence are required in "FROM" and "TO" fields.

Technical Changes		
	1	**FROM: Section/Paragraph XXX**
		TO: Section/Paragraph xxx
		Justification (If necessary)
	2	**FROM: Section/Paragraph XXX**
		TO: Section/Paragraph xxx
		Justification (If necessary)

Motion		Negative is addressed by the technical change(s).	
Motion by/2nd by		Name (Company)/Name (Company)	
Discussion			
Result of Vote (check one)		XX **Y**-XX **N**; Motion passed/failed.	
		2/3 ≤ [Negative is addressed by the technical change(s).]	**GO TO "Incorporation of the Technical Change" subsection**
		[Negative is not addressed by the technical change(s).] < 2/3	**GO TO "Final" subsection → (E)**
Incorporation of	**Motion**	To incorporate the technical change(s).	
	Motion by/2nd by	Name (Company)/Name (Company)	
	Discussion		

		Result of Vote (check one)	XX **Y**-XX **N**; Motion passed/failed.		
				90% ≤ [Agree to incorporate.]	GO TO "Final" subsection → (F)
				[Disagree to incorporate.]>10%	GO TO "Final" subsection → (E)
Not Significant Finding Option	This option can be used only "if the TC Chapter finds a Negative not persuasive by a vote equal to or greater than 90% of the persons voting on the action". (*Regulations* ¶ 9.6.4.4.2)				
	Use of "Not significant finding option" (check one)		It is mutually agreed upon to term the Negative "not significant".		GO TO "Final" subsection → (D)
			It is mutually agreed upon to term the Negative "significant".		GO TO "Final" subsection → (C)
			Whether or not the Negative is "not significant" is decided by a vote.		
	Motion	The Negative is "not significant".			
	Motion by/ 2nd by	Name (Company)/Name (Company)			
	Vote		XX **Y**-XX **N**; Motion passed with simple majority		GO TO "Final" subsection → (D)
			XX **Y**-XX **N**; Motion failed with simple majority		GO TO "Final" subsection → (C)
Final	(check if applicable)	x	**(A)**	Withdrawn (counted under h in disposition)	
			(B)	Not related (counted under i in disposition)	
			(C)	Related and not persuasive (significant)	
			(D)	Not significant (counted under j in disposition)	
			(E)	Related and persuasive and not addressed by technical change	DOCUMENT FAILS
			(F)	Addressed by technical change (counted under k disposition)	
	(check if applicable)		Comment generated. See Section V-(ii) Comment # X.		

Disposition of Voting Interest Reject 1

Check only when the Document has not been failed.

1	Original number (#) of Negatives			**(g)**
1	Number of Negatives withdrawn			**(h)**
#	Number of Negatives found not related			**(i)**
#	Number of Negatives found not significant			**(j)**
#	Number of Negatives addressed by technical change (Negative becomes not significant)			**(k)**
Final		x	**g** - (**h** + **i** +**j** + **k**) = 0	Reject is Not Valid and is not included in the denominator of § VI. *Approval Conditions Check*
			g - (**h** + **i** +**j** + **k**) >0	Reject is included in the denominator of § VI. *Approval Conditions Check*
			Reject without a Negative	Not Valid

Note: If all of the Negatives included with a Reject Vote are withdrawn, determined to be not related, or determined to be not significant, the Reject Vote is not valid. (*Regulations* ¶ 9.4.3.3)

Note: A Negative addressed by a technical change is automatically considered to be not significant. (*Regulations* ¶ 9.6.4.4.2)

IV. Other Technical Issues

None

V. Comments

V- (i) Voters' Comments

Commenter 1 (Lauren Crane (KLA-Tencor)) - Comment 1

Comment	**LI1B 13.3.4.1**			
	The second Exception is un-numbered.			
Action	**The TC Chapter agreed to do one of the following actions.**			
	***No motion is required in this step.**			
		Already addressed by Commenter #, Comment #		
		No further action was taken by the TC Chapter.		
		Refer to the TF for more consideration.		
		New Business		
	x	Editorial Change		
		Options for editorial change **(check one)**	x	**Case 1: No vote in this section:**
				To be included and voted on as a group in § VI. *Editorial Changes Other than Those Voted on in § V*.
				Case 2: Voted in this section:
				Original section number and at least one full sentence are required in "FROM" and "TO" fields.

Commenter 2 (Eric Sklar (Safety Guru)) - Comment 1

	Part B: **D1-2.1**

Comment	Comment: Restructure differently Reason/Justification: I agree that the structure of 13.3.4 is less than clear. However, creating a "13.3.4.1" from "b)" doesn't fix the problem, and it creates an instance of a single item at an outline level, which is generally an undesirable thing. I suggest restructuring 13.3.4 thusly: 13.3.4 EMO Design and Performance {Remove the em dash and the text after it; eliminating the redundant "should"s and the confusing "should include the EMO circuit should not include controls…".) First "NOTE 41" Second "NOTE 41"" 13.3.4.1 {Text of "a)", appropriately capitalized and punctuated. 13.3.4.2 {Text of "b)", appropriately capitalized and punctuated. Present Exception, with the addition of the "1" Proposed Exception, with the addition of the"2" 13.3.4.3 {Text of "c)", appropriately capitalized and punctuated. 13.3.4.4 {Text of "d)", appropriately capitalized and punctuated. 13.3.4.5 {Text of "e)", appropriately capitalized and punctuated.		
Action	**The TC Chapter agreed to do one of the following actions.**		
	***No motion is required in this step.**		
			Already addressed by Commenter #, Comment #
			No further action was taken by the TC Chapter.
			Refer to the TF for more consideration.
			New Business
	x		Editorial Change
	Options for editorial change **(check one)**	x	**Case 1: No vote in this section:** **To be included and voted on as a group in § VI. *Editorial Changes Other than Those Voted on in § V*.**
			Case 2: Voted in this section: **Original section number and at least one full sentence are required in "FROM" and "TO" fields.**

Commenter 2 (Eric Sklar (Safety Guru)) - Comment 2

Comment	**Part B:** **D1-2.1**		
	Comment: Insert "2" after "EXCEPTION" in the proposed exception to 13.3.4.1. Reason/Justification: This would be the second exception to the preceding numbered paragraph. As this change would fix a deviation from the approved Style and does not change the technical content, it is editorial.		
Action	**The TC Chapter agreed to do one of the following actions.**		
	***No motion is required in this step.**		
			Already addressed by Commenter #, Comment #
			No further action was taken by the TC Chapter.
			Refer to the TF for more consideration.
			New Business
	x		Editorial Change
	Options for editorial	x	**Case 1: No vote in this section:** **To be included and voted on as a group in § VI. *Editorial Changes Other than Those Voted on in § V*.**

change (check one)		**Case 2: Voted in this section:**
		Original section number and at least one full sentence are required in "FROM" and "TO" fields.

Commenter 3 (YoYu Imamiya (DNS)- Comment 1

Comment	**11.6.1**	
	There is no word "programmable safety controller" in SEMI S22. The words should be aligned with SEMI S22. It may be "programmable safety control system".	
Action	**The TC Chapter agreed to do one of the following actions.**	
	***No motion is required in this step.**	
		Already addressed by Commenter #, Comment #
		No further action was taken by the TC Chapter.
	x	Refer to the TF for more consideration. [TF consensus was to refer this to the TF for further review. There seem to be a few issues with the related terminology that could use some improvement.]
		New Business
		Editorial Change

V-(ii) Comments Created by Handling Negative

None

VI. Editorial Changes Other than Those Voted on in § V

Original section/paragraph number and at least one full sentence are required in "FROM" and "TO" fields.

1	Origin of this editorial change (Check one)	x	Commenter 1 and 2 / Comment 1 and 2
			Other [ ]

FROM:

13.3.4 *EMO Design* — The design and performance of the EMO circuit should include all the following:

a) the EMO circuit should not include controls that enable it to be defeated or bypassed

b) the each EMO actuator should be self-latching

c) resetting the an EMO switch should not re-energize circuits, equipment, or subassemblies that create a hazard to personnel or the facility

d) the EMO circuit should shut down the equipment by de-energizing rather than energizing control components

NOTE 41: For equipment intended for use in potentially explosive or flammable atmospheres, it is recommended that a pneumatic or intrinsically safe EMO circuit be considered.

13.3.4.1 The EMO circuit should consist of electro-mechanical components.

EXCEPTION 1: Solid-state devices and components may be used, provided the system or relevant parts of the system are evaluated and found suitable for use. The components should be evaluated and found suitable considering abnormal conditions such as over voltage, under voltage, power supply interruption, transient over voltage, ramp voltage, electromagnetic susceptibility, electrostatic discharge, thermal cycling, humidity, dust, vibration and jarring. The final removal of power should be accomplished by means of electromechanical components.

EXCEPTION: FECS may be used in conjunction with electromechanical or solid state devices and components provided the FECS meets the criteria of ¶¶ 13.7.3.1 and 13.7.3.2. The final removal of power should be accomplished by means of electromechanical components.

TO:

13.3.4 *EMO Design and Performance*

NOTE 41: For equipment intended for use in potentially explosive or flammable atmospheres, it is recommended that a pneumatic or intrinsically safe EMO circuit be considered.

13.3.4.1 The EMO circuit should not include controls that enable it to be defeated or bypassed.

13.3.4.2 The EMO circuit should consist of electro-mechanical components.

EXCEPTION 1: Solid-state devices and components may be used, provided the system or relevant parts of the system are evaluated and found suitable for use. The components should be evaluated and found suitable considering abnormal conditions such as over voltage, under voltage, power supply interruption, transient over voltage, ramp voltage, electromagnetic susceptibility, electrostatic discharge, thermal cycling, humidity, dust, vibration and jarring. The final removal of power should be accomplished by means of electromechanical components.

EXCEPTION 2: FECS may be used in conjunction with electromechanical or solid state devices and components provided the FECS meets the criteria of ¶¶ 13.7.3.1 and 13.7.3.2. The final removal of power should be accomplished by means of electromechanical components.

13.3.4.3 Each EMO actuator should be self-latching.

13.3.4.4 Resetting an EMO actuator should not re-energize circuits, equipment, or subassemblies that create a hazard to personnel or the facility.

13.3.4.5 The EMO circuit should shut down the equipment by de-energizing rather than energizing control components.

Justification: (If necessary)

Restructure is more consistent than having a lettered list with a single separate numbered paragraph, but the change is needed as exceptions only apply to one item of the list.
Clarification for changing “actuator” to “switch” as the intent for both is the same
Rearrangement of note location to keep it applying to all of EMO design.
All proposed changes are strictly editorial.

Motion	To approve the above editorial change(s).
Motion by/ 2nd by	Sean Larsen (Lam Research)/Eric Sklar (Safety Guru)
Discussion	Questioned committee if anyone felt that any of the changes were not editorial. No response/objection.
Vote	7 **Y**-0 **N**; Motion passed

VII. Approval Conditions Check

VII. - (i). Approval Rate

APPROVAL CONDITION 1: All Negatives have been discussed and were withdrawn, found not related, found not persuasive, or addressed by a technical change. (*Regulations* ¶ 9.7.1.2)

APPROVAL CONDITION 2: At least 90% of the sum of valid Voting Interest Accept and Voting Interest Reject Votes must be Accept. (*Regulations* ¶ 9.7.1.3)

Note: If both approval conditions are not satisfied, the Document fails.

		Accepts		(Accepts + Valid Rejects)				
Approval Rate	=	36	/	36	=	100.0%		≥90%

VII. – (ii) Approval Level (check one)

Note: See *Regulations* § 9.7.2 for further information.

X	**Globally Approved (No Ratification Ballot needed):** Line Item 1 meets the Letter Ballot approval conditions for the global technical committee.
	Need a Ratification Ballot: Line Item 1 meets the Letter Ballot approval conditions for the TC Chapter and a Ratification Ballot will be issued to validate technical changes.

Checks for Entire Document Including All Approved Line Items

VIII. Safety Check

Note: This Safety check applies to the entire Standard or Safety Guideline including all the approved Line Items. See § 15 of the *Regulations* for further information.

Motion			
		This is not a Safety Document, when all safety-related information is removed, the Document is still technically sound and complete. (*Regulations* ¶ 8.7.1)	
	x	**This is a Safety Document**, when all safety-related information is removed, the Document is not technically sound and complete. (*Regulations* ¶ 8.7.2)	
		x	Safety Checklist (*Regulations* ¶ 15.3) is complete and has been included with the Document throughout the balloting process. (*Regulations* ¶ 15.1.2)
Motion by/2nd by			Sean Larsen (Lam Research)/Carl Wong (Applied Materials)
Discussion			None
Vote			6 **Y**-0 **N**; Motion passed

IX. Intellectual Property (IP) Check

Note: This IP check applies to the entire Standard or Safety Guideline including all the approved Line Items. See § 16 of the *Regulations* for further information.

x	The TC Chapter meeting chair asked those participating, if they were aware of any potentially material patented technology or copyrighted items* in the Standard or Guideline. (*Regulations* ¶ 8.8.1)			
	x	No potentially material patented technology or reproduction of copyrighted items is known.		**GO TO SECTION X.**
		Potentially material patented technology or reproduction of copyrighted items is known, but a Letter of Assurance (LOA) or copyright release letter for such items has been obtained or presented to the TC Chapter.		**GO TO SECTION X.**
		Potentially material patented technology or reproduction of copyrighted items is known and use of such materials is technically justified by the TC Chapter, but an LOA or copyright release letter for some of the item(s) has NOT been obtained or presented to the TC Chapter.		
	Motion		Ask ISC for special permission to publish.	
			Quit activity.	
			Wait for LOA for patented technology or release of copyrighted items.	
	Motion by/2nd by		Name (Company)/Name (Company)	
	Discussion		XXXX	
	Vote		XX **Y**-XX **N**	
	Final Action		Motion passed	
			Motion failed	

*** Note: Such potentially material patented technology or copyrighted items might have become known since the Standard or Safety Guideline was last reviewed, or might become relevant due to this Letter Ballot.**

X. Action for This Document

Motion (Check all applicable items)		Line item(s) [x] passed TC Chapter review as balloted and will be forwarded to the ISC A&R SC for procedural review.
	x	Line item(s) [1] passed TC Chapter review with editorial changes and will be forwarded to the ISC A&R SC for procedural review.
		Line item(s) [X], [X] and [X] passed TC Chapter review with technical changes and with or without editorial changes and will be forwarded to the ISC A&R SC for procedural review. A Ratification Ballot will be issued to verify the technical changes.
		Line item(s) [X], [X] and [X] failed TC Chapter review and will be returned to the TF for rework.
		Line item(s) [X], [X] and [X] failed TC Chapter review and work will be discontinued.

Motion by/ 2nd by	Sean Larsen (Lam Research)/Carl Wong (Applied Materials)	
Discussion	None	
Vote	4 **Y** - 0 **N**	
Final Action	x	Motion passed
		Motion failed

Standards staff to record the result of the A&R procedural review here:

A&R		**Line item(s) [X], [X] and [X] are Approved for publication**
		Line item(s) [X], [X] and [X] are Approved pending acceptance of the Ratification Ballot
		Line item(s) [X], [X] and [X] are Not approved
	Reason:	