

China PV Committee
Meeting Summary and Minutes
 China Summer Standards Meetings 2014
 June 13th, 2014, Friday, 09:00 -17:30
 Power Valley International Hotel, Power Valley Hall, 3F
 No.1888, Chaoyang North Avenue, Baoding, China

Next Committee Meeting
 Friday, September 12th, 2014

Table 1 Meeting Attendees

Co-Chairs: Guangchun Zhang (CanadianSolar)

SEMI Staff: Allen Lu – SEMI China, Kris Shen – SEMI China, Richard Jiang – SEMI China, Toby Liu – SEMI China

<i>Company</i>	<i>Last</i>	<i>First</i>	<i>Company</i>	<i>Last</i>	<i>First</i>
48th Research Institute	Lv	Wenli	Sevenstar	Li	Dongqi
48th Research Institute	Liu	Liangyu	SIBCO	Schless	Ton
48th Research Institute	Cai	Xianwu	SIBCO	Liu	Leo
Astronergy	Niu	Xinwei	SINOSICO	Yan	Dazhou
Baoding Times	Su	Kuili	SINOSICO	Chu	Dongxu
Borealis Asia Ltd	Liu	Andy	Sunport	Lu	Zhonglin
Canadiansolar	Zhang	Guangchun	Suntech	Zhu	Jinbing
Canadiansolar	Peng	Lixia	Suntech	Chen	Rulong
CEMIA	Lu	Jin	Suntech	Liang	Zhe
CESI	Feng	Yabin	Sveck	Yang	Qiuping
CNSMQ	He	Dongjiang	Sveck	Shen	Wenjuan
CPVT	He	Li	TBEA	Qiu	Yanmei
CPVT	Jiang	Wei	TESA	Li	Fangcheng
Darbond	Liu	Zhongxun	Tianwei New Energy	Lin	Hongfeng
Darbond	Wang	Xuegang	TONSAN	Yang	Xue
Dowcoring	Xue	Yang	Trina	Xiao	Xinmin
Dowcoring	An	Qinpeng	Trina	Xu	Jianmei
DSM	Wang	Xiaolian	Trina	Xiao	Taoyun
Dupont	Ye	Wenyuan	TÜV SÜD-	Wu	Yaozhong
Dupont	Du	Peng	TÜVRheinland	Zou	Chris
Edwards	Shao	Wei	TÜVRheinland	Li	Shaobo
Fujian Metrology Institute	Yang	Aijun	Wacker	Qin	Wenfang
Fujian Metrology Institute	Li	Jiansheng	Yidao Solar	Meng	Yachao
GCL	Liu	Xiaoxia	Yingli	Song	Dengyuan
GDSOLAR	Wu	Xiexiang	Yingli	Li	Gaofeng
Hanergy	Lv	Baotang	Yingli	Zhang	Lei
Hanergy	Zhang	Ying	Yingli	Wu	Cuigu
Hanergy	Guo	Feng	Yingli	Li	Yingye
Hebei University	Chen	Jianhui	Yingli	Wang	Jing
Heraeus	Wang	Yihua	Yingli	Wang	Tao
HonBest	Huang	Junran	Yingli	Tian	Shuquan
Jiasheng Solar	Guo	Zhengyang	Yingli	Ma	Chao
Jiasheng Solar	Wang	Chunzhe	Yingli	Wang	Huixiao
Jinko	Yao	Yanyan	Yingli	Sun	Fengxia
Jolywood	Xie	Jianjun	Yingli	Zhang	Xi
Jolywood	Cao	Jinjin	Yingli	Zhang	Duchao
Jolywood	Sun	Yuhai	Yingli	Zhao	Huali
JYT	Zhao	Tongrong	Yingli	Gao	Yanjie

JYT	Guo	Dawei	Yingli	Li	Yingjian
LCT	Li	Zhixin	Yingli	Su	Zhe
LDK	Liu	Linyan	Yingli	Jian	Huaxin
LDK	Liu	Hai	Yingli	Jian	Qizhong
Lightway	Wu	Zhenyu	Yingli	Gao	Tiancai
Lightway	Li	Huulin	Yingli	Zhang	Linbiao
Lightway	Yu	Hongwei	Yingli	An	Libing
Lohmann	Wang	Jinbo	Yingli	Li	Shoujie
Redsolar	Luo	Liang	Yingli	Cheng	Qipeng
SEMILAB	Huang	Li	Yingli	Liu	Shiyuan
Sevenstar	Liu	Buzhong	Yingli	Song	Tianlei

Table 2 Leadership Changes

<i>Group</i>	<i>Previous Leader</i>	<i>New Leader</i>
Multi-wire Saws Task Force (new)		Jingying Jia (National Engineering Research Center for Photovoltaic Equipment) Xianwu Cai (CETC 48 th Institute) Zhixin Li (LCT)

Table 3 Ballot Results

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

Failed ballots and line items were returned to the originating task forces for re-work and re-balloting.

<i>Document #</i>	<i>Document Title</i>	<i>Committee Action</i>
Doc. 5382B	New Standard: Specification for Quasi-monocrystalline Silicon Wafers Used in Photovoltaic Solar Cells	Failed and return to TF for re-work
Doc. 5659	New Standard: Test Method Based on RGB for C-Si Solar Cell Color	Failed and return to TF for re-work
Doc. 5477B	New Standard: Test Method for Determining B, P, Fe, Al, Ca Contents in Silicon Powder for PV Applications by Inductively-Coupled-Plasma Optical Emission Spectrometry	Failed and return to TF for re-work

Table 4 Authorized Ballots

<i>#</i>	<i>When</i>	<i>SC/TF/WG</i>	<i>Details</i>
#5563A	Cycle 5-2014	PV Module Task Force	New Standard: Specification for Framing Tape for PV Modules
#5660	Cycle 5-2014	PV Module Task Force	Specification for Ultra-thin Glasses Used for Photovoltaic Modules
#5644	Cycle 5-2014	PV Module Task Force	New Standard: Terminology for Back Contact PV Cell and Module
#5426A	Cycle 5-2014	Crystalline Silicon Cell Task Force	Specification for Aluminum Paste, Used in Back Surface Field of Crystalline Silicon Solar Cells
#5476B	Cycle 5-2014	PV Silicon Raw Materials Task Force	New Standard: Test Method for Determination of Total Carbon Content in Silicon Powder by Infrared Absorption After Combustion in an Induction Furnace
#5564B	Cycle 5-2014	PV Silicon Raw Materials Task Force	New Standard: Test Method for the Measurement of Chlorine in Silicon by Ion Chromatography

Table 5 Authorized Activities

<i>#</i>	<i>Type</i>	<i>SC/TF/WG</i>	<i>Details</i>
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Table 5 Authorized Activities

#	Type	SC/TF/WG	Details
#5724	SNARF	PV Silicon Wafer Task Force	New Standard: Guide for Specifying Quasi Monocrystalline Silicon Wafers used in Photovoltaic Solar Cells
#5725	SNARF	PV Module Task Force	New Standard: Practice for Metal Wrap Through (MWT) Back Contact PV Module Assembly
#5726	SNARF	Crystalline Silicon Cell Task Force	New Standard: Test Method for Determining the Aspect Ratio of Solar Cell Metal Fingers by Confocal Laser Scanning Microscope
#5727	SNARF	Crystalline Silicon Cell Task Force	New Standard: Test Method for the Etch Rate of A Crystalline Silicon Wafer by Determining The Weight Loss
#5728	SNARF	Multi-wire Saws Task Force	New Standard: Test Method for the Wire Tension of Multi-wire Saws
#5729	SNARF	PV Power Station Equipment Integrated Performance Task Force	New Standard: Specification for Hotspot in Crystalline Silicon PV Modules in the Field
	TFOF	Multi-wire Saws Task Force	Scope: Develop the standards of Multi-wire sawing in the PV industrial chain.

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

Table 6 New Action Items

Item #	Assigned to	Details
ChinaPV-0614-01	PV Module TF	Review 3 published standards: <ul style="list-style-type: none"> SEMI PV44-0513, Specification for Package Protection Technology for PV Modules SEMI PV45-0513, Test Method for the Content of Vinyl Acetate (VA) in Ethylene-Vinyl Acetate (EVA) Applied in PV Modules Using Thermal Gravimetric Analysis (TGA) SEMI PV47-0513, Specification for Anti-Reflective-Coated Glass, Used in Crystalline Silicon Photovoltaic Modules

Table 7 Previous Meeting Action Items

Item #	Assigned to	Details	Status
None			

1 Welcome, Reminders, and Introductions

Committee co-chair Guangchun Zhang chair the meeting and welcome all attendees, all the attendees introduced themselves. Kris Shen called the meeting to order at 9:10 AM. The meeting reminders on antitrust issues, intellectual property issues and effective meeting guidelines were reviewed. Agenda was reviewed.

2 Review of Previous Meeting Minutes

Minutes were reviewed. No change was made.

Motion: To accept the minutes of the previous meeting as submitted

By / 2nd: Dengyuan Song(Yingli)/ Dazhou Yan (SINOSICO)

Discussion: None

Vote: 34-0. Motion passed

Attachment-1, China PV TC Minutes 20140320.pdf

3 Staff Report

Kris Shen (SEMI) gave the staff report. Highlights

- Overview the SEMI Global 2014 Calendar of Events
- Remind the upcoming SEMI standards ballots submission deadline, and remind to vote for Cycle 4
- Recently Published 2 PV Standards
 - SEMI PV53-0514 Test Method for In-Line Monitoring of Flat Temperature Zone in Horizontal Diffusion Furnace
 - SEMI PV54-0514 Specification for Silver Paste, Used to Contact with N+ Diffusion Layer of Crystalline Silicon Solar Cells

Attachment-2, SEMI Staff Report 20140613.pdf

4 Liaison Reports

4.1 North America PV Materials Committee

Kris Shen (SEMI) reported. Highlights:

- Next meeting – Intersolar North America Meetings, San Francisco Marriott, CA, July 9, 2014

Attachment-3, NA Liaison Report PV Materials 20140504.pdf

4.2 Europe PV Automation Committee

Kris Shen (SEMI) reported. Highlights:

- TC to be disbanded

Attachment-4, Europe PV Automation Liaison Report June 10, 2014.ppt

4.3 Europe PV Materials Committee

Kris Shen (SEMI) reported. Highlights:

- Next meeting – Date to be decided
- Ballot Results Summary from October meeting
 - Doc 5565, Line Item Revision to PV42, Test Method for In-Line Measurement of Waviness on PV Silicon Wafers by a Light Sectioning Technique Using Multiple Line Segments – PASSED
 - Doc 5433, New Standard, Test Method for In-line Characterization of PV Silicon Wafers regarding Grain Size – PASSED
 - Doc 5432, New Standard, Test Method for In-line Characterization of PV Silicon Wafers by Using Photoluminescence – PASSED

Attachment-5, Europe PV Materials Liaison Report March 17, 2014.ppt

4.4 Japan PV Automation Committee

Kris Shen (SEMI) reported. Highlights:

- Next meeting – June 27, 2014, SEMI Japan, Tokyo, Japan
- Ballot Action in Cycle 6
 - Doc. #5223A, New Subordinate Standard: “Media Interface Specifications for a Horizontal Communication between Equipment” to be Used to Implement SEMI PV35--Passed as balloted
 - Doc. #5631, Line Item Revisions to SEMI PV35-1012, Specification For Horizontal Communication Between Equipment For Photovoltaic Fabrication System

Attachment-6, JP_PVAuto_Liaison_for_CH_2014_0613_R0.9.ppt

4.5 Japan PV Materials Committee

Kris Shen (SEMI) reported. Highlights:

- Next meeting – July 4, 2014, SEMI Japan Office, Tokyo, Japan
- Working on
 - Doc. #5417, New Standard: Test Method for Measurement of Defects in PV Silicon Wafers in PV Modules by Electroluminescence Imaging

- Doc. #5532, New Standard: Test Method for Measurement of Cracks in PV Silicon Wafers in PV Modules by Laser Scanning

Attachment-7, 140612 JA_PV&PVM_China-Summer_2014_R0.1.pptx

4.6 Taiwan PV Committee

Kris Shen (SEMI) reported. Highlights:

- Next meeting – July 25, 2013, SEMI Office, Hsinchu

Attachment-8, Taiwan Liaison Report for SJ Meeting December 2013_PV.ppt

5 Ballot Review

5.1 Cycle 3-2014: Doc. 5382B, New Standard: Specification for Quasi-monocrystalline Silicon Wafers Used in Photovoltaic Solar Cells

5.1.1 Document **failed** technical review due to persuasive reject and was sent back to TF for rework. See attachment below for detail adjudication.

Attachment-9, 5382B Failed.pdf

5.2 Cycle 3-2014: Doc. 5659, New Standard: Test Method Based on RGB for C-Si Solar Cell Color

5.2.1 Document **failed** technical review due to persuasive reject and was sent back to TF for rework. See attachment below for detail adjudication.

Attachment-10, 5659 Failed.pdf

5.3 Cycle 3-2014: Doc. 5477B, New Standard: Test Method for Determining B, P, Fe, Al, Ca Contents in Silicon Powder for PV Applications by Inductively-Coupled-Plasma Optical Emission Spectrometry

5.3.1 Document **failed** technical review due to persuasive reject and was sent back to TF for rework. See attachment below for detail adjudication.

Attachment-11, 5477B Failed.pdf

6 Task Force Reports

6.1 PV Raw Materials Task Force

- Working on

- Doc. 5476, New Standard: Test Method for Determination of Total Carbon Content in Silicon Powder by Infrared Absorption after Combustion in an Induction Furnace.
- Doc. 5477, New Standard: Test Method for Determining B, P, Fe, Al, Ca Contents in Silicon Powder for PV Applications by Inductively-Coupled-Plasma Optical Emission Spectrometry.
- Doc. 5564A, New Standard: Test Method for the Measurement of Chlorine in Silicon by Ion Chromatography.

Attachment-12, PV Silicon Raw Material 20140609.ppt

6.2 PV Silicon Wafer Task Force

- Working on Doc. 5382A, New Standard : Specification for Quasi-monocrystalline Silicon Wafers used in Photovoltaic Solar Cells

Attachment-13, PV Silicon Wafer TF Report 13.06.2014.ppt

6.3 Crystalline Silicon Cell Task Force

- Working on

- Doc. 5426, Specification For Aluminum Paste, Used In Back Surface Field Of Crystalline Silicon Solar Cells

- Doc. 5427, Specification For Silver Paste, Used To Contact With N+ Diffusion Layer Of Crystalline Silicon Solar Cells
- Doc. 5659, Test Method Based on RGB for C-Si Solar Cell Color

Attachment-14, Crystalline Silicon Solar Cell Task Force Report -20140606.pptx

6.4 PV Module Task Force

- Working on 4 documents
 - Doc. 5660, Specification for Ultra-thin Glasses Used for Photovoltaic Modules
 - Doc. 5661, Test Method for Electrical Parameters of Bifacial Solar Module
 - Doc. 5563, Specification for Framing Tape for PV Modules
 - Doc. 5644, Terminology for Back Contact PV Cell and Module

Attachment-15, PV Module TF Report-2014-6-13.ppt

6.5 Silicon Thin Film PV Module Task Force

- Working on Doc. 5478, Test method for thin-film silicon PV modules light soaking

Attachment-16, Silicon Thin Film PV Module Task Force.ppt

6.6 PV Diffusion Furnace Test Methods Task Force

- Working on Doc. 5429, New Standards: Test Method for In-line Monitoring of Flat Temperature Zone in Horizontal Diffusion Furnaces

Attachment-17, PV Diffusion Furnace Test Methods TF Report0613.ppt

6.7 PV Power Station Equipment Integrated Performance Task Force

- Working on Doc. 5648, New standard: Test Method for the Integrated Efficiency of Installed PV Components
- New SNARF: Specification for on Site Hotspot Failure

Attachment-18, PV Power System Task Force Report -2014 6 13.ppt

7 Old Business

None

8 New Business

8.1 Request for Ballots in cycle 5-2014

- Doc. 5563A, New Standard: Specification for Framing Tape for PV Modules

Motion: To approve Doc. 5563A for Balloting in cycle 5-2014

By/2 nd: Shuquan Tian (Yingli)/ Zhixin Li(LCT)

Discussion: Shuquan Tian shows the data for the 180 degree peeling test that come from the different tape suppliers and it includes different material test plates in this experiment, for example aluminum, PET, TPE, glass and stainless. The data shows that there is not significant difference between the different material test plate, so it is OK to use the stainless plate for this standard.

Question 1st: It is necessary to define the stainless type because of so many different type.

Answer: Yes, it is right, the type of stainless is 304 in this standard.

Question 2nd: The histogram is OK for the management level people, but we need to have the detail and scientific analysis method for the technology guys.

Answer: OK, I agree.

Vote: 30-0, Motion Passed

- Doc. 5660, Specification for Ultra-thin Glasses Used for Photovoltaic Modules

Motion: To approve Doc. 5660 for Balloting in cycle 5-2014

By/2 nd: Jianmei Xu(Trina) / Dengyuan Song(Yingli)

Discussion: Q1: the current scope of the ultra-thin glasses is 2.0-3.0mm, if there is some thinner glasses in the future, how to define?

A1: The standard name cannot update, we can update the standard in the future if there is some new thinner glasses.

Vote: 28-0, Motion Passed

- Doc.5644, New Standard: Terminology for Back Contact PV Cell and Module

Motion: To approve Doc. 5644 for Balloting in cycle 5-2014

By/2 nd: Ton Schless(SIBCO) / Dazhou Yan(SINOSICO)

Discussion: None

Vote: 25-0, Motion Passed

- Doc. 5426A, Specification for Aluminum Paste, Used in Back Surface Field of Crystalline Silicon Solar Cells

Motion: To approve Doc. 5426A for Balloting in cycle 5-2014

By/2 nd: Rulong Chen(Suntech) / Dengyuan Song(Yingli)

Discussion: None

Vote: 27-0, Motion Passed

- Doc. 5476B, New Standard: Test Method for Determination of Total Carbon Content in Silicon Powder by Infrared Absorption After Combustion in an Induction Furnace

Motion: To approve Doc. 5476B for Balloting in cycle 5-2014

By/2 nd: Li He(CPVT) / Dengyuan Song(Yingli)

Discussion: The change of “1.1 The purpose of this test method is to standardize analytical protocols for the determination of total carbon content in PV silicon raw materials which may affect the properties and performances of PV solar product or its ~~process-procedure~~ processing. ” in Doc. 5476B was suggested by Mr. Xiexiang Wu

Vote: 27-0, Motion Passed

- Doc. 5564B, New Standard: Test Method for the Measurement of Chlorine in Silicon by Ion Chromatography

Motion: To approve Doc. 5476B for Balloting in cycle 5-2014

By/2 nd: Xiaoxia Liu(GCL) / Dengyuan Song(Yingli)

Discussion: None

Vote: 27-0, Motion Passed

8.2 New SNARFs & TFOFs

- SNARF- New Standard: Specification for Hotspot in Crystalline Silicon PV Modules in the Field

Motion: To approve the SNARF

By/2 nd: Zhe Liang (Suntech)/ Dengyuan Song(Yingli)

Discussion: Dr. Dengyuan Song: There are many uncertain factors in the field, such as wind seep, humidity and temperature, and they possibly affect the test result.

Dr. Zhenyu Wu: Seasonal and transportation factors should be considered. The pass/fail criteria of hot-spot should be different between standard module and double glass module.

Dr. Xinwei Niu: The scope of this standard should be only for crystalline silicon PV module.

Mr. Guangchun Zhang: If the temperature difference affect the output power, the module should be replaced.

Mr. Xiexiang Wu: From the point of view of the power station owner, this standard is very important and helpful, I suggest that the module should be replace if the temperature difference is 30°C or 40°C.

Vote: 27-1, Motion Passed

- SNARF- New Standard: Test Method for Determining the Aspect Ratio of Solar Cell Metal Fingers by Confocal Laser Scanning Microscope

Motion: To approve the SNARF

By/2nd: Jing Wang (Yingli)/ Zhixin Li (LCT)

Discussion: Question 1st: Now in addition to the Confocal Laser Scanning Microscope and Veeco, is there any other test method?

Answer: For high precision testing, only Confocal Laser Scanning Microscopy test method and Veeco.

Question 2nd: The disadvantages of Confocal Laser Scanning Microscopy?

Answer: The minimum resolution of Confocal Laser Scanning Microscopy is 2 μm , and Veeco is 2nm. Compared to Veeco, the accuracy of Confocal Laser Scanning Microscopy is lower. But as the tool of testing aspect ratio of solar cell metal fingers, is enough, and this method can be more direct, more informative, and no contact, nondestructive test.

Vote: 29-0, Motion Passed

Attachment-19, Test Method for Determining the Aspect Ratio.pdf

- SNARF- New Standard: Test Method for the Etch Rate of A Crystalline Silicon Wafer by Determining The Weight Loss

Motion: To approve the SNARF

By/2nd: Fengxia Sun (Yingli)/ Zhixin Li (LCT)

Discussion: Question 1st: What's advantage of the standard method compared with other methods?

Answer: Weighing method has advantages of low cost and easy to popularize compare with confocal microscopy and level meter method .

Question 2nd: Discuss the standard's English name

Answer: Test Method for The Rate of A Crystalline Silicon Wafer by Determining The Weight Loss.

Question 3 rd: Weighing method is the oldest method, There is no data?

Answer: There are images and comparison data of weighing method and confocal, See PPT image data..

Vote: 11-4, Motion Passed

Attachment-20, Test Method for Etch Rate.pdf

- SNARF- New Standard: Practice for MWT Back Contact PV Module Assembly

Motion: To approve the SNARF

By/2nd: Ton Schless (SIBCO)/ Jingbing Zhu (Suntech)

Discussion: Question 1st: MWT should be show the whole name .

Answer: OK, added the whole name and updated the doc name to *Practice for Metal Wrap Through (MWT) Back Contact PV Module Assembly*.

Vote: 23-1, Motion Passed

- SNARF- New Standard: Guide for Specifying Quasi Monocrystalline Silicon Wafers used in Photovoltaic Solar Cells

Motion: To approve the SNARF

By/2nd: Linyan Liu (LDK)/ Dengyuan Song (Yingli)

Discussion: None.

Vote: 26-0, Motion Passed

- SNARF- New Standard: Test Method for Measuring the Multi-wire Sawing Tension

Motion: To approve the SNARF

By/2nd: Liangyu Liu (48th Research Institute)/ Zhixin Li (LCT)

Discussion: Q1: The actual tension should be the wire tension, so the title must be modified.

A1:Accept for the expert suggest. And updated the doc name to *Test Method for the Wire Tension of Multi-wire Saws*

Q2:"Test method" can be modified to "guide", or not?

A2:This standard introduce a test method, can be applied to measure kinds of wire, not aim at the

specially wire, so the standard belongs to the scope of test method.
Q3: The process of measuring by this test method is static or dynamic?
A3: It is static.

Vote: 22-1, Motion Passed

Attachment-21, Test method for the wire tension of multi-wire saws.pdf

● New Task Force: Multi-wire Saws Task Force

Motion: To approve the TFOF

By/2nd: Liangyu Liu (48th Research Institute)/ Dengyuan Song (Yingli)

Discussion: None.

Vote: 25-0, Motion Passed

9 Action Item Review

9.1 Open Action Items

None

9.2 New Action Items

See Table 6.

10 Next Meeting and Adjournment

The next meeting of the China PV Standards committee will be on September 12th, 2014, Friday, in Dalian, Liaoning, China.

Respectfully submitted by:

Kris Shen
SEMI China

Minutes approved by:

Jun Liu (CESI) , Co-chair	2014/6/27
Guangchun Zhang (CanadianSolar), Co-chair	2014/6/27

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3	NA Liaison Report PV Materials 20140504	14	Crystalline Silicon Solar Cell Task Force Report -20140606.pptx
4	Europe PV Automation Liaison Report June 10, 2014.ppt	15	PV Module TF Report-2014-6-13.ppt
5	Europe PV Materials Liaison Report March 17, 2014.ppt	16	Silicon Thin Film PV Module Task Force.ppt
6	JP_PVAuto_Liaison_for_CH_2014_0613_R0.9.ppt	17	PV Diffusion Furnace Test Methods TF Report0613.ppt
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11	5477B Failed.pdf		
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#1 Due to file size and delivery issues, attachments must be downloaded separately. A .zip file containing all attachments for these minutes is available at www.semi.org. For additional information or to obtain individual attachments, please contact [SEMI Staff Name] at the contact information above.