NA PV/PV Materials TC Chapters Meeting Minutes

Intersolar NA Meeting 2015
Wednesday, July 15, 2015, 1:00 PM - 3:00 PM
San Francisco Marriott Marquis, San Francisco, CA

Next Committee Meeting
Wednesday, November 4, 2015, San Jose, CA in conjunction with the NA Fall Standards Meeting 2015. Check www.semi.org/standards for the latest update.

SEMI Staff
Kevin Nguyen – SEMI HQ

Co-chair – Lori Nye (Brewer Science)

Table 1 – Meeting Attendees

Last Name	*First Name*	*Company*
Dornberger	Erich	Wacker
Gotts	Hugh	Air Liquide Electronics US
Sinton	Ron	Sinton Instruments
Wagner	Peter	Self
Yanagisawa	Chie	SEMI Japan staff

Table 2 – Organization/Task Force Changes
None

Table 3 – Ballots Summary

Document #	*Document Title*	*Committee Action*
Doc. 5802A	New Standard: Test Method for In-Line Measurement of Saw Marks on PV Silicon Wafers by Laser Triangulation Sensors	Failed and returned to TF for reballot
Doc. 5803A	New Standard: Test Method for In Line, Noncontact Measurement of Thickness and Thickness Variation of Silicon Wafers for PV Applications Using Laser Triangulation Sensors	Failed and returned to TF for reballot
Doc. 5860	Line Item Revision of SEMI PV11-1110 Specification for Hydrofluoric Acid, Used In Photovoltaic Applications	Passed
Doc. 5861	Line Item Revision of SEMI PV12-1110 Specification for Phosphoric Acid Used In Photovoltaic Applications	Passed
Doc. 5862	Reapproval of SEMI PV3-0310 Guide for High Purity Water Used In Photovoltaic Cell Processing	Passed
Doc. 5863	Reapproval of SEMI PV5-1110 Guide for Oxygen (O2), Bulk, Used In Photovoltaic Applications	Passed
Doc. 5864	Reapproval of SEMI PV6-1110 Guide for Argon (Ar), Bulk, Used In Photovoltaic Applications	Passed
Doc. 5865	Reapproval of SEMI PV7-1110 Guide for Hydrogen (H2), Bulk, Used In Photovoltaic Applications	Passed
Doc. 5866	Reapproval of SEMI PV8-1110 Guide for Nitrogen (N2), Bulk, Used In Photovoltaic Applications	Passed

Table 4 – Authorized Ballots

#	When	SC/TF/WG	Details
5895	Cycle 6/7-2015	Int'l PV Analytical Test Methods, Metrology, and Inspection	Line Item Revision of SEMI PV16-0611 Specifications for Nitric Acid, Used in Photovoltaic Applications
5896	Cycle 6/7-2015	Int'l PV Analytical Test Methods, Metrology, and Inspection	Line Item Revision to SEMI PV20-1011 Specifications for Hydrochloric Acid, Used in Photovoltaic Applications
5897	Cycle 6/7-2015	Int'l PV Analytical Test Methods, Metrology, and Inspection	Line Item Revision to SEMI PV27-1011 Specifications for Ammonium Hydroxide, Used in Photovoltaic Applications
5898	Cycle 6/7-2015	Int'l PV Analytical Test Methods, Metrology, and Inspection	Line Item Revision to SEMI PV28-0212 Test Methods for Measuring Resistivity or Sheet Resistance with a Single-Sided Noncontact Eddy-Current Gauge
5899	Cycle 6/7-2015	Int'l PV Analytical Test Methods, Metrology, and Inspection	Line Item Revision to SEMI PV30-0212 Specifications for 2-Propanol, Used in Photovoltaic Applications
5900	Cycle 6/7-2015	Int'l PV Analytical Test Methods, Metrology, and Inspection	Line Item Revision to SEMI PV33-0212 Specifications for Sulfuric Acid, Used in Photovoltaic Applications
5901	Cycle 6/7-2015	Int'l PV Analytical Test Methods, Metrology, and Inspection	Line Item Revision to SEMI PV36-0912 Specifications for Hydrogen Peroxide, Used in Photovoltaic Applications
5902	Cycle 6/7-2015	Int'l PV Analytical Test Methods, Metrology, and Inspection	Reapproval of SEMI PV1-0211 Test Method for Measuring Trace Elements in Silicon Feedstock for Silicon Solar Cells by High-Mass Resolution Glow Discharge Mass Spectrometry
5903	Cycle 6/7-2015	Int'l PV Analytical Test Methods, Metrology, and Inspection	Reapproval of SEMI PV9-0611 Test Method for Excess Charge Carrier Decay in PV Silicon Materials by Non-Contact Measurements of Microwave Reflectance After a Short Illumination Pulse
5904	Cycle 6/7-2015	Int'l PV Analytical Test Methods, Metrology, and Inspection	Reapproval of SEMI PV14-0211 Guide for Phosphorus Oxychloride, Used in Photovoltaic Applications
5905	Cycle 6/7-2015	Int'l PV Analytical Test Methods, Metrology, and Inspection	Reapproval of SEMI PV15-0211 Guide for Defining Conditions for Angle Resolved Light Scatter Measurements to Monitor the Surface Roughness and Texture of PV Materials
5802B	Cycle 6/7-2015	Int'l PV Analytical Test Methods, Metrology, and Inspection	New Standard: Test Method for In-Line Measurement of Saw Marks on PV Silicon Wafers by Laser Triangulation Sensors
5803B	Cycle 6/7-2015	Int'l PV Analytical Test Methods, Metrology, and Inspection	New Standard: Test Method for In Line, Noncontact Measurement of Thickness and Thickness Variation of Silicon Wafers for PV Applications Using Laser Triangulation Sensors

Table 5 – Authorized Activities

#	Type	SC/TF/WG	Details
5093	SNARF	Int'l PV Analytical Test Methods, Metrology, and Inspection	Auxiliary Document: Round Robin (Multi-laboratory Test) of SEMI PV9-1110 Test Method for Excess Charge Carrier Decay in PV Silicon Materials by Non-Contact Measurement of Microwave Reflectance After a Short Illumination Pulse • SNARF was abandoned.
5894	SNARF	Int'l PV Analytical Test Methods, Metrology, and Inspection	Line Item Revision to SEMI PV10, Test Method for Instrumental Neutron Activation Analysis (INAA) of Silicon
5895	SNARF	Int'l PV Analytical Test Methods, Metrology, and	Line Item Revision of SEMI PV16-0611 Specifications for Nitric Acid, Used in Photovoltaic Applications

#	Type	SC/TF/WG	Details
		Inspection	
5896	SNARF	Int'l PV Analytical Test Methods, Metrology, and Inspection	Line Item Revision to SEMI PV20-1011 Specifications for Hydrochloric Acid, Used in Photovoltaic Applications
5897	SNARF	Int'l PV Analytical Test Methods, Metrology, and Inspection	Line Item Revision to SEMI PV27-1011 Specifications for Ammonium Hydroxide, Used in Photovoltaic Applications
5898	SNARF	Int'l PV Analytical Test Methods, Metrology, and Inspection	Line Item Revision to SEMI PV28-0212 Test Methods for Measuring Resistivity or Sheet Resistance with a Single-Sided Noncontact Eddy-Current Gauge
5899	SNARF	Int'l PV Analytical Test Methods, Metrology, and Inspection	Line Item Revision to SEMI PV30-0212 Specifications for 2-Propanol, Used in Photovoltaic Applications
5900	SNARF	Int'l PV Analytical Test Methods, Metrology, and Inspection	Line Item Revision to SEMI PV33-0212 Specifications for Sulfuric Acid, Used in Photovoltaic Applications
5901	SNARF	Int'l PV Analytical Test Methods, Metrology, and Inspection	Line Item Revision to SEMI PV36-0912 Specifications for Hydrogen Peroxide, Used in Photovoltaic Applications
5902	SNARF	Int'l PV Analytical Test Methods, Metrology, and Inspection	Reapproval of SEMI PV1-0211 Test Method for Measuring Trace Elements in Silicon Feedstock for Silicon Solar Cells by High-Mass Resolution Glow Discharge Mass Spectrometry
5903	SNARF	Int'l PV Analytical Test Methods, Metrology, and Inspection	Reapproval of SEMI PV9-0611 Test Method for Excess Charge Carrier Decay in PV Silicon Materials by Non-Contact Measurements of Microwave Reflectance After a Short Illumination Pulse
5904	SNARF	Int'l PV Analytical Test Methods, Metrology, and Inspection	Reapproval of SEMI PV14-0211 Guide for Phosphorus Oxychloride, Used in Photovoltaic Applications
5905	SNARF	Int'l PV Analytical Test Methods, Metrology, and Inspection	Reapproval of SEMI PV15-0211 Guide for Defining Conditions for Angle Resolved Light Scatter Measurements to Monitor the Surface Roughness and Texture of PV Materials

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

Table 6 – Previous Meeting Actions Items

Item #	Assigned to	Details	Status
0415-1	Kevin Nguyen (SEMI Staff)	To inform Kris Shen to review activities in the Power Station Equipment Integrated Performance Task Force with leaders in China and recommend to disband due to out of alignment with PV Committee and SEMI's scope.	Pending
0415-2	Hugh Gotts (Air Liquide)	To contact Evans Analytical Group to provide round robins data for the Inert Gas Fusion Infrared Detection Method and Carbon Concentration by SIMS Method	Pending

Table 7 – New Actions Items

Item #	Assigned to	Details
0715-2	Hugh Gotts (Air Liquide) and Lori Nye (Brewer Science)	To set up a meeting with Evans Analytical Group for releasing round robins data for the Inert Gas Fusion Infrared Detection Method and Carbon Concentration by SIMS Method

1.0 Call to Order

Lori Nye called the meeting to order and welcomed everyone who attended. A round of self-introduction was made. All SEMI standards meetings are subjected to SEMI Anti-Trust Reminder and Guidelines concerning Patentable Technology. SEMI Regulations now require all attendees to be members of SEMI standards. Membership enrollment is at www.semi.org/standardsmembership. The agenda was reviewed and approved.

2.0 Review and Approval of Meeting Minutes from NA Spring Standards Meeting, San Jose, CA, April 1, 2015

Minutes were reviewed. No change was made.

Motion: To accept the minutes as written.
By / 2nd: Ron Sinton/Peter Wagner
Discussion: None
Vote: Unanimous. Motion passed

Attachment – 1, NAPVMaterialsMeetingMinutes20150401

3.0 Staff Report

Report was given by Kevin. Highlights:

- Upcoming NA Meetings
  - 2015
    - NA Fall, Nov 2-5, 2015 at SEMI HQ in San Jose, California
  - 2016
    - NA Spring, April 4-7, 2016, at SEMI HQ in San Jose, California
    - SEMICON West, July 11-14, 2016, San Francisco, California
- There are now 9 ballots cycle for 2015
  - http://www.semi.org/Standards/Ballots
- SEMI Standards Publications
  - Total SEMI Standards in portfolio: 937
- New Requirements/Process Reminders for TC Chapter Meetings from December 2014 Regulations
  - Standards Document Development Project Period
    - Project period shall not exceed 3 years (Regs 8.3.2)
    - If document development activity is found to be continuing, but cannot completed with the project period, TC Chapter may grant one-year extension at a time, as many times as necessary.
  - SNARF Review Period
    - A submitted SNARF for a new, or for a major revision to an existing, Standard or Safety Guideline is made available to all members of a TC Chapter's parent global technical committee for two weeks for their review and comment. (Regs 8.2.1)
      - If the SNARF is submitted at a TC Chapter meeting, the committee can review and approve, but the SNARF will need to be distributed for two weeks and then approved via GCS.
  - Procedures for Correcting Nonconforming Titles of Published Standards Document (PM Appendix 4)
    - Some Standards qualify for a special procedure where a line item change can be used to correct the titles. Otherwise, the corrective action will likely require a major revision.
    - The following standards are in need of title correction for title conformance
      - SEMI PV16-0611 Specifications for Nitric Acid, Used in Photovoltaic Applications
      - SEMI PV20-1011 Specifications for Hydrochloric Acid, Used in Photovoltaic Applications
      - SEMI PV27-1011 Specifications for Ammonium Hydroxide, Used in Photovoltaic Applications
      - SEMI PV28-0212 Test Methods for Measuring Resistivity or Sheet Resistance with a Single-Sided Noncontact Eddy-Current Gauge

- SEMI PV30-0212 Specifications for 2-Propanol, Used in Photovoltaic Applications
- SEMI PV33-0212 Specifications for Sulfuric Acid, Used in Photovoltaic Applications
- SEMI PV36-0912 Specifications for Hydrogen Peroxide, Used in Photovoltaic Applications

Motion: To issue line item ballots for cycle 6-15 for title correction
By / 2nd: Peter Wagner/Hugh Gotts
Discussion: None
Vote: 4-0 in favor. Motion passed

- 5 **Year Review**
  - The following standards are due for 5 year review
    - SEMI PV1-0211 Test Method for Measuring Trace Elements in Silicon Feedstock for Silicon Solar Cells by High-Mass Resolution Glow Discharge Mass Spectrometry
    - SEMI PV9-0611 Test Method for Excess Charge Carrier Decay in PV Silicon Materials by Non-Contact Measurements of Microwave Reflectance After a Short Illumination Pulse
    - SEMI PV16-0611 Specifications for Nitric Acid, Used in Photovoltaic Applications
    - SEMI PV14-0211 Guide for Phosphorus Oxychloride, Used in Photovoltaic Applications
    - SEMI PV15-0211 Guide for Defining Conditions for Angle Resolved Light Scatter Measurements to Monitor the Surface Roughness and Texture of PV Materials

Motion: To send 5 year reapproval ballot for cycle 6/7
By / 2nd: Peter Wagner/Hugh Gotts
Discussion: If any of these standards need revision, a SNARF may be issued.
Vote: 4-0 in favor. Motion passed

- **3 Year Status SNARF.**
  - The following SNARFs are coming up for the maximum 3 year project period.
    - 5093 Auxiliary Document: Round Robin (Multi-laboratory Test) of SEMI PV9-1110 Test Method for Excess Charge Carrier Decay in PV Silicon Materials by Non-Contact Measurement of Microwave Reflectance After a Short Illumination Pulse
      - SNARF was approved on 11/10/2010

      Motion: To abandon SNARF 5093
      By / 2nd: Ron Sinton/Hugh Gotts
      Discussion: None
      Vote: 4-0 in favor. Motion passed

    - 5435 Auxiliary Information to include interlaboratory study for SEMI PV25-1011, Test Method for Simultaneously Measuring Oxygen, Carbon, Boron and Phosphorus in Solar Silicon Wafers and Feedstock by Secondary Ion Mass Spectrometry
      - SNARF was approved on 7/11/2012
    - 5437 Line item revision of SEMI PV25-1011, Test Method for Simultaneously Measuring Oxygen, Carbon, Boron and Phosphorus in Solar Silicon Wafers and Feedstock by Secondary Ion Mass Spectrometry
      - SNARF was approved on 7/11/2012
    - 5501 Auxiliary Document: Interlaboratory Study for PV43-0113 - Test Method For The Measurement Of Oxygen Concentration In PV Silicon

Materials For Silicon Solar Cells By Inert Gas Fusion Infrared Detection Method

- SNARF was approved on 10/31/2012

Motion: To grant one year extension for SNARF 5435, 5437, and 5501
By / 2nd: Peter Wagner/Ron Sinton
Discussion: None
Vote: 4-0 in favor. Motion passed

Attachment – 2, SEMI Staff Report (West 2015) PV

4.0 Liaison Reports

4.1 European PV Materials Committee

Report was given by Peter Wagner. Highlights.

- Last meeting
  - June 11, 2015
  - Intersolar Europe
  - Munich, Germany
- Next meeting
  - October 6-8, 2015
  - SEMICON Europa in Dresden
- New TFOF/SNARF
  - PV Material Degradation Task Force
    - Leaders:
      - Dr. Köntopp Max (Hanwha Q-Cells)
      - Dr. Hagendorf Christian (Fraunhofer CSP)
  - Doc. 5889, New Standard: Test Method on Cell Level For Potential-induced Degradation Susceptibility Of Solar Cells And Module Encapsulation Materials
  - This test method is patented. Letter of Intent has been sent to SEMI Europe staff.
- SEMI Europe Staff. Andrea Busch is no longer with SEMI. For interim, please contact.
  - Kevin Nguyen (knguyen@semi.org)

Attachment – 3, 170715_Europe_PVMat_LiaisonReport

4.2 Japan PV/PV Materials Committee

Report was given by Chie Yanagisawa.

- Last Meeting
  - December 10, 2014 at SEMI Japan Office, Tokyo, Japan
- Next Meeting
  - TBD
- Reorganization
  - Japan TC Chapters of PV Global TC and PV Materials Global TC have been jointly discussing the reorganization.
- SEMI Japan Staff (Chie Yanagisawa, cyanagisawa@semi.org)

Attachment – 4, 150715_JA_PV&PVM_SW2015_R0.1

4.3 Taiwan PV Committee

Highlights. Report given by Kevin.

- Last meeting
  - March 26, 2015
  - ITRI

- Next meeting
  - August 6, 2015
  - ITRI
- Ballot in cycle 5-15
  - SEMI Doc 5647 Test Method for Spectrum Response (SR) Measurement of Organic Photovoltaic (OPV) and Dye-Sensitized Solar Cell (DSSC)
- Drafting documents.
  - SEMI Doc 5560 - Classification of BIPV – Part 1: Classification of BIPV Module Dimension
  - SEMI Doc 5598 - Test Method for Durability of Low Light Intensity Organic Photovoltaic (OPV) and Dye Sensitized Solar Cell (DSSC)
  - SEMI Doc 5739 -Test Method to Evaluate an Accelerated Thermo Humidity Resistance of PV Encapsulants
  - SEMI Doc 5740 -Test Method of Electrochemical Corrosion for PV Module
- Regional Staff Contact Information.
  - Andy Tuan (atuan@semi.org)

Attachment – 5, Taiwan PV Liaison Report July 2015

4.4 China PV Committee

Kevin reported. Highlights

- Last Meeting
  - Tuesday, March 17th, 2015
  - Shanghai, China
- Next Meeting
  - Friday, July 31st, 2015
  - Qingdao, Shandong, China
- *PV Silicon Wafer Task Force*
  - Drafting
    - Doc. 5724, New Standard: Guide for Specifying Quasi Monocrystalline Silicon Wafers used in Photovoltaic Solar Cells
    - Doc. 5767, New Standard: Guide for Material Requirements of Internal Feeders Used in Mono-crystal Silicon Growers
    - Doc 5843, Revision of SEMI PV22-1011, Specification for Silicon Wafers for Use in Photovoltaic Solar Cells (New SNARF)
- *PV Module Task Force*
  - Published
    - 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
    - SEMI PV61-0115, Specification for Framing Tape for PV Modules (Recently published)
    - SEMI PV62-0215, Terminology for Back Contact PV Cell and Module (Recently published)
    - SEMI PV63-0215, Specification for Ultra-thin Glasses Used for Photovoltaic Modules (Recently published)
  - Drafting
    - Doc. 5661, New Standard: Test Method for Electrical Parameters Testing of Bifacial Solar Module

        - Doc. 5725, New Standard: Practice for Metal Wrap Through (MWT) Back Contact PV Module Assembly
        - Doc. 5768, New Standard: Specification for Testing Requirements of Electroluminescence Defect Detection System for Crystalline Silicon PV Modules
        - Doc. 5773, New Standard: Test Method for Cell Defects in Crystalline Silicon PV Modules by Using Electroluminescence
        - Doc. 5830, New Standard: Classification for Electroluminescence Inspection of Crystalline Silicon Photovoltaic Modules
        - Doc. 5840, New Standard: Guide for Calibration of PV Module UV Test Chambers (New SNARF)
- *PV Diffusion Furnace Test Methods Task Force*
    - Published
        - SEMI PV53-0514, Test Method for In-line Monitoring of Flat Temperature Zone in Horizontal Diffusion Furnaces
    - Drafting
        - Doc 5841, New Standard: Guide for Specifying Low Pressure Horizontal Diffusion Furnace (New SNARF)
- *PV Silicon Raw Materials Task Force*
    - Published
        - SEMI PV50-0114 Specification for Impurities in Polyethylene Packaging Materials for Polysilicon Feedstock
        - SEMI PV59-0115, Test Method for Determination of Total Carbon Content in Silicon Powder by Infrared Absorption after Combustion in an Induction Furnace (Recently published)
    - Activity:
        - Doc. 5477D, Test Method for Determining B, P, Fe, Al, Ca Contents in Silicon Powder for PV Applications by Inductively-Coupled-Plasma Optical Emission Spectrometry
            - Passed in ballot review, will be submitted to A&R review cycle
        - Doc. 5564B, Test Method for the Measurement of Chlorine in Silicon by Ion Chromatography
        - Doc. 5699, Test Method for Interstitial Atomic Oxygen Content of Crystalline Silicon by Multiple Transmission-reflection Infrared Absorption
        - Doc. 5700, Test Method for Substituted Carbon Content of Crystalline Silicon by Multiple Transmission-reflection Infrared Absorption
- *PV Thin Film Task Force*
    - Drafting:
        - Doc. 5478: Test Method for Thin-film Silicon PV modules Light Soaking

- *PV Power Station Equipment Integrated Performance Task Force*
    - Drafting:
        - Doc. 5648, New Standard: Test Method for the Integrated Efficiency of Installed PV Components
            - Failed in ballot review, and return to TF for rework
        - Doc. 5729, New Standard: Specification for Hotspot in Crystalline Silicon PV Modules in the Field
    - Kevin mentioned China will disband this task force as recommended from the last meeting. Lori asked to leave this item for follow-up until this task force is disbanded at the next meeting.
- *Crystalline Silicon Solar Cell Task Force*
    - Published
        - SEMI PV54-0514, Specification for Silver Paste, Used to Contact with N+ Diffusion Layer of Crystalline Silicon Solar Cells

        - SEMI PV58-0115, Specification for Aluminum Paste, Used in Back Surface Field of Crystalline Silicon Solar Cells (Recently published)
    - Drafting:
        - Doc. 5659A, New Standard: Test Method Based on RGB for C-Si Solar Cell Color
            - Passed in ballot review, will be submitted to A&R review cycle
        - Doc. 5726, New Standard: Test Method for Determining the Aspect Ratio of Solar Cell Metal Fingers by Confocal Laser Scanning Microscope
            - Passed in ballot review, will be submitted to A&R review cycle
        - Doc. 5727, New Standard: Test Method for the Etch Rate of A Crystalline Silicon Wafer by Determining The Weight Loss
            - Passed in ballot review, will be submitted to A&R review cycle
        - Doc 5842, New Standard: Test Method for Metal-Wrap-Through Solar Cell Via Resistance (New SNARF)
- Multi-wire Saws Task Force
    - Drafting:
        - Doc. 5728, New Standard: Test Method for the Wire Tension of Multi-wire Saws (New SNARF)
            - Passed in ballot review, will be submitted to A&R review cycle
- SEMI China Standards Contact : Kris Shen (kshen@semi.org)

Attachment – 6, China Photovoltaic Committee Liaison Report20150630

5.0 Ballots Review

5.1 Doc. 5802A, New Standard: Test Method for In-Line Measurement of Saw Marks on PV Silicon Wafers by Laser Triangulation Sensors
- The ballot received one reject from Peter Wagner. The ballot failed review and was authorized to resubmit for cycle 6/7 for review at the next meeting.

5.2 Doc.5803A, New Standard: Test Method for In Line, Noncontact Measurement of Thickness and Thickness Variation of Silicon Wafers for PV Applications Using Laser Triangulation Sensors
- The ballot received one reject from Peter Wagner. The ballot failed review and was authorized to resubmit for cycle 6/7 for review at the next meeting.

5.3 Doc. 5861, Line Item Revision of SEMI PV12-1110 Specification for Phosphoric Acid Used In Photovoltaic Applications
- Ballot passed. See attached for ballot adjudication.

5.4 Doc. 5862, Reapproval of SEMI PV3-0310 Guide for High Purity Water Used In Photovoltaic Cell Processing
- Ballot passed. See attached for ballot adjudication.

5.5 Doc. 5863, Reapproval of SEMI PV5-1110 Guide for Oxygen (O2), Bulk, Used In Photovoltaic Applications
- Ballot passed. See attached for ballot adjudication.

5.6 Doc. 5864, Reapproval of SEMI PV6-1110 Guide for Argon (Ar), Bulk, Used In Photovoltaic Applications
- Ballot passed. See attached for ballot adjudication.

5.7 Doc. 5865, Reapproval of SEMI PV7-1110 Guide for Hydrogen (H2), Bulk, Used In Photovoltaic Applications
- Ballot passed. See attached for ballot adjudication.

5.8 Doc. 5866, Reapproval of SEMI PV8-1110 Guide for Nitrogen (N2), Bulk, Used In Photovoltaic Applications

- Ballot passed. See attached for ballot adjudication.

Attachment – 7, BallotReviewsJuly2015

6.0 Current Activities

6.1 *Int'l PV Analytical Test Methods, Metrology, and Inspection TF/Hugh Gotts (Air Liquide)*

- Hugh Gotts reported meeting summary. Highlights.

- Ballots were reviewed – All passed excepted for doc. 5802A and 5803A. These documents will be issued for cycle 6 or 7 for review at the next meeting.
  - Document 5802A - New Standard: Test Method for In-Line Measurement of Saw Marks on PV Silicon Wafers by Laser Position Sensor
  - Document 5803A - New Standard: Test Method for In-Line, Noncontact Measurement of Thickness and Thickness Variation of Silicon Wafers for PV Applications Using Laser Position Sensor

- Old business
  - Round Robin Update - Method for the Measurement of Oxygen Concentration in Silicon Feedstock for Silicon Solar Cells by Inert Gas Fusion Infrared Detection Method – data not available
    - Evans Analytical Group, which led the round robin, collected the data and is no longer involved with SEMI Standards. Attempts were made in seeking the data be opened, but unsuccessful.
    - Action Item - Hugh and Lori to set up a meeting with Evans Analytical Group management for a follow up.
  - Round Robin Update - Method for the Measurement of Carbon Concentration in Silicon Feedstock for Silicon Solar Cells by SIMS Method – data not available
    - Similar to above, data were kept by Evans.
  - Round Robin Update - Test Method For The Measurement Of Elemental Impurity Concentrations In Silicon Feedstock For Silicon Solar Cells By Bulk Digestion, Inductively Coupled-Plasma Mass Spectrometry (Hugh Gotts)
    - Pending. Materials need to be resent.
  - Doc. 5801, New Standard: Guide for Performance of Round Robin Studies
    - Chris Moore will provide an update by the next meeting.
- New business
  - SNARF for line item revision of SEMI PV10-1110 Test Method for Instrumental Neutron Activation Analysis (INAA) of Silicon
  - Peter presented the SNARF for line item revision of PV10

Motion: To approve SNARF
By / 2nd: Peter Wagner/Ron Sinton
Discussion: None
Vote: 4/0. Motion passed

Attachment – 8, SNARF RevPV10 v2

Attachment – 9, 2015 Summer NA PV Standards Analytical TF agenda Rev 1

7.0 Old Business

An outstanding item was to follow-up with Evans Analytical on releasing data for the round robin.

8.0 New Business

To follow up with Kris Shen on disbanding the China PV Power Station Task Force.

9.0 Next Meetings

The next NA PV/PV Materials TC Chapter is scheduled for Wednesday, November 4, 2015 at the SEMI HQ, San Jose, CA. Check www.semi.org/standards for latest update. Tentatively, the meeting schedule is proposed as shown.

- Task Force 8:30-10:00 AM
- Committee 10:30 AM -12:00 PM

10.0 Action Item Review

Summary of action was reviewed by Kevin Nguyen. If any, these can be found in the New Action Items table 7 at the beginning of these minutes.

11.0 Adjourn

Adjournment of the meeting was held at 2:45 PM

These minutes are respectfully submitted by:

Kevin Nguyen,
SEMI Standards Operations Manager
Phone: 408-943-7997
Email: knguyen@semi.org

Approved by:
Lori Nye (Brewer Science) August 6, 2015
Hugh Gotts (Air Liquide)

Table 8 – Index of Attachment Summary

#	Title		Title
1	NAPVMaterialsMeetingMinutes20150401	6	China Photovoltaic Committee Liaison Report20150630
2	SEMI Staff Report (West 2015) PV	7	BallotReviewsJuly2015
3	170715_Europe_PVMat_LiaisonReport	8	SNARF RevPV10 v2
4	150715_JA_PV&PVM_SW2015_R0.1	9	2015 Summer NA PV Standards Analytical TF agenda Rev 1
5	Taiwan PV Liaison Report July 2015		

#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 Kevin Nguyen at the contact information above