

International PV Module QA Forum Program

July 15, 2011 Friday morning

7:00 Registration and continental breakfast

8:00 Welcome: Yasuhiro Sakuma (METI)

8:10 Welcome: Kevin Lynn (DOE)

8:20 Introduction to International PV Module QA Forum: Michio Kondo (AIST)

8:30 Session I. Defining the Need

Session chairs: Michio Kondo (AIST), Sarah Kurtz (NREL)

Defining the Need – The Importance of Quality Assurance

As the community increases investment in PV systems, many are asking how to assure that the PV module design will be durable in their application/location and how to assure that the manufacturing process is adequately controlled. This session will provide PV customers' as well as suppliers' perspectives on PV Quality Assurance needs and challenges.

8:30 "Module Makers' Perspective" – Yoshihito Eguchi (JEMA/Sharp)

8:55 "Financial Investors' Perspective on Quality Assurance" – David Williams
(CleanPath Ventures)

9:20 "PV Sustainability Through Collaborative Quality Management" – Jifan Gao (Trina Solar)

9:50 "PV Module Quality and Reliability Standards – an End Users View" – Chris Wright
(Florida Power & Light)

10:15 Discussion

10:40 Break

11:00 Session II. Existing Standards

Session chairs: David Degraaff (SunPower), Masaaki Yamamichi (AIST)

Existing Standards – What They Do and Don't Do

Existing pass-fail standards have been very helpful toward improving PV reliability in the field, but do not attempt to compare durability to stresses that vary by location and application. This session will review the history of the test methodology development and describe how these approaches may be applied to develop comparative tests.

11:00 "History of IEC Qualification Standards" – John Wohlgemuth (NREL)

11:30 "Introduction to IEC PV Program" – Liang Ji (UL)

11:50 "SEMI Manufacturing Standards Under Development" – James Amano (SEMI)

12:10 Discussion

12:30 Lunch

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13:30 **Session III. Regional and Application-Specific Requirements**

Session chairs: Tony Tang (Suntech), Danny Cunningham (BPSolar)

Regional and Application-Specific Requirements

Differing climates and mounting configurations place differing requirements on PV module durability. This session will describe how these requirements vary, and key failures that are seen in the field.

13:30 “How do Qualified Modules Fail? – What is the Root Cause?” – David DeGraaff (SunPower)

14:00 “Long-Term Outdoor Exposure in Different Climate Zones” - Nicolas Bogdanski (TUV)

14:20 “Results of Field Tests in Japan” – Kohji Masuda (JET)

14:40 “Modeling the Ranges of Stresses for Different Climates/Applications” – Michael Kempe (NREL)

15:00 Discussion

15:20 Break

15:45 **Session IV. Proposed New Tests**

Session chairs: Yoichi Murakami (JET), Michael Koehl (Fraunhofer, ISE)

Proposed New Tests

Many laboratories have been developing new tests that “go beyond IEC 61215.” This session will describe some of the tests that have been proposed and suggest how they may be useful toward defining comparative tests to differentiate products for different locations/applications.

15:45 “The Thresher Test” – Alelie Fucell (Renewable Energy Test Center)

16:00 “Long Term Sequential Testing” – Govindasamy Tamizhmani (TUV Rheinland)

16:15 “Mechanical Load Testing of PV Modules in Mounting Structures” – Thomas Friesen (SUPSI ISAAC)

16:30 “Atlas’ PV Long Term Durability Test” – Kurt Scott (Atlas)

16:45 “PVEL’s Reliability Demonstration Test” – Jenya Meydbray (PV Evolution)

17:00 “UV-Thermal combined stress acceleration test” – Takuya Doi (AIST)

17:15 Discussion

18:00 Adjourn Day 1

19:00 – 22:00 Evening Friendship Dinner at the Thirsty Bear

July 16, 2011 Saturday morning

8:00 Registration and continental breakfast

8:30 Session V. Proposals for Manufacturing QA Guideline and QA Rating

Methodology

Session chairs: Tony Sample (EC JRC), Govindasamy Tamizhmani (TUV)

Proposals of QA Guideline and Rating Methodology

As the community develops a consensus on how to create QA standards, it's useful to start with skeletons that are logical and practical. Then, the community will be given opportunity to provide input. This session will begin with a proposal for a Manufacturing QA guideline, then define the QA Rating Methodology questions for break-out sessions.

8:30 "Manufacturing Quality Assurance Guideline" – Alex Mikonowicz (PowerMark)

8:50 Discussion

9:00 Introduction of Breakout Session – Sarah Kurtz (NREL)

9:30 Breakout Sessions

Customers would like PV module durability information reported in a way that is easy to understand, but is scientifically accurate. The breakout sessions in Session V will ask participants to identify the types of durability information they would like to see on PV module nameplates, datasheets, and/or test reports. For example, would it be useful to devise a rating system that could give up to 5 stars for thermal endurance, up to 3 stars for resistance to humidity, and a pass-fail rating for resistance to ammonia?

11:00 Break

11:30 Wrap-up of Breakout Session

12:00 Lunch

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13:00 Session VI. Prioritization of Failure/Degradation Mechanisms

Session chairs: Dan Doble (Fraunhofer CSE), Gerhard Kleiss (SolarWorld)

13:00 Introduction of Breakout Session – John Wohlgemuth (NREL)

13:30 Breakout Sessions

The Forum will begin an International effort to create standards that predict PV module durability in various parts of the world. It will not be possible to test for every failure mechanism; these breakout sessions will prioritize the failure and degradation mechanisms that are most important in determining a module's service life. Committees will be created to address the prioritized failure mechanisms. Individuals will be given an opportunity to present two slides if they have made a reservation in advance.

15:00 Break

15:30 Wrap-up of Breakout Session

16:00 Next Steps and Forum Statement: John Wohlgemuth (NREL)

After the Forum, International committees will develop draft interim standards that will then be submitted to Standards Organizations for formal approval.

16:30 Closing:

17:00 Adjourn Day 2