AGENDA AND POSTER SESSION FOR NREL 2013 PHOTOVOLTAIC MODULE RELIABILITY WORKSHOP

FEBRUARY 26 & 27, 2013
National Renewable Energy Laboratory | Golden, CO, USA
AGENDA FOR NREL 2013 PHOTOVOLTAIC MODULE RELIABILITY WORKSHOP

TUESDAY FEBRUARY 26, 2013

7:30  Continental Breakfast
8:00  Welcome, by Kevin Lynn of DOE
8:15  Linkage to Previous QA Task Force Workshops (Introduce NWIP), by Sarah Kurtz of NREL
8:30  Accelerated Stress Testing, Qualification Testing, HAST, Field Experience – What Do They All Mean? by John Wohlgemuth of NREL
9:00  Field Experience: Failure and Degradation Modes of PV Modules in a Hot Dry Climate – Results After 11 to 26 Years of Field Exposure, by Govindasamy Tamizhmani of ASU
9:30  Delamination Failures in Long-Term Field-Aged PV Modules, by Tsuyoshi Shioda of Mitsui Chemical
10:00 Break and Posters for Field Experience of Crystalline Si and Thin-Film Modules
10:45 Discussion: Field Experience/Accelerated Stress Testing (Led by Tony Sample of JRC and Ralph Romero of Black and Vetch)
11:45 Group 2: Thermal and Mechanical Fatigue – Introduction, by Chris Flueckiger of UL
12:00 Group 2: Thermal Cycling Combined with Dynamic Mechanical Load: Preliminary Report, by Tadanori Tanahashi of ESPEC Corp.
12:30 Group 2: Accelerating Fatigue Testing for Cu Ribbon Interconnects, by Nick Bosco of NREL
1:00 Lunch
1:45 Posters for Area 2 (Thermal and Mechanical Fatigue) and Other Accelerated Stress Tests and Combinations of Stress tests
2:30 Group 2: Discussion (Led by Chris Flueckiger of UL and Nick Bosco of NREL)
3:30 Group 4: Diodes, Shading and Reverse Bias – Introduction, by Paul Robusto of Intertek
3:45 Group 4: ESD Testing of Diodes, by Kent Whitfield of Solaria
4:15 Group 4: Environmental Testing of Diodes, by Yasunori Uchida of JET
4:30 Beak and Posters for Group 4 (Diodes, Shading and Reverse Bias) and PV Standards
5:30 Group 4: Discussion (Led by Paul Robusto of Intertek and Kent Whitfield of Solaria)
6:30 Adjourn for day 1

WEDNESDAY FEBRUARY 27, 2013

7:30  Continental Breakfast
8:00  Group 3: Humidity, Temperature and Voltage – Introduction, by John Wohlgemuth of NREL
8:15  Group 3: Understanding the Temperature and Humidity Environment Inside a PV Module, by Michael Kempe of NREL
8:45 Group 3: PID Failure of c-Si and Thin-Film Modules and Possible Correlation with Leakage Currents, by Peter Lechner of ZSW
9:15 Break and Posters for Area 3 (Humidity, Temperature and Voltage)
10:00 Group 3: Discussion (Led by John Wohlgemuth of NREL and Tony Sample of JRC)
11:00 Group 5: UV, Temperature and Humidity – Introduction, by David Miller of NREL and Michael Koehl of Fraunhofer ISE
11:15 Group 5: Light Sources for Reproducing the Effects of Sunlight in the Natural Weathering of PV Materials, Components and Modules, by David Burns of 3M and Kurt Scott of Atlas
11:45 Group 5: Accelerated UV Aging and Correlation with Outdoor Exposure of EVA Based PV Encapsulants, by Charlie Reid, Jayesh Bokria, and Joseph Woods of STR
12:15 Lunch
1:00 Posters for Area 5 (UV, Temperature and Humidity) and PV Materials
1:45 Group 5: Discussion (Led by Michael Koehl of Fraunhofer ISE and David Miller of NREL)
2:45 Break
3:00 Overall Discussion: What are we missing? (Led by QA Task Force Steering Committee and Task Group 2 to 5 US Leaders)
4:00 Closing Remarks, by John Wohlgemuth of NREL
4:30 Close
POSTER SESSION

POSTER SESSION 1:
TUESDAY FEBRUARY 26 AT 10:00 AM
Field Experience of Crystalline Si and Thin-Film Modules


4. M. Propst and N.A. Olsson of Pearl Laboratories, “STC Laboratory Testing: Necessary but not Sufficient”

5. L. McClung of SAIC, “The Impact of Module Reliability on PV Plant Lifetimes Exceeding 25 Years”


8. R. Sundaramoorthy, J.R. Lloyd, D. Metacarpa, and P. Haldar of PVMC, “Compilation of PV Failure Modes and Mechanisms, Types of Tests for Reliability Analysis Reported In the Literature for Thin Film Reliability Studies”

9. J. Sorensen of First Solar, “Understanding Differences in Induced Stresses to Improve Variation in Light Soak Response”


11. S. Dongaonkar and M.A. Alam of Purdue University, “Shade Tolerant Design of Thin Film Modules”

12. A. Pineda and J. Meydbray of CleanPath, PVUSA and PV Evolutions, “Preliminary Analysis of Modules Deployed at PVUSA for 18–24 Years”


17. L. Kazmerski of NREL, “Solar Energy Research Institute for India and the US (SERIIUS)”


POSTER SESSION 2:
TUESDAY FEBRUARY 26 AT 1:45 PM
Group 2: Thermal and Mechanical Fatigue, Other Accelerated Stress Tests, and Combinations of Accelerated Stress tests


2. L. Bruckman, N. Wheeler, J. Ma, E. Wang, C. Wang, I. Chou, J. Sun, and R. French of Case Western Reserve University, “Statistical and Domain Analytics Applied to PV Module Lifetime and Degradation Science”

3. T. Friesen of SUPSI, “Round Robin results For Hail Grain Characterization”


7. A. Colli and J.P. Looney of Brookhaven National Laboratory, “A Multi-Perspective Approach to PV Module Reliability and Degradation”


11. L. Pratt, M. Plass, M. Yamasaki and N. Riedel of CFV Solar Test Lab, “Failure Rates from Certification Testing to UL and IEC Standards for Flat Plate Modules”

12. E. Li and P. Chaparala of Alta Devices Inc., “High-Efficiency GaAs Thin-Film Solar Cell Reliability”


POSTER SESSION 3:
TUESDAY FEBRUARY 26 AT 4:30 PM
Group 4: Diodes, Shading, and Reverse Bias and PV Standards


2. J. Posbic and E. Rhee of MEMC, “High Temperature Reverse Bypass Diodes Bias and Failure”

POSTER SESSION 4:
WEDNESDAY FEBRUARY 27 AT 9:15 AM
Group 3: Humidity, Temperature and Voltage

1. S. Hoffmann and M. Koehl of Fraunhofer ISE, “Effect of Humidity and Temperature on the Potential Induced Degradation”


3. K. Nanjundiah and N. Nickel of Dow Chemical, “Encapsulant Based Solution to Potential Induced Degradation of PV Modules”


6. R. Rice of Tata Steel, “The Use of Humidity Sensors to Develop BIPV Packaging Solutions”


POSTER SESSION 5:
WEDNESDAY FEBRUARY 27 AT 1:00 PM
Group 5: UV, Temperature and Humidity, and Testing of PV Materials


2. S. Fowler of Q-Lab Corporation, “UV Conditioning of PV Modules: A Practical and Cost Effective Way to Meet the IEC Requirements”


10. J. Bratcher of Honeywell, “Reducing c-Si Module Operating temperature via PV Packaging Components”


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