

Minutes of US TC 82 TAG meeting, SkySong, ASU, Scottsdale, Arizona 24 – 25 September 2008

On 24 – 25 September, 2008 the TC 82 Technical Advisory Group held its first face-to-face meeting in many years, this time in Scottsdale, Arizona at the Arizona State University SkySong complex. It was generously hosted by the ASU Photovoltaic Testing Laboratory. Some thirty three interested TAG members attended.

24 September.

As many of the members were new to the standards writing process, the beginning time was spent in showing the “straw man” for initiating standards and the process by which they are sent out for comments, revisions and final voting. The arcane method of accessing the IEC webpages were also discussed, as this is the method by which members will obtain the latest draft standards to view and make comments.

Sarah Kurtz began the discussions by noting WG 7 is in process of starting a new tracking standard. This is in the throes of getting started, but should probably be submitted to the Central Office in Geneva after the WG 7 meeting in November. She was joined by Keith Emery in discussing the spectrums associated with concentrators and the difficulties of accurately testing triple junction cells. Also touched on was the question of “where does concentrations really begin—for our purposes?” 10X or below? 5X or below?

Several documents that are in process of revision or as new work item proposals were discussed by the convenor of WG 2, John Wohlgemuth, while Chuck Whitaker covered the documents progressing through WG 3 and his WG 6. The review process of documents was touched upon to show the mechanics of what is expected, but the fine details were left out.

Two working groups are looking for the assignment of experts from the US. The basics of how to organize this within the TAG was discussed and it was decided by a majority of the members present that individuals wanting to be assigned indicate this desire to the TAG Technical Advisor (Alex Mikonowicz) or the TAG Administrator (Howard Barikmo), and send their resumes to them at the same time. The resumes will then be sent to the TAG members via e-mail along with the vacancies needing to be filled in the Working Groups. It will be the TAG membership, then, that approves the assignment of the experts.

It was noted that four openings exist in Working Group 7. It was further noted that one expert could also be assigned to WG 3. Because Greg Ball indicated an interest, and there being greater than 50% of the TAG membership at the meeting, his request was approved at this meeting. His resume will be circulated, after the fact, to the TAG. Future vacancies will be filled by the e-mail route, unless there are upcoming TAG meetings where 50% or more of the membership will be in attendance.

When discussing the frequency of face-to-face meetings of the TAG discussions centered around holding on such meeting annually. When trying to determine when to hold such meetings, it was felt that other meetings such as conferences or workshops sponsored by the National Labs that the members will be attracted to anyway should be considered. Then a one day TAG meeting to be held before or after the principal event could be scheduled.

One such meeting for 2009 might be the Accelerated Aging workshop that is being organized by Sandia for the April timeframe. As most of the US PV manufacturers and systems integrators have a great interest in this workshop, the group tentatively decided to hitch onto this venue as one that the TAG could make use of. Jennifer Granata is organizing the workshop and will keep the TAG meeting in mind.

Attention was directed to the documents needing action in the near future. The first is 82/540/FDIS, IEC 60904-7 Ed.3: Photovoltaic devices - Part 7: Computation of the spectral mismatch correction for measurements of photovoltaic devices. Comments and vote is needed by October 31 to ANSI. This means the TA needs to have it by October 15 in order to coordinate and suggested no votes or technical comments. This draft was reviewed at the meeting. No one had any objections or comments during that process. Therefore, it is assumed that the US TC 82 TAG will vote YES with no comments. However, if any TAG members have comments or wish to suggest a NO vote, these must be sent to Alex Mikonowicz by October 15th. Comments must be made on the IEC Comments form. Comments on an FDIS are limited to editorial only—no technical comments at this stage.

Two more documents are being circulated for comment and vote:

82/533/CDV IEC 60904-4 Ed.1: Photovoltaic Devices - Part 4: Procedure for establishing the traceability of the calibration of reference solar devices. Send comments to TA by January 2, 2009.

82/539/CDV EC 60904-10 Ed.2: Photovoltaic devices - Part 10: Methods of linearity measurement. Send comments to TA by January 15, 2009.

On Wednesday evening a dinner was held at the Monti's La Casa Vieja Restaurant to honor retired Technical Advisor of many years, Steve Chalmers. Steve and his wife Jane, son Seth and daughter Clare enjoyed to plaudits provided by many of Steve's friends and fellow TAG members. Two plaques, one commemorating Steve's early service to the IEEE PV standards program was presented by Tom Basso, and the second presented by Chuck Whitaker noted Steve's long service to the US TC 82 TAG as Technical Advisor. Steve, thanks for your long and faithful service.

25 September

Discussion this morning was centered on arcing in dc photovoltaic systems. Tim Zgonena of UL is leading a team under contract with the Solar America Initiative to investigate this phenomenon with the expectation of perhaps providing dc arc fault interruptor circuits for use at the high voltages found in these systems.

Eaton Corporation, which has been developing components for dc circuits in lower voltages used in automotive applications as well as for aerospace needs, showed a number of videos of their experiments. The first was of a "typical" PV connector. Assumption was that the connector was in a high voltage dc string system and was being disconnected because the wire and connector were "caught" on a tracking system and the connection slowly pulled apart. It was further assumed that 150 volts was impressed across the connector during the experiment. Dramatic smoke and flames, over time, were visible.

Other videos included circuits that were not protected and the resultant large sustained arc when a guillotine blade opened the circuit. With proper arc detecting and disconnecting circuitry the visible arc was minimal as the circuit was disconnected.

Tim Zgonena lamented the lack of field data telling of any arcing events in installed PV systems within the United States. He asks that any systems integrators, or others with such data, provide him (Timothy.P.Zgonena@us.ul.com) with such data so it can be entered in a data base. Jennifer Granata (jegrana@sandia.gov), of Sandia, also asked that such data also be duplicated and sent to her. These data will be protected and no attempt to tie manufacturers with such data in any public use.

Another dramatic video was presented by John Wohlgemuth of BP Solar. He showed the results of a multi-crystalline module that had deliberately not been soldered on two tabs of one cell. This module continued the normal production process with the encapsulation materials and the lamination process providing enough pressure on the two unsoldered tabs to allow it to pass I-V and other tests that made it look like a normal module. It was then placed in a string with another six, or so, modules—a typical PV installation. With normal heating of the module, there was enough movement in the tabs to open the electrical connections with disastrous—and spectacular visual—results.

The TAG Administrator suggested arcing in high voltage PV systems to be one of the major problems facing the PV industry.

At the conclusion of the TAG meeting—around 11:45 AM—attendees were invited to tour the Arizona Public Service Company's Solar Test And Research (STAR) Center. STAR has been in existence for some fifteen years, with systems in place to include various roof-mounted systems, concentrator systems, horizontal and tilted axis single axis tracking systems, remnants of a Stirling engine, as well as two axis tracking systems with various technologies of flat-plate modules mounted. STAR also is “providing” real estate for some manufacturers to test their systems under the environmentally challenging Arizona sun.