A meeting of the full IEEE Standard P1547.2 (Draft Application Guide for IEEE Standard 1547, Standard for Interconnecting Distributed Resources with Electric Power Systems) Work Group was held on June 6-7, 2006 in Arlington, Virginia. New WG officers were announced; Bob Saint as Chairman, and Dave Bassett as Vice-Chairman, replacing Bob Saint and Dick Friedman as Co-Chairs. Secretary T. basso thanked Bob Saint for NRECA hosting this meeting.

Mr. Robert Saint, Chairman for the P1547.2 Work Group, chaired the meeting with David Bassett, Vice-Chairman, participating via conference all. The participant list is included as Attachment 1.

The meeting focus was on: technical corrections, gap filling, suggestions & rewrites to condense lengthy sections, etc. (not wordsmithing); the IEEE P1547.2 meeting agenda and introductory materials were presented and discussed (Attachment 2) including the IEEE Standards Board By-Laws on Patents and Inappropriate Topics. An opportunity was provided for WG members to identify or disclose patents that the WG member believes may be essential for the use of the standard; none were identified by the participants.

**The following P1547.2 Target Schedule was presented.**
- June 6-7: complete gap analysis of Draft 4 (assignments for Draft 5).
- July 10: receive inputs for Draft 5
- July 24: post P1547.2 Draft 5
- August 1-4, 2006 P1547.x series of meetings (P1547.2 on Aug 3-4).
- Oct. – Nov 2006: complete pre-ballot Draft 6 for P1547.2 WG
- Winter 2006-2007: P1547.2 meet - critical review for ballot ready draft
- Winter 2006 -Spring 2007: conduct ballot

Relating activity of other 1547 Working Groups and the Power Engineering Society were discussed. Then, P1547.2 Draft 4 was reviewed, section by section, to assess comments and identify sections that need additional or revised content. Specific writing assignments agreed to during the meeting are shown below.
<table>
<thead>
<tr>
<th>Section</th>
<th>Action [assignment lead]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Clean-up [Tom Basso, Bob Saint]</td>
</tr>
<tr>
<td>2</td>
<td>Complete when document is closer to being finished [Tom Basso]</td>
</tr>
<tr>
<td>3</td>
<td>Complete when document is closer to being finished [Paul Sheaffer, Tom Basso, Tom Gordon]</td>
</tr>
<tr>
<td>4</td>
<td>Clean-up, use Figure 1 from 15471. [Dave Bassett]</td>
</tr>
<tr>
<td>5</td>
<td>Add section on Static Power Converters, non 60 Hz rotating [Tom Gordon]</td>
</tr>
<tr>
<td>6.1.1</td>
<td>Need text to discuss included schematics, maybe additional schematics [Tom Gordon]</td>
</tr>
<tr>
<td>6.1.2</td>
<td>Needs text on “operation” or delete [Bob Saint will work with Scott Lacey to clean up]</td>
</tr>
<tr>
<td>6.2.1</td>
<td>Needs text on “operation” or delete [Tom Gordon, also pull in Table 4.1 info]</td>
</tr>
<tr>
<td>6.2</td>
<td>Remove reference to “microgrids”, other clean-up [Terry Conrad]</td>
</tr>
<tr>
<td>6.2.3.4</td>
<td>Needs figures [Bob Saint]</td>
</tr>
<tr>
<td>7</td>
<td>Modify diagrams to be consistent with Figure 4.1, move information to Annex [Tom Basso]</td>
</tr>
<tr>
<td>8.1.1</td>
<td>Figure 8.1 needs to be clarified, other clean-up [Bob Saint, Dave Bassett]</td>
</tr>
<tr>
<td>8.1.2</td>
<td>Multiple comments need to be addressed [Simon Wall]</td>
</tr>
<tr>
<td>8.1.3</td>
<td>Address comments, clean-up [Dave Bassett and Simon Wall]</td>
</tr>
<tr>
<td>8.1.4</td>
<td>Address comments, clean-up [Daniel Sammon]</td>
</tr>
<tr>
<td>8.1.6</td>
<td>Needs review by other group, clean-up [Dave Bassett with Simon Wall]</td>
</tr>
<tr>
<td>8.1.7</td>
<td>Needs consolidation – two submissions [Terry Conrad]</td>
</tr>
<tr>
<td>8.1.8.1</td>
<td>Address changes from 1995 to 2004, C37.90.2, look at other standards [Gerald Johnson]</td>
</tr>
<tr>
<td>8.2.1</td>
<td>Address comments, clean-up [Charles Rogers]</td>
</tr>
<tr>
<td>8.2.2</td>
<td>Address comments, clean-up [Simon Wall]</td>
</tr>
<tr>
<td>8.2.3</td>
<td>Needs pieces moved to appendix – Elec Dist System Disturbances [Paul Sheaffer]</td>
</tr>
<tr>
<td>8.2.4</td>
<td>Impact of DR – rewrite, move current text to background [Simon Wall]</td>
</tr>
<tr>
<td>8.3.2</td>
<td>Move material to DR Prime Movers– DR Equipment/Flicker, move text [Paul Sheaffer]</td>
</tr>
<tr>
<td>8.4.2</td>
<td>Review clean-up [Bob Saint, get Ben Kroposki to review, and to contact BC Hydro and to contact Detroit Edison/DTE about figure and a peer reviewed citation]</td>
</tr>
<tr>
<td>10</td>
<td>Needs most pieces moved to appendix, minor comments, clean-up [Dave Bassett]</td>
</tr>
<tr>
<td>Ann A+B</td>
<td>Definitions, Bibliography, Glossary clean-up (whole document) [Tom Basso]</td>
</tr>
<tr>
<td>Ann E</td>
<td>Insert Pitt, PJM drawings [Paul Sheaffer]</td>
</tr>
<tr>
<td>Ann F</td>
<td>Clean-up, combine with App G [Dave Bassett with some input from Bob Saint]</td>
</tr>
<tr>
<td>Ann G</td>
<td>System impact studies – develop intro, scope, purpose, rational, what is an impact study, etc. with other group [Bob Saint]</td>
</tr>
</tbody>
</table>
These changes and modifications pertain to Draft 4, which was made available prior to the meeting. The deadline for revisions is July 10, 2006, with revisions being sent to:

robert.saint@nreca.coop
dlbassett@pplweb.com
thomas_Basso@nrel.gov
sheaffer@rdcnf.com

Assignments/revisions will be incorporated as Draft 5, which will be posted on the IEEE 1547.2 web site by July 24, 2006 in preparation for the next Working Group Meeting on August 3-4 in Las Vegas.

We continue to work towards our goals of developing a complete pre-ballot Draft 6 by September-November 2006 and conducting a ballot in Winter-Spring 2007.

Respectfully submitted, June 9, 2006, Tom Basso, Secretary with thanks to Paul Sheaffer for scribing these notes.

**ATTACHMENT 1 – Attendees:** P1547.2 Work Group Meeting: June 6-7, Arlington, Virginia

<table>
<thead>
<tr>
<th>Bassett</th>
<th>David</th>
<th>PPL Electric Utilities (via phone)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basso</td>
<td>Tom</td>
<td>National Renewable Energy Laboratory</td>
</tr>
<tr>
<td>Bui</td>
<td>Mike</td>
<td>TXU Electric Delivery</td>
</tr>
<tr>
<td>Conrad</td>
<td>Terry</td>
<td>Concurrent Technologies Corporation</td>
</tr>
<tr>
<td>Doyle</td>
<td>Mike</td>
<td>TXU Electric Delivery</td>
</tr>
<tr>
<td>Gordon</td>
<td>Tom</td>
<td>Siemens Power Generation, Inc.</td>
</tr>
<tr>
<td>Johnson</td>
<td>Travis</td>
<td>Georgia Power Company</td>
</tr>
<tr>
<td>Lin</td>
<td>Jason</td>
<td>GE Zenith Controls</td>
</tr>
<tr>
<td>Saint</td>
<td>Bob</td>
<td>National Rural Electric Cooperative Association</td>
</tr>
<tr>
<td>Sammon</td>
<td>Daniel</td>
<td>Consolidated Edison of New York</td>
</tr>
<tr>
<td>Sheaffer</td>
<td>Paul</td>
<td>Resource Dynamics Corp.</td>
</tr>
<tr>
<td>Wall</td>
<td>Simon</td>
<td>Capstone Turbine Corporation</td>
</tr>
<tr>
<td>Weisz</td>
<td>Douglas</td>
<td>Wisconsin Public Service</td>
</tr>
</tbody>
</table>

**ATTACHMENT 2 (follows) – P1547.2 Meeting agenda, introductory and background information.**
P1547.2 Draft Application Guide for
IEEE Std 1547, Standard for
Interconnecting Distributed Resources
with Electric Power Systems

Chairperson: R. Saint
Vice Chair: D. Bassett
Secretary: T. Basso

Agenda P1547.2 June 6-7, 2006

Welcome and Introductions
- Please sign in on the attendee list
- correct and/or add your contact information

IEEE Standards

P1547.2 Discussion and Breakouts

Next Actions

Adjourn

IEEE Standards Development

IEEE Instructions - the WG membership shall be advised that:

- IEEE's Patent Policy is consistent with the ANSI patent policy and is
described in Clause 6 of the IEEE SA Standards Board Bylaws;

- Early disclosure of patents which may be essential for the use of
standards under development is encouraged -- WG members should
identify or disclose patents that you believe may be essential for the use of
this standard; responses (specifically the patents and patent applications
identified, if any, and by whom) will be recorded in this meeting’s minutes.

- Disclosures made of such patents may not be exhaustive of all patents
that may be essential for the use of standards under development, and
neither the IEEE, the WG nor the WG Chairman ensure the accuracy or
completeness of any disclosure or whether any disclosure is of a patent
that in fact may be essential for the use of standards under development.
IEEE-SA Standards Board Bylaws on Patents in Standards

6. Patents. IEEE standards may include the known use of essential patents and patent applications provided the IEEE receives assurance from the patent holder or applicant with respect to patents whose infringement is, or in the case of patent applications, potential future infringement the applicant asserts will be, unavoidable in a compliant implementation of either mandatory or optional portions of the standard (essential patents). This assurance shall be provided without coercion and prior to approval of the standard (or reaffirmation when a patent or patent application becomes known after initial approval of the standard). This assurance shall be a letter that is in the form of either:
   a) A general disclaimer to the effect that the patentee will not enforce any of its present or future patent(s) whose use would be required to implement either mandatory or optional portions of the proposed IEEE standard against any person or entity complying with the standard; or
   b) A statement that a license for such implementation will be made available without compensation or under reasonable rates, with reasonable terms and conditions that are demonstrably free of any unfair discrimination.
   This assurance shall apply, at a minimum, from the date of the standard's approval to the date of the standard's withdrawal and is irrevocable during that period.

Inappropriate Topics for IEEE WG Meetings

- Don't discuss licensing terms or conditions
- Don't discuss product pricing, territorial restrictions or market share
- Don't discuss ongoing litigation or threatened litigation
- Don't be silent if inappropriate topics are discussed... do formally object.

If you have questions, contact the IEEE-SA Standards Board Patent Committee Administrator at patcom@ieee.org or visit http://standards.ieee.org/board/pat/index.html

Approved by IEEE-SA Standards Board – March 2003 (Revised February 2004)

P1547.2 IEEE Web Site

P1547.2 public web site
http://grouper.ieee.org/groups/scc21/1547.2/1547.2_index.html

- P1547.2 Archives
  - Meeting information
  - Registration Information – First time attendees, please return a completed registration form (Excel 24 KB) to David Glickson and Tom Basso, the SCC21 secretary, at least two weeks before the meeting. Ongoing attendees, please RSVP and provide any changes to your contact information.
  - Agenda – for most recent meeting
  - Minutes

P1547.2 Web Site – Work Group Area

- P1547.2 Work Group Area (password protected)
  http://grouper.ieee.org/groups/scc21/1547.2/private/
  Username p1547.2 password for7dot2
  Contacts – WG member information (standards development use only).
- Special Topics - background information for the Work Group.
- StdDrafts – Drafts under development
- Listserv – listserv archived emails

Approved by IEEE-SA Standards Board – March 2003 (Revised February 2004)
P1547.2 IEEE ListServ
ListServ is for IEEE standards development use only.
IEEE code of ethics identified in Information file sent to each subscriber.

To: stds-p1547-2@ieee.listserv.org
From: you@yourISP.com
Only subscribers can send to the list. Exchanges between individuals
and among your self-established small groups are encouraged.

ListServ emails are immediately sent to all subscribers;
Reply to all – sent to all;
Reply to sender – only sent to sender.
Email to listserv is auto-archived at
P1547.2 Work Group Area (password protected)
at ListServ
Archived emails can be viewed either under
Subject Thread or Date Thread.

--- IEEE ---

IEEE Standards Classification

Standard: documents with mandatory requirements
(shall)

Recommended Practice: documents in which
procedures and positions preferred
by the IEEE are presented (should)

Guide: documents in which alternative approaches
to good practice are suggested but
no clear-cut recommendations are made (may)

--- IEEE ---

IEEE SCC21 1547 Series of Interconnection Standards

  Distributed Resources with Electric Power Systems
  Conformance Test Procedures for Equipment
  Interconnecting Distributed Resources with Electric Power Systems
- IEEE Std 1547.2 Draft Guide for Design, Operation, and Integration of Distributed Resource Island Systems with Electric Power Systems
- IEEE Std 1547.3 Draft Application Guide for IEEE 1547 Standard for Interconnecting Distributed Resources with Electric Power Systems
- IEEE Std 1547.4 Draft Guide for Impacts
- IEEE Std 1547.5 Draft Technical Guidelines for Interconnection of Electric Power Sources Greater Than 10 MVA to the Power Transmission Grid
- IEEE Std 1547.6 Draft Recommended Practice for Interconnecting Distributed Resources with Electric Power Systems Distribution Secondary Networks

Current SCC21 Interconnection Projects

Title | Scope & Purpose
--- | ---
IEEE Std 1547™ (2003) Standard for Interconnecting Distributed Resources with Electric Power Systems | This Standard establishes criteria and requirements for interconnection of distributed resources (DR) with electric power systems (EPS).

IEEE Std 1547.1™ (2005) Standard for Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems | This Standard specifies the type, production, and commissioning tests that shall be performed to demonstrate that interconnection functions and equipment of a distributed resource (DR) conform to IEEE Std 1547. Interconnection equipment that connects distributed resources (DR) to an electric power system (EPS) must meet the requirements specified in IEEE Standard 1547. Standardized test procedures are necessary to establish and verify compliance with those requirements. These test procedures must provide both repeatable results, independent of test location, and flexibility to accommodate a variety of DR technologies.

---

T. Basso
### Current SCC21 Interconnection Projects

<table>
<thead>
<tr>
<th>Title</th>
<th>Scope and Purpose</th>
</tr>
</thead>
</table>
| **P1547.2**™ Draft Application Guide for IEEE Standard 547 for Interconnecting Distributed Resources with Electric Power Systems | • This Guide provides technical background and application details to support the understanding of IEEE 1547 Standard for Interconnecting Distributed Resources with Electric Power Systems.  
• This document facilitates the use of IEEE 1547 by characterizing the various forms of distributed resource technologies and the associated interconnection issues. Additionally, the background and rationale of the technical requirements are discussed in terms of the operation of the distributed resource interconnected with the electric power system. Presented in the document are technical descriptions and schematics, applications guidance and interconnection examples to enhance the use of IEEE 1547. |
| **P1547.3**™ Draft Guide for Monitoring, Information Exchange and Control of Distributed Resources Interconnected with Electric Power Systems | • This document provides guidelines regarding the technical requirements, including design, construction, commissioning acceptance testing and maintenance requirements, for interconnecting dispatchable electric power sources with a capacity of more than 10 MVA to a bulk power transmission grid.  
• The purpose of this project is to provide technical information and guidance to all parties involved in the interconnection of dispatchable electric power sources to a transmission grid about the various considerations needed to be evaluated for establishing acceptable parameters such that the interconnection is technically correct. |

### Current SCC21 Interconnection Projects

<table>
<thead>
<tr>
<th>Title</th>
<th>Scope and Purpose</th>
</tr>
</thead>
</table>
| **P1547.5** Draft Technical Guidelines for Interconnection of Electric Power Sources Greater Than 10 MVA to the Power Transmission Grid | • This standard builds upon IEEE Standard 1547 for the interconnection of distributed resources (DR) to distribution secondary network systems. This standard establishes recommended criteria, requirements and tests, and provides guidance for interconnection of distribution secondary network system types of area electric power systems (Area EPS) with distributed resources (DR) providing electric power generation in local electric power systems (Local EPS).  
• This standard focuses on the technical issues associated with the interconnection of Area EPS distribution secondary networks with a Local EPS having DR generation. The standard provides recommendations relevant to the performance, operation, testing, safety considerations, and maintenance of the interconnection. In this standard consideration is given to the needs of the Local EPS to be able to provide enhanced service to the DR owner loads as well as to other loads served by the network. Equally, the standard addresses the technical concerns and issues of the Area EPS. Further, this standard identifies communication and control recommendations and provides guidance on considerations that will have to be addressed for such DR interconnections. |
| **P1547.6** Draft Recommended Practice for Interconnecting Distributed Resources With Electric Power Systems Distribution Secondary Networks | • This standard builds upon IEEE Standard 1547 for the interconnection of distributed resources (DR) to distribution secondary network systems. This standard establishes recommended criteria, requirements and tests, and provides guidance for interconnection of distribution secondary network system types of area electric power systems (Area EPS) with distributed resources (DR) providing electric power generation in local electric power systems (Local EPS).  
• This standard focuses on the technical issues associated with the interconnection of Area EPS distribution secondary networks with a Local EPS having DR generation. The standard provides recommendations relevant to the performance, operation, testing, safety considerations, and maintenance of the interconnection. In this standard consideration is given to the needs of the Local EPS to be able to provide enhanced service to the DR owner loads as well as to other loads served by the network. Equally, the standard addresses the technical concerns and issues of the Area EPS. Further, this standard identifies communication and control recommendations and provides guidance on considerations that will have to be addressed for such DR interconnections. |


*(IEEE 1547 Developed By National Team of 444 Professionals)*

<table>
<thead>
<tr>
<th>Title</th>
<th>Scope and Purpose</th>
</tr>
</thead>
</table>
| **P1547.4**™ Draft Guide for Design, Operation, and Integration of Distributed Resource Island Systems with Electric Power Systems | • This document provides alternative approaches and good practices for the design, operation, and integration of distributed resource (DR) island systems with electric power systems (EPS). This includes the ability to separate from and reconnect to part of the area EPS while providing power to the islanded local EPSs. This guide includes the distributed resources, interconnection systems, and participating electric power systems.  
• This guide is intended to be used by EPS designers, operators, system integrators, and equipment manufacturers. The document is intended to provide an introduction, overview and address engineering concerns of DR island systems. It is relevant to the design, operation, and integration of DR island systems. Implementation of this guide will expand the benefits of using DR by targeting improved electric power system reliability and build upon the interconnection requirements of IEEE 1547. |
States with Interconnection Mandates prior to 2005 EPACT

IA, FL, ME, MN, and others are in process or being considered. And FERC, RTOs/ISOs, MADRI, and others are in process or considering interconnection.

Next Actions: P1547.2

P1547.2 Target Schedule
June 6-7: complete gap analysis of Draft 4 (assignments for Draft 5).
July 10: receive inputs for Draft 5
July 24: post P1547.2 Draft 5
August 1-4, 2006 P1547 x series of meetings (P1547.2 on Aug 3-4), Embassy Suites Convention Ctr (Ambassador Rooms A & B), Mention IEEE (NREL) 1-800-EMBASSY (1-800-362-2779) 1-702-893-8000 http://www.ESLVCC.com
Oct. – Nov 2006: complete pre-ballot Draft 6 for P1547.2 WG
Winter 2006-2007: P1547.2 meet - critical review for ballot ready draft
Winter 2006 - Spring 2007: conduct ballot

PJM Interconnect * Small Generator Interconnection Standard FERC approved 2005

- Two Major Goals** -- 2 MW DG Standard (expanding to 10 MW, then 20 MW)
  - Standardize interconnection requirements, based on IEEE 1547, throughout PJM business domain
  - Ensure test compliance to IEEE 1547.1
- PJM standard allows pre-certification
  - PJM Interconnect, Inc. is a Regional Transmission Organization (RTO) with over 180 GW load

** Technical Support by DOE/NREL

P1547.X Series Aug 1- 4, 2006
Las Vegas NV Embassy Suites Conventer Ctr
August 1 Tuesday  8:30 am - 5pm
P1547.3 (Information Exchange); and P1547.4 (DR Islanding Systems)
August 2 Wednesday  8:30 am – 3pm
P1547.3 (Information Exchange) and P1547.4 (DR Islanding Systems)
August 3 Thursday  8:30 am – 5pm
P1547.2 (Guide to 1547) and P1547.6 (DR/Networks)
August 4 Friday   8:30 am – 3pm (adjourn)
P1547.2 (Guide to 1547) and P1547.6 (DR/Networks)