



**Electricity, Resources,
& Building Systems
Integration**

Update on IEEE Interconnection Standards



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Solar ABCs

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NREL is a national laboratory of the U. S. Department of Energy,
Office of Energy Efficiency and Renewable Energy, operated by
the Alliance for Sustainable Energy, LLC.

IEEE SCC21 Standards Coordinating Committee on Fuel Cells,
Photovoltaics, Dispersed Generation, and Energy Storage

Published Standards in 2011

- IEEE 1547.4™ – Planned Island Systems
- IEEE 1547.6™ – Secondary Network Distribution Systems
- IEEE 2030™ – Smart Grid Interoperability

Standards Under Development

- IEEE P1547.7 – Impact Studies
- IEEE P1547.8 – Expanded Use of IEEE 1547

IEEE 1547.4™

Guide for Design, Operation, and Integration of Distributed Resource Island Systems with Electric Power Systems

Purpose

“...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...”

Published 2011

IEEE 1547.6™

Draft Recommended Practice For Interconnecting
Distributed Resources With Electric Power Systems
Distribution Secondary Networks

Purpose

“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....”

Published 2011

IEEE 2030™

Draft Guide for Smart Grid Interoperability of Energy Technology and Information Technology Operation with the Electric Power System (EPS), and End-Use Applications and Loads

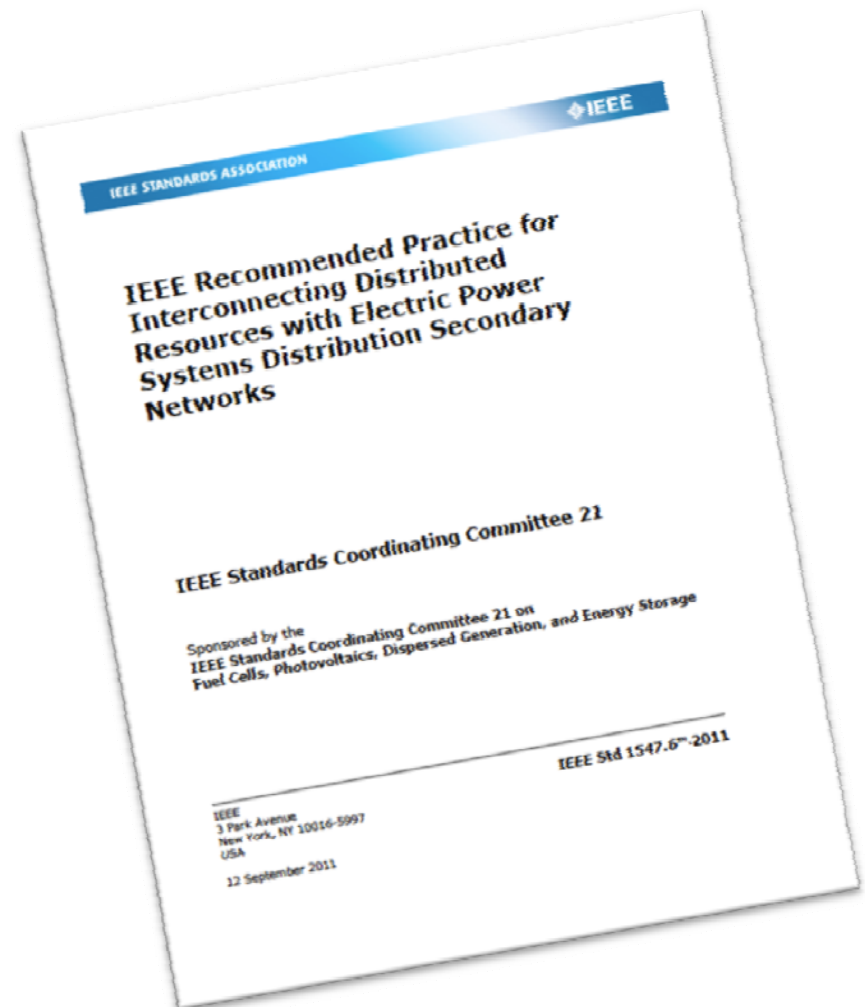
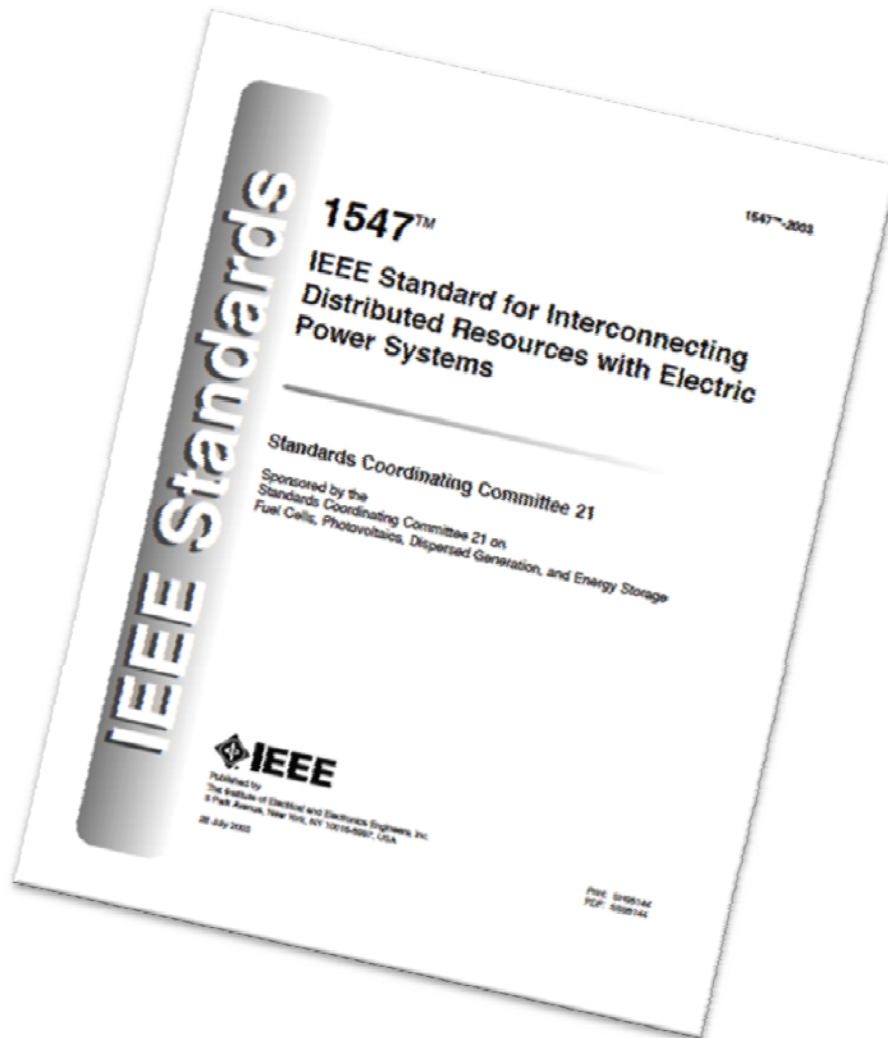
Purpose

“This standard provides guidelines in understanding and defining smart grid interoperability of the electric power system with end-use applications and loads. ...”

Published 2011

Standards Coordinating Committee 21

Standards Under Development



IEEE P1547.7

Draft Guide to Conducting Distribution Impact Studies for Distributed Resource Interconnection

Purpose

“..... a described methodology for when distribution system impact studies are appropriate, what data is required, how they are performed, and how the study results are evaluated. In the absence of such guidelines, the necessity and extent of DR interconnection impact studies has been widely and inconsistently defined and applied.”

Major Study Types

- Power Flow
- Short Circuit
- Power Quality
- Quasi-Static
- Dynamic Stability
- Transient Stability

IEEE P1547.8

“Recommended Practice to Expand The
Usefulness And Utilization Of IEEE Std 1547”

Overview of P1547.8

- Guide will reflect IEEE 1547 clauses
- Focus on High Penetration Distributed Generation
- Intent is to make DG systems “Utility Friendly”
- Solutions should incorporate advanced functionality inverters

Topics of Focus for P1547.8

- Voltage Regulation
- Monitoring & Communications
- Response to Area EPS Abnormal Conditions
- Power Quality
- Coordination with NEC and UL 1741
- Optimizing Group Behavior of DG
- DR Requirements to “See” Fault Conditions
- Additional Data Requirements
- DG Greater than 10 MW (< 20MW)

What's Next?

- IEEE P1547.7 may go to Ballot in 2012
- IEEE P1547.8 details;
 - Three Working Group meetings since August 2010
 - Over 100 pages of text and graphics submitted
 - May be ready for Writing Group/Ballot by 2013
 - Experience from this “Recommended Practice” should feed into a revision of IEEE 1547 or a new Standard for Interconnection
 - Next meetings planned for February 2012



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Thank you

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