IEEE 1547.2 Overview

IEEE P1547.2 Draft Application Guide for IEEE Std 1547 for Interconnecting Distributed Resources with Electric Power Systems

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IEEE P1547.2 Project

Title. **P1547.2 Draft Application Guide for IEEE Standard 1547 for Interconnecting Distributed Resources with Electric Power Systems**

Scope. This Guide provides technical background and application details to support the understanding of IEEE 1547 Standard for Interconnecting Distributed Resources with Electric Power Systems.

Purpose. 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 interconnection 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.

Chairperson: Dick Friedman, Resource Dynamics Corp.

Secretary: Tom Basso, NREL

PAR approved Dec 2001 by IEEE (project authorization request); expect first ballot Dec 2004 (delayed); ballot to be completed by Dec 2005

IEEE P1547.2 Contents (Draft 1 7/30/04)

Introduction

1. Overview (scope, purpose, use)
2. References
3. Definitions and Acronyms
4. The Interconnection System
5. The Electric Power System (Area and Local EPS)
6. The Distributed Resource
7. Rationale For Technical Requirements
8. Application Guidance for IEEE Std 1547 Technical Specifications and Requirements
9. Application Guidance for IEEE Std 1547 Test Specifications and Requirements
10. Interconnection Information

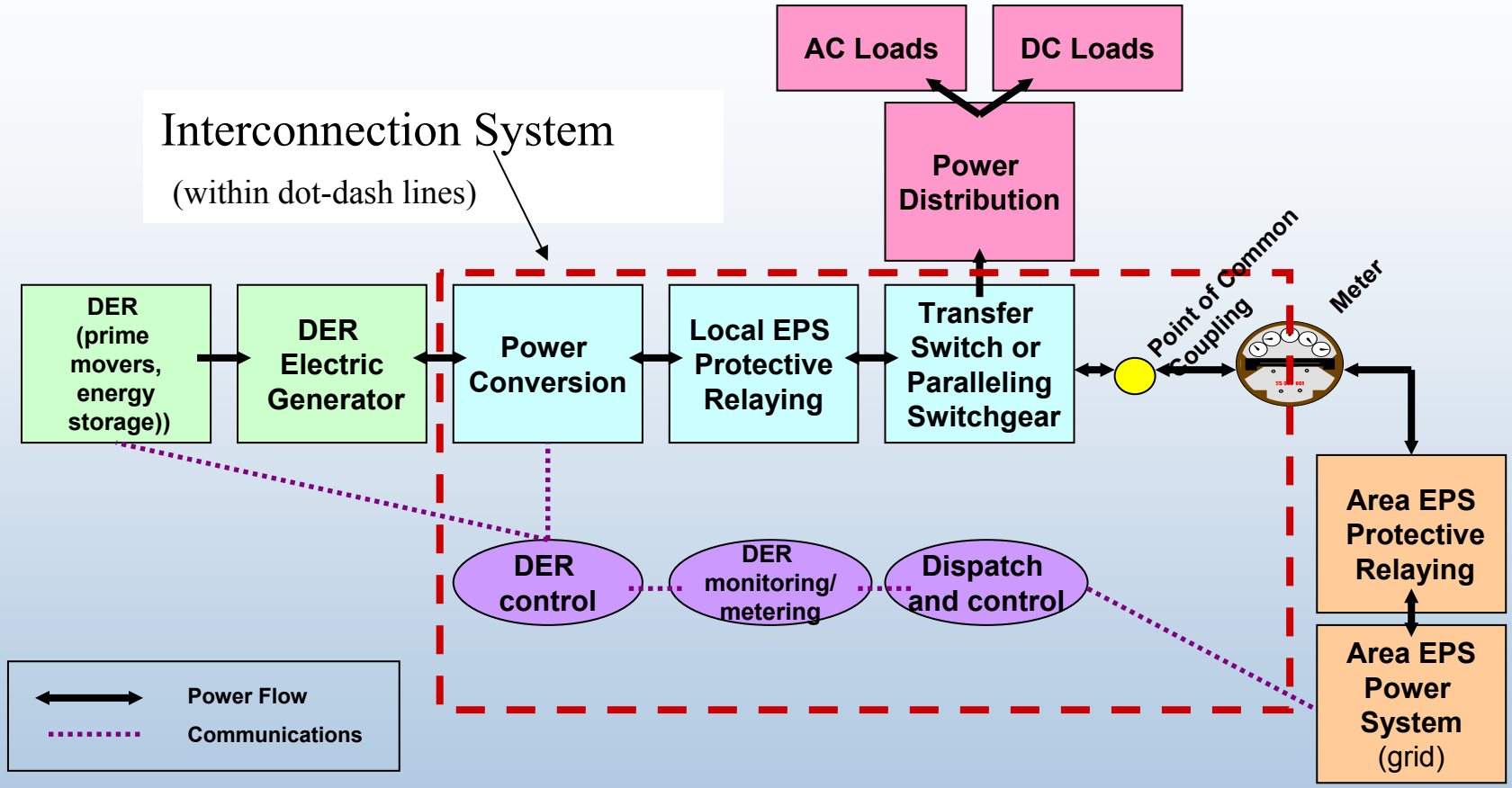
Annexes A – F (Bibliography; Glossary; Examples; System Impacts; Networks; Index)

IEEE P1547.2 Draft Content

Generally, For each IEEE Std 1547 Clause:

- **Application Guidance**
- **Background**
- **Impact of DR**
- **Tips, Techniques and Rules of Thumb**

Interconnection System -- Functional Block Diagram



The interconnection system (within the dotted line) is designed to handle the power between and serve as the communication and control gateway among the DER, the Area EPS and the customer loads. Workshops with industry provided a forum for furthering this activity and several manufacturers are working on developing and validating standardized, advanced, universal interconnection technologies [NREL/SR-560-32459].

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IEEE Std 1547 technical requirements remain valid for all interconnection systems equipment types.

- "Prime mover" traditionally performs fuel/primary-input energy conversion, e.g., recip engine, fuel cell, PV panel

  Prime mover characteristics have limited interaction effects on utility grid; they drive the electric generators-converters: (synchronous, induction, or inverter–based machines).
- DG-grid interface is via *"power conversion"* devices and relaying and switching protective devices/schemes.

  Power conversion characteristics largely contribute to DG-grid interaction effects; relaying, switching and protection devices/schemes largely contribute to DG-grid coordination/operation interactions.
- Equipment technologies/approaches often combine above differentiations of technical functionalities.

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Example Issues in Meeting Std 1547 requirements

- **Short circuit contribution**
- **Protection coordination**
- **Voltage regulation**
- **Unintentional islanding**
- **Grounding and overvoltages**
- **Network issues**

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➔ Application issues are real and resolvable, e.g., specific to equipment, design, location, application, etc.

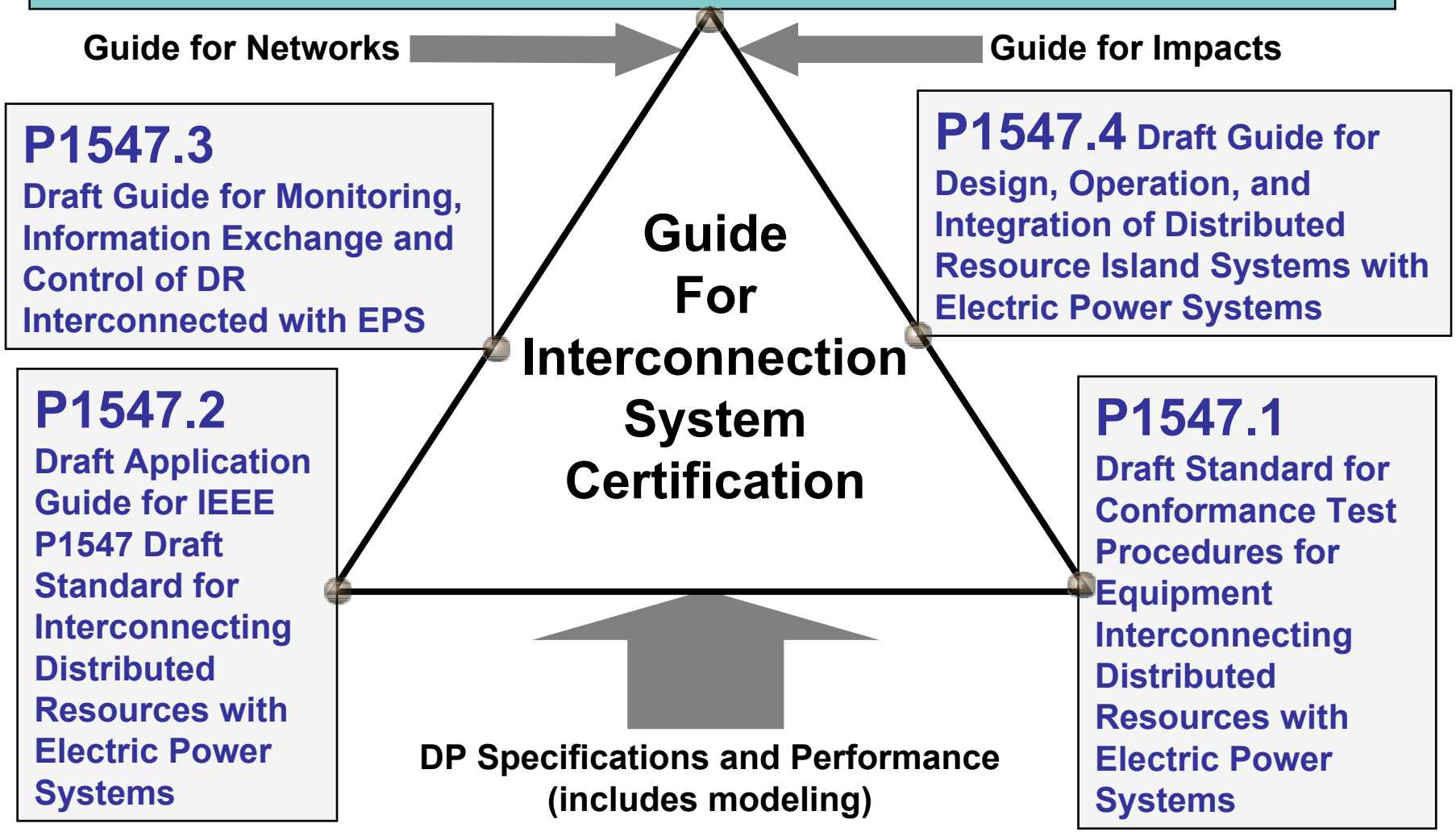
➔ Operational philosophies vary from utility to utility

➔ No “Absolute” Solutions

➔ Recognize the Potential Misapplication

IEEE SCC21 1547 Series of Interconnection Standards

IEEE Std 1547™ (2003) Standard for Interconnecting Distributed Resources with Electric Power Systems



The above identifies existing IEEE SCC21 standards development projects (1547 series) and activities under discussion by SCC21 Work Group members.