



Standard Practice for Installation, Commissioning, Operation, and Maintenance Process (ICOMP) of Photovoltaic Arrays¹

This standard is issued under the fixed designation E3010; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice details the minimum requirements for installation, commissioning, operations, and maintenance processes to ensure safe and reliable power generation for the expected life of the photovoltaic system. Specifically dealing with commercial photovoltaic installations, this practice covers a broad spectrum of designs and applications and is focused on the proper process to ensure quality.

1.2 This practice does not cover the electrical aspects of installation found in existing and national codes and does not replace or supersede details of electrical installation covered by the same. The practice does address the integration of best practices into design and construction.

1.3 This practice shall not dictate specific design criteria or favor any product or technology.

1.4 This practice shall be focused on the proper, documented process required to build and operate a quality PV plant as defined in Section 3.

1.5 Integration of best practices shall be relevant to this standard and promote a mechanism for rapid evolution and reaction to changes or events. Conformity assessment for PV power plants is being developed through the IEC System for Certification to Standards Relating to Equipment for Use in Renewable Energy Applications (IECRE System). Sandia Labs has developed several model documents that may be adopted as acceptable consensus standards through other standards development organizations.

1.6 The standard is divided into three key areas:

1.6.1 Design, engineering, and construction of the PV plant. Systems should be designed with operation and maintenance (O&M) in mind. Further standards should be developed for building integrated or building mounted systems, modules with embedded power electronics, lightweight flexible modules, or other specific components.

1.6.2 Commissioning, testing, and approval for power generation (Utility Witness Testing). Standards for owner acceptance will also be addressed.

1.6.3 O&M of the PV plant including performance monitoring, periodic inspection, preventive maintenance, and periodic re-commissioning.

1.7 Safety and hazard considerations unique to this application, such as worker fall protection, electrical exposure, accessibility of modules, and roof clearance (around the perimeter of the array) are addressed by other codes, standards, or authorities having jurisdiction.

1.8 This practice provides guidelines for minimum processes required and must be used in conjunction with applicable codes and standards, government regulations, manufacturer requirements, and best practices.

1.9 This practice is not intended to replace or supersede any other applicable local codes, standards or Licensed Design Professional instructions for a given installation.

1.10 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards*:²

E772 Terminology of Solar Energy Conversion

E2047 Test Method for Wet Insulation Integrity Testing of Photovoltaic Arrays

E2848 Test Method for Reporting Photovoltaic Non-Concentrator System Performance

E2908 Guide for Fire Prevention for Photovoltaic Panels, Modules, and Systems

2.2 *IEC Standards*:³

IEC 61215: Terrestrial Photovoltaic (PV) Modules – Design Qualification and Type Approval

¹ This test method is under the jurisdiction of ASTM Committee E44 on Solar, Geothermal and Other Alternative Energy Sources and is the direct responsibility of Subcommittee E44.09 on Photovoltaic Electric Power Conversion.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from International Electrotechnical Commission (IEC), 3, rue de Varembe, P.O. Box 131, CH-1211 Geneva 20, Switzerland, <http://www.iec.ch>.