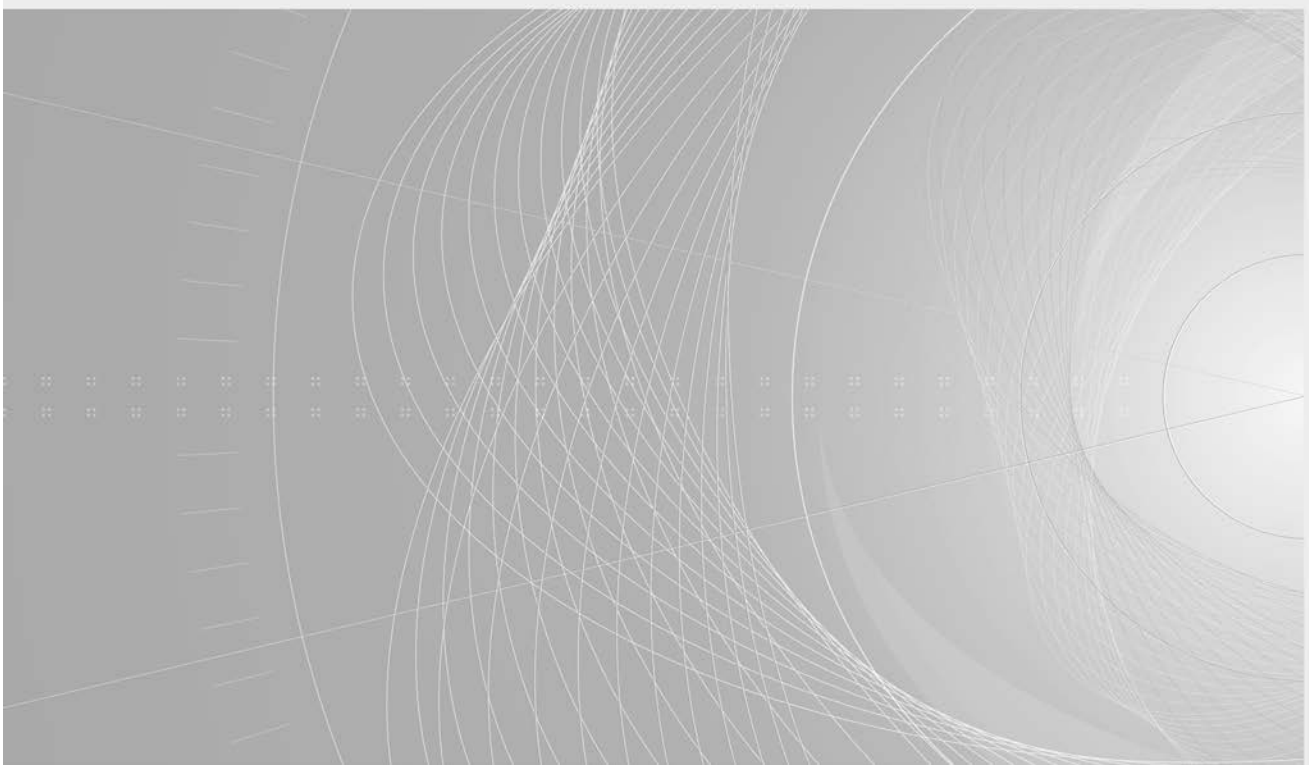


IECRE PUBLICATION

IEC System for Certification to Standards Relating to Equipment for Use in Renewable Energy Applications (IECRE System)





THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2016 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

IEC Catalogue - webstore.iec.ch/catalogue

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

IEC publications search - www.iec.ch/searchpub

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

Electropedia - www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing more than 30 000 terms and definitions in English and French, with equivalent terms in 14 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary

More than 55 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.



IECRE 04

Edition 1.0 2016-07-12

IECRE PUBLICATION

IEC System for Certification to Standards Relating to Equipment for Use in Renewable Energy Applications (IECRE System)

Rules of Procedure for the Certification of Photovoltaic Systems according to the IECRE-PV Schemes

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

PRICE CODE **ZZ**

Table of Contents:

INTRODUCTION	4
PV-OMC Terms of Reference	4
1 Scope	6
1.1 Objective	6
1.2 Applicable Documents	6
2 Normative references	6
3 Terms and definitions	7
3.1 applicant.....	7
3.2 certificate holder	7
3.3 certification.....	7
3.4 IECRE- Member Body (REMB)	7
3.5 Certification body (RECB)	7
3.6 Inspection Body (REIB).....	8
3.7 Certification system	8
3.8 Conformity Statement	8
3.9 commissioning.....	8
3.10 final evaluation report	8
3.11 inspection	8
3.12 installation	8
3.13 manufacturing.....	8
3.14 manufacturer	8
3.15 modification	8
3.16 photovoltaic power plant (PV power plant) Certificate of Conformity (CoC)	8
3.17 product type certificate.....	8
3.18 PV system (or PV power plant).....	9
3.19 repair	9
3.20 replacement.....	9
3.21 surveillance	9
3.22 component.....	9
3.23 conditional photovoltaic power plant (PV power plant) certificate.....	9
3.24 SCADA (Supervisory control and data acquisition).....	9
3.25 Abbreviations.....	9
4 Structure and Governance	9
4.1 Introduction	9
4.2 Membership and Participation	9
4.3 Acceptance.....	10
4.4 Voting.....	10
5 PV Certification and Inspection Bodies	10
5.1 Role and responsibility of the RECB and REIB	10
5.1.1 Role and responsibility of The RECB.....	10
5.1.2 Role and responsibility of the REIB (PV Inspection body)	10
5.2 Role and responsibility of REIB Peer Assessors	11
5.3 Prerequisites for Acceptance.....	11
5.3.1 The RECB and REIB shall operate under the responsibility of an accepted and recognized IECRE-MB.....	11

5.3.2	A REIB may cooperate with more than one RECB in the same IECRE category.	11
5.3.3	The RECB and REIB shall be nominated to the IECRE by its IECRE Member Body.	11
5.3.4	5.3.4 RECB and REIBs carrying out inspection and/or certification activities shall not be influenced by manufacturers, installers, EPC companies or designers. Furthermore, the RECB and the REIB shall be impartial and not offer assistance or other services to the clients that may compromise the objectivity of its activities and decisions.	11
5.4	Application for Acceptance.....	11
5.5	Suspension or termination.....	11
5.5.1	Suspension or withdrawal by the PV-OMC.....	11
5.5.2	Suspension or withdrawal by the IECRE-MB.....	12
5.5.3	Suspension or withdrawal information	12
5.6	Initial Acceptance for Starting Operation of the System.....	12
6	Management of the certification system	12
6.1	General	12
6.2	Agreement on certification	12
6.3	Issue of certificates and conformity statements.....	13
6.4	Security of relevant documentation.....	13
6.5	Validity, maintenance and expiration of certificates.....	13
6.5.1	General	13
6.5.2	Maintenance of PV power plant certificate	13
6.6	Incident Reporting	14
7	The extent of certification	14
7.1	General	14
7.2	Applicability	14
7.3	Categories of certificates	14
7.3.1	System usage and location categories	15
7.3.2	System lifecycle categories.....	16
7.4	PV power plant certificate types	16
7.4.1	Project design certificate.....	16
7.4.1.1	Certification of the supplier's quality system	16
7.4.2	Conditional project certificate.....	16
7.4.3	Final project certificate.....	17
7.4.4	Project operations & maintenance certificate	17
	Annex A - Applicable Standards.....	18
	Annex B - Modifications requiring recertification	19
	Annex C (informative) - Design documentation.....	20
	Annex D (informative) - Reporting of system performance data for statistical aggregation and analysis.....	21

INTRODUCTION

This document defines the rules and procedures for conformity assessment and certification of photovoltaic (PV) power plants with respect to standards and technical requirements for photovoltaic equipment, as well as installation and operation of the system. It is intended to facilitate mutual recognition by participants (reciprocal acceptance) of test results and certificates issued by other participants for obtaining certification at a national or international level. It operates within the scope of the IEC TC82 standards and other relevant international or national standards.

The procedures in this document may refer to a certification scheme for components based on third party conformity assessment of a PV power plant at a specific location. Such certification scheme is deemed sufficient if it is equivalent to an ISO Type 5 Certification System, and a RECB may then issue an IECRE Certificate of Conformity.

In addition to design verification, this document provides information for the recognition of or assessment for certification of the supplier's quality system on the basis of regular surveillance of the supplier's quality system and quality plans.

The document is provided to assist applicants by reducing the number of steps necessary to obtain certification or approval at a national level, and to increase investor confidence.

PV-OMC Terms of Reference

The PV-OMC mission is to define the certification schemes for the solar PV sector of the IECRE System. The PV-OMC shall focus on issues that are specific to the PV sector and value that can be provided to investors and stakeholders within the sector.

In reporting to the REMC, the duties of the OMC are to operate as a management committee to support the schemes within its sector to serve market needs, build trust and shall include:

- Support of mutual recognition and to manage national differences;
- Prepare a proposal for decision regarding applications and continued operation of Certification Bodies and Inspection Bodies for the consideration of REMC;
- Publish results of interpretations and conclusions regarding conformity assessment and test procedures;
- Provide transparent and independent certification process;
- Define scope of standards applicable in various market segments within solar sector;
- Coordination of requirements for component certification under other IEC systems (IECEE)
- Nurture and drive the development of standards that are complementary with the OMC goals;
- Provide understanding of which issues are critical to end users and geared towards reducing their risk;
- Ensure a balanced representation of:
 - Inspection bodies and Conformity Assessment Bodies ;
 - Utility scale solar power plant designers and installers, their consultants and major component suppliers;
 - End Users (owner/operators, customer, insurance, banking and authorities having jurisdiction, government representative);
 - Certification bodies;
 - Commercial and small solar power plant installers representatives and
 - O&M representatives;
- Propose PV OMC subcommittees and Working Groups to the REMC;
- Ensure a common approach to the application of IECRE Scheme Rules and Operational Documents where applicable;

- Identify the additional technical requirements necessary to operate the IECRE Schemes and communicate these needs to the appropriate Technical Committees; and
- Promote the IECRE Schemes in the Solar Energy Sector internationally through harmonized and high confidence means to build confidence in financial performance, compatibility (interoperability) of data, transparency and bankability of solar assets;
- Recommend role of IECRE standards for environmental related checks like impact studies, emergency response plans for operating assets, construction process and end of life disposition of assets;
- Provide leadership to install confidence in IECRE amongst investors, users, rating agencies, underwriters and regulators;
- Define scope of personnel certification needs & requirements for the PV industry on periodic and continuous operations surveillance basis;
- Provide guidance and resolve grid locks to OMC committees and working groups on elements that are critical to performance over life cycle of power plant, validation of performance parameters, and definition of performance assessment procedures;
- Establish criteria for type certification of PV power plant assets, provide re-certification guidelines, and identify factors that always require site-specific assessment;
- Define requirements and procedures for certification of legacy power plants upon change of ownership;
- Determine whether multiple schemes are required for different system types or different applications;
- Define requirements for different systems based on size, type and/or application (e.g., systems on buildings might have additional safety requirements);
- Coordinate requirements for components, define system level procedures to verify integration of components into systems, and identify critical parameters, appropriate standards and procedures for assessments, for power plant certification, operation and disposition, taking into consideration the environmental conditions at an individual site.

Solar PV Operating Management Committee (PV-OMC) Rules of Procedure for the Certification of Photovoltaic Systems according to the IECRE-PV Schemes

1 Scope

The PV-OMC mission is to define the certification schemes for the solar photovoltaic (PV) sector. The PV-OMC shall focus on issues that are specific to the PV sector and value that can be provided to investors and stakeholders within the sector.

This publication contains the Rules of Procedure of the Solar PV Sector (IECRE PV) under the IECRE Conformity Assessment System, hereinafter referred to as the “RoP”, intended for use in solar energy applications and which comply with one or more IEC/ISO or other well recognized and adapted International Standards. These Rules relate to the Basic Rules of the IECRE System, as given in Publication IECRE 01. A list of standards in use is published on the IECRE website: www.IECRE.org. This list reflects updates and transition periods not yet implemented in Operational Documents (OD's).

1.1 Objective

In order to further assist working groups and subcommittees of the PV-OMC sector, this document defines the rules and procedures for conformity assessment and certification of photovoltaic (PV) power plants with respect to standards and technical requirements for photovoltaic equipment, as well as procedures described in this document to cover the assessment of photovoltaic power plant, including support structure/foundation designs, installation, commissioning, operation and maintenance activities covering various categories of power plants based on their application and location classes. It provides:

- Definitions of the elements in photovoltaic system conformity assessment and certification processes;
- Procedures for conformity assessment in a PV system certification;
- Procedures for surveillance;
- and
- Requirements for certification bodies and testing laboratories.

The purpose of the rules of procedure is to provide a common basis for the conformity assessment and certification of photovoltaic systems and to provide a basis for the acceptance of certification bodies, inspection bodies and testing laboratories and the mutual recognition of certificates.

1.2 Applicable Documents

The rules and procedures are to be used in conjunction with the relevant International Standards, ISO/IEC Guides, and other normative documents listed below. In many cases, there will be additional regulations (e.g., building codes and electrical codes) relevant to the local jurisdiction of the PV power plant as well as specific client requirements. IEC standards shall form the baseline for audit requirements but shall allow local/alternative codes & standards to be used if they are deemed equivalent or better and form the design basis as approved by the local permitting agency. Certifying agencies shall therefore reach alignment with the designer or installer on applicable codes and standards relevant to the local site at the beginning of engagement.

2 Normative references

The following referenced documents are indispensable to the application of this document:

ISO/IEC 17000, *Conformity assessment - Vocabulary and general principles*

ISO/IEC 17020, *General criteria for the operation of various types of bodies performing inspection*

ISO/IEC 17021, *Conformity assessment – Requirements for bodies providing audit and certification of management systems*

ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*

ISO/IEC Guide 2, *Standardization and related activities – General vocabulary*

ISO/IEC 17065, *Conformity assessment: Requirements for bodies certifying products, processes and services.*

ISO 9001, *Quality management systems – Requirements*

Draft OD 401, *Conditional Project Certificate*

Draft OD 402, *Final Project Certificate*

Draft OD 403, *Project Design Certificate (under development)*

Draft OD 404, *Project O&M Certificate (under development)*

Draft OD 405, *Installation Surveillance Requirements*

Draft ODxx, *Factory Audit process and Checksheet with Pass/Fail criteria (under development)*

Draft ODyy, *IECRE-PV Certified Equipment Scheme – Procedures for the Issuing of IECRE-PV Certificates of Conformity, IECRE-PV Test Reports and IECRE-PV Quality Assessment Reports (under development)*

Draft ODxx, *Application Requirements for RECBs and REIBs (under development)*

IECRE OD-003, *Costs related to Peer Assessment Services*

Standards used as the basis for IECRE PV assessments are listed in Annex A.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply, together with the relevant definitions contained in ISO/IEC 17000, ISO/IEC Guide 2 and IEC TS 61836 Ed.2.

3.1 applicant

Entity applying for certification

3.2 certificate holder

Entity holding a certificate after the certificate is issued

NOTE: This entity may not be the original applicant but nevertheless is responsible for maintenance of the certificate.

3.3 certification

Independent verification that a PV system at a specific site conforms to the relevant international standards and relevant local regulations. See 5.5 of ISO 17000.

3.4 IECRE- Member Body (REMB)

National member body to interface with IECRE

3.5 Certification body (RECB)

Organization that conducts conformity assessments and issues Certificate of Conformity (CoC) to PV systems. See 2.5 of ISO 17000.

3.6 Inspection Body (REIB)

Organization that performs inspection of PV systems.

3.7 Certification system

Certification scheme type as described in ISO 17067. See A.4.3 of ISO 17000.

3.8 Conformity Statement

Document issued upon successful completion of evaluation of assessment against the requirements of a specified standard. Procedural requirements for issuing a certificate or conformity statement are specified in the relevant OD's.

3.9 commissioning

Process that encompasses functional safety checks, connecting the PV power plant to the grid and putting it into operation

3.10 final evaluation report

Report containing the results of conformity evaluations relating to certification and the basis for the decision to issue the certificate

3.11 inspection

Examination of a product design, process or installation and determination of its conformity with specific requirements or, on the basis of professional judgement, with general requirements.

3.12 installation

Process that encompasses site preparation, component assembly and connection and assembly

3.13 manufacturing

Process that encompasses fabrication and assembly in a factory or workshop

3.14 manufacturer

Any legal entity manufacturing a product or has a product designed or manufactured, and markets that product under its name or trademark. It may be the entity manufacturing the PV power plant or, where relevant, main equipment of the PV power plant

3.15 modification

A new installation or changes to an existing installation, which changes the original design/specification

3.16 photovoltaic power plant (PV power plant) Certificate of Conformity (CoC)

Document issued upon successful completion of project certification

Procedural requirements for issuing certificates of conformity are specified in the relevant OD's.

3.17 product type certificate

Document issued upon successful completion of a product certification according system 5 of ISO 17065.

Certificates of conformity issued under the IECEE CB scheme are accepted as valid for the purposes of the IECRE-PV scheme if include FCS certification.

Procedural requirements for issuing conforming statements are defined in the relevant OD's.

3.18 PV system (or PV power plant)

System for generating electrical power according the categories describe after, in which one or more PV inverters are connected to a PV array; including all elements of foundation, support structure, wiring and any other balance-of-system (BOS) equipment up to connection point with the utility (including medium voltage equipment as appropriate).

3.19 repair

Restoration of a unit or a piece of equipment to its original design/specification

3.20 replacement

Substitution of a unit or a piece of equipment, in conformance with its original design/specification

3.21 surveillance

Continued monitoring and verification of the status of procedures, products and services, and analysis of records in relation to referenced documents to ensure specified requirements are met

3.22 component

A part of a PV power plant, with specific design, materials and parts, fabricated according to a common manufacturing process and uniquely described by a specific range of parameters and design conditions.

3.23 conditional photovoltaic power plant (PV power plant) certificate

Document issued upon commissioning and initial operation of project.

3.24 SCADA (Supervisory control and data acquisition)

a system operating with coded signals over communication channels so as to provide control of remote equipment

3.25 Abbreviations

OD - operating documents to specify details of processes, procedures, and requirements under the IECRE PV-OMC - IECRE Solar PV sector Operating Management Committee
REMC - Management Committee of the IECRE System

4 Structure and Governance

4.1 Introduction

The basic rules governing the IECRE system are described in IECRE 01, Basic Rules. The basic rules are the overarching basis for operation of the IECRE System, its management committee (REMC) , the committees, and working groups working under it.

The Rules of Procedure put forth in the current document are for the operation of the Photovoltaic Energy Sector Scheme(s) (IECRE PV) governed by the REMC, and operated by the IECRE PV-OMC.

4.2 Membership and Participation

IECRE Certification Bodies (RECBs) and IECRE Inspection bodies (REIBs) approved by the REMC in accordance with the IECRE 01, Basic Rules, and associated IECRE and IECRE PV Operational Documents may participate in the IECRE PV Scheme(s).

Applications from organizations seeking acceptance as RECB or REIB for the purpose of issuing IECRE PV certificates and test reports, can be accepted from Member Bodies in an IECRE participating country. Reference is made to IECRE 01, Basic Rules, regarding country membership of the IECRE System.

It is the duty of all parties operating in the IECRE PV Scheme(s), including manufacturers and other organizations seeking IECRE PV certificates, to conduct affairs in a professional and ethical manner, that does not result in actions, misleading information or claims that may bring the IECRE credibility into question.

4.3 Acceptance

Certification bodies and inspection bodies are accepted into the IECRE PV Scheme(s) following satisfactory assessment of their impartiality and competence by the team of assessors approved by the IECRE PV-OMC.

Successful assessment should provide adequate confidence in the certification scheme to regulatory authorities, users, manufacturers, testing laboratories and certification bodies.

Impartiality and competence are assessed with reference to ISO/IEC 17065, ISO/IEC 17020 and IECRE PV-OMC Operating Documents (ODs).

The IECRE PV-OMC is responsible for setting up and maintaining the pool from which the team of assessors for a specific assessment are selected. A training program for assessors will be developed and described in the relevant OD.

4.4 Voting

The voting for the PV-OMC will be done by the IECRE member bodies, who have become members of the IECRE PV.

5 PV Certification and Inspection Bodies

5.1 Role and responsibility of the RECB and REIB

5.1.1 Role and responsibility of The RECB

The RECB is responsible for:

- following the requirements of the signed agreement with the IECRE-MB enabling the activities of the CB PV systems certification;
- providing the facilities and resources to support the PV certification activities,
- ensuring that the PV certification technicians have technical competence and experience within their scope;

These responsibilities cannot be delegated or subcontracted by the RECB-.

5.1.2 Role and responsibility of the REIB (PV Inspection body)

The PV IB is responsible for:

- operating in compliance with all relevant requirements of the IECRE RECB- requirements, procedures and decisions;
- operating with the procedures and working instructions of the responsible REIB and RECB regarding the activities for PV inspections
- maintaining technical competency for the accepted scope,
- being available, as appropriate, to be assessed under the peer assessment programs pertaining to the responsible RECB / REIB as requested in advance by the Lead Assessor of the Peer Assessment Team;
- accepting on site supervision upon request of the responsible RECB
- maintaining accurate documentation regarding technical competency of its PV Inspectors for the accepted scope and informing the responsible RECB about any change in status;

These responsibilities cannot be delegated or subcontracted by the REIB Inspector.

5.2 Role and responsibility of RECB/REIB Peer Assessors

IECRE Lead Assessors and Technical Assessors once registered as PV Peer Assessors (RPVPA) can be assigned to carry out Peer Assessments to the REIBs for acceptance and continued acceptance to operate in the IECRE System.

Provisions for handling costs of peer assessments are as specified in IECRE OD-003, Costs Related to Peer Assessment Services.

The requirements for the peers' assessors are defined in IECRE OD (under development).

5.3 Prerequisites for Acceptance

- 5.3.1** The RECB and REIB shall operate under the responsibility of an accepted and recognized IECRE-MB.
- 5.3.2** A REIB may cooperate with more than one RECB in the same IECRE category.
- 5.3.3** The RECB and REIB shall be nominated to the IECRE by its IECRE Member Body.
- 5.3.4** RECB and REIBs carrying out inspection and/or certification activities shall not be influenced by manufacturers, installers, EPC companies or designers. Furthermore, the RECB and the REIB shall be impartial and not offer assistance or other services to the clients that may compromise the objectivity of its activities and decisions.

5.4 Application for Acceptance

5.4.1 An application for the acceptance of a RECB and REIB for one or more IECRE Categories shall be approved by the responsible IECRE-MB endorsed by its Member Body of the IECRE.

5.4.2 The application shall be submitted to the Executive Secretary of the IECRE and shall be accompanied by the documentation as detailed in this chapter as far as applicable.

Note: an application to seek REIB participation can only be made if the IECRE-MB is recognized and accepted as member of the CB Sector as Issuing/Recognizing Body in the last three years prior to the application.

5.4.3 The REIB must be accredited according ISO/IEC 17020 (REIB for inspection) and RECB shall be accredited according to ISO/IEC 17065 (RECB for certification) by an IAF member for PV power plant inspection, testing and certification in some standard directly related with PV technology (IEC 62446, Grid code,...). If any organization wants to apply for inspection and certification, it must have both ISO/IEC standards accredited (ISO/IEC 17020 and ISO/IEC 17065)

5.4.4 The REIB must have the experience of at least 3 PV systems inspections for REIB or certifications for RECB according point 5.4.3

5.5 Suspension or termination

5.5.1 Suspension or withdrawal by the PV-OMC

The acceptance of a REIB or RECB may be suspended or withdrawn by the PV-OMC on recommendation of the Secretary of the IECRE if that REIB or RECB no longer fulfils the conditions for participation or if it violates these rules. Before such a recommendation is made, the REIB or RECB shall be given the opportunity to take corrective action over a period of six months and state its own opinion on the matter. In case of a suspension, the REIB or RECB in question shall not be allowed to claim relations with the IECRE or the CB Sector.

5.5.2 Suspension or withdrawal by the IECRE-MB

A IECRE-MB wishing to discontinue recognizing PV power plants certifications and inspections reports shall notify the Executive Secretary of the IECRE and shall indicate the date from which the discontinuation becomes effective at least one year in advance.

Such a notice automatically cancels the right for the IECRE-MB in conjunction with all associated REIBs to operate in RECB and to issue PV systems certification and conduct inspections in the field of the IECRE System.

5.5.3 Suspension or withdrawal information

The IECRE Secretariat will post this information on suspension or withdrawal of REIB or IECRE-MB on the IECRE Web Site and also inform all other RECBs of the decision.

5.6 Initial Acceptance for Starting Operation of the System

The initial list of approved REIBs and RECBs shall be established by a decision of the PV-OMC based on the compliance of the chapter 5.1 and 5.4.

To apply for this initial approval, REIBs and RECBs should complete a self-assessment & submit with completed application to the PV-OMC until the end of June, 2017. The application shall be provided to IECRE Secretary.

All REIBs and RECBs must pass the 1st Peer Assessment by the end of 3rd year after their initial acceptance. Thereafter 5.1 through 5.4 will apply.

6 Management of the certification system

6.1 General

The certification system shall be managed and operated in accordance with ISO/IEC 17065 and the applicable Rules of Procedure and Operational Documents of the IECRE System.

6.2 Agreement on certification

A certification body shall, upon request, be prepared to take on work for certification PV systems according to the rules of this procedure. The services of the certification body shall be available to all applicants without undue financial or other conditions.

Prior to starting certification work an agreement between applicant and certification body shall be made. In addition to financial and other usual contract conditions, the agreement shall include:

- The scope of work definition. A RECB and associated REIB must ascertain that the scope of work is within their respective scope of acceptance;
- The identification of collaborating bodies (inspection or testing bodies), their accreditation and their responsibilities;
- Whether the applicant has an established quality management system;
- Whether a surcharge applies for manufacturers from non-member countries;
- Estimation of costs and time to complete project;
- Determination of any special requirements, e.g. travel for site audit etc.;
- Agreement on method and system of payment by applicant, in accordance with RECB's own policy and quality system;
- The set of technical requirements to which conformity shall be evaluated;
- Definition of documentation to be provided at different stages; and
- Requirements for on-site work, including safety & environmental compliance training and conditions for reporting and investigating incidents.

6.3 Issue of certificates and conformity statements

The certification system covers the issue of certificates and conformity statements.

A certificate or conformity statement is based on evaluation of PV system documentation and the results of inspection, surveillance or testing, as applicable. The results of evaluation shall be documented in a final report. A certificate or a conformity statement shall be issued on the basis of an assessment of the completeness and correctness of an evaluation report or reports.

Procedural requirements for issuing a certificate or conformity statement are specified in the relevant OD's.

6.4 Security of relevant documentation

The certification body shall keep a file of all received material that is relevant to the certificate or conformity statement. This file shall be kept in a place with restricted access for the period of validity of the certificate. Subsequently the file and any copies shall be returned to the applicant or destroyed with written notice thereof.

6.5 Validity, maintenance and expiration of certificates

6.5.1 General

The scope, validity and expiration of each type of certificate is defined in the applicable Operational Document for that certificate type.

Critical issues and substantial changes to the site and PV system may require re-certification at the discretion of the RECB. Critical issues are those that substantially affect power plant production versus production minimum thresholds, safety and environmental requirements.

In the case of a provisional certificate or conformity statement the period during which all outstanding issues shall be documented by the applicant and evaluated by the certification body shall not exceed one year.

6.5.2 Maintenance of PV power plant certificate

A PV power plant certificate is issued for PV system as installed at the site specified in the certificate at the date of issue.

A REIB, under the supervision of RECB, shall perform operation and maintenance surveillance, in order to confirm that operation and maintenance is carried out according to O&M manuals at specified periodic intervals or as otherwise indicated. Failures (see 6.6) of the PV power plant which affect safe operation or performance out of the tolerance limits shall be reported. Modifications of the PV power plants to address critical issues shall obtain the certifier approval beforehand.

In order to maintain a PV system certificate the applicant and the certification body shall meet the following requirements:

- The applicant shall maintain a configuration record including all approved changes to date for the certified project to be sent to the certification body for review upon request. The report shall include information on installed PV equipment and additional installation(s) as installed at the site, deviant operating experience known to the certificate holder and minor modifications not listed in Annex B;
- The applicant shall report to the certification body beforehand any modifications listed in Annex B intended to be made to the certified PV system. In case the certificate holder intends to update the certificate, the update of all documents affected by the modification shall be provided; and the RECB shall issue a notice of approval to the application that shall be filed with the prior power plant assessment documents
- A certification body shall perform operation and maintenance surveillance in conjunction with the periodic performance assessment, with the purpose to ascertain that a PV system is operated and maintained in conformity with the relevant manuals included in the design

documentation and conducts the required surveillance according to these rules. The period of review shall be annually to facilitate documentation of annual performance testing.. The RECB shall issue a renewed conformance report and certificate that shall be filed with the prior power plant assessment documents

6.6 Incident Reporting

The certification body shall be informed without delay if, from log-book data or other information brought to the attention of the certificate holder, a PV system in question is shown not to function according to the design specifications and/or other criteria relevant to the certificate. Incidents known to the certificate holder where the safety of a project or the surroundings is involved shall be reported to the certification body in a timely manner on occurrence prior to any corrective action implementation.

If after preliminary evaluation the certification body determines a serious defect affecting the power plant level capacity performance of a PV system or safety of its components in question, the certificate shall be immediately suspended. The certification body shall subsequently carry out a thorough evaluation of the defect. This evaluation may result in reissuance or withdrawal of the certificate.

7 The extent of certification

7.1 General

The certification procedures specified in this document constitute a complete third party independent engineering assessment of a PV system at a specific location, from design evaluation to monitoring of installation, commissioning, operation and maintenance.

The purpose of PV system certification is to evaluate whether the constructed PV system including all equipment, components, structural elements, procedures, contracts and other elements (such as software) conform with applicable IEC or other international standards, contractual requirements, applicable construction and electrical codes and other requirements relevant to a specific site.

7.2 Applicability

The following types of products and power plants can be certified under these RoP:

- Modular Power plant product blocks or kits that are scalable with certified configurations.
- New, upgraded or refurbished PV power plants
- Various PV technologies, such as PV, PV/Thermal and CPV
- Various DC operating voltage designs (e.g. DC 600 V, DC 1000V, DC 1500 V)
- Designs of different topologies (e.g. string inverter, micro inverter, central inverter)
- Various PV power plant systems (with or without storage, on-grid, off-grid, micro grid etc.)

PV system certification shall confirm, for a specific site, that type-certified PV equipment or equivalent and particular civil, mechanical, structural and electrical designs meet requirements applicable to site-specific conditions and comply with international or national standards, applicable local codes and other requirements relevant to the site.

PV system certification also confirms that installation and commissioning and O&M provisioning conform to applicable standards, relevant contractual obligations and other requirements as defined by the project scope, and that the PV system is monitored, operated and maintained in conformity with relevant manufacturer manuals, integrator instructions and applicable standards.

7.3 Categories of certificates

The approach given in this procedure has a tiered structure in order to account for requests for conformity statements regarding specific aspects (e.g. design evaluation) of a PV system.

The normative documents, against which conformity shall be evaluated in the certification process, shall be IEC or ISO standards, when available. Other national or international standards may be used when appropriate or required.

The scope of a specific Certification shall be relevant to the specific PV power plant, usage category, location category, and project lifecycle stage, as shown in Figures 1 and 2 below:

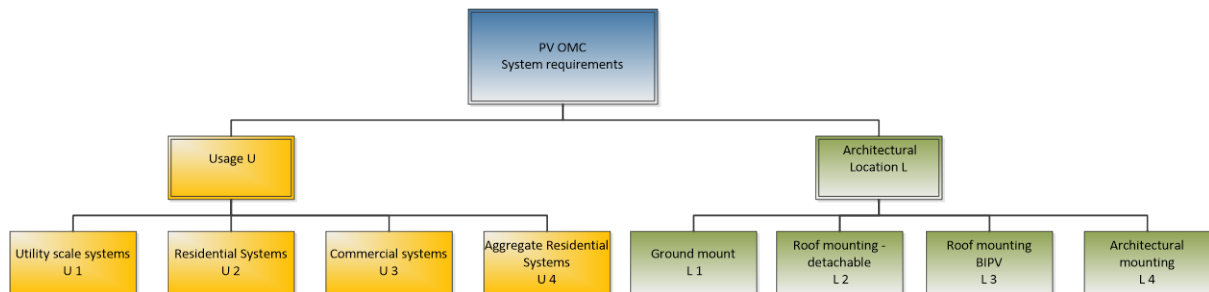


Figure 1 - Usage and Location categories

7.3.1 System usage and location categories

The Usage category (U) and Location category (L) of the PV power plant, shall be recorded on the certificate and any associated test or inspection reports.

PV power plant categories by usage are as follows:

U1: “Utility” scale” Operated by commercial organization on commercial property, >1000kWp

U2: “Residential” Operated by private individual, disaggregated, <25kWp

U3: “Commercial” Operated by commercial organization on commercial property, <1000kWp

U4: “Aggregate Residential Systems” Operated by private individual or professional on private property, standardized procedures, standardized contract procurement, standardized design, standardized construction, standardized commissioning, standardized monitoring

PV power plant categories by architectural location are as follows:

L1: Ground mounted, not part of a building

L2: Roof mounted, not part of the building envelope (e.g. rack or pan mount)

L3: Roof mounted, part of building envelope (e.g. BIPV)

L4: Combined use (e.g. car-port)

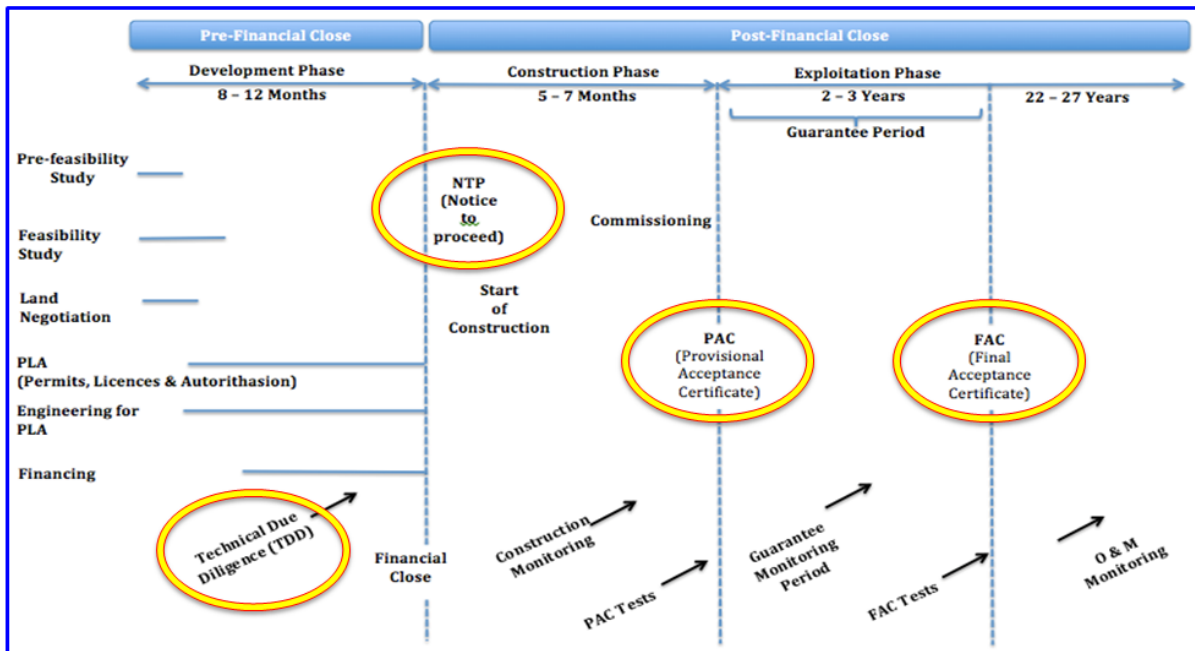


Figure 2 - PV system lifecycle stages. The timeline is only informative

7.3.2 System lifecycle categories

The System lifecycle category of the PV power plant, shall determine the relevant type of certificate for which evaluation is performed.

PV power plant categories by lifecycle stage are as follows:

D: Project design stage

C: “Conditional” certification for initial operation (usually one year)

F: “Final” certification including validated annual energy production

O: “O&M” certification for a specific period of operation (e.g. 2-3 years)

7.4 PV power plant certificate types

A PV power plant Certificate documents conformity for all aspects of the PV power plants . The certificate is issued on the basis of the completeness and positive outcome of the evaluation reports and certificates of conformity are issued as specified in Draft the relevant OD’s.

7.4.1 Project design certificate

A PV Project Design certificate of conformity covers the electrical and mechanical design of the PV power plant, and the equipment specified, at the site listed on the certificate that has been evaluated against specified requirements defined in Draft OD 403 Project Design Certificate (under development).

7.4.1.1 Certification of the supplier's quality system

A supplier’s quality system certificate covers conformance of the supplier’s quality system for the equipment specified in the design of the power plant with applicable international standards that has been evaluated against specified requirements defined in Draft ODxx Factory Audit process and Checksheet with Pass/Fail criteria (under development).

7.4.2 Conditional project certificate

A PV Conditional Project certificate of conformity covers the electrical and mechanical design of the PV power plant, installed equipment, and installation, commissioning and initial

performance measurement at the site listed on the certificate that has been evaluated against specified requirements defined in Draft OD 401 Conditional Project Certificate (under development) and Draft OD 405 Installation Surveillance Requirements (under development).

7.4.3 Final project certificate

A PV Final Project certificate of conformity covers the design, equipment, operations and maintenance, and annual energy measurement of the PV power plant, at the site listed on the certificate that has been evaluated against specified requirements defined in Draft OD 402 Final Project Certificate (under development).

7.4.4 Project operations & maintenance certificate

A PV Project O&M certificate of conformity covers the operations and maintenance, and annual energy measurement of the PV power plant, at the site listed on the certificate that has been evaluated against specified requirements defined in Draft OD 404 Project O&M Certificate (under development).

Annex A - Applicable Standards

IEC 62548	Photovoltaic (PV) arrays - Design requirements
IEC 62738	Design guidelines and recommendations for photovoltaic power plants
IEC 62446-1	Grid connected photovoltaic systems - Minimum requirements for system documentation, commissioning tests and inspection
IEC 62446-2	Grid connected photovoltaic systems - Maintenance of PV systems
IEC 61724-1	Photovoltaic system performance - Part 1: Monitoring
IEC 61724-2	Photovoltaic system performance - Part 2: Capacity evaluation method
IEC 61724-3	Photovoltaic system performance - Part 3: Energy evaluation method
IEC 61215 series	Terrestrial photovoltaic (PV) modules - Design qualification and type approval
IEC 61730 series	Photovoltaic (PV) module safety qualification
IEC/TS 62941	Guideline for increased confidence in PV module design qualification and type approval
IEC 62109 series	Safety of power converters for use in photovoltaic power systems
IEC 62817	Photovoltaic systems - Design qualification of solar trackers

Annex B - Modifications requiring recertification

The table below lists the evaluation required for recertification following modifications to the PV power plant.

Modifications	Section to review
Change of PV module power rating, model or manufacturer	7.4 and 7.8.1.(applicable part)
Change of PV inverter model or manufacturer	7.4, 7.5.2 and 7.8.1.(applicable part)
Change of Solar Tracker model or manufacturer or alternative components	7.4, 7.5.2 and 7.8.1.(applicable part)
Change of Transformer model or manufacturer	7.4, 7.5.2 and 7.8.1.(applicable part)
Change of support structure type or model or additional reinforcements	7.4, 7.5.2 and 7.8.1.(applicable part)
Change to meteorological station utilizing lower accuracy or different measurement techniques	7.4, 7.5.2 and 7.8.1.(applicable part)

Annex C (informative) - Design documentation

This section is under development with input from PVQAT TG11.

Annex D (informative) - Reporting of system performance data for statistical aggregation and analysis

Results of the conformity assessments (including power plant performance metrics, significant findings, validity of certificates, governing limitations etc.) are intended to be made publicly available for all industry stakeholders to monitor and drive value-based activities.

Details of the mechanisms and the system through which such reports and data will be available are currently under development.

General goals of PV system data reporting include:

- Pass reporting and publication guidelines
- Fail reporting and confidentiality. Determine retrying guidelines within a certain time frame.
- All certifications and limitations will be made available to stakeholders upon legal release by the contracting parties

Anonymous data will be provided online to the public at large.

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

3, rue de Varembé
PO Box 131
CH-1211 Geneva 20
Switzerland

Tel: + 41 22 919 02 11
info@iec.ch
www.iec.ch

IEC SYSTEM FOR CERTIFICATION TO
STANDARDS RELATING TO EQUIPMENT FOR
USE IN RENEWABLE ENERGY APPLICATIONS

IECRE Secretariat c/o IEC
3, rue de Varembé
PO Box 131
CH-1211 Geneva 20
Switzerland

Tel: + 41 22 919 02 11
secretariat@iecre.org
www.iecre.org