



IECRE OPERATIONAL DOCUMENT

**IEC System for Certification to Standards relating to Equipment for use in
Renewable Energy applications (IECRE System)**

**Conditional PV project certificate
-supplement: site regulation, civil and construction work**



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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

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IECRE

**CONDITIONAL PV PROJECT CERTIFICATE
-SUPPLEMENT: SITE REGULATION, CIVIL AND CONSTRUCTION WORK****INTRODUCTION**

Assessment of a PV system requires oversight of the design and manufacture of the components as well as the design, installation, and operation of the system. A Conditional PV Project Certificate may be completed at the time a PV system is commissioned as described in this document. The Annual PV Project Certificate builds on the Conditional PV Project Certificate and is based on a full year of operation so as to quantify the observed performance of the system and document conformance to accepted maintenance procedures as described in OD-402. This supplement describes the additional check points of site regulation clearance documents, civil work record documents, and installation work record documents.

1 Scope

This Operational Document defines the requirements for issuance of a Conditional PV Project Certificate that reflects the design and manufacture of the components as well as the design and installation, and commissioning of the system.

This Operational Document describes the requirements for the Conditional PV Project Certificate on:

- Site regulation clearance report
- Site preparation with civil works record
- Installation of equipment record

For the requirements for the Conditional PV Project Certificate based on below items are described in *OD-401 Conditional PV Project Certificate*.

- Type Certification of the PV modules according to IEC 61215 and IEC 61730 for modules,
- Certification of the PV module manufacturer's Quality Management System according to IEC/TS 62941,
- Type Certification of the PV inverters according to IEC 62109, other local requirements should be necessary,
- Type Certification of the solar trackers according to IEC 62817,
- Certification of the audit of the Quality Management System used for installation according to IEC/TS 63049, including oversight of the system design (see IEC 62548 or IEC/TS 62738), installation, and plan for maintenance (IEC 62446-2),
- Statement of Conformity of the system commissioning according to IEC 62446-1, and
- Selected test results obtained from application of IEC 61724-1 and IEC 61724-2.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61215 series

IEC 61724-1 *Photovoltaic system performance – Part 1: Monitoring (FDIS or published version)*

IEC/TS 61724-2 *Photovoltaic system performance – Part 2: Capacity evaluation method (DTS or published version)*

IEC 61730 series

IEC 62109 series

IEC 62446-1 *Grid connected photovoltaic (PV) systems – Part 1: Minimum requirements for system documentation, commissioning tests and inspection*

IEC/TS 62446-2 *Grid connected photovoltaic (PV) systems – Part 2: Maintenance of PV systems (CD or most recent version)*

IEC 62548 *Photovoltaic (PV) arrays – Design requirements (CD2 or most recent version)*

and/or IEC/TS 62738 *Design guidelines and recommendations for photovoltaic power plants (DTS or published version)*

IEC/TS 62941 *Guideline for increased confidence in PV module design qualification and type approval*

IECRE 01 *System Basic Rules*

IECRE 02 *System Rules of Procedure*

IECRE 04 *PV-OMC Rules of Procedure*

ISO/IEC 17020 *Conformity assessment – Requirements for the operation of various types of bodies performing inspection*

ISO/IEC 17025 *General Requirements for the Competence of Testing and Calibration Laboratories*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in the International Electrotechnical Commission Glossary (<http://std.iec.ch/glossary>) and the following apply.

3.1 Modular approach (power block product)

A power block may be identified and assessed in a modular fashion for its system design and component compliance to the relevant standards. Details of the power block that can be reconfigured for a different site or climate shall be identified as part of the initial assessment.

A power block certificate can then be issued covering those aspects that are constant across all sites. This power block certificate is intended to be portable across future sites as long as the fundamental design remains constant.

Any aspects requiring changes to the power block configuration due to site-specific requirements are covered under the scope of the site conformity certificate.

4 General Provisions

The normative ISO/IEC references define the general program requirements for RECB and REIB operating under the PV program.

Additional requirements for RECBs and REIBs operating the PV program are described in IECRE 01, IECRE 02, and IECRE *04 PV OMC Rules of Procedure*.

5 Site certification/regulation clearance documents

This evaluation shall be performed by the RECB based in the report of the REIB.

The final test report will include the site evaluation and regulation clearance reports created by execution of the IEC 62548 Photovoltaic (PV) arrays - Design requirements (CD2 or most recent version) and/or IEC/TS 62738 Design guidelines and recommendations for photovoltaic power plants (DTS or published version).

In addition, the site certification/regulation clearance documents will include the following using the template in Annex A (below) and the standardized digital format in Annex B (below).

- 1) System integrator company
- 2) Site place address altitude/longitude
- 3) Connection point of distribution/transmission line
- 4) Connection power company
- 5) Draft OD 403 Project Design Certificate (under development)
- 6) Regulation clearance document
- 7) Agreement documents
- 8) Others

6 Civil/construction certificate

This evaluation shall be performed by the RECB based in the report of the REIB.

The civil and construction certification created by execution of the IEC 62548 Photovoltaic (PV) arrays - Design requirements (CD2 or most recent version) and/or IEC/TS 62738 Design guidelines and recommendations for photovoltaic power plants (DTS or published version).

In addition, the Conditional PV Project Certificate will include the following using the template in Annex A (below) and the standardized digital format in Annex B (below).

- 1) Draft OD 405-X Installation Surveillance Requirements
- 2) Ground work record PV array foundation
- 3) Civil work design and records
- 4) Others

7 Installation/cabling certificate

This evaluation shall be performed by the RECB based in the report of the REIB.

The installation/cabling certificate created by execution of the IEC 62548 Photovoltaic (PV) arrays - Design requirements (CD2 or most recent version) and/or IEC/TS 62738 Design guidelines and recommendations for photovoltaic power plants (DTS or published version).

In addition, the Conditional PV Project Certificate will include the following using the template in Annex A (below) and the standardized digital format in Annex B (below).

- 1) Draft OD 405-X Installation Surveillance Requirements
- 2) Installation and cabling certificate created by Draft OD 405-X Installation Surveillance Requirements
- 3) Others

Annex A:
Site certification/regulation clearance documents

Site certification/ regulation clearance document	Reference completing document number)	(entity test and reference	Date	Resolution of findings
Site name				
System owner company name				
System integrator company name				
Site place address altitude/longitude				
Connection point of distribution/transmission line name/number				
Connection power company name				
Instruction manual of facilities				
Permission and license documents by the municipality				
Understanding statement of nearby residents				
Land contract of sales or lease				
Interconnection Agreement with electric power company				
Power Purchase Agreement,				
Property insurance agreement				
Maintenance agreement				
General national regulation/codes				
a)natural environmental protection law				
b)Audible noise control law				

c)Water pollution control law			
d)Greening law			
e)Fishing rights protection law			
g)Disaster prevention law			
h)Occupational safety and Health law			
Local/prefectural regulation/codes			
a)Natural environmental protection law			
b)Audible noise control law			
c)Water pollution control law			
d)Greening law			
e)Fishing rights protection law			
f)Disaster prevention law			

Civil/construction certificate

Civil/construction record document	Reference completing document number)	(entity test and reference	Date	Resolution of findings
N-value, blow count data				
Ground/soil reinforcement design with e.g. surface soil reinforcement with cement material, pile embedding, or soil water drainage.				
Soil characteristics evaluation(compaction, penetration, resistivity, pH, corrosivity, moisture and so on)				

Ground/soil reinforcement work record including photograph			
Ground/soil reinforcement strength evaluation record			
PV array foundation design			
PV array foundation weight/size and strength calculation sheet			
PV array foundation iron bar arrangement drawing			
PV array foundation specification of cement mixture plan			
PV array foundation cement mixture test data and photo			
PV array foundation cement slump test record and photo			
Concrete break test record and photo			
PV array foundation iron bar arrangement accuracy test record			
PV array foundation concrete placing form accuracy record and photo			
PV array support structure accuracy record			
PV array support bolt tightning strength check list record			
Confirmation document stating that all civil design documents have been reviewed and stamped by a Professional Engineer.			
Confirmation document stating that civil engineering budgets and schedule are reasonable by a professional engineer.			

Record of acceptable pullout resistance tests for PV array supporting posts.			
Document and check list with photos of protection of direct buried cable insulation from damage from rocks in backfill (using sand in trenches).			
Documents of drainage plan, e.g., retaining ponds, culverts, use of man-made and preferably naturally occurring waterways, etc, and conformance to local permit requirements.			
Revegetation/seeding plan consistent with local biome system to prevent erosion if topsoil and native vegetation is removed which is not preferred.			
Confirmation document that the wind loading study has been used to inform structural design and the wind speed is used to trigger stow position on tracking systems.			
Review documents of decommissioning plan and budget when required by conditional land use permission, site lease or other agreement.			
Confirmation documents that civil engineering plans have been done to support:			
a)High voltage interface infrastructure for substations and transmission			
b)Communication infrastructure of direct buried fiber and outside telephony of the project,			
c) Plan of access and maintenance roads,			

d) Documents of on-site operations center if one is built,			
e) Fence and intrusion detection/monitoring system,			
f) Tentative warehouse for PV module delivery			
g) Rain water drainage oil detection, PH check, treatment and pumping facility			
h) Cable route lacking and burial system with protection from physical damage from compaction, filler rock, and heat dissipation.			

Installation/cabling certificate

Civil/construction record document	Reference completing document number	(entity test and reference)	Date	Resolution of findings
PV array module installation				
-PV array module place serial number record				
-PV array module bolt tightening check list record				
-PV array module installation check list record				
-PV array string megaohm test record				
-PV array withstand voltage test record				
PV array module installation				
-combiner box installation record				
-combiner box d.c. cable terminal bolt tightening record				

Annex B: Digital Template for Conditional PV Project Certificate

The following provides a consistent format for data reporting to facilitate data base creation.

Field name	Example	Units
Certificate_number	IECREPV458976.1	N
Certificate_type	F	Milestone
Name_of_System	Hypothetical Ground-mount System #1	
Certificate_holder	PG&E	
Authorized_viewer1	Wells Fargo	
Authorized_viewer2		
Authorized_viewer3		
Authorized_viewer4		
System-type	U1L1	usage,architecture
Geo_Location		deg/deg
System_Capacity_contract	1000000	kW
System_Capacity_measured	998000	kW
System_Capacity_ppi	.998	Ratio
Uncertainty_sc	1.5	%
Timestamp	2015.05.21.08.05.01	yyyy.mm.dd.hh.mm.ss
Availability_contract	99	%
Certifier	TUVR	Name

**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

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RELATING TO EQUIPMENT FOR USE IN RENEWABLE
ENERGY APPLICATIONS (IECRE SYSTEM)**

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