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Communication networks and systems for power utility automation – Part 90-7: Object models for power converters in distributed energy resources (DER) systems

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COMMUNICATION NETWORKS AND SYSTEMS FOR POWER UTILITY AUTOMATION –

Part 90-7: Object models for power converters in distributed energy resources (DER) systems

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The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
57/1239/DTR	57/1281/RVC

Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

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COMMUNICATION NETWORKS AND SYSTEMS FOR POWER UTILITY AUTOMATION –

Part 90-7: Object models for power converters in distributed energy resources (DER) systems

1 Scope

This part of IEC 61850 describes the functions for power converter-based distributed energy resources (DER) systems, focused on DC-to-AC and AC-to-AC conversions and including photovoltaic systems (PV), battery storage systems, electric vehicle (EV) charging systems, and any other DER systems with a controllable power converter. It defines the IEC 61850 information models to be used in the exchange of information between these power converter-based DER systems and the utilities, energy service providers (ESPs), or other entities which are tasked with managing the volt, var, and watt capabilities of these power converter-based systems.

These power converter-based DER systems can range from very small grid-connected systems at residential customer sites, to medium-sized systems configured as microgrids on campuses or communities, to very large systems in utility-operated power plants, and to many other configurations and ownership models. They may or may not combine different types of DER systems behind the power converter, such as an power converter-based DER system and a battery that are connected at the DC level.

The namespace of this document is:

"(Tr) IEC 61850-90-7:2012"

The namespace "IEC 61850-90-7" is considered as "transitional" since the models are expected to be included in IEC 61850-7-420. Potential extensions/modifications may happen if/when the models are moved to International Standard status.

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NOTE The term power converter is being used in place of "inverter" since it covers more types of conversion from input to output power:

- AC to DC (rectifier)
- DC to AC (inverter)
- DC to DC (DC-to-DC converter)
- AC to AC (AC-to-AC converter)

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 61850-7-2, *Communication networks and systems for power utility automation – Part 7-2: Basic communication structure – Abstract communication service interface (ACSI)*

IEC 61850-7-3, *Communication networks and systems for power utility automation – Part 7-3: Basic communication structure – Common data classes*

IEC 61850-7-4, *Communication networks and systems for power utility automation – Part 7-4: Basic communication structure – Compatible logical node classes and data object classes*

IEC 61850-7-410, *Communication networks and systems for power utility automation – Part 7-410: Hydroelectric power plants – Communication for monitoring and control*

IEC 61850-7-420, *Communication networks and systems for power utility automation – Part 7-420: Basic communication structure – Distributed energy resources logical nodes*

IEC 61850-8-1, *Communication networks and systems for power utility automation – Part 8-1: Specific communication service mapping (SCSM) – Mappings to MMS (ISO 9506-1 and ISO 9506-2) and to ISO/IEC 8802-3*

ISO 4217, *Codes for the representation of currencies and funds*

EEI Handbook for Electricity Metering, 10th Edition (2002), Edison Electric Institute, Washington, D.C.

3 Terms, definitions and acronyms

For the purposes of the present document, the following terms, definitions and acronyms apply.

3.1 Terms and definitions

3.1.1
autonomous
responding, reacting, or developing independently of the whole; not controlled by others or by outside forces; independent

[SOURCE: Merriam-Webster dictionary]

3.1.2
common data class
CDC
classes of commonly used data structures which are mostly defined in IEC 61850-7-3, but are sometimes initially defined in other IEC 61850 documents until they can be updated in IEC 61850-7-3

3.1.3
device
material element or assembly of such elements intended to perform a required function

Note 1 to entry: A device may form part of a larger device.

[SOURCE: IEC 60050-151:2001, 151-11-20]

3.1.4
electrical connection point
ECP
point of electrical connection between the DER source of energy (generation or storage) and any electric power system (EPS)

Note 1 to entry: Each DER (generation or storage) unit has an ECP connecting it to its local power system; groups of DER units have an ECP where they interconnect to the power system at a specific site or plant; a group of DER units plus local loads have an ECP where they are interconnected to the utility power system.