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Electricity metering – Glossary of terms

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CONTENTS

Page

FOREWORD 3

Clause

1 Scope 5
2 Sources of terms 5
3 Acronyms and abbreviations 6
4 General 9
5 Utility systems/services 12
6 Physical meters and metering 14
7 Meter reading 16
8 Demand 17
9 Billing and tariffs 18
10 Load management and load control 21
11 Distribution system automation 22
12 Open systems interconnection 24
13 Data communications 27
14 Distribution automation using DLC media 37
15 Quality 42
16 DLMS vocabulary 44
17 Pre-payment electricity metering 45
18 Dependability 51
19 Liberalized utility market 52

Index 54

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTRICITY METERING – GLOSSARY OF TERMS

FOREWORD

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Technical reports do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

IEC 62051, which is a technical report, has been prepared by IEC technical committee 13: Equipment for electrical energy measurement and load control.

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

Enquiry draft	Report on voting
13/1151/CDV	13/1178/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.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

This document, which is purely informative, is not to be regarded as an International Standard.

The definitions in this glossary are intended to assist in understanding the work of technical committee 13.

The preparation of this report is based on the

- Australian Standard AS 4140.

In addition, the following standard organizations have contributed to the preparation of this technical report:

- CEN technical committee 294, working group 2;
- USA and Canada AMRA/AMSI/IC/IEEE joint working group.

ELECTRICITY METERING – GLOSSARY OF TERMS

1 Scope

This technical report provides definitions of specific terms which may be used for drafting standards for electrical energy measurement, tariff and load control, and customer/utility information exchange systems.

Standards and technical reports which deal with Distribution Automation Systems (DAS) using Distribution Line Carrier (DLC) systems use a number of terms with specific meaning, which are not defined in IEC 60050(371). The present technical report includes these terms and their definitions, as well as those terms that are already defined in IEC 60050(371). It presents a comprehensive means of referring to terms used in standard documents on customer/utility information exchange (CUIE) systems prepared or being prepared by IEC TC 13.

This report also incorporates specific terms used in present and future standards on electricity pre-payment systems, and specific terms concerning the dependability of electricity metering equipment.

2 Sources of terms

The following documents were used to establish this glossary of terms.

General terms given in the IEC 60050 series are repeated with reference to the appropriate IEV term. Other sources are identified by a figure in brackets which refers to the following list:

(1) American National Standards Institute: *IEEE Standard Dictionary of Electrical and Electronics Terms* (1984)

(2) IEC 60050(351): *International Electrotechnical Vocabulary (IEV) – Chapter 351: Automatic control*

(3) IEC 60050(721):1992, *International Electrotechnical Vocabulary (IEV) – Chapter 721: Telegraphy, facsimile and data communication*

(4) ISO/IEC 2382-9:1995, *Information technology – Vocabulary – Part 9: Data communication*

(5) Australian Standard AS 4140-1995: *Metering and utility information exchange – Glossary of terms*

(6) IEC 60050(191):1990, *International Electrotechnical Vocabulary (IEV) – Chapter 191: Dependability and quality of service*

(7) IEC/TR3 60870-1-3:1997, *Telecontrol equipment and systems – Part 1: General considerations – Section 3: Glossary*

(8) ISO/IEC 7498-1:1994, *Information technology – Open Systems Interconnection – Basic Reference Model – The Basic Model*

(9) ISO/IEC 10731:1994, *Information technology – Open Systems Interconnection – Basic Reference Model – Conventions for the definition of OSI services* (source: ITU-T X.210: 1993)

(10) IEC 60050(161):1990, *International Electrotechnical Vocabulary (IEV) – Chapter 161: Electromagnetic compatibility*

(11) ISO 8402:1994, *Quality management and quality assurance – Vocabulary*

(12) South African Specification NRS009-1. *Electricity Sales Systems – Part 1: Glossary and System Overview.* (Subsequently published as South African Standard: SABS 1524-0)

(13) IEC 60050(691):1973, *International Electrotechnical Vocabulary (IEV) – Chapter 691: Tariffs for electricity*

(14) ISO/IEC 2382-14:1997, *Information technology – Vocabulary – Part 14: Reliability, maintainability and availability*

(15) IEC 61107:1996, *Data exchange for meter reading, tariff and load control – Direct local data exchange*

(16) IEC 61134-4-41:1996, *Distribution automation using distribution line carrier systems – Part 4: Data communication protocols – Section 41: Application protocol distribution line message specification*

(17) ISO/IEC 9506-1:1990, *Industrial automation systems – Manufacturing message specification – Part 1: Service definition*

(18) ISO/IEC 9506-2:1990, *Industrial automation systems – Manufacturing message specification – Part 2: Protocol specification*

(19) ISO 8824:1990, *Information technology – Open Systems Interconnection – Specification of Abstract Syntax Notation One (ASN.1)* (Provisionally retained edition)

(20) ISO 8825:1990, *Information technology – Open Systems Interconnection – Specification of Basic Encoding Rules for Abstract Syntax Notation One (ASN.1)* (Provisionally retained edition)

(21) IEC 60050(371):1984, *International Electrotechnical Vocabulary (IEV) – Chapter 371: Telecontrol*

(22) IEC 60050(702):1992, *International Electrotechnical Vocabulary (IEV) – Chapter 702: Oscillations, signals and related devices*

3 Acronyms and abbreviations

AP	Application Process (application layer/OSI)
API	Application Program Interface
ASK	Amplitude Shift Keying
ASN.1	Abstract Syntax Notation 1 (ISO 8824)
A-XDR	Adapted eXternal Data Representation – (IEC TC 57 WG 09 NWIP)
BER	Basic Encoding Rules – ISO 8825
CA	Customer Authorization
CAU**	Customer Automation Unit
CEN	European Committee for Standardization
CENELEC	Comité Européen de Normalisation ELECtrotechnique
CCG*	Customer Communication Gateway
CCITT	Comité Consultatif International Télégraphique et Téléphonique (see ITU-T)
CCT	Complex Control Transducer
CI*	Central Interface
CLI*	Central Low Voltage Interface

* These terms are used in some countries.

CLCU*	Central Low Voltage Communication Unit
CLPU*	Central Low Voltage Processing Unit
CLU*	Central Low Voltage Unit
CMCU*	Central Medium Voltage Communication Unit
CMI*	Central Medium Voltage Interface
CMPU*	Central Medium Voltage Processing Unit
CMT	Complex Measuring Transducer
CMU*	Central Medium Voltage Unit
CPE*	Customer Premises Equipment
CPU	Central Processing Unit
CU*	Control Unit
CVS	Common Vending System
C&M*	Control and Metering Unit
DA	Distribution Automation
DAS	Distribution Automation System
dB	Decibel
dBm	dB referred to 1 mW at 600 Ω
DCE	Data Circuit-terminating Equipment
DES	Data Encryption Standard
DFM	Distributed Facilities Management
DLC	Distribution Line Carrier
DLMS	Distribution Line Message Specification
DMS	Distribution Management System
DOV	Data Over Voice
DPSK	Differential Phase Shift Keying
DS	Data Set
DSA	Distribution System Automation
DSM	Demand Side Management
DTE	Data Terminal Equipment
EIA	Electronic Industries Association
EMC	Electromagnetic compatibility
FSK	Frequency Shift Keying
FPI	Fault Passage Indicator
HAS	Home Automation System
HV	High Voltage
HHU	Hand Held Unit
ID	IDentification number
IEEE	Institute of Electrical and Electronics Engineers
IMS	Industrial Messaging System
IR	Infrared
ISDN	Integrated Services Digital Network
ISO	International Standards Organization
ITU-T	International Telecommunications Union – Telecommunications
LAN	Local Area Network
LLAC	Logical Link Access Control
LLC	Logical Link Control
LV	Low Voltage

* These terms are used in some countries.

MAC	Medium Access Control
MAP	Meter Accounting Process
MDT	Mean Down Time
MES	Maximum Error In Service
MEV	Maximum Error in Verification
MIB	Management Information Base
MMS	Manufacturing Message Specification (ISO/IEC 9506-1 and ISO/IEC 9506-2)
MODEM	MOdulator and DEModulator
MTBF	Mean Time Between Failures
MV	Medium Voltage
NET	Network
OSI	Open System Interconnection
PER	Packed Encoding Rules
PEP	Peak Envelope Power
PLC	Power Line Carrier
POST	Point Of Sale Terminal
PSK	Phase Shift Keying
PSTN	Public Switched Telephone Network
PSDN	Packet Switched Data Network
PTT	Public Telephone and Telegraph
RLI*	Remote Low Voltage Interface
RLCU*	Remote Low Voltage Communication Unit
RLPU*	Remote Low Voltage Processing Unit
RLVU*	Remote Low Voltage Unit
RMCU*	Remote Medium Voltage Communication Unit
RMI*	Remote Medium Voltage Interface
RMPU*	Remote Medium Voltage Processing Unit
RMVU	Remote Medium Voltage Unit
RMU*	Ring Main Unit
SCADA	Supervisory Control and Data Acquisition
SCT	Simple Control Transducer
SHA	Secure Hash Algorithm
SMAP	System Management Application Process
SMT	Simple Measuring Transducer
S-FSK	Spread Frequency Shift Keying
TI	Task Invocation
TOU	Time of Use
UBUS	Utility Bus
VAA	Virtual Application Association
VDE	Virtual Distribution Equipment (not to be confused with Verband Deutscher Elektrotechniker)
V.24	Definition for interchange circuits between DTE and DCE
WAN	Wide Area Network

* These terms are used in some countries.

4 General

4.1 Access method (for meter reading)

The method and technology used for reading a meter:

- Case 0: single meter, local visual reading (conventional visual reading)
- Case A: single meter, local direct electronic reading (automatic reading with a HHU)
- Case B: single meter, local remote reading (outdoor reading of an indoor meter)
- Case C: single meter, distant remote reading (remote access of a single meter)
- Case D: meter network, local remote reading (reading at a LAN access point)
- Case E: meter network, distant remote reading (reading at a WAN access point)

NOTE – CEN TC 294 WG1/N65 (user requirements) specifies these six cases.

4.2 Access point

A physical interface point used to transfer data from/to the meter network. It may be a gateway from a LAN to a higher order network or an interface to a temporary reading equipment such as a HHU, a portable PC, etc.

4.3 Architecture

The overall requirement and application of the communication network, indicating structure and hierarchy.

4.4 Automatically

The capability to produce a desired response to certain predetermined conditions without direct human intervention.

4.5 Basic metering functions

The most essential functions which are implemented in every meter. A system should provide full compatibility with complex meters independent of the amount of other functions provided.

4.6 Company

Term used to refer to a business entity, the purpose of which is to supply a product or service (11).

NOTE – Figures in brackets refer to clause 2: Sources of terms.

4.7 Configuration

Setting of measurement and communication parameters to operate the meter correctly.

4.7.1 Auto-configuration

The capability of a communication system to auto-identify and configure new meters on the network.

4.7.2 Manual-configuration

Setting measurement and communication parameters to operate the meter correctly.

4.7.3 Re-configuration

Restoring the correct configuration of a network after a modification or replacement of a meter.

4.8 Customer

The purchaser and/or user of a product or service supplied by a company (service provider, utility, manufacturer).

NOTE 1 – In a contractual situation, the "customer" may be called the "purchaser".

NOTE 2 – The "customer" may be for example the ultimate consumer, user, beneficiary or purchaser.

NOTE 3 – The "customer" can be either external or internal to a company.

4.9 Customer/utility data exchange

The exchange of information (readings, billings, messages) between customers and utilities via one or more communication networks, using appropriate interfaces between systems and entities.

4.10 Customer premises equipment (CPE)

Equipment which is installed at the customer premises.

4.11 Customer service management system

The system normally used by customer service staff who have direct contact with the public, configured for the modification of data and the entry of any relationships between various data elements, e.g.

a) applications for supply;

b) automatic phone transfers for domestic customers;

c) registered customers;

d) premises;

e) registered guarantors;

f) guarantee agreements;

g) requests for services.

Data may be accessed by identifiers such as customer name, guarantor name, account number, guarantee number or meter number. The system usually contains all customer and installation details, and can process the agreement for supply. It may provide displays (browse screens) to assist in identifying a customer or installation (in case of insufficient information), and maintain a comprehensive history of all changes to important agreements so that an agreement may be subsequently reconstructed.

4.12 Domestic meter

A meter for installation in domestic customers' premises.

4.13 Electromagnetic compatibility

The ability of a device, equipment or system to function satisfactorily in its electromagnetic environment without introducing intolerable electromagnetic disturbances to anything in that environment (IEV 161-01-07).

4.14 Electromagnetic compatibility level

The specified value of an electromagnetic disturbance for which electromagnetic compatibility with a very high degree of probability exists for the equipment operating within a given system or part of a system (IEV 161-03-10).

4.15 Electromagnetic disturbance

Any electromagnetic phenomenon which may degrade the performance of a device, equipment or system (IEV 161-01-05).

4.16 Electromagnetic emission

The phenomenon by which electromagnetic energy emanates from a source (IEV 161-01-08).

4.17 Electromagnetic interference

Degradation of the performance of a device, equipment or system caused by an electromagnetic disturbance (IEV 161-01-06).

4.18 Function

A function is a process which constantly or at certain intervals, automatically or on demand, performs certain activities, such as sampling data, reading a data set, verifying or changing a status, or activating a switch. An application is composed of one or more functions. A function can be basic or optional.

4.19 Hand-held unit (HHU)

A portable device for reading and programming equipment or meters at the customer's premises or at the access point.

4.20 Interoperability

The capability to operate products (meters), from different types and manufacturers, on the same network under the same conditions and rules.

4.21 Meter

A device for measuring and totalling the variable consumption of a product. In general a meter consists of a sensor and an integrating device which displays the total consumption in metrological units.

4.22 Metering and control

The facility to record inputs from utility metering systems within the premises and to provide unique signals to control its availability.

4.23 Optional functions

All other functions except the basic functions. They are part of the standard procedure but on implementation they can be omitted whenever not needed.

4.24 Organization

A company, corporation, firm, enterprise or institution, or part thereof, whether incorporated or not, public or private, which has its own functions and administration (11).

4.25 Real time

The actual time during which a physical process occurs, e.g. pertaining to a system or mode of operation in which computation is performed during the time that an external process occurs, in order that the computation results can be used to control, monitor, or respond in a timely manner and in the correct logical sequence to the external process.

4.26 Real-time system

A system whose response time is comparable to the physical process duration.

4.27 Remote

Capable of producing a desired response over a distance.

4.28 Remote meter reading

The facility to interrogate and recover metering data from an on-site meter by communication from a remote access point.

4.29 Severity level

Value of an influencing electromagnetic quantity specified for an immunity test.

NOTE – A test standard can specify several severity levels according to several immunity levels.

4.30 Smart meter

A complex meter with extended features, which may include load control, tariff management, etc.

4.31 Utility

A provider of electricity, gas, water, heat, telecommunications or other related services to its customers.

5 Utility systems/services

5.1 Disconnection/reconnection

The removal of supply to a customer premises by physical disconnection of the supply. Reconnection is the reverse operation, i.e. restoration of supply.

5.2 Distributed facilities management (DFM)

The corporate system which records the detailed information about distribution facilities. The record should include the location and basic information with the associated data base containing the detailed information about the facilities. An automation system may provide direct input and updating of mapping power line carrier information, e.g. low voltage mapping by low voltage distribution line carrier systems.

Also known as automated mapping/facilities management or geographic information system.

5.3 Loss-of-supply monitoring

The provision of a facility for remote indication to the utility of a total or partial loss of supply at the equipment location.

5.4 Meter asset management

The system which maintains data on the characteristics of meters and metering equipment to assist in their management and efficient operation and replacement. All devices approaching the stage where maintenance and recalibration is required are identified in reports for testing and replacement to ensure the metering accuracy. The location of equipment may be easily traced at any point in time to provide control over its utilization.

5.5 Network management

A set of functions which provides the network operator with the ability to monitor, coordinate and control the use of network resources. Key areas include the following:

a) fault management: testing and verification, detection, isolation and correction;

b) configuration management: inventory of network equipment, rearrangement of the network, connection and disconnection of services, setting of options and addresses;

c) performance management: measurement and analysis of usage levels and response times, adjustment/timing of network configuration;

d) accounting management: collection and correlation of usage data, allocation of costs;

e) security management: authentication and control of various levels of access to terminals and the network, recording access for analysis and audit trail.

5.6 On-selling (reselling)

The sale by an intermediate party of a product or service (purchased from a producer or supplier) to a third party (usually an end-user) invariably at a margin over cost.

5.7 Real-time investigations

The facility to perform investigations, from a remote location, into the performance of the distribution or communications network by measuring and analysing the parameters required to determine the state of that network in real time.

5.8 Service order management

The activity of providing the facility for the production of all service or work orders associated with the connection, maintenance and disconnection of supply to a customer. Service order requests are generally recorded in the service order management subsystem via the consumer services subsystem. These requests are subsequently translated into printed service orders at the discretion of the particular service depot for the necessary action.

5.9 Service provider

An organization which provides a product or service to a customer or a utility.

5.10 Value added services

Services other than basic that can be provided at the customer premises, e.g. security and medical alarms, banking and full electronic funds transfer.

5.11 Wheeling

The direct sale by a producer of a product or service, via a second party transmission or distribution system, to a third party (usually an end-user). The second party will normally charge a transport or haulage fee.