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Demand-side power quality management

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CONTENTS

FOREWORD 8
INTRODUCTION 10
1 Scope 12
2 Normative references 12
3 Terms and definitions 12
4 Phases of a measurement plan 16
4.1 Six-phase measurement plan 16
4.2 Phase 1: Define the context, the objectives and the constraints 16
4.2.1 Goal of phase 1 16
4.2.2 Context of the DSPQ improvement plan 17
4.2.3 Motivations of the organization 17
4.2.4 Boundaries of the DSPQ improvement plan 17
4.2.5 Stakeholders of the plan 17
4.2.6 Budget 17
4.2.7 Planning 18
4.2.8 Resources 18
4.2.9 Levels of the measurement system 18
4.2.10 Deliverables for phase 1 18
4.3 Phase 2: Assess the initial situation 18
4.3.1 Goal of phase 2 18
4.3.2 Preliminary analysis 19
4.3.3 Critical and disruptive loads 19
4.3.4 Zones 19
4.3.5 Relevant variables 19
4.3.6 Existing measuring devices 19
4.3.7 Data reading and storage 20
4.3.8 Deliverables for phase 2 20
4.4 Phase 3: Design an action plan to improve the measurement system 20
4.4.1 Goal of phase 3 20
4.4.2 Proposal of improvement actions 20
4.4.3 Prioritize the actions 21
4.4.4 Periodic review of the action plan 21
4.4.5 Deliverables for phase 3 21
4.5 Phase 4: Implement the action plan to improve the measurement system 21
4.5.1 Goal of phase 4 21
4.5.2 Documentation related to measurement equipment implementation 21
4.5.3 Installation and commissioning of measurement equipment 21
4.5.4 Deliverables for phase 4 21
4.6 Phase 5: Use the measurement data 21
4.6.1 Goal of phase 5 21
4.6.2 Storage of power quality data 22
4.6.3 Analysis of power quality data 22
4.6.4 Dissemination and protection of power quality data 22
4.6.5 Deliverables for phase 5 22
4.7 Phase 6: Maintain the measurement system 22
4.7.1 Goal of phase 6 22
4.7.2 Verification of the measurement system 22

4.7.3 Metrological maintenance and monitoring 22
4.7.4 Deliverables for phase 6 22
5 Demand-side power quality disturbances and their impact 23
5.1 General 23
5.2 Frequency deviation 24
5.2.1 Origins 24
5.2.2 Effects 24
5.2.3 Possible mitigation measures 24
5.2.4 Key parameters to measure 24
5.3 Magnitude of supply voltage: deviation, underdeviations, overdeviations 25
5.3.1 Origins 25
5.3.2 Effects 25
5.3.3 Possible mitigation measures 26
5.3.4 Key parameters to measure 26
5.4 Flicker 26
5.4.1 Origins 26
5.4.2 Effects 27
5.4.3 Possible mitigation measures 27
5.4.4 Key parameters to measure 27
5.5 Voltage dips, swells and interruptions 27
5.5.1 Origins 27
5.5.2 Effects 28
5.5.3 Possible mitigation measures 28
5.5.4 Key parameters to measure 28
5.6 Transient overvoltages 30
5.6.1 General 30
5.6.2 Origins 30
5.6.3 Effects 30
5.6.4 Possible mitigation measures 30
5.6.5 Key parameters to measure 31
5.7 Supply voltage unbalance and current unbalance 31
5.7.1 General 31
5.7.2 Origins 32
5.7.3 Effects 32
5.7.4 Possible mitigation measures 32
5.7.5 Key parameters to measure 32
5.8 Voltage and current harmonics, inter-harmonics and sub-harmonics 33
5.8.1 Origins 33
5.8.2 Effects 34
5.8.3 Possible mitigation measures 35
5.8.4 Key parameters to measure 35
5.8.5 Emerging topic 36
5.9 Mains signalling voltage 36
5.9.1 Origins 36
5.9.2 Effects 36
5.9.3 Possible mitigation measures 36
5.9.4 Key parameters to measure 36
5.10 Rapid voltage changes 36
5.10.1 Origins 36

5.10.2 Effects 37
5.10.3 Possible mitigation measures 37
5.10.4 Key parameters to measure 37
5.11 Synthesis of events and their impacts 38
5.12 Synthesis of events and their impact on energy usage 38
Annex A (informative) Tool to report the ability to assess the power quality of an electrical installation 40
A.1 General 40
A.2 Ability to assess the power quality of an electrical installation 40
A.3 Determination of the ability to assess the power quality of an electrical installation 41
A.3.1 General 41
A.3.2 Ability to manage the power quality of the installation 42
A.3.3 Ability to monitor the installation 42
A.3.4 Ability to quantify the influencing factors that affect the DSPQ 47
A.3.5 Ability to take readings from the quality points at regular intervals 47
A.3.6 Ability to monitor and analyse the DSPQ 48
A.3.7 Ability to maintain the measurement system 50
A.4 Results summary 50
A.5 Typical level according to application 51
Annex B (informative) Example of the scope of a measurement plan: organization, sites, zones, energy uses 53
Annex C (informative) Disturbance levels on the demand-side PQ 54
C.1 General 54
C.2 Transients and short-term events 55
C.3 Continuous voltage phenomena 56
C.4 Continuous current phenomena 58
C.5 Power-related events 58
Annex D (informative) Relationship between devices and electrical phenomena 59
Annex E (informative) General statements about demand-side power quality 72
Annex F (informative) Consequence of grid evolution 73
Annex G (informative) Non-exhaustive list of relevant standards 75
Annex H (informative) Definitions of electrical parameters 77
H.1 General 77
H.2 Definitions in the presence of a neutral 77
H.3 Power measurement in three-phase three-wire systems using the two-wattmeter method 83
H.3.1 General 83
H.3.2 Total active power 83
H.3.3 Total vector reactive power using quadrature phase shift definition 84
H.3.4 Total vector reactive power using Budeanu’s definition 84
H.4 Additional relationships in case of sinusoidal voltage 84
Annex I (informative) DC distribution 85
I.1 General 85
I.2 DC demand-side power quality disturbances and impact 85
I.2.1 General 85
I.2.2 Frequency 85
I.2.3 Magnitude of supply voltage deviations, under-deviations, over-deviations 85

I.2.4 Transient overvoltages 86
I.2.5 Supply voltage unbalance, current unbalance 87
I.2.6 Voltage and current harmonics, interharmonics and subharmonics 87
I.2.7 Rapid voltage changes 88
I.3 Examples of demand-side AC distribution and of demand-side DC distribution 88
I.4 Examples of AC signals and DC signals 89
Bibliography 92

Figure 1 – Overview of electrical distribution system from supply side to demand side, with related standards 10
Figure 2 – Six-phase measurement plan 16
Figure 3 – Effects of voltage deviation on a motor 25
Figure 4 – Visualization of voltage events in modified ITI curve 29
Figure 5 – Examples of balanced and unbalanced systems 31
Figure 6 – Typical current waveforms for single-phase non-linear loads 34
Figure 7 – Typical current waveforms for three-phase non-linear loads 34
Figure 8 – RVC characterization 37
Figure A.1 – Ability levels to assess the power quality of an electrical installation 40
Figure A.2 – Parameter AM01: Example 43
Figure A.3 – Parameter AM02: Example 44
Figure A.4 – Parameter AM03 45
Figure A.5 – Parameter AM03: Example 45
Figure A.6 – Parameter AM04: Example 46
Figure B.1 – Example of the scope of a measurement plan 53
Figure F.1 – The old centralized grid 73
Figure F.2 – The new decentralized grid 73
Figure F.3 – Example of consequences of a decentralized grid (DG) 74
Figure H.1 – Arithmetic and vector apparent powers in sinusoidal situation 82
Figure H.2 – Three-phase circuit without neutral 83
Figure I.1 – Overvoltage phenomena in DC distribution 86
Figure I.2 – Example of DC interconnected sources 87
Figure I.3 – Example 1 of disturbed DC signal 87
Figure I.4 – Example 2 of disturbed DC signal 88
Figure I.5 – Demand-side DC distribution 89
Figure I.6 – Demand-side AC distribution 89
Figure I.7 – Examples of AC signals [a) to d)] and DC signals [e) to i)] 90

Table 1 – Example of overview of the readings and storage carried out 20
Table 2 – Classification of PQ phenomena 23
Table 3 – Origins of PQ problems 23
Table 4 – Impacts of PQ problems on consumers, manufacturers and utilities 24
Table 5 – Voltage dip, interruption and swell classification according to EN 50160 29
Table 6 – Voltage event classification according to IEC TS 62749 29

Table 7 – Rapid voltage change limits 37
Table 8 – Overview of events and impacts 38
Table 9 – Overview of events and impact on usages 39
Table A.1 – Electrical installation power quality ability levels 41
Table A.2 – Power quality parameters 41
Table A.3 – Parameter EX01 42
Table A.4 – Parameter EX02 42
Table A.5 – Parameter AM01 42
Table A.6 – Parameter AM02 43
Table A.7 – Parameter AM03 44
Table A.8 – Minimum required functions 46
Table A.9 – Parameter AM04 46
Table A.10 – Parameter IF01 47
Table A.11 – Parameter IF02 47
Table A.12 – Parameter IF03 47
Table A.13 – Parameter RI01 48
Table A.14 – Parameter RI02 48
Table A.15 – Parameter AA01 48
Table A.16 – Parameter AA02 49
Table A.17 – Parameter AA03 49
Table A.18 – Parameter AA04 50
Table A.19 – Parameter MS01 50
Table A.20 – Parameter MS02 50
Table A.21 – Calculation table 51
Table A.22 – Typical level according to application 52
Table C.1 – Classification of transients and short-term events 55
Table C.2 – Classification of continuous voltage phenomena 56
Table C.3 – Classification of continuous current phenomena 58
Table C.4 – Classification of power-related events 58
Table D.1 – Relationship between current-using equipment and electrical phenomena 60
Table D.2 – Motors 61
Table D.3 – Variable speed drives 62
Table D.4 – Transformers 63
Table D.5 – Capacitors 64
Table D.6 – Conventional generators (Genset) 65
Table D.7 – Uninterrupted power supply (UPS) 66
Table D.8 – Lighting 67
Table D.9 – Office equipment 68
Table D.10 – Cabling 69
Table D.11 – Programmable logic controllers (PLCs) 70
Table D.12 – Inverter based generators (PV, storage) 71
Table G.1 – Existing requirements about PQ (non-exhaustive list) 75
Table G.2 – Compatibility levels 76

Table G.3 – Existing requirements about disturbance measurement methods and instruments (non-exhaustive list) 76
Table H.1 – Definition of symbols 77
Table H.2 – Calculation definitions for RMS values 78
Table H.3 – Calculation definitions for phase powers 79
Table H.4 – Calculation definitions for phase energies 79
Table H.5 – Calculation definitions for total powers 80
Table H.6 – Calculation definitions for power factors 80
Table H.7 – Calculation definitions for fundamental powers 80
Table H.8 – Calculation definitions for distortion indicators 81
Table H.9 – Calculation definitions for unbalance indicators 82
Table H.10 – Calculation definitions for electrical quantity indicators 82
Table I.1 – Definitions of AC signals and DC signals 91

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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DEMAND-SIDE POWER QUALITY MANAGEMENT

FOREWORD

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IEC TS 63191 has been prepared by IEC technical committee 85: Measuring equipment for electrical and electromagnetic quantities. It is a Technical Specification.

This first edition cancels and replaces IEC TR 63191, published in 2018. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) a new informative Annex A describing a tool to report the ability to assess the power quality of an electrical installation.

The text of this Technical Specification is based on the following documents:

Draft	Report on voting
85/893/DTS	85/902/RVDTS

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

The language used for the development of this Technical Specification is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

The effective management of power quality on the demand side (power consumer) is an essential activity to ensure the proper operation of the electrical equipment operating on the consumer site.

While the level of power quality present at the point of supply is generally monitored and managed by the power provider (utility), the actual level of power disturbances present on the consumer site can be significantly worse and can negatively impact the operation of the electrical equipment. The interaction between these loads and the voltage supply is often the cause of degraded power quality on the demand side.

One effective step in the prevention of the hindrances caused by inadequate power quality is the assessment of the level of power quality disturbance present on the demand side. However, proper measurements require adequate planning and understanding of the measurement systems and their results.

This document provides guidance on how to establish, implement, exploit, maintain and improve a demand-side power quality monitoring system. This document will also facilitate the tailoring of power quality monitoring concepts to the specific site where it will be deployed.

Disturbances in the electrical energy can have an important impact on the equipment, processes, organization's activities. Some electrical installations (industrial sites, data centres, hospitals, etc.) are particularly impacted by the poor quality of electrical energy.

The quality of the electrical energy has different origins, impacts and measurement indicators on the supply side and on the demand side – see Figure 1 presenting an overview of the electrical network from generation (supply side) to consumer (demand side).

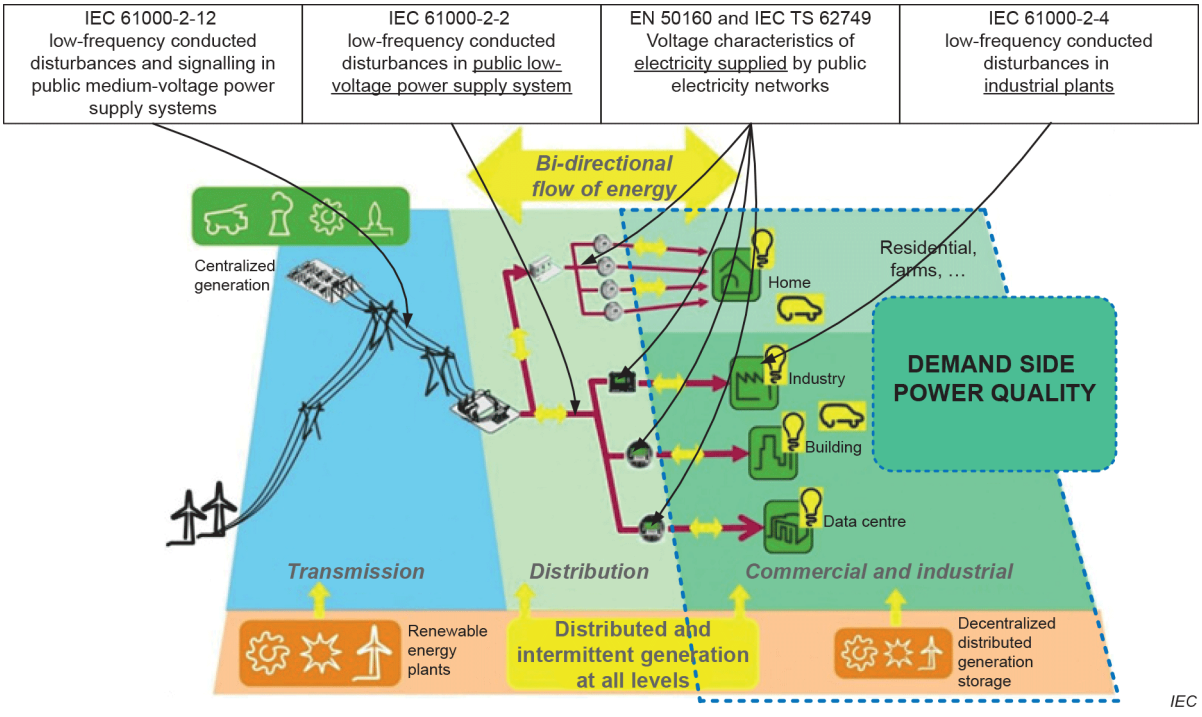

Figure 1 – Overview of electrical distribution system from supply side to demand side, with related standards

While documents such as IEC TS 62749 and EN 50160 define the voltage characteristics provided by a public network (called power quality of the grid), this document gives guidance on qualifying the power quality in internal networks (called demand-side power quality).

In this document, power quality on the demand side, related to buildings, industrial and data centre applications is referred to as demand-side power quality (DSPQ).

See Annex A for a tool to report the ability to assess the power quality.

See Annex E for a general statement on demand-side power quality.

See Annex F for a discussion about grid evolution.

See Annex G for a list of standards related to demand-side power quality.

See Annex H for definition of electrical parameters.

It is assumed that users of this document possess a minimum knowledge of power quality phenomena.

DEMAND-SIDE POWER QUALITY MANAGEMENT

1 Scope

This document specifies recommendations about power quality measurement and assessment within installations.

NOTE 1 Most standards address power quality at the delivery point between energy providers and customers.

This document outlines the various phases needed for the establishment of a demand-side power quality measurement plan for buildings and industry installations.

NOTE 2 The demand side refers to the electrical installation, beyond the PCC (point of common coupling), which is under the jurisdiction of facility managers.

Such a power quality measurement plan will enable the optimization of the energy availability and efficiency, improve the assets lifetime and facilitate the resolutions of power quality problems. A power quality measurement plan encompasses the following phases:

- definition of the context, objectives and constraints;
- assessment of the initial power quality situation;
- definition of an action plan for the improvement of the power quality situation;
- implementation of the power quality measuring system;
- exploitation of the measurement system for the improvement of the power quality situation;
- maintenance of the measurement system.

This document will also help facility managers tailor their measurement plan to the specific needs of the electrical system under their control. It addresses all the disturbances present in such networks, but does not cover the disturbances present in public electrical distribution networks (supply side) as they are governed by specific documents such as EN 50160 and IEC TS 62749.

2 Normative references

There are no normative references in this document.