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Guidelines for the adjustment potential evaluation of demand side resources

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Draft	Report on voting
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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– withdrawn, or
– revised.

INTRODUCTION

With the increase of dispatchable loads, electric vehicles, distributed energy resources, and microgrids, demand side resources (DSR) are expected to have more interactions with, and provide support to, the electric power networks. The utilization of DSR requires a comprehensive consideration of its physical characteristics, user behaviour, willingness to participate, and market conditions, etc. This document only considers the physical characteristics of DSR in the evaluation of its adjustment potential.

This document provides an evaluation method of DSR adjustment potential and specifies the evaluation indices for different applications. The objects of DSR adjustment potential evaluation focus on the aggregated characteristics of DSR units for various stakeholders, such as users participating in demand response, DSR aggregators, virtual power plant (VPP) owners and operators, and distribution system operators (DSOs).

1 Scope

This document provides principles and technical requirements for the adjustment potential of demand side resources in demand side management. Demand side resources include dispatchable loads, electrical energy storage, grid-connected microgrids, and distributed energy resources, which are connected to power distribution systems and capable of adjusting their operating state and exchanging information with grid control systems. It includes the DSR characteristics, system requirements, data preparation and evaluation process.

The adjustments of demand side resources can be subject to relevant local regulations or specifications. Electricity market mechanisms, user behaviour and data privacy are excluded from the scope of this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC TS 63189-1:2023, *Virtual power plants - Part 1: Architecture and functional requirements*

IEC TS 63276, *Guidelines for the hosting capacity evaluation of distribution networks for distributed energy resources*

IEC 62351-3, *Power systems management and associated information exchange - Data and communications security - Part 3: Communication network and system security - Profiles including TCP/IP*

IEC 62351-5, *Power systems management and associated information exchange - Data and communications security - Part 5: Security for IEC 60870-5 and derivatives*

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[2] IEC 60050-617:2009, *International electrotechnical vocabulary (IEV) - Part 617: Organization/Market of electricity*

[3] IEC 60050-161:1990, *International electrotechnical vocabulary (IEV) - Part 161: Electromagnetic compatibility*

[4] IEC 61000-4-30, *Electromagnetic compatibility (EMC) - Part 4-30: Testing and measurement techniques - Power quality measurement methods*

[5] IEC 61557-12, *Electrical safety in low voltage distribution systems up to 1 000 V AC and 1 500 V DC - Equipment for testing, measuring or monitoring of protective measures - Part 12: Power metering and monitoring devices (PMD)*

[6] IEC 61850, *Communication networks and systems for power utility automation*

[7] IEC 62053-21:2020, *Electricity metering equipment (a.c.) - Particular requirements - Part 21: Static meters for active energy (classes 1 and 2)*

[8] IEC TS 62786-1:2023, *Distributed energy resources connection with the grid - Part 1: General requirements*

[9] IEC TS 62898-3-3, *Microgrids - Part 3-3: Technical requirements - Self-regulation of dispatchable loads*

[10] IEC TS 63191, *Demand-side power quality management*

[11] IEC TR 62898-4:2023, *Microgrids - Part 4: Use cases*

[12] IEC TR 63097:2017, *Smart grid standardization roadmap*

[13] IEC SRD 63268, *Energy and data interfaces of users connected to the smart grid with other smart grid stakeholders. Standardization landscape*

[14] IEC White Paper 2018 *Stable grid operations in a future of distributed electric power*

[15] *Roadmap on the Evolution of the Regulatory Framework for Distributed Flexibility*. A joint report by ENTSO-E and the European Associations representing DSOs (CEDEC, E.DSO, Eurelectric, GEODE), June 2021

[16] IEC TS 63189-2, *Virtual Power Plants - Part 2: Use Cases*

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