

TECHNICAL SPECIFICATION



AMENDMENT 1

Microgrids – Part 3-1: Technical requirements - Protection and dynamic control

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MICROGRIDS –

**Part 3-1: Technical requirements –
Protection and dynamic control**

AMENDMENT 1

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Amendment 1 to IEC 62898-3-1:2020 has been prepared subcommittee 8B: Decentralized electrical energy systems, of IEC technical committee 8: System aspects of electrical energy supply.

The text of this Amendment is based on the following documents:

Draft	Report on voting
8B/174/DTS	8B/199/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 Amendment 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/.

A list of all parts in the IEC 62898 series, published under the general title *Microgrids*, can be found on the IEC website.

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- withdrawn,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.

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3 Terms and definitions

Add, after 3.4, the following new Definition 3.4.1:

3.4.1 renewable energy sources RES

distributed energy resources whose primary energy source is constantly replenished and will not become depleted

Note 1 to entry: Examples of renewable energy are: wind, solar, geothermal, hydropower.

Note 2 to entry: Fossil fuels are non-renewable.

6 Dynamic stability and control

6.2.3.2 Frequency stability

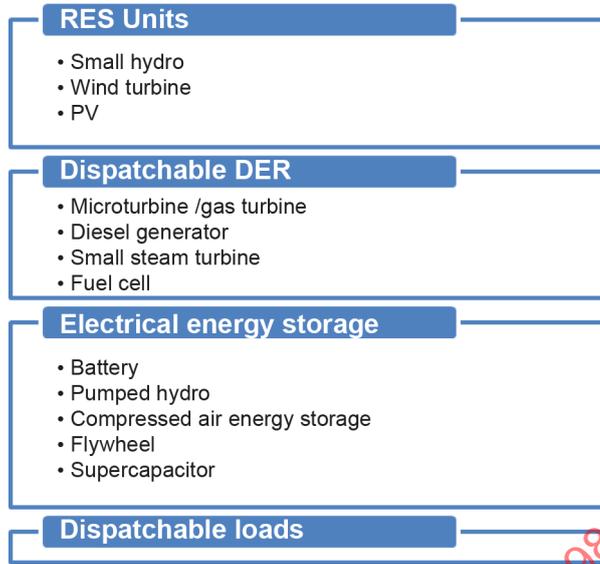
Replace, in the fourth sentence, "primary" with "local".

6.3.3.1 Major control elements in microgrid

Replace the existing second paragraph with the following:

Microgrids may include, but are not limited to, the following elements that can be involved in the dynamic control of the microgrids (see Figure 2).

Replace the existing Figure 2 with the following:



6.3.3.2 Intermittent RES units

Add, in the first sentence, "are" between "cases" and "the dominant sources".

Replace, in the penultimate sentence, "source inverters" with "source converters".

6.3.3.4 Energy storage systems

Add, in the title and in the three occurrences in the paragraph, "electrical" before "energy storage systems".

6.3.3.5 Dispatchable loads

Delete Footnote 1.

6.3.4.1 Control system hierarchy

Replace the first sentence with the following:

Control of a microgrid can be divided into three layers as shown in the functional mapping for operation and control of microgrids (Figure 3).

Replace the existing Figure 3 and its title with the following:

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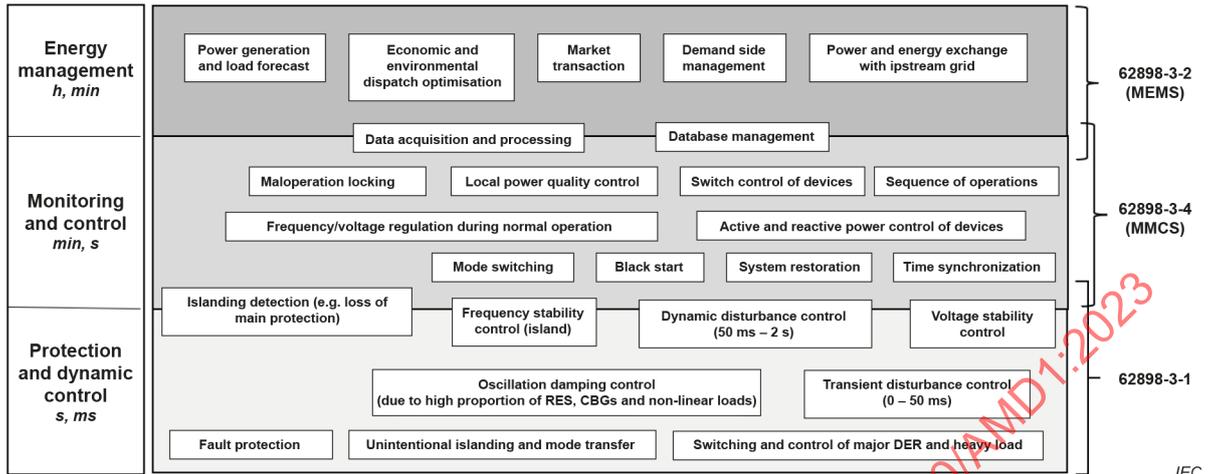


Figure 3 – Functional mapping for operation and control of microgrids

Replace the existing second paragraph with the following:

Control systems of microgrids, especially those with a sufficiently high number of components, involve a hierarchy of control functions including local and central controls. Local control includes fundamental control hardware for internal voltage and current control loops of the DER. The central control is intended to compensate for deviations in the system-level voltage and frequency which are caused by the local controls, through which voltage and frequency stability can be ensured. Higher level controls, such as for optimal operation (for optimization of parameters such as cost, power loss, emission, etc.) and for power exchange with the grid, generally operate over longer times and are handled by the higher-level control. Detailed requirements for this control level and its functions are provided in IEC TS 62898-3-2¹.

Replace Footnote 2 with Footnote 1.

Replace the existing Figure 4 with the following:

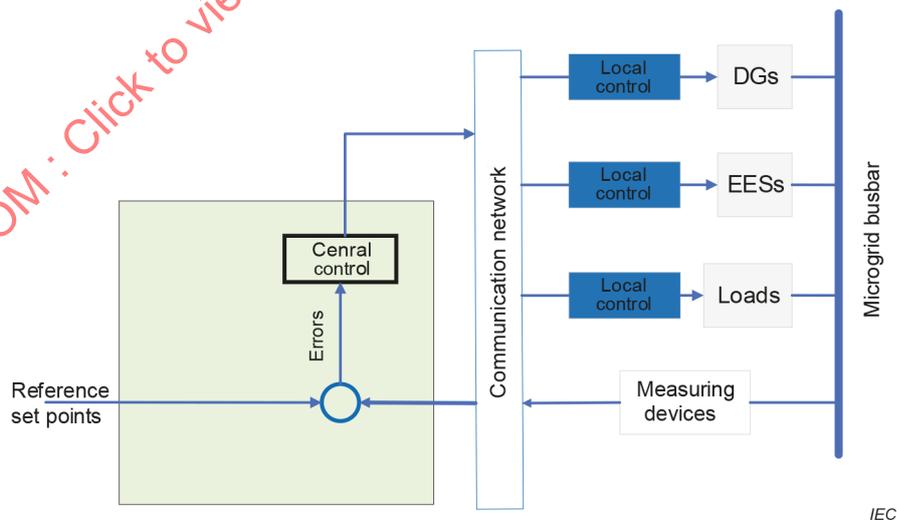


Figure 4 – Typical multilevel control of microgrids

Delete, in the paragraph following Figure 4, "centralized" in the first sentence and replace, in the fourth sentence, "secondary" with "central".

6.3.4.2 Primary control

Replace, in the title, "Primary" with "Local".

Replace, in the first sentence, "Primary" with "Local".

Replace the third sentence with "Control functions such as output control, load sharing, islanding detection and plug and play of DGs are achieved through such control."

Replace, in the second paragraph, "primary" with "local" and replace the last sentence with the following: "Different types of CBGs employ different control methods."

Replace, in item a), "The primary control in grid-forming CBGs is intended" with "Grid-forming CBGs are intended".

Delete, in the last line of item a), the term "primary".

Delete, in the last line of item b), the term "primary".

Delete, in the third sentence of item c), the term "primary".

Replace, in the paragraph following item c), "primary" with "local".

Add, in the first sentence of the last paragraph, ", such as hysteresis," after "improved versions".

Replace, in the last sentence of the last paragraph, "primary" with "local".

6.3.4.3 Secondary controls

Replace, in the title, "Secondary" with "Central".

Replace the existing first sentence of the first paragraph with the following: "Central controls are the second layer control in a hierarchical control of the microgrid."

Replace, in the second sentence, "primary" with "local".

Replace, in the third sentence of the first paragraph, "Secondary" with "This" and replace "primary" with "local".

Replace, in the last sentence of the first paragraph, "primary" with "local".

Replace, in the second sentence of the second paragraph, "primary" with "local".

Replace, in the paragraph preceding item a), "Secondary" with "Central".

Replace, in the paragraph after item c), "Secondary" with "Central".

6.3.6 Control of microgrids during island mode

Add, in item 3), "Electrical" before "Energy storage systems".

Annex A – Use cases for dynamic control of microgrids

Replace the existing Figure A.3 with the following:

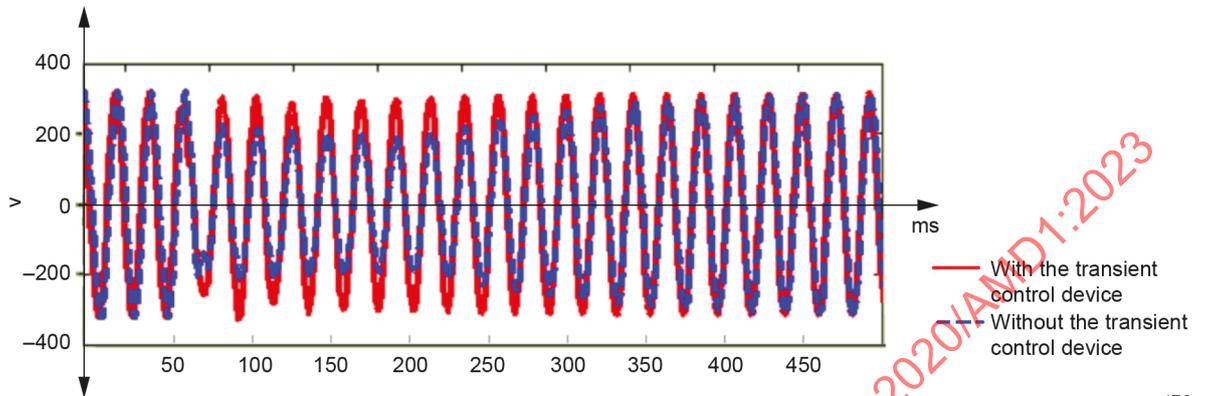


Figure A.3 – Voltage profile during field testing of transient disturbance with and without transient control device

Replace the existing Figure A.4 with the following:

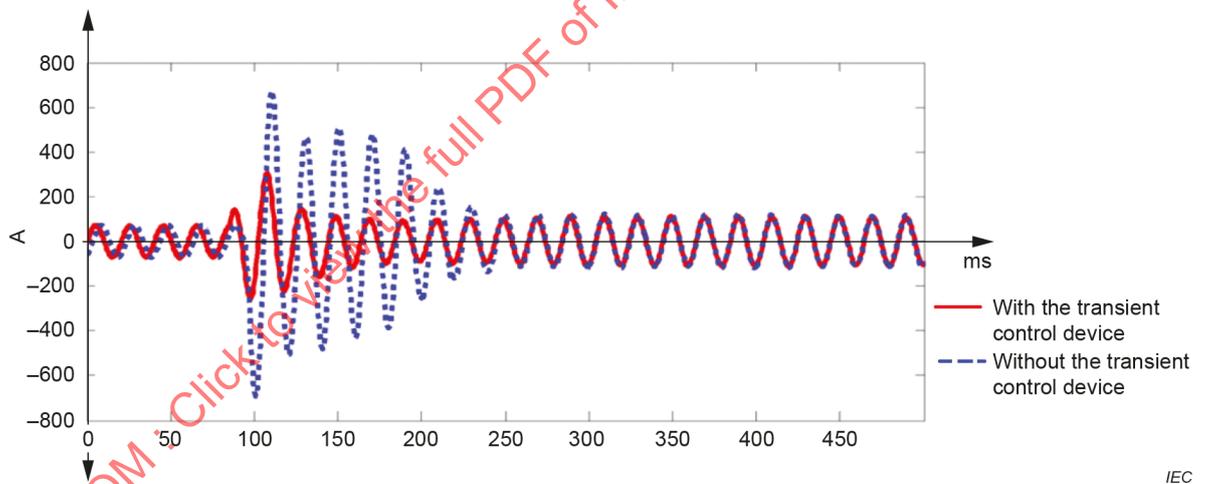


Figure A.4 – Current profile during field testing of transient disturbance with and without transient control device

Replace the existing Figure A.6 with the following: