



# TECHNICAL SPECIFICATION

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**Power System Stability Control -  
Part 2: Guideline for quantitative assessment of power system stability and  
security**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

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IEC TS 63384-2 has been prepared by subcommittee 8C: Network management in interconnected electric power systems, of IEC technical committee 8: System aspects of electrical energy supply. It is a Technical Specification.

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

Draft	Report on voting
8C/136/DTS	8C/156/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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

A list of all parts in the IEC 63384 series, published under the general title *Power system stability control*, 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](http://webstore.iec.ch) in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

This corrected version of IEC TS 63384-2:2026 incorporates the following correction:

- Addition of bibliographic reference numbers in the content

## 1 Scope

This Technical Specification (TS) addresses the quantitative assessment of power system stability and security. Its purpose is to provide guidelines encompassing the use of terms and definitions, as well as the objectives and general requirements for conducting quantitative assessments. The TS includes the classification of stability and security, classification of quantitative indices, and key considerations for implementing quantitative assessments. These considerations involve selecting appropriate assessment indices, methods for obtaining these indices, model and data requirements, and strategies for improving assessment efficiency. Examples of quantitative indices are also provided (see informative [Annex A](#)).

The application of a stability and security quantitative assessment serves several purposes. Firstly, it establishes an adequate margin to ensure the synchronous operation of the power system and the safety of primary equipment under both normal and abnormal conditions. Additionally, it helps improve the cost-benefit ratio of power system operations. The TS is applicable to various domains, including system planning, operation planning, operation control, stability control system design, and stability control decision planning, as well as software, equipment, and systems for the secure and stable operation of the power system. By using quantitative assessment of stability and security, it is possible to identify key factors that contribute to instability and to develop mitigating methods for enhancing stable operation.

The stability and security quantitative assessment techniques specified in IEC TS 63384-2 are independent of any specific software, equipment, or systems used for the secure and stable operation of the power system.

## 2 Normative references

There are no normative references in this document.

## Bibliography

- [1] Stability definitions and characterization of dynamic behavior in systems with high penetration of power electronic interfaced technologies, IEEE Power and Energy Society, Tech. Rep. PES-TR77, May 2020. [Online]. Available: [https://resourcecenter.ieee-pes.org/technical-publications/technical-reports/PES\\_TP\\_TR77\\_PSDP\\_stability\\_051320.html](https://resourcecenter.ieee-pes.org/technical-publications/technical-reports/PES_TP_TR77_PSDP_stability_051320.html)
- [2] Nikos Hatziargyriou, Jovica Milanovic, Claudia Rahmann, et al. Definition and Classification of Power System Stability - Revisited & Extended[J]. IEEE TRANSACTIONS ON POWER SYSTEMS, VOL. 36, NO. 4, JULY 2021: 3271-3281
- [3] IEEE/CIGRE Joint Task Force on Stability Terms and Definitions. Definition and classification of power system stability[J]. IEEE TRANSACTIONS ON POWER SYSTEMS, VOL. 19, NO. 3, May 2004: 1387-1401.
- [4] IEC 60050-617:2009, *International Electrotechnical Vocabulary (IEV) - Part 617: Organization/Market of electricity*
- [5] Technical specifications for monitoring, assessment and visualization of power grid operational risk: GB/T 40585-2021. Beijing: Standards Press of China, 2021.
- [6] Cigre Working Group B4.62 Report. Connection of wind farms to weak AC networks. December 2016
- [7] Calculation specification for power system security and stability: GB/T 40581-2021. Beijing: Standards Press of China, 2021.