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Guidelines for evaluation of distribution network operation

配电网运营评价导则

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Foreword

This document was issued on 28 December 2023 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 April 2024.

It is a GB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

It is classified under ICS 29.240.01, Chinese classification F20.

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1. Structure and Drafting Rules of Standardization Documents"

Drafting.

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Distribution Network Operation Evaluation Guidelines

1 Scope

GB/T 43451-2023 sets out how the operation of a distribution network is evaluated.

Distribution is the part of the grid the customer actually experiences: almost all interruptions originate below the transmission level, so the reliability figures a utility reports are largely a statement about its distribution network. Those figures are also easy to construct favourably - how outages are counted, which are excluded as exceptional, whether momentary interruptions register, and how customer-minutes are weighted all change the result substantially without anyone falsifying anything. Distribution is now under pressure it was

not designed for, from rooftop solar exporting power back up the feeder and from electric vehicle charging concentrating demand, so comparability over time matters as much as comparability between utilities. This document defines the terms of distribution network operation evaluation, specifies the basic provisions and the evaluation content, and describes the evaluation methods. Under ICS 29.240.01 and CCS F20, it is written for distribution utilities, for the energy regulators who assess their performance, and for the planners deciding where investment should go.

This document defines the terms and definitions of distribution network operation evaluation, stipulates basic regulations, evaluation content, and describes evaluation methods.

This document is suitable for the evaluation of distribution networks in prefectures and below.

2 Normative reference documents

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, the dated quotations

For undated referenced documents, only the version corresponding to that date applies to this document; for undated referenced documents, the latest version (including all amendments) applies to

this document.

GB/T 12325 Power quality supply voltage deviation

GB/T 14549 Power Quality Public Grid Harmonics

GB/T 15543 Power quality three-phase voltage imbalance

3 Terms and definitions

The following terms and definitions apply to this document.

3.1

Distribution network distribution network

Electric energy is received from the power supply side (transmission network, power generation facilities, distributed power sources, etc.) and distributed to various users locally or step by step through distribution facilities.

household's power network.

Note. The 110kV~35kV power grid is a high-voltage distribution network, the 10(20, 6)kV power grid is a medium-voltage distribution network, and the 220/380V power grid is a

low-voltage distribution network.

3.2

In accordance with distribution network standards and specifications, the distribution network is analyzed and evaluated based on operating data to determine the operation level of the distribution network.

Note. Including safety production evaluation, power supply service evaluation, power supply capacity evaluation, power supply quality evaluation, operating efficiency evaluation and equipment status evaluation.

3.3

capacity-loadratio

The ratio of the total capacity of public substation equipment in a certain power supply zone and the same voltage level grid to the maximum load of the corresponding grid supply.

Note. Generally used to evaluate the capacity margin of power grids of 35kV and above, it is a macro indicator for distribution network planning and evaluation.

3.4

equipment statusconditionofequipment

A comprehensive evaluation result that reflects the technical performance of the equipment and is determined based on the state characteristic quantities.

Note. It is divided into health status, attention status, abnormal status and serious status. The state characteristic quantity is stable and within the standard limits, and the technical performance is intact, which is healthy

State; some state characteristic quantities do not meet the standard limits, but do not affect the operation of the equipment, and are in the attention state; state characteristic quantities significantly exceed the standard limits, and some state characteristic quantities significantly exceed the standard limits.

The performance is seriously degraded, which is an abnormal state; the state characteristic quantity seriously exceeds the standard limit, and the equipment can no longer perform the specified functions normally, which is a critical state.

4 basic requirements

4.1 Distribution network operation evaluation aims to quantify the overall operation level of the distribution network during the evaluation period, identify weak links, and provide guidance for the construction and transformation of the distribution network.