

SolarInnovate Energy Solutions

AGC Energy Storage Frequency Regulation Project



Overview

What is the purpose of AGC frequency regulation control?

Objective Function of AGC Frequency Regulation Control: The essence of coordinated control of the joint participation of thermal power units and the energy storage in AGC frequency regulation is to allocate the AGC instructions issued by the dispatching center between the thermal power unit and the energy storage system.

What is a double-layer automatic generation control (AGC) frequency regulation control method?

Aiming at the problem of power grid frequency regulation caused by the large-scale grid connection of new energy, this paper proposes a double-layer automatic generation control (AGC) frequency regulation control method that considers the operating economic cost and the consistency of the state of charge (SOC) of the energy storage.

How do energy storage systems participate in AGC frequency modulation?

When the energy storage system participates in AGC frequency modulation, it needs a certain response time to follow the charging and discharging process of the command signal. To simplify the description, the first-order inertial link can be used to simplify the process, and the equivalent model is shown in Fig. 3.

How do you calculate AGC frequency regulation?

Therefore, the sum of frequency regulation active power commands borne by the thermal power unit and energy storage should be equal to the total AGC command at this moment, namely:
$$P_{agc, k} = \sum P_{U, i, k} + \sum P_{B, j, k}$$
 Where $P_{agc, k}$ is the AGC frequency regulation command sent by the dispatching center at time k .

Does SoC management affect unit-storage combined AGC frequency regulation performance?

In order to minimize the impact of SOC management on the unit-storage combined AGC frequency regulation performance, this paper chooses to perform fine-tuning management of SOC under conditions where load disturbance changes slowly and the battery energy storage system is in the idle state of frequency regulation.

What is the frequency regulation system of a regional power grid?

The frequency regulation system of the regional power grid equipped with energy storage comprises dispatching agencies, conventional thermal power units, battery energy storage systems, power conversion systems (PCS), transformers and power distribution, main power grids, and electrical protection systems.

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