

1. Effects of Inverter Side Parameters on Stability and Dynamic Performance of HVDC Transmission Control System

Accession number: 20210910007959

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Source title: 2020 10th International Conference on Power and Energy Systems, ICPES 2020

Abbreviated source title: Int. Conf. Power Energy Syst., ICPES

Part number: 1 of 1

Issue title: 2020 10th International Conference on Power and Energy Systems, ICPES 2020

Issue date: December 25, 2020

Publication year: 2020

Pages: 61-66

Article number: 9349729

Language: English

ISBN-13: 9781665404945

Document type: Conference article (CA)

Conference name: 10th International Conference on Power and Energy Systems, ICPES 2020

Conference date: December 25, 2020 - December 27, 2020

Conference location: Virtual, Chengdu, China

Conference code: 167217

Sponsor: IEEE; IEEE Power and Energy Society; University of Electronic Science and Technology of China

Publisher: Institute of Electrical and Electronics Engineers Inc.

Abstract: In order to reveal the relationship between the performance of the control system and the inverter side key operating parameters under the faults of AC bus, the firing angle advance and its duration on the inverter side, as well as the extinction angle reference value increase and its duration are considered, and their effects on the stability and dynamic performance of HVDC transmission control system are analyzed. In this paper, appropriate stability and dynamic performance indexes are proposed, and their rationality and discrimination are verified. Based on the transfer function model of inverter side constant extinction angle control, the influence of control parameters on stability is analyzed. Then, based on the CIGRE benchmark model of HVDC, the simulation and dynamic performance impact analysis are carried out in PSCAD/EMTDC, and the discrete data of simulation is processed by surface fitting through MATLAB. The results show that the stability of the control system will be reduced by increasing the firing angle. Besides, increasing the firing angle can improve the dynamic performance. Finally, the increase of the extinction angle reference value is beneficial to increase the extinction area of the commutation process, but too large is harmful to the economy and safety reliability of the system. © 2020 IEEE.

Number of references: 16

Main heading: Control systems

Controlled terms: Control system stability - HVDC power transmission - Transfer functions - Benchmarking - Electric inverters - MATLAB - Mechanisms

Uncontrolled terms: Benchmark models - Commutation process - Control parameters - Dynamic performance - HVDC transmission control - Operating parameters - Reference values - Transfer function model

Classification code: 601.3 Mechanisms - 706.1.1 Electric Power Transmission - 723.5 Computer Applications - 731.1 Control Systems - 731.4 Control System Stability - 921 Mathematics

DOI: [10.1109/ICPES51309.2020.9349729](https://doi.org/10.1109/ICPES51309.2020.9349729)

Funding Details: Number: ZBKJXM20180104, Acronym: CSG, Sponsor: China Southern Power Grid; Number: -, Acronym: CSG, Sponsor: China Southern Power Grid;

Funding text: This work was supported by science and technology project of China Southern Power Grid (ZBKJXM20180104).

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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