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**INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

DL/T 2040-2019

**Technical specification for 220 kV substation load transfer
equipment**

(English Translation)

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009 "Guidelines for Standardization Work Part 1: Standard Structure and Compilation".

This standard was proposed by the China Electricity Council.

This standard is under the jurisdiction of the National Grid Operation and Control Standardization Technical Committee (SAC/TC446).

1 Scope

This standard specifies the specifications and requirements that the 220kV voltage level load transfer device of 220kV substations should follow, including the original configuration of the device Rules, technical principles, technical conditions, functional requirements and design requirements.

This standard applies to the design, manufacture, commissioning, operation and maintenance of 220kV voltage level load transfer devices in 220kV substations. 110 (66) the kV voltage level load transfer device can be implemented by reference.

2 Normative references

The following documents are indispensable for the application of this document. For dated reference documents, only the dated version applies to this document.

For undated references, the latest version (including all amendments) applies to this document.

GB/T 14285 Technical Regulations for Relay Protection and Safety Automatic Equipment
GB/T 14598.24 General format requirements for power system transient data exchange (COMTRADE)
DL/T 478 General technical requirements for relay protection and safety automatic devices
DL/T 526 Technical requirements for automatic standby power supply device
DL/T 667 Telecontrol equipment and system
DL/T 720 Power system relay protection and safety automatic device cabinet (screen) general technical conditions
DL/T 860 Substation communication network and system

3 Terms and definitions

The following terms and definitions defined in DL/T 526 apply to this standard. For ease of use, the following repeated lists in DL/T 526 Some terms and definitions of 3.1 Main power supply an independent power source that supplies power to the load or bus during normal operation.

[DL/T 526, Terms and Definitions 3.3] 3.2 Standby power supply an independent power

supply that restores power to the load or bus after it is switched on.

[DL/T 526, Terms and Definitions 3.4] 3.3 Main power supply line an independent power line that supplies power to the load or bus during normal operation.

Standby power supply line an independent power line that restores power to the load or bus after it is switched on.

Automatic transfer function of standby power supply line when the main power supply circuit loses power and the operating bus loses voltage, it will automatically turn on the standby power circuit to restore the load or control the bus power supply Features.

Automatic transfer function of bus tie circuit breaker in the bus split operation mode, when all the main power supply lines on any bus section are lost, the bus tie (section) circuit breaker is automatically switched on Restore the control function of load or bus power supply.

Load transfer equipment the load transfer device (hereinafter referred to as the device) means that one or more times of the main power supply are automatically switched on after the main power supply is lost, so as to increase the system supply.

The function of the electrical reliability device is mainly divided into the line backup automatic switch and the bus tie (section) backup automatic switch function.

4.1 Device configuration principles

4.1.1

The device is generally configured at the hierarchical partition point of the 220kV grid, and should be configured independently according to the principle of dualization.

4.1.2

Newly built, rebuilt and expanded substations can be constructed simultaneously as required.

4.2 Principles of device technology

4.2.1

The device shall meet the relevant requirements of GB/T 14285, DL/T 526 and DL/T 860.

4.2.2

The device should have line backup automatic switching function and bus coupler (segment) backup automatic switching function. Typical 220kV substation 220kV voltage level negative See Appendix A, Appendix B and Appendix C for examples of load transfer device functions, input and output, and setting settings.

4.2.3

The device should be equipped with a total function pressure plate. After the general function pressing plate is withdrawn, the tripping and closing exit of the locking device and the control logic function will be different.

Normal, input quantity display and other functions remain normal; after the general function pressing plate is put in, the load transfer function of the device is opened.

4.2.4

The device should be equipped with a component maintenance pressure plate. When the component maintenance pressure plate is put in, the device function logic should determine that the component is in maintenance status state.

4.2.5

The device should be equipped with closing and tripping outlet pressure plates respectively. When the outlet pressure plate is put in, the closing and tripping of the device can act on the actual breaker.

4.2.6

When the main power supply of the substation loses power and there is no other blocking action condition, the device shall cut off the main power. After the power source is reliably disconnected, the standby power source is automatically turned on.

4.2.7

The line backup automatic switching strategy should be flexibly adjustable through fixed value.

4.2.8

After the device is operated, it shall have the function of local and remote return. The signal is reset and the conditions for re-action are met before the next action is allowed.

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4.2.9

The device should have the function of unloading the grid-connected power supply of the substation and the function of load shedding.

4.2.10

When receiving external blocking signals such as bus differential or failure protection action, the device should be reliably blocked without action.

4.2.11

The device shall have the function of detecting abnormal position of the circuit breaker. When the abnormal position of the circuit breaker is judged, the alarm signal shall be