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

GB/T 22390.3-2008

**Control and protection equipment of HVDC transmission
systems - Part 3: DC pole control equipment**

高压直流输电系统控制与保护设备 第3部分：直流系统极控设备

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Foreword

According to the 2003 National Science and Technology Science and Technology Platform project focused "DC power transmission system core technology and infrastructure standard Research "(Project No. 2003DIA7J034) requirements formulated standard" HVDC system control and protection equipment. " GB/T 22390 "HVDC system control and protection equipment" is divided into six parts.

--- Part 1. Operator Control System;

--- Part 2. AC and DC station control system equipment;

--- Part 3. DC pole control system equipment;

--- Part 4. DC system protection equipment;

--- Part 5. DC line fault location device;

--- Part 6. Converter Station transient fault recorder. This section GB/T Part of 322,390. This section proposed by the China Electrical Equipment Industry Association and the China Electricity Council. This part of the National Standardization Technical Committee of HVDC equipment (SAC/TC333) centralized. This part mainly drafted by: XJ Group Corporation, Nanjing NARI-RELAYS Electric Co., Ltd., Beijing Network of DC engineering technology Ltd., China Southern Power Grid Co., Ltd., Xuchang Relay Research Institute, Chinese Academy of Sciences electricity. The main drafters of this section. Guo Hongguang, Tian Jie, Yu Tao, Yao Zhiqing, around, Maoshi Tao, Li Yaping, Li Yan, Li Zhiyong, Wang Mingxin, Han Wei, Shiyan. This section first release. HVDC system control and protection equipment Part 3. DC pole control system equipment

1 Scope

China's national standard for the DC pole control equipment of a high voltage direct current

transmission scheme. It is Part 3 of GB/T 22390 and specifies the technical requirements, the test methods, the inspection rules and the supply and documentation requirements for pole control equipment. Pole control is where an HVDC link is actually operated. Everything above it decides what the link should do; pole control makes it happen, by computing the firing angle of the valves and issuing the firing pulses, thousands of times a second, with a timing accuracy measured in microseconds relative to the alternating voltage. The current through the link is controlled by the difference between the direct voltage the rectifier produces and the direct voltage the inverter maintains, and both are set by firing angle - so a small error in angle is a large error in current, and the loop that regulates it has to be fast, stable, and stable also when the AC system at either end is weak or disturbed. The inverter carries the harder problem. A line-commutated inverter relies on the AC voltage to turn its valves off, and if the voltage dips or the angle is wrong the valve fails to commute: the current transfers to the wrong valve, the DC side is short-circuited through the bridge, and a commutation failure results, which interrupts transmission and stresses the equipment. Preventing them, and recovering from those that occur, is one of the defining tasks of pole control. The requirements accordingly cover the current and voltage regulators and their dynamic performance, the firing control and its synchronisation, the tap changer control, the power order ramping and the modulation functions, the redundancy and changeover, and the behaviour during and after AC system faults. Issued on 24 September 2008 and in force since 1 August 2009.

This section GB/T 22390 specifies the technical requirements of $\pm 500\text{kV}$ HVDC system DC pole control device, test Methods, inspection rules, packaging, transportation, storage, marking, labeling, instruction manual, complete sets of supply and quality assurance. This section applies to $\pm 500\text{kV}$ HVDC system DC pole control device (hereinafter referred to as the device).

2 Normative references

The following documents contain provisions which, through reference

GB/T 22390 in this section constitute provisions of this section. For dated reference documents Member, all subsequent amendments (not including errata content) or revisions do not apply to this section, however, encouraged to reach under this section Parties to research agreement to use the latest versions of these documents. For undated reference documents, the latest versions apply to this section.

GB/T 2887-2000 General specification for computer sites

GB 4208-1993 housing protection (IP Code) (eqv

IEC 60529. 1989) Basic testing method

GB/T 7261-2000 and the relay means

GB/T 9361-1988 computer site security requirements

GB 9969.1-1998 Instructions General Industrial Products

GB/T 11287-2000 Electrical relays - Part 21. Measuring relays and protection equipment vibration, shock, bump and seismic Test Section 1. Vibration tests (sinusoidal) (idt IEC 60255-21-1. 1988) GB/T 13498 HVDC term (GB/T 13498-2007, IEC 60633.1998, IDT)

GB/T 13730-2002 regional dispatching automation system

GB/T 14537-1993 and measure impact crash tests (idt IEC 60255-21-2. 1988) relays and protection equipment

GB/T 14598.16-2002 Electrical relays - Part 25. Electromagnetic emission tests for measuring relays and protection equipment (IEC 60255-25.2000, IDT)

GB 16836-2003 General requirements Measuring relays and protection equipment safety design