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Technical specification for communication architecture and interface of low voltage auxiliary power systems for electric power stations and substations

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Table of Contents

Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part

1.Structure and drafting rules for standardization documents" Drafting is required. Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document was proposed and coordinated by the National Power System Plant Low Voltage Electricity Standardization Working Group (SAC/SWG21). This document was

drafted by: State Grid Sichuan Electric Power Company Electric Power Research Institute, Nanjing NARI Relay Protection Electric Co., Ltd., Shenzhen Aotexun Electric Power Equipment Co., Ltd., Zhejiang Kechang Electronics Co., Ltd., Guangdong Qianshun Technology Co., Ltd., State Grid Sichuan Electric Power Company, Guodian Nanjing Automation Co., Ltd., China Electric Power Engineering Consulting Group North China Electric Power Design Institute Co., Ltd., China Electric Power Research Institute Co., Ltd., Zhiyang Innovation Technology Co., Ltd., Anhui Nanrui Jiyuan Power Grid Technology Co., Ltd., Beijing Sifang Jibao Automation Co., Ltd. Co., Ltd., State Grid Sichuan Integrated Energy Services Co., Ltd., Hebei Chuangke Electronic Technology Co., Ltd., Dalian Lushun Power Electronic Equipment Co., Ltd. Company, State Grid Liaoning Electric Power Co., Ltd. Electric Power Research Institute, Shenzhen Taiang Energy Technology Co., Ltd., Guangzhou Youwei Electronic Technology Co., Ltd. Technology Co., Ltd., Schneider Electric (China) Co., Ltd., Sichuan Electric Power Design Consulting Co., Ltd., State Grid Hebei Electric Power Co., Ltd. Electric Power Research Institute, Shenzhen Power Supply Bureau Co., Ltd., State Grid Jibei Electric Power Co., Ltd. Zhangjiakou Power Supply Company, Guizhou Power Grid Co., Ltd. Electric Power Research Institute, Shandong Taikai Automation Co., Ltd., and Xuji Power Supply Co., Ltd. The main drafters of this document are. Dong Hanbin, Li Jing, Luo Yang, Dai Xiaoxiang, Hu Shaoqian, Wang Fengren, Xu Zhaode, Li Shuqi, Zhang Zhenqian, Fang Yuan, Wang Jinli, Chen Shuxin, Xu Yufeng, Qian Lili, Fan Songhai, Yang Jing, Zhao Mengxin, Xiang Bo, Zhang Zongxi, Ma Xiaomin, Yang Yueping, Chen Shi, Liu Li, Wang Hongmei, Xiong Xiaodan, Liu Guoyong, Li Yongxiang, Zhang Wuyang, Ma Yanqiang, Zhao Yanqing, Wang Yali, Zhou Guangyuan, Liu Zhongxiang, Zhao Yinglong, Li Bingyu, Yang Zhongliang, Liu Bin, Wang Hong, Li Yingchun, Xu Wei, Luo Zhijun. Information architecture and interface of low voltage power system in power plants and stations Technical Specifications

1 Scope

GB/T 45223-2025 specifies the information architecture and interfaces of the low voltage auxiliary power system in a power station or substation. The auxiliary supply is the system that keeps the plant itself alive, the protection, the cooling, the motors, the lighting and the DC systems, and its failure takes the plant down as surely as a fault on the main circuit; yet historically it has been the least instrumented part of the site, assembled from switchgear and controllers of a dozen makes that do not speak to one another. This standard fixes that. It sets the system structure and network architecture, the information interaction between the components, the model requirements and the interface requirements; then the information model itself, its functional decomposition, its general principles and the object model for the devices and measurements involved; and then the interface specification, the services, the mapping onto the communication protocol and the requirements on configuration and on the engineering data that accompanies it. For a switchgear or controller vendor selling into Chinese power plant auxiliary systems, this is the

interoperability contract. It takes effect on 1 August 2025.

This document specifies the relevant technical requirements for the architecture, model and interface of the low-voltage power system information of power plants and describes the corresponding test method. This document is applicable to the research, design and development of monitoring information communication in low voltage AC and DC power systems of power projects such as power plants and substations. manufacture.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document.

GB/T 2900.1 Basic terms of electrical engineering

GB/T 2900.33 Electrical terminology Power electronics technology

GB/T 32890 Relay protection

IEC 61850 engineering application model

GB/T 36572 Guidelines for network security protection of power monitoring systems DL/T 860 (all parts) Power automation communication networks and systems DL/T 860.74 Power automation communication networks and systems Part 7-

4.Basic communication structure compatible logical node classes and data According to the category DL/T 1146 DL/T 860 Implementation Technical Specifications

3 Terms and definitions

The terms and definitions defined in GB/T 2900.1, GB/T 2900.33 and DL/T 860 (all parts) and the following apply to this document.

3.1 tions;APS A system that provides power to low-voltage equipment and related communication equipment in power projects such as power plants and substations under normal or accident conditions.

4 Abbreviations

The following abbreviations apply to this document. INV. Inverter LLN

0.Logical Node Zero LN. Logical Node