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**Internet of things systems for offshore oil and gas production -
Part 1: General requirements**

面向海上油气生产的物联网系统 第1部分：通用要求

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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. This document is part 1 of GB/T 44249 "Internet of Things Systems for Offshore Oil and Gas Production". GB/T 44249 has been published The following parts.

1. General requirements. 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 Technical Committee for Information Technology Standardization (SAC/TC28). This document was drafted by: CNOOC Tianjin Chemical Research and Design Institute Co., Ltd., China Electronics Technology Standardization Institute, China National Offshore Oil Corporation China National Offshore Oil Corporation, China National Offshore Oil Corporation, China Oilfield Services Limited, China National Offshore Oil Corporation (China) CNOOC Energy Technology & Development Co., Ltd., Offshore Oil Engineering Co., Ltd., CNOOC Information Technology Co., Ltd., Wuxi Internet of Things Industrial Research Institute, University of Electronic Science and Technology of China, Northwest Branch of Exploration and Development Research Institute of China National Petroleum Corporation, Anhui Telecom Planning and Design Institute Co., Ltd., Hangzhou Hikvision Digital Technology Co., Ltd., National Petroleum and Natural Gas Pipeline Network Group Co., Ltd. Branch of the General Research Institute, Chengdu Qinchuan Internet of Things Technology Co., Ltd., Jingfeng Technology (Shenzhen) Co., Ltd., Southwest University of

Electronic Science and Technology, Shandong Provincial Computing Center (National Supercomputing Jinan Center), Jiangsu Zhongtian Technology Co., Ltd., Paifang Technology (Beijing) Co., Ltd., CNOOC Energy Development Equipment Technology Co., Ltd., Beijing Ankong Oil and Gas Technology Co., Ltd., Chongqing University of Posts and Telecommunications, Perception Digital Chain (Wuxi) Technology Co., Ltd., Shanxi Yicheng Kexin Technology Co., Ltd., Beijing Telecom Planning and Design Institute Co., Ltd., Xi'an Huasheng Communication Co., Ltd., CNOOC LaiBo (Tianjin) Technology Co., Ltd., Kashgar Electronic Information Industry Technology Research Institute, Beijing Dongtu Technology Co., Ltd., Tianjin New Intelligent Perception Technology Co., Ltd. and Shanghai Tianchen Micro-Nano Technology Co., Ltd. The main drafters of this document are. Chen Su, Chen Shaokai, Sun Wei, Zhuo Lan, Wang Jianfeng, Jiang Xubiao, Wang Wei, Chu Xichao, Zhong Rongfeng, Yin Hong, Zhou Jiang, Zhang Hui, Zhang Shaofeng, Yang Hong, Liu Zhaonian, Wang Ning, Zou Fubing, Fu Genli, Wang Xiaochun, Wan Huan, Qu Xiaohui, Chen Shuyi, Wang Huanxiao, Jin Yu, Su Jingru, Zhang Liangxuan, An Zhenwen, Meng Xue, Li Yanli, Qiao Nan, Yao Gang, Liu Qiong, Li Li, Yang Wuyang, Yang Yufeng, Wei Min, Ren Junmin, Wang Wen, Zheng Desheng, Ge Yongxin, Li Penghua, Li Xiaoyu, Zhang Lei, Shao Zehua, Gong Youzhi, Wang Wenming, Yang Shunkun, Zhang Xiangyang, Jia Zhihui, Li Yaya, Qiao Yajun, Zhang Wei, Wang Haiyang, Wu Mingjuan, Bai Wenzhu, Li Jiajing, Xiao Yu, Xia Ming, Chen Demin, Cheng Yuan, Li Gang, Wu Zhonghua, Zhou Mingle, Zhou Lixiong, Yang Huiqing, Meng Wei, Cao Ji, Bian Ruixin, Wu Tongda.

The development of Internet of Things technology plays an important role in reducing offshore oil and gas production costs, changing methods, and optimizing organization. GB/T 44249 "Internet of Things System for Offshore Oil and Gas Production" can effectively guide the construction of offshore oil and gas production Internet of Things system and promote offshore oil and gas production. The application of offshore oil and gas production information system, the establishment of an IoT standard system for offshore oil and gas production that meets the needs of my country's technology and industrial development, Meet the needs of system research and development, demonstration, promotion and application, and promote the digital transformation of offshore oil and gas production. GB/T 44249 is intended to consist of three parts.

- 1.General requirements. The purpose is to provide guidance on the system architecture and deployment methods of the offshore oil and gas production Internet of Things system.
- 2.Data collection requirements. The purpose is to clarify the data collection requirements for offshore oil and gas production Internet of Things systems.
- 3.Networking requirements. The purpose is to standardize the networking requirements of offshore oil and gas production Internet of Things systems, such as integrating satellites, private networks, Various networking forms for different application scenarios such as mobile communications. IoT systems for offshore oil and gas production Part

1 Scope

Part 1 of China's national standard for internet of things systems in offshore oil and gas production, giving the general requirements. An offshore platform is an attractive and difficult place for instrumentation. Attractive because everything about it is expensive - a maintenance visit means a helicopter or a boat, an unplanned shutdown costs a day's production, and the workforce offshore is minimised for reasons of both cost and safety, so anything that can be monitored remotely should be. Difficult because it is a hazardous area where every device must be certified intrinsically safe or explosion-proof, it is corrosive, it moves, and it has limited and expensive communications back to shore. Those constraints shape the whole architecture, which is why a general requirements standard is needed before any specific application: the device, the network, the edge processing and the data model all have to be settled together.

This document proposes the system architecture and deployment method of the offshore oil and gas production Internet of Things system, and specifies the common technical requirements of each part of the system architecture. Technical requirements. This document applies to the design, construction, application and operation and maintenance of offshore oil and gas production Internet of Things systems.

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 17626 (all parts) Electromagnetic compatibility test and measurement technology

GB/T 22239-2019 Information security technology - Basic requirements for cybersecurity level protection

GB/T 31072-2014 Unified identity authentication for technology platforms

GB/T 33474-2016 Internet of Things Reference Architecture

GB/T 33863 (all parts) OPC Unified Architecture

GB/T 36468-2018 General rules for the compilation of the evaluation index system for the Internet of Things

GB/T 36478.1-2018 Internet of Things Information Exchange and Sharing Part

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 internet of things system for offshore oil and gas producing Using the Internet of Things technology, we can realize the coordination of all levels of institutions in the entire process of offshore oil and gas production, from offshore oil and gas exploration to oil and gas product output. A collection of hardware and software for centralized management and control of related production equipment, facilities, personnel and production processes.

3.2 Typhoon mode During the evacuation of offshore oil and gas production facilities due to a typhoon, when sea conditions such as wind and waves are within the permitted range, remote control of the sea The oil and gas facilities can achieve short-term unattended operation in production mode.

4 Data Interface

GB/T 38624.1-2020 Internet of Things Gateway Part