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Integrity management of units

成套装置完整性管理

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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: Please note that some contents of this document may refer to patents: The issuing agency of this document assumes no responsibility for identifying patents: This document is proposed and managed by the National Standardization Technical Committee of Boilers and Pressure Vessels (SAC/TC262): This document is drafted by: Hefei General Machinery Research Institute Co., Ltd.; China Petrochemical Corporation, China Special Equipment Inspection Research Institute, Sinopec Qingdao Refining and Chemical Co., Ltd.; Fujian United Petrochemical Co., Ltd.; National Pipeline Group Eastern Crude Oil Reserve Transport Co., Ltd.; Shanghai Special Equipment Supervision and Inspection Technology Research Institute, PetroChina Sichuan Petrochemical Co., Ltd.; PetroChina Co., Ltd.; Urumqi Petrochemical Branch, Sinopec Zhenhai Refining and Chemical Branch: The main drafters of this document: Chen Wei, Hu Jiushao, He Chenghou, Xie Guoshan, Liu Cheng,

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This document is based on the PAS55 asset management standard of the British Standards Institution, the Center for Chemical Process Safety (CCPS) of the American Institute of Chemical Engineers "Guidelines for Asset Integrity Management" and the ISO 55000 international asset management standard family as a reference, drawing on Sinopec, PetroChina, the national pipeline network, etc: Based on the excellent experience in plant integrity management, it is compiled based on the basic national conditions of my country's petrochemical equipment integrity management: this document It standardizes the content, main technical methods and requirements of the integrity management of the complete set of equipment, and clarifies the risk management of the whole life cycle of the complete set of equipment: Supporting technologies, application conditions, and analysis procedures provide a basis for enterprises to carry out integrity management of complete sets of equipment under the guidance of factory integrity management: It is of great significance to ensure the safe, economical and efficient operation of the complete set of equipment: Plant Integrity Management

1 Scope

China's national standard for the integrity management of process units. Integrity management extends beyond the individual pressure vessel or pipeline to the operating unit as a whole - a distillation train, a reactor section, a compressor house - and its premise is that the reliability of a plant is a property of the system rather than of its components. A unit whose every item has passed its inspection can still be unfit for service if the inspection intervals were set without regard to the actual degradation mechanisms, if the corrosion loops were drawn wrongly so that a line was assessed against the wrong fluid, or if a change was made without anyone reassessing what it affected. The standard sets out the framework: identifying the mechanisms, defining the assessment, setting intervals by risk, and closing the loop so that what an inspection finds changes what is inspected next.

This document specifies the static equipment (pressure vessels, atmospheric storage tanks, industrial pipelines, furnace tubes, valves, etc:) Contents, methods and requirements of life cycle integrity management of dynamic equipment (pumps, compressors, fans, etc:), instrumentation systems, and electrical equipment, including Integrity management content of equipment design, manufacturing and installation, commissioning and operation, decommissioning and scrapping: This document is applicable to the integrity management of oil refining, chemical, and coal chemical complete sets of equipment, as well as the integrity management of oil and gas gathering stations and oil reserve bases: Can refer to use:

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text: Among them, dated references For documents, only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to this document:

GB/T 150 (all parts) pressure vessels

GB/T 19624 Safety assessment of pressure vessels with defects in use

GB/T 20438 (all parts) Functional safety of electrical/electronic/programmable electronic safety-related systems

GB/T 21109 (all parts) Functional safety of safety instrumented systems in the process industry

GB/T 26610 (all parts) Implementation guidelines for risk-based inspection of pressure equipment systems

GB/T 29639 Guidelines for the preparation of emergency plans for production safety accidents in production and business units

GB/T 30578 Risk-based inspection and evaluation of atmospheric storage tanks

GB/T 30579 Damage Pattern Recognition of Pressure Equipment

GB/T 32857 Application Guidelines for Layer of Protection Analysis (LOPA)

GB/T 35013 Fitness-for-service evaluation of pressure equipment

GB/T 35320 Hazard and Operability Analysis (HAZOP Analysis) Application Guide

GB/T 37327 Atmospheric Storage Tank Integrity Management SY/T 5921 Specification for operation, maintenance and repair of vertical cylindrical steel welded oil tanks

3 Terms and Definitions

The following terms and definitions apply to this document: 3:

1 Complete set of integrated units In the oil refining, chemical and coal chemical industries, process equipment, industrial pipelines, instruments, electrical appliances that process raw materials into chemical products through technological processes System combination of gas equipment: 3:

2 Integrity Comprehensive attributes that reflect that the complete set of devices is complete in structure and function, in a safe and reliable controlled state, and conforms to expected functions: