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

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**Non-destructive testing - Gamma ray scanning method on
process columns**

无损检测 工艺塔伽马射线扫描方法

(English Translation)

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents" Drafting:

This document is equivalent to ISO 23159:2020 "Gamma ray scanning method for non-destructive testing process towers":

Please note that some content in this document may be subject to patents: The publisher of this document assumes no responsibility for identifying patents:

Introduction

Gamma (gamma) ray scanning is a non-invasive non-destructive testing method that is widely used for troubleshooting and diagnosis in petrochemical and chemical plants:

Gamma ray scanning provides a way to address online conditions inside process towers and vessels: Gamma-ray scanning has proven to be an identification factory and process

problems, saving a lot of costs: Gamma ray scanning is a continuous inspection method during the process:

The benefits of using gamma ray scanning methods to solve problems are manifold, such as improving safety, preventing environmental pollution and saving costs:

Gamma ray scanning is based on radiography technology: When gamma rays pass through the tower, the intensity of the transmitted ray beam is the length of the material path passed is related to the density: Suitable gamma sources and detectors are aligned at the same height opposite each other outside the tower: When the gamma source when moving synchronously with the detector along the tower, the radiation intensity is measured at the corresponding position: The source-detector data thus obtained show a function of position the distribution of changing radiation intensity or material density: Detailed analysis of these data can evaluate the internal structure and process conditions of the tower:

Non-destructive testing process tower gamma ray scanning method

1 Scope

This document describes a non-destructive testing method using gamma ray scanning for troubleshooting and inspection of process towers in industry: This document applies for inspection of process towers and pipelines in various separation processes: This includes towers with different pallet structures and filling levels:

2 Normative reference documents

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

ISO 5576 Non-destructive testing industrial X-ray and gamma ray terminology
(Non-destructive testing-IndustrialX-ray andgamma-rayradiology-Vocabulary) Note: GB/T 12604.2-2005 Non-destructive testing term radiographic testing (ISO 5576:1997, IDT)

3 Terms and definitions

The terms and definitions defined in ISO 5576 apply to this document:

towercolumn

A vertical cylindrical vessel used to facilitate the separation of liquid mixtures by distillation or extraction:

demister

A device usually equipped with a vapor-liquid separation vessel to enhance the removal of liquid droplets or mist entrained in the vapor stream:

[Source: ISO/T R27912:2016,3:25] 3.3 downcomer A device for conveying liquid from one tray to the next lower tray within a tower (3:1):

mist entrainment

Mist, droplets or particles transported by a fluid:

[Source: ISO/T R3857-4:2012,2:37] 3.5 flooding A phenomenon in which the normal operation of a distillation column is disrupted due to the excessive velocity of vapor flowing upward along the column (3:1), impeding the flow of liquid:

[Source: ISO :1998-4:1998,4:10:052] 3.6 foaming Liquid expansion resulting from high interfacial liquid-vapor contact in the distillation column (3:1):