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**On-line monitoring requirements for process industry safety
instrumented systems**

过程工业安全仪表系统在线监视要求

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Table of Contents

Preface	III
Introduction	IV
1 Scope	1
2 Normative references	1
3 Terms and Definitions	1
4 Abbreviations	1
5 General Requirements	2
6 Online monitoring content	3
7 Data Awareness for Online Monitoring	4
8 Data transmission for online monitoring	5
9 Data Analysis of Online Monitoring	6
10 Online monitoring result display and alarm	7
Appendix A (Informative) Guidelines for obtaining SIS status information through self-diagnosis	9
Appendix B (Informative) Security Component Attribute Model and List Construction Example	12
References	16

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 of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents.

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Introduction

During the operation of the safety instrument system (SIS), the accuracy of process variables is the key to determining whether the safety function can be correctly executed.

Whether the variables can be accurately and timely transmitted and calculated depends on the state of the SIS itself (for example, whether it is faulty).

Coverage design can generate a lot of useful status information. The status information related to system inspection and maintenance is also crucial to the realization of safety capabilities.

Traditionally, this information has not been presented intuitively to users, and users cannot know exactly the actual operating conditions of safety instruments.

For example, whether an alarm is caused by an internal device failure, communication failure, or other reasons, or whether the safety integrity capability is still maintained in the current situation.

This is very unfavorable for safe operation and it is difficult to effectively manage SIS. Especially for high-risk and complex applications SIS, Accurately and in real time, obtaining safety-related information of field equipment and taking appropriate treatment measures are the key to ensuring safe operation.

Therefore, it is very important to use digital and networked technologies to realize the status monitoring of SIS, including safety sensors, safety controllers, etc.

The device status of the controller and safety actuator as well as the status of the entire safety function loop.

By acquiring, analyzing, and displaying these states, the safety and availability of production operations can be improved. For example, operators can Take relatively correct actions when critical SIS has an abnormality, or get advance warning when safety capabilities fail to meet expectations.

This document specifies the requirements for online monitoring during SIS operation, including the status of the entire safety instrumented function (SIF) and the status of individual units. Monitoring of equipment.

Effective online analysis can improve the safety and availability of SIS production operations.

Through the development of this document, it is also possible to provide implementation requirements for the standardization of online monitoring processes, including.

- Definition of security-aware data for devices/SIF;
- Transmission of security-aware data;
- Analysis and presentation of security perception data.

Requirements for online monitoring of safety instrumented systems in process industries

1 Scope

This document specifies the content of online monitoring of process industry safety instrumented systems and the requirements for corresponding data perception, transmission, analysis and display.

This document applies to online monitoring of safety instrumented systems in the process industry.

2 Normative references

GB/T 21109.1

GB/T 42456

GB/T 42457

3 Terms and definitions

The terms and definitions defined in GB/T 21109.1 and the following apply to this document.

3.1 online monitoring

Real-time perception and analysis of status, attributes or capabilities during normal production operations.

3.2 system

Online monitoring of the real-time status, fault conditions and safety integrity of the safety

instrumented system and giving appropriate alarm prompts

4 Abbreviations

The following abbreviations apply to this document. A/D. Analog/Digital AI. Analog Input AO. Analog Output DI. Digital Input DO. Digital Output ESD. Emergency Shut Down

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