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**Code for design of safety instrumented system in
petrochemical engineering
(English Translation)**

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1 General

1.0.1

This specification is formulated to prevent and reduce process risks in petrochemical plants or installations, ensure personal and property safety, and protect the environment.

1.0.2

This specification is applicable to the engineering design of safety instrumented systems for new construction, expansion and reconstruction projects of petrochemical plants or devices.

1.0.3

The engineering design of the petrochemical safety instrument system shall not only comply with this specification, but also comply with the current relevant national standards.

2.1.1 Safety instrumented system safety instrumented system

An instrumented system that implements one or more safety instrumented functions.

2.1.2 Risk

Specific hazardous events and consequences that are expected to occur.

2.1.3 Process risk process risk

Risk arising from changes in process conditions caused by abnormal events.

2.1.4 Safety life cycle safety life cycle

The total time from the start of engineering scheme design to the decommissioning of all safety instrumented functions.

2.1.5 Hazard

The possibility of causing personal injury or illness, property damage, environmental damage, etc.

2.1.6 Risk assessment risk assessment

The whole process of assessing the size of the risk and determining the tolerance level of the risk.

2.1.7 Protection layer protection layer

Measures to reduce risks through control, prevention, mitigation, etc.

2.1.8 Safety function safety function

Functions performed by safety instrumented systems, other safety-related systems or external risk reduction facilities in order to achieve or maintain a safe state for a process.

2.1.9 Safety instrumented function safety instrumented function

In order to prevent and reduce the occurrence of dangerous events or maintain a safe state of the process, the safety protection function or safety control function realized by measuring instruments, logic controllers, final components and related software.

2.1.10 Fault fault

An abnormal condition that results in a reduction or loss of the ability of a functional unit to perform.

2.1.11 Safety integrity safety integrity

The average probability that a safety instrumented system completes a safety instrumented function within specified conditions and time.

2.1.12 Safety integrity level safety integrity level

The level of the security function. The safety integrity level is SIL1~SIL4 from low to high.

2.1.13 Failure

Functional Unit Termination of a certain function or ability to perform.

2.1.14 Dangerous failure dangerous failure

A failure that could result in a potential hazard or loss of function of a safety instrumented system.

2.1.15 Safe failure safe failure

A failure that is unlikely to result in a potential hazard or loss of function of the safety instrumented system.

2.1.16 Measuring instrument sensor

A component of a safety instrumented system, a device used to measure process variables.

2.1.17 Logic controller logic solver

A component of a safety instrumented system, a device that performs logic functions.

2.1.18 Final element final element

A component of a safety instrumented system is a device that executes the actions commanded or set by the logic controller to make the process reach a safe state.

2.1.19 Basic process control system basic process control system

In response to the input signals of process measurement and other related equipment, other instruments, control systems or operators, according to process control laws, algorithms and methods, output signals are generated to realize process control and related equipment operation.

2.1.20 Fail safe fail safe

When the safety instrumented system fails, the controlled process is transferred to a predetermined safe state.

2.1.21 Redundancy

Two or more components or systems that independently perform the same function are used as backup and switching for each other.

2.1.22 Fault tolerant

The ability of a functional unit to continue to perform a specified function in the event of a fault or error.

2.1.23 Switch digital variable

A variable with only two values of 0 or 1 is used to represent the state of things or events. Also known as a numeric variable.

2.1.24 Switch

A state device with two stable positions. There are software switches and hardware switches.