

ICS 25.040
CCS N 10



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

GB/T 32202.1-2026

Replacing GB/T 32202-2015

**Functional safety of safety instrumented systems in oil and gas
pipelines - Part 1: Assessment requirements**

油气管道安全仪表系统的功能安全 第1部分：评估要求

Issued on: May 25, 2026

Implemented on: December 1, 2026

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

Table of Contents

1	Scope
5	General Requirements
5.1	Evaluation Nodes
5.2	Personnel Requirements
5.3	Assessment Agency
5.4	Assessment Management
6	Safety Requirements Assessment
6.2	Evaluation Basis
6.3	Assessment Content
6.3.2.14	The details of each activity from
6.4	Documentation Requirements
6.4.10	Attachment
7	Design Phase Assessment
7.2	Assessment Basis
7.3	Assessment Content
7.3.1	SIS Performance Evaluation
7.3.2	Independence Assessment
7.3.3	Feasibility Assessment
7.3.8	Hardware Failure Margin (HFT) Assessment
8	Operation and Maintenance Phase Assessment
8.3	Assessment Content
8.4	Documentation Requirements

Foreword

GB/T 32202.1-2026 | Functional safety of safety instrumented system in oil and gas pipelines - Part 1: Assessment requirements

GB/T 32202.1-2026 English version. Functional safety of safety instrumented system in oil and gas pipelines - Part

1 Scope

GB/T 32202.1-2026 is the Chinese national standard covering the functional safety

assessment of a pipeline's instrumented protection - the hazard and risk analysis, the safety functions identified and the integrity level required of each, and the verification that the design achieves it. It replaces GB/T 32202-2015, splitting the subject into two parts with GB/T 32202.2-2026 on acceptance. In force from 1 December 2026. It was issued on 25 May 2026 and takes effect on 1 December 2026, replacing GB/T 32202-2015. The document is under the responsibility of the China Machinery Industry Federation. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

5.2.1 and include personnel who meet the requirements of 5.2.2, 5.2.3, and

5.2.4 respectively. This means the team meets the requirements of

5.2 and does not require further evaluation. Each member of the estimation group simultaneously meets the requirements of 5.2.2, 5.2.3, and 5.2.4. Note

2.Senior qualified personnel refers to senior engineers or personnel holding training certificates from authoritative industry institutions.

5.2.5 Project designers should cooperate with evaluators in the evaluation activities. The design team should preferably send process and instrumentation professionals according to the analysis requirements. Staff, and when necessary, also need to send out professionals in electrical engineering, fire protection, general layout design, etc., with no less than 3 years of professional experience.

5.2.6 The party being evaluated shall send relevant professional personnel with no less than 3 years of professional experience as required by the evaluation.

5.1 Evaluation Nodes

5.1.1 Functional safety assessment should be conducted throughout the SIS safety lifecycle. This should be in accordance with GB/T 21109 (all parts) and the SIS safety standards for oil and gas pipelines. Functional safety assessment activities should be performed at the following points throughout the entire lifecycle (see Figure 1).

5.1.2 SIS safety requirements assessment and SIS design assessment should be completed during the design phase.

5.1.3 For similar stations or facilities that have already undergone functional safety assessments, the assessment conclusions may be adopted as a reference, but a difference analysis should be performed, and [further details should be provided]. The differences will be evaluated.

5.1.4 For renovation and expansion projects, functional safety assessments should be conducted at each stage of the safety lifecycle. For simple changes, they should be carried out in accordance with Article 8. This chapter requires execution. Any changes should be

executed according to the relevant chapter based on the current lifecycle stage.

5.1.5 During the operation and maintenance phase, FSAs should be conducted regularly to ensure that maintenance and operation are performed in accordance with design expectations and meet GB/T standards. Requirements related to security management and verification in 21109 (all parts).

5.2 Personnel Requirements

5.2.1 The level of independence of personnel conducting functional safety assessments shall meet the requirements of

8.2 in GB/T 20438.1-2017.

5.2.2 Functional safety assessment personnel should be familiar with the basic functional safety standard GB/T 20438 (all parts) and applicable standards in the process industry. Comply with GB/T 21109 (all parts), and undergo training and assessment to obtain the corresponding certificate.

5.2.3 Personnel conducting functional safety assessments should possess relevant experience in oil and gas pipeline engineering and knowledge of relevant laws and regulations to ensure the reasonableness of the assessment results. Credible.

5.2.4 The number of senior qualified personnel in the assessment team should not be less than 2/3 of the total number. Note

5.3 Assessment Agency

5.3.1 Functional safety assessment activities should be conducted by qualified organizations within the scope of their accreditation certificates.

5.3.2 The level of independence of the assessment body shall meet the requirements of 8.2 in GB/T 20438.1-2017.

5.4 Assessment Management

5.4.1 The assessment organization shall establish an assessment team and clearly define the responsibilities and independence requirements of each member.

5.4.2 Personnel and organizations performing functional safety assessment activities shall meet the requirements of

5.4.3 The assessment team shall prepare a functional safety assessment plan, which shall include.

---The lifecycle phase that requires functional safety assessment activities, i.e., the scope of functional safety assessment;

- Activities required at each stage;
- Personnel, departments, organizations, or other entities involved in the evaluation activities;
- All resources needed to complete the functional safety assessment activities;
- The outputs that should be obtained from completing a functional safety assessment activity;
- The skills, responsibilities, and authority of the functional safety assessment team;
- The level of independence of the assessment team;
- The method used to re-verify functional safety assessments after system modifications.

5.4.4 Throughout the entire lifecycle, the functional safety assessment plan should be continuously updated and maintained. Any equipment or system change may... Additional functional safety assessment activities are required to determine whether any new hazards may arise.

5.4.5 Before conducting a functional safety assessment, the functional safety assessment plan should be approved by the assessment organization.

5.4.6 The assessment team shall manage and conduct functional safety assessments in accordance with the functional safety assessment plan.

6 Safety Requirements Assessment

6.1 General Requirements The process of developing the SIS safety requirements specification, proposing safety functions, and determining the safety integrity level should be reviewed and assessed. Does it meet functional safety requirements?

6.2 Evaluation Basis

6.2.1 The assessment criteria that best reflect reality should be adopted.

6.2.2 The basis for the assessment includes. hazard analysis and risk assessment report, safety requirement allocation report, and safety requirement specifications. (Necessary conditions) In this case, it should also include the relevant procedural documents for each of the above activities, as well as the analysis and reference materials recorded in the analysis report. Note

1. Sometimes, the names of these documents are not fixed as above, and the document formats are not uniform. For example. HAZOP analysis method is used to conduct hazard analysis. If a risk assessment is included, the report can be a HAZOP analysis report. Note

2. Considering the characteristics of oil and gas pipelines, such as long distances, long routes, and complex environments, attention should be paid to the potential impact of