

HG

**CHEMICAL INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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Replacing HG/T 20573-1995

Code for engineering design of distributed control systems

分散型控制系统工程设计规范

(English Translation)

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Table of Contents

Foreword	7
1 General Provisions	9
2 Normative References	10
3 Terms, Definitions and Abbreviations	11
4 General Requirements for DCS	16
5 Design Principles and Responsibility Distribution of DCS Engineering Design	19
6 Control Stations (Process Control Stations)	21
7 Operator's Stations	24
8 Engineer's Operating Stations	27
9 Communication Systems	28
10 Software, Application Software, Software Configuration File and Software Configuration	30
11 Procedure for DCS Engineering Design	32
12 Design of DCS Control Rooms	33
13 Design of DCS Power Supply System, Grounding System and Lightning Protection System	34
14 Acceptance Test, Installation, Integration Test and Commissioning of DCS	35
Appendix A Requirements for Preparation of DCS Technical Specification	37

1 General Provisions

1.0.1

This code specifies the technical requirements of DCS, the procedure and task of DCS engineering design and the preparation requirements of DCS technical specification.

1.0.2

This code is applicable to the DCS engineering design in the chemical industry and other process production industries, it not only may be used for the DCS control scheme formulation and the DCS engineering design work of the new construction projects or the technological transformation projects of old enterprises, but also is applicable to the cooperation work for DCS purchasing as well as the participation in such design service works as configuration, installation, integration test and commissioning of DCS.

2 Normative References

The following referenced documents are indispensable for the application of this code. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document applies. "Design Code for Control Room" (HG/T 20508) "Design Code for Instrument Power Supply System" (HG/T 20509) "Design Code for Instrument Grounding" (HG/T 20513) "Procedure for Engineering Design of Instrumentation" (HG/T 20636.7) "Common Terms and Definition for Measurement and Control System Design" (HG/T 20699) design "Terms for Distributed Control System" (JB/T 9268-1999) "Design Code for Instrument System Lightning Surge Protection Engineering in Petrochemical Engineering" (SH/T 3164-2012)

3.1 Terms and Definitions

For the purpose of this code, the following terms and definitions apply.

3.1.1 Application software

The generic term of computer programs, processes, regulations and relevant documents required to let DCS complete the supervision on a certain production process.

3.1.5 Broadband LAN

A kind of local area network that is able to encode and reuse the data and also is able to realize data transmission by wave carrier modulation.

3.1.6 Bus network

A kind of local area network that has only one access between any two data stations and in which the data sent by one station is usable for all other stations in the same transmission medium.

3.1.7 Communication system

A kind of system that is composed of various communication links, protocols and functional units and provides the effective communication among the component parts of computer network. This system ensures the information transfer by a decided mode in a group of interconnected stations.

3.1.11 Data station

A complete set of functional units that is also known as station and is composed of data terminal equipment, data circuit-terminating equipment and its common interface.

3.1.12 Distributed control system-DCS

A kind of intelligent station network that is characterized by distributed control function, centralized operating display and hierarchical structure. It is applied for the purpose of controlling or controlling and managing an industrial process or factory.

3.1.13 Engineer's operating station

The intelligent station provided for the Engineer at the supervision level of distributed control system to realize the system generation, which generally also has the functions of operator's station.

3.2 Abbreviations

This code adopts the following abbreviations.

4 General Requirements for DCS

4.3.3

Configuration for connection with information management network.

When DCS is connected with the information management network, it may be configured with internetworking components, e.g. repeater, bridge, router and gateway, etc.

4.3.4

Configuration of auxiliary cabinets.

According to the demand of engineering project, the guard grating/isolator/relay cabinet or intermediate terminal cabinet may be configured.

4.1.1 Dispersibility

DCS shall adopt distributed configuration over hardware units to realize the distribution of system functions and operation risks as well as the requirements of formidable function and flexible configuration.

4.1.4 Advancement

DCS shall have advanced hardware and software environment and be able to satisfy the requirements of runners on advanced control and real-time process optimization software.

4.1.5 Expansibility

It's required to construct the business information system or integrated management automatic system on the basis of DCS by utilizing the openness, extensibility and integrability of DCS.

4.2 Application Requirements

4.2.1

Independent application of DCS

The supervision function of DCS upon the production process shall meet the following requirements.

4.2.3

Combination between DCS and upper computer

The combination of DCS and upper computer shall meet the following requirements.

4.2.4

Combination between DCS and other control devices

DCS shall be able to adopt the communication mode to combine with the following supervision devices/ systems.

4.2.6

Application of computer integrated management system.

Computer integrated management system (CIMS) is constructed by integrating the DCS process control technology and the computer information management technology and is used for conducting the enterprise strategies for improving production, optimizing management and improving economic performance, etc.

5.1 Design Principles

5.1.1

DCS engineering design shall take comprehensive consideration of practicability, reliability, availability, maintainability, traceability, economical efficiency and expansibility, and shall reasonably adopt the redundant and tolerant technique.

5.1.5

The requirements on the combination of other complete sets of control systems shall be proposed according to the DCS configuration conditions of the main device; DCS also shall satisfy the special combination requirements proposed by the complete set of control systems as required.

5.2 Responsibility Distribution

The main works within the life cycle of DCS involved in this code, e.g. DCS engineering design, DCS purchasing, DCS installation and commissioning, as well as the DCS manufacture and after-sale service, are undertaken by the designer, buyer and seller