

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

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**Specifications for load design of hydraulic structures
(English Translation)**

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1 Scope

This code is applicable to the structural design of various hydraulic structures.

2 Reference standards the provisions contained in the following standards constitute the provisions of this standard by quotation in this standard. When this standard was published, the editions shown were effect. All standards will be revised, all parties using this standard should explore the possibility of using the latest version of the following standards.

GB 50199-94 Unified Standard for Structural Reliability Design of Water Conservancy and Hydropower Projects GB J 9-87 Building Structural Load Specification GB J 145-90 soil classification standards DL/T 5058-1996 Design Specification for Surge Chamber of Hydropower Station

3 General

3.0.1 In order to unify the function value standards of hydraulic structure design, and make the design meet the requirements of safety and application, economical rationality, and advanced technology, this specification is specially formulated.

3.0.2 This specification is based on the principles stipulated in GB 50199-94 "Unified Standards for Structural Reliability Design of Water Conservancy and Hydropower Engineering".

3.0.3 Other functions not specified in this code shall be determined in accordance with the provisions of various hydraulic structure design codes.

3.0.4 When the hydraulic structure design refers to the functions related to highway, shipping and port engineering, it shall be determined after specific analysis in accordance with the provisions of the design codes of various departments.

The relevant provisions of Chapter 4 and Chapter 7, and the subsequent chapters have made specific provisions on the value of various functions and their sub-coefficients.

The role of structure usually refers to the general name of various causes of effects

(internal force, deformation, etc.) on the structure, and can be classified as direct action and Indirect effect. Direct action refers to the concentrated or distributed force directly applied to the structure, which can also be called "load"; indirect action refers to the effect Causes of external deformation or constrained deformation of the structure, such as earthquakes and temperature effects. For a long time, the engineering community has been accustomed to making no distinction between the two types of roles, both are called "loads". In order to simplify the name of the code and take care of idioms, this code is still named "Code for Design of Loads on Hydraulic Structures".

But in fact, it includes direct and indirect roles.

3.0.3 There are many functions on hydraulic structures, and subject to objective conditions, it is impossible for this code to conduct a comprehensive study of all functions the corresponding regulations only deal with some of the main functions commonly encountered in the design of hydraulic structures. As for the special role of certain buildings (structures), or this regulation Other functions not included in Fan, such as structural prestress, soil pore water pressure and welding deformation of steel structure, etc., can be determined by the corresponding hydraulic structure the design specifications make provisions as needed.

3.0.4 The design rules of the departments of highway, shipping and port engineering, the principles and methods of their value (load) may not be consistent with this code, so when quoting the value of the action (load), the characteristics of the hydraulic structure should be analyzed in detail to determine the value of the related action and its partial coefficient.

To be used in conjunction with this specification.

5 Action classification and combination of action effects

5.1 Function classification and representative value

5.1.1 Various functions in structure, when they are independent in time and space, then each function can be considered as a separate function. "Hydraulics "Standard Standard" adopts three classification methods for action, namely, the variation with time of action, the variation with space position (fixed or movable) and the effect on structure the response characteristics (static or dynamic) are classified. Among them, the classification according to the variability of action over time is the most important classification, because it is directly related to the choice of probability models of action variables, the value of some actions is also related to the length of their duration. This specification will be based on the "Hydraulic Standards" the variation with time is divided into the following three categories.

(1) Permanent effect. the value does not change with time during the design reference period, or its change is negligible compared with the average value;

(2) Variable effect. the value changes with time during the design reference period, and its change cannot be ignored compared with the average value (3) Accidental effect. The

probability of occurrence in the design reference period is very small, and once it appears, its value is large and the duration is very short.

Appendix A "Classification of main functions of hydraulic structure according to time variation" is listed in principle according to Appendix D of "Hydraulic Standards".

5.1.2 When using the partial coefficient limit state design method, the value used in the acting variable in the design expression is called the acting representative value.

"Hydraulics the "Standard Standard" stipulates that. the representative values of permanent action and variable action shall adopt the standard value of action, and the representative value of accidental action shall be determined according to the relevant specifications.

"water the "Standard of Engineering Standards" specifies specific principles and methods for determining the value of the function standard. When determining the standard values of various permanent and variable actions in this specification, Followed these rules. As for the two main accidental effects in the design of hydraulic structures-the representative values of the hydrostatic pressure and earthquake action when checking the flood level, this specification makes provisions in the relevant chapters.

5.2 Combination of effects

5.2.1 When the entire structure (including foundation and surrounding rock) or a part of the structure exceeds a certain state and cannot meet the functional requirements specified in the design at this time, the specific state is called the limit state of the structure corresponding to the function. Starting from the actual needs of engineering structure design, the limit state can be divided into There are two types of "bearing capacity limit state" and "normal use limit state". The limit state of the bearing capacity of the structure is generally based on the structure or structure the structural member reaches the maximum load-carrying capacity or is unsuitable for continued load-bearing deformation; it is based on the structure or structural structure for the normal use limit state Based on a certain functional limit for normal use or durability requirements. The internal force and deformation caused by the action on the structure, such as axial force, bending moment, Shear forces, displacements, deflections and cracks are collectively called "action effects" and should be determined by structural analysis.

According to the different structures, action systems and environmental conditions that may appear in different stages of construction, installation, operation and maintenance, the structure the design status can be divided into the following three types.

- (1) Enduring condition. It must appear during the normal use of the structure and the duration is very long, generally the same order of magnitude as the structural design benchmark period Design status
- (2) Transient conditions. design conditions that appear briefly during structural construction (installation), maintenance, or use;
- (3) Accidental situation. a design situation with a low probability and a short duration during the use of the structure.