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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 21075-2026

Replacing GB/T 21075-2007

Reservoir-induced earthquake hazard assessment

水库诱发地震危险性评价

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1.Structure and Drafting Rules of Standardization Documents". Drafting. This document replaces GB/T 21075-2007 "Evaluation of Seismic Hazard Induced by Reservoirs". Compared with GB/T 21075-2007, except for the structure... Aside from adjustments and editorial changes, the main technical changes are as follows:

a) The definition of the reservoir-induced earthquake influence zone has been changed (see 3.4,.2007 version 3.4);

b) The definition of seismic induction factors has been added (see 3.5);

c) The scope and scope of application for reservoir-induced earthquake hazard assessment have been changed (see Chapter 4, Chapter 4 of the.2007 edition);

d) The regulations for map scales have been changed (see 4.3,

6.1 in the.2007 edition);

e) The regulations regarding the labeling content of reservoir-induced earthquake hazard assessment maps have been revised (see 4.3,

5.1 of the.2007 edition);

f) The requirements for collecting and organizing background data on seismic activity have been revised (see 6.1, 6.3, and

7.2 in the.2007 edition);

g) The requirements for library segmentation have been changed (see 7.1,

8.1 in the.2007 version);

h) The rules for collecting probability assessment data have been changed (see 8.1,

4.1 Basic Provisions

4.1.1 The induced seismic hazard assessment for newly built, renovated, and expanded reservoirs shall meet the following requirements.

a) When the reservoir capacity reaches or exceeds 5x10^8 m^3, or the dam height reaches or exceeds 100 m, the reservoir-induced earthquake hazard assessment should be conducted. evaluate;

b) When the reservoir capacity is between 1x10^8 m^3 and 5x10^8 m^3, the reservoir-induced earthquake hazard should be demonstrated and considered. evaluate;

c) When the reservoir capacity is less than 1x10^8 m^3, this document can be consulted to determine whether to conduct an evaluation after fully demonstrating its necessity.

4.1.2 For existing reservoirs, based on their reservoir capacity, dam height, and actual needs, it is advisable to conduct a feasibility study and determine the implementation of reservoir-induced earthquake hazard assessment in accordance with the provisions of 4.1.1. The necessity of sexual evaluation.

4.1.3 The spatial extent of the reservoir-induced earthquake influence zone should be defined based on the reservoir shoreline corresponding to the normal water level, extending towards the reservoir shoreline. The horizontal distance extends for no less than 15km.

4.2 Content Requirements The reservoir-induced earthquake hazard assessment should include the following tasks.

a) Geological survey of the reservoir area;

b) Investigation of seismic activity background and geostress field in the reservoir-induced earthquake-affected area;

c) Deterministic evaluation;

d) Probability evaluation;

e) Overall evaluation.

4.3 Drawing Requirements

4.3.1 The following maps should be submitted after the reservoir-induced seismic hazard assessment is completed.

a) Geological map;

b) Historical earthquake epicenter distribution map;

c) Reservoir-induced earthquake hazard assessment map.

4.3.2 The preparation of drawings shall comply with the following provisions.

a) Geological charts should be drawn according to the following content and requirements. 1) The distribution, attitude, nature, and latest activity patterns of major faults in the reservoir-induced earthquake-affected area; 2) The lithological assemblage or rock mass structure type, age, and boundaries of the strata that the reservoir water can come into contact with; 3) Location of the spring (cold spring and hot spring) outlet.

b) The geological map is primarily defined by the reservoir-induced earthquake influence zone; when active faults exist outside the influence zone, the reservoir-induced earthquake influence zone is considered. It extends beyond the scope of the affected area.

c) The earthquake epicenter distribution map indicates the start and end dates of the data and the earthquake magnitude.

d) The reservoir-induced earthquake hazard assessment map indicates the maximum magnitude and horizontal direction of the ground motion in each reservoir section within the reservoir-induced earthquake influence zone. Peak acceleration (hereinafter referred to as peak acceleration).

e) The map scale shall be no less than 1.250,000, and all maps shall indicate the location of the reservoir area and the dam site.

5 Geological survey of the reservoir area

5.1 The location, attitude, and dynamic characteristics of the main faults in the reservoir area should be verified, and relevant active fault data should be collected; and in this process... Based on this, the fault activity was identified in accordance with the provisions of GB/T 36072.

5.2 The occurrence, density, and properties of joints should be investigated and measured, and stereographic projections or rose diagrams of the joint measurements should be drawn.

5.3 The water content, permeability, and sealing conditions of various discontinuous surfaces should be collected and analyzed.

5.4 The lithology, occurrence, assemblage relationship and hydrogeological characteristics of the reservoir area should be reviewed.

5.5 The distribution of soluble rocks in the reservoir area, as well as the degree of karst development, scale, and connectivity with the reservoir water, should be investigated.

5.6 Data on large unstable geological bodies in the reservoir area should be collected and investigated.

5.7 Information on the location, flow rate, water temperature (hot springs), and other information of springs in the reservoir area, as well as their causes, should be collected and verified.

6.Investigation of seismic activity background and geostress field in the reservoir-induced earthquake-affected area

6.1 It is necessary to investigate and collect data on earthquakes with strong or greater impact in the reservoir area and their causes, and to compile isoseismal lines and instruments for earthquakes with a magnitude greater than or equal to M4.7. The peak ground acceleration of recorded earthquakes with strong perceptible force.

6.2 Seismic data for reservoir-induced earthquake-affected areas should be collected in accordance with the relevant provisions of GB 17741 regarding regional seismic activity assessment. Compile an earthquake catalog. When the collected earthquake data is insufficient, locally constructed and operated seismic networks or engineering-dedicated seismic monitoring networks can be utilized. Seismic data is used as a supplement.

6.3 The location of the epicenter of historical earthquakes in the reservoir-induced earthquake-affected area should be reviewed.

6.4 When a regional or local seismic network cannot control a reservoir-induced earthquake of magnitude

1.0 or greater within the affected area, procedures should be followed before impoundment. GB/T 31077 stipulates the construction of a reservoir seismic monitoring network to monitor the background seismic activity in the reservoir-induced earthquake-affected area. (Reservoir earthquakes) The monitoring network should ideally be completed and operational one year before water storage.

6.5 The following requirements shall be met when conducting a geostress field survey in the reservoir-induced earthquake-affected area.

7.1 Division of Reservoir-Induced Earthquakes

7.1.1 Reservoir-induced earthquakes are classified into the following three types.

a) A reservoir segment with a high probability of triggering earthquakes;

b) Less likely induced earthquake reservoir segments;

c) The reservoir section is not prone to inducing earthquakes.

7.1.2 The reservoir section for reservoir-induced earthquakes shall be delineated based on the following information, in accordance with the provisions of Appendix A.

a) Topographic and geomorphological features;

b) Lithological assemblage or rock mass structural characteristics;