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NB

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

NB/T 35057-2024

Replacing NB 35057-2015

Code for seismic design of hydropower projects

水电工程防震抗震设计规范

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Foreword

This document was issued on 25 December 2024 by the National Energy Administration of the PRC and takes effect on 25 June 2025.

It is a NB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

It is classified under ICS 27.140, Chinese classification P 59.

It replaces NB 35057-2015, which is superseded.

This code was revised in accordance with the requirements of the Notice of the General Department of the National Energy Administration on issuing the 2022 plan for the formulation and revision of industry standards in the energy field and the plan for the translation of foreign language versions, document Guo Neng Zong Tong Ke Ji [2022] No. 96. The drafting group carried out extensive investigation and research, carefully summarised practical experience, and revised this code on the basis of wide consultation.

The main technical content of this code is: general provisions; terms; basic requirements; site selection and site class; seismic design criteria; project layout and structures; foundations and slopes; metal structures; electromechanical works; telecommunication; access roads; earthquake monitoring; and emergency management.

The main changes made in this revision are as follows:

- the requirements relating to seismic safety evaluation of the site in the former code have been merged into the basic requirements;
- the chapter formerly titled electromechanical facilities has been revised to electromechanical works;
- two new sections, hydraulic machinery and heating, ventilation and fire protection, have been added to the electromechanical chapter;

- the requirements relating to the communication network of the automatic hydrological telemetry system in the former code have been merged into the general requirements of the telecommunication chapter;
- the content of the telecommunication chapter has been revised into general requirements, satellite communication and telecommunication power supply;
- the content of the access roads chapter has been revised into general requirements, seismic criteria for access roads and seismic design requirements for access roads;
- the content of the earthquake monitoring chapter has been revised into strong motion monitoring and reservoir earthquake monitoring;
- general requirements have been added to the emergency management chapter; earthquake emergency goods and their storage requirements has been revised to emergency goods and reserve requirements; and emergency shelters and emergency evacuation sites has been revised to emergency refuge and emergency evacuation.

This code is administered by the National Energy Administration and was proposed by the General Institute of Hydropower and Water Resources Planning and Design.

1 Scope

NB/T 35057-2024 is the Chinese code for the seismic design of hydropower projects. It exists because China builds its biggest dams where the water falls fastest, and that is on the tectonic margin of the Tibetan plateau - the same ground that produced the Wenchuan earthquake in 2008. A dam is unlike any other structure in an earthquake: the consequence of failure is not the loss of the structure but the sudden release of the reservoir behind it onto whatever lies downstream, which is why the code defines the ultimate seismic resistance of a dam explicitly as the point beyond which uncontrolled release of the reservoir water is expected. That single definition explains the shape of the whole document. Class A dams are designed against two levels of earthquake rather than one, the design earthquake and the check earthquake; the earthquake basic intensity is fixed at the 10 percent exceedance probability in fifty years; and the code covers not only the dam but everything the dam depends on after the shaking stops. Its thirteen chapters run from site selection and site classification, through the seismic design criteria and the project layout and hydraulic structures, the foundations and slopes, the metal structures of gates and hoists, and the electromechanical works - hydraulic machinery, electrical installations, station service and DC supplies, heating, ventilation and fire protection - to telecommunication including satellite links and communication power supply, and the access roads, which are what determines whether anyone can reach the site at all after a major event. The last two chapters are the ones a dam owner is judged on: earthquake monitoring, split into strong motion monitoring of the structure and reservoir earthquake monitoring of induced seismicity, and emergency management, covering the emergency

response plan, the response organizations, the emergency goods and their storage, and the emergency shelters and evacuation points. This edition merges the former site seismic safety evaluation requirements into the basic requirements, adds hydraulic machinery and HVAC and fire protection sections to the electromechanical chapter, and rewrites the telecommunication, access roads, monitoring and emergency chapters. It was issued on 25 December 2024 by the National Energy Administration, takes effect on 25 June 2025, and replaces NB 35057-2015.

1.0.1 This code is formulated in order to make clear the principles, the design criteria, the design objectives and the basic requirements of the seismic design of hydropower projects, to strengthen the seismic design work of hydropower projects, and to raise their capacity for earthquake prevention and disaster reduction.

1.0.2 This code applies to the seismic design of newly built, reconstructed and extended hydropower projects, and to the post-earthquake seismic re-appraisal of hydropower projects.

1.0.3 The seismic work of a hydropower project shall follow the policy of putting prevention first and combining defence with rescue, and shall run through every stage of planning, design, construction and operation.

1.0.4 River hydropower planning, pumped storage site selection planning and hydropower project design shall strengthen the identification of earthquake risk and the study of risk prevention and control; shall analyse, for the structures and the equipment of the project, the possibility of earthquake damage and its consequences; shall put forward prevention and control measures; and shall set out seismic requirements for the construction and for the operational management of the project.

1.0.5 In addition to complying with this code, the seismic design of a hydropower project shall also comply with the provisions of the relevant current national standards.

2 Terms

2.0.1 seismic design

The non-engineering and engineering design measures adopted in order to reduce earthquake damage to the works and to avoid secondary disasters induced by earthquake, namely reasonable avoidance, structural strengthening and post-earthquake emergency response.

2.0.2 seismic fortification class

The fortification grade assigned to the various classes of structure, facility and equipment according to the casualties, the direct and indirect economic loss and the social impact that earthquake damage to the works may cause, and according to their role in earthquake relief.