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NB

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

NB/T 10390-2020

Replacing DL/T 5107-1999

Code for design of desilting basin for hydropower projects

水电工程沉沙池设计规范

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Foreword

This document was issued on 23 October 2020 by the National Energy Administration of the PRC and takes effect on 1 February 2021.

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 P59.

It replaces DL/T 5107-1999, which is superseded.

In accordance with the requirements of the Notice of the National Energy Administration on Issuing the 2015 Plan for Formulation and Revision of Energy Sector Industry Standards (Guo Neng Ke Ji [2015] No. 283), the drafting group of this code revised this code through extensive investigation and research, careful summarization of practical experience, reference to relevant advanced domestic standards and on the basis of wide solicitation of opinions.

The main technical contents of this code are: general provisions, terms, setting conditions and design criteria for desilting basins, selection of desilting basin types, layout of desilting basins, hydraulic design and main dimension calculation, structural design, operation design and sediment monitoring design.

The main technical contents revised in this code are as follows:

Calculation requirements related to the structural design of desilting basins have been added.

The scope of application of the code has been modified: from desilting basins of Grade 3 and above in large and medium-sized hydropower and water resources projects to desilting basins of hydropower projects.

The setting criteria for desilting basins have been modified.

The setting criteria for desilting basins of water resources projects have been deleted.

The National Energy Administration is in charge of the administration of this code. China Renewable Energy Engineering Institute has proposed this code and is responsible for its routine management, and the Energy Industry Standardization Technical Committee on Hydropower Investigation and Design is responsible for the explanation of specific technical contents. Comments or suggestions arising during implementation should be sent to China Renewable Energy Engineering Institute (Address: No. 2 Liupukang North Xiaojie, Xicheng District, Beijing; Postal code: 100120).

Chief development organization of this code: PowerChina Chengdu Engineering Corporation Limited.

Chief drafting staff of this code: Zhu Wanqiang, Huang Yankun, Hao Yuanlin, Jiang Dequan, He Xianpei, Liu Ding, Tian Xun, Lü Jinbo, Lu Peican, Yuan Liyi, Chen Qiang, Ju Lin.

Chief reviewers of this code: Dang Lincui, Fang Guangda, Zhang Hongwu, Liu Xingnian, Li Guobin, Long Qihuang, Cao Yubo, Wang Yi, Guan Lihai, Hu Wangxing, Jiang Hongjun, Wu Caiping, Yang Jinying, Zhao Tie, Liu Rongli, Li Shisheng.

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Announcement of the National Energy Administration, 2020 No. 5: the National Energy Administration approved 502 energy industry standards, including the Technical Code for Real-time Monitoring System of Ecological Flow of Hydropower Projects (Annex 1), and 35 English versions of energy industry standards, including Series Parameters for Horizontal Hydraulic Hoist (Cylinder) (Annex 2), and hereby issues them. Dated 23 October 2020.

Annex 1, Catalogue of Industry Standards, entry No. 6: NB/T 10390-2020, Code for Design of Desilting Basin for Hydropower Projects, replacing DL/T 5107-1999, approved on 2020-10-23, implemented on 2021-02-01.

1 Scope

NB/T 10390-2020 is the Chinese design code for desilting basins on hydropower projects, replacing DL/T 5107-1999. On rivers carrying heavy sediment loads, typical of the mountain rivers of western China, the fine sand drawn into a run-of-river intake will erode turbine runners, guide vanes and seals within a season if it is not removed first. A desilting basin slows the flow enough for the harmful particles to settle out before the water reaches the headrace and the machines. The code sets the general provisions and defined terms and symbols, then the basic requirements: the design sediment data, the particle size that must be removed, the removal efficiency required, and the design discharge. It covers the choice and arrangement of basin types - continuous flushing, periodic flushing and mechanically cleaned basins, open and underground, single and multiple chambers - together with the inlet transition that distributes the flow evenly and the outlet structure. Hydraulic design follows, with the calculation of settling length, width and depth, the settling velocity of the design particle, the turbulence and non-uniformity corrections, and the verification of removal efficiency. Flushing design covers the sediment storage volume, the flushing galleries and gates, and the flushing flow and duration. Structural design, operation rules

and the monitoring of sediment close the code.

1.0.1 This code is formulated with a view to standardizing the design of desilting basins in water diversion structures of hydropower projects.

1.0.2 This code is applicable to the design of desilting basins treating suspended sediment in hydropower projects.

1.0.3 In addition to this code, the design of desilting basins for hydropower projects shall also comply with the provisions of the current relevant standards of the nation.

2 Terms

2.0.1 desilting basin: a structure used to settle suspended sediment with particle sizes larger than the design settling particle size from sediment-laden flow, thereby reducing the sediment concentration of the flow.

2.0.2 periodic flushing desilting basin: a desilting basin in which, after deposition has reached a certain extent, the flushing gate is opened for flushing, so that sediment settling and flushing operate alternately.

2.0.3 continuous flushing desilting basin: a desilting basin in which the settled sediment is continuously flushed into the downstream river channel while water supply is maintained continuously.

2.0.4 desilting channel: a wide and shallow earth-channel desilting basin of considerable length formed by making use of a natural depression.

2.0.5 working section: the main section of a desilting basin used for settling sediment.

2.0.6 working length: the length of the working section of a desilting basin used for sediment deposition.

2.0.7 working width: the width of the working section of a desilting basin used for sediment deposition.

2.0.8 working depth: the water depth between the normal water level of a desilting basin and the design sediment deposition elevation.

2.0.9 working flow: for a periodic flushing desilting basin of a hydropower station, the diversion discharge; for a periodic flushing desilting basin provided with sediment releasing orifices, the sum of the diversion discharge and the sediment releasing discharge through the bottom orifices at the end of the basin; for a continuous flushing desilting basin, the sum of the diversion discharge and the flushing discharge.

2.0.10 flushing flow: for a periodic flushing desilting basin, in which sediment settling and flushing operate alternately, the discharge admitted through the intake gate for flushing sediment when a basin chamber (tank) is being flushed.