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ENERGY INDUSTRY STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

NB/T 35066-2015

Specification of overburden drilling techniques for hydropower projects

水电工程覆盖层钻探技术规程

Issued on: October 27, 2015 **Implemented on: March 1, 2016**

Issued by: National Energy Administration of the PRC

Preview: page 1 of 5 shown, 45 in the full document. Complete English PDF, instant download:
https://chinastandards.org/standards/nb-t-35066-2015

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Table of Contents

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Foreword

Preview: page 2 of 5 shown, 45 in the full document. Complete English PDF, instant download:
https://chinastandards.org/standards/nb-t-35066-2015

This document was issued on 27 October 2015 by the National Energy Administration of the PRC and takes effect on 1 March 2016.

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.

This specification was compiled in accordance with the requirements of the Notice of the National Energy Administration on Issuing the First Batch of the 2013 Plan for Formulating and Revising Industry Standards in the Energy Field, Guo Neng Ke Ji [2013] No. 235.

The drafting group carried out extensive investigation and research, summarised practical experience, referred to the relevant domestic standards and prepared this specification on the basis of a wide solicitation of comments.

The main technical contents of this specification are: preparation work; drilling methods; drilling fluid and hole wall protection and loss shut-off; coring and sampling; experiment and test; drilling quality.

This specification is administered by the National Energy Administration.

It is proposed by, and placed under day-to-day administration by, the Hydropower and Water Resources Planning and Design General Institute; the Energy Industry Standardization Technical Committee for Hydropower Investigation and Design is responsible for the interpretation of the specific technical content.

Comments and suggestions arising during implementation should be sent to the Hydropower and Water Resources Planning and Design General Institute, No. 2 Liupukang Beixiaojie, Xicheng District, Beijing, postcode 100120.

The chief drafting organisations are PowerChina Chengdu Engineering Corporation Limited and Chengdu Water Conservancy and Hydropower Construction Co., Ltd.

The foreword lists twelve principal drafters and twenty-two principal reviewers by name.

Publication data

NB/T 35066-2015, Specification of overburden drilling techniques for hydropower projects, is an energy industry standard of the People's Republic of China issued by the National Energy Administration.

The cover carries the classification data ICS 27.140 and the Chinese standard classification code P 59, together with the filing (record) number 52245-2015.

The standard was issued on 27 October 2015 and came into force on 1 March 2016, as printed on the lower part of the cover.

No superseded document is named on the cover: this specification is a first edition and

Preview: page 3 of 5 shown, 45 in the full document. Complete English PDF, instant download:
https://chinastandards.org/standards/nb-t-35066-2015

does not replace an earlier code.

The title page names the Hydropower and Water Resources Planning and Design General Institute as the department in charge of compilation and the National Energy Administration as the approving department, and repeats 1 March 2016 as the date of entry into force.

The volume was published by China Electric Power Press, Beijing, in 2016.

Announcement No. 6 of 2015 of the National Energy Administration, dated 27 October 2015, approved 96 energy industry standards (NB) under the rules of the Notice on Issuing the Administrative Measures for Standardization in the Energy Field (Trial) and its implementing rules, Guo Neng Ju Ke Ji [2009] No. 52.

In the attached catalogue of industry standards this specification is item 39; the catalogue entry confirms the approval date 2015-10-27 and the implementation date 2016-03-01 and leaves the columns for the replaced standard and for the adopted standard empty.

Structure of the document

The specification is organised in eight chapters followed by two appendices and three closing parts; the wording used below is that of the official English contents page bound with the Chinese text.

Chapter 1, General provisions, begins on page 1; Chapter 2, Terms, on page 2.

Chapter 3, Preparation work, begins on page 3 and is divided into 3.1 Technical preparation (page 3) and 3.2 Site preparation (page 4).

Chapter 4, Drilling methods, begins on page 6 and contains five sections: 4.1 Tungsten-carbide drilling (page 6), 4.2 Diamond drilling (page 8), 4.3 Pneumatic DTH hammer core drilling with casing (page 9), 4.4 Wire-line core drilling (page 10) and 4.5 Tubular drilling (page 11).

Chapter 5, Drilling fluid and hole wall protection and loss shut-off, begins on page 14 and contains 5.1 Drilling fluid (page 14) and 5.2 Hole wall protection and loss shut-off (page 17).

Chapter 6, Coring and sampling, begins on page 21 and contains 6.1 Coring (page 21), 6.2 Sampling (page 22) and 6.3 Core logging and storaging and transportating (page 25), the heading of 6.3 being reproduced here exactly as printed in the official contents.

Chapter 7, Experiment and test, begins on page 27 and contains 7.1 Hydrogeological test and 7.2 In situ test, both starting on page 27.

Chapter 8, Drilling quality, begins on page 28 and contains 8.1 Evaluation project of the drilling quality (page 28) and 8.2 Drilling quality assessment (page 29).

Appendix A, Overburden drilling method, is on page 32 and Appendix B, Cover borehole structure design, on page 33.

Preview: page 4 of 5 shown, 45 in the full document. Complete English PDF, instant download:
https://chinastandards.org/standards/nb-t-35066-2015

The closing parts are Explanation of wording in this specification (page 34), List of normative standards (page 35) and the appended Explanation of provisions, which starts on page 37.

The Chinese contents pages and the English contents pages agree item by item and give the same page numbers throughout.

1 Scope

NB/T 35066-2015 governs drilling through overburden on hydropower projects - the loose alluvium, glacial deposits, talus and fill that sit between the surface and the bedrock, which in the deep valleys of western China can be a hundred metres or more thick. Drilling through such ground without disturbing it is genuinely difficult: the hole collapses, the core washes away, and a sample recovered carelessly tells the designer nothing about the density and grading that actually govern the foundation. The specification sets the general provisions and defined terms, then the basic requirements on planning a borehole, the equipment and the drilling fluids, and the qualifications of the crew. It covers the drilling methods in turn - percussion and rotary drilling, casing advance and follow, single, double and triple tube core barrels, diamond drilling, and the wireline and sonic techniques used where recovery matters most - with the parameters and the precautions for each in sand, gravel, boulder and mixed ground. Core recovery, logging, photography, storage and transport are treated in detail, since the core is the product. Borehole deviation, water level observation, hole stabilisation and grouting, and the backfilling of the hole on completion are specified, as are the quality evaluation criteria for a completed borehole and the records and report that accompany it.

1.0.1 This specification is formulated in order to standardise the overburden investigation drilling work of hydropower projects, to define the work content, the methods and the technical requirements, to ensure the quality of the drilling exploration and to meet the needs of engineering geological evaluation.

1.0.2 This specification applies to overburden investigation drilling for hydropower projects; it may also be applied to overburden investigation drilling for renewable energy projects such as wind power and solar power.

1.0.3 The overburden drilling method shall be determined after comprehensive analysis and comparison, on the basis of factors such as the purpose of the borehole, the category of the overburden and the construction conditions.

1.0.4 In addition to complying with this specification, overburden investigation drilling for hydropower projects shall also comply with the provisions of the relevant current national standards.

Chapter 1 occupies page 1 of the printed text and consists of these four clauses only.

Preview: page 5 of 5 shown, 45 in the full document. Complete English PDF, instant download:
https://chinastandards.org/standards/nb-t-35066-2015