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**Technical specification for advance prediction of hydropower
and water conservancy underground engineering geology**

水电水利地下工程地质超前预报技术规程

(English Translation)

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Foreword

According to the "Notice of the National Energy Administration on Issuing the First Batch of Industry Standard System (Revision) Plans in the Energy Sector in 2010" (Guoneng Science and Technology [2010] No. 320) requirements, after extensive investigation and Based on the work experience in advanced forecasting of underground engineering geology, this regulation was formulated on the basis of a wide range of opinions.

This regulation is divided into 8 chapters, the main technical contents are. general rules, terminology, basic regulations, geological analysis method, advanced geology Drilling method, geophysical exploration method, advanced pilot hole method and result report.

This regulation is managed by the National Energy Administration and proposed by the China Electricity Council.

The Zhunhua Technical Committee is responsible for daily management, and the Yangtze River Water Resources Commission and the Yangtze River Academy of Sciences are responsible for the interpretation of specific technical content.

If you have comments and suggestions during the implementation process, please send them to the Standardization Center of China Electricity Council (Address. Baiguang, Beijing) no. 1, Lu Er Tiao, Zip Code. 100761).

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1 General

1.0.1

In order to standardize the advance forecast of hydropower and underground engineering geology, ensure the quality of advance forecast, and give full play to the geology for the application of advance forecast in hydropower and water conservancy and underground engineering, this regulation is formulated.

1.0.2

This regulation is applicable to geological advance prediction of hydropower and underground engineering.

1.0.3

In addition to this regulation, the geological advance forecast of hydropower and underground engineering shall also comply with the current relevant national standards Provisions.

2.0.1 Geological advanced prediction

According to the site conditions, one or more of geological analysis, advanced geological drilling, geophysical exploration, advanced pilot hole, etc.

A kind of forecasting method, multi-scale and multi-parameter forecast of the geological conditions in front of the work.

2.0.2 Geological hazard body

Geological bodies that may cause underground engineering collapse, roof fall, water inrush, mud outburst and other geological hazards, such as fault fracture zone, joints Fractured zones, karsts, soft rock deformation layers, water-bearing structures, etc.

2.0.3 Geological analysis method

Collect preliminary geological data, investigate the geological conditions on the surface and underground, analyze the structural characteristics of the working face, and infer Good geological body.

2.0.4 Advanced geological drilling method

Use geological drilling equipment to drill holes on the working surface to expose the lithology, structure, karst, and groundwater of the front strata.

2.0.5 Geophysical detection method

Based on the differences in the physical properties of geological bodies, the spatial distribution of geological bodies is determined by observing changes in natural or artificial physical fields through instruments.

Fabric and physical parameters, referred to as geophysical methods.

2.0.6 Elastic wave reflection method

Based on the elastic difference between bad geological bodies and surrounding rocks, obtain and analyze the kinematic and dynamic information of elastic reflection waves, Infer the location, shape and physical properties of bad geological bodies.

2.0.7 Ground penetrating radar method

Based on the difference in resistivity and permittivity between bad geological bodies and surrounding rocks, obtain and analyze the propagation characteristics of reflected electromagnetic waves.

Sign, infer the location, shape, and water content of bad geological bodies.

2.0.8 Transient electromagnetic method

Use an ungrounded loop to send a pulsed electromagnetic field to the front of the work surface, measure and analyze the conductivity of poor geological bodies the secondary induced electromagnetic field caused by the difference can infer the location, shape, and water content of bad geological bodies.

2.0.9 Infrared detection method

Based on the temperature difference between the surrounding rock and the water-bearing body, detect the changes in infrared radiation energy and infer the water-bearing properties of the surrounding rock.