



Electric Power Industry Standard of the People's Republic of China

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DL/T 5409.3—2010

Technical Code for Engineering
Investigation of Nuclear Power Plants
Part 3: Hydrological and
Meteorological Survey

核电厂工程勘测技术规程
第3部分：水文气象
(英文版)

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**Technical Code for Engineering
Investigation of Nuclear Power Plants
Part 3: Hydrological and
Meteorological Survey**

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Foreword

The DL/T 5409 *Technical Code for Engineering Investigation of Nuclear Power Plants* consists of four parts:

Part 1: Seismic Hazard

Part 2: Geotechnical Engineering

Part 3: Hydrological and Meteorological Survey

Part 4: Surveying

This is Part 3 of DL/T 5409.

This code is prepared as required by the *Notice on Printing and Distributing Industrial Standards Project Plan of the Year 2005* (FGBGY (2005) 739) issued by the General Office of the National Development and Reform Commission.

This code is proposed by China Electricity Council.

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The chief drafting organization of this Part: East China Electric Power Design Institute and Guangdong Provincial Electric Power Design and Research Institute.

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Any comments and suggestions made during the implementation

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of this code are kindly requested to be referred to the Standardization Center of China Electricity Council at No.1, Lane 2, Baiguang Road, Xuanwu District, Beijing, China.

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1 Scope

This Part of DL/T 5409 specifies the basic technical requirements and design basis for hydrological and meteorological survey for nuclear power plants.

This Part applies to the survey engineering of nuclear power plants.

2 Normative References

The following normative documents contain provisions which, through reference in this text, constitute the provisions of this Part. For dated references, subsequent amendments to (excluding corrigendum), or revision of, any of these publications do not apply. However, parties to agreements based on this Part are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document applies.

GB/T 12763.2 *Specifications for Oceanographic Survey, Part 2: Marine Hydrographic Observation*

GB/T 12763.3 *Specifications for Oceanographic Survey, Part 3: Marine Meteorological Observations*

GB/T 14914 *The Specification for Offshore Observations*

GB/T 50138 *Standard for Stage Observation*

GB 50159 *Code for Measurements of Suspended Sediment in Open Channels*

GB 50179 *Code for Liquid Flow Measurement in Open Channels*

HAD 101/11 *Design Basis Tropical Cyclone for Nuclear Power Plants*

HAD 102/09 *Final Heat Sink and Directly Associated Heat Transport Systems for Nuclear Power Plants*

DL/T 5084 *Technical Code of Hydrology for Electrical Power Projects*

DL/T 5158 *Technical Code of Meteorological Surveying for Electrical Power Projects*

SL 44 *Regulation for Calculating Design Flood of Water Resources and Hydropower Projects*

SL 58 *Technical Standard for General Geodesic Survey in Hydrology*

SL 257 *Code for Waterway Survey*

QX/T 45 *Specifications for Surface Meteorological Observation, Part 1: General*

QX/T 61 *Specifications for Surface Meteorological Observation, Part 17: Measurements at Automatic Meteorological Stations*

3 Terms and Definitions

The following terms and definitions are applicable to this code.

3.0.1

Deterministic method

A method by which most parameters and their values can be determined mathematically and explained by means of physical correlations.

3.0.2

Probabilistic method

A method by which extreme values of hydrometeorological parameters are calculated using frequency analysis based on historical data.

3.0.3

Design basis

Values of design parameters determined for important nuclear safety-related items to meet their design criteria.

3.0.4

Region

A geographical area large enough to include all the features related to a phenomenon or involved under the effect of a special condition.

3.0.5

Final heat sink

A medium which can always take the residual heat from nuclear power plants when all other means have failed or cannot remove all the heat.

3.0.6

Important safety-related item

Structures, systems, or components, the failure or breakdown of which may expose the site personnel or public to radiation.

3.0.7

Hydrometeorological regime

The situation and trend how hydrometeorological elements change in time and space.

3.0.8

Storm surge

The abnormal and aperiodic rise and fall of local sea surface caused by the strong wind and sudden change of atmospheric pressure accompanying extreme weather systems such as tropical and extratropical cyclones when passing by.

3.0.9

Tsunami

Long-cycle seismic ocean waves caused by pulse disturbances such as sharp displacement of seabed caused by earthquake in seas or oceans, volcanic eruption, or landslides beneath the ocean.

3.0.10

Seiche

The oscillation of enclosed or semi-enclosed water body caused for disturbance of atmosphere, ocean or earthquake.

3.0.11

Hydrometric test

The operations carried out to measure hydrometric elements.

3.0.12

Special meteorological and hydrometric station

The hydrometeorological observation station set up for acquiring

hydrometeorological element values at the site for construction purposes. Its observation items and service life are determined according to the intended use of the station.

4 Basic Requirements

4.0.1 The hydrological and meteorological survey for nuclear power plants must follow the nation's safety-first policy on civil nuclear facilities and laws and regulations related to nuclear power construction. This code is developed to unify the technical standards for hydrometric survey of nuclear power plants, objectively evaluate the hydrometric characteristics of plant sites, and finalize the hydrometeorology design basis for nuclear power projects.

4.0.2 The hydrometeorological survey for a nuclear power plant shall be carried out in stages, preferably involving site survey, pre-feasibility study, feasibility study, preliminary design, detailed design, construction, and operation.

4.0.3 The whole process of a hydrometeorological survey shall be carried out under the effective operation of the established quality assurance system and strict quality monitoring.

4.0.4 The hydrometeorological survey, analysis and calculation shall be carried out based on facts with safety and quality being the primary considerations. An in-depth investigation and study of the regional hydrometric regime shall be conducted, with focus placed on the analysis of regional hydrometric laws.

4.0.5 The regional hydrometeorological observation and investigation data shall be used as the primary source for analysis and calculation of hydrometeorology for purpose of the nuclear power plant. In addition, hydrometric test and special hydrometeorological station can also be used based on the site features to obtain site-specific representative data. The hydrometric data used shall be