ICS 27.100
F 20
Record No. J1045—2010

DL

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

P **DL / T** 5252 — 2010

Meteorological Testing Specification for Environment Impact Assessment of Thermal Power Plants

Issue Date: May 24, 2010 Implementation Date: October 1, 2010

Issued by the National Energy Administration

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

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Translation sponsored by : China Electric Power Planning & Engineering Association

Translated by: SUNTHER Consulting Co., Ltd.

Reviewed by: Northwest Electric Power Design Institute,
Central Southern Electric Power Design Institute, and
Xinjiang Electric Power Design Institute

CHINA ELECTRIC POWER PRESS

BEIJING, 2013

图书在版编目（CIP）数据

DL/T 5252—2010 火力发电厂环境影响评价气象测试技术规定= Meteorological Testing Specification for Environment Impact Assessment of Thermal Power plants: 英文/国家能源局发布. —北京：中国电力出版社，2013.5

ISBN 978-7-5123-4188-3

Ⅰ. ①D… Ⅱ. ①国… Ⅲ. ①火电厂–电力工程–环境气象学–环境影响–大气评价–规定–英文 Ⅳ. ①X823②X16

中国版本图书馆 CIP 数据核字（2013）第 050263 号

中国电力出版社出版

（北京市东城区北京站西街 19 号 100005 http://www.cepp.sgcc.com.cn）

北京博图彩色印刷有限公司印刷

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2013 年 5 月第一版 2013 年 5 月北京第一次印刷

850 毫米×1168 毫米 32 开本 1.125 印张 25 千字

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Foreword

This specification is prepared in accordance with the requirements of the *Notice on Issuance of Plan for Supplementing Electric Power Industry Standard* 2003 *issued by the General Office of National Development and Reform Commission* (FGBGY [2003] 873).

This specification is a revision to SDGJ 95—1990 *Meteorological Testing Specification for Pollution of Thermal Power Plant* (*trial*) issued by the former Ministry of Energy of the People's Republic of China, referring to the requirements of HJ 2.2 *Guidelines for Environmental Impact Assessment-Atmospheric Environment* and GB/T 3840 *Technical Methods for Making Local Emission Standards of Air Pollutants.*

Appendixes A, B and C to this specification are informative.

This specification is proposed by the China Electricity Council, and solely managed by the Technical Committee on Electric Power Planning and Engineering of Standardization Administration of Power Industry.

Chief drafting organizations: Northwest Electric Power Design Institute under China Power Engineering Consulting Group Corporation, Central Southern Electric Power Design Institute under China Power Engineering Consulting Group Corporation and Xinjiang Electric Power Design Institute.

Chief drafting staff: Xie Yongping, Wang Peihua and Liu Shu.

This specification supersedes the SDGJ 95—1990 *Meteorological Testing Specification for Pollution of Thermal power plant* (*trial*) upon implementation on October 1, 2010.

Any comments and suggestions raised during the implementation of this specification are to be referred to the Standardization Center of China Electricity Council at the address: No.1, Ertiao, Baiguang Road, Beijing, 100761.

This specification is translated by SUNTHER Translation & Solutions under the authority of China Electric Power Planning & Engineering Association.

1 Scope

This specification defines the fundamental requirements on meteorological testing activities in environmental impact assessment for construction projects of thermal power plants.

This specification is applicable to the meteorological testing activities in environmental impact assessment for construction projects of thermal power plants. It may also be taken as a reference for waste fired power stations and biomass power generation projects.

2 Normative Reference

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

GB/T 3840 *Technical Methods for Making Local Emission Standards of Air Pollutants*

GB 13223 *Emission Standard of Air Pollutants for Thermal Power Plants*

HJ 2.2 *Guidelines for Environmental Impact Assessment-Atmospheric Environment*

3 Terms and Definitions

The following terms and definitions apply to this specification.

3.0.1

Assessment area

Abbreviated from environmental impact assessment area. Different pollution sources result in different impact areas for different environmental elements. The assessment area described herein refers to the atmospheric environmental impact assessment area.

3.0.2

Cavitation at leeward slope

When an air flow passes obstacles, such as mountains, buildings, the counterflow area formed within a certain distance range of such obstacles at the leeward side.

3.0.3

Mountain valley breeze

It results from thermodynamic difference between a mountain valley and the surrounding air. In the daytime, wind blows from the valley to slope of a mountain (referred to as valley breeze); and at night, wind blows from the slope to valley of a mountain (referred to as mountain breeze). Valley breeze and mountain breeze are collectively called as the mountain valley breeze.

3.0.4

Sea breeze and land breeze

A wind characterized by diurnal variation which is formed near coasts due to uneven temperature between the land and the sea.

Where the basic air flow is weak, wind blows from the sea to the land in the daytime (referred to as sea breeze), and blows from the land to the sea at night (referred to as land breeze), and the both of them are collectively called as sea breeze and land breeze.

3.0.5

Atmospheric boundary layer

The lowest layer of aerosphere, also known as the "planetary boundary layer". In this layer, strong exchanges of various properties between the atmosphere and the ground occur due to thermal and dynamic effects from the ground, and as a result, the atmospheric motions present substantially irregular turbulent state.

3.0.6

Internal boundary layer

A new boundary layer occurring in the original boundary layer when air flow transits from one underlying surface to another underlying surface with different thermal and dynamic properties, also known as secondary boundary layer.

3.0.7

Urban heat island circulation

A kind of local wind caused by the temperature difference between urban area and the surrounding suburban or rural areas.

3.0.8

Temperature inversion

The phenomena that the atmospheric temperature rises with the increase in height above the ground.

4 General Provisions

4.0.1 When it is determined to carry out the environmental impact assessment for a project, the following data concerning the project and the project area shall be preliminarily acquired and confirmed.

1 Characteristics, planned capacity, and the current construction scale of the power plant;

2 Fuel composition analysis and fuel consumption;

3 Main flue gas pollutants and the emission amount thereof (refer to Appendix A for the calculation method of emission amount of flue gas pollutants);

4 The design scheme and relevant data of the project at early stage, especially the design data concerning air pollution prevention and control facilities;

5 Geographical location and topographical conditions of the plant site, and the applicable ambient air quality standards.

4.0.2 The following meteorological and climate data for the last five years shall be acquired from the meteorological observatory (station) most close to the plant site.

1 Frequencies of the individual wind directions of each month and over an entire year;

2 Average wind speeds of the individual months and over an entire year;

3 Average temperatures of the individual months and over an entire year;

4 Average humidity, maximum wind speed, minimum wind speed, highest air temperature, lowest air temperature and the ground

surface temperature of the individual months;

5 Number of rainy days and amount of precipitation of the individual months;

6 Number of foggy days and snowy days of the individual months;

7 The special climatic features in the local area.

4.0.3 The topographical and climatic features of the assessment area shall be surveyed through on-site observing and probing in a targeted manner.

4.0.4 The meteorological items for test should not be selected and determined beyond the scope as follows:

1 Probing on the wind direction and wind speed of atmospheric boundary layer;

2 Probing on the temperature stratification of atmospheric boundary layer;

3 Probing on the turbulence characteristic parameters of atmospheric boundary layer;

4 Probing on horizontal flow field on the ground;

5 Observation of meteorological elements at ground;

6 Probing on the special atmospheric structure under complex topographical condition, such as cavitation at leeward slope, mountain valley breeze, sea breeze and land breeze, internal boundary layer, and urban heat island circulation.

4.0.5 The instruments may be selected for meteorological test as follows:

1 Electrical earth anemorumbometer;

2 Barometer or aneroid barometer;

3 Wet-and-dry-bulb thermometer or Assmann ventilated wet-and-dry-bulb thermometer;

4 Sunphotometer;

5 Water thermometer;

6 Pilot balloon theodolite;

7 Electronic low-altitude radiosonde;

8 Atmospheric Data Acquisition System (ADAS) low-altitude detection system;

9 Acoustic radar for temperature measuring;

10 Three-component anemometer.

4.0.6 Thermal power plant sites have two types of topography as follows:

1 Simple topography: means that the terrain elevation (except for buildings) of assessment area is less than the height of exhaust stack and the assessment area involves no medium and large cities and land-sea interface areas.

2 Complex topography: means that the terrain elevation (except for buildings) of assessment area exceeds the height of exhaust stack, or the assessment area involves medium and large cities or land-sea interface areas.

4.0.7 Where the meteorological test involves the application of hydrogen gas or work at height on site, the applicable national regulations must be observed.

5 Selection of Meteorological Test Schemes

5.0.1 The seasons when meteorological test work is to be carried out shall be determined according to the local climatic and topographical features.

5.0.2 The duration and frequency of meteorological tests shall meet the following requirements:

1 For the projects requiring temporary ground-based meteorological observation, it is necessary to carry out observation for two quarters for assessment of Class I and one quarter for Class II. The effective time of observation shall not be less than 30 days for each quarter. See the relevant provisions for the daily observation frequency.

2 For the projects requiring probe on the mean wind field of atmospheric boundary layer and test on the atmospheric turbulent diffusion:

1) The effective test days shall not be less than 15 quarterly and the test shall be made for at least 6 times per day.
2) The test frequency shall be determined taking into account the uniformity of intervals between tests during daytime and night and the diurnal variation characteristics of meteorological elements. Where the terrain is complex, additional observations may be carried out in periods when the diurnal variation of meteorological element peaks or shifts.
3) The test shall be made for eight times per day,

respectively at 02:00, 05:00, 08:00, 11:00, 14:00, 17:00, 20:00 and 23:00.

4) For the special pollution meteorological processes, the observations performed for additional times may be needed for two or three days, with the tests being increased to 12 times per day.

5.0.3 Simple Topography

1 Where there are basic meteorological stations near the assessment area (within 50 km of the flue gas exhaust source of the power plant, the same below), the routine ground-based meteorological data available from them for the recent five years may be used without the necessity of carrying out temporary ground-based meteorological observation. Otherwise, temporary ground-based meteorological observation shall be performed.

2 Where the test data on mean wind field of atmospheric boundary layer of the locations near the assessment area is already available, it can be used directly without the necessity of carrying out the relevant tests. Otherwise, a one-quarter test shall be made in the season that has relatively more serious impact on environment.

3 The atmospheric turbulent diffusion test may be eliminated. Instead, the diffusion parameters may be directly selected from the recommended values given in the technical guidelines for environmental impact assessment.

4 Test items and requirements are as follows:

1) Ground-based observation of meteorological elements and weather conditions shall include:

Wind direction and wind speed at a height of 10m above the ground;

Total cloud amount and low cloud amount;

Atmospheric temperature, humidity and pressure at the ground surface;

Weather phenomena.

2) The test on distribution of wind directions and wind speeds in atmospheric boundary layer should be made using baseline-balloon wind-measuring method. If conditions permit, ADAS may be used.

3) It should be probed by using electronic low-altitude radiosonde for temperature stratification in atmospheric boundary layer, while test wind by baseline-balloon wind- measuring method. If conditions permit, ADAS may be used.

5.0.4 Complex Topography

1 Where there are basic meteorological stations near the assessment area, the routine ground-based meteorological data available from them for the recent five years may be used without the necessity of carrying out temporary ground-based meteorological observation. Otherwise, temporary ground-based meteorological observation shall be performed.

2 Where the test data on mean wind field of atmospheric boundary layer of the locations near the assessment area is already available, it can be used directly without the necessity of carrying out the relevant tests. Otherwise, a two-quarter test shall be made in the seasons that have relatively more serious impact on environment.

3 In addition to the test items specified in 5.0.3, one or more of the following test items shall be included depending upon the characteristics of local flow field:

1) Frequency, time period, diurnal wind-speed variation range and spatial impact coverage of the mountain

valley breeze;

2) Frequency, time period, diurnal wind-speed variation range and spatial impact coverage of the sea breeze and land breeze;
3) Frequency, time period, diurnal wind-speed variation range and spatial impact coverage of the urban heat island circulation;
4) Ground temperature and water temperature;
5) Solar radiation;
6) Atmospheric diffusion parameters.