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NB

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

NB/T 51043-2015

**Technical Specification for Repairing Collapse Shaft of
Production Mine**

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Table of Contents

1 General Provisions	1
2 Terms	2
3 Basic Regulations	3
3.1 Classification and Grading of Vertical Shaft Collapse	3
3.2 The Principle of Management and Remediation	3
3.3 The Procedures of Management and Remediation	4
4 Exploration and Assessment of Vertical Shaft Collapse	6
4.1 General Regulations	6
4.2 Exploration of Vertical Shaft Collapse	6
4.3 Assessment of Vertical Shaft Collapse	7
5 Management and Remediation of Vertical Shaft Collapse	9
5.1 General Regulations	9
5.2 Temporary Lifting System	9
5.3 Shaft Repairmen	10
5.4 Shaft Grouting	12
5.5 Clean of Collapse Rubble	14
6 Removal and Installation of Vertical Shaft Equipment	16
6.1 General Regulations	16
6.2 Removal of Shaft Equipment	16
6.3 Installation of Shaft Equipment	16
7 Auxiliary Facilities	18
8 Acceptance of Project and Commissioning	19
8.1 Acceptance of Project	19
8.2 Commissioning and Final Acceptance	20
Appendix A Table of Preliminary Vertical Shaft Collapse Investigation.....	21
Appendix B Table of Detailed Vertical Shaft Collapse Investigation.....	22
Explanation of Words in the Specification	25
A List of Reference Standards	26
Addition: Explanation of Provisions	27

Foreword

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 73.020, Chinese classification P 00/09.

By Announcement No. 6 of 2015, dated 27 October 2015, the National Energy Administration approved and issued 96 energy industry standards (NB), including this specification, which is listed as item 62 with an approval date of 2015-10-27 and an implementation date of 2016-03-01.

This specification was formulated in accordance with the Notice of the National Energy Administration on Issuing the First Batch of Energy Sector Industry Standard Formulation and Revision Plans for 2012 (Guoneng Keji [2012] No. 83) and the Notice on Issuing the Administrative Measures for Industry Standardization in the Energy Sector (Trial) and Their Implementing Rules (Guonengju Keji [2009] No. 52). The drafting group carried out extensive investigation and research, summarized practical experience, referred to relevant domestic and foreign codes and standards, and widely solicited opinions.

This specification consists of 8 chapters and 2 appendices. Its main contents include general provisions, terms, basic regulations, investigation and assessment of vertical shaft collapse, repair and remediation of vertical shafts, removal and installation of vertical shaft equipment, auxiliary facilities, and acceptance and trial operation.

This specification is administered by the National Energy Administration; the China Coal Construction Association is responsible for its routine management, and Hunan Chuxiang Construction Engineering Co., Ltd. is responsible for the interpretation of specific technical content. Opinions or suggestions arising during implementation should be sent to Hunan Chuxiang Construction Engineering Co., Ltd. (No. 102 Xinmei Road, Tianxin District, Changsha, Hunan Province; postcode 410114).

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1 Scope

NB/T 51043-2015 governs the remediation and reconstruction of collapsed vertical shafts in operating coal mines. A shaft collapse in a working mine is a crisis: the shaft is the mine's lifeline for hoisting, ventilation and access, and the collapsed section is unstable, often water-bearing and surrounded by disturbed ground. The standard sets the general

provisions and defined terms, then classifies shaft collapse damage into grades I to III by the height of the collapsed section and sets out the principles and the twelve stages of a remediation. It covers the investigation that must precede any work - the preliminary and the detailed survey of the collapse, the condition of the lining above and below, the hydrogeology and the state of the surrounding ground. The treatment follows: the stabilisation and consolidation of the collapsed zone, the grouting of loose material and of water-bearing strata, the removal of debris, and the repair of the shaft wall with its support and lining. The standard then deals with the restoration of the shaft equipment - the guides, buntons, pipes and cables - and the hoisting system, and with the safety measures that apply throughout, including monitoring of deformation and water inflow. The inspection and acceptance of the repaired shaft and the records to be kept close the standard. It applies to coal mines in China.

1.0.1 This specification is formulated to standardize the repair and remediation of collapsed vertical shafts, so that the work is safe and reliable, technically mature and economically reasonable.

1.0.2 This specification is applicable to repair and remediation projects for collapsed vertical shafts of production mines.

1.0.3 The repair and remediation of a collapsed vertical shaft is an emergency rescue and disaster relief operation, and the scheme shall be formulated on the principles of safety, speed and economy.

1.0.4 The repair and remediation of a vertical shaft shall be closely coordinated with the production activities of the whole mine, under unified command and dispatching.

1.0.5 In addition to this specification, vertical shaft repair work shall also comply with the provisions of the relevant current national standards, codes and regulations.

2 Terms

2.0.1 Shaft collapse: the phenomenon of fragmentation and caving of the shaft wall and the surrounding rock of a vertical shaft.

2.0.2 Collapse height: the distance from the upper edge to the lower edge of the part of the shaft wall that has collapsed or fragmented.

2.0.3 Cavity of collapse: the void formed after the surrounding rock has caved in.

2.0.4 Temporary supporting: support installed before permanent support in order to temporarily maintain the stability of the surrounding rock and ensure the safety of operations.

2.0.5 Permanent supporting: support installed to maintain the stability of the rock surrounding the shaft or roadway throughout its service life.

2.0.6 Construction platform: a working platform built during construction for safe and convenient operation.

2.0.7 Temporary hoists system: a hoisting and transport system set up temporarily during production and construction to move materials, facilities and personnel up and down.

3 Basic Regulations

3.1.1 According to the cause of collapse, vertical shaft collapses are classified into collapses affected by mining and collapses not affected by mining.

3.1.2 According to the collapse height and the damage to the ventilation, drainage and power supply systems and to the shaft equipment, the damage grade of a vertical shaft collapse may be determined in accordance with Table 3.1.2 (damage grades of vertical shaft collapse in production mines).

Table 3.1.2, grade I: cumulative collapse height not more than 5 m, and height of any single section not more than 3 m.

Table 3.1.2, grade II: cumulative height greater than 5 m and not more than 20 m, or height of a single section greater than 3 m and not more than 10 m.

Table 3.1.2, grade III: cumulative height greater than 20 m, or height of a single collapsed section greater than 10 m.

Note to Table 3.1.2: for a grade I or grade II collapse, where the ventilation, drainage or power supply system is damaged or the shaft equipment is damaged, the collapse damage grade shall be raised by one grade.

3.2.1 Before repair and remediation, a special demonstration of the necessity and feasibility of repairing the collapsed shaft shall be carried out, and a decision shall be made either to repair or to rebuild.

3.2.2 After a vertical shaft collapse, a special assessment of the underground safe production conditions shall be carried out, giving a conclusive opinion on whether to maintain, stop or partially stop mine production activities.

3.2.3 The repair and remediation scheme shall be selected according to factors such as the purpose of the shaft, the cause of collapse, the degree of damage and the geological conditions of the damaged section.

3.2.4 The repair of the vertical shaft wall may be carried out in three sections: reinforcement above the collapsed section, repair of the collapsed section, and reinforcement below the collapsed section.

3.2.5 Before repair and remediation of a collapsed vertical shaft begins, the hoisting, ventilation, drainage, compressed air, water supply, power supply, signalling,