



MANAGEMENT OF COKING COAL RESOURCES



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Management of Coking Coal Resources

Dedication

This book is dedicated to the loving memory of late Dr Krishna Dhan Kumar and late Ms Sneha Lata Kumar.

Preface

We are inspired by the multidisciplinary approach in the *magnum opus* of the world-famous Saxonian scientist Georgius Agricola's *De re metallica libri XII* written in 1556. He wrote 12 books of different disciplines in the field of mining and metallurgy. Even today, this achievement is referred to and recognized quite often. Although mining and metallurgy are considered separate fields, we want to address both subjects in this book. The objective is to integrate mining and metallurgy so that the big picture is revealed. Readers from different backgrounds – geologists, mining engineers, metallurgists, business managers, economists, social scientists, students, and others – will find this book a one-stop shop, covering all aspects of the coking coal supply chain. The subject matter of coking coal has been considered from a global perspective with special reference made to the Indian coal industry. Readers will have access to the different problems faced by the industry, and their possible solutions.

The Indian coal industry has been rapidly depleting its indigenous coking coal resources. A sizable portion of the resources had already been used up for steam generation and other nonmetallurgical purposes during most of the twentieth century. Moreover, there are possibilities of further losses in mining processes as a consequence of fire. Thus, the risk of future coking coal scarcity in the Indian steel industry is real. To counter this, India may need to import coal. This has led the authors to probe deeper into the crux of the issue.

Compared with sizable iron ore resources in India, coking coal resources are deficient both in quantity and quality. In fact, it has become necessary to import high-grade coking coal to supply demand from the steel industry. Yet, the reserves of noncoking coal in India are overly adequate, giving the possibility of replacing coking coal with noncoking coal in steel making via emerging techniques.

Estimation of coal resources is a continuous process with reserves being updated periodically as a result of the exploration activities of different agencies.

Other factors like increases in coal price can convert uneconomic resources into economically exploitable ones.

Coking coal reserves, as per our present knowledge, are likely to last only a few decades based upon present and projected rates of consumption. There are revolutionary advances being made in different scientific fields concerning the steel and coal industries. Hopefully, advances in exploration, mining technology, beneficiation techniques, coke making, steel manufacturing, and globalization will help extend the lifespan of coking coal reserves.

The subject chosen in the text encompasses a wide range of scientific and technological disciplines. This book represents not only the culmination of many years of studying reports, published material, and unpublished material, but also of a sustained effort to scientifically relate their findings.

The following interdisciplinary problems encompassing economics, management systems, and mathematical analyses have been dealt with:

- The present state of the Indian steel industry and possible methods of reducing consumption of coking coal.
- A purposive classification of resources, status of coking coal reserves in India, and their lifespans.
- The present mining conditions in India and the possibilities of improvement in exploitation methods.
- Transportation system bottlenecks and examination of the feasibility of introducing hydraulic transportation.
- Economic considerations for resource assessment, mining, quality control, and supply problems.
- Sustainable mining and its role in the viability of the mining industry.

As there is no specific book on coking coal, the subject matter is both timely and relevant for undergraduate and graduate students, practicing engineers, supervisors, and the research community. Although the service industry may override the manufacturing industry in enhancing the GDP of a country, basic industrialization rests on the growth of steel production. Blast furnace technology is going to be around for several decades, and consequently coking coal use will not lose its dominance. Therefore, the subject matter is highly appropriate in that it details the steps required to support the growth of the steel industry in the context of coking coal.

The emphasis is on sound management practice to insure profitability with due regard to community development. Strategic plans have been drawn to optimize the planning process incorporating all governing factors. There is enough scope for improvement of productivity in mining operations, most markedly in mining technology, the use of higher capacity equipment for

larger mines, autonomous control, predictive maintenance (PdM), and digital communication systems.

It is hoped that the broad coverage and in-depth study of each problem presented in this book will make a seminal contribution to the coking coal sector, the mining and steel industries of India, and the world at large.

May 2015

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Deepak Kumar

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Contents

PREFACE	xiii
ACKNOWLEDGMENTS	xvii
CHAPTER 1 Introduction	1
1.1 Problems	1
1.2 The objective of this book.....	2
1.3 Supply chain management.....	4
1.4 Resurgence of the Indian coal industry	6
References	8
CHAPTER 2 Latest Developments in the Iron and Steel Industry	9
2.1 Global perspective.....	9
2.1.1 Steel consumption and economic growth	9
2.1.2 Technology of steel making	13
2.1.3 Reuse and recycling.....	16
2.1.4 Technical efficiency of iron and steel firms.....	23
2.2 Indian steel industry.....	24
2.2.1 Preamble.....	24
2.2.2 Milestones.....	25
2.2.3 Industry structure and trends	26
2.2.4 Optimum level of coal ash feed	26
2.2.5 SWOT analysis.....	26
2.2.6 Calculation of safety stock: a hypothetical example	26
2.2.7 Reduction in the consumption of coking coal	31
2.2.8 An update on BF iron making	52
2.2.9 Supply of raw materials.....	55
2.2.10 Market mechanism.....	57
References	59
CHAPTER 3 Evaluation of Coking Coal Resources and Reserves	61
3.1 Definition of resources and reserves	61
3.1.1 World coal resources	61
3.1.2 National vis-à-vis international classification of resources	62
3.2 International classification of coals	71
3.3 Measurement of coking propensity	71
3.3.1 Petrography	73

3.4	Indian classification of coking coal	78
3.4.1	Coking coals.....	78
3.4.2	Gondwana coal deposits.....	80
3.4.3	Tertiary coals	83
3.5	Description of coalfields	85
3.5.1	The Bokaro coalfield	85
3.5.2	The North Karanpura coalfield.....	87
3.5.3	The South Karanpura coalfield.....	87
3.5.4	The Sohagpur coalfield.....	88
3.5.5	The Raniganj coalfield	88
3.5.6	The Ramgarh coalfield	89
3.5.7	The Pench-Kanhan valley coalfields.....	89
3.5.8	The Sonhat coalfield	90
3.6	Estimation of minable reserves	90
3.6.1	Geological factors	90
3.6.2	Economic considerations.....	91
3.6.3	The reserves/production ratio (R/P) recovery factor	92
3.6.4	Losses during mining	92
3.6.5	Indian coking coal reserves.....	93
3.6.6	Demand estimates.....	96
3.7	Growth rate analysis.....	96
3.7.1	Nomenclature.....	96
3.7.2	Linear growth.....	96
3.7.3	Compound growth	97
3.7.4	Exponential growth.....	98
3.7.5	Comparison of growth types.....	98
3.7.6	The life expectancy of reserves	98
3.8	Geological exploration.....	99
3.8.1	Conventional methods.....	100
3.8.2	Geophysical methods.....	101
3.8.3	Drilling methods.....	104
3.8.4	Evaluation methods	106
3.8.5	Geochemical methods	107
3.8.6	The cost of exploration	108
3.8.7	Assessing the grade of an exploration block	108
3.8.8	The latest international developments	110
	References	110

CHAPTER 4 Rational Implementation of Mining Technology 113

4.1	The journey through the digital age	113
4.1.1	Mine site automation – graduating to autonomous systems.....	114
4.2	The ERP system	118
4.2.1	A cloud-based ERP solution	120
4.3	Total quality management (TQM)	120
4.3.1	Attributes of coking coal.....	122
4.3.2	Benchmarking – a necessity	123
4.4	Productivity management	124
4.4.1	The productivity concept.....	125

4.4.2	Factors affecting productivity	125
4.4.3	Quality and productivity	125
4.4.4	Measuring productivity	127
4.4.5	The effect of mechanization	129
4.5	Mining strategies and related issues.....	130
4.5.1	External factors	132
4.5.2	Internal factors	134
4.5.3	Indian perspective – the bottom line	137
4.6	Innovation, globalization, and local flexibility	137
4.6.1	Global mining management	140
4.7	The history of Indian coal mining.....	142
4.7.1	The preindependence period.....	142
4.7.2	The postindependence period	143
4.7.3	Conspectus of mining conditions	144
4.7.4	U-turn in technology.....	146
4.8	Extractability	147
4.9	Selective mining	148
4.10	Special mining methods.....	149
4.10.1	Importing technology.....	151
4.11	Highwall mining	151
4.12	Integrated coal preparation through deshaling.....	152
4.13	Implementation of IT in India	153
4.14	Quality control at coal mines	154
4.15	Revitalization of the Jharia coalfield.....	155
4.15.1	Preamble.....	155
4.15.2	Geology of the coalfield	155
4.15.3	Existing conditions.....	156
4.15.4	Mine planning and operation.....	157
4.15.5	General approach at the Jharia coalfield	159
4.15.6	Further exploration.....	161
4.15.7	Methods of mining	162
4.16	Concluding Remarks.....	166
	References	167
	Appendix: underground coal mining – new dimensions	169
	Stocktaking.....	169
	Longwall mining – a critique.....	171
	Outsourcing through MDOs.....	173
	Maintenance management	173
	Training through simulators	174
	The way ahead.....	174
CHAPTER 5	Solutions to Transportation Problems.....	177
5.1	Preamble	177
5.2	Storage and handling	178
5.3	Rail transportation	178
5.4	Pipeline transport	179
5.4.1	Advantages of pipeline transport	180
5.5	Potentiality of pipeline transport in India	180

5.6	Process design considerations for pipeline transport	181
5.6.1	Theoretical aspects.....	181
5.6.2	Experimental studies.....	185
5.7	The suitability of pipeline transportation for coking coal.....	185
5.8	Transport of (–6 mm) coal by pipeline	186
5.9	The logistics of transportation.....	187
5.10	Discussion	188
5.11	Pipeline transportation of different minerals.....	190
5.11.1	Kudremukh project.....	191
5.12	Final comments on transportation bottlenecks	191
	References	192
CHAPTER 6	Societal Responsibility and Economic Viability	193
6.1	The background to sustainable mining.....	193
6.1.1	Seven questions about sustainability	195
6.1.2	Community development tools of the ICMM	196
6.1.3	Government of India's eight sustainable development frameworks.....	198
6.1.4	The milos statement	198
6.1.5	Sustainable coking coal resources.....	199
6.1.6	Zero waste.....	201
6.1.7	Value chain analysis.....	202
6.1.8	Traditional cost accounting system (TCS) <i>vis-à-vis</i> activity-based cost (ABC) accounting	204
6.1.9	Social issues – corporate social responsibility (CSR) ...	206
6.1.10	Economic performance	207
6.1.11	Social license to operate (SLO).....	208
6.1.12	Engagement of local people in sustainability projects	210
6.1.13	Environmental issues and the management plan	210
6.1.14	Governance – a subject of concern.....	216
6.2	Economic viability.....	216
6.2.1	Preamble.....	216
6.2.2	The price of coal.....	217
6.2.3	Mining costs.....	218
6.2.4	The feasibility of a project.....	221
6.2.5	Financial analysis	227
6.2.6	Production losses and recovery – economic evaluation.....	230
6.2.7	Economic considerations.....	234
6.2.8	Evaluation of mining losses, contamination, and profitability.....	234
6.2.9	The minability of marginal parts of a deposit	235
6.2.10	Improved resource recovery	237
6.2.11	Supply problems	239
6.2.12	Importing coking coal	244
6.2.13	Mine closure	245
6.2.14	Concluding remarks	249