

Technical Guide on Internal Audit of Coal Industry



Internal Audit Standards Board
The Institute of Chartered Accountants of India
(Set up by an Act of Parliament)
New Delhi

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Basic draft of this publication was prepared by CA. Sunil Kumar Mehta, CA. Ashish Kumar Gupta, CA. Sandeep Garg, CA. Kundan Shahi, CA. Rinku Kumar Agarwalla, CA. Manjiri Kush Tapas, CA. Sanjay Kumar Singh

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Foreword

Development of Internal audit functions and related activities has always been an important area of focus for the Institute. The Internal Audit Standards Board (IASB) of the Institute of Chartered Accountants of India (ICAI) is working relentlessly to equip members of the Institute with critical knowledge for providing value added internal audit services. The Board, under the authority of the Council issues Standards on Internal Audit (SIAs) on the important areas of internal audit such as Nature of Assurance, Risk Management, Internal Audit Planning, Internal Controls, etc. The Standards represent a codification of the best practices for internal auditors. In addition, the Board has also brought out a number of other publications, industry specific as well as general guide, to impart knowledge about the emerging concepts in internal audit,

Considering the unique nature of Coal Industry, Internal Auditors can help organisations to navigate the rapidly changing business landscape across a range of risks. I congratulate CA. Charanjot Singh Nanda, Chairman, Internal Audit Standards Board, ICAI, CA. Gyan Chandra Misra, Vice Chairman, and other members of the Board for preparing the publication “*Technical Guide on Internal Audit of Coal Industry*” which is an important publication providing practical and valuable guidance to internal auditors related to this Industry.

I am sure that this publication would prove useful to members involved in conducting an internal audit of coal industry in efficient discharge of their professional responsibilities.

February 3, 2023
New Delhi

CA. (Dr.) Debashis Mitra
President, ICAI

Preface

The coal sector in India plays an important role, not just in terms of energy source for the country but also for the socio-economic of the country. Coal Industry contribute to economy by providing cheap, reliable power sources, jobs and billions of rupees in form of cess, taxes, royalties, and rents. For development of coal industry, there is a need to develop strong planning, scheduling and monitoring mechanisms coupled with optimisation of utilisation of coal resources. Coal Industry needs more focus of internal control, fund utilization, expenditure variance, budgeting and statutory compliances.

Considering the unique nature of this Industry, Internal Auditors can help organisations to navigate the rapidly changing business landscape across a range of risks including data privacy and security, regulations and policies, fraud risks, global impacts, etc. Internal auditors should establish credibility with leaders of the organization by demonstrating their skills and capabilities in all strategic areas. Considering this, the Internal Audit Standards Board, ICAI is issuing this publication “Technical Guide on Internal Audit of Coal Industry” which provides practical and valuable guidance to internal auditors related to this Industry.

The Technical Guide is divided into various Chapters. The guide provides Overview of coal industry in India, Energy scenario, types of coal mines. This guide deals overview of coal industry in India such as mine planning, mine scheduling, and mine development. The Guide also explains scenario in the Indian coal industry and challenges faced by an entity operating in this sector. It gives an overview on various aspects like, policies and regulations applicable to coal industry. This also explains applicability of Accounting and Auditing Standards and Standards on Internal Audit to coal industry. This Guide also deals with finance and accounting features of coal industry. The Guide deals with the internal audit aspect of coal industry and procedures to be undertaken by the internal auditors with regard to peculiar aspects related to Coal industry like, production, inputs, machines, explosives, power, etc.

At this juncture, I am grateful to CA. Sunil Kumar Mehta and study group members, viz., CMA Sanjay Kumar Singh, CA. Manjiri Kush Tapas, CA. Ashish Kumar Gupta, CA. Sandeep Garg, CA. Kundan Shahi, CA. Rinku

Kumar Agarwalla for sharing their experience and knowledge and preparing the draft of the Technical Guide. I am also thankful to CA. Harish Nagpal for reviewing the draft Guide and giving his valuable comments.

I would like to thank CA. (Dr.) Debashis Mitra, President, ICAI and CA. Aniket S. Talati, Vice President, ICAI and CA. Gyan Chandra Misra, Vice Chairman, IASB for their continuous support and encouragement to the initiatives of the Board.

I must also thank my colleagues from the Council at the Internal Audit Standards Board, viz., CA. Chandrashekhar V. Chitale, CA. Vishal Doshi, CA. Durgesh Kumar Kabra, CA. Piyush Sohanrajji Chhajer, CA. Purushottam Khandelwal, CA. Priti Salva, CA. Sridhar Muppala, CA. Prasanna Kumar D., CA. Cotha S. Srinivas, CA. Ranjeet Kumar Agarwal, CA. Rohit Ruwatia, CA. Abhay Chhajer, CA. Anuj Goyal, CA. Prakash Sharma, CA. Sanjay Kumar Agarwal, CA. (Dr.) Raj Chawla, CA. Hans Raj Chugh, CA. Pramod Jain, CA. (Dr.) Sanjeev Kumar Singhal, Shri Deepak Kapoor and Shri Chandra Wadhwa and co-opted Members, viz., CA. Anil Kumar Jain, CA. Sapna Govindalal, Gandhi, CA. Viswanath K., CA. Vivek Choudhary, CA. Nagesh Pinge, CA. Venugopala Rao P., CA. Satish Patel, CA. Sunil Kumar Mehta, and Special Invitee, CA. Pradeep Tyagi for their vision and support and their invaluable guidance and also their dedication and support to the various initiatives of the Board. I also wish to express my sincere appreciation for CA. Arti Bansal, Secretary, Internal Audit Standards Board, ICAI, Mr. Harish Dua, Advisor, Internal Audit Standards Board and her team for their efforts in giving final shape to the publication.

I am sure that this publication would prove useful to members involved in conducting internal audit of coal industry in efficiently discharge their professional responsibilities as internal auditors.

February 5, 2023
New Delhi

CA. Charanjot Singh Nanda
Chairman, Internal Audit Standards Board, ICAI

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Abbreviations

AICPI	All India Consumer Price Index
BICP	Bureau of Industrial Cost and Price
COP	Conference of the Parties
CMR	Coal Mines Regulations
CV	Calorific Value
DA	Dearness Allowances
DMO	Domestic Market Obligation
G	Grade
GC	Global Coal
HBA	Harga Batubara Acuan
ICI	Indonesia Coal Index
LHD	Load, Haul and Dump
LoA	Letter of Allocation
MGR	Merry-Go-Round System
MCP	Mine Closure Plan
NDC	National Development Council
NEWC	
Index	Newcastle Coal Index
OECD	Organisation for Economic Co-operation and Development
OBR	Over Burden Removal
OB	Over Burden
OC	Open Cast
ROM	Run-of-Mine
SDL	Side Discharge Loader
UG	Under Ground
WPI	Wholesale Price Index

Chapter 1

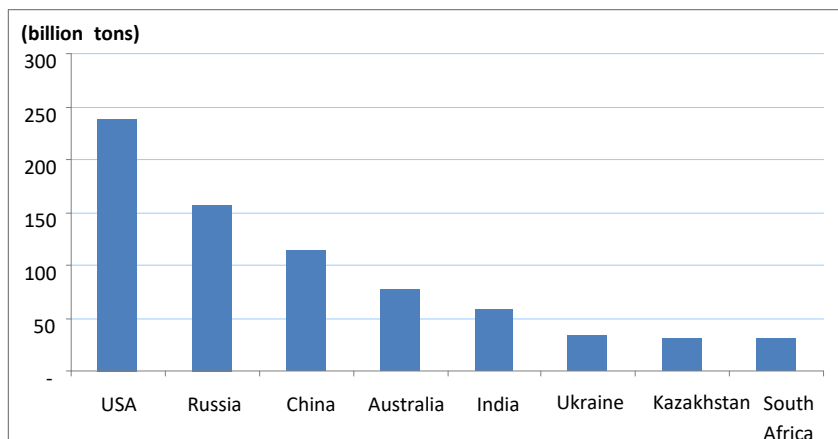
Overview of Coal Industry

Overview of the Global Coal Industry

1.1 Coal meets approximately 41% of the world's electricity needs. However, in certain countries, such as, South Africa, coal accounts for approximately 78% of their electricity needs, while in China and India, it accounts for 78%, and 52% of their electricity needs, respectively.

India is the second largest coal producing country in the world after China. The United States has the largest proved coal reserves, followed by Russia, China, Australia and India, respectively.

Global coal reserves



Although coal deposits are widely distributed across the world, 82% of the world's recoverable reserves are located in five regions: The United States (29%), Russia (19%), China (14%), certain non-OECD countries in Europe and Eurasia primarily former Soviet countries) (10%), and Australia and New Zealand (9%). India accounts for 6.7% of the world's recoverable reserves.

Global Coal Consumption

1.2 Most countries have a congruent consumption and production pattern, except Australia, which produces much more than its domestic demand. China consumes the maximum amount of coal, while India is the third largest consumer of coal. Asia, the biggest market for coal, currently accounts for

60% of global coal consumption, owing to China and India, who are the primary consumers.

Approximately 27% of the world's primary energy needs was met through coal in 2020, and coal was used to generate approximately 40% of electricity used throughout the world. Further, about 13% of total hard coal production is used by the steel industry. Generally, growth in coal consumption in developing countries is a result of higher rates of economic growth and increasing rates of electrification.

Global Coal Exports and Imports

1.3 The major coal exporting countries in the world are Australia, Indonesia, Russia and South Africa. The major coal importing countries are China, India, Japan, Republic of Korea, Taiwan, United Kingdom and Germany.

The lack of indigenous coal resources, technology to mine coal resources and need for specific types of coal prompts countries to import coal. Major coal producers such as China, United States and India also import coal for quality and logistical reasons. India has small reserves of coking coal which are, generally, of low quality and hence imports coking coal to meet its requirement.

Chapter 2

Global Pressure for Phasedown of Coal

2.1 During the Financial Year 2022-23, India has produced Coal about 892 MT. The majority of Coal produced by CIL, SECL and the rest by other private companies to the tune of 100 MT.

World energy demand is growing. The energy demand is expected to grow by more than 60% in the coming years. Therefore, Coal will have major contribution to meet the energy demand.

Higher natural gas prices amid global energy demand led to increase more rely on coal for generation of power. However, by 2025, European coal demand is expected to decline below the 2020 level.

The three major Coal producers China, India and Indonesia have hit record production in 2022-23 and to keep the GDP growth of these countries, the value of coal production will increase upto next 10 years. However, the percentage of share of coal of total energy demands to be reduced and share of renewal energy to be increased in next 10 years.

2.2 With climate change issues on fore, there is call for phase out/phase down of coal from every global environmental forum. Coal has been branded as the dirtiest fuel majorly responsible for global warming. The negotiations at COP26 climate summit in Glasgow (2021) also called for the phase down of coal. In line with environmental commitments made in NDCs submitted during COP21 at Paris, India committed to continue its climate mitigation initiatives through its Panchamrit announcements made at COP26:

- India will reach its non-fossil energy capacity to 500 GW by 2030.
- India will meet 50% of its energy requirements from renewable energy by 2030.
- India will reduce total projected carbon emissions by 1 BT from now onwards till 2030.
- By 2030, India will reduce the carbon intensity of its economy by less than 45%.

Technical Guide on Internal Audit of Coal Industry

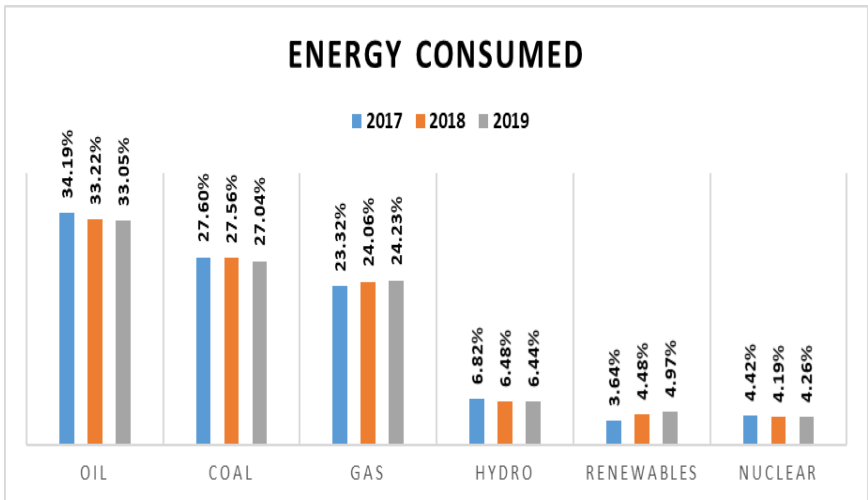
- India will continue to phase down Coal Fire power generation and achieve net zero carbon emission by 2070.
- India will install renewal energy capacity (including Hydro) stood at 165 GW and India is targeting 450 GW by 2030 to keep the process of phasing down of coal.

Chapter 3

Energy Scenario

3.1 The primary sources of commercial energy are oil, coal, natural gas, renewable energy (such as, solar, wind, biomass, etc.), hydroelectricity and nuclear energy. Most of the world's energy consumed is produced by oil (33%). Countries like the US, the UK, Spain, Italy, Australia, Saudi Arabia, Germany and Japan are significantly dependent on oil as the primary source of energy. However, countries like India, China, South Africa, Poland, Ukraine, Czech Republic, Indonesia and several other countries of Asia Pacific are dependent on coal as their primary source of energy. Out of all the continents, Asia is the most dependent on coal, which is evident from the fact that nearly 40% of the total energy consumed in Asia in 2019 was produced from coal.

3.2 Relative contribution of different sources of energy to the total world energy in the past three years is as follows:



As can be seen from above, coal stands at the second place in terms of magnitude of energy consumed in the world. The total energy consumed in the world in 2019 was 583.90 Exajoules. Out of this, 27.04% i.e., 157.90 Exajoules was produced from coal (B.P. Statistical Review 2020).

By the end of 2019, the top five countries occupied the places of highest proved coal and lignite reserves i.e., US (23.33%), the Russian Federation

(15.16%), Australia (13.94%), China (13.24%) and India (9.90%). These five countries together, the coal reserves account for 75.61% of the total world coal reserve. In 2019, India ranked second in the world in production of coal after China, contributing 10.34% of the world coal production. India also ranks second in the year 2019 regarding import coal (both coking and non-coking), amounting to 246,734 MT of coal (Coal Controller's Organisation 2020). These figures clearly imply that India is heavily dependent on coal (both by import and indigenous production) to meet her energy requirements.

3.3 The percentage share of global electricity generation by different source in the year 2020 is depicted as below:

Global Electricity Generation (TWh)			
Source	2009	2019	2020
Oil	1.5	0.3	0.3
Natural Gas	12	4.2	4.5
Coal	69	74	72
Nuclear	1.9	2.8	2.9
Hydro	12	10	10
Renewables	3.2	8.7	9.7

Total electrical energy generated in India in 2018-19 from utilities (public owned plants) and non-utilities (private owned plants) was 1,546,779 GWh. Out of this, 1,371,779 GWh (89%) was generated by utilities alone. Out of the 89% of the electric energy generated by the utilities of India, 1,072,314 GWh (79%) was generated by thermal power plants (B.P. Statistical Review 2020). Thermal power plants are primarily run by steam (that requires coal as source of energy). The increasing demand of energy in India is also explained by the consistently increasing trend of production of raw coal over the past decade.

Overview of the Coal Sector in India

4.1 Nationalization of the Indian coal industry occurred in the early 1970s with a view to enable investment of large public fund for faster growth in coal sector and to stop wasteful mining, optimize available coal resources, improve mine standards and working conditions.

Subsequently, in the context of safety, conservation and scientific development, Government of India acquired all coking coal mines on October 16, 1971, and nationalized them on May 1, 1972. Following the state takeover of non-coking coal mines on January 31, 1973, the Coal Mines Authority Limited was formed in May 1973.

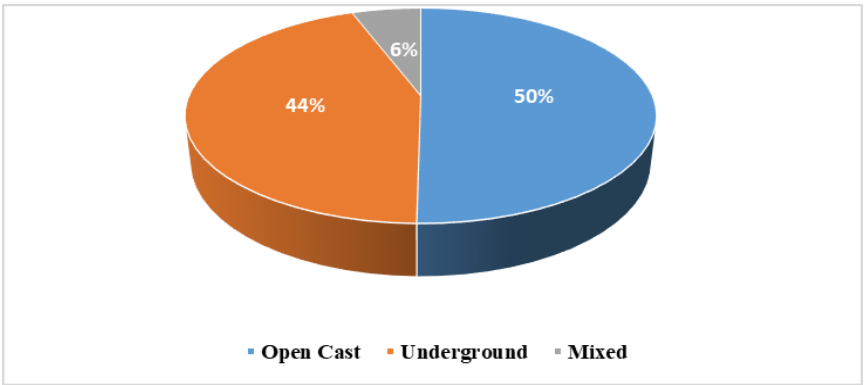
Coal is the dominant source of energy and met 52%, while oil and natural gas met approximately 42% of the total primary energy requirement of India. The low cost of power generation using coal and the availability of huge coal reserves in India are the major incentives for setting up coal-based power plants. Similarly, vast iron ore reserves have encouraged domestic steel players to set up huge steel capacities in India.

The coal sector in India is primarily dominated by the PSUs under the central and the state governments. Most of the coal produced in India is fit for use in power generation. Of the total proven reserves in India, approximately 87.0% of non-coking coal is fit for use in the power sector and the remaining reserves (coking coal) are fit for steel production.

Chapter 5

Type of Coal Mines

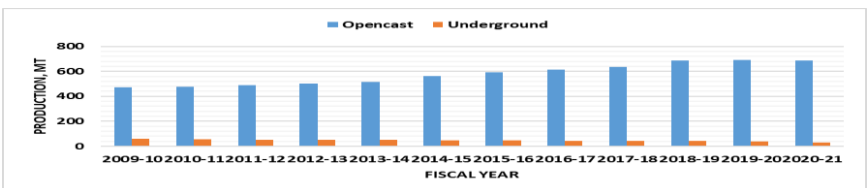
5.1 Coal is primarily extracted by opencast mining in India. Opencast mining is the most popular for profitable winning of coal due to its advantages like higher extraction ratio, higher productivity and lower safety concerns. Distribution of types of coal mining in India as on 31.03.2020 is as follows:



As on 2020 in India, 222 mines are operated by opencast mining method and 195 are underground mining method and 25 are mixed mining method.

In the year 2020-21, 95.64% of coal production in India was from Open Cast mines (684.862 MT) and the rest 4.36% was from Under Ground mines (31.222 MT). In the year 2019-20, the total production of raw coal in India was 730.874 MT whereas it was 728.718 MT in 2018-19. In 2019-20 around 94.44% of coal production in India was from Open Cast mines (690.208 MT) and the rest 5.56% was from Underground mines (40.666 MT), there is an increase in percentage of production of coal from opencast mine (Coal Controller's Organisation 2020).

5.2 The statistics of coal production by opencast and underground mining in India over the past twelve years is shown as below.



It shows a consistently increasing significance of opencast mining in India for profitable extraction of coal. This implies that superior technical and scientific execution of optimized unit operations of surface mining is the need of the hour for maximization of coal productivity in India.

Opencast/ Surface Mine

5.3 Surface mines are typically used for more shallow and less valuable deposits. The view of opencast/ surface mine for better understanding is given below:

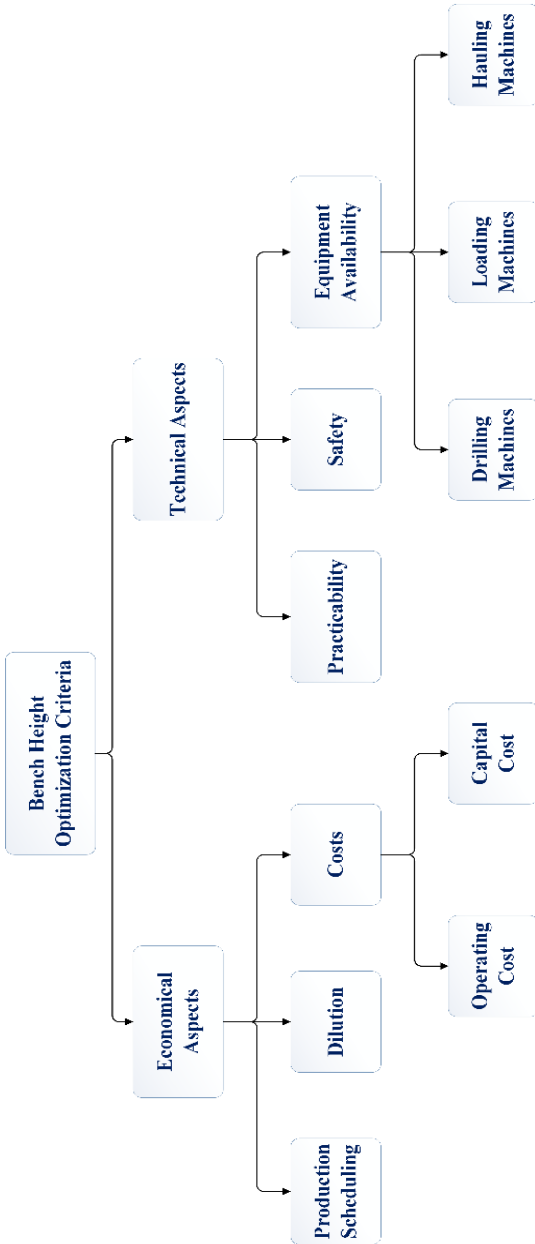


Open-pit mining, also known as open-cast or open-cut mining and in larger contexts mega-mining, is a surface mining technique of extracting rock or minerals from the earth from an open-air pit, sometimes known as a borrow.

This form of mining differs from extractive methods that require tunnelling into the earth. Open-pit mines are used when deposits of commercially useful ore or rocks are found near the surface. It is applied to ore or rocks found at the surface because the overburden is relatively thin, or the material of interest is structurally unsuitable for tunnelling. In contrast, minerals that have been found underground but are difficult to retrieve due to hard rock, can be reached using a form of underground mining.

To create an open pit mine, the miners must determine the information of the extent of coal seam that is underground. This is done through drilling of probe holes in the ground, then plotting each hole's location on a map. The information gained through the holes provides an idea of the vertical extent of the coal seam. This vertical information is then used to pit tentative locations of the benches that will occur in the mine. It is important to consider the grade and economic value of the coal seam in the potential pit. The

bench height depends upon the various aspects and for better understanding bench height optimization criteria is depicted below:



Open-pit mines are typically enlarged until either the mineral resource is exhausted, or an increasing ratio of overburden to coal makes further mining uneconomic. When this occurs, the exhaust mines are sometimes converted to landfills for disposal of solid waste. However, some form of water control is usually required to keep the mine pit from becoming a lake, if the mine is situated in a climate of considerable precipitation or if any layers of the pit forming the mine border productive aquifers. In Germany and adjacent countries several former open pit mines have been deliberately converted into artificial lakes forming areas such as the Lusatian Lake District, the Central German Lake District or the Upper Palatinate Lake District. A particular concern in the formation of these lakes is acid mine drainage.

Open-pit mining is to be considered one of the most dangerous sectors in the industrial world. It causes significant effects to miners' health, as well as damage to the ecological land. Open-pit mining causes changes to vegetation, soil, and bedrock, which ultimately contributes to changes in surface hydrology, groundwater levels, and flow paths. Additionally, open pit produces harmful pollutants depending on the type of mineral, being mined, and the type of mining process, being used.

(i) Shovel Dumper Combination: In Shovel dumper combination, looseness of earth material like Overburden, Coal is done through blasting operation. After blasting operation, the extracted material loaded on Dumper (Hauling equipment's) with the help of Excavators (Loading equipment's). Loading and hauling operation for extraction of earth mineral from Opencast/Surface Mine is shown below:



(ii) Surface Miner: Surface miner is a suitable replacement to drilling and blasting operations in open cast mines, but it cannot be applied anywhere and everywhere. At present in India Surface Miners are used only for coal cutting and removal of overburden done through traditional manner such as drilling and blasting. The operation of surface miner for extraction/cutting of coal seam is shown below:



The selection criteria of surface miner are mainly depending upon the strength of rock strata and degree of deposits.

(iii) Xcentric Ripper: The purpose of blasting is to break the rock but there are unwanted phenomena associated with this, such as, blast-induced ground vibrations, air blast, fly rocks, backbreak, etc. which is required proper attention. Due to the commissioning of large mines in the vicinity of habitation, populous area and near sensitive structures, the generation of blast-induced ground vibration, fly rocks have been a major concern for the mining industry. Apart from this backbreak generation is also a big concern for blast engineers and planners due to Instability of high wall, improper fragmentation, lower productivity, and Safety.

Now, Hydraulic Ripper is gaining popularity because there are various unwanted phenomenon are associated with blasting operation such as, ground vibration, air overpressure, fly rock, backbreak, heat, noise, fume, etc.

The Xcentric Ripper combines the working principles of impact force of a hydraulic breaker with vibration and ripping power of a conventional ripper. Due to this combination of both breaking, vibration and ripping, it can yield up to five-times higher excavation rates compared to conventional hydraulic rock breakers. Xcentric Ripper is exceptionally suitable for soft to medium hard rock like limestone, sandstone and basalt, as well as reinforced concrete.

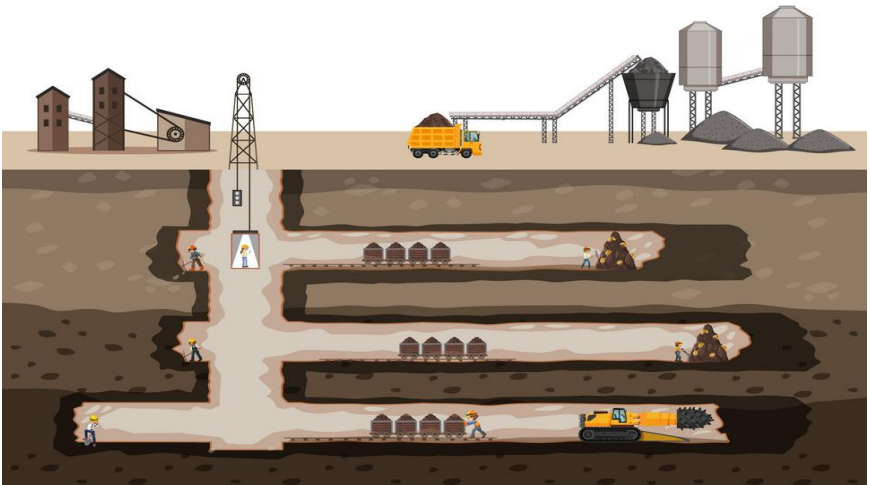
The operation of Xcentric Ripper for breaking rockmass is shown below.



Underground Mining Method

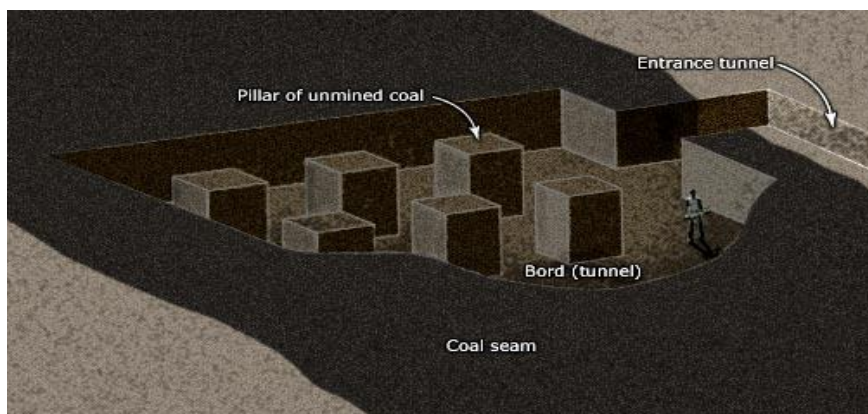
5.4 Underground mining methods become necessary when the stripping ratio becomes uneconomical, or occasionally when the surface use of the land would prohibit surface mining.

In India, two most popular Underground methods for coal extraction are traditionally broken into two groups: Bord and pillar method, and Longwall method. The general layout of the underground mine is given below.



(i) **Bord and Pillar Method:** Miners extracted coal along roadways or bords, with the coal between the bords acting as pillars holding up the roof. The outer pillars were then mined, leaving the roof to collapse in a controlled way as the miners retreated towards the exit.

The layout of the Bord and Pillar is depicted below:



Size of pillar considering the depth of cover from surface (CMR, 2017) is as below:

Depth of seam from Surface	Where the width of the galleries does not exceed 3.0 meters	Where the width of the galleries does not exceed 3.6 meters	Where the width of the galleries does not exceed 4.2 meters	Where the width of the galleries does not exceed 4.8 meters
	The distance between centres of adjacent pillars shall not be less than			
(1)	(2)	(3)	(4)	(5)
	Meters	Meters	Meters	Meters
Not exceeding 60 meters	12.00	15.00	18.00	19.50
Exceeding 60 but not exceeding 90 meters	13.50	16.50	19.50	21.00
Exceeding 90 but not exceeding 150 meters	16.50	19.50	22.50	25.50

Exceeding 150 but not exceeding 240 meters	22.50	25.50	30.50	34.50
Exceeding 240 but not exceeding 360 meters	28.50	34.50	39.50	45.00
Exceeding 360 meters	39.00	42.00	45.00	48.00

Bord and pillar method is adopted for working:

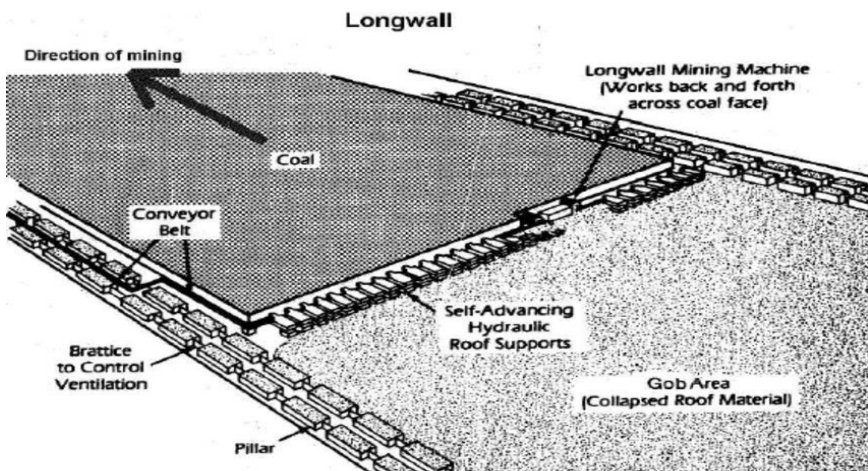
- A seam thicker than 1.5 m.
- A seam free from stone or dirt bands. Stone or dirt bands, if present in a seam, can be easily disposed of for strip packing in longwall advancing method of mining.
- Seam at moderate depth.
- Seams which are not very gassy.
- Seams with strong roof and floor which can stand for a long period after development stage is over.
- Coal of adequate crushing strength.

In India most of the coal mines satisfy the above conditions and therefore, bord and pillar method of mining has been commonly adopted in a large number of the mines. It possesses the following advantages:

- Roads and airways are made of solid coal and their maintenance cost is low throughout the life of the mine.
- Coal output is obtained while roadways are being made during the development stage, and naturally during the depillaring stage, thus providing a continuous flow of coal after the seam is touched.
- Unlike in Longwall mining no unproductive work of dinting, strip packing, etc. is involved.
- The development stage reveals the geological disturbances enabling the management to plan accordingly.

- The working team is usually small at working faces. This helps in simpler methods of calculation of work performance, smoother and more coordinated work.
 - Surface features like railways, important building, rivers etc. which should not be disturbed by underground method of mining and can be well supported during the development stage by the solid pillars of coal and later by only partially extracting the pillars if stowing is not possible.
- (i) Different combination of mechanization in Bord and Pillar Method:
- a) SDL-haulage combination.
 - b) SDL-Belt Conveyor Combination.
 - c) LHD-Belt Conveyor Combination.
 - d) Continuous Miner-Shuttle Car-Belt Conveyor Combination.
 - e) Continuous Miner-LHD-Belt Conveyor Combination

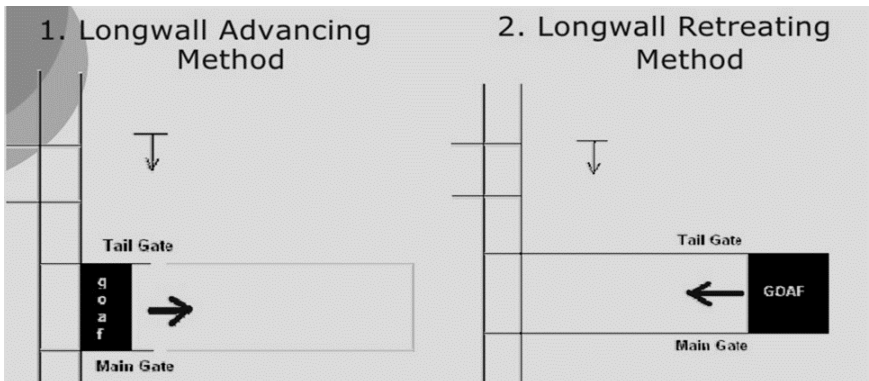
(ii) **Longwall Mining Method:** Longwall method of working consists in laying out long (60-200 m long) from which all coal in working section of the coal seam is removed by a series of operations, maintaining a continuous line of advance in one direction and leaving behind the void (Called goaf). General layout of longwall mining method is depicted below:



The roof over the goaf is partially or completely supported by walls of stone (called pack walls), sand or other material like crushed stone to prevent collapse of roof and only a small strip 3 to 6 m wide and parallel to the face is

supported by timber or steel props, bars, chocks or hydraulic props and cogs in a systematic manner. Alternatively, the roof over the goaf is allowed to cave in but the roadways are secured by packwalls and chocks if they have to be used.

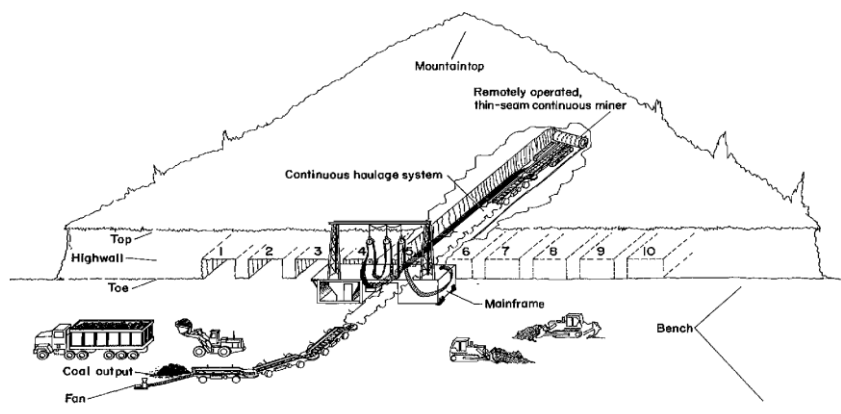
The longwall method of mining is further categorized into two groups i.e., longwall advancing and longwall retreating. In Longwall advancing, the extraction of coal commences from the vicinity of the shaft pillar and proceeds towards the boundary of the mine or panel. On the other hand, in Longwall retreating pairs of headings are driven in solid coal, certain intervals apart, to a predetermined boundary where they are connected by a long roadway to provide a longwall face. Extraction of coal then commences from the boundary and the coal face retreats towards the shaft. In this system goaf packing is not essential for roof support if subsidence of surface or strata above the seam is permitted. Plan view of Longwall Advancing and Longwall Retreating methods is depicted below:



(iii) Highwall Mining

It is a hybrid method of opencast and underground method. Highwall is the final boundary of an opencast mine beyond which the economic extraction of coal by opencast mining is not possible.

Sometimes the presence of some local surface constraints also restricts the further progress of opencast mines. In highwall mining, a series of parallel rectangular, unsupported entries separated by a narrow web pillar are made in the exposed coal seam in the highwall of an opencast mine, is given below:



The entries are made via a remote controlled operated unmanned cutter head and coal transport system placed in front of the highwall. Since all the personnel remain outside the entries, there is no need of ventilation and support. Continuous highwall miner (CHM) systems were introduced in 1980. In CHM system, modified underground continuous miner is used for cutting of coal and a material transfer mechanism using belt or screw conveyors is used to transport the cut coal to surface.

Highwall mining methods are useful to mine:

- Coal blocked in the highwalls of open cast mines due to un-economic stripping ratio.
- Coal blocked in the boundaries of opencast mines.
- Coal blocked in thin seams for which no conventional mining method is available or economically viable.
- Coal seams in hills and in forest area.
- Coal blocked below roads, permanent surface structures and villages.
- Coal where conventional extraction is constrained for various reasons.

The following options are generally practiced with highwall miner:

(a) Contour Mining: When the coal seams appear at outcrop in hilly area conventional method of mining i.e. opencast or underground may not be best economic choice. Highwall mining can be used economically and safely, since it follows the contour of the coal seam along the sides of the hill.

(b) Trench Mining: Trench mining offers an economic option for mining thin reasonably flat coal seams which may not be amenable to opencast

mining. In this method, an artificial highwall is created by making a trench at a convenient place up to the coal seam. The miner is positioned on the floor of the seam within the trench and entries are driven on both sides of the purposely prepared trench.

(c) **Opencast:** Highwall mining from opencast pit practiced when the opencast mine reaches its economic stripping ratio or mining is not possible because of some surface constraint like forest, villages and any permanent structures. In this method the highwall miner is positioned on the floor of the seam and in front of the highwall; from this location the galleries are driven in the highwall.

Chapter 6

Mine Planning

6.1 For designing a mine plan, all the data and information collected from the exploratory studies are collated at a single place. With the help of software and tools mine is designed, based on which the planning and scheduling is made.

In India, the mines have been categorised in the following two categories for the purpose of Mine Planning:

- **Category A mines:** Category A mines shall be such mines where the work is being carried out by deployment of heavy mining machinery for deep hole drilling, excavation, loading and transport is carried out with the help of heavy machinery.
- **Category B Mines:** Other than fully mechanized category A mines, where the number of average employments exceeds 150 in all or 75 in workings below ground.

There are minor differences in mine plans for category A and B mines.

Components of a Mine Plan

6.2 Following are the components of a Mine Plan:

(i) Part A

- Geology and Exploration
 - Indicating general topography and geology.
 - Geological sections and year wise future program of exploration.
 - Indicate geological and recoverable reserves and grade. Availability of resources should also be indicated for the entire leasehold.
 - Indicate mineable reserves by slice plan / level plan method, as applicable, as per the proposed mining parameters.
- Mining
 - Existing/ proposed method for developing/ working the deposit with all design parameters.

- Quantum of development and tonnage and grade of production expected pit-wise.
- Year wise plans and sections.
- Proposed rate of production when the mine is fully developed and expected life of the mine and the year from which effected.
- Conceptual mining plan based on geological, mining and environmental considerations.
- In case of open cast mining, following are the further components specific to it:
 - o Mode of working
 - o Layout of mine workings, the layout of faces and sites for disposal of overburden / waste.
- In case of underground mining, following are the further components specific to it:
 - o Mode of entry
 - o System of winding / hoisting
 - o Underground layout
 - o Method and sequence of stoping
 - o Mine ventilation
 - o Extent of mechanization (Drilling machine, loading equipment, haulage and transport and miscellaneous).
- Blasting
 - Broad blasting parameters
 - Type of explosives used.
 - Powder factor in ore and overburden/ waste/ development heading/ stope
 - Whether secondary blasting is needed - Storage of explosives.
- Mine Drainage
 - Depth of water table
 - Progress of working related to above or below water table.

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- Quantity and quality of water likely to be encountered.
- Pumping arrangements
- Discharge of pumped out water.
- Stacking of mineral rejects and disposal of waste
 - Nature and quantity of topsoil, overburden/ waste and mineral rejects likely to be generated during the next five years
 - Land chosen for disposal of waste with proposed justification.
 - Manner of disposal, sequence of buildup of dumps along with the proposals for the stacking of sub-grade ore.
- Use of mineral
 - End-use of the mineral
 - Physical and chemical specifications stipulated by buyers.
 - Details of blending of sub grade ore being practiced or need to be practiced.
- Other
 - Site services
 - Employment potential of Highly Skilled or Skilled or Semi-Skilled or Un-Skilled.
- Mineral processing
 - Nature of the processing/ beneficiation (If required) indicating size grade of feed material and concentrate and recovery rate.
 - Disposal method for tailings
 - Schematic diagram of the processing procedure
 - Specify quantity and type of chemicals to be used
 - Quantity (cu.m./day) of water required, sources of supply of water - Disposal of water and extent of recycling.

(ii) Part B

- Environmental Management Plan
 - Existing land use pattern
 - Water regime

- Flora and fauna
- Quality of air, ambient noise level and water
- Climatic conditions
- Human settlements
- Public buildings, places of worship and monuments
- Attach plans showing the locations of sampling stations
- Does area (partly or fully) fall under notified area under Water (Prevention & Control of Pollution), Act, 1974
- Environmental Impact Assessment - Land area - Air quality - Water quality - Noise levels - Vibration levels (due to blasting) - Water regime - Socio-economics - Historical monuments etc.
- Temporary storage and utilization of topsoil
- Year wise proposal for reclamation of land
- Programme of afforestation, year wise for the initial five years
- Stabilization and vegetation of dumps along with waste dump management.

Measures to control erosion/ sedimentation of water courses - Treatment and disposal of water from mine.

Chapter 7

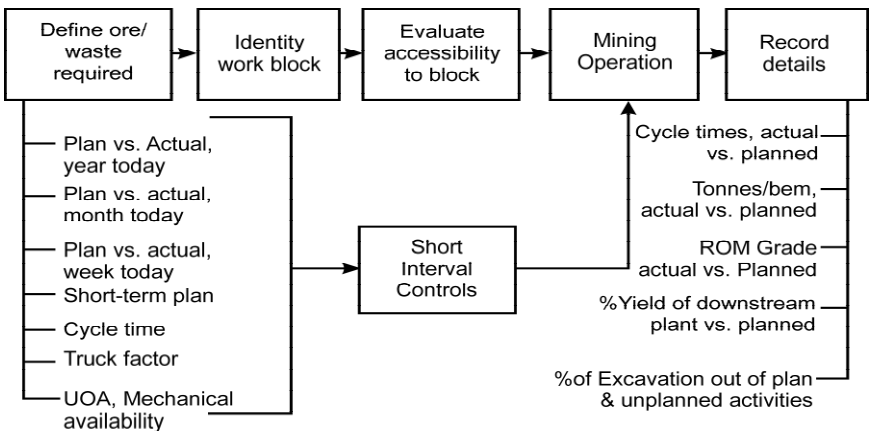
Mine Scheduling

7.1 An approved mine plan contains the scheduling for all the time bound components, like Mine Development, Mine operations (year-wise/ month-wise), Mine Closure activities, Offtake of the Run of Mine (ROM)/ processed ore/ mineral.

Some of the general time schedules prepared even during the predevelopment stages of the mine are:

- Timelines for the processing plants construction – This would specify the various timelines required for the construction and commissioning of the ore processing plant. This would be aligned with respect to the mine production start date.
- Timelines for various infrastructure constructions – This timeline would include the developmental constructions on the surface.
- Material procurement planning – Material procurement and storage are equally important aspect of any type of industry. Plans would be made for the long-term consumables and for the daily consumables, depending on the requirement of the mine development and operation.

7.2 The mine scheduling aspect can be broadly segregated into various heads which have been defined in the process flow diagram below:



Chapter 8

Mine Development

8.1 If the mining deposit, after all the due diligence and exploratory studies, is found to be economically feasible, the mine is developed to achieve its desired production. Depending on whether the mine is to be operated by Open Cast Mining Method or Underground Mining Method, as per the Letter of Allocation (LoA)/ Mining Lease for the mining area and subsequently the approved mine plan, the mine development strategy is made.

The first step involved in the mine development activity is to perform a general site survey. This would involve the survey of the whole mining area from the perspective of:

- Topographical survey
- Planimetric survey
- Contour survey

Site identification would be followed to identify the main and the basic mine infrastructure and facilities. The identification would be carried based on the results and interpretation obtained from the site surveys.

Mine Development Methodology - Opencast Mining/ Underground Mining

8.2 The following are the activities involved in mine development:

- **Forestry and Land Clearance** – The first and foremost activity involved in the Mine Development activity is the Site Clearance, also known as Deforestation. This activity is performed by using heavy equipment like, dozers and graders. The activity is essential in the sense that it provides access to the mining area and the mining activities to be carried out.
- **Development of Mine** – For the development of mine, various plans showing the following are prepared. These plans are part of either Opencast or Underground mine depending on the method of working adopted.
 - (a) **General Layout of the Surface** – This plan is prepared on a large scale, showing all key surface features, lease boundary,

mining boundary, presence of any type of water body, presence of habitation, presence of civil or mechanical constructions, if any. All these features are incorporated if they are present inside the lease area or in the nearby vicinity of the mine. This is to ensure the specific precaution, for all the above mentioned features, that need to be taken during the mine operation.

- (b) **Shaft** – Shafts are the most important capital openings of deep mines, providing all services for underground operations including fresh air, transportation of ore and supplies, personnel traffic, power (electricity and compressed air), communications, water supply, and drainage. Depending on the depth of the mine, shaft sinking may consume as much as 60% of the mine development time.

Mine technical data are used for determining the shaft location which is to be followed by plan for designing a 2-shaft mine, or a multiple-shaft mine. The number of shafts in a mine depends directly on the daily production rate and the dimensions of the mining area. To obtain a minimum cost per tonne of production, it is essential that an optimum balance between capital expenditure and operating costs be found.

- **Shaft Design** – The shaft sinking plan would include all the key features of a shaft design, such as the following:
 - Description of the geologic column in the form of a table identifying the rock strata, their geotechnical parameters, and groundwater levels together with water heads, calculated inflow, and degree of chemical contamination, if any.
 - Determination of the shaft diameter, with justification.
 - Choice of shaft sinking technology and its justification.
 - Description of the shaft lining and a list of lining sections with the thicknesses.
 - The shaft foundations (footings), their locations and dimensions.
 - The shaft collar, its depths and foundation, thickness and construction material, kind and number of openings with their function, and dimensions and elevations.

- The shaft sump, its depth, structural characteristics, pumping arrangement, and cleaning system.
 - Surveying data for particular shaft elements.
 - Calculations comprising ground and water pressure acting on lining, resulting lining thicknesses, shaft insets with their dimensions, and airflow capacity.
 - Timetable of construction, with such elements as preparatory works, shaft sinking, lining erection, shaft equipment installation, and liquidation of construction arrangements.
 - Cost specifications, covering both capitals as well as operating costs.
 - Drawings of the general mine layout, with shaft location, plan of shaft site (construction stage), and shaft cross section with an outline of equipment and compartments.
- **Underground Mine Development Plan** – Underground mine development begins with the positive investment decision to mine and ends with the inception of full scale exploitation. It incorporates all activities, personnel, and equipment required for creation of underground access to a mineral deposit, such as the following aspects:
 - **Mine Access Road** – The basic mine approach road needs to be developed which provides the approach to the mining area. The roads are developed by using heavy machineries like, Excavators, Trucks, Graders, Dozers and Compactors along with the access roads, mining haul roads are also developed in parallel.
 - **Material Transportation and Winding Plan** – For the transportation of ore on the surface, various combinations of wagon system integrated with belt conveyor system is made. Ore is brought onto the surface from inside the mine using the material winding shaft. From the pit-head it is transported to the processing plant from where it would be transferred onto the wagons to be dispatched out of the mine.
 - **Stowing Plan** – Stowing in an underground mine is an equally important activity. This requires civil and mechanical

construction in the form of bunkers, pipeline networks and chambers. Site allocation for this is, therefore, equally important, as all the stowing characteristics, like, fluid flow, head, throw, rate of stowing, would depend on the proper site allocation.

- **Ventilation Plan** – Ventilation plan of a mine is very important to maintain the acceptable working environment for the miners. The exhaustive plan would encompass designing the ventilation circuits during development, during mine operation and during mine closure. The Ventilation Plan consists of the following parameters for which different plans are prepared:
 - Ventilation (air flow) route.
 - Plan showing quality of air (humidity, temperature, percentage of methane on the general body of air, percentage of any other gases which needs to be measured) at various points in the mine.
 - Ventilation stoppings to divert and channelize the air flow as per the mine design and requirements at various points in the mine.
 - Placement of secondary ventilators (like, booster fans).
- **Electricity Supply Plan** – Electricity is a very vital source for energy in such mines. Proper lighting arrangements provide a hassle free and safe working environment inside the mine. Therefore, a site location for an electrical sub-station is very important. Power source, from the nearby main station is identified and electricity would be drawn from that source to the substation from where it is re-distributed inside the mine, or on the surface.
- **Water Supply Plan** – Water in any mine area is an essential commodity. Proper circulation of water for various purposes, like, water sprinkling, drinking would contribute towards Environmental Health and Safety issue. For this, adequate water supply in the mine is provided through a water network system involving forcing pumps, water coolants, recirculation of

fresh drinking water, separate water pipelines for drinking, water sprinkling, etc.

- **Pumping Plan** – Pumping of water forms an integral part of underground mining technology. The mine water, flowing in either from the ground water or seeping in from the surface needs a continuous pumping so as to serve the following purposes:

- (i) Provide a water-free working face.
- (ii) Avoid water logging in the areas where activities are taking place, like material transport, man transport, electrical substations, voids for stowing, pumping substations, etc.

It is very essential to locate area for installation of the main pumps on the surface. Generally, an area with the highest of the altitude is selected for the station. The sump is created at a low lying area where water, either through pumping, or through gravity flows to it.

Various type of pumping system may be combined to counter the issues of water logging. The main pumping route is as per the following:

- (i) Transfer from the working face to the nearby local sump.
- (ii) Transfer from the local sumps in the mine to the main sump area which may be near the shaft inset, having exhaust route for the mine air.
- (iii) Throw from the main pump to the surface.

All these activities require respective type of pumps which have been mentioned below:

- (i) Pumps with high head, less throw.
- (ii) Pumps with high throw, less head.

These two types of pump may be moveable or may be fixed at one particular place, except for the main pump which throws the water out of the main pump to the surface which is stationary.

- **Ore processing Plans** – The Ore processing plans are important for production of saleable product as per market conditions as well as to control the environmental pollution. Ore processing plans will describe the process to be employed, material handling and handling of rejects.
- **Phasing and Planning for Procurement/ Operations** – Equipment selection and sizing is a major mining engineering activity. It follows the positive investment decision to mine and begins with selection of a mining method. Although equipment selection begins during the formulation of a “milestone diagram,” in which the minable reserve is parceled out into zones and distinguished by method of mining, suitability and production analyses for mining equipment are not conducted until after layout and sequencing are accomplished and before scheduling is undertaken.

With the advancements in the mining industry, various technologies and software are being used for the purpose. Different types of plans are developed for deploying such technologies and their use during the starting of the mine, and also during the operation stage.

Chapter 9

Mining Operations

9.1 Mining, in general, involves the following operations:

- Site preparation
- Drilling and blasting
- Loading and hauling
- Stockpile management
- Off take arrangements and material handling
- Equipment maintenance process

After which the mined material is further beneficiated to improve its quality and render it useful for use in various industries.

Site Preparation

This step involves preparing the site where bore holes are to be drilled. This may involve cutting trees, levelling, etc. Levelling is required to provide a stable ground to the drilling rig. Generally, a dozer is used for levelling in open cast mines.

Drilling and Blasting

Boreholes are drilled in which explosive is loaded for blasting is the next step. The pattern and number of the holes to be drilled is pre-decided so as to optimally utilize all of the blast energy, achieve proper fragmentation and restrict blast waves. In opencast mines drilling rigs are used for drilling, while in underground simple jackhammers, jumbo drills or specialized drilling machines may be used depending on the level of automation and the desired level of production.

Followed by drilling of boreholes, explosives are loaded and the material is blasted so as to fragment it using shock waves and enable easier loading in the next step. The blasting pattern is carefully designed to control the blast and cause proper fragmentation, minimize fly rocks, prevent the surrounding rock structures, etc. In India, strict government guidelines govern the amount and type of explosives that can be used.

Loading and Hauling

Following blasting, the blasted material is loaded onto haulage equipment (dumpers, tubs, conveyors, etc.) using shovels, LHD or SDL. After loading, the transport equipment (dumpers, tubs or conveyor) hauls the extracted material from the working area and dumps it in the designated stockyard/ plant/ dump.

Stockpile Management

The Stockpile Management process is used to stock the product. In case of metalliferous mines, the stockpiling of the Run of Mine (ROM) and the processed ore are maintained separately. While in case of coal, the stockpiling is mainly made for the purpose of crushing, blending or washing, or combined.

The Stockpiling activity requires various heavy equipment, like, crushers, dozers, trucks, excavators and in cases, where the ROM needs to be treated to form the saleable product. Ore/Mineral Washeries are needed which treat the ROM chemically (or non-chemically). Another important activity from the Stockpile which takes place is the off take of the ROM/ processed ore/ mineral to the desired location/ end-use plant/ export destinations.

Off take Arrangements and Material Handling

The mined/ processed material may be required to be off take from mine face; stockpile; railway siding or any other point. The choice of inland transportation mainly depends on the available and feasible infrastructure. The common modes of transportation are explained below and may include railways, Merry Go-Round System (MGR), belt conveyor, stacker reclaimer, ropeways, trucks, etc. Quite often the combination of various modes is used for the arrangement. For example, the material from belt conveyors is discharged on to chutes and is then transported by stacker to stock yard.

(i) **Belt conveyor** – In this a rubber belt with two or more pulleys is used to transport the material. One or both of the pulleys are powered which move the belt and the material on the belt forward. Sometimes, series of belt conveyors few kilometres long are also used for transportation of material.

(ii) **Ropeway** – In this material is transported using an aerial ropeway moving at a constant speed. This mode can be used to transport material to long distances (few kilometres).

(iii) MGR – A merry-go-round (MGR) train is a block train of hopper wagons which both loads and unloads its cargo while moving. The locomotives used are fitted with electronic speed control which allows the driver to engage the system and the train proceeds at a fixed slow speed under the loading and unloading facilities.

(iv) Stacker Reclaimer – In the stacker reclaimer system, stacker is used to pile the bulk material while reclaimer is used to recover the material. For longitudinal stores the commonly used stacking methods are Chevron, Windrow and Cone Shell. In these methods a large number of layers are stacked on top of each other in the longitudinal direction of the pile.

In Chevron method stacker moves to and fro over the centre line of the pile. This result causes segregation of the material with fine particles in the central part of the pile and coarse particles on the surface and at the bottom of the pile. In Windrow method, number of positions across the width of the pile is used to deposit the material which ensures even distribution of fine and coarse particles across the pile. When homogenization is not the priority then Cone Shell method can be used. In this cone of material is formed from a fixed position and when the conical pile is full, a new cone is formed against the shell of the first one.

For circular stores generally continuous Chevron stacking method is used. The reclaimers are equipped with constant speed motors and the reclaimed material is carried by belt conveyors and discharged into a feed bin of a relatively large volume.

Equipment Maintenance Process

The Equipment maintenance process forms another important integral part of any mining operation. This is a specialized activity which involves expertise in the areas of machineries and their maintenance. As the mining operations completely rely on the machine and equipment availability and utilization, it is therefore, very important to select the correct type of equipment for the complete operations and subsequently the maintenance.

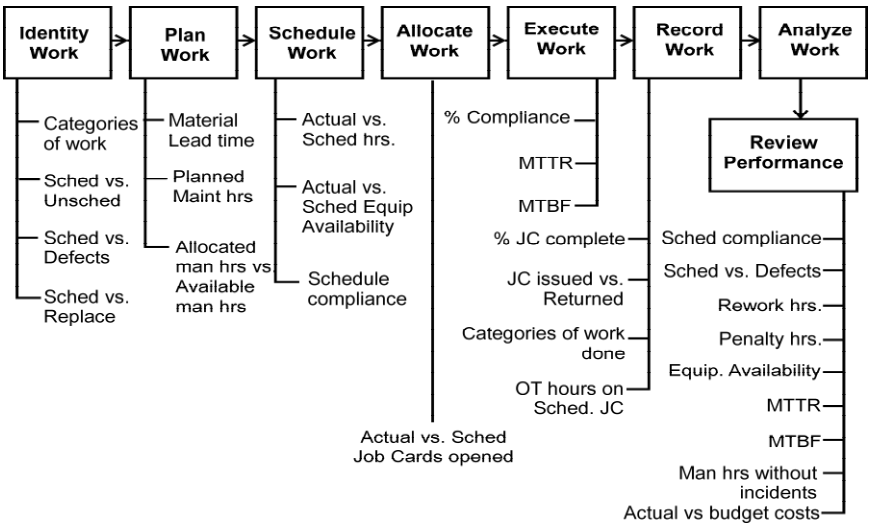
Broadly, the maintenance is carried out in the following different ways:

- **Regular maintenance** – This involves the regular machine check-ups on a daily and shift-to-shift basis and also involves attending of breakdowns.

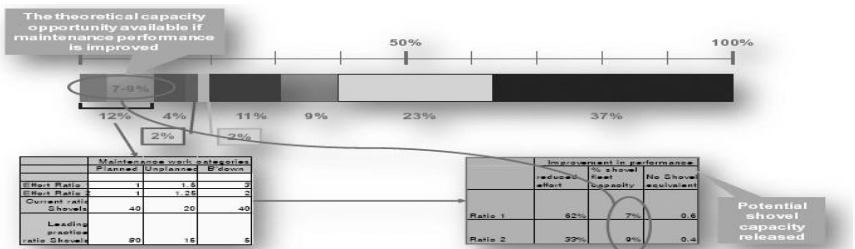
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- **Scheduled maintenance** – The machines/ equipment are sometimes withdrawn from their production activity and are checked thoroughly which may include change of filter oils, lube oils, hoses and other mechanicals smaller parts.
- **Over-hauling** – This activity involves the complete change of major mechanical/ electrical components of an equipment/ machine like gear, swing motors. This activity is performed after the machine has achieved its rated maximum hours of operations. The over-hauling activity almost renews the complete equipment/ machine.

The diagram below explains the maintenance procedures, generally, followed in the mining activity.



A proper maintenance in any mining activity is very important as it affects the total production, productivity and the mining cost controls. A typical example showing potential impact on operational efficiency due to proper maintenance of shovel is depicted in the diagram below:



Chapter 10

Overview of Policies and Regulations

10.1 The Constitution of India allocates the subject of mineral development and regulation to State governments (entry number 23, State list (List II) of Seventh Schedule) subject to the law of Parliament (entry number 54, Union List (list I) of Seventh Schedule). The role of Union Government is limited by the boundaries set by such law, which in this case is The Mines and Minerals (Regulation and Development) Act, 1957 and rules and regulations framed thereunder. As mandated by The Mines and Minerals (Regulation and Development) Act, 1957, the Union Government has framed rules for regulating grant of mineral in respect of all minerals other than atomic minerals and minor minerals. The State Governments have framed the rules for minor minerals. The Ministry of Mines, Government of India administers The Mines and Minerals (Regulation and Development) Act, 1957 in India.

Further, the Constitution allocates the subject of development and regulation of mineral resources in the territorial waters, continental shelf, exclusive economic zone and other maritime zones of India to the Union Government. The Ministry of Coal, under Union Government, administers rules and regulation including the Coking Coal Mines (Nationalisation) Act, 1972 and the Coal Mines (Nationalisation) Act, 1973, for development of coal resources in the country.

The Constitution allocates the subject of regulation of labour and safety in mines to the Union Government (entry number 55, Union List (list I) of Seventh Schedule). The Union Government, through Ministry of Labour and Employment, exercises this right through Mines Act, 1952 and rules and regulation framed there under. Administration of environment and forestry issues through various acts including the Air Act, Water Act and Forest Conservation Act, etc. are carried out by both the Union and State governments.

The Mines and Minerals (Regulation and Development) Act, 1957 had already been amended several times and as further amendments may not clearly reflect the objects and reasons emanating from the new National Mineral Policy, it is considered necessary to reformulate the legislative

framework in the light of the new National Mineral Policy, 2008 by repealing the Mines and Minerals (Regulation and Development) Act, 1957. The salient features of the Mines and Minerals (Development and Regulation) Bill, 2015, *inter alia*, are as follows:

- (a) it provides for a simple and transparent mechanism for grant of mining lease or prospecting licence through competitive bidding in areas of known mineralization, and on the basis of first-in-time in areas where mineralization is not known;
- (b) it enables the mining holders to adopt the advanced and sophisticated technologies for exploration of deep-seated and concealed mineral deposits, especially of metals in short supply through a new mineral concession;
- (c) it enables the Central Government to promote scientific mineral development, through Mining Plans and Mine Closure Plans enforced by a central technical agency namely the Indian Bureau of Mines, as well as the Regulatory Authorities and Tribunals;
- (d) it empowers the State Governments to cancel the existing concessions or debar a person from obtaining concession in future for preventing the illegal and irregular mining;
- (e) it empowers the Central Government and State Governments to levy and collect cess;
- (f) establishment of the Mineral Funds at National and State level for funding the activities pertaining to capacity building of regulatory bodies like Indian Bureau of Mines and for research and development issues in the mining areas;
- (g) it provides for reservation of an area for the purpose of conservation of minerals;
- (h) it enables the registered co-operatives for obtaining mineral concessions on small deposits in order to encourage tribals and small miners to enter into mining activities;
- (i) it empowers the Central Government to institutionalise a statutory mechanism for ensuring sustainable mining with adequate concerns for environment and socio economic issues in the mining areas, through a National Sustainable Development Framework;

- (j) it provides for establishment of the National Mining Regulatory Authority which consists of a Chairperson and not more than nine members to advise the Government on rates of royalty, dead rent, benefit sharing with District Mineral Foundation, quality standards, and also conduct investigation and launch prosecution in cases of large scale illegal mining;
- (k) it provides for establishment of the State Mining Regulatory Authority consisting of such persons as may be prescribed by the State Government to exercise the powers and functions in respect of minor minerals;
- (l) it provides for establishment of a National Mining Tribunal and State Mining Tribunals to exercise jurisdiction, powers and authority conferred on it under the proposed legislation;
- (m) it empowers the State Governments to constitute Special Courts for the purpose of providing speedy trial of the offences relating to illegal mining;
- (n) it empowers the Central Government to intervene in the cases of illegal mining where the concerned State Government fails to take action against illegal mining;
- (o) it provides for stringent punishments for contravention of certain provisions of the proposed legislation;

The Mines and Minerals (Development and Regulation) Amendment Bill, 2021 was introduced in Lok Sabha on March 15, 2021. The Bill amends the Mines and Minerals (Development and Regulation) Act, 1957. The Act regulates the mining sector in India.

- **Removal of restriction on end-use of minerals:** The Act empowers the central government to reserve any mine (other than coal, lignite, and atomic minerals) to be leased through an auction for a particular end-use (such as iron ore mine for a steel plant). Such mines are known as captive mines. The Bill provides that no mine will be reserved for particular end-use.
- **Sale of minerals by captive mines:** The Bill provides that captive mines (other than atomic minerals) may sell up to 50% of their annual mineral production in the open market after meeting their own needs. The central government may increase this threshold through a

notification. The lessee will have to pay additional charges for mineral sold in the open market.

- **Auction by the central government in certain cases:** Under the Act, states conduct the auction of mineral concessions (other than coal, lignite, and atomic minerals). Mineral concessions include mining lease and prospecting license-cum-mining lease. The Bill empowers the central government to specify a time period for completion of the auction process in consultation with the state government. If the state government is unable to complete the auction process within this period, the auctions may be conducted by the central government.
- **Transfer of statutory clearances:** Upon expiry of a mining lease (other than coal, lignite, and atomic minerals), mines are leased to new persons through auction. The statutory clearances issued to the previous lessee are transferred to the new lessee for a period of two years. The new lessee is required to obtain fresh clearances within these two years. The Bill replaces this provision and instead provides that transferred statutory clearances will be valid throughout the lease period of the new lessee.
- **Allocation of mines with expired leases:** The Bill adds that mines (other than coal, lignite, and atomic minerals), whose lease has expired, may be allocated to a government company in certain cases. This will be applicable if the auction process for granting a new lease has not been completed, or the new lease has been terminated within a year of the auction. The state government may grant a lease for such a mine to a government company for a period of up to 10 years or until the selection of a new lessee, whichever is earlier.
- **Rights of certain existing concession holders:** In 2015, the Act was amended to provide that mines will be leased through an auction process. Existing concession holders and applicants have been provided with certain rights including: (i) right to obtain prospecting licence or mining lease to a holder of reconnaissance permit or prospecting licence (issued before commencement of the 2015 Amendment Act), and (ii) right for grant of mining lease where the central government had given its approval or letter of intent was issued by the state government before the commencement of the 2015 Amendment Act. The Bill provides that the right to obtain a

prospecting license or a mining lease will lapse on the date of commencement of the 2021 Amendment Act. Such persons will be reimbursed for any expenditure incurred towards reconnaissance or prospecting operations.

- **Extension of leases to government companies:** The Act provides that the period of mining leases granted to government companies will be prescribed by the central government. The Bill provides that the period of mining leases of government companies (other than leases granted through auction) may be extended on payment of additional amount prescribed in the Bill.
- **Conditions for lapse of mining lease:** The Act provides that a mining lease will lapse if the lessee: (i) is not able to start mining operations within two years of the grant of a lease, or (ii) has discontinued mining operations for a period of two years. However, the lease will not lapse at the end of this period if a concession is provided by the state government upon an application by the lessee. The Bill adds that the threshold period for lapse of the lease may be extended by the state government only once and up to one year.
- **Non-exclusive reconnaissance permit:** The Act provides for a non-exclusive reconnaissance permit (for minerals other than coal, lignite, and atomic minerals). Reconnaissance means preliminary prospecting of a mineral through certain surveys. The Bill removes the provision for this permit.

List of Central Acts and Rules, Regulations and Policies

10.2 The Mines and Minerals (Development & Regulation) Act, 1957, ('MMDR') and the Mines Act, 1952 together with the rules and regulations framed under them constitute the basic laws governing the mining sector on land in India. For territorial waters, continental shelf, exclusive economic zone and other maritime zones of India, the Offshore Areas Mineral (Development and Regulation) Act, 2002 has been enacted and is effective from 31st January, 2003.

The relevant rules in force under the MMDR Act are the Mineral Concession Rules, 1960, the Mineral Conservation and Development Rules, 1988, Granite Conservation and Development Rules, 1999 and Marble Development and Conservation Rules, 2002. The health and safety of the

workers is governed by the Mines Rules, 1955, framed under the Mines Act, 1952.

The Mineral Concession Rules, 1960 outline the procedures and conditions for obtaining a Reconnaissance Permit or a Prospecting Licence or a Mining Lease, for all minerals other than petroleum and natural gas and also other than those minerals notified as 'minor' minerals. The Mineral Conservation and Development Rules, 1988 lay down the guidelines for ensuring mining on a scientific basis, while at the same time, conserving the environment. The provisions of Mineral Conservation and Development Rules are, however, not applicable to coal, atomic minerals and minor minerals. The State Governments have powers to formulate the Minor Mineral Concession Rules and grant mineral concessions for such minerals under such rules.

Important Acts/policies are as follows:

- (a) New Coal Distribution Policy, 2007
- (b) Environment (Protection) Act, 1986
- (c) Air (Prevention and Control of Pollution) Act, 1981
- (d) Water (Prevention and Control of Pollution) Act, 1974
- (e) National Green Tribunal Act, 2010
- (f) Indian Forest Act, 1927
- (g) Forest (Conservation) Act, 1980
- (h) Wild Life (Protection) Act, 1972
- (i) Public Liability Insurance Act, 1991

Contract Labour (Regulation & Abolition) Act, 1970 is applicable for employment of contract labour in mining projects.

Mines and Minerals (Development and Regulation) Act, 1957

The Mines and Minerals (Development and Regulation) Act, 1957 provides for the regulation of mines and the development of minerals under the control of the Union. This Act provides that no person shall undertake any reconnaissance, prospecting or mining operations in any area, except under and in accordance with the terms and conditions of reconnaissance permit or of a prospecting licence or, as the case may be, a mining lease, granted under this Act and the rules made thereunder.

Further, it provides that any State Government may, after prior consultation with the Central Government and in accordance with the Rules under Section 18, undertake reconnaissance, prospecting or mining operations with respect to any mineral specified in the First Schedule in any area within that State which is not already held under any reconnaissance permit, prospecting licence or mining lease.

Section 4A of the Act provides that “Where the Central Government, after consultation with the State Government, is of opinion that it is expedient in the interest of Regulation of Mines and Mineral Development, Preservation of natural environment, control of floods, prevention of pollution or to avoid danger to public health or communications or to ensure safety of buildings, monuments or other structures or for conservation of mineral resources or for maintaining safety in the mines or for such other purposes, as the Central Government may deem fit, it may request the State Government to make a premature termination of prospecting licence or mining lease in respect of any mineral other than a minor mineral in any area or part thereof, and, on receipt of such request, the State Government shall make an order making a premature termination of such prospecting licence or mining lease with respect to the area or any part thereof.”

The Mines Act, 1952

The Mines Act, 1952 amends and consolidates the law relating to the regulation of labour and safety in mines. It lays down that every mine should make effective provisions for drinking water, conservancy, medical appliance, etc. It requires that in every mine there shall be arrangements for the conveyance to hospitals or dispensaries of persons who, while employed in the mine suffer bodily injury or become ill. It also prescribes rules for weekly day of rest and compensatory days of rest for persons working in mines. Further, it limits the hours of work below ground to forty eight hours in any week or for more than eight hours in any day.

The Offshore Areas Mineral (Development and Regulation) Act, 2002

The Offshore Areas Mineral (Development and Regulation) Act, 2002 provides for development and regulation of mineral resources in the territorial waters, continental shelf, exclusive economic zone and other maritime zones of India and provides for matters connected therewith or incidental thereto. The Act shall apply to all minerals in the offshore areas including any

minerals prescribed under the Atomic Energy Act, 1962 except mineral oils and hydrocarbons related thereto.

The Coal Mines (Nationalisation) Act, 1973

The Coal Mines (Nationalisation) Act, 1973 provides for the acquisition and transfer of the right, title and interest of the owners in respect of the coal mines specified in the Schedule with a view to re-organising and reconstructing such coal mines so as to ensure the rational, co-ordinated and scientific development and utilisation of coal resources consistent with the growing requirements of the country, in order that the ownership and control of such resources are vested in the State and thereby so distributed as best to subserve the common good, and for matters connected therewith or incidental thereto.

Coal Mine (Nationalisation) Act (CMNA), 1973

CMNA recognizes that all the coal resources within India belong to Union Government.

Eligibility for Unrestricted Coal Mining

The eligibility to undertake coal mining in the country has been laid down in Section 3 (3) of the Coal Mines (Nationalisation) Act, 1973. As per the provisions of the Act, the parties eligible to undertake coal mining in India without the restriction for captive consumption are:

- (a) The Central Government, a Government Company (including a State Government Company), a Corporation owned, managed and controlled by the Central Government.
- (b) A person to whom a sub-lease has been granted by the Government or a company/corporation having a coal mining lease where the coal reserves covered from the sub-lease are in isolated small pockets or are
- (c) Not sufficient for scientific and economic development in a coordinated manner and the coal produced will not be required to be transported by rail.

Default Lessee

- (a) Coal India Limited (CIL), Singareni Collieries Company Limited (SCCL) and Neyveli Lignite Corporation (NLC) enjoy the status of central agencies for coal mining.

- (b) Subsidiaries of CIL have statutory rights for mining of coal which falls within the areas of respective subsidiaries.
- (c) SCCL have mining rights for coal mining in Godavari Valley coalfields (State of Andhra Pradesh).

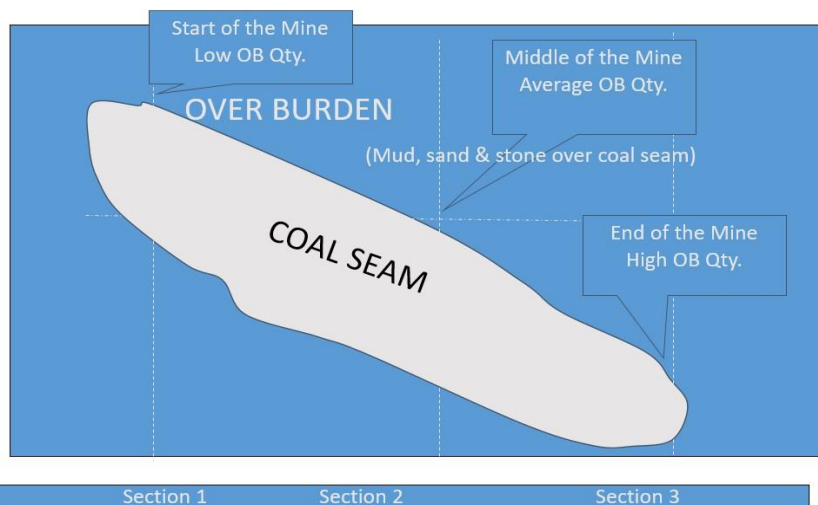
Chapter 11

Over Burden Removal (OBR) Adjustments (Stripping Activity Adjustments)

Accounting Policy on Stripping Activity Expense/Adjustment

11.1 In case of opencast mining, the mine waste materials (“overburden”) which consists of soil and rock on the top of coal seam is required to be removed to get access to the coal and its extraction. This waste removal activity is known as ‘Stripping’. In opencast mines, the company has to incur such expenses over the life of the mine (as technically estimated).

DIAGRAM OF AN OPENCAST MINE



Therefore, as a policy, in the mines with rated capacity of one million tonnes per annum and above, cost of Stripping may be charged on technically evaluated average stripping ratio (OB: COAL) at each mine with due adjustment for stripping activity asset and ratio-variance account after the mines are brought to revenue.

Over Burden Removal (OBR) Adjustments (Stripping Activity Adjustments)

Net of balances of stripping activity asset and ratio variance at the Balance Sheet date is shown as Stripping Activity Adjustment under the head Non - Current Provisions / Other Non-Current Assets as the case may be.

The reported quantity of overburden as per record is considered in calculating the ratio for OBR accounting where the variance between reported quantity and measured quantity is within the lower of the two alternative permissible limits, as detailed hereunder:

Annual Quantum of OBR of the Mine	Permissible limits of variance	
	I	II
	%	Quantum (in Mill. Cu. Mtr.)
Less than 1 Mill. CUM	+/- 5%	0.03
Between 1 and 5 Mill. CUM	+/- 3%	0.20
More than 5 Mill. CUM	+/- 2%	

However, where the variance is beyond the permissible limits as above, the measured quantity is considered.

In case of mines with rated capacity of less than one million tonne, the above policy may not be applied and actual cost of stripping activity incurred during the year is recognised in Statement of Profit and Loss.

- In opencast mines, removal of OB constitutes major portion of the mining activity and major portion of the resources are utilized in OB removal.
- In the initial years OB removal is very low as compared to Standard Ratio, which increases when the mine advances to deeper side.
- To spread the OB removal cost evenly over the life of the project OBR Accounting is done based on Standard Ratio.

OBR Accounting

11.2 OBR Accounting is to be done into two parts:

Advance Stripping

The Cost of OB removed for which coal production is to be done in future period is shown in Balance Sheet as Advance Stripping.

Ratio Variance

OB removal cost as ratio variance is spread over the life of the project through OB cost Equalization Account. (Ratio Variance Account) applying the principle of OBR Accounting.

Net effect of Advance Stripping and Ratio Variance is shown in Financial Statements

Advance Stripping (Like Work-in-Progress)

- Advance Stripping denotes the excess OB removed where coal is not extracted.
- In the first year this Advance Stripping is shown as Closing Advance Stripping (Asset).
- In the next year the above Advance Stripping is treated as Opening Advance Stripping and charged in the Profit and Loss A/C and at the year-end Closing Advance Stripping is accounted as asset by crediting the Profit & Loss A/C.

Ratio Variance (OBR Accounting)

- During the initial year the quantity of OB removal will be low. The advantage of low OB removal is accumulated as Ratio Variance Reserve (Provision).
- The reserve is utilized during the later period of the project when the OB Coal ratio becomes adverse.
- Finally at the end of the life of the project the Ratio Variance Reserve account stands nullified.
- OBR Accounting is done in the mines having Annual Capacity of 1 Million Ton and above.

Standard Ratio (SR) (CuM/Tonne) of a mine is the ratio between the total quantity of OB to be removed (in M³) and the total coal to be extracted (in Tonne) during the life of the project. This ratio for a particular mine is determined at the time of preparation of Project Report and is constant for the life of the project unless it is revised due to unusual circumstances.

Total quantity of OB to be removed from the mine during its life (in M³)

Total mineable coal reserve in the mine (in tonne)

Over Burden Removal (OBR) Adjustments (Stripping Activity Adjustments)

Current Ratio (CR): The ratio of OB to Coal in a particular patch of mine being worked during the year as per the calendar plan is called Current Ratio. This is the OB immediately overlying upon the coal being extracted. It is a short term ratio and may change from one year to the next.

$$\frac{\text{Opening Adv Str. + OB removed during the period} - \text{Closing Adv Str (in M}^3\text{)}}{\text{Coal produced during the period (in tonne)}}$$

Ratio Variance

- During the initial years of the project the OB removal will be low and Current Ratio will be less than Standard Ratio. In the later years the OB removal and the Current Ratio will show an increasing trend and at a particular point of time CR will be more than SR.
- The advantage of low ratio is accumulated as a reserve and when the situation becomes adverse this reserve is utilized. Finally, at the end of the life of the project the Ratio Variance Reserve appearing in the Balance Sheet stands nullified.

When Current Ratio is less than Standard Ratio

Ratio Variance Reserve (Provision) is created.

When current ratio is greater than Standard Ratio

Ratio Variance Reserve (Provision) is withdrawn.

- Standard Ratio for a particular mine is determined at the time of preparation of project report and is constant for the life of the project unless it is revised due to unusual circumstances.
- It is to be reviewed periodically.
- At the time of revision of SR, quantity of Advance Stripping & Ratio Variance Reserve account (as per Audited Account) is also to be considered along with the balance quantity of OB & Coal to be mined.
- Revised SR = [(Opening Adv Str. + OB to be removed in balance period – Opening Ratio Variance Reserve quantity) (in M³)] / Coal to be produced in balance period (in Tonne)

EXAMPLE

Life of the project	3 Years
Annual Capacity	100 MT

Technical Guide on Internal Audit of Coal Industry

OB to be removed during the life of the project	600 MCuM
Coal to be extracted during the life of the project	300 MT
Standard Ratio (SR) = 600 : 300 =	2 : 1

1st Year

Standard Ratio	2 : 1
OB Removed	175 MCuM
Coal extracted	100 MT
Advance Stripping	50 MCuM
OB removed related to Coal = 175 - 50 =	125 MCuM
OB at SR = 100 X 2 =	200 MCuM
	(To be charged to P&L)
Ratio Variance Reserve = 200-125 =	75 MCuM
Balance Sheet at the end of the year	
Advance Stripping	50 MCuM
Ratio Variance Reserve	75 MCuM

Net effect in Balance Sheet – 25 MCuM as Reserve (Provision) and charge in Profit & Loss

2nd Year

Standard Ratio	2 : 1
Opening Advance Stripping	50 MCuM
Opening Ratio Variance Reserve	75 MCuM
OB Removed	250 MCuM
Coal extracted	100 MT
Advance Stripping	80 MCuM
OB removed related to Coal = 50 + 250 - 80 =	220 MCuM
OB at SR = 100 X 2 =	200 MCuM
	(To be charged to P&L)
Withdrawal from Ratio Variance Reserve = 220-200 =	20 MCuM
Balance Sheet at the end of the year	
Advance Stripping	80 MCuM
Ratio Variance Reserve = 75 – 20 =	55 MCuM

Over Burden Removal (OBR) Adjustments (Stripping Activity Adjustments)

Net effect in Balance Sheet (80-55) 25 MCuM as Asset and credit in Profit & Loss

3rd Year

Standard Ratio	2 : 1
Opening Advance Stripping	80 MCuM
Opening Ratio Variance Reserve	55 MCuM
OB Removed	175 MCuM
Coal extracted	100 MT
Advance Stripping	0 MCuM
OB removed related to Coal = $80 + 175 - 0 =$	255 MCuM
OB at SR = $100 \times 2 =$	200 M.CuM
(To be charged to P&L)	
Withdrawal from Ratio Variance Reserve = $255 - 200 =$	55 MCuM
Balance Sheet at the end of the year	
Advance Stripping	0 MCuM
Ratio Variance Reserve	= $55 - 55 = 0$ MCuM

Chapter 12

Mine Closure

12.1 "Progressive Closure Plan" and "Final Closure Plan" should be in the format and as per the guidelines issued by the Indian Bureau of Mines. The Mine Closure Plan (progressive and final) shall be approved along with the approval of Mining Plan/ Feasibility Report / Project Report as applicable.

Progressive Mine Closure Plan would include various land use activities to be done continuously and sequentially during the entire period of the mine operations from the day one of the mining operations. Such a plan ensures that the land and the other affected areas are being continuously recovered (or afforested) to the planned state from the very first day of mining operations.

Whereas the Final Mine Closure activities would start towards the end of mine life, generally during the last 4-5 years of the mine life. This type of plan ensures the full and the final closure of the mine. In case of Opencast mine, this is, generally, followed by finally covering the mined out area by top soil and subsequently followed by plantations or creating some kind of place for flora and fauna to develop, as per the Ministry Guidelines and the approved plan. While in case of Underground mining activity, this is followed by abandoning the complete mining activity and finally followed by the shaft closures, as per the Ministry Guidelines and the approved plan.

Mine closure encompasses rehabilitation process as an ongoing programme designed to restore physical, chemical and biological quality disturbed by the mining to a level acceptable to all concerned. It must aim at leaving the area in such a way that rehabilitation does not become a burden to the society after mining operation is over. It must also aim to create as self-sustained ecosystem.

Mine closure operation is a continuous series of activities starting from day one of the initiation of mining project. Therefore, progressive mine closure plan will be an additional chapter in the present mining plan and will be reviewed every five years in the Scheme of Mining. As progressive mine closure is a continuous series of activities, it is obvious that the proposals of scientific mining have included most of the activities to be included in the progressive mine closure plan. Therefore, reference to relevant paragraphs and a gist of the same in progressive mine closure plan will be sufficient.

Mine Closure Plan

12.2 The mine closure plan consists of the following parameters and objectives:

- **Mined-Out Land** – Describe the proposals to be implemented for reclamation and rehabilitation of mined-out land including the manner in which the actual site of the pit will be restored for future use. The proposals should be supported with relevant plans and sections depicting the method of land restoration / reclamation / rehabilitation.
- **Water Quality Management** – Describe in detail the existing surface and ground water bodies available in the lease areas and the measures to be taken for protection of the same including control of erosion, sedimentation, siltation, water treatment, diversion of water courses , if any, measures for protection of contamination of ground water from leaching, etc. Quantity and quality of surface water bodies should also be indicated and corrective measures proposed to meet the water quality conforming to the permissible limits should also be described. Report of hydrological study carried out in the area may also be submitted. The water balance chart should be given. If there is potential of Acid Mine Drainage then the treatment method should be given.
- **Air Quality Management** – Describe the existing air quality status. The corrective measures to be taken for prevention of pollution of air should be described.
- **Waste Management** – Describe the type, quality and quantity of overburden, mineral reject etc. available and their disposal practice. If no utilisation of waste material is proposed, the manner in which the waste material will be stabilised should be described. The protective measures to be taken for prevention of siltation, erosion and dust generation from these waste materials should also be described. If toxic and hazardous elements are present in the waste material the protective measures to be taken for prevention of their dispersal in the air environment, leaching in the surface and ground water etc, should be described.
- **Top Soil Management** – The top soil available at the site and its utilisation should be described.

- **Tailing Dam Management** – The steps to be taken for protection and stability of tailing dam, stabilisation of tailing material and its utilisation, periodic desilting, measures to prevent water pollution from tailings, etc., arrangement for surplus water overflow along with detail design, structural stability studies, the embankment seepage loss into the receiving environment and ground water contaminant if any should be given.
- **Infrastructure** – The existing infrastructural facilities available such as, roads, aerial ropeways, conveyer belts, railways, power lines, buildings and structures, water treatment plant, transport, water supply sources in the area, etc. and their future utilisation should be evaluated on case to case basis. If retained, the measures to be taken for their physical stability and maintenance should be described. If decommissioning proposed, dismantling and disposal of building structures, support facilities and other infrastructure like, electric transmission line, water line, gas pipeline, water works, sewer line, telephone cables, underground tanks, transportation infrastructure like roads, rails, bridges, culverts etc., electrical equipments and infrastructures like, electric cables, transformers to be described in connection with restoring land for further use.
- **Disposal of Mining Machinery** – The decommissioning of mining machineries and their possible post mining utilisation, if any, to be described.
- **Safety and Security** – Explain the safety measures implemented to prevent access to surface openings, excavations, etc., and arrangements proposed during the mine abandonment plan and up to the site being opened for general public should be described.
- **Disaster Management and Risk Assessment** – This should deal with action plan for high risk accidents like, landslides, subsidence flood, inundation in underground mines, fire, seismic activities, tailing dam failure, etc. and emergency plan proposed for quick evacuation, ameliorative measures to be taken, etc. The capability of lessee to meet such eventualities and the assistance to be required from the local authority should also be described.

Time Scheduling for Abandonment

12.3 The manpower and other resources required for completion of

proposed job should be described. The schedule of such operations should also be supplemented by PERT (Programme Evaluation & Review Technique), Bar chart, etc.

Site Restoration/ Mine Closure Cost in Coal Mines

12.4 Coal mine owner has to fulfil its obligation of restoring the mining sites as per the statutory requirements. Cost incurred for fulfilling such obligation is broadly termed as site restoration cost or alternatively, as mine closure cost.

Guideline for preparation of mine closure plan (MCP) is issued by Ministry of Coal, Government of India. The first guideline came into effect from 27th August, 2009, thereafter amended from time to time. Latest amended guideline F. No. 34011/28/2019-CAPM has been issued on 16th December, 2019. No project can be approved without having a mine closure plan in place. The company is required to provide for the liability for total project area once any activity starts on land, i.e., mine closure obligation arises as soon as any activity starts on land and therefore, recognition of obligation of site restoration is started from development stage of the mine.

The Government of India monitors implementation of MCP, maintain the escrow fund related to MCP through Coal Controller, an organisation set up under the Ministry of Coal to look into inter-alia conservation and development of mines.

Brief of Financial Aspects in Mine Closure Guidelines

- All coal mine owners shall adopt a Mine Closure Plan for each of their mines comprising progressive closure plan and final closure plan duly approved by the competent authority.
- The Mine Closure Plans will have two components viz. i) Progressive or Concurrent Mine Closure Plan and ii) Final Mine Closure Plan.
- Progressive Mine Closure Plan would include various land use activities to be done continuously and sequentially during the entire period of the mining operations, whereas the Final Mine Closure activities would start towards the end of mine life, and may continue even after the reserves are exhausted and/or mining is discontinued till the mining area is restored to an acceptable level by the Coal controller.

- Annual closure cost of Mine closure be computed at the base rate of 01.04.2019 considering the total project area of ₹ 9 lakhs per hectare in case of Opencast Mine and ₹ 1.50 lakhs per hectare in underground mine (₹ 6 Lakh per hectare and ₹1 Lakh per hectare in open cast mines and underground mines respectively at the base rate of August, 2009 as per previous guidelines). Annual closure cost is to be computed considering the total project area of the mine by escalated rate (WPI * base rate) and dividing the same by the entire life of mine in years for new projects and balance life of mine in years for operating/existing mines.
- An amount equal to the annual cost is deposited in Escrow Account each year throughout mine life compounded @ 5% annually. (annual cost is mentioned in Project Report)
- An escrow account is opened separately for each mine where the aforesaid amount shall be deposited annually.
- As per latest guidelines, up to 50% of the total deposited amount, including interest accrued in the ESCROW account is released by Coal controller after every five years in line with the periodic examination of the closure plan. The amount released should be equal to expenditure incurred on the progressive mine closure in past five years or 50% whichever is less.

Accounting Aspects

A. Appendix A, Changes in Existing Decommissioning, Restoration and Similar Liabilities to Ind AS 16 deals with the accounting for changes in measurement of decommissioning liability:

Background

Many entities have obligations to dismantle, remove and restore items of property, plant and equipment. In this Appendix such obligations are referred to as 'decommissioning, restoration and similar liabilities'. Under Ind AS 16, the cost of an item of property, plant and equipment includes the initial estimate of the costs of dismantling and removing the item and restoring the site on which it is located, the obligation for which an entity incurs either when the item is acquired or as a consequence of having used the item during a particular period for purposes other than to produce inventories during that period. Ind AS 37 contains requirements on how to measure

decommissioning, restoration and similar liabilities. This Appendix provides guidance on how to account for the effect of changes in the measurement of existing decommissioning, restoration and similar liabilities.

Scope

This Appendix applies to changes in the measurement of any existing decommissioning, restoration or similar liability that is both:

- (a) recognised as part of the cost of an item of property, plant and equipment in accordance with Ind AS 16 or as part of the cost of a right-of-use asset in accordance with Ind AS 116; and
- (b) recognised as a liability in accordance with Ind AS 37.

For example, a decommissioning, restoration or similar liability may exist for decommissioning a plant, rehabilitating environmental damage in extractive industries, or removing equipment.

Accounting Principles

Changes in the measurement of an existing decommissioning, restoration and similar liability that result from changes in the estimated timing or amount of the outflow of resources embodying economic benefits required to settle the obligation, or a change in the discount rate, shall be accounted for in accordance with paragraphs 5–7 of the appendix.

Para 5 deals with Cost Model

Para 6 deals with Revaluation Model

Para 7 deals with Depreciation

Para 8 deals with Unwinding of Discount

Cost Model

- (a) subject to (b), changes in the liability shall be added to, or deducted from, the cost of the related asset in the current period.
- (b) the amount deducted from the cost of the asset shall not exceed its carrying amount. If a decrease in the liability exceeds the carrying amount of the asset, the excess shall be recognised immediately in profit or loss.
- (c) if the adjustment results in an addition to the cost of an asset, the entity shall consider whether this is an indication that the new carrying amount of the asset may not be fully recoverable. If it is such an

indication, the entity shall test the asset for impairment by estimating its recoverable amount, and shall account for any impairment loss, in accordance with Ind AS 36.

Depreciation

The adjusted depreciable amount of the asset is depreciated over its useful life. Therefore, once the related asset has reached the end of its useful life, all subsequent changes in the liability shall be recognised in profit or loss as they occur. This applies under both the cost model and the revaluation model.

Unwinding of Discount

The periodic unwinding of the discount shall be recognised in profit or loss as a finance cost as it occurs. Capitalisation under Ind AS 23 is not permitted.

B. Appendix A to Ind AS 37, 'Rights to Interests arising from Decommissioning, Restoration and Environmental Rehabilitation Funds' provides guidance on the accounting treatment for the contributions to a separate fund established to help fund closure and environmental obligations. The Appendix contains following requirement:

Background

1. The purpose of decommissioning, restoration and environmental rehabilitation funds, hereafter referred to as 'decommissioning funds' or 'funds', is to segregate assets to fund some or all of the costs of decommissioning plant (such as a nuclear plant) or certain equipment (such as cars), or in undertaking environmental rehabilitation (such as rectifying pollution of water or restoring mined land), together referred to as 'decommissioning'.

2. Contributions to these funds may be voluntary or required by regulation or law. The funds may have one of the following structures:

- (a) funds that are established by a single contributor to fund its own decommissioning obligations, whether for a particular site, or for a number of geographically dispersed sites.
- (b) funds that are established with multiple contributors to fund their individual or joint decommissioning obligations, when contributors are entitled to reimbursement for decommissioning expenses to the extent

of their contributions plus any actual earnings on those contributions less their share of the costs of administering the fund. Contributors may have an obligation to make additional contributions, for example, in the event of the bankruptcy of another contributor.

- (c) funds that are established with multiple contributors to fund their individual or joint decommissioning obligations when the required level of contributions is based on the current activity of a contributor and the benefit obtained by that contributor is based on its past activity. In such cases there is a potential mismatch in the amount of contributions made by a contributor (based on current activity) and the value realisable from the fund (based on past activity).
3. Such funds, generally, have the following features:
- (a) the fund is separately administered by independent trustees.
 - (b) entities (contributors) make contributions to the fund, which are invested in a range of assets that may include both debt and equity investments, and are available to help pay the contributors' decommissioning costs. The trustees determine how contributions are invested, within the constraints set by the fund's governing documents and any applicable legislation or other regulations.
 - (c) the contributors retain the obligation to pay decommissioning costs. However, contributors are able to obtain reimbursement of decommissioning costs from the fund up to the lower of the decommissioning costs incurred and the contributor's share of assets of the fund.
 - (d) the contributors may have restricted access or no access to any surplus of assets of the fund over those used to meet eligible decommissioning costs.

Scope

This Appendix applies to accounting in the financial statements of a contributor for interests arising from decommissioning funds that have both of the following features:

- (a) the assets are administered separately (either by being held in a separate legal entity or as segregated assets within another entity); and

- (b) a contributor's right to access the assets is restricted.

Issues

The issues addressed in this Appendix are:

- (a) how should a contributor account for its interest in a fund?
- (b) when a contributor has an obligation to make additional contributions, for example, in the event of the bankruptcy of another contributor, how should that obligation be accounted for?

Accounting for an interest in a fund

Para 7: The contributor shall recognise its obligation to pay decommissioning costs as a liability and recognise its interest in the fund separately unless the contributor is not liable to pay decommissioning costs even if the fund fails to pay.

Para 8: The contributor shall determine whether it has control or joint control of, or significant influence over, the fund by reference to Ind AS 110, Consolidated Financial Statements, Ind AS 111, Joint Arrangements, and Ind AS 28, Investments in Associates and Joint Ventures. If it does, the contributor shall account for its interest in the fund in accordance with those Standards.

Para 9: If a contributor does not have control or joint control of, or significant influence over, the fund, the contributor shall recognise the right to receive reimbursement from the fund as a reimbursement in accordance with Ind AS 37. This reimbursement shall be measured at the lower of:

- (a) the amount of the decommissioning obligation recognised; and
- (b) the contributor's share of the fair value of the net assets of the fund attributable to contributors. Changes in the carrying value of the right to receive reimbursement other than contributions to and payments from the fund shall be recognised in profit or loss in the period in which these changes occur.

Accounting for obligations to make additional contributions

Para 10: When a contributor has an obligation to make potential additional contributions, for example, in the event of the bankruptcy of another contributor or if the value of the investment assets held by the fund decreases to an extent that they are insufficient to fulfil the fund's reimbursement obligations, this obligation is a contingent liability that is

within the scope of Ind AS 37. The contributor shall recognise a liability only if it is probable that additional contributions will be made.

Disclosure

Para 11: A contributor shall disclose the nature of its interest in a fund and any restrictions on access to the assets in the fund.

Para 12: When a contributor has an obligation to make potential additional contributions that is not recognised as a liability (see paragraph 10), it shall make the disclosures required by paragraph 86 of Ind AS 37.

Para 13: When a contributor accounts for its interest in the fund in accordance with paragraph 9, it shall make the disclosures required by paragraph 85(c) of Ind AS 37.

C. Accounting procedure

- Mine closure plan prepared for each mine separately as per the requirement of guidelines issued by Government of India.
- Calculation of estimated annual closure cost, for deposit in ESCROW account yearly for each mine prepared based on requirement of guidelines.
- Total cost estimated for a mine at the end of the life of mine as per mine closure plan is discounted to present value on the date of beginning of the mine closure plan.
- The discounted value is capitalised as 'Site restoration asset' and a 'Site restoration/mine closure provision' is created.
- Mine closure/Site restoration asset is amortised over the life of mine.
- The provision is unwound each year using the same factor used for discounting and recognising the unwinding as finance cost
- Interest on escrow is recognised as income.
- Concurrent expenditure on mine closure recognised as receivable when incurred and adjusted with provision in the year in which the money is withdrawn from escrow account in respect of such expenditure.
- Based on management's assessment, discounting factor/rate is used for this purpose and is reviewed every year.

Specimen Calculation

Example:

For the ease of simple calculation and understanding, it is assumed that as on 01.04.2019 the mining land area is 111.1 hectare and the estimated life of mine is 10 years. (All calculation has been rounded off)

As per recent Mine Closure guideline, as on 01.04.2019, total MCP cost before 5% escalation will be Land area 111.1 hectare * ₹ 9 lakhs per hectare = ₹1000 lakhs.

Base amount for each year before 5% escalation will be ₹1000 lakhs/ Life 10 years = ₹100 lakhs

Total Amount to be deposited in the escrow account considering the 5% escalation in each year are summarised in the table below:

	As per Mince Closure Plan		
Year	Base Amount for each year	Escalation @ 5%	Amount to be deposited in each year
2019-20	100	-	100
2020-21	100	5	105
2021-22	100	10	110
2022-23	100	16	116
2023-24	100	22	122
2024-25	100	28	128
2025-26	100	34	134
2026-27	100	41	141
2027-28	100	48	148
2028-29	100	55	155
Total	1,000	258	1,258

Therefore, the total estimated cost required by end of life of mine on 31.03.2029 will be ₹1258 lakhs.

Now let us assume that as per management assessment the rate of discount is 8%. With the discounting rate of 8% the discounting table is given in the following table:

Year	Discounted Value for ₹ 1
2019-20	1.00
2020-21	0.93
2021-22	0.86
2022-23	0.79
2023-24	0.74
2024-25	0.68
2025-26	0.63
2026-27	0.58
2027-28	0.54
2028-29	0.50

Present value of MCP cost = Total Cost ₹1258 lakhs * discounting factor 0.50 = ₹629 lakhs This present value of ₹629 lakhs will be capitalised as Site Restoration Assets.

Depreciation expense for each year = Total Assets Value ₹629 lakhs / Life of Mine 10 Years = ₹63

Based on above calculation, year wise unwinding of discount value, mine closure value and depreciation value are given hereunder:

	Accounting As per Ind AS			
	MCP to be recognized	Cumulative Value	Depreciation	(Unwinding of discount) Interest Cost
	A	B	C	D
2019-20	629	629	63	
2020-21	50	679	63	50
2021-22	54	734	63	54
2022-23	59	793	63	59
2023-24	63	856	63	63

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2024-25	68	924	63	68
2025-26	74	998	63	74
2026-27	80	1,078	63	80
2027-28	86	1,165	63	86
2028-29	93	1,258	63	93
Total	1,258		629	629

Chapter 13

Coal Pricing Methodology

13.1 Pricing of coal was controlled by central government since 1945 under colliery control order. After the recommendation of BICP (Bureau of Industrial Cost and Price) a decision was taken to deregulate the price of all grade of coking coal and certain grades of non-coking coal. In 2000 the price was totally deregulated under colliery control order 2000.

The coal price has been completely deregulated w.e.f 01.01.2000. After deregulation, Coal companies in India have been fixing the run of mine (ROM) prices for all the grades of non-coking coal produced.

The Prices of ROM coking Coal is done by Coal companies. The prices of washed coal (both coking and non-coking) and coal products like middling, hard coke etc. are fixed by the concerned companies. The prices of washed coking coal are fixed by the coal companies generally based on import parity price and production cost on negotiation basis.

13.2 Prices of coal are fixed from time to time based keeping in mind the following important considerations:

- Due to inflation and upwards movement of AICPI and WPI, there is regular increase in almost all input cost for production of coal,
- Labour cost is a major factor of cost of production, almost half of the total cost, for coal companies. Apart from regular increase in DA rates, coal companies are bound to bear the increased labour cost due to implementation of the recommendation of new wage board after every five years and executives' salary after ten years.
- Coal Companies are required to develop new coal mines every year which a continuous process is. Huge capital expenditure is required to be done by the coal companies for the same.
- Prices are required to be increased from time to time to ensure financially viability of new coal as well as existing coal projects.
- Regular funds are required by coal companies for investment in upcoming projects and modernization of existing mines for augmentation of production.

- Capacity of the market to absorb the coal price, demand and supply scenario, for maintaining import price parity, landed cost of imported coal etc. are some of other criteria for revision of the prices.

The basic objective of the pricing policy is to ensure generation of sufficient surplus after meeting its revenue requirement to facilitate financing of fresh investment with reasonable return. The policy takes into consideration the prevailing rate of inflation and other macro-economic indicators for price revisions from time to time to maintain the surplus at uniform level. The price is also guided by the market forces so that the landed cost of domestic coal remains competitive vis-à-vis landed cost of imported coal at different consuming points.

13.3 The current practice is dual pricing for Coal since 2011 and the details are as follows:

- for consumers in the regulated sector (i.e., Power Utilities (including IPPs), Fertilizers and Defence), and
- for consumers other than Power utilities including IPPs, Fertilizers and Defense (non-regulated sector).

Presently, the prices of G1 to G5 grades of non-coking coal are the same for both Regulated and Non-regulated sectors. The prices of Grade G7 to G17 of non-coking coal for Non-regulated sector are higher by 16-17% over the price applicable for regulated sector.

Dual pricing of coal appreciates that while power and fertilizer sectors in the country are operating in regulated regime and the cost advantages in generation/ production, if any, are passed on to the consumers, other coal consuming sectors, are operating in a market driven pricing mechanism and therefore, have high market absorption capacity.

E-Auctions are also conducted under which any Indian Buyer (viz. individual, partnership firm, companies, etc.) can participate for procurement of coal. Price under such auctions is determined by market dynamics of demand and supply.

International Thermal Coal Pricing System

13.4 Thermal coal pricing is considered to be relatively straightforward because coal used specifically for combustion derives its value from its net heat content, with some allowance made for pollutant content, for example,

sulphur, nitrogen, etc., and detrimental ash effects, for example, sodium, sulphur, ash fusion, etc.

Apart from such allowances which are country-specific, coal cost on as delivered basis irrespective of the countries usually includes the following:

- Pithead costs: labour cost, production cost, royalty and capital cost
- Transportation costs: railing, sea freight, road transportation, etc.
- Port costs (whenever involved)
- Retail profit margins
- Taxes and levies.

Every country has its own unique pricing structure. It has at least two cost components: coal quality parameters and market parameters which depend to a great extent upon the origin of the coal and environmental legislation and supply–demand laws, respectively.

Country-specific allowances depend on the characteristics of the coal, indigenous or imported, consumed in the respective countries.

13.5 The coal pricing mechanism of few countries is discussed as under:

Indonesia

- Around 80 percent of Indonesia's domestic coal production being exported, Mostly to China and India. About 98% of domestic coal consumption is coming from the power (85.5%) and cement industry (12.4%).
- The government introduced MEMR Regulation No. 34/2009 on Domestic Market Obligation (DMO) to secure the supply of coal for domestic needs. However, the DMO realization has consistently failed to achieve its set target.
- Introduced a benchmark pricing mechanism for its coal including steam coal since February 2010 for the domestic supplies as well the export market.
- Determination of separate benchmark prices for thermal, metallurgical and low-rank inferior grade coal on monthly basis.
- The benchmark price for thermal coal is determined using a formula that refers to the average coal prices based on local and international market indices.

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- Government determines the Coal Price Reference (Harga Batubara Acuan or HBA) by averaging the calorific (heat) value of coal in four coal price indices, namely:
 1. Newcastle Coal Index (NEX)
 2. Global Coal Index (GC)
 3. Platts
 4. Indonesia Coal Index (ICI).
- Each coal category has a weight of 25 per cent. The coal category is divided based on coal quality, which is set at 6,322 kcal/kg on as received basis (ARB), moisture content at 8 per cent (ARB), sulphur content at 0.8 per cent (ARB), and ash content at 15 per cent (ARB).
- HBA is calculated as $HBA = 25\%ICI - 1 + 25\%Platts - 1 + 20\%NEX + 25\%GC$
- After determining the HBA, the benchmark coal price (HPB) is calculated by a well-defined pricing formula. This Calculated price imposes penalty for high sulphur (emission), moisture (heat/freight loss) and ash to account for the particulate emissions and for disposal cum storage of ash.
- The government subsidizes coal industry sector through loan guarantee, tax exemption, and preferential royalties and tax rates. This is factored in calculation of HBA wherein Platts and Indonesia Coal Index (ICI) are local indices.
- The government imposes a price cap on coal consumed for public power generation.
- All the environmental and social cost that is not included in coal production cost.

China

- The government sets coal power tariffs at a level sufficient to cover average generation costs (including fuel and labor), taxes, depreciation expenses, and to provide investors (both debt and equity) a return on invested capital.
- Tariff revenues provided to cover depreciation expenses – which amount to between 2-5% of total asset value each year – and provide

a return on capital are now a significant source of cash for SOE capital expenditures.

- Depreciation as a portion of capital expenditures has been at or near 50%, indicating that tariff revenue from depreciation alone has been enough to fund half of capital expenditures on power plant expenditure.
- Besides production cost and labour cost, the total cost of coal production includes resource cost, environment cost, sustainable development cost and safety cost.
- 'Resource cost' consists of resource tax, resource compensation fee, mining right fee, etc.
- Subsidies are present at all levels of government. Central government and state level subsidies are often the most visible, but subsidies from provincial and local government can also be very significant. Significant subsidies are as follows :
 1. Temporary tax and fee relief from provincial and local governments
 2. Investment in fixed assets from the state budget
 3. Compensations for the coal mines that are shut down in the coal phase-out plan.
 4. Value-added tax (VAT) rebates, including VAT rebates for coalbed methane production.
 5. Direct subsidies to listed coal companies (USD 100 million).
 6. Coalbed methane production subsidies (USD 70 million).
 7. Research and development support from the state budget.
 8. Special fund for risky exploration of overseas mine resources.

South Africa

- More than 90 per cent of the power produced in South Africa is coal-fired.
- Domestic power generation by state-owned power monopoly Eskom.
- Export of clean coal, which is produced by cleaning, that is, processing the Run-of-Mine (ROM) coal. Clean coal quality - 12.5 per cent ash

and calorific value (CV) = 6,000 kcal/kg on Net-as-Received (NAR) basis.

- A small fraction of similar quality coal, but closely sized into the traditionally named Nuts, Peas and Beans, is sold on the inland market to a variety of industrial and domestic consumers.
- Another saleable products is the so-called middlings (intermediate) fraction, which varies in CV between 4,300 and 5,500 kcal/kg and sold to power sector.
- Pricing is different for each delivered segment (Eskom, domestic and export)
- Power sector product and export products have completely different product specifications, many mines produce both these products, and pricing is often calculated on a cost sharing basis.
- Besides CV, ash and volatile matter contents, abrasive index plays an important role in price fixation. Higher the abrasive index, shorter is the life of the equipment coming in contact with coal. Among other quality parameters, size of the coal, moisture and sulphur content are limited to certain mandated values.

Russia

- Coal pricing in Russia is done at two different levels: for domestic market and for export market.
- Theoretically speaking, the price for steam (non-coking) coal is proportionate to its calorific value. While this is usually the case, prices are often adjusted at a much lower level for other factors such as ash, sulphur, and in some isolated cases even for phosphorous content.
- Coal price is basically market driven. There exists coal grade classification which does not ordinarily take into account ash and sulphur content. These are the characteristic values which determine whether the coal can be exported or not.
- The following properties of a steam coal significantly affect Russian thermal coal prices:
 1. Calorific value (measured usually on the ash-free basis) is the core factor affecting price. It may reach 7,000 kcal/kg for high quality coal while the usual range of hard steam coal comes to

some 3,500–6,500 kcal/kg. According to SECA, calorific value of standardized high-grade steam coal must exceed 5,800 kcal/kg.

2. Ash content is another parameter having a significant effect on steam coal prices. It may reach as much as 40 per cent. SECA stipulates that ash content must be below 10 per cent (15 per cent in the UK of dry weight).
3. Sulphur content may significantly discount coal price. SECA requires sulphur below 1 per cent.
4. Excessive coal moisture results in transportation difficulties during the winter, besides the deterioration in power plant thermal efficiency, moisture content might also affect the coal price.

Australia

- Determined in free market and through negotiations between buyers and sellers.
- In Australia, the coal mining industry is regulated by states. State governments issue mining leases and exploration licences, collect rents and royalties, and charge the use of transport infrastructure including port facilities.

Chapter 14

Internal Auditing Approach

14.1 Internal Auditing Approach is as follows:

1. The Internal Auditor shall check to ensure whether the entity has designed, implemented and maintained effective and efficient Internal Controls.
2. The audit procedures need to be sufficient to allow the Internal Auditor to check the design, proper implementation and operating effectiveness of the Internal Controls.
3. Any shortcoming shall result in recommendations for improvement and suggestions on how to make the Internal Controls more efficient and effective in line with the objectives.
4. The Internal Auditor shall review the risk assessment exercise undertaken at the time of planning the audit assignment to establish a basis of evaluating whether adequate and appropriate Internal Controls are in place to address the risks identified.
5. Audit procedures to be conducted would primarily be directed over high and medium risk Internal Controls and adequate documentation (e.g., a Risk Control Matrix) should be in place to confirm the linkage of the audit procedures with the respective risks.
6. Unless specially excluded from the audit approach, the Internal Auditor shall plan and conduct risk based internal audits. This requires the application of risk management concepts to ensure that the audits are prioritised in areas of importance, appropriate resources are allocated effectively where needed most, audit procedures are designed to give due attention to important matters and issues identified and reported are significant in nature.
7. The process of risk management generally involves:
 - A clear understanding of the organization's long and short-term objectives.
 - Identification of the risks associated with non-performance or deviation from set objectives.

- Assessment of the probability and potential impact of particular risks factors that are crucial to achieving operational performance.
- Development of action plans and delivery programs to address the identified risks.
- Monitoring and evaluating the risks on a continuous basis.

8. The nature and extent of audit procedures to be conducted in the area of risk management is dependent on the maturity of the risk management processes and the framework in place. Where management has implemented a risk management framework, the Internal Auditor shall plan and perform audit procedures to evaluate the design, implementation and operating effectiveness of the organisation's risk management framework to provide independent assurance to management and those charged with governance.

9. Where no formal risk management framework exists, the Internal Auditor shall design and conduct audit procedures with a view to highlight any exposures arising from weak or absent risk management activities, make recommendations to implement and strengthen related processes and thereby improve risk management.

10. The Internal Auditor shall not assume any responsibility to manage the risks or to execute risk management decisions. It is not the responsibility of the Internal Auditor to mitigate or resolve the risks.

11. The nature and extent of internal audit procedures to be conducted in the area of governance is dependent on the framework in place and the maturity of the processes. Where management has implemented a formal governance framework, and unless specifically excluded from the audit scope (or technically not feasible), the Internal Auditor shall plan and perform internal audit procedures to evaluate the design, implementation and operating effectiveness of such framework so as to provide independent assurance to management and to those charged with governance.

12. Where no formal governance framework exists, the Internal Auditor shall design and conduct audit procedures with a view to highlight any exposures arising from weak or absent governance activities and processes, make recommendations to implement and strengthen those processes and thereby, improve governance.

13. The Internal Auditor shall not assume any responsibility to manage or operate the Governance framework or to take governance related decisions. The focus of the audit procedures is on the process of governance and not the outcome of the process, such as, second guessing or questioning the actions or decisions of the governing bodies. It is not the responsibility of the Internal Auditor to execute or resolve governance related risks.

14. The nature and extent of internal audit procedures to be conducted in the area of compliance is dependent on the framework in place and the maturity of the processes. Where management has implemented a formal compliance framework, and unless specifically excluded from the audit scope (or technically not feasible), the Internal Auditor shall plan and perform internal audit procedures to evaluate the design, implementation and operating effectiveness of such framework so as to provide independent assurance to management and to those charged with governance.

15. Where no formal compliance framework exists, the Internal Auditor shall design and conduct audit procedures with a view to highlight any exposures arising from weak or absent compliance activities and processes, make recommendations to implement and strengthen those processes and thereby, improve compliance.

16. Where the independent assurance requires the issuance of an audit opinion over the design, implementation and operating effectiveness over compliance, this shall be undertaken in line with the requirements of SIA 110, Nature of Assurance, especially with regard to the need to have a formal compliance framework in place, which shall form the basis of such an assurance.

17. The Internal Auditor shall not assume any responsibility to manage or operate the compliance framework (e.g., to act in the capacity of a chief compliance officer, to take ownership of the compliance tracking system, etc.) or to take compliance related decisions (e.g., to accept the risk of non-compliance). It is not responsibility of the Internal Auditor to execute or resolve compliance related risks (e.g., engaging directly with regulators, etc.). Management is responsible for the applicable compliances and risk management of the same.

18. The Internal Auditor shall study and evaluate the scope of TPSP's services, governance and oversight process in place to outsource and

manage risks of deploying TPSPs, especially, risks arising from direct access and control over critical information of the User Entity.

19. Though the internal auditor will be entitled to rely on the work performed by other auditors and experts, he should exercise adequate skill and care in ascertaining their competence and skills and also in evaluating, analysing and using the results of the work performed by the experts. He must also look into the assumptions, if any, made by such other experts and obtain reasonable assurance that the work performed by other auditors and experts is adequate for his purposes. He should be satisfied that he has no reason to believe that he should not have relied on the work of the expert. The reliance placed on the work done by the assistants and/ or other auditors and experts notwithstanding, the internal auditor will continue to be responsible for forming his opinion on the areas/ processes being subject to internal audit or his findings.

20. A periodic independent risk assessment of each third-party arrangement shall be conducted by the management and reviewed by the Internal Auditor to ensure adequate mitigation steps and control activities are designed, implemented, and operated effectively.

21. Internal Auditor of User Entities outsourcing to TPSPs shall review scope of outsourcing as well as third party's governance and oversight process.

22. The User Entity management should undertake due diligence of the governance, risks, and control environment at the TPSP, especially, its ability to provide a highly reliable and secure IT system. Apart from conducting a back-ground check of the TPSP, an assessment should be made to evaluate their ability to conduct business with high integrity, and in a safe and secure manner and in compliances with all laws and regulations.

23. Internal audit function mainly focusses on internal controls of the Organization to move forward and establishing the reports with facts. However, ERP systems have many embedded parameters like

- Process parameters,
- Operational parameters,
- Cost sharing methods,
- Legacy applications,

- Financial Integration etc.

As the correctness of input data which becomes control data is the key source information that validates and integrates the rest of operational results financial integration is vital and crucial. Auditor has to apply the checks and test the same at the foundation level and base the results to analyze the Reporting pattern.

Systems Audit

24. Systems audit is an examination of management's controls within an IT Infrastructure. The evaluation of obtained evidence determines if the information systems are safeguarding assets, maintaining data integrity, and operating effectively to achieve the organization's goals or objectives.

A systems audit is different from a financial statement audit. While a financial audit's purpose is to evaluate whether an organization is adhering to standard accounting practices, the purposes of a systems audit are to evaluate the system's internal control design and effectiveness. This includes, but is not limited to, efficiency and security protocols, development processes, and IT governance or oversight. Installing controls are necessary but not sufficient to provide adequate security. The people responsible for security must consider if the controls are installed as intended, if they are effective if any breach in security has occurred and if so, what actions can be taken to prevent future breaches. These inquiries must be answered by independent and unbiased observers. These observers are performing the task of information systems 27 auditing. In an Information Systems (IS) environment, an audit is an examination of information systems, their inputs, outputs, and processing.

Some of the key Systems Controls to be reviewed by Auditor shall include the following:

- ERP controls (SAP / Oracle / Tally etc, as applicable)
- IT general controls (ITGC) including:
 - Physical security of IT assets, servers and related assets
 - Access rights management
 - Firewalls, Cyber security measures
 - Data safety and security
 - Change management protocols

- Backup and recovery procedures
- Incident management
- Compliance to applicable local Laws and regulations like- Information protection Bill, GDPR, maintenance of Audit Trails, etc.

25. ERP systems adoption leads to a significant change in the information processing environment at the organization. The transition from fragmented ad hoc systems to integrated systems allows for automated document flows, eliminating replications and the resulting inconsistencies in the data. They allow for built-in controls to data verification and data integrity. Yet these systems are complex and require significant effort in implementing and specialized skills in customizing in maintaining the systems. ERP adoption thus leads to new risks during both implementation and operational stages.

ERP systems generally lead to significant improvements in the internal audit function's ability to assess and manage risk in most risk categories. On the other hand, there is an increase in the levels of technology risk factors and operational risk factors, a decrease in financial risks, and wider variation in miscellaneous risk factors. Post implementation of ERP systems, internal auditors are spending more time in quality assurance in processes rather than less time in managing crises. However, as is the case with most organizations, loss of time and effort tend to increase when internal auditors do not play a more important role in implementation, particularly in defining internal control or being part of the reengineering effort necessitated by ERP adoption.

26. Explosives procurement is a major expenditure in Mining Industries. It has various hazardous impacts on the environment also. Therefore, it needs to be checked whether, Company has a system to verify suppliers at regular interval.

27. The suggested points/documents to verify explosives suppliers by company has been tabulated in below mentioned formats.

1	Name of the Company
2(a)	Address of office
(b)	Phone no
(c)	Fax no

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(d)	Location of Factory/Plant with details manufacturing facility
(e)	Contact Person
3	Joint Test Report
4	Factory Layout with detail of plant & machinery approved by PESO
5	Land Deed Submitted
6	Name of the product applied/request for enlistment
7	Licence/Approval CCE/PESO submitted
8	Production capacity as per PESO/CCOE Licence
9	SSI/NSIC/ISO certificate
10	Certificate of Registration & Memorandum and Article of Association and Partnership Deed if partnership concern
11	Date of incorporation
12	Copy of VAT No
13	Central Excise Registration certificate no.
14	Audited Balance sheet & P&L A/c for the last three years and financial capability of the firm as Certified by Auditor of the firm
15	Copy of PAN no
16	Environment/Pollution Clearance submitted
17	Facility for Alternative Source of Power Supply (with documentary evidence)
18	Facility of transportation of explosives (with documentary proof)
19	Municipality Tax/Electric Bill/Rent Receipt
20	Plant & Machinery Testing facilities
21	Facility of process check & Quality Control check for end product
22	Whether Infra-Structure Sufficient for targeted capacity
23	Present Utilized Capacity
24	List of Existing Customer if any for the product applied for and performance certificate by Customer

25	Present Credit facility with Bank (Banker's Certificate)
26	Sanctioned Credit Limit Certified by the banker
27	Certificate from banker regarding regularity of repayment of loan and interest realization
28	Whether Banker is ready to provide sufficient loan for the business for expansion of present project/starting of new project (Banker's Certificate)
29	Quality Assurance and Mining Personnel
30	Product Literature and Technical Data sheet of the product

Chapter 15

General Guidelines of Internal Audit in Coal Sector

15.1 The scope of work suggests the areas to be worked on by the internal auditor. However, a suggestive list is put up for which are required to be considered while doing internal audit of coal mining companies. The list is only illustrative and Internal Auditor is not bound by it. The Auditor is expected to be innovative and review internal controls; compliance of delegation of powers, whether spending is judicious, and look into wastages, pilferages, and theft, adequacy of designed SOPs, policies and compliances thereto, and fraud-prone areas intensely. Surprise checks, physical verifications, integrity checks need to be conducted and suspicious and high-risk transactions need to be closely monitored by the Internal Auditor.

SL No.	Suggested Scope/Checklist
1	COAL PRODUCTION AND OVERBURDEN (OB) REMOVAL:
1.1	<p>PRODUCTION:</p> <p>To Check and Verify the reported production as per the reporting formats as approved by the Board and amended from time to time along with prescribed form/SAP and to report variations, if any:</p>
	<p>MINING AGREEMENT:</p> <p>a) To Check the terms and conditions of coal blocks allocated.</p> <p>b) Check and verify the terms and validity period of mining agreement are in force, and whether all conditions are complied or not.</p> <p>c) Check the payments made to government bodies pertaining to mining agreement are correct as per the defined agreement.</p>
1.1.1	<p>Under Ground</p> <p>Coal Production:</p> <p>a) Checking of Shift-wise coal production as per Form prescribed.</p>

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	<ul style="list-style-type: none"> b) Checking of daily report of coal production with Form prescribed. c) Checking of monthly report of coal production as per Form prescribed, the difference if any to report. d) Checking of daily and monthly coal production from outsourced, if any. e) Checking of coal loaded in tubs and payment to piece-rated workers (in case of manual loading. f) Whether the conversion factor of coal is reviewed in every third year, if applicable.
1.1.2	Open Cast:
1.1.2.(a)	Coal - Departmental <ul style="list-style-type: none"> a) Checking of Shift-wise coal production as per prescribed form. b) Checking of daily report of coal production with the prescribed form. c) Checking of monthly coal production report as per prescribed form, the difference if any to report.
1.1.2.(b)	Coal – Outsourced <ul style="list-style-type: none"> a) Checking of Shift-wise coal production as per prescribed form. b) Checking of daily report of coal production with the prescribed form. c) Checking of monthly coal production report with prescribed form, the difference if any to report.
1.1.2.(c)	Overburden - Departmental <ul style="list-style-type: none"> a) Checking of Shift-wise Over Burden (OB) removal as per prescribed form. b) Checking of daily report of OB removal with the prescribed form. c) Checking of monthly report of OB removal as per prescribed form, the difference if any to report.

1.1.2.(d)	<p>Over Burden - Outsourced</p> <p>a) Checking of Shift-wise Over Burden (OB) removal with prescribed form.</p> <p>b) Checking of daily report of OB removal with prescribed form.</p> <p>c) Checking of monthly report of OB removal as per prescribed form, difference if any to report.</p>
1.1.2.(e)	<p>a) Review Report on incidences of theft of coal if any.</p> <p>b) Review the theft cases to ascertain the impact, root causes and process gaps identified.</p> <p>c) Check whether unit has taken corrective actions to address those gaps, and whether those actions are effective and sufficient to prevent such incidents</p>
1.1.3	<p>Washery:</p>
1.1.3 (a)	<p>Raw coal received</p> <p>a) Checking of Shift-wise coal received as per prescribed form.</p> <p>b) Checking of daily report of coal received at Washery as per prescribed form.</p> <p>c) Checking of monthly report of coal received as per prescribed from.</p>
1.1.3 (b)	<p>Production:</p> <p>a) Checking of Shift-wise coal processed in washery as per prescribed form.</p> <p>b) Checking of report of coal processed in washery with prescribed form.</p> <p>c) Checking of monthly report of coal processed in washery as per prescribed from</p>
1.1.4	<p>Capacity utilization of the washery and comment on the reasons for underutilization if any.</p>
1.1.5	<p>Percentage of yield and comparison of the same with the target and last year's figures and reasons for variance, if any.</p>

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1.1.6	To check whether the procedure adopted for OBR accounting is uniform. (On a quarterly basis)
1.1.7	OBR Accounting is to be checked
2	MARKETING & SALES
2.1	Report on actual off-take with the Annual Action Plan (AAP) target.
2.2	Checking of records that the coal is dispatched after weighing on electronic weighbridges and if not report thereof.
2.3	<p>Report on overloading/under-loading (quantity and amount) and Demurrage paid to Railways.</p> <p>(a) For demurrage charges incurred, to report on -</p> <p style="padding-left: 40px;">(i) Whether the indent for wagons placed with Railways are more than the capacity of the siding?</p> <p style="padding-left: 40px;">(ii) Whether there is untimely supply of wagons, where manual loading is done?</p> <p style="padding-left: 40px;">(iii) any other reason for such demurrage.</p> <p style="padding-left: 40px;">(iv) Whether any protest lodged with Railways for unreasonable claim.</p> <p>(b) Whether Demurrage charged is owing to failure of Contractor where wagon loading is done contractually? If so, whether such demurrage has been recovered from contractor's bill?</p>
2.4	Report on Maintenance of records for road sales – Delivery Order wise, Party wise Ledger, Weighment register, Gate Pass, etc.
2.5	<p>(a) Report on Performance of weighbridge and % of coal weighed.</p> <p>(b) Reasons of unweighted wagon and since when.</p>
2.6	Report of unweighted wagons, if any with the name of the party and place of coal dispatched, basis of raising of sale bill.
2.7	Report on delay in raising invoices for credit sales on the following:

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	<p>(a) Time taken by various departments.</p> <p>(b) Date of loading</p> <p>(c) Date of receipt of RR</p> <p>(d) Date of billing</p> <p>(e) Date of dispatching the bill.</p>
2.8	Checking of Monthly reconciliation between billed quantity and dispatched quantity. If any variation report thereof with reasons.
2.9	<p>Checking of disputed and undisputed dues of Sundry Debtors, age-wise and reason wise and report on disputed dues and check that payments are received as per the fuel supply agreement.</p> <p>Reconciliation with debtors and creditors has been done at regular interval or not?</p> <p>Check the reconciliation records and review the old pending items for reason and whether corrective actions taken by unit</p>
2.10	Checking of records of Bank Guarantees (BG) and timely action taken for renewal and encashment as the case may be and also that the lapsed BG have been returned to the party and all BG have been verified from the Bank through post or through SFMS (Structured Financial Messaging System) mode.
2.11	Checking of Sale bills (test check) are raised as per the Delivery order and surface transportation charges are billed with reference to the lead certificate with applicable rates.
2.12	Report on input tax credit availed correctly and fully against Input GST on revenue as well as capital items.
2.13	Report on incentive/bonus bills has been raised timely and correctly as per FSA and realization thereof and also credit note for a penalty for non-supply of coal as per norm, if any, has been given.
2.14	Report on forfeiture of EMD from e-auction parties with quantity and value during the period/year. In case of failure on part of the Company, competent approval is taken for a refund of the full value of coal, to report quantity and value thereof.

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2.15	To report on Un-lifted quantity/ Short dispatch Quantity to Power Plant/Road Sales/Linkage Sales/Other Sales of coal, if book stock is positive on the given date. (Monthly basis)
2.16	To check whether debit/credit notes have been issued for the settled case of grade variance etc.
2.17	No. of complaints and grievances received from customers and settled/action taken during the period/ year.
2.18	Checking of Delivery Orders for coal are in accordance with Fuel Supply Agreement or any other agreement/order and the full amount is received from the customers.
2.19	Check the records for the supply of coal through washery mode as per FSA or any other arrangement and approval of competent authority is taken.
2.20	Checking of the advance amount received from the customer with the bills raised and in case excess amount, refunded timely, if not report thereof.
2.21	Checking of EMD amount received on e-auction of coal and adjusted against delivery orders issued and in case party has not deposited balance value of coal, whether the EMD forfeited and accounted for.
2.22	Report on Weighbridge calibration done by the statutory authority and date thereof.
2.23	Checking of under-loading charges calculated as per the Railway guidelines and allowed as per the provisions of FSA.
2.24	Report on the under-loading cost and quantity and reason thereof, its comparison with the corresponding period of the previous year and previous month.
2.25	<p>Railway Siding:</p> <ol style="list-style-type: none"> a) Checking of Shift-wise coal received at Railway Siding and despatch, b) Checking of daily report of coal received at Railway Siding and despatch, c) Checking of monthly report of coal received at Railway Siding and despatch, the difference if any to report.

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.26	Levying of penalty by Coal Companies: Report on account of delay in case of reporting of third-party and referee results as per Tripartite Agreement.
2.27	To check whether refund / adjustment of EMD of successful buyers is done within timelines specified.
2.28	To check whether refund of Coal Value of Un-lifted Quantity is done within timelines specified.
2.29	To check whether Performance Security & Financial Coverage BGs are returned as per timelines specified.
2.30	To check whether Joint Reconciliation Statements properly incorporate the head-wise, period-wise and reason-wise outstanding claims not accepted by consumer and Coal Company separately.
2.31	To check whether records of reason-wise claims of consumers not accepted by Coal Company are properly maintained and provisioning is made against the same.
2.32	To check whether long-pending unsettled claims of Coal Companies against CPSEs are referred to AMRCD.
2.33	To check whether undisputed dues reported by Coal Companies in MIS reports (Daily /Monthly/Quarterly) correspond to dues accepted by consumers as per Joint Reconciliation Statement.
2.34	To verify whether expenditure for lodging, boarding and transportation to third party testing agency (CSIR-CIMFR) is being shared by Coal companies and power utilities as per agreement."
3	<p>Checking of Quantitative reconciliation:</p> <p>Opening stock, production, off-take (Dispatch + Colliery consumption) and closing stock as per production report and compare the same with prescribed form and variation, if any, should be reported.</p> <p>Note:</p> <p>a) Opening stock should be verified with the closing stock</p>

	<p>of the same in prescribed form of the previous month/period.</p> <p>b) Production should be verified from the production report as mentioned herein before.</p> <p>c) Dispatch should be verified from Sale Bill Register.</p> <p>d) Inter unit transfer should be verified from Stock Transfer statement.</p>
3.1	To report on the verification and reconciliation of Colliery-wise/Project-wise coal transport quantity to siding with the coal received quantity at Siding on a periodical basis.
4	PRODUCTIVITY
4.1	<p>Analysis of Output per Men Shift (OMS)</p> <p>a) Checking of overall OMS and comparison with previous month & target and report thereon.</p> <p>b) Checking of departmental overall OMS vis-a-vis total overall OMS and report thereon.</p>
5	INPUTS
5.1	<p>MANPOWER:</p> <p>a) Checking of actual deployment of manpower with the approved manpower. Report on short/excess manpower, if possible, discipline-wise. Also, to report on gainful utilization of surplus manpower, if any.</p> <p>b) Check internal controls to ensure correctness of number of workmen and staff used, and time / hours worked for the respective periods.</p> <p>c) Checking of diversion of piece-rated workers in time-rated jobs, number of such cases and whether approval of competent authority is taken for such diversion, if not, report thereon.</p> <p>d) Checking of Absenteeism statement with the Attendance Register, in case of variance, report thereon.</p> <p>e) Efforts has been made for control of overtime or not.</p> <p>f) Manpower deployment in closed mines/abandoned mines.</p>

	<ul style="list-style-type: none"> g) Manpower rationalisation is optimum or not. h) Check PF, ESI and other statutory dues are computed correctly and deposited as per applicable rules. i) Check labour contractors license validity, contractual terms and conditions adherence and timely payment of statutory dues.
5.2	MACHINES (HEMM, CHP, SDL, LHD, CM, Surface Miners, High Wall Equipment, and Power Support Longwall, etc.)
5.2.1	Checking of Monthly Performance of the HEMM and UG machines with respect to Last Year's Actual and with the previous month as per prescribed norms.
5.2.2	<p>Checking of HEMM and UG Machines under breakdown for more than three months, more than three months to one year and more than one year, separately for machines and recovery made for break down, if any:</p> <ul style="list-style-type: none"> (i) Under MARC (ii) Under Warranty (iii) Others
5.2.3	<p>Report on HEMM and other Machines –</p> <ul style="list-style-type: none"> (i) Report on mismatch of Equipment in case of Opencast mines - digging and transporting of coal/ OB with quantitative details. (ii) Checking of HEMM and UG machines which have completed its life as per norms and whether the same is surveyed off or machine is still in operation, report thereon. (iii) Checking of replaced machines in place of surveyed-off during the period under audit. (iv) Checking of Machines surveyed off and grounded during the period under audit. (v) Checking of productivity of the machines and in case it is less than the norms, report thereon. (vi) Checking of guaranteed availability of new machine for the first year (as per contract).

	<p>(vii) Report on Instances where procurement of Components has been made during the valid warranty period.</p> <p>(viii) In case machines or vehicles are taken by unit on rent, check validity of rental agreement with vendors, terms and conditions, and number of hours / days usage of said equipments/vehicles and correctness of payments for the same</p>
5.2.4	<p>Maintenance of Logbooks of HEMM and other Machines:</p> <p>(i) Checking of logbooks:</p> <p>a) All columns are filled up,</p> <p>b) Entry of POL is done on regular basis and in case of variation from the previous day reasons to be recorded,</p> <p>c) The hours/ service meter of the machines are in working order, if not working, report thereon.</p> <p>d) Entry of major sub-assemblies and spares fitted in the machine.</p> <p>e) Maintenance of HEMM as per maintenance schedules is done, if not, report thereof.</p> <p>(ii) Logbooks are signed by the concerned authorized person and operator.</p> <p>(iii) Checking the performance of individual machine from logbook viz. working hours, breakdown hours, available hours, progressive hours on test check basis and report thereof.</p> <p>(iv) Checking the time lag between the date of issue of main spares and the date of its fitting in the machine.</p>
5.3	<p>Burnt Oil: Checking of section-wise burnt oil received and disposed of.</p>
5.4	<p>Checking of actual Performance of the Equipment under maintenance contract (MARC) Vis-à-vis terms of the contract.</p>
5.5	<p>Workshop – checking of jobs assigned and completed within time schedule if delayed report thereof and checking of amount charged for jobs and bills raised, test check.</p>

5.6	Rehabilitation of Equipment: (i) Report on the machines rehabilitated and completed useful life (in terms of years and hours) as per norms, if not report thereof. (ii) To check that the equipment rehabilitation norms of Coal Companies have been followed, if not, report thereon.
6	EXPLOSIVES
6.1	Checking of statutory records required as per rule, if not report thereof.
6.2	Checking of Actual powder factor separately for Coal and OB party wise and compared with benchmark. To check that deductions for variances are pointed out and recovered from Suppliers bills.
6.3	Checking of records for supply of Site mixed Emulsion (SME) explosives as per allocation/requirement and recording of actual supply, party-wise Powder factor for Coal and OB (For Powder factor calculation, total OB should exclude loose un-blasted OB and quantity of OB re-handled) is calculated separately and the same is signed by the authorized person, if any discrepancy report thereof.
6.4	Report on comparison of Powder factor and Detonator factor with norms, previous month and previous year's figures.
6.5	Report on variance analysis of cost per CuM/Tonne of OB and coal respectively, in comparison with Budget showing details of volume variance and price variance.
6.6	Checking of Reconciliation of records of Explosive and accessories with consumption of stock.
6.7	Check maker checker control on explosives purchases, maintenance, record keeping and physical verification.
6.8	Check any discrepancies noted in periodic physical verification versus book stock and reasons and remedial actions on the same

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7	<p>Safety:</p> <p>The utilisation of materials for support in underground mines for safety</p>
7.1	Checking of records for receipt, issue & stock of support material.
7.2	Checking of consumption of all underground support and safety material e.g. timber, steel bolt, roof bolt, cement capsules etc. is vetted by the Safety department.
7.3	Check physical adherence of workmen on site regarding usage of safety equipment's and safeguards
7.4	Check safety briefings, safety guidelines and trainings provided are adequate or not
8	OIL & LUBRICANTS
8.1	Checking of internal control regarding receipt, issue & stock of POL.
8.2	Physical verification of quantity of diesel on test check basis in tankers as well as storage tanks and report thereof.
8.3	Consumption of diesel per CuM of composite production in Open Cast Projects (excluding production by Dragline) and comparison with CMPDIL norms for specific diesel consumption and previous year's figures, report on variance.
8.4	Consumption of diesel per working hour of the machine and comparison with previous month and previous year's figure and report thereof.
8.5	Report on the consumption of POL – volume and price variance.
8.6	Report on short supply of HSD and recovery thereof.
8.7	Checking of records of Dip stick measurement of diesel tank before receipt and after decantation from diesel tanker.
8.8	To check all credit notes/discounts given by PSU oil companies as per the agreement with them.

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8.9	Report on the POL issued to hire patch party and recovery thereof on bulk industrial rate/retail rate on monthly basis.
8.10	Check controls over physical safety and security of oil storage, and controls to prevent theft or accident
9	Power
9.1	Report on consumption of Power per unit of production and comparison with previous month and previous years.
9.2	Report on contract demand (CD) of power and actual contract demand utilized.
9.3	Report on penalty imposed due to: a) Delay in payment. b) Low Power Factor c) Recorded Maximum Demand d) Any other
9.4	Report on variance analysis of power cost per CuM/ tonne as compared to budget and previous year.
9.5	Report on concessional tariff for domestic consumption is availed of, in case commercial tariff to be reported.
9.6	Checking of records that separate Meters are installed for industrial consumption and domestic consumption, if not report thereof.
9.7	Report on Electrical Equipment /machine strength with its annual power consumption standards if any
9.8	Report on initiation of installation of the Solar panel at the unit for supply of power for own consumption subject to feasibility as per the solar target set by the subsidiary unit.
10	FINANCE
10.1	The utilisation of Fund: (a) Checking of budgetary control for indenting, release and utilization of funds under major heads. (b) Checking of the fund's utilization immediately on receipt for the purpose indented for, any deviation to report.

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	<p>(c) Checking of cash receipts and payments and reasons as to why in cash and not through digital mode/bank.</p> <p>(d) Checking of the unsettled amount returned by the bank on the failure of RTGS/NEFT.</p> <p>(e) Checking of payment made through account payee cheque or demand draft, whether approval from competent authority is taken.</p> <p>(f) Checking of bank reconciliation statement and report if any unreconciled amount lying unadjusted for more than one month.</p> <p>(g) Payments to contractors and suppliers are made in serial/chronological order, any deviation report thereof should be supported by proper approval.</p> <p>(h) To report on whether CLTD (Corporate Linked Term Deposit) facility with a reasonable threshold limit has been obtained against the current account of the unit/Area with the concerned bank?</p> <p>(i) To check whether Budget consumption of one head is tallied with General ledger (Mapped GL).</p>
10.2	Checking of balances of subsidiary ledgers with the General ledger and any variance report thereof.
10.3	To report on the age-wise break-up of all advances & receivables appearing on the balance sheet on a quarterly basis. Also, to report on the balances lying for more than 5 years and the possibilities of their being written back/written off.
10.4	Checking of bills as per Supply/Work Order/Agreement/Manual on test check basis and if any deviation report thereof.
10.5	Exceptional reports and types of exceptional transactions need to be checked by auditors. Exceptional transactions signify those transactions made beyond the predefined powers in SAP regarding the transaction by executives for bill passing and payment of bills.
10.6	Check adequacy of segregation of duties for financial transactions & areas like- cash and bank, debtors' collection and recording, payments to vendors, BRS, etc.

10.7	<p>Verification of Investment of Surplus Fund:</p> <p>(a) Whether Deposit Policy, as approved by the Board, being followed?</p> <p>(b) Timely realization of Investments and credit to proper accounts.</p> <p>(c) Reinvestment after maturity of the Term deposits/Mutual funds in time.</p> <p>(d) Timely investment of surplus fund and report if any idle fund not invested.</p> <p>(e) Checking of Fixed Deposits/ICD physically with the bank statements and interest accrued certificates are collected quarterly and accounted for, if not report thereof.</p>
10.8	<p>Checking of Bank draft/Bankers Cheque, received towards EMD and Security Deposits from contractors/ suppliers are accounted for and deposited timely in the bank, if not report thereof.</p>
10.9	<p>Bank Guarantee: Checking for-</p> <p>(a) To check the procedure regarding acceptance, custody and disposal of bank guarantee in accordance to the provision laid down under Finance manuals and time to time guidelines issued by the management.</p> <p>(b) Whether Bank Guarantee submitted against the security deposit and performance guarantee has sufficient coverage for period of work?</p> <p>(c) Whether Bank Guarantee has been properly recorded and realized in case of default?</p> <p>(d) Whether genuineness of Bank Guarantee has been confirmed as per prevailing rules by the issuing bank and verified on SFMS platform?</p>
10.10	<p>Gratuity claims amount received from LIC (if applicable) as per One Year Renewable Group Term Assurance (OYRGTA) policy and checking thereof:</p> <p>a) Whether a claim for reimbursement has been lodged with LIC on time or not.</p>

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	<p>b) Whether reimbursement from LIC has been received timely and paid to the authorized nominee of the deceased employee, if not report thereof.</p>
10.11	<p>Checking of legal bills whether paid as per schedule of legal fee to the empanelled advocates.</p>
10.12	<p>To verify that supply orders /work orders are signed by the authorized officer empowered and verified with the specimen signature of these officials.</p>
10.13	<p>To check that the amount of laptop/tab value (WDV) with perquisite tax has been realized / recovered? from the executives on superannuation/ resignation/ termination.</p>
10.14	<p>Air Tickets:</p> <p>a) Whether booking in respect of Air tickets done on the basis of requisition slip duly approved by the competent authority?</p> <p>b) Whether the bill of service provider (Travel Agent) is passed as per the terms & Conditions of the contracts?</p>
10.15	<p>Booking of Hotel Accommodation:</p> <p>a) Whether booking of accommodation done in the empanelled Hotel and as per entitlement of the person concerned?</p> <p>b) Whether the bill of hotel is passed as per terms & Conditions of the contracts?</p>
10.16	<p>Vehicle:</p> <p>a) Whether hiring of vehicle is done as per terms & Conditions of the Contract?</p> <p>b) Whether the bill of service provider is passed as per terms & Conditions of the contracts?</p> <p>c) Whether insurance covered of the company owned vehicle is renewed in time?</p> <p>Logbooks of vehicles:</p> <p>a) To check that the logbooks are maintained properly giving relevant details such as the places travelled,</p>

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	<p>purpose, meter readings, fuel filling etc. signed by the driver and the Authorized person.</p> <p>b) To check that the recoveries have been made for use of vehicles for personal use.</p>
10.17	<p>Leased Properties:</p> <p>a) To check that the lease rent is recovered as per the agreement.</p> <p>b) To check that the revision of rent is done on due dates and in time as per the terms of the agreement, if not to report.</p>
10.18	<p>Comments on the genuineness of payables for old open items under different payables heads (GzuR/ SRIR/ ARIR). Whether any double booking of expenses or double payment of expenses is identified upon such verification.</p> <p>To conduct vouching of 100% of bills of major heads of expenses and report on any irregularity.</p>
10.19	<p>Auditor's specific comments on completeness and accuracy of booking of major high value expenditures such as contractual expenses related to Coal and OB and repair & maintenance of HEMM. Comment on reconciliation of quantity in the bills with manual/electronic registers maintained at mines for quantities of coal/OB.</p>
10.20	<p>School Grant:</p> <ol style="list-style-type: none">1. To check whether the school are complying with all the regulation and guidelines of the MOU with the Company, if not same should be reported.2. Whether audited accounts of schools are checked before releasing grants.
10.21	<p>SAP-related points:</p> <ol style="list-style-type: none">1. All parked items need to be checked and also checked about status.2. Check if review of open PRs, POs, Work Orders is done monthly / quarterly, and action is taken thereon.3. Employee vendor legacy, customer legacy and vendor legacy balance need to be checked.

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	<p>4. Check master's related controls in system including for-Vendor master file, Item master, Customer master and whether access rights in system are given to select few to modify such masters only based on defined approval and documentation</p>
11	GST
11.1	<p>Registration:</p> <p>1. Whether additional places of business within a state are added in the registration certificate?</p>
11.2	<p>Invoice verification:</p> <p>1. Whether invoice has all the prescribed particulars as required under Section 31 and rules made thereunder?</p> <p>2. Whether bill of supply issued as per requirement of GST Law?</p> <p>3. Whether the time limit for issue of invoice has been adhered to?</p> <p>4. Whether "Self-Invoice" is raised in case of RCM transactions?</p> <p>5. Whether Credit note/ Debit notes are issued and incorporated in GSTR as per the provisions of the GST law?</p> <p>6. Whether document as per books of accounts match with Returns?</p> <p>7. Whether e-invoice has been issued for Business to Business (B to B) or not</p>
11.3	<p>GST Return & Payment:</p> <p>1. Whether returns as applicable have been filed within the due dates?</p> <p>2. In case of late filing whether late fees have been paid?</p> <p>3. Whether supply as per books of account matches with supply as per GSTR?</p> <p>4. Whether the change in tax rates has been dealt with correctly?</p>

	<ol style="list-style-type: none">5. Whether tax has been paid within the prescribed due dates?6. In case of late payments whether interest has been paid?
11.4	<p>Input Tax Credit:</p> <ol style="list-style-type: none">1. Whether input tax credit is taken based on eligible documents having all the prescribed particulars as per the Rules made in this regard?2. Whether the goods / services on which ITC is claimed has been received by the entity before taking ITC?3. Any Reversal of input tax credit for the goods sent for job work?4. Whether Input tax credit is reversed against the receipt of Credit Note?5. Whether wrong ITC availed has been reversed along with interest?6. Whether ITC available in particular month is showing in GSTR-2B or not?
11.5	<p>TDS on GST:</p> <ol style="list-style-type: none">1. Whether TDS on GST deducted as per GST Law and timely payment of TDS?2. Whether TDS certificates issued timely?
11.6	<p>RCM:</p> <ol style="list-style-type: none">1. Whether Reverse Charge has been paid on all inward supplies notified u/s. 9(3) of the CGST Act and u/s. 5(3) of the IGST Act?2. Whether ITC has been availed of the tax paid under reverse charge?
11.7	<p>Misc:</p> <ol style="list-style-type: none">1. Whether books of accounts are maintained at each place of business?2. Whether the Register E-way Bill/Delivery challan is maintained as per the law?3. Are there any departmental inspection proceedings for Transitional Credits or any other demands created?

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12	Purchases
12.1	Checking of Purchase orders placed are as per Purchase Manual or applicable SOPs & Policies and competent approval is taken and necessary formalities as per manual are complied with, if any deviation to be reported.
12.2	Report on Purchase order placed under various mode of purchase as per Purchase Manual and whether purchases are made accordingly.
12.3	To check that no attempt has been made to split the tenders, to keep the value of the contract within the delegated powers of the approving authority, if any report thereof.
12.4	Report on delay in placement of supply orders from the date of approval of indent beyond prescribed time, if any.
12.5	To check that the material is received, and GRN has been processed in SAP within the stipulated time; if not, whether liquidated damages have been imposed, if not report thereof.
12.6	Report on maintenance of records such as Tender Register, TCR files, Supply orders, Bill Passing Register, etc. are in order, in case of any discrepancy report thereof.
12.7	To check that the local purchases are made within the powers delegated to the approving authority. In case of local purchase, whether the materials purchased have been consumed immediately, if not report thereof?
12.8	To check if any advance payment is made to suppliers is as per the NIT/Order and has been adjusted as per the terms of advance payment. Any outstanding for a long time; list of such advances (separately for P&M and Spares) with age and reason for non-adjustment is to be reported.
12.09	Checking of Modules Orders placed for rehabilitation of equipment/HEMM. Also to check that the spares/ materials received are utilized for particular rehabilitation of equipment/HEMM, any discrepancy to report.
12.10	Checking of procurement of centralized items at Area/ Project/ HQ is done with proper justification and with the approval of

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	competent authority and whether all approvals documentation and evidence is maintained on records
12.11	Checking of deletion or insertion of terms and conditions in the standard NIT, whether proper justification has been recorded and competent approval has been obtained.
12.12	To check that the e-tenders are floated, and reverse auction has been followed whenever applicable.
12.13	To check whether all entries have been made in SAP or applicable ERP against orders placed through the e-procurement portal or GeM.
12.14	For all high value purchases, check whether all key terms and conditions of order placed, or Contract are met or not. If not, whether applicable penalty is charged on the vendors. For coal- check coal grade, moisture level, GCV as per contract terms
12.15	Check process of purchase returns where applicable, and quality testing of materials received as per stipulated specifications
13	STORES
13.1	To check & verify proper maintenance of records such as Day Book, Stores Receipts, Issue Voucher, Kardex posting, Store Return Voucher, etc. To check that the entries are made on daily basis in SAP.
13.2	Physical verification of certain items of stores at random and basis of sample size and report the exception, if any. Analyse and ask the reasons for variance noted
13.3	Checking of claims lodged for receipt of short material and damaged material and whether settled, pending such cases to be reported.
13.4	Checking of non-moving and slow-moving store items and to check the details thereof has been circulated to other Areas and Headquarters for gainful use at other places.
13.5	Checking of records maintained for scrap & disposal thereof.
13.6	Checking of reconciliation of materials issued from the Main Stores tally with that received in the Charge-off Stores.

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13.7	Checking of reconciliation between Inventory Ledger generated through ERP and physical store verification is done timely and accounted for quarterly/ yearly.
13.8	To check that the obsolete and non-moving stores & spares have been identified and accounted for.
13.9	To certify the list of obsolete, non-moving stores & spares which are not in use for last 5 years and to report on the steps taken by the company to dispose-off such obsolete and non-moving stores and spares. Check whether slow / non-moving inventory is returned to vendors, where contract allows the same
13.10	In case of any agreement of buy-back of stores, the Auditor has to certify whether the process has been followed.
13.11	Checking of errors in Inventory Ledger and report thereon.
13.12	Checking of inspection reports on test check basis of material and the same is in conformity with provision in the Supply Order. Reporting on List of those material lying in stores waiting inspection for a period exceeding one month.
13.13	Checking of records of used tyres, battery and other recoverable items against the issue of new item.
13.14	Checking of records of warranty spare parts/ spare parts provided with equipment is kept separately and proper record is maintained for the same.
13.15	To check that all material received in stores is having material code and entered in ERP.
13.16	Shortages of stores and spares reported by stock verifier must be reported for provision adjustment in MM module
13.17	To check whether system for goods transfer/goods issue for workshop/ goods returned during inspection must be in/out through proper and timely GR/SR Note generated through SAP, with the proper/ under the surveillance of CCTV camera wherever available.
13.18	Check maker checker control around Stores ordering, receiving, recording, dispatch and stock verification and reconciliation

13.19	Check if the controls are adequate to prevent theft or pilferage of stocked items. Check for any theft cases happened in past, check report and RCA on the same and whether corrective actions are taken by unit
14	<p>SERVICE CONTRACTS AWARDED BY CONTRACT MANAGEMENT CELL (CMC) OR BY ANY OTHER DEPARTMENT:</p> <p>This covers coal transport, sand transport, hiring of pay loaders for loading of coal, hiring of HEMM, surface miner, drills, continuous miner, high wall for over burden removal and coal production, Mine Developer & Operator (MDO) contracts, hiring of vehicles, Turnkey basis contracts etc.</p>
14.1	<p>Coal Transport:</p> <p>To check that the CMC manual is complied with in finalizing relevant tenders of coal transportation awarded by Contract Management Cell or by any other department.</p>
14.1.1	Checking of route map of coal transportation, which is certified by competent person as shortest possible route of transportation.
14.1.2	Checking of work order executed is as per the terms of contract and deviation of time/quantity has been approved by the competent authority and payment released is as per terms of contract/ work order.
14.1.3	Checking of monthly target quantity for transport and penalty for short fall, if any is recovered from the contractor as per the work order. In case waiver of penalty, the same should have competent approval as per the DOP or defined policies.
14.1.4	Surprise checks are to be carried out during weighment of trucks/ tippers/dumpers and discrepancy, if any, to be reported.
14.1.5	Checking of monthly reconciliation of coal transported with Dispatches + Closing Stock – Opening Stock and also to check re-handled quantity, if any.
14.1.6	To check the quantity re-handled and approval of competent authority.

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14.1.7	Checking of records maintained at weighbridge e.g. Gate Pass, Bill, MB, Bill Passing Register etc. on test check basis.
14.1.8	Checking of bills of transporters and it is as per the terms and conditions of the work order and contract and based on the certificate of the concerned authority regarding satisfactory performance and to check that all recoveries such as Security Deposit, Income Tax etc., have been made correctly.
14.1.9	Checking of escalation/de-escalation is calculated correctly and the same is adjusted/ paid to the transporter, any delay more than one month to be reported.
14.1.10	Checking of reconciliation of coal transported from quarry and coal received at dispatch point.
14.1.11	Checking of records of coal transportation done by both departmental and contractual means from the same mines and to check that separate identification of the quantity transported by both the means has been made.
14.1.12	To check that the GPS (Global Positioning System) installed in all the Trucks/ HEMMs deployed in the mine is operating effectively and monitored, if not report thereof.
	Check process of on-boarding and registration of transporters and logistics vendors, like Vendor registration Form, required KYC documents, firm background check, performance evaluation, competitive bidding and comparative quotes selection before awarding the work orders.
14.2	Sand Transport:
14.2.1	To check that the CMC manual is complied with in finalizing relevant tenders of sand transportation awarded by Contract Management Cell or by any other department
14.2.2	To check the total quantity transported is within the awarded quantity and prior approval of competent authority has been obtained for any excess quantity and approval of competent authority has been obtained for excess in the value of work on account of price escalation.

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14.2.3	Checking of reconciliation statement (reconciliation of receipt quantity and dispatch quantity) (Opening stock of sand+ Sand transported from River / Stock to Bunker – Sand stowed) = Closing stock of sand.
14.2.4	Checking of book stock with physical stock of sand and any difference to report.
14.2.5	Checking of records of Sand stowing and also to check that the claim for sand stowing has been made regularly.
14.2.6	Checking of sand stowing ratio and comparison with norms and variance if any to report.
14.2.7	Checking of Shortest route for sand transportation has been identified by a committee and approved by the competent authority.
14.3	The Hiring of HEMM for OB Removal
14.3.1	To check that the CMC manual is complied with in finalizing relevant tenders of OB Removal awarded by Contract Management Cell or by any other department.
14.3.2	To check that the estimate is supported with shortest lead certificate, non-availability of departmental capacity.
14.3.2	To check and report on contracts of time and quantity extension granted and reasons thereof and to report.
14.3.3	Whether there is any splitting of contract in terms of quantity/time to accommodate the tender value within specific delegation of power?
14.3.4	Whether Personnel Dept. certified regarding fulfilling requirement of labor laws specifically for correct wages and PF/CMPF?
14.3.5	No. of contracts extended for time / quantity and whether such extensions is supported with proper justifications.
14.3.6	Whether payment of escalation/de-escalation has been properly calculated?

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14.3.7	Checking of initial and final measurement document of contractual OB removal.
14.3.8	Reconciliation with survey report and OBR reported.
14.3.9	Whether Uniform practice has been followed for acceptance / rejection of offers including the time period for such decision on test check basis?
14.3.10	OBR removed during the year with bill paid and reconciliation with physical measurement.
14.3.11	Checking of the closing advance stripping with Surveyor's Report.
14.3.12	Whether Hindrance Register is maintained and updated for every Coal, Sand transport and OB Removal contracts.
14.4	<p>Other Contracts</p> <p>To check that the CMC manual is complied with in finalizing the relevant tenders and to check all other details while making the payment</p>
15	<p>CIVIL CONTRACT WORKS (CAPITAL & REVENUE)</p> <p>It covers all construction works under capital head, revenue works and turnkey contracts etc.</p>
15.1	To check that the Civil Engineering Manual / Contract Management Manual /Schedule of Rates are complied with in finalizing the relevant tenders.
15.2	To check that no attempt has been made to split the tenders to keep the value of the contract within the delegated powers of the approving authority.
15.3	To check that the works awarded have been completed within the scheduled time, if not to check that the competent approval is taken for time extension as per provisions of Manual.
15.4	To check that there is no failure on part of the management, due to which the work could not be completed in time resulting in escalation of value of contract.
15.5	To check that for completed works, final bills have been

	prepared in time and accounted for. To check that the details of running and final bills are recorded in the Measurement Book (MB) and any material issued to the contractors has been recovered. Test check of MB with bills. To report for capital works in progress after the completion of work period as per contract.
15.6	To check and report for abnormal variations in quantities as per estimates of awarded work.
15.7	To check that the advances, if any paid against contract are adjusted as per the terms of the contract and in case interest bearing, correct interest has been recovered from the contractor.
15.8	To check that the payments have been made as per the terms and conditions of the work order and on the basis of satisfactory performance as certified by the concerned authority; whether recoveries towards security deposit, secured advance, income tax, etc. have been made correctly.
15.9	To check BG/Security has been refunded only after No dues and Performance Certificate from Engineer In-Charge.
16	ESTABLISHMENT
16.1	<p>Manpower:</p> <ul style="list-style-type: none"> (a) To check the reconciliation of manpower on roll and manpower paid as per Pay-sheet. (b) Checking of fixation of basic pay on promotion, revision of basic pay in disciplinary action, subsistence allowance and other allowances sanctioned time to time and pay fixation of new recruitments etc. (c) To check the details and documents submitted by the new recruitment's executives/ non-executives. (d) To check the complete records for employment given to land oustees and suitable compensation paid as per the statutory requirement e.g. R&R Policy/State Level Policy. (e) To check that on death and in medical unfit cases whether competent approval is taken before giving the employment.

	<ul style="list-style-type: none"> (f) To check the records of vacancies to be filled by promotion of existing employees and report thereof. (g) To check the records of transferred employees as transferred and not released and report thereof. (h) To check the cases of retirement on medical ground/Retirement before superannuation/VRS and and to check that the competent approval is obtained.
16.2	<p>Service Record Verifications</p> <ul style="list-style-type: none"> (a) Whether photographs of the employee have been affixed and attested, if not, report thereon. (b) Whether the Service Book has been signed by the employee and countersigned by the authorized person? (c) Whether date of birth and all other columns have been filled up? (d) Whether there are any discrepancies in the date of birth of the employee with regard to Service Records? (e) Whether any case is pending for age or qualification dispute.
4	<p>Attendance (Integrated with SAP or other applicable ERP):</p> <ul style="list-style-type: none"> (a) To check that the Bio-Metric attendance system is in operation and pay sheets are prepared after taking attendance directly through system and without manual interference, if any to report. If manual to check that attendance is marked daily and cross totaled are made in the attendance register. The attendance register is signed daily by the authorized person. (b) In case of Underground, cross-check the attendance with Cap Lamp Register. (c) Whether attendance is being captured through Biometric machine and the same is integrated with SAP. (d) Deputation- Tour program and Sunday attendance must be crossed checked with approval copy of competent authorities and CAP Lamp issue register must be checked for UG attendance.

16.4	<p>Leave Records</p> <ul style="list-style-type: none">(a) To check that the leave records are maintained in the prescribed format/SAP.(b) To check that the balances of leave are correctly carried forward and added for the current year as per eligibility, leave availed are correctly recorded in SAP.(c) Leave availed is supported by applications and duly sanctioned as per leave SOP in SAP.(d) To check that the leave register is updated and corrected regularly.(e) To check the instances where leave has been availed but having no leave balance.
16.5	<p>Overtime and Rest Day workings records</p> <ul style="list-style-type: none">(a) To check that proper record for overtime is maintained, specifying the engagement of hours with reasons.(b) To check that the OT sanctioned is within the delegated powers.(c) To check that the OT/Rest Day wages paid have been duly sanctioned.(d) To check the instances where the employee was on leave / rest day, but OT is paid.(e) To check the instances where employees have been engaged on overtime continuously for more than eight hours.(f) To check that compensatory rest has been availed in all cases, if not to report.(g) To report for Variance in cost of normal overtime and Sunday / Holiday workings with Budget and previous year in terms of hours/days and financial.(h) To Report on Sunday deployment vs Normal deployment.
16.6	<p>Visit to Home Town</p> <p>To check that the Home Town register is maintained properly giving all the relevant information like details of the employee,</p>

	<p>members of his family, age, address (updated time to time on receipt of applications from the employees for any changes), details of previous Home Town availed, date & amount of advance taken and subsequent adjustment thereof etc. and to check the rates of fare are as per applicable rates of mode of travels.</p>
<p>16.7</p>	<p>Salary & Wages Audit</p> <p>(a) To check that the provisions of NCWA in case of non-executives and in case of executives -Executive Pay Revision are followed in preparation and payment of wages and salary.</p> <p>(b) To report whether payment of salary & wages is made only through Bio-metric attendance system and this system is integrated with SAP.</p> <p>(c) System & transaction audit to be carried out on sample basis in respect of each element of salary & wages including arrear salary & wages and PRP paid and to report weaknesses and deficiencies in internal control.</p> <p>(d) Checking of all deduction, recoveries and adjustments are made and reconciled e.g. CMPF, Family Pension and Pension, HBA, conveyance loan etc.</p> <p>(e) Checking of pay fixation arising out of promotion/up-gradation, annual increment and stagnation increment and on implementation of NCWA and Executive Pay Revision as and when due. Also to check arrears arising out of such fixation/ revision.</p> <p>(f) To confirm that discontinuation of billing of departed employees is made in the next month and no payment through system is generated thereafter.</p> <p>(g) To check fall back wages, whether competent approval has been obtained.</p> <p>(h) To check that all the terminal benefits have been settled and paid to superannuated/ resigned employees, any pending case to report.</p> <p>(i) Checking of arrear salary & wages and arrear PRP bills before making final payments to separated employees.</p>

	<ul style="list-style-type: none"> (j) Whether employees have necessary approval for joining after long absenteeism, if not to report. (k) Checking of register for recovery of rent and reporting on outstanding amount. (l) To check the records relating to occupancy of quarters and rent is recovered as per rule of the company. (m) Unauthorized occupancy of company accommodation, if any, should be reported. (n) Reconciling HRA payment, Conveyance reimbursements, Transport Subsidy etc. against respective sanction order. (o) To check whether the entry in SAP / applicable ERP of relevant supporting documents with the date of validity have been properly done on the basis of which Transport subsidy are being reimbursed as per the clause of latest wages agreement. (p) Reporting on monthly checking of Salary and monthly variance report may also be included
16.8	<p>Advances to Employees</p> <ul style="list-style-type: none"> (a) To check that the advances are adjusted and in case of recovery the same is regularly done, no second advance unless the first one is adjusted. (b) To check the schedules of advances under various heads duly tallied with the balances of General Ledger. (c) To check that the Debit Memos for the Transfer TA and other advances for the transferred employees have been issued timely to the place of transfer and recorded in the LPC. (d) To check that the interest on House Building and Conveyance advances has been calculated correctly and recovered regularly. (e) A summary of Employee Advances and its recovery may also be given. (f) Checking and reporting of Classification of Medical Advances:

	<ol style="list-style-type: none"> 1. Existing Employee (On Roll): <ol style="list-style-type: none"> a) Hospital Medical Advance - item not admissible. 2. Retired/Death cases – Amount recoverable from: <ol style="list-style-type: none"> a) From terminal benefits b) Non- recoverable
16.9	<p>Other Payments</p> <ol style="list-style-type: none"> (a) Checking of other expenditures like TA, Transfer TA, LTC, Medical reimbursement, medical reimbursement to retired employees under CPRMS etc. has been made as per the relevant circulars of the company and if any irregularities to be reported. (b) To check the Performance Related pay (PRP) and production incentive etc. is calculated correctly. (c) Checking of full deduction towards CPRMS for both executive as well as non-Executives and transfer of its fund to related Trust.
16.10	<p>Outside Repairs</p> <ol style="list-style-type: none"> (a) To check that major outside repair has been done after obtaining proper approval. (b) To check that the relevant manuals are complied with for awarding such works. (c) To check that the proper records is maintained for all such works e.g. details of work order, bill passing details, deductions etc. (d) To check that the equipment/ machines sent for repair have been received in time and to report if there is any delay for more than three months.
16.11	<p>Statutory Payments & Returns</p> <p>Check whether Unit has a comprehensive List of applicable Laws, compliances and requirements to be complied with. Whether compliances monitoring process is established and working properly at the unit.</p> <ol style="list-style-type: none"> (a) Verification of receipts/acknowledgements for the payment of statutory dues like Income tax, Sales tax,

	<p>GST, Royalty on coal and sand, Stowing, Road tax, Insurance etc.</p> <p>(b) To check that the statutory dues have been deposited in time and reconciliation of collections/receipts as the case may be and payments of statutory levies and if any penalty due to late payment to report.</p> <p>(c) To check that all Statutory Returns have been filed in time, in case not complied to report.</p> <p>(d) To check that all statutory deductions made from the bills of contractors are deposited to the appropriate authorities within the time schedule like PF, ESI etc.</p> <p>(e) To prepare a status of old pending cases at various levels and report on necessary action taken including suggestions on how to ensure that litigation is reduced.</p> <p>(f) In case of delays noted for payment of statutory dues, is applicable interest, penalty paid, and whether suitable communication / warning is given to the concerned vendors to ensure compliances going forward</p>
17	SYSTEM
17.1	<p>(a) To check that A.M.C's exists to protect the hardware and software installed.</p> <p>(b) To check that all software installed is fully utilized, if not to report.</p> <p>(c) To check the areas where the inbuilt check exists in the computer environment and needs to be reviewed.</p> <p>(d) To check the document retention policy to eliminate the problem of extracting information from computer file due to lack of back up of past records, exists or not.</p> <p>(e) To check that a system of proper documentation of software program exists.</p> <p>(f) To check that corrections made in master data are done by authorized person and complete record centrally in computer department is being kept and having the approval of head of System department.</p>

	<ul style="list-style-type: none"> (g) To check that the backup of data is being taken regularly. (h) Whether there is a system of identifying and disposal of e-waste. (i) To check the verification of creation of master records of employees transferred in /newly joined during the month & elimination of master records of employees, who have left the organization during the month on account of transfer, retirement, resignation, death, dismissal, removal, etc., if not to report. (j) To check the anti-virus software is installed and working effectively (as per backup policy). (k) To check schedule of authority (SOA) and ensure that the delegated has sufficient control for discharging his responsibilities. (l) To check and ensure that hardware access control have fully been implemented so that remote user has proper authority to see, create & delete data and confidential/ payment related data, if shared, are encrypted or not, if not to report. (m) To check and report the existence of software password control along with periodic modification are in operation. (n) To check the existence of disaster recovery and business continuity plan along with periodic testing and review of the procedure. (o) To check the existence of software base control to block the access immediately after cessation of service like superannuation/ dismissal/ death/ termination etc.
17.2	<ul style="list-style-type: none"> (a) To check whether CCTV recordings are being kept safely for future use as per norms, if not then report on the same. (b) Check how many CCTVs cameras are not working, for how long. CCTV recordings maintained are adequate or not.

	<ul style="list-style-type: none"> (c) Report if any boom barrier and RFID installed at Area or colliery are not in function or remains idle. (d) Report whether VTS system is updated or not. (e) To check whether the system installed for recording of Coal weighment is in order and properly functioning, if not then report on the same. (f) To check whether E-Invoice on E-way bill is generated from SAP or not. (g) To check whether payment interface is updated regularly, if not then report on the same. (h) Check all Purchase Orders from SAP system and compare it with the suppliers' bills for which payments are made.
<p>18</p>	<p>FIXED ASSETS</p> <ul style="list-style-type: none"> (a) Checking of Fixed Assets Register having all required details e.g. Quantity, unit, Location, Identification Number, Original Cost, Date of Capitalization, Life of the Assets, Rate of Depreciation, Depreciation for the year, Additions, Deletions, Accumulated Depreciation, WDV etc. (b) To check that the Physical verification of fixed assets has been carried by the management during the year and discrepancies, if any observed have been accounted for. (c) Verification of title deeds of Lands. Whether title deeds of immovable properties are held in the name of Company? Where title deeds are not available or documentation is incomplete, whether requisite efforts are taken by unit to address the same? (d) To check the reconciliation of balance as per Fixed Assets Register and General Ledger and report for any difference. (e) Review the process of fixed assets – purchase, installation, capitalisation, depreciation, transfer / disposal; and whether correct entries are made in books and requisite approvals obtained as per DOP / policies.

	<p>Capital WIP</p> <p>(a) To report and check with reasons of any WIP assets lying pending for more than 3 years for capitalization.</p> <p>(b) To review Project wise status of CWIP items lying more than 3 years and recommend for write off the same if required.</p>
<p>19</p>	<p>HOSPITAL/ DISPENSARY</p> <p>(a) To check the receipt of the medicines and issue is recorded properly.</p> <p>(b) Physical verification of medicines and other related material on test check basis with a sample size and to tally with the book stock, any deviation to report.</p> <p>(c) Check the manning of Dispensary/Hospital for doctor(s) and staff availability is adequate to manage the number of patients coming.</p> <p>(d) To check the record of expiry medicines with reference to date of purchase, if purchase is within three months, to report, also to check the disposal thereof with the approval.</p> <p>(e) To check the equipment purchased and not installed within a reasonable time.</p> <p>(f) To check and to report on the breakdown of major equipment and that Annual Maintenance Contract exists or not.</p>
<p>20</p>	<p>CENTRAL/ REGIONAL WORK SHOP</p> <p>To check the records of shop wise, for expenditure incurred during the month/ quarter.</p> <p>(a) To check the jobs undertaken and completed within scheduled time.</p> <p>(b) To check that the work undertaken by the workshop after obtaining formal work order.</p> <p>(c) To check that the material received and used for repairing the machine / equipment is accounted for.</p>

	<p>(d) Physical verification of stores and spares on test check basis to reconcile with the book stock, any deviation to report.</p> <p>(e) To check that the proper record is maintained for surveyed off equipment at workshop with the disposal.</p>
21	CONSULTANCY
21.1	<p>Sales Billing & Realization:</p> <p>(a) Checking of records of jobs undertaken by Consultant as the work orders received from companies .</p> <p>(b) Checking of bills raised as per the estimate submitted / work order– Deviation if any to report.</p> <p>(c) Checking of customer ledgers any payment due for more than 3 months to report from the date of bill issued.</p> <p>(d) To check the records related to verification of Quantum of drilling block-wise and subsidiary-wise.</p> <p>(e) Periodical reconciliation with different subsidiary companies for settlement of disputed outstanding bills, if any.</p> <p>(f) To check the Variation if any, between actual numbers of Engineering Day (ED) booked vis-à-vis budgeted.</p> <p>(g) To check that the statutory payments are made in time and returns have been filed in time, delay if any to report, in case any penalty for delayed payment to report</p>
21.2	<p>Business Development Division:</p> <p>(a) To examine the Tenders or quotations received in response to the Tender from outside parties other than Coal Companies.</p> <p>(b) Rates arrived at for above.</p> <p>(c) Deviation if any.</p> <p>(d) Examine standard % over the estimated expenditure as margin is added to arrive at rates.</p>
21.3	<p>Drilling Camp:</p> <p>(a) Maintenance of Vehicle log book.</p>

	<ul style="list-style-type: none"> (b) Maintenance of drill machine log book. (c) Actual hours run during the shifts, breakdown hours and machine maintenance hours. (d) Consumption of POL. (e) Machine-wise consumption of POL. (f) Actual consumption of power, POL, stores vis-à-vis targeted consumption as per approved budget.
21.4	<p>Machine Utilization of Drilling Camps:</p> <ul style="list-style-type: none"> (a) To check the actual machine utilization at drilling camps: <ul style="list-style-type: none"> i. Actual shift hours ii. Breakdown hours. iii. % of breakdown hours to shift hours. iv. Available hours. v. Production hours. vi. % of production hours to shift hours. vii. % of non-production hours to shift hours. viii. Total utilization hours. ix. % of utilization hours to shift hours. x. Idle time hours. xi. Break-up of idle hours. (b) Available capacity of meterage of individual drilling machine and utilization. Deviation if any. (c) Excess and shortfall of meterage drilled by individual machine.
21.5	<p>Costing:</p> <ul style="list-style-type: none"> (a) To check the cost arrived at for calculation of rate per meter. (b) Examine all expenditure incurred have been duly incorporated in the Cost Sheet. (c) Consumption rate of the items complied in the Cost sheet like Power, POL, Explosive, stores etc. and

	<p>compare with the consumption rates targeted in the approved annual budget.</p> <p>(d) Comparison of actual controllable expenditure vis-à-vis budgeted expenditure any deviation to report.</p> <p>(e) Examine the percentage added over the actual cost is correct or not.</p> <p>(f) Calculation of rates for Planning & Designing jobs.</p> <p>(g) Calculation of rate for drilling jobs.</p> <p>(h) Checking of different MIS reports regularly prepared.</p>
22	<p>Corporate Social Responsibilities Expenses (CSR):</p> <p>(a) To check the activity-wise budget and actual expenditure under Corporate Social Responsibilities (CSR).</p> <p>(b) To check that works undertaken under CSR are within the allocated budget and also as per CSR policy of company.</p> <p>(c) To check and report unspent amount and also to check that the works undertaken by outside agencies, utilization certificates are received in time.</p> <p>(d) Report age analysis and reasons for time over run and action required.</p> <p>(e) Test check the details of CSR programs and expenditure incurred to assess the benefits derived from the same</p>
23	<p>Mine Closure Plan Expenditure (MCP):</p> <p>(a) To check the progressive mine closure expenses are identified and charged to a separate head of account.</p> <p>(b) To check that the amount is withdrawn from Escrow account at the interval of every five years for the expenditure incurred for mine closure.</p> <p>(c) To check that proper record is maintained for mine closure expenses.</p> <p>(d) Check if the adequate provision is made periodically for such expenses and the basis of the same (expenses estimation by inhouse technical team or independent agency)</p>

<p>24</p>	<p>Under the head legal:</p> <ul style="list-style-type: none"> (a) The internal auditor should check whether all legal cases have been regularly pursued by the advocate and legal department or not? (b) Whether any case not taken up due to non-attendance of advocate of department (c) Whether proper mentioning of cases are being done for early redressal of the cases. (d) Check for adequate provision / disclosure in books where required for the cases
<p>25.</p>	<p>IT Governance and Strategy</p> <ul style="list-style-type: none"> (a) Executive management is periodically updated with the values achieved from system implementation. (b) Presence of a formal methodology for evaluating a system solution prior to commencement of development activities and its approval by the authorized personnel on a periodic basis. (c) Application changes are appropriately tested and approved before being moved into the production environment. (d) The presence of structured IT Policy and personnel are aware of the applicable policies. (e) All accounts used by the system are unique and have been assigned to personnel with ultimate responsibility over the usage of the account(s). For each system, usage of its account is tracked and reviewed on a periodical basis. In case shared accounts are used, compensatory controls are in place as appropriate. (f) Management approves the nature and extent of user-access privileges for new and modified user access, standard. (g) application profiles/ roles, critical financial reporting transactions, and segregation of duties. (h) Physical security procedures are implemented, only

	<p>authorized users have access to data center, access to data center is monitored, environment control like, raised ceiling, humidity controls, smoke detection and automatic fire-extinguishing equipment is installed for protection against fire hazards.</p> <ul style="list-style-type: none"><li data-bbox="210 331 954 479">(i) The information system identifies and handles error conditions in an expeditious manner without providing access to any information that could be exploited by adversaries.<li data-bbox="210 496 954 644">(j) All Systems interface and jobs are adequately monitored. Only authorised persons have access to schedule interface/ job and monitor the same to ensure appropriate, accurate and successful Interface and Job.<li data-bbox="210 661 954 843">(k) Vendor reliability is considered before purchasing IT system hardware and software. Vendor agreements cover relevant clause(s) to ensure confidentiality, integrity and availability of support. Agreements are signed with defined SLA and monitoring mechanism.<li data-bbox="210 861 954 1121">(l) The level of cyber protection established on servers and workstations is determined and the monitoring of cyber-attack is undertaken by IT administration. Cyber protection is ensured through antivirus, DLP (Data Loss/ Leakage Prevention), and other Applications is updated on a monthly basis. Laptops and Remote login access, if issued, are ensured to have secured internet access.<li data-bbox="210 1138 954 1242">(m) Data privacy editing and validation check controls are designed and implemented. Privacy controls are designed and implemented as per Privacy Policy.<li data-bbox="210 1260 954 1329">(n) Network is adequately designed, tested and managed with the perspective of cyber security
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