CHAPTER - IX

SUMMARY AND FINDINGS

9.1 INTRODUCTION :
This chapter has been divided into two sections. The first section contains a chapterwise summary of the Report. In the second section are presented the findings and recommendations of this study.

SECTION - I

CHAPTERWISE SUMMARY OF THE REPORT

9.2 SUMMARY OF CHAPTER - I
This chapter discusses among other things the objectives of nationalisation of coal industry in India in 1973. It contains an illuminating discussion of the concept of safety and emphasizes that "safety" is a primary responsibility of management and a primary charge on the revenue of the coal mines as the cost of maintaining the health and safety of coal-miners must be considered as an essential part of the cost of production of coal. Further the Government has stated unequivocally that health and safety of coal miners was and continues to be one of the principal objectives of nationalisation of the coal industry in India.

The chapter also contains a detailed discussion of :

i) Topic of research and its socio-economic significance.

ii) Scope and limitations of the study.

iii) The hypothesis to be tested.
iv) Sources of data.

v) Field work and case study.

vi) Methodology of the study and,

vii) Chapter arrangement of the report.

9.3 SUMMARY OF CHAPTER - II

This chapter contains an in-depth study of Accidents and their causes, consequences, and prevention. The chapter is divided into four sections:

SECTION - I: Presents the definition of "accident" as given in regulation - 9 of Coal Mines Regulations (1957) framed under the Mines Act, 1952.

SECTION - II: Discusses the causes of accidents. The discussion emphasizes that mining is 3 to 8 times hazardous than manufacturing activity, and goes on to discuss the special hazards in mining. A discussion of ILO and DGMS classification of causes of accidents and their significance in the analysis of accidents follows. This section also presents time series data on pre and post nationalisation accident statistics and also some international data for the purpose of comparison.

SECTION - III: Discusses the consequences of accidents and the cost of the accident to the employer, the state, the community as also to the person and family of the injured worker and the dependents of a diseased worker.

SECTION - IV: Discusses the anatomy of an accident with a view to identify the cause of accident and prevent its recurrence. The philosophy of safety, policy of ZAP (Zero Accident Potential) and
MAP (Minimum accident Potential), new techniques of analysis of accidents, and methods of prevention of accidents as well as the strategy for accident prevention and the basic elements of a safety programme have also been discussed, in this section.

9.4 SUMMARY OF CHAPTER - III:

This chapter discusses the problem of industrial health and related matters. The chapter is divided into two sections - the first dealing with health hazards and the second with accident compensation.

SECTION - I: Discusses the definition of industrial health as given by ILO and WHO and the various occupational diseases associated with coal mining. In particular Pneumo-coniosis and Silicosis have been discussed. This section contains a thorough discussion of the climate and environment in the mines and their significance for the health and safety of coal miners. Specifically the impact of -

i) Thermal stress and hot and humid climate.

ii) Presence of rock and coal dust in the air.

iii) Presence of noxious and inflammable gases and other pollutants in the air.

iv) Noise and glare.

v) Lack of illumination and ventilation.

vi) Unhygienic conditions etc.

On the health of mine workers have been discussed using relevant technical data. Measures for containing or minimising the health hazard have been discussed.

SECTION - II: Deals with bodily injuries and discusses the
scale of compensation prescribed by law for various types of injuries. An analysis of statistical data on bodily injuries has also been presented.

9.5 SUMMARY OF CHAPTER - IV :
Chapter - IV contains a comprehensive review of legislation covering the coal mining industry, and discusses the legislative provisions and their effectiveness. The Chapter has been divided into two sections - the first dealing with the central laws pertaining to coal mines and their judicial foundation, the second dealing with regulations governing health and safety of coal miners and a discussion of the effectiveness of these regulations.

SECTION - I : Points out that it is the constitutional responsibility of the Government of India to enact industrial laws to establish a just and fair social order and ensure social justice through labour laws and prevent exploitation of labour by the Management. It also emphasises that since WCL is a public enterprise, Government as an employer must act as a model employer and provide fair wages and maintain high standards of health and safety of workers. The useful and constructive role of ILO and WHO have also been emphasised. A historical review of mining legislation in India follows.

This chapter provides a statistical profile of WCL which is a fully owned sub-sidiary of CIL. Since there is no separate annual report published for WCL and only an annual reports of CIL which presents comparative data for all its subsidiaries, the discussion of the profile of WCL is based on the data furnished by the Annual Reports of CIL.

This chapter discusses the following topics:

1) Organisation of coal industry in India
2) Trends in investment, production, technology and productivity in coal industry in India.
3) Conservation of coal.
4) Marketing and pricing of coal.
5) Demand satisfaction.
6) R & D work.
7) Industrial relations and labour welfare.
8) Welfare programmes including programmes for
   i) Housing.
   ii) Supply of drinking water.
   iii) Medical facilities.
   iv) Educational facilities.
   v) Mine safety.

A comparative profile of CIL and WCL covering all these aspects has been presented with supporting statistical data.
This chapter discusses Management Safety in coal mines in India. All the three aspects of safety management, namely, policy, organisation and administration have been covered. Policy has been discussed in Section-I, Organisation in Section-II, and Administration in Section-III, of this chapter.

SECTION - I : Identifies the policy goals and discusses the policy of ZAP and MAP and their suitability and practicability, elements of safety policy and ensuring effectiveness of safety policy and reducing accident costs.

SECTION - II : Deals with the safety organisation and presents an organisation chart of WCL and its internal safety organisation. A detailed discussion of duties and responsibilities of field officers and safety officers at various levels have been discussed at length. The communication lines have also been discussed.

SECTION - III : Deals with administration of safety policy. It contains a highly illuminating discussion of the implications of making safety a line function. It also outlines the management strategy for control of safety. The importance of analysis of the causes of accidents and avoiding unsafe conditions in mines and unsafe actions by mine personnel have been heavily emphasised. In addition, topics like responsibility and accountability for accidents, role of DGMS, role of Tripartite conferences, role of Internal Safety Organisation, importance of workers participation etc. have been discussed.
One of the principal objectives of nationalisation of coal industry in India in 1973 was:

"To improve the working conditions in the mines and thus promote the health, safety and welfare of the mine workers". (See para 1.1 (3))

Consequently the main objective of this study is to test the hypothesis that "The safety situation with regard to coal miners has distinctly improved as a result of nationalisation" (See para 1.4). Since promoting health and safety is a continuous objective, it is considered necessary to establish through a field study covering a long period that this objective is being continuously and vigorously pursued year after year registering progressive improvement in the working conditions of coal miners after nationalisation. Hence an in-depth case study covering the period from 1973 to 1989 was carried out to test the following hypothesis (See para 7.3).

1. Adequate legal framework to ensure promotion of health and safety has been created;

2) The various enactments have ensured that organisations and authorities have been created to formulate and execute plans for health, safety, rescue and rehabilitation, and welfare of the mine workers and that these organisations and authorities are working regularly, continuously and effectively for that purpose.

3) Management, monitoring and control of safety is ensured through elimination of unsafe working conditions, through
accident analysis to identify causes of accidents and through elimination of unsafe actions by mine personnel.

4) Safety programmes ensure that large and small mines are equally safe to work.

5) Continuous and vigorous pursuit of a policy of health and safety has resulted in:
   i) Significant decline in the rate of accidents;
   ii) Significant decline in the rate of fatalities;
   iii) Significant decline in the rate of serious injuries;
   iv) Significant improvement in medical, health, rescue and rehabilitation facilities for mine workers;
   v) Significant improvement in communication facilities; and
   vi) Significant and progressive improvement in health and safety of mine workers, and in working conditions in mines.

Of these the first three hypothesis have been tested and proved in this chapter and the last two hypothesis have been tested and proven in Chapter - VIII.

The case study has clearly demonstrated that the mining laws enacted and the regulations framed thereunder in 1957 are adequate and comprehensive and ensure effective management of safety in coal mines in India. Also the various bodies and authorities created by law (e.g. DGMS, Tripartite Conference etc) are functioning regularly, continuously and effectively.

All the four aspects of the problem namely i) Health ii) Safety iii) Rescue and rehabilitation and iv) Social welfare are being well attended to.
The case study also demonstrated that the management, monitoring and control of safety programmes is being pursued continuously and vigorously year after year by —

i) Eliminating unsafe conditions.

ii) Discovering causes of accidents through accident analysis.

iii) Eliminating of unsafe actions by mine personnel.

9.9 SUMMARY OF CHAPTER - VIII:

In this chapter the impact of health and safety programmes has been assessed in all its aspects viz.

i) Impact on rate of accident, fatalities and serious injuries.

ii) Rescue, rehabilitation and compensation for loss of life and limb.

iii) Improvement in working conditions and in the environment in mines.

iv) Technology and R&D work and finally

v) Social welfare of the miners and their families.

The statistical data collected during the course of the case study provide overwhelming evidence that after nationalisation there has been a steady and progressive improvement in the health and safety of mine workers and in the working conditions in the mines. Significant decline has been recorded in the rate of accident and the rate of fatalities and serious injuries. The policy of need based budgeting and measures for preventing accidents has ensured that equal attention is paid to problems of safety in both large and small mines and the condition of health and safety in small mines are in no way inferior to those in large mines. Hence it may be safely concluded that after

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nationalisation the principal objective of nationalisation viz. providing better health and safety conditions for mine workers has been achieved successfully.

SECTION - II

FINDINGS AND RECOMMENDATIONS

9.10 PRINCIPAL OBJECTIVES OF NATIONALISATION OF COAL INDUSTRIES IN INDIA:

As has been stated in para 1.1 clause (3) one of the principal objectives of nationalisation was:

"To improve the working conditions in the mines and thus promote the health, safety and welfare of the mine workers."

Consequently, the present research study was undertaken primarily to establish conclusively with documentary evidence that "The safety situation with regard to coal miners has distinctly improved as a result of nationalisation of coal industry in India". (See para 1.4). The in-depth case study of WCL covering the period of its operation from 1973 to 1989 was undertaken primarily to establish continuously, and vigorously pursuing this objective year after year and have incorporated this objective into their corporate goal so that it guides all corporate planning both short term and long term. Further safety plan is incorporated into the welfare plan of WCL and CIL. (See para 7.9 (a)). Further this corporate goal is explicitly stated in the safety policy reiterated in every annual safety action plan prepared and
published areawise (See Appendix 7-6) and para 7.11 (a). The conclusion is therefore inescapable that both CIL and WCL are fully conscious of their responsibility for the health and safety of coal miners and have consequently made it a line function. The implication and consequences of making health and safety of mine workers a line function have been discussed at great length in para 7.9.

9.11 THE HYPOTHESIS TESTED IN THIS STUDY :
As part of this research study FIVE hypothesis have been tested (See para 7.3 and 9.8 for a statement of these hypothesis). The statistical indices used to test the validity of these hypothesis have been discussed in detail in para 7.11 (d). In the ensuing paragraphs we have discussed the evidence proving the validity of these hypothesis.

9.12 HYPOTHESIS - 1 :
"Adequate legal framework has been created to ensure health and safety of mine workers".
In Chapter - IV we have discussed the various laws enactments and regulations governing the health and safety of mine workers, and have demonstrated that the scope of the enactments has been comprehensive and adequate and that statutory bodies and authorities have been created to plan and implement and monitor programmes of health and safety for mine workers. In the course of the case study it was conclusively established that these bodies, authorities and agencies and organisations are functioning regularly, efficiently and effectively. (See
9.13 HYPOTHESIS - 2:

"The various enactments ensured that organisations and authorities have been created to formulate and execute plans for health and safety, for rescue and rehabilitation and for the welfare of mine workers and that these organisations and authorities are working regularly, continuously and effectively for the purpose". Through field investigation, case study, interview with office bearers, visit to offices, study and inspection of their annual reports etc. the author has found that these bodies are in existence, are active and are pursuing relentlessly the objective of health, safety and welfare of mine workers and progressive improvement in the working conditions in mines. There was sufficient documentary and other evidence that annual safety action plans are formulated, executed and their performance monitored and reviewed. Also the work of rescue and rehabilitation and welfare activities like housing, supply of drinking water, creation and maintenance of hospitals and medical facilities and financial support to educational institutions is being undertaken regularly year after year vouching for the continuous and sustained interest of the management in the health, safety and welfare of mine workers.

9.14 HYPOTHESIS - 3:

"Management, monitoring and control of safety is ensured through elimination of unsafe conditions, through identification of causes of accidents through accident analysis and elimination of
The case study revealed that the conditions in mines were regularly inspected by both field officers, officers of ISO and officers of DGMS and their recommendations were strictly implemented. Special attention was paid to backward shifts, accident prone mines, problematic mines and deep mines (more than 150 metres deep). Safety rating and inspection of mines was carried out regularly and if the mine was "unsafe" permission to commence mining operations was withheld. Also air samples were tested to detect presence of toxic or noxious gases, of rock and coal dust and other pollutants in the air, beyond permissible limit.

Accident reports were prepared after each accident. These reports as well as accident statistics are analysed to discover proximate as well as the deep underlying causes of accident as they would enable initiation of remedial measures to prevent recurrence of similar accidents. That this was being done has been demonstrated in the case study through examination of reports and records and recommendations and their implementation and compliance reports.

Unsafe actions were located through inspection and through engineering research to improve machines and equipment and the method of work and through education and training of mine personnel and through propaganda campaign to make mine personnel conscious of their personal safety and their responsibility for the same. Workers participation is encouraged to ensure that workers take personal interest in safety measure and programmes.
9.15 HYPOTHESIS – 4 :

"Safety programmes ensure that large and small mines are equally safe to work". The author discovered in the course of the case study that WCL's policy was to pay equal attention to both large and small mines. Also need-based budgeting policy was followed in the preparation of the health and safety action plans. Consequently the smaller mines have not suffered from lack of financial resources to support programmes of health and safety. This was reflected by the fact that there was no significant difference in the rate of accidents and rate of fatality and serious injuries as between large and small mines.

9.16 HYPOTHESIS – 5 :

After nationalisation of coal industry, the "Continuous and vigorous pursuit of a policy of health and safety has resulted in:

a) Significant decline in rate of accidents, fatalities and serious injuries.
b) Significant improvement in medicare, health, rescue and rehabilitation of mine workers.
c) Significant improvement in transport, communication and lighting facilities in mine area and,
d) Significant and progressive improvement in health and safety of mine workers and in working conditions in mines.

a) This study has established conclusively with statistical evidence that there has been a very significant decline in the rate of accidents, fatalities and serious injuries in the coal mines in the face of expanding labour force and greatly increased
b) The study has with documentary evidence established that there has been significant increase, both in terms of quality and quantity, in the medicare, health, rescue and rehabilitation facilities offered to coal miners.

c) The study has also noted that significant improvement has been recorded in road mileage and conditions of transport, in road and haulage tracks, in communication facilities and in the area of illumination.

d) Lastly it has been noted with great satisfaction that after nationalisation regular, continuous and progressive improvement in health and safety of mine workers and in the working conditions of miners has been registered, thus fulfilling one of the basic goals of nationalisation of coal industry in India.

9.17 OCCUPATIONAL AND HEALTH HAZARDS :

In Chapter - III of this report as part of the study of industrial health and related problems, the problem of occupational and health hazards in coal industry were discussed. It was indicated that coal miners are particularly prone to such diseases as pneumoconiosis, silicosis and T.B. The case study has revealed that inspite of regular annual medical check up and inspite of notification that two diseases (Pneumoconiosis and silicosis) should be considered as occupational diseases of coal industry, very few such cases have been identified testifying to either total absence or very low incidence of such occupational diseases. Even the few cases of pneumo-coniosis that were
detected were treated promptly and the disease was brought under control. Thus it is evident that after nationalisation of coal industry much greater attention is being paid to the health and medicare of mine workers.

9.18 INCREASE IN OUTPUT OF COAL AND IN LABOUR PRODUCTIVITY IN COAL INDUSTRY:

One of the principal objectives of nationalisation of coal industry was to improve production and productivity of the coal industry. This study has provided statistical evidence that very substantial increase in coal output and labour productivity in coal industry have been achieved. This is the result of massive investment in coal industry, mechanisation of mining operations, introduction of more efficient techniques of mining such as open cast mining, long wall method etc. and investment in R & D work to improve designs of machines and equipment and to improve methods/systems of work.

9.19 R AND D WORK:

Before nationalisation the owners of coal mines paid scant attention to R and D work. Production was stagnant and investment level was very low. All this has changed after nationalisation. National level research institutions have been set up to carry on research on various problems of the coal industry. Adequate budgetary support is extended to R and D work. Also heavy investments have been made to modernise the industry, mechanise mining operations and introduce more efficient techniques of production thus improving total output and labour productivity of
9.20 MAIN FINDING:

The objectives of nationalisation of coal industry have been largely realised. In particular progressive improvement has been achieved in the health and safety of miners and in working conditions in mines. Consequently a significant decline in rate of accidents, fatalities and injuries and a significant rise in output and labour productivity in the industry have been achieved. To-day the mine workers are healthier and the mines are safer than they were on the eve of nationalisation of the coal industry in 1973.

9.21 FUTURE OF COAL INDUSTRY:

In the years to come the demand for coal will increase enormously as petroleum and petroleum products become more and more scarce and costly. Hence the industry has a bright future. The new liberal economic policy will ultimately lead to free pricing of coal. This is bound to make coal/production more profitable and more competitive and will give a big boost to production of coal.