Sl. No. 233

REPORT OF THE COMPTROLLER & AUDITOR GENERAL OF
INDIA : UNION GOVT. (COMMERCIAL) PART II 1983

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REPORT OF THE

COMPTROLLER AND AUDITOR GENERAL OF INDIA

UNION GOVERNMENT (COMMERCIAL)

1983

PART II

MINERAL EXPLORATION CORPORATION LIMITED

44/4/13

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13	Figure of percentage of Achievement relating to promotional drilling for 1982-83	72	73
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43	Figures for 1979 in the first table	289	239
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46	Figure of shortage of accessories for 1982-83	6792	679
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47	7th and 8th line	considerable	considerably
59	12th line	and vehicle bodies built	manufactured
63	11th line from bottom	Est-Coast	East-Coast
66	Figure in last column, 3rd line from bottom	(—)337.79	(—)237.79
67	5th line from bottom	Deterioration in Law and Order position in Coal Field.	Disturbed conditions in the Eastern Indian Sector.
67	4th line from bottom	15.2.3	15.2.2
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80	5th line from bottom	(6.55 lakhs)	(Rs. 6.55 lakhs)
97	*Table-item* 3 & 4		
	(*i*) below year 1978	November June	— —
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	"	April (11% increase over 1979) Oct.	91 133
	(*iii*) below 1980	101 March —	April (11% increase over 1979) 101 Oct. March
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PREFATORY REMARKS

A reference is invited to Paragraph 5 of the Prefatory Remarks contained in Part I of the Report of the Comptroller and Auditor General of India—Union Government (Commercial), 1983 regarding selection of certain undertakings for appraisal by Audit Board under the supervision and control of the Comptroller and Auditor General of India and the decision to present the reports in a number of parts. This part contains the results of the appraisal undertaken by the Audit Board on the working of the Mineral Exploration Corporation Limited. In this case, the Audit Board consisted of the following Members :

S/Shri

1. R. C. Suri	Chairman, Audit Board and Ex-Officio Additional Deputy Comptroller and Auditor General (Commercial).
2. N. Srivastava	Member, Audit Board and Ex-Officio Director of Commercial Audit, Bhopal.
3. A. P. Sinha	Member, Audit Board and Ex-Officio Director of Commercial Audit, Calcutta.
4. *A. N. Banerjee	Chairman-*cum*-Managing Director (Retired), Central Mine Planning and Design Institute—Part-time Member.
5. S. V. P. Iyengar	Deputy Director General (Retired), Geological Survey of India—Part-time Member.

*Shri A. N. Banerjee did not attend the meeting held on 9th December 1983.

2. The Report was finalised by the Audit Board after taking into account the results of discussions held with the representatives of the Ministry of Steel and Mines (Department of Mines) and the Company, at its meeting held on 9th December 1983 and the additional information furnished by the Ministry in December 1983.

3. The Comptroller and Auditor General of India wishes to place on record his appreciation of the work done by the Audit Board and acknowledges with thanks the contribution, in particular, of the Members who are not officers of the Indian Audit and Accounts Department.

1. Introduction

The Mineral Exploration Corporation Limited (MECL) was established on 21st October 1972 by transferring the function of mineral exploration and the related equipment and personnel from the Geological Survey of India. The primary object of formation of the Company was to give a commercial bias to mineral exploration and to bridge the gap between initial discovery and eventual exploitation of mineral deposits. With this objective, MECL carries out detailed exploration of mineral deposits and prepares detailed geological reports which would enable the exploiting agency to take investment decisions or to commission preparation of feasibility reports. MECL also undertakes drilling and underground development as well as mine construction. Its exploration work is undertaken on contractual basis for clients or on promotional basis on behalf of the Government of India.

2. Objectives and role of MECL

2.1 *Objectives*

2.1.1 The main objectives of the Company as laid down in the Memorandum of Association and the micro objectives adopted by the Company have been reproduced in Annexure I.

2.1.2 In pursuance of the recommendation of the Administrative Reforms Commission, the Ministry of Finance, Bureau of Public Enterprises in November 1970 requested all the Ministries to initiate action to lay down the objectives and obligations, both financial and economic, of each enterprise under their administrative control. The objectives and obligations of MECL in terms of this recommendation have, however, not been laid down so far.

2.1.3 In the meeting of the Audit Board held in December 1983, it was pointed out to the Ministry that setting out of micro objectives has necessarily to be accompanied by short and long term plans which would indicate in concrete and quantified terms how the Company proposed to achieve these micro objectives. The Secretary, Department of Mines, was of the view that perception about the macro objectives keeps on changing from time to time with the growth of industry and diversification programme etc. The Secretary also mentioned that an attempt made earlier to lay down the macro objectives of each public undertaking was ultimately given up because the fixation of macro objectives was beset with enormous number of difficulties and problems owing to diversity of factors involved.

2.2 *Role of MECL*

2.2.1 The Company was conceived as the sole agency of the Government of India to carry out detailed exploration of minerals throughout the country. It was also decided at the time of formation of the Company that the public sector agencies engaged in exploitation of mineral deposits may carry out underground development/exploration in the mines through their own agencies or through the MECL. The exact line of demarcation between the public sector exploiting agencies and the Mineral Exploration Corporation was, however, to be determined in consultation with the concerned interests after the Corporation was set up. Even though 11 years have elapsed no exact line of demarcation between the public sector exploiting agencies and Mineral Exploration Corporation has been determined so far and the public sector undertakings like Coal India Limited and its subsidiaries, National Mineral Development Corporation Limited, Hindustan Copper Limited, Hindustan Zinc Limited etc. who are engaged in the exploitation of mineral deposits, also carry out mineral exploration through their own agencies. In this connection, the Management stated (June 1983) as follows :

> "Tendency of other exploiting agencies to develop their own exploration wing creates a situation where

MECL is not clear of its future role. This also affects its plans for modernisation and investment besides creating a situation where it has to face undesirable competition."

2.2.2 In reply to a query about the need for a clear definition of the role of MECL in mineral exploration, the Ministry stated (November 1983) as follows :

"The public sector undertakings under the Department of Mines have taken up exploration work only within their lease hold areas; new areas are left for exploration by MECL. However, in the case of coal, exploration work is done both by Coal Mines Planning and Design Institute (CMPDI) and MECL. The question of assigning the work of coal exploration between CMPDI and MECL is under consideration of the Department of Mines and a satisfactory solution will be arrived at in consultation with the Department of Coal."

2.2.3 The main activity of the MECL is at present confined to exploratory drilling in the coalfield areas. But the CMPDI has developed its own exploration wing to take up exploration work on behalf of its sister coal companies and it assigns work to MECL on a year to year basis only. The uncertainty of work, according to the Management, has acted as a major constraint for the Company in planning on a long term basis. The need for a clear definition of the role of MECL in mineral exploration *vis-a-vis* exploiting agencies in public sector, therefore, cannot be over-emphasised.

2.2.4 On being pointed out by the Audit Board in its meeting with the Ministry that there was a certain amount of overlapping of functions of CMPDI and MECL, the representative of the Ministry stated that CMPDI was primarily a mine planning and design undertaking and should not take up exploration work at the cost of MECL which was intended to be the chief mineral exploration agency of the Central Government to expedite mineral development in the country. The Secretary, Department of Mines, was of the view that MECL should be strengthened by entrusting the entire exploration work in the coal sector exclusively to it. He also stated that a working group has been formed to work out the strategy for exploration of non-ferrous metals during the Seventh Five Year Plan and this aspect would also be considered by the group.

2.2.5 Regarding the role of the MECL in mineral exploration, the Audit Board in its meeting with the Ministry enquired whether it would not be desirable for the Company to have a key role in the planning and programming of mineral exploration in the country instead of being only a contracting agency. The Secretary, Department of Mines agreed with the analysis and stated that such an approach would indeed be in consonance with the Government decision for setting up the MECL.

3. **Organisational set up**

3.1 The Management of the Company vests in the Board of Directors consisting of Managing Director and Directors. The Managing Director is assisted by one Director (Technical), Financial Adviser and Chief Accounts Officer and by Heads of other Departments.

3.1.1 The Company had set up five zonal offices one each at Nagpur, Calcutta, Hyderabad, Lucknow and Jaipur at the time of its formation. The Company found the following drawbacks in these zonal offices :

(i) Multiplication of common administrative services like personnel, administration, accounting, stores, office buildings, laboratories etc. disproportionate to the work load in the region ;

(ii) As adequate financial and administrative powers had not been delegated to the zonal offices, the matters had perforce to come to Company's Head Quarters for decision getting delayed in the process ; and

(iii) Lack of co-ordination in activities like deployment of equipment, recruitment and wages of ctntingent employees, hiring of building, resulting in proliferation of facilities disproportionate to the existing or likely future needs.

3.1.2 Realising these drawbacks and anticipating economy of Rs. 28 lakhs per year, the Company decided in November 1975 to abolish the three zonal offices at Hyderabad, Lucknow and Jaipur. However, with a view to halting falling trend in productivity and achieving better organisational effectiveness, the Company on the basis of a report of officers submitted in February 1982, decided (April 1982) to retain the project management system on matrix concept with introduction of three tier management system by creating five Area Offices at Calcutta, Ranchi, Nagpur, Hyderabad and Jaipur for operating the projects on geographical basis, and creation of the posts of Area Managers.

3.1.3 Under this system, each Area Manager is assisted by a number of Project Managers depending upon the concentration of activity; functions like accounts, personnel and stores have been decentralised, and financial and administrative powers have been delegated to Area Managers. The Company anticipates 10 per cent increase in productivity as a result of this reorganisation.

4. Capital structure

4.1 The authorised capital of the Company is Rs. 25 crores. As on 31st March 1983, its paid up capital stood at Rs. 23.89 crores (including advance against shares) fully subscribed and paid by the Government of India. Besides, a sum of Rs. 4.20

crores was paid by the Government as loan to the Company upto 1982-83 for purchase of capital equipment. The debt equity ratio as on 31st March 1983 was 0.18 : 1.

5. Mineral Exploration Work

5.1 *Existing Activities*

5.1.1 Exploratory drilling, mining, mine construction along with the requisite geological and analytical works and finally preparation and submission of geological reports containing results of the investigations and reserves established, form the main activities of the Company. The major exploration activity of the Company at present is in the various coal fields of the country though it has also done mineral exploration in ferrous, non-ferrous, non-metallic and precious metals. Besides mineral exploration, the Company has extended in recent years its activities to geotechnical investigations for dam foundation and ground water resources.

5.1.2 Since its inception in October 1972 and upto 1982-83, the Company has done 12.10 lakh metres of drilling, 0.56 lakh metres of exploratory mining, 640 sq. kilometres of surface topographical survey and 623 sq. kilometres of geological mapping. The Company has also claimed to have established 15734 million tonnes of additional reserves of various minerals including 5787 million tonnes of coking coal, 5886 million tonnes of non-coking coal, 1175 million tonnes of bauxite, 1972 million tonnes of iron ore etc. upto 1982-83. In response to a query of the Audit Board whether the Company had the system of post project coordination with the clients and association of its geologists at the stage of implementation the Management stated (July 1983) as follows :—

> "The suggestion made by the Audit Board about the post project coordination with the clients and association of our geologists at the stage of opening up of

deposit has been noted and will be implemented as this would provide feed back for increasing the confidence level of the work of exploration. Such a system does not, as yet, exist in a formal way ....."

5.2 *Plan performance for mineral exploration*

5.2.1 The Company had prepared Fifth and Sixth Five Year plan proposals.

The Fifth Five Year Plan (1973—78) proposals submitted to the Government of India in June 1973 envisaged a total financial outlay of Rs. 56.41 crores and profit of Rs. 5.51 crores during the plan period. The targets for the plan period in respect of exploration works as fixed by the Company and actuals there-against are given below :—

Sl. No.	Item of work	Unit	Target	Actuals
(*i*)	Detailed mapping	Sq. Km.	518.75	N.A.
(*ii*)	Core Drilling	metres	12,76,150	4,19,481
(*iii*)	Exploratory mining	metres	54,604	16492
(*iv*)	Sample analysis	numbers	4,07,230	N.A.

It would be seen that Company's achievement during Fifth Five Year Plan period was only 32.87 per cent in core drilling and 30.20 per cent in exploratory mining.

5.2.2 The Sixth Five Year Plan (1978—83) was drawn up by the Company in October 1977. This envisaged a total capital expenditure of Rs. 19.17 crores to be financed from internal resources (Rs. 8.74 crores) and from Government of India as equity (Rs. 10.43 crores). In addition, Rs. 28.73 crores were envisaged as a grant from Government of India against promotional work. However, as the Government modified the plan period to 1980—85, the Company revised the plan and submitted it to Government in October 1980. The details of the physical targets in the original and revised Sixth Five Year Plan are given below :—

Sl. No.	Item of work	Unit	Total quantity	
			Original 1978-79 to 1982-83	Revised 1980-81 to 1984-85
1	2	3	4	5
1.	Detailed surveying and geological mapping . .	Sq. Kms.	630	500
2.	Core drilling . . .	Metres	8,80,000	8,88,500
3.	Exploratory mining . .	Metres	40,400	50,500
4.	Analytical work . . .	Nos.	3,20,000 samples and 11,26,000 determination samples	75,000 samples
5.	Mineralogical, Petrological and trace element studies .	Nos.	9,000 samples	7,500 samples
6.	Beneficiation Studies	Nos.	60 samples	60 samples

5.2.3 To achieve the targets as laid down in the Revised Plan, Rs. 25 crores were required for capital expenditure and Rs. 20 crores as grant for promotional projects. Of the capital expenditure of Rs. 25 crores, Rs. 13.70 crores were to be received as grant from Government of India and balance Rs. 11.30 crores was to be met from internal resources. The Government of India, however, approved only Rs. 20 crores for capital expenditure wherein internal generation component of Rs. 11.30 crores remained unchanged and the Government's grant was reduced from Rs. 13.70 crores to Rs. 8.70 crores.

5.2.4 Against the promotional projects of Rs. 20 crores for the plan period 1980—85, the Company utilised only Rs. 6.53 crores in the first two years *i.e.* 1980-81 and 1981-82, leaving a balance of Rs. 13.47 crores for the remaining 3 years.

5.2.5 The mineralwise work programme proposed in the Sixth Plan for the first two years i.e. for 1980-81 and 1981-82 and actual performance thereagainst are indicated below :—

Sl. No.	Mineral	1980-81						1981-82					
		Geological mapping & Survey (Sq. Km.)		Drilling (metres)		Mining (metres)		Geological mapping & Survey (Sq. Km.)		Drilling (metres)		Mining (metres)	
		Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual
1.	Coal .	82	56	136500	101728	..	..	92	63	129000	112821	..	..
2.	Copper .	6	1	7800	3623	900	388	6	2	18000	7545	3100	497
3.	Lead-zinc	2	..	5300	5236	1410	1134	2	1	3000	3575	1600	2352
4.	Bauxite .	5	5	3750	7642	2060	1814	5	..	3000	1489	500	20
5.	Gold .	1	..	4600	3617	250	..	1	..	4000	2736	1000	726
6.	Diamond	..	..	4500	2340	800	274	..	..	5000	5995	2500	2948
7.	Manganese	..	..	..	..	2580	1884	..	..	5000	..	1800	39
8.	Chromite	..	..	3000	2057	..	..	..	..	5000	567	..	..
9.	Ground water & Geotechnical work .	..	..	3050	4262	500	430	..	..	..	10181	..	569
10.	Others .	..	..	..	892	..	..	4	..	8000	232	..	..
	TOTAL .	96	62	168500	131397	8500	5924	110	66	180000	145141	10500	7151

5.2.6 It would be seen that during the first two years of the Plan, only 31 per cent of total drilling targets, 26 per cent of total mining targets and 25.6 per cent of geological mapping and surveying work set for the Sixth Plan period were achieved.

5.2.7 The Company further revised its Sixth Plan proposals and submitted its Revised Plan on 5th October 1982 to the Ministry. In the revised proposals, the Company revised its drilling targets from 8,88,500 metres to 11,01,500 metres, mining targets from 50,000 metres to 52,300 metres, geological mapping and survey from 500 sq. km. to 460 sq. km., analytical work from 75,000 samples to 80,000 samples and mineralogical|petrological studies from 7500 samples to 8000 samples. The total outlay of the Sixth Plan was also changed from Rs. 47.90 crores to Rs. 95.28 crores.

The Ministry stated (December 1983) that these proposals were not considered due to constraint of financial resources.

5.2.8 The Audit Board pointed out during the meeting with the Ministry that the Company was trying to increase its capacity by acquiring sophisticated equipment but on the basis of the work load of around 1.8 lakh metres of drilling in 1982-83, it was doubtful whether there would be sufficient work load to achieve the target of 3 lakh metres of drilling by 1984-85. Further, the CMPDI had indicated to MECL the availability of 16 lakh metrage of drilling during next 10 years and the promotional drilling work available was around 20,000 metres per year. The Secretary, Department of Mines stated that adequate work load would be forthcoming but the only problem was the removal of management constraints to meet the challenge for which the management was being geared up.

6. Operational performance

6.1 The Company had not drawn up since its inception to 1982-83 any long term programme in mineral exploration indicating, *inter alia,* drilling and mining capacities of the Company.

In this connection, the Management stated (June 1983) that there has been a tendency on the part of other exploiting agencies to develop their own exploration wings and CMPDI, which is Company's main customer, has not been able to indicate the long term plan for coal development with the result that the Company has not been able to gear itself for a long term growth, including development and training of personnel, investment in plant| machinery, modernisation etc. In reply to a query of the Audit Board whether it was not due to lack of confidence in the capabilities or due to lack of capacity, the Company could not take up the entire work load of mineral exploration in the country, the Management stated (July 1983). *inter alia.* as follows :—

> "The Corporation is aware of (i) necessity to build adequate capacity to undertake exploration for coal and other minerals, (ii) to modernise its exploration tools, (iii) improve the quality of its work and (iv) to adhere to time schedules for exploration. These alone can build confidence in the organisation by its clients, besides morale of its own work force..........
>
> There have not been any allegations on the quality of the work done by the Corporation..................... In a few cases, however, there have been differences of opinion on the interpretation of coalfield structure between CMPDI and the Corporation. Such cases are very few in relation to the work done and in our opinion could not be totally avoided in an interpretative science............ However, the suggestion of............ Audit Board to maintain close liaison with the client to obtain regular feed back on the quality of report based on the information gathered by client during construction phase has been taken due note of............ This will not only enable to improve confidence level within the

organisation but also examine the reasons for incorrect, if any, interpretations............"

6.1.1 In regard to long term planning, the Management further, stated (July 1983) as follows :—

"One of the major constraint, having a serious impact on the long term growth of the organisation, is the uncertainty on its future workload........... Only now have CMPDI indicated that in the next 10 years MECL will be awarded 16 lakhs metres of drilling as a part of its coal exploration programme. For base metals too there is no plan for exploration with accent on long or medium terms forecasts. It is done on prospect to prospect basis........ Corporation is now preparing a plan for long term exploration of minerals like copper, gold etc. based on the need to meet the internal demand and known sources of these minerals based on earlier regional exploration done by GSI. We propose discussing this plan with the Government, the concerned exploiting agencies and GSI so that a long term plan of exploration of all major minerals demarcated............ This will enable the Corporation to draw up a reasonably firm plan from 1984-85 for growth, equipment procurement, personnel development, creation of infrastructure and supporting facilities etc."

6.1.2 Annual mineralwise exploration programmes were drawn up by the Company at the time of preparation of its annual budget estimates on the basis of the drilling, mining works etc. to be undertaken during that year on continuing projects and anticipated works on projects to be assigned to it by the Government of India, CMPDI and other clients. The programme was invariably revised, while preparing the Revised Budget Estimates, on the basis of the actual work done during the first five|six months of the year on the on-going and new projects taken up during these months.

6.1.3 The table below indicates the targets fixed in the original and revised Budget Estimates, *vis-a-vis* the actual operational performance during the year 1977-78 to 1982-83 in respect of the main activities of the Company.

Sl. No. Item	1977-78					1978-79					1979-80				
	Budget Estimate	Revised Target	Achievement	Percentage of Achievement with BE	Percentage of Achievement with RE	Budget Estimates	Revised Target	Achievement	Percentage of Achievement with BE	Percentage of Achievement with RE	Budget Estimate	Revised Target	Achievement	Percentage of Achievement with BE	Percentage of Achievement with RE
I. *Drilling (metres)*															
Promotional	14060	15620	15433	110	99	57600	49000	50083	87	102	52800	45480	44338	84	97
Contractual	140203	119610	119704	85	100	100000	134700	137080	137	102	137100	132420	100512	73	76
TOTAL	154263	135230	135137	88	100	157600	183700	187163	119	102	189900	177900	144850	76	81
II. *Mining (metres)*															
Promotional	3060	2677	3365	110	126	7060	5991	6749	96	113	5029	4492	4761	95	106
Contractual	2860	2665	3177	111	119	840	1909	1526	182	80	2971	4517	3658	123	81
TOTAL	5920	5342	6542	111	122	7900	7900	8275	105	105	8000	9009	8419	105	93
III. *Workshop* (A)															
Manufacture T.C. Bits			17132					6288					4398		
Others			8253					8932					10412		
TOTAL			25385					15220					14810		

Sl. No. Item	1980-81					1981-82					1982-83				
	Budget Estimate	Revised Target	Achievement	Percentage of Achievement with BE	Percentage of Achievement with RE	Budget Estimate	Revised Target	Achievement	Percentage of Achievement with BE	Percentage of Achievement with RE	Budget Estimate	Revised Target	Achievement	Percentage of Achievement with BE	Percentage of Achievement with RE
I. *Drilling (metres)*															
Promotional	55300	27450	19797	36	72	48000	22100	18570	39	84	29700	19390	14236	48	72
Contractual	133600	141038	111600	84	79	132000	129200	126571	96	98	152500	166310	175135	115	105
TOTAL	188900	168488	131397	70	78	180000	151300	145141	81	96	182200	185700	189371	104	102
II. *Mining (metres)*															
Promotional	5699	4190	3010	53	72	5100	4470	4191	82	94	4200	4899	5841	130	119
Contractual	4788	4330	2914	61	67	5400	3130	2960	55	95	6300	4791	4001	64	83
TOTAL	10487	8520	5924	56	70	10500	7600	7151	68	94	10500	9690	9842	94	102
III. *Workshop* (A)															
Manufacture T.C. Bits			7970					6525					N.A.		
Others			11121					9466					N.A.		
TOTAL			19091					15991					23719		

NOTE: Mining includes excavation in cubic metres which is converted into liner metres by adopting a factor 6 cubic metres to 1 metre.

(A) Targets in B.E. and R.E. were not fixed for working.

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6.1.4 The following points are of interest in this connection :—

Drilling performance

The total drilling done in respect of promotional and contractual works during 1977-78 was 1,35,137 metres which increased in next year to 1,87,163 metres. Thereafter the meterage drilled has fallen down during 1979-80 to 1981-82 but again picked up during 1982-83. For the years 1979-80, 1980-81 and 1981-82, the decrease compared to 1978-79 has been 22.61 per cent, 29.80 per cent and 22.46 per cent respectively.

The shortfall in over all drilling performance was contributed mainly by exploratory drilling work in promotional projects which came down to 18570 metres during 1981-82 from 50083 metres in 1978-79 showing a drop of 63 per cent.

Mining Performance

In the year 1977-78 the Company did 6542 metres mining work which increased to 8275 metres and 8419 metres in the years 1978-79 and 1979-80 respectively. But it decreased to 5924 metres and 7151 metres in 1980-81 and 1981-82 respectively. The year 1980-81 had maximum decrease of 29.64 per cent as compared to performance of 1979-80. Percentage of actual performance compared to the budgeted target was very low during 1980-81 and 1981-82 (56 per cent, 68 per cent respectively), though the Company had been earlier achieving more than 100 per cent of the budgeted targets during immediately preceding three years.

Mining performance in promotional works was 3365 metres, 6749 metres, 4761 metres, 3010 metres and 4191 metres during the year 1977-78, 1978-79, 1979-80, 1980-81 and 1981-82 respectively. The decrease in mining performance compared to 1978-79 was 29.46 per cent, 55.40 per cent and 37.90 per cent respectively for the years 1979-80, 1980-81 and 1981-82. Similarly, during the years 1980-81 and 1981-82 mining performance in respect of contractual works was only 61 per cent and 55 per cent of the respective budget estimates.

6.1.5 The Management attributed the shortfall in drilling and mining performance to the following reasons :—

1979-80

A—Drilling

(i) acute shortage of HSD oil;

(ii) non-materialisation of anticipated work load; and

(iii) non-availability of large size (HX) casings.

B—Mining

(i) Non-materialisation of constractual workload (e.g., Khetri) ;

(ii) frequent shortage of explosives in some projects ;

(iii) some of the mine construction jobs are of the nature of mine reconditioning ;

(iv) floods in Brahmaputhra Flood Control Council areas ; and

(v) non-availability of high speed diesel.

1980-81

Drilling and Mining

(i) Non-materialisation of work in Khetri project ;

(ii) work in diamond project could not be commenced ; and

(iii) absence of sustained workload and agitation bv the employees.

1981-82

(a) *Drilling*

In promotional work due to shortage of diamond tools in gold and diamond projects and contractual work due to shortage of essential operating equipments, drilling accessories, wire line drill rods and diamond tools.

(b) *Mining*

In promotional project at Ramgiri, the work was reclamation and reconditioning of shafts and in contractual projects in Managenese Ore (India) Ltd., the closure of work and operational problems due to water seepage in Agucha, power failure in Khetri.

6.2 *Geological Reports*

Results of inverstigations conducted for mineral exploration and the reserves established are embodied in the geological reports prepared by the Company on the closure of the project. Such reports are required to be submitted to the Government of India in the case of the promotional projects and to the concerned exploiting agency/State Government in the case of contractual projects. For delay in submission/non-submission of the report, the Company is liable to pay penalty as per the terms and conditions in the contract, besides a part of the total payment to be made to the Company is also withheld by the Government of India/client till the report is submitted.

6.2.1 During the period from 1973-74 to 1982-83, the Company completed 41 promotional and 133 contractual projects. Of these 174 projects, geological reports were not required to be submitted by the Company in respect of 28 projects. Out of the remaining, the Company submitted 18 final geological reports in time; in respect of 21 projects, draft reports were submitted within the due dates and submission of final reports was delayed. There were delays of 1 to 6 months for submission of 36 geological reports and of 6 months and above in respect of 71 reports. Thus, there were delays in submission of reports in respect of 61.5 per cent of the projects. As on 31st March, 1983, there were 12 reports pending with the Company for submission to their clients.

6.2.2 The Management attributed (July 1983) the delays in submission of the Reports to :

"*A—External reasons*

(i) Quantum of drilling originally envisaged is revised number of times leading to alternations in calcula-
tion and inferences already drawn.

(ii) Frequent changes and enlargement of objectives ini-
tially allotted. The area to be covered by drilling
exploration and survey is also changed leading to
available additional efforts and remaking of the
documents.

(iii) Frequent changes in *inter se* priority of blocks lead-
ling to the situation where frequent shifting of per-
sonnel from one project to another has to be resor-
ted to. For pregmatic reasons such frequent shifts
are neither feasible nor desirable and lend to un-
avoidable delays. Receipt of chemical analysis has
been delayed in several cases and in some cases it
came in bunches after a long spell.

(iv) Even though constant dialogue during the course of
exploration and upto the stage of preparation of
draft report is maintained, difference of opinion in
many cases is voiced only after the final draft is
submitted leading to further discussion for arriving
at a mutually acceptable solution.

(v) Although the inputs needed have increased very con-
siderably, the time allowed for report preparation
remains the same. While there has been nearly 3
fold increase in geological documentation, the time
for preparation of report continues to be as stipula-
ted in the Contract of 1975 *i.e.* 4 months.

(vi) As per draft contract, CMPDI are required to vet
the draft within 45 days. However, in nearly half

of the cases this time ranges from 2 months to 14 months.

(B) *Internal reasons*

(i) During the year 1976 when final options became operative for Geological Survey of India officers who were on deputation to Mineral Exploration Corporation Limited, about 17 officers left the organisation. The gap could not be filled up by new officers for quite a long time.

(ii) The size of reports had been increasing and number of reports also increasing, and there was a shortfall in strength of officers. Because of very difficult working and other conditions it had not been possible to attract adequate officers.

(iii) Shortage of technical personnel like draftsmen."

6.2.3 The Ministry stated (November 1983) as follows :

"Factors contributing to undue time-lag between the completion of exploration work and submission of geological reports have been identified. The Company has proposed the following action to reduce this time lag :

(a) At present a flat period of four months is allowed for preparation of reports irrespective of the work-load. It is now proposed that the period for preparation of these reports should be decided depending on the amount of work involved. It is also proposed that even where the MECL has actually started the work the period of submission of report would also be extended in case of an increase in the work of extension of blocks after MECL has actually started the work.

(b) According to the present practice, only after receipt of the comments of the client on the draft reports, the final report is prepared and submitted to the client. Sometimes the client takes a long time to furnish its comments. In some cases, like coal, samples are analysed by the Central Fuel Research Institute (CFRI), which has its own priorities. The time taken by CFRI in giving its analysis report is also counted against the period of four months allowed to MECL for submitting its report.

MECL will have a dialogue with CFRI with a view to reducing to the minimum, the time taken for providing analysis reports. The Company also intends to stipulated in future contracts that either the period for preparation of its final report should count from the date of receipt of comments by the client or a maximum period of 45 days should be allowed for the client to furnish his comments failing which MECL will finalise its report and the client will make full payment to MECL and not withhold any percentage on account of non-submission of final report.

It may be mentioned that after concerted efforts made by the Company, there are now only two reports on promotional projects (Baphilimalli and Kodingamalli) pending.

The Company hopes to submit these reports also by January 1984 and clear all arrear reports on contractual work by March 1984."

6.2.4 The Audit Board in its meeting with the Ministry suggested that detailed analysis of delays that had already occurred in the submission of geological reports should be made to ascertain the reasons therefor and to adopt remedial measures in so far as they pertained to in house management. The Management explained in the meeting that they have already analysed about 20 cases and drawn certain broad conclusions therefrom and were trying to frame more realistic time schedule for submission of reports by assessing the time requirements item-wise and the future contracts would be concluded on the basis of this study. Further the Company has already acquired one computer and it was considering to have another to reduce the delay in preparation of the geological reports.

6.3 *Pentlty imposed by CMPDI due to non-completion of work in scheduled time.*

In May 1975, the Company entered into an agreement with the Bharat Coking Coal Limited (BCCL) to drill by March 1976 about 137 boreholes involving 55245 metres of drilling and to submit the geological reports by 31st July 1976. The agreement further provided that in case the final reports are delayed beyond 31st December 1976, the Company would be liable to pay penalty at the rate of ½ per cent of the contract value for each block for each fortnight of delay beyond 31st December 1976 upto a maximum of 5 per cent of the block contract value. The Company was entitled to receive bonus for the blocks for which reports were submitted before 31st July 1976@ ½ per cent of the contract value for the block for each fortnight subject to a maximum of 5 per cent.

6.3.1 The Company also entered on 5th March 1975 into a contract with erstwhile Coal Mines Authority Limited (now CIL) for detailed exploration and submission of Geological documentation complete with all data and plans for planning and designing of mines as per yearly schedule. This contract also contained similar provision for bonus and penalty for early or delayed performance with reference to the dates stipulated in the schedule.

6.3.2 The Company did not submit the reports in scheduled time in respect of 49 projects/blocks. The Central Mine Planning and Design Institute (CMPDI) who looks after the exploration work on behalf of its sister Coal companies, deducted Rs. 22.09 lakhs as penalty from the bills raised by the Company for delayed submission of reports as per contracts.

6.3.3 The Management attributed the levy of penalty to the following reasons :—

(i) Repatriation of large number of officers in 1976 and the newly recruited staff was not geared up properly to submit the report within stipulated time—Rs. 2.04 lakhs.

(ii) Diversion of officers to crash programme of sampling of coal cores and non-availability of required typists, drawing stores etc.—Rs. 3.88 lakhs.

(iii) Withdrawal of powers for purchasing ammonia paper and supply of outdated ammonia printing paper by stores (150 rolls)—Rs. 1.81 lakhs.

6.3.4 It was noticed in audit that while accepting the penalty of Rs. 7.73 lakhs as correct, the Chief Geolologist had observed that the penalty of Rs. 13.24 lakhs imposed between July 1976 and November 1981 was not acceptable to him. The Company has, however, not taken up the matter with the CMPDI so far (December 1982). It was further noticed that the remarks of the Chief Geologist had not been obtained on the remaining penalty of Rs. 1.22 lakhs.

6.3.5 The Ministry stated (December 1983) that MECL was in contact with CMPDI and it was proposed to settle the issue by discussions.

6.4 *Work-in-Progress—Work done but not billed*

6.4.1 The total amount in respect of work-in-progress—work done but not billed by the company for the last five years ending 31st March 1982 is given below :—

(Rupees in lakhs)

Year	Amount
1977-78	86.60
1978-79	159.87
1979-80	228.81
1980-81	236.33
1981-82	191.08

6.4.2 The work-in-progress—work done but not billed of the Company is increasing year after year and stood at Rs. 191.08 lakhs as on 31st March 1982 as compared to Rs. 86.60 lakhs on 31st March 1978. A review conducted in audit of the amounts lying under work-in-progress—work done but not billed revealed the following :—

(i) *Work done but not billed on account of promotional works done on behalf of Government of India.*

Bills for geological work and promotional activity taken up at the behest of Government of India are raised by the Company to the extent of 95 per cent of value of work done. The bills for balance 5 per cent value are raised on completion of work and submission of final Geological Reports. The value of work done but not billed as on 31st March 1982 on account of non-billing of 5 per cent value of work done was Rs. 65.20 lakhs while as on 31st March 1978 it was only Rs. 11.24 lakhs. The amount was not billed mainly as the relevant reports had not been submitted to the Government of India though the projects had been completed.

In the quarterly performance review meeting of the Company held on 25th October 1982 under the Chairmanship of Secretary, Department of Mines, it was agreed that 100 per cent claims against promotional work would be paid by the Ministry and the Company was asked to submit its claims for the balance 5 per cent amount not billed in respect of geological reports for the work done upto September 1982. The MECL submitted a bill for Rs. 68.66 lakhs (Rs. 65.20 lakhs being the net amount for the work done and Rs. 3.46 lakhs towards estimated cost of Geological reports) for such claims upto 31st March 1982. The Government of India released an amount of Rs. 64.37 lakhs.

As regards the balance, the Ministry stated (December 1983) that "the matter has since been resolved and final payment is being made to MECL on account of these works".

Eleven bills for Rs. 3.50 lakhs for the work done from April 1982 to October 1982 were raised in November/December 1982 but no amount has been received by the Company upto January 1983. The decision taken to release 100 per cent payment without submission of the Geological Reports tantamounts to extending un-intended benefit to the Company. The Ministry stated (November 1983) that this was "a conscious decision of the Government in the context of the difficult ways and means position of the Company which arose mainly on account of the delay in the revision of coal drilling rates".

(ii) (a) *BCCL—Contractual work*

As per the agreement entered into between MECL and BCCL on 30th May 1975, it was agreed by the parties that the bills for the work done would be submitted by MECL every month in triplicate giving reference of the name of the block, borehole number, depth drilled, size core recovery and the amount. The bills were to be presented to the office of the CME (Planning) BCCL for verification and onward transmission to the accounts department for payment. An amount of 93 per cent of the bill, if found in order, was to be paid within 3 weeks of the presentation. The balance of 7 per cent was to be paid after receipt of the final exploration report to the satisfaction of BCCL. A sum of Rs. 29.14 lakhs (net after deducting estimated cost of Rs. 12.77 lakhs in respect of Geological reports) mainly representing balance of 7 per cent claim was lying under "work done but not billed" on 31st March, 1982.

(b) *Coal (India) Limited—Contractual*

Similarly, in terms of the agreement entered into between MECL and erstwhile CMAL (now CIL) on 5th March 1975, bills for the metreage drilled would be preferred by the MECL every month and 80 per cent of the bill, if found in order, would be paid by the CMPDI within one month of the receipt of the bill. In respect of completed bore holes, MECL would prefer separate bills to CMPDI for balance 10 per cent of the total amount of the bills. The balance payment of 10 per cent would be released by the CMPDI within three months from the date of receipt of the complete Geological documentation. It was, however, observed that a sum of Rs. 69.61 lakhs (net after deducting estimated cost of Geological reports Rs. 17.10 lakhs) was lying under work-in-progress—work done but not billed as on 31st March 1982. The Company has since raised upto 31st March 1983 bills amounting to Rs. 4.62 lakhs for Dawra, Nuandili and Shymsunderpur projects. No payment has been received by the Company so far (June 1983).

(iii) *Other terms of work of promotional Projects including work done in excess of sanctioned limits.*

Rs. 18.76 lakhs were outstanding under this head due to work done in excess of limits sanctioned by the Government of India in respect of promotional works, petrological charges in respect of closed projects and for physical/chemical analysis done in respect of these projects. The bills were not raised as the sanction of the Government of India for work done in excess of the limits was not asked for and also because relevant reports/results of investigations were awaited.

7. Review of Projects

7.1 A review conducted in audit of certain promotional and contractual projects revealed the following major deficiencies :—

(i) Inadequate pre-project planning ;

(ii) Inadequate project management and control reflected in large cost and time over-runs ;

(iii) Delay in closure of camps ;

(iv) Low productivity per worker per month ;

(v) Low drilling per drill month ;

(vi) Delay in submission of geological reports ;

(vii) Idleness of equipment and man power etc.

7.2 The project-wise deficiencies noticed are given in the succeeding paragraphs :—

1. *Askot Multimetal Project Pithoragarh District (U.P.)...*

(i) The project taken up on behalf of Government of India involved an estimated aditing work of 830 metres. After completing 539 metres of aditing, the project was abandoned because "the rocks encountered were very loose, highly weathered and fractured" and there were signs of old workings. This shows that the project was taken up with inadequate preproject survey.

(ii) As against the estimated cost of Rs. 32.72 lakhs for the whole work, the actual cost of part of the work done amounted to Rs. 33.66 lakhs. Against the estimated cost of Rs. 2500 per metre of aditing, the actual average rate worked out to Rs. 6245 per metre.

(iii) Although Government sanction for closure of the work was received in July 1979, the camp was finally wound up in March 1981. The expenditure on salaries, POL and other ancillary expenses from July 1979 to March 1981 amounted to Rs. 1.14 lakhs.

2. *Jaggayyapeta Lime Stone Deposits, Andhra Pradesh*

(i) The productivity achieved for average borehole depth of 2510 metres was only 120 metres per drill month.

(ii) There was delay of 1½ months in shifting the drill after completion of the work for want of alternate work.

3. *Exploration of Chiria Iron Ore Deposits II, Bihar*

(i) The work of conducting detailed exploration in Western, Central and Northern Blocks of Chiria Iron Ore Deposit (Bihar) taken up in two phase on behalf of Iron Ore Board was commenced in December 1975 and completed in June 1978. The Company suffered losses of Rs. 2.55 lakhs and Rs. 6.50 lakhs in core drilling and geological work respectively and made a profit of Rs. 0.91 lakh in mining. The profit or loss on chemical analysis for which the Company received an amount of Rs. 8.78 lakhs could not be worked out for want of relevant cost data.

(ii) Overall productivity of drilling achieved in the project was 44.90 metres per drill month.

(iii) Against the normal time of 1 to 3 days taken to start a new borehole after closing the old borehole, the time taken in the project ranged from 5 to 22 days.

4. *Kesarpur Copper Project, Orissa*

(i) The actual cost of this promotional work was Rs. 58.45 lakhs against the estimated cost of Rs. 43.06 lakhs although the actual work done on drilling and mining was 1492 metres and 810 metres against the estimates of 1620 metres and 960 metres respectively.

(ii) As against the total cost of Rs. 58.45 lakhs, bill for Rs. 47.16 lakhs has been raised, the balance of Rs. 11.29 lakhs being direct loss to the Company.

(iii) The project was completed in 44 months as against 30 months envisaged in the esthunates.

(iv) The actual cost per metre worked out to Rs. 983 against the estimate of Rs. 477 per metre, the variation being due to more time taken and proportionately more expenditure incurred on salaries, wages, p.o.l. etc.

(v) Geological report was sent to Government of India in November 1981 although the project was completed in January 1981 and the report was to be submitted within 2 months of the completion of the project.

5. *Baphlimali Bauxite Project, Orissa*

(i) The Company took 33 months in completing the promotional project as against 21 months stipulated in the sanctioned scheme.

(ii) Though the project was completed in July 1981, the geological report has not been submitted to Government of India so far (December 1983).

(iii) The actual cost of drilling was Rs. 211.19 per metre as against Rs. 550 per metre charged from the Government; the profit margin on drilling being 167.52 per cent.

6. *Kodingamali Bauxite Project*

(i) There was delay of 3 months in completion of the project.

(ii) The actual cost of drilling worked out to Rs. 17.67 lakhs as against Rs. 53.17 lakhs realised from the Government, the realisations being three times of the cost.

(iii) In mining, there was a loss of Rs. 2.49 lakhs as the cost of mining worked out to Rs. 2756.50 per metre as against Rs. 1800 per metre quoted in the estimates. The cost of direct labour alone was Rs. 1428 per metre.

(iv) Geological survey report which was to be submitted by November 1980 has not been submitted so far (July 1983).

7. *Sindeswar Kalan Lead-Zinc Project, Rajasthan*

(i) Though drilling and geology work was over in May 1982, the expenditure on camp winding up continued to be incurred upto November 1982.

(ii) Average manpower deployed per drill month ranged from 12 to 31. The average productivity per worker per month ranged between 1.41 metres to 15.29 metres.

(iii) Drilling done in depths below 150 metres was 54 per cent of the total metreage to be drilled as against 37 per cent of such drilling stipulated in the sanction issued by the Government of India.

(iv) The Government of India had sanctioned Rs. 69.27 lakhs for this promotional project involving drilling of 8780 metres in three phases. The total expenditure incurred on this project upto November 1982 was Rs. 49.10 lakhs and the Company had raised bills for Rs. 54.88 lakhs for work done upto 8780 metres. For extra work of 235 metres drilling no bill has been raised (October 1983). In the draft geological report prepared by the Company it has been observed (June 1983) by the Chief (Planning) that categorisation of reserves established by the Company in addition to the exploratory work done by GSI was not indicated and also the Company was not able to arrive at any definite conclusion about the deposits explored.

8. *Siju Project, Meghalaya*

(i) Though the Government of Meghalaya and the Board of Directors had approved the project by June 1975, the contract was executed in March 1977 and the work commenced in May 1977. Additional work was also later taken up (August 1979) at the same rates.

(ii) There were delays in completion of the work as well as submission of geological reports. The work was completed finaly in November 1979 as against the extension granted upto

June 1979 and the geological report was submitted in December 1980 *i.e.* after 13 months of the final completion of the project.

(iii) The productivity of four drills deployed at the site was only 35 metres per rig month.

(iv) Equipment and manpower remained idle for 2 months due to preliminary establishment and for 3 months for want of instruction regarding commencement of second phase of the work.

(v) The total expenditure on the project amounted to Rs. 32.84 lakhs against the contract price of Rs. 19.40 lakhs thereby resulting in a loss of Rs. 13.44 lakhs.

8. **Non-fixation of norms**

8.1 The main activities of the Company are drilling, mining and geology works. To perform these activities, the company deploys various machines such as drills, pumps, compressors and a large manpower to run these machines; transport vehicles are also maintained for transporting men, mechines and materials. Though a period of over 10 years has elapsed since the formation of the Company, it has not laid down (June 1983) any norms of :—

(i) Consumption of POL by various drills, other machines and vehicles;

(ii) Consumption of bits including diamond bits and other accessories;

(iii) Productivity of various types of drills and other machines operating in a given strata/mineral;

(iv) Man-power to be deployed on various machines;

(v) Establishment of shifts at the project sites taking into account vagaries of nature, location, etc;

(vi) Maximum permissible down-time and cost of maintenance (corrective as well as preventive) of various types of equipment;

(vii) Levels of inventory in terms of cost and number of months consumption for different items of stores and spares;

(viii) Standard costs of operations.

8.1.1 The overall capacity of the Company to take up mineral exploration works and other ancillary jobs has also not been laid down. In the absence of these norms it has not been possible to analyse the performance of the Company in a systematic manner and verify whether the available resources have been utilised to their optimum capacity and the Company's working has been economical.

8.1.2 In this connection the Management stated (July 1983), *inter alia*, as follows :—

"......all the officers who in the initial stage formed the management of the Company were extremely competent geoscientists, they had not been exposed to the art and science of management. Further in the formative years the Company was keen to gather work for itself..... In 1979-80 the Corporation faced acute financitl strain arising of the reduction in drilling rates following the BPE award..... This had a great demoralising aspect...... Thereafter it had to fase the continuing disturbed law and order situation and strained industrial relations........ Thus, viewed in retrospect, the organisation has been literally carrying out "fire fighting" operations and had hardly time to concentrate on the broader management aspects like evolving an effective management controls system, performance evaluation etc........."

8.1.3 The Ministry stated (November 1983) as follows :—

"MECL is a service organisation as distinct from a processing unit. Its performance depends on the nature of the mineral explored, the strata and the terrain where it has to operate and also no other geographical and environmental variables.

In view of the diversities of the factors involved during exploration it has not been possible for the Company to evolve standard norms as commonly understood to judge the performance in different drilling jobs. The Company has, however, evolved a system for control of operations and costs and for monitoring the work in the various projects."

The Ministry further stated that "in view of the diversity in the nature of jobs performed in the process of exploratory mining/drilling, it was extremely difficult to arrive at standard norms against which the performance of all the projects could be judged".

8.1.4 During the meeting of the Audit Board held on 9th December 1983 with the representatives of the Ministry and the Management, it was pointed out by the Audit Board that resources available in the form of equipment, men etc. being known, it should not be difficult for the Company to fix the overall capacity of the equipment and men in position so that whenever targets were fixed lower than the capacity, the factors due to which such lower targets were fixed could be analysed. Similarly, in respect of norms of production, productivity and various inputs, it was suggested that if it was not possible to fix global norms, atleast projectwise norms taking into account the local factors should be fixed with which the actual performance can be compared for assessing the performance of each project. The Secretary, Department of Mines agreed with both the suggestions and desired that the Company should examine them for implementation. The Management, however, intimated that during 1983-84 an attempt has been made in this regard and project-wise productivity for drills has been laid down and norms of major inputs and manpower also have been fixed. It was also stated that a Committee has also been set up by Department of Mines to study, *inter alia*, the question of fixing norms of the crew of various types of equipment in the different public undertakings.

9. Position of Drills, their Utilisation and Productivity

9.1 Exploratory drilling in various minerals has been the major activity of the company so far. It had taken over 82 drills from GSI at the time of its formation. Of these, 68 drills have been declared obsolete and written off; 6 others are under write off. Thus only 8 drills taken over from GSI are still under operation. The Company has purchased 171 drills during 1973-74 to 1982-83 as per details below :—

Year	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	Total
Number of drills purchased	15	21	50	8	30	17	1	7	12	10	171

9.2 *Deployment efficiency*

9.2.1 The following table shows the deployment efficiency of the drills available with the Company during 1977-78 to 1982-83.

As on 31st March	1978	1979	1980	1981	1982	1983
1. Drills available .	142	154	157	162	174	177
2. Drills not in operation due to :						
(*i*) Break down .	5	12	5	6	1	1
(*ii*) Major Repairs	12	8	20	4	8	6
(*iii*) Shifting	5	9	15	8	18	10
3. Drills in operation						
(*i*) Wireline .	N.A.	N.A.	45	45	50	40
(*ii*) Others .	N.A.	N.A.	78	101	100	122
TOTAL . .	120	125	117+6* =123	144+2* =146	147+3* =150	160+2* =162
4. Deployment efficiency in respect of MECL drills (in percentage)	85	81	75	89	84	90

*represents number of drills taken on hire from the clients.

9.2.2 It would be seen that the deployment efficiency which was 85 per cent in 1977-78 came down to 81 per cent in 1978-79 and 75 per cent in 1979-80 despite the fact that during 1978-79, 126 drills were 5 years or less old and during 1979-80, 105 drills were 5 years or less old. During 1980-81 the deployment efficiency picked up to 89 per cent but again it came down to 84 per cent in 1981-82. In 1982-83 it was 90 per cent.

9.2.3 It may also be mentioned that the number of drills remaining out of operation owing to breakdown and major repairs was highest in 1979-80. The Company has, however, not laid down any norms for the time required for preventive mtintenance and for the number of drills required as standby.

9.3 *Productivity*

9.3.1 The following table shows the porductivity as per various parameters *viz.*, productivity per drill, per shift and per drill month for the last six years :—

	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83
1. Drills in operation	120	125	123	146	150	162
2. Total drilling done in metres	135137	187163	144850	131397	145141	189371
3. Productivity per drill per year (metres) . .	1126	1497	1178	900	968	1169
4. Productivity per drill based on 280 days a year per day (metres)	4.02	5.35	4.20	3.21	3.45	4.17
5. Shifts in operation	N.A.	N.A.	N.A.	41801	53739	48646
6. Productivity per shift (metres)	N.A.	N.A.	N.A.	3.1	2.7	3.9
7. Drill months available	1581	1870	1855	1897	2023	2112
8. Drill months in operation	1230	1438	1378 +62*	1469 +30*	1670 +16*	1849
9. Productivity per drill month in metres . . .	110	130	101	88	86	102

*Represents drill months in respect of hired drills.

9.3.2 It would be seen that there has been continuous downward trend in the productivity per drill from 1978-79. The productivity per drill in 1978-79 was 1497 metres. In 1980-81, it came down to 900 metres and in 1981-82 it improved to 968 metres and in 1982-83 to 1169 metres but was still lower as compared to the productivity during 1978-79. The productivity per shift has also decreased. It was 3.1 metres in 1980-81 but reduced to 2.7 metres in 1981-82. In 1982-83 it was 3.9 metres per shift. Productivity in terms of per drill month also decreased continuously from 1978-79 to 1981-82. It came down from 130 metres in 1978-79 to 86 metres in 1981-82; and increased to 102 metres in 1982-83. Thus apart from the downward trend in deployment efficiency of the drills available as mentioned in paragraph 9.2.2, the productivity as per various parameters had also come down in spite of purchase of new drills and increase in wireline drills with better productivity.

9.3.3 No norms either in respect of the deployment efficiency or productivity have been fixed by the Company to exercise control on the productivity and efficiency of drilling operations. In the absence of norms the Management have no parameters with which the performance of company's operations can be assessed from time to time.

9.3.4 The Management attributed (July 1983) the decline in preductivity since 1977-78, to the following main reasons :—

(i) lack of adequate control and difficulties faced in communicating with far flung projects located all over the country,

(ii) due to unremunerative rates mainly for coal drilling work of CMPDI, the corporation had a chronic shortage of funds which led to slowing down of investment on essential operating accessories.

(iii) due to procurement of substantial number of indigenous accessories in 1977-78 and 1978-79 which started breaking down earlier than expected (within a year or two instead of normal life of 3|4 years) resulting in premature shortage of equipment affecting the progress.

(iv) non-availability of needed accessories affected the general morale of workmen.

(v) increasing industrial relation problems, general indiscipline and continuously increase in demands of workmen at the projects.

(vi) difficult law and order situation in the eastern regions.

(vii) increase in bore-hole depth and more difficult formation.

9.3.5 In this connection, the Ministry further added (November 1983) as follows :

"acquisition of new drills does not lead to increase in productivity immediately. Most of the new drills acquired were of indigenous origin and were under warranty for one year. Repairs during this period have to be got done through the suppliers, which takes a long time and reduces drill availability."

9.3.6 In its Sixth Plan, the Company has laid down projections for drills productivity for 1983-84 at 100, 140, 250, 250 and 300 metres for conventional drilling, wireline drilling and non-core-drilling through indigenous drills, wireline drilling and non-core-drilling through imported drills; projections have also been made in the Plan for 1984-85.

9.3.7 The performance of drills working with wireline equipment and their productivity compared to drills using conventional equipment and also doing non-core-drilling during the last four years ending 31st March 1983, is given below :—

As on	Type of drilling	No. of drills deployed	Productivity in m/drill month	Where deployed
31-3-1980 . .	Wireline	45	100	Coal
	Conventonal	30	86	Coal
	Non-core	39	107	Non-coal
31-3-1981 . .	Wireline	45	90	Coal
	Conventional	57	79	Coal
	Non-core	44	62	Non-coal
31-3-1982 . .	Wireline	50	98	Coal
	Conventional	54	88	Coal
	Non-core	46	98	Ground water
			53	Non-coal
31-3-1983 . .	Wireline	40	117	Coal
	Conventional	88	107	Coal
	Non-core	34	74	Non-coal

9.3.8 It would be seen that the productivity of wireline drill, though in operation since 1980, ranged from 90 to 117 metres per drill month during the period 1979-80 to 1982-83 as against 140 metres indicated in the Sixth Five Year Plan.

9.3.9 The Audit Board pointed out during the meeting with the representatives of the Ministry and Management that the two main reasons attributed by the Management to the lower output of drills in the past were :—

(i) low life and frequent breakdown of indigenous equipment;

(ii) shortage of accessories.

In reply to a query of the Audit Board about the steps being taken by the Company to obviate idle time of men and equipment because of these reasons, the Management in the meeting stated (December 1983) that a study was in progress regarding the purchase of imported drills and equipment and was likely to be completed within a couple of months. As regards accessories, it was stated that the procedure of forecasting, procurement and inventory control were being streamlined so as to avoid idle time for want of accessories in future.

9.3.10 The table below indicates the productivity attained by the Company in respect of mining activity for last six years from 1977-78 to 1982-83 :—

Particulars	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83
1. Total mining work done in metres .	6542	8275	8419	5924	7151	981
2. Number of project months operation .	106	140	159	121	142	132
3. Average productivity in metres per project month :	62	59	53	49	50	75

9.3.11 It would be seen that there has been a continuous decreasing trend in the mining productivity till 1981-82. During 1982-83 the productivity, however, increased to 75 metres per project month.

9.3.12 The Company attributed (June 1983) the less production and poor productivity in mining operations to curtailment of work by clients, non-materialisation of projects and crippling power shortage at the establishment of clients in 1981-82.

9.3.13 In regard to fixing of productivity target, the Management (July 1983) as follows :—

> "Fixing or productivity targets is........neither feasible nor practicable. In mining industry, for production purposes, productivity is measured in terms of output per man shift (OMS). In MECL's type of work where ore production is not the objective even this measurement is not possible."

10. Man Power

10.1 The following table shows manpower employed in MECL per drill and per shift for the last six years :—

Particular	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83
1. Total drills available . .	142	154	157	162	174	177
2. Drills in operation . . .	120	125	123	146	150	162
3. Total manpower employed .	2661	3332	3417	2878	3108	3529
4. Manpower employed per drill available . .	19	22	22	18	18	20
5. Manpower employed per drill in operation .	22	27	28	20	21	22
6. Shifts available .	..	..	..	52807	67051	76502
7. Shifts in operation . . .	..	..	..	41801	53739	48646
8. Manpower employed per shift available . $\frac{\text{Manpower} \times 365}{\text{Shifts}}$	..	..	..	19.90	16.92	16.84
9. Manpower employed per shift in operation .	..	..	..	25.13	21.11	26.48

10.1.1 Manpower employed per drill in operation has ranged from 20 to 28 during 1977-78 to 1982-83 and per shift it was 25.13 in 1980-81, 21.11 in 1981-82 and 26.48 in 1982-83.

According to the norms of CMPDI one drill on an average was provided with 29 to 30 men for *two shifts operations* including the jobs connected with geology, watch and ward, repairs and maintenance, accounts, store, administrative works, road building etc. in the camp. Thus, employment of man power per shift in MECL even excluding manpower employed on jobs connected with geology, repairs and maintenance etc. was on the higher side as compared to CMPDI. The employment of excess manpower by the MECL was also pointed out by the BPE in 1979. The MECL did not, however, fix any norms for deployment of manpower.

10.1.2 The Board of Directors (as early as in January 1974) directed the Company to carry out work study and determine the manpower for each type of work and evolve an organisational chart by appointing consultants after inviting offers from National Productivity Council and other agencies. But no agency was appointed for this purpose. However, in February 1982 a committee of the departmental heads including the FA&CAO was constituted to study and suggest changes necessary in the organisational structure. The committee recommended three tier system by introducing Area Managers offices on geographical basis with a likely cost of Rs. 38 lakhs on recurring basis and Rs. 20 lakhs as onetime expenditure which was expected to enhance the productivity by 10 per cent. The Board constituted a sub-committee of Directors (April 1982) to examine the report and finalise the manpower requirement and authorised the Managing Director to act thereon without further reference to the Board of Directors.

10.1.3 On the basis of the recommendations made by the aforesaid Committee 144 posts in different scales have been created with effect from 2nd July 1982.

10.1.4 The FA&CAO, however, had reservations on these proposals and had observed that though 60 per cent to 70 per cent of the expenditure of the company was on manpower yet demands for men were being raised. He felt that some sort of self control should be introduced by fixing percentage of manpower cost linked to breakeven output.

10.1.5 The Management stated (June 1983) as follows :—

"Services of National Productivity Council were not taken as they were requiring longtime. Since a change in management system was felt urgently, an internal committee of Heads of Divisions was constituted in February 1982 whose report was considered by the Board of Directors on 29th April 1982.

Certain additional posts would necessarily be needed when a new system of management was being introduced and although FA&CAO was well within his right to strike a note of caution regarding increase in wage bill, a calculated risk for creating additional posts had to be taken if a new system of management was to be tried."

In this connection it may be noted that the FA&CAO in his note had, *inter-alia*, suggested to fix percentage of manpower cost linked with breakeven point. The Company had been sustaining heavy losses. It was noted that as per performance of Area Offices reported in the Quarterly Financial Report for the quarter ending 31st December 1982, except Nagpur Area Office, all other offices were working on loss.

10.1.6 The Ministry stated (November 1983) as follows :—

"........it is not easy to lay down standard norms for deployment of manpower in different areas on MECL projects. Nevertheless, this matter needs to be reviewed carefully by the Company and for this purpose an Industrial Engineering Unit has been set up within MECL. During 1983-84 productivity norms as also norms for various inputs including manpower have been worked out."

10.2 The table below indicates the sanctioned strength (regular staff), men in position there against and daily rated employees :—

	sanctioned strength (Regular staff)	Men in position (Regular)			Others	Daily rated employees			Others	Total			Others	Total Man Power
		Drilling	Mining	Geology		Drilling	Mining	Geology		Drilling	Mining	Geology		
31-3-1978	1600	473	128	182	415	2188	759	298	273	3145	1032	539	Apportioned	4716
31-3-1979	1683	500	167	239	542	2832	924	390	254	3902	1254	690	on the	5848
31-3-1980	1762	518	195	268	568	2899	1195	341	365	4062	1611	676	basis of	6349
31-3-1981	3014	776	294	383	961	2102	623	79	161	3649	1166	564	earning of	5379
31-3-1982	3030	932	322	393	1003	2176	627	92	150	3880	1235	580	drilling,	5695
													mining and	
													geology	

	Physical Performance			Earnings (Rs. in lakhs)			Total earnings in lakhs	Index of Performance			Percentage of variations of the Index of productivities per man with 1978-79 as base year		
	Drilling in Metres	Mining in Metres	Geology in square Metres	Drilling	Mining	Geology		Driling Metreage per man	Mining Metreage per man	Geology Square metreage per man	Drilling	Mining	Geology
31-3-1978	135137	6542	80.15	522.99	156.65	64.13	743.77	42.968	6.339	0.148	(—)10.373	(—)3.925	(+)72.093
31-3-1979	187163	8275	60.00	669.28	190.47	71.00	930.75	47.941	6.598	0.086	..	..	..
31-3-1980	144850	8419	135.00	530.84	182.31	55.48	768.63	35.659	5.225	0.201	(—)25.618	(—)20.809	(+)133.720
31-3-1981	121397	5924	90.85	517.76	167.55	68.24	753.55	36.009	5.080	0.161	(—)24.888	(—)23.006	(+)87.209
31-3-1982	145141	7151	53.761	627.63	232.64	76.93	937.20	37.407	5.790	0.092	(—)21.972	(—)12.246	(—)6.976

10.2.1 It would be seen from above that 1978-79 with a turnover of Rs. 930.75 lakhs and physical performance of 187163 metres of drilling and 8275 metres of mining was practically the best year with a total manpower of 5848. Next year (1979-80) with higher manpower (6349), performance dropped both physically and monetarily as the total earnings dropped to Rs. 768.63 lakhs and physical performance indices *i.e.* metreage drilled or mined per man came down to 35.6 and 5.2 respectively compared to 47.9 and 6.6 in 1978-79. In fact, during 1977-78 with significantly lesser number of staff and workmen (4716), the physical performance indices were much better at 42.97 metres for drilling and 6.34 metres for mining compared to that of 1979-80 when it had maximum number of employees (6439). Though after 1979-80 there has been some improvement in performance indices (productivity of the employees) even so it continues to be much below that of 1977-78 when the Company's strength was only 77 per cent of the strength during 1981-82. The percentages of variations in the productivity of the employees in drilling and mining during 1979-80 to 1981-82 as compared to 1978-79 have been as follows :—

	Variation in productivity 1978-79—Base year	
	Drilling	Mining
1979-80	(—)25.62	(—)20.81
1980-81	(—)24.89	(—)23.00
1981-82	(—)21.97	(—)12.25

10.2.2 The Management stated (June 1983) as follows :—

"In an organisation like MECL, where productivity and output for man month is controlled by a large number of factors, including the diverse location of work spots, availability of work, depth ranges of bore-holes, nature of mining operations, strata being worked, product mix etc., it is difficult to make a straight comparison of output per man month from year to year.

For example when a deep bore-hole is taken by a heavy capacity drill in the deeper depth ranges, the output per man month decreases not only because there is a fall in productivity at deeper levels, but also because for operating a heavy capacity drill more men are needed."

11. Utilisation of shifts

11.1 The Company has not prepared any programme, at the level of the Corporate Office, for the deployment of shifts on the basis of the number of drills, work-load and manpower at Project sites. In the absence of such a programme the Company was not in a position to exercise any control on the shifts established and on optimum utilisation of men, material and machines.

11.1.1 The following table gives the details of shifts available and shifts in operation during 1980-81 to 1982-83. :—

	1980-81	1981-82	1982-83
Drills available	162	174	177
Drills in operation	146	150	162
Shifts indicated by the Company as available for operation	52807	67051	76502
Shifts available on 2 shift basis per drill in operation and 280 working days in a year (Drill × 2 × 280)	81760	84000	90720
Shifts shown to have been lost in local shifting	3694	3965	4147
Balance	78066	80035	86573
Shifts lost due to :			
Break down	4333	5381	4710
Shortage of POL	551	145	445
Shortage of accessories	744	1394	6792
Other reasons	1684 7312	2427 9347	2538 837
Net shifts available for work	70754	70688	78201
Shifts actually worked	41801	53739	48646
Shifts not worked	28953	16949	29555

11.1.2 On the basis of two shifts operation per drill and 280 working days in a year, shifts available for the drills in operation works out to 81760, 84000 and 90720 during 1980-81, 1981-82 and 1982-83 respectively. As against this, the shifts available have been indicated by the Company as 52807 in 1980-81, 67051 in 1981-82 and 76502 in 1982-83 (Paragraph 11.1.1 refers). The shifts available as indicated by the Company were thus considerable less.

11.1.3 The Ministry stated (November 1983) as follows :—

> "the number of operational drills increases only gradually during the year and reaches the maximum number on 31st March. In other words, the drills shown with MECL on 31st March are not available throughout the year. It may also be mentioned that new drills require some time for their initial deployment and to become operational. There are also factors like shifting of drills from one place to another or operations in hazardous areas or maintenance jobs to be taken into account. In such situation, the Company counts only one shift as available. In certain areas like North-East India local conditions do not permit working after sun set."

11.1.4 Considering the Ministry's reply that the drills shown with MECL on 31st March are not available throughout the year, the shifts available have been worked out on the basis of average number of drills in operation during the year and the number of shifts thus available work out to 75600, 82880 and 87360 respectively as against 52807, 67051 and 76502 shifts indicated as available by the Company during 1980-81, 1981-82 and 1982-83. Thus even on this basis, the shifts available as indicated by the Company, were considerably less.

11.2 The mineral-wise information regarding shifts available as shown by the Company, shifts utilised in drilling, shifts utilised in shifting of drills, machinery and other equipment, shifts lost on account of break down, shortage of POL, shortage of accessories etc. and percentage of shifts lost to shifts available for the years 1980-81 to 1982-83 is given in the table below :—

Sl. No.	Mineral	Shifts available			Drill Shifts			Shifting			Shifts lost 1980-81					Shifts lost 1981-82					Shifts lost 1982-83					Percentage of Shifts lost		
		1980-81	1981-82	1982-83	1980-81	1981-82	1982-83	1980-81	1981-82	1982-83	Break down	Shortage of POL	Shortage of accessories	Others	Total	Break down	Shortage of POL	Shortage of accessories	Others	Total	Break down	Shortage of POL	Shortage of accessories	Others	Total	1980-81	1981-82	1982-83
1.	Chromite	2132	605	..	1755	474	..	202	47	..	117	18	..	40	175	61	..	..	23	84	..	..	..	..	..	8	14	..
2.	Gold	1620	1716	2520	1416	1404	1475	70	49	58	99	16	18	1	134	68	91	104	..	263	323	304	68	206	901	8	15	36
3.	Multimetal	1571	1920	1211	1355	1575	691	68	100	181	118	..	2	28	148	189	4	32	20	245	66	..	15	90	171	9	13	14
4.	Copper	1444	3935	4267	1236	3292	2804	47	199	167	96	5	36	24	161	209	..	156	79	444	129	..	88	119	336	11	11	8
5.	Diamonds	1153	2622	2082	693	2052	1388	87	278	48	59	224	34	56	373	221	..	31	40	292	89	..	..	300	389	32	11	19
6.	Bauxite	860	..	1203	711	..	952	8	..	34	132	8	..	1	141	..	..	..	..	..	112	..	..	69	181	16	..	15
7.	Geo-technical	543	1116	7145	368	798	4349	89	95	326	61	..	11	14	86	79	..	61	83	223	397	93	192	221	903	16	20	13
8.	Ground Water	289	1556	1968	158	1057	1261	11	128	140	50	..	70	..	120	181	..	149	41	371	93	..	..	62	155	42	24	8
9.	Coal	43195	53581	54288	34109	43087	34548	3112	3069	3020	3601	280	573	1520	5974	4373	50	861	2141	7425	3337	10	316	1409	5072	11	14	9
10.	Lime stone	..	..	1818	..	..	1178	..	..	173											164	38	..	62	264	..	..	14
	TOTAL	52807	67051	76502	41801	53739	48646	3694	3965	4147	4333	551	744	1684	7312	5381	145	1394	2427	9347	4710	445	679	2538	8372	14	14	11

11.2.1 It will be observed from the above table that though the total percentage of shifts lost was 14 in 1980-81 and 1981-82 and 11 in 1982-83, the percentages of shifts lost in projects engaged in ground water drilling and diamond drilling were 42 and 32 respectively during 1980-81. Similarly, in 1981-82 the percentages of shifts lost in ground water drilling and Geo-technical were 24 and 20 respectively and in 1982-83, the percentage of shifts lost in gold drilling was 36. Further, out of total shifts (52807) available with the Company during 1980-81, 551 shifts and 744 shifts were lost due to shortage of P.O.L. and accessories respectively; during 1981-82 out of total shifts (67051) available with the Company, 145 shifts and 1394 shifts and during 1982-83 out of total shifts (76502) available, 445 shifts and 679 shifts were lost due to shortage of P.O.L. and accessories respectively. Apparently the losss of shifts on account of these two factors could have been minimised by following appropriate purchase policy.

11.2.2 The Management stated (June 1983) as follows :—

> "Overall utilisation of 86 per cent of the available shifts in 1980-82 period could be normally considered as reasonable utilisation. Ground water drilling was undertaken by the Corporation for the first time in 1980-81 in the interior areas of Orissa. For this old drills were modified to meet the requirement....."

11.2.3 Similar data regarding utilisation of shifts etc. from the year 1977-78 to 1979-80 were not compiled and submitted to the Board of Directors. The Board of Directors observed (September 1981) as follows :—

> "They noted with displeasure that their directives to the Company to undertake immediately idle time analysis of their machinery and equipment was not followed up altogether through the year even though MECL themselves had been doing such exercises upto 1977. The Board further noted that there was no satisfactory explanation as to why the practice of compiling idle time data was dispensed with. The

Board was surprised to note that whereas certain data regarding idle time and loss of production in the field continued to be maintained at Camp sites neither the division Heads nor the Corporate Management and the Finance Wing had direct and continuing access to such vital information."

11.3 An analysis of the shifts lost during 1980-81 to 1982-83 in various projects was also conducted in audit. Particulars of the projects where the percentage of shifts lost was 19 or more are given in the table below :—

Sl. No.	Project/block	Mineral/Area	Shifts available	Shfts lost	Percentage of shifts lost to shifts available
1980-81					
1.	Diamonds A.P.	Diamonds A.P.	622	268	43
2.	Diamonds M.P.	Diamonds M.P.	531	105	20
3.	Panch East .	WCL-Coal	1922	388	20
4.	Udala . .	Ground Water, Orissa	82	35	43
5.	Bangriposi .	—do—	115	45	39
6.	Baripada .	—do—	92	40	43
7.	Gaurradih .	ECL Coal	982	183	19
8.	Kasta-west .	NCL Coal	1192	228	19
9.	Kanhan . .	WCL Coal . .	4684	901	19
1981-82					
1.	NHPC . .	Geo-technical North India	1116	223	20
2.	Dharmaband .	BCCL Coal	2673	866	32
3.	Bhowra North .	—do—	256	55	22
4.	Gaurandih .	ECL Coal	1037	232	22
5.	Kasta East .	ECL Coal	1236	427	35
6.	Kasta West .	ECL Coal	792	213	27
7.	Tilahoni .	ECL Coal . .	1136	226	20
8.	Bongriposi .	Ground Water, Orissa	706	148	21
9.	Gorubathen .	NEC-Multimetal	343	100	29
1982-83					
1.	Kolar Gold Field	Gold	2520	901	36
2.	Panna . .	Diamond	2082	389	19

11.3.1 The Management had neither investigated into the reasons for these heavy shift losses nor had it taken any corrective measures to arrest the shift losses. Even in the review of utilisation of drill shifts and shifts lost during 1981-82, put up to the Board in February 1983, reasons for these excessive shift losses had not been analysed|highlighted.

12. Workshops

12.1 The Company is having a central workshop at Nagpur and one field workshop at Godhur (Dhanbad).

12.1.1 The central workshop taken over from GSI at the time of the formation of the Company with machines and accessories valued at Rs. 2.44 lakhs is equipped with facilities for manufacturing T. C. Bits, drilling accessories, casings, spare parts, threading of rods and fabricating hutments, drilling derricks, water tanks, vehicle bodies and racks and for undertaking repairs of drilling and mining equipment and vehicles of the Company and salvaging diamonds from used and worn out diamond bits. Four lathe machines valued at Rs. 5.32 lakhs were later added to it, one in 1976-77 and three in 1982-83.

12.1.2 The field workshop at Godhur carries out the repairs of drilling and mining equipment and vehicles. It also undertakes fabrication works wherever necessary.

12.2 *Manpower*

12.2.1 The number of employees engaged in these two workshops during the last six years ending 31st March 1983 and the total value of work done are indicated in the table below :—

Particulars	1977-78	1978-79	1979-89	1980-81	1981-82	1982-83
1. *Central Workshop*						
(*i*) Regular	71	76	108	137	126	122
(*ii*) Casual	68	60	48	30	29	36
	139	136	156	167	155	158
2. *Godhur Workshop*						
(*i*) Regular	9	9	9	18	18	18
(*ii*) Casual	25	23	22	13	7	7
	34	32	31	31	25	25
TOTAL	173	168	187	198	180	183
3. Total salaries and wages paid—Rupees . .	N.A.	N.A.	1513733	1998162	2264406	N.A
4. Value of total work done	4416068	3670426	3719998	5467601	5898748	N.A.
5. Value added per man (Rs.)	25526	21848	19893	27614	32771	N.A
	(Base year) .	(85.59)	(77.93)	(108.18)	(128.38)	N.A.
6. Value added per rupee spent on wages etc. (Taking other elements of cost as Nil)	N.A.	N.A.	2.46	2.74	2.60	N.A.

12.2.2 It will be seen that value added per man (cost of work done per man|year) decreased by 14 per cent and 22 per cent during the year 1978-79 and 1979-80 while it increased by 8 per cent and 28 per cent during 1980-81 and 1981-82 as compared to that of 1977-78. Further, the value added per rupee spent on salaries and wages etc. ranged between Rs. 2.46 and Rs. 2.74.

12.3 *Capacity*

12.3.1 The Compnay has neither laid down the installed capacity of the workshops nor has it fixed targets of various jobs to be undertaken by the workshops during a particular year. In the absence thereof it has not been possible to verify whether the facilities of the workshops have been utilised to their optimum capacity.

12.3.2 The Management stated (June 1983) as follows :—

> "the output of the workshop is tuned essentially to the needs of the operating divisions and hence it works as per indents received from them. The 'product mix' generated by the workshop, therefore, depends on the needs of the operating divisions and hence it is not possible to fix independent production targets for the workshop."

12.3.3 In a technical review of the Central Workshop done for the year 1974-75 the Management intimated to the Board of Directors in their meeting held on 13th June 1975 as under :—

> "Correct manufacturing techniques, close manufacturing control and use of best quality raw materials together with experience and expertise have made it possible to accelerate the tempo of production since

the taking over of the workshop by MECL and now in addition to our own demtnd, we are in a position to meet the requirements of our sister organisations *e.g.*, GSI, IBM, Central Ground Water Board, Atomic Energy Commission, NMDC, MOIL and Directorate of Geology and Mining, Maharashtra State etc."

12.3.4 Although a period of 7 years has elapsed after noting the above position by the Board of Directors in June 1975, no sustained efforts appear to have been made by the Company to obtain additional jobs from above mentioned organisation for further utilisation of the capacity.

12.3.5 The Ministry stated (November 1983) that :—

"MECL's workshops are meant essentially for servicing MEC's own vehicles and equipment. Efforts were however made to get additional jobs during 1976-77 and 1977-78. In the absence of sustained demands, outside jobs could not be obtained. Besides, there has also been increased internal demand on the facilities of the workshops. Above all excise and other duties are payable on its entire production if even small quantity of goods and services is sold to outside agencies."

12.4 *Poduction Performance*

12.4.1 The production performance of the Central Workshop, Nagpur as well as field workshop, Godhur (Dhanbad) in terms of the items of work done for the period from April 1977 to March 1983 is given in Annexure II. It will be seen therefrom that the performance of the workshop has been registering a downward trend both in manufacture as well as repair, year after year, as compared to its performance in 1977-78 excepting in cases of threading of rods|casings and adopter couplings during the years 1978-79 to 1981-82 and threading of rods|casings and T. C. Bits during 1982-83. The sharp variations in the number of units manufactured in different years indicates that the company had no systematic programme of manufacture of various items. The Management attributed (June 1983) the decline in performance to manpower constraints and stated that :—

> "proposal for additional manpower for manning the central workshop as also field workshops and the projects by workshop personnel have been finalised. Necessary negotiations with the union in this connection are under way. Performance review of the workshop is conducted regularly to improve its performance to a higher level and informal system of fixing targets on a month to month basis commensurate with the workload pattern has also been evolved."

12.4.2 It was, however, noticed that the manpower deployed on these two workshops had a small decline of 5 men in 1978-79 as compared with 1977-78. In other years it was substantially more than that in 1977-78.

12.5 *Utilisation of Manpower (idle hours)*

12.5.1 The Company has not made any analysis of manhours lost in the workshops due to various reasons during 1977-78 to 1981-82.

12.5.2 A review of 3205 time cards of various shops for the period October 1981 to March 1982 made in audit has, however, revealed that 57 per cent of total hours lost were due to (i) union activities (30 per cent), (ii) want of raw materials (10 per cent), (iii) want of work (8 per cent) and (iv) machine breakdown (9 per cent).

12.6 *Utilisation of Machines*

12.6.1 A review conducted in audit regarding the utilisa tion of machines in the Central Workshop, Nagpur revealed the following :

Period	No. of machines	Actual hour available	Hours	(Balance idle machine hours)	
			Actually utilised	Due to machine breakdown	Due to non availability of operator
1977-78	19	91,200	8,0256 (88 %)	912 (1 %)	10032 (11 %)
1978-79	19	91,840	78,983 (86%)	1102 (1.20 %)	11955 (12.80 %)
1979-80	19	89,920	76,432 (83 %)	1359 (1.50 %)	12319(13.70 %)
1980-81	19.	90,520	75,165 (83 %)	1359 (1.50 %)	14036 (15.50 %)
1981-82	19	90,560	77,146 (85.19 %)	1411 (1.56 %)	12003 (13.25 %)
1982-83	22	1,09.440	87605 (80.05 %)	1589(1.45 %)	20246(18.50 %)

12.7 *Review of Jobcards*

12.7.1 A review of jobcards of jobs completed during the years 1980-81 and 1981-82 revealed that the entries regarding issuance of material|spares from stores|outside purchase had only been made in the jobcards. The information regarding anticipated time and cost and catual total cost incurred and time taken in completing the jobs have not been filled in; consequently the actual cost of production, cost of labour and machine hours etc. and the actual cost of production of each item could not be ascertained. However, on the basis of cost data as available in the cost sheets, the cost of four types of T. C. bits and vehicle bodies built in the workshop during 1978 to 1982 as computed in audit is given in Annexure III.

12.7.2 Since the company has neither prescribed standard costs nor analysed the reasons for variations in the cost of various inputs, it is not possible to verify if the variations in the cost per unit were justified.

13. Costing and Management Information Systems

13.1 *Costing System*

13.1.1 During 1975-76 the Company introduced a system of costing under which cost data was prescribed to be furnished monthly by each project to Headquarters. The cost centres in case of drilling, mining and geology were the activity; in case of workshop, each job was the cost centre. However, the system did not provide for classification of the costs into fixed costs and variable costs, ascertainment of idle time for labour and machinery, comparison of the actual cost with the estimated cost and analysis of the variations. Fixation of Standard costs keeping in view the mineral strata, depth of borehole etc. was also not considered. Further, the headquarters expenses were to be apportioned on the basis of financial expenditure incurred on a project and not on the basis of physical performance of the project. A review of the costing records also revealed that the cost statemens were not reconciled with the financial accounts till 1978-79. Further, cost sheets were neither received regularly nor were these received in time from the projects and workshops. Estimated costs were adopted for compiling the annual cost in such cases where monthly cost sheets were not prepared. There was also no system of putting up the cost statements to the Management/Board.

13.1.2 In the workshops, no standard costs were prescribed though the workshops were manufacturing limited number of accessories and fabricating items like vehicle bodies, water tanks etc. No analysis of idle man-power and machinery hours was made. Though the cost of manufacturing the same items differed widely, yet no analysis was made to find out reasons therefor. The overheads were charged at 130 per cent of the labour cost without any regard to actual production either in physical quantities or financial cost thereof.

13.1.3 The Company introduced a modified costing system on 1st April 1982. The effectiveness of the modified costing system will be known after it has worked for one or two years. But even the modified system does not provide for classification of the costs into fixed and variable costs and fixing of standard costs.

13.2 *Management Information System*

13.2.1 The Company introduced a comprehensive management information system comprising of internal management information as also the outgoing reports to the Ministry only in October 1982. Majority of the reports prescribed prior to this date were in the nature of progress reports indicating the state of work in the units and did not supply information needed by the Management for effective control on costs and functions of the Company. These reports were also not received regularly. The main objective in introducing the new system is to obtain vital information from various operating units and Central Headquarters office in order to keep all levels of Management informed of all developments in the Company which effect its functioning and to serve as effective working tools for managerial personnel so that action could be taken by them at the right time in respect of functions|operations for which they are accountable. The efficacy of the system would, however, be known only after it has run for one or, two years.

14. Pricing Policy

14.1 *Pricing policy for promotional projects*

14.1.1 The Company undertakes promotional works on behalf of Government of India at the schedule of rates prescribed by the Government. Till 31st December 1975, Geological Survey of India schedule of rates were adopted for promotional works. In September 1975 the Government indicated to the Company that :—

(i) The GSI schedule of rates is essentially meant for charging the outside parties for the work carried out by the Government agencies like GSI.

(ii) Since Mineral Exploration Corporation Limited is carrying out the promotional work at the behest of the Government, it would be in the fitness of the things that Government reimburse the actual cost of the work without involving any marginal considerations.

14.1.2 The Company was further advised to make an exercise to study the actual cost involved including the direct and indirect costs on the promotional work so that a suitable criterion could be evolved which may form the basis of payment by the Government.

14.1.3 The cost data furnished by the Company to the Ministry in 1976 for evolving a criterion for fixing the rate for promotional work was found inadequate. Consequently, the GSI rates prevailing in 1976 still form the basis for promotional rates for MECL with some esclations allowed by the Government in the cost of inputs etc. The Ministry stated (November 1983) as follows :

> "MECL has been asked to draw up adequate cost data so that rates for promotional work can be fixed suitably. As a commercial organisation, it would be unrealistic to expect MECL to take up promotional work on actual cost basis without any return on the capital employed."

14.1.4 The fact remains that the Government has not fixed any margin to be added by the Company on promotional works.

14.2 *Pricing Policy for contractual works*

14.2.1 The contractual works are undertaken on behalf of Public Sector Undertakings and other parties. The Company prepares the estimates for drilling, mining and geological work and adds to it a margin of profit. However, the final rates for such works are decided after negotiations with the contracting parties.

14.3 *Profitability of promotional and contractual works*

14.3.1 Annexure IV indicates the profit or loss made by the Company during 1977-78 to 1982-83 on drilling and mining done on promotional basis on behalf of Government and drilling work done on contractual basis on behalf of the CMPDI which is the main client of the Company. It will be seen therefrom that except during 1981-82 when the Company incurred loss on promotional mining, the Company has invaribaly made profit on promotional works done on behalf of the Government of India. On the other hand, except during 1978-79 when the Company made a marginal profit on contractual drilling, the Company has invariably incurred losses on the contractual drilling done on behalf of the CMPDI.

14.3.2 The percentage of profit on promotional drilling has ranged between 28.61 and 106.13 during 1977-78 to 1981-82 and the percentage of profit on promotional mining has ranged between 0.12 and 52.20 during 1977-78 to 1980-81. The loss on contractual drilling done on behalf of CMPDI has varied between 1.32 per cent and 35.42 per cent during 1977-78 to 1982-83 except during 1978-79 when there was a marginal profit on contractual drilling.

14.3.3 In respect of the high profit margin on promotional drilling and loss on contractual drilling, the Ministry stated (November 1983), *inter alia,* as follows :—

> "There was high profit margin in promotional drilling projects during 1977-78 to 1979-80 mainly due to the Est-coast bauxite exploration work, which do not involve deep drilling and was carried out in compact areas. When bauxite exploration work tapered off during 1980-81, the profit margin also came down.....
>
> There have been some losses in the contractual drilling done by MECL for CMPDI. The payment rates were originally settled by MECL with BCCL in 1973 and the Coal Mines Authority Limited in 1975. In 1978-79, at the instance of CMPDI, the rates payable for coal drilling were

referred to BPE for arbitration as CMPDI was of the view that the rates fixed earlier were on the higher side. BPE recommended a rate of Rs. 377 per metre drilling in respect of CIL areas and Rs. 349 per metre in respect of BCCL areas effective from 1-4-1979 and valid for one year. The rates which should be paid for subsequent years were referred to the Cost Accounts Branch of the Ministry of Finance. The cost Accounts Branch recommended revised rates, which have been accepted by CMPDI with some modifications........

The rates recommended by BPE in 1979 were in the nature of an award and were accepted by the Company even though these rates were not remunerative. The Company had also expected that higher rates would be recommended by Cost Accounts Branch for Coal drilling by MECL, but in order to reduce its losses and improve its liquidity position, these rates were accepted even after a slight reduction made in them by CMPDI. It would thus be seen that the losses incurred by MECL were not due to the absence of cost control, but on account of other factors."

14.3.4 During the meeting with the Audit Board, the Secretary, Department of Mines stated that the report of Cost Accounts Branch which was accepted unanomously by the Secretary (Expenditure), Secretary (Coal), Secretary (Mines) and Director General (BPE) should be implemented to ensure that the Company becomes financially viable.

15. Financial Management

15.1 *Financial Position*

15.1.1 The table below summarises the financial position of the Company under broad headings for the last six years ending 1982-83 :

(Rupees in lakhs)

	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83
Liabilities						
(*a*) Paid-up Capital	1759.00	1799.00	1799.00	1799.00	2129.00	2389.00
(*b*) Reserves & Surplus	3.90	81.30	87.68	17.04	25.21	25.91
(*c*) Borrowing :						
(*i*) From Banks	..	..	..	..	..	43.62
(*ii*) Loan from Govt. of India . . .	..	..	..	..	160.00	420.00
(*d*) Trade dues and other current liabilities (including provisions)	199.76	302.30	200.08	333.76	349.85	412.79
TOTAL	1962.66	2182.60	2086.76	2149.80	2664.06	3291.32
Assets						
(*e*) Gross Block	1048.84	1330.16	1482.47	1731.83	2038.44	2582.59
(*f*) Less Depreciation	506.45	733.57	948.63	1116.48	1305.54	1571.43
(*g*) Not fixed assets	542.39	596.59	533.84	615.35	732.90	1011.16
(*h*) Capital Assets in transit	149.41	9.05	3.57	3.79	36.79	4.34
(*i*) Capital items in stores	266.55	261.54	243.38	173.86	215.98	197.43
(*j*) Current Assets Loans & Advances . .	1004.31	1315.42	1305.97	1202.03	1278.59	1281.87
(*k*) Profit & Loss A/c (Loss)	..	..	..	154.77	399.80	796.52
TOTAL	1962.66	2182.60	2086.76	2149.80	2664.06	3291.32
Capital employed	1362.36	1633.13	1675.07	1534.78	1730.06	1966.11
Net worth	1762.90	1880.30	1886.68	1661.27	1754.41	1618.39

NOTES : 1. Capital employed represents net fixed assets plus working capital.
2. Net worth represents paid-up capital plus reserves and surplus less intangible assets.

15.2 *Working Results*

The working results of the Company for the last eleven years ending 31st March 1983 are tabulated below :—

(Rupees in lakhs)

Year	Profit(+) Loss(—) of the year	Effect, on profit or loss, of Prior Period Adjustments, Provisions written back and other Adjustment	Profit (+) Loss (—) after adjustments
1972-73	(—)26.42	..	(—)26.42
(Year ending 30th Sept. 1973)			
1973-74	(—)15.90	(—)6.35	(—)22.25
(Year ending 31st March 1974)			
1974-75	(—)82.02	(—)3.09	(—)85.11
1975-76	(—)51.13	(—)22.15	(—)73.28
1976-77	(+)108.27	(—)3.15	(+)105.12
1977-78	(+)128.80	(—)26.36	(+)102.44
1978-79	(+)221.57	(—)36.78	(+)184.79*
1979-80	(+)5.11	(+)0.01	(+)5.12
1980-81	(—)262.32	(+)24.53	(—)337.79
1981-82	(—)353.84	(+)108.82	(—)245.02
1982-83	(—)355.38	(—)41.35	(—)396.73

*The Company paid a dividend of Rs 107.39 lakhs. out of profit for 1978-79.

15.2.1 The adverse financial results during 1980-81 and 1981-82 were attributed by the Company to the following reasons:—

1980-81

(i) Non-remunerative rates for coal exploration.

(ii) Rising cost of materials, increased liability arising out of revision of wages and regularisation of about 1000 daily rated employees; and

(iii) Deterioration in Law and Order position in coal field areas leading to reduced production and productivity.

1981-82

(i) Non-remunerative drilling rates for coal;

(ii) Increase in cost of materials and escalations in general resulting in increase in operational cost; and

(iii) Deterioration in Law and Order position in coal field

15.2.3 The Ministry stated (November 1983) that on the basis of revised rates agreed to be paid by CMPDI for 1980-81 and onwards the accumulated loss of MECL upto 31st March 1983 would reduce by about Rs. 540 lakhs.

15.3 *Outstanding Debtors*

15.3.1 The analysis of debts outstanding at the end of each of the six years upto March 1983 is given below :—

(Rupees in lakhs)

	March 1978		March 1979		March 1980		March 1981		March 1982		March 1983	
	Govt. Deptt. including Public Sector Under-takings	Private parties	Govt. Deptt. including Public Sector Under-takings	Private parties	Govt. Deptt. including Public Sector Under-takings	Private parties	Govt. Deptt. including Public Sector Under-takings	Private partis	Govt. Deptt. including Public Sector Under-takings	Private parties	Govt. Deptt. including Public Sector Under-takings	Private parties
(1) Debts outstanding for more than one year but less than two years	38.41	0.001	108.25	0.01	30.22	0.03	15.56	..	54.65	..	52.70	..
(2) Debts outstanding for more than two years but less than three years	2.08	0.030	13.29	..	21.29	..	26.33	..	13.09	..	26.27	..
(3) Debts out standing - for more than three years	9.61	0.010	12.13	0.03	10.97	0.04	13.00	0.3	26.89	..	41.52	..

15.3.2 The outstanding debts were due mainly from the Government department including public sector undertakings.

15.4 *Non-preparation of Accounting Manual*

15.4.1 As per the guidelines communicated by the Government of India, Ministry of Steel and Mines (Department of Mines) in March 1973 the Company was required to pay special attention to the preparation of Accounting Manual. After a lapse of over eight years the Company entrusted in July 1981, the work of drafting the accounting manual to a private firm of consultancy at a fee of Rs. 25,000. The Accounting Manual has not been finalised and approved by the Board so far (June 1983).

15.4.2 The Company stated (June 1983) as follows :—

> "The draft manual submitted by the consultant has to be revised on account of the introduction of Area Offices and decentralisation of functions of the Finance and Accounts. The revised draft manual has been received in 1st week of June 1983 and is under study."

15.4.3 *Internal Audit*

Although the Internal Audit Wing in the Company has been in existence since October 1975, yet it has not conducted so far (June 1983) any review of the systems, procedures and operations in the Company as a whole.

15.5 *Incentive Scheme*

15.5.1 With a view to increasing productivity per drill, the Company introduced an incentive payment scheme on an experimental basis with effect from 1st April, 1982. In terms of the scheme approved by the Board, the base line output in respect of all the projects covered under it was to correspond to the average monthly progress achieved in 1978-79. In case of new projects, the base line output was to be the monthly output as taken in cost input estimates. However, while prescribing base line output for the scheme, the Company took into consideration the average productivity achieved in previous three years corelated to any substantial change in the drilling conditions. The base line output was, however, revised further to the lower side after negotiation with the trade unions.

15.5.2 Incentive payment under the scheme is payable out of the saving of salaries and wages due to achievement of higher output per drill month. The savings are to be shared by the employees by way of incentive payment at 35 per cent upto the first 10 metres of extra output with a rise of 5 per cent for each additional 10 metres of extra output subject to a maximum of 70 per cent. The total incentive payment per individual per quarter is not to exceed Rs. 600. A review of the working of the incentive scheme in respect of five projects for the last quarter of 1982-83 indicated that the increase in average output per drill month over the base line output ranged between 10 per cent and 87 per cent. The overall increase in production and productivity and saving to the Company as a result of introduction of the scheme have, however, not been assessed. The Management stated (July 1983) as follows :—

> "In 1982-83, there has been an increase in productivity which is due to a number of reasons which include *inter-alia* better monitoring, improved supply of accessories and the incentive scheme. It is difficult to state the role of the incentive or its contribution but our assessment is that it did make a positive contribution towards better product and productivity in 1982-83."

16. Material Management and Stores

16.1 The Corporation has introduced in July 1976, a Stores Manual outlining the purchase procedure. According to the Manual, the Stores Department is *inter-alia* responsible for overall control of Stores transactions including material planning and programming, maintenance schedule, inventory control, ledger records, store-keeping, classification, coding and standardisation of the store items. The Company has, however, not drawn up any long term plan for the purchase of stores and equipment. The Company has also neither laid down any maintenance schedule nor has it done the codification and standardisation of stores.

16.1.1 The Company stated (June 1983) as follows :

> "In the peculiar circumstances attending to our organisation, the material planning and programming in the strict sense is not perhaps possible. The fore-casting of requirements is difficult since firm indication for possible work for the year is not available at any one time. However, efforts to have annual material planning and programming are underway and if our efforts to know our involvement in coal exploration work say for next five years bear fruit we will concentrate on material planning also. The basic exercises on coding and standardisation have been carried out and await implementation."

16.1.2 The stock of stores and spares as at the close of each year, purchases, consumption during the year, and closing balance in terms of months' consumption, value of work-in-progress, cost of operations, closing balance of work-in-progress in number of months and cost of operation during six years from 1977-78 to

1982-83 are given in the table below :—

(Rpees in lakhs)

	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83
1. Stock of stores & spares (including stores & spares in transit) & loose tools	189.51	217.03	250.84	272.74	273.38	305.29
2. Consumption during the year	152.60	156.61	192.19	263.01	332.76	448.81
3. Closing balance as number of months' consumption	14.7	15.9	15.1	12.3	9.9	8.2
4. Purchases during the year	197.00	184.13	226.00	284.91	333.40	480.72
5. Work-in-progress	88.31	160.88	231.25	239.97	198.49	242.75
6. Cost of operations (including depreciation) . .	675.16	752.24	813.45	1045.97	1321.66	1546.68
7. Closing balance of work-in-progress in number of months' cost of operations (including depreciation)	1.5	2.2	3.1	2.7	1.7	1.9

16.1.3 It would be seen that the purchases made during the years 1977-78 to 1982-83 exceeded the consumption each year. Special feature of the purchases has been that stores including P.O.L. purchased locally during 1980-81 and 1981-82 amounted to 46.19 per cent and 60.52 per cent of the total purchases made during those years respectively. The stock of stores and spares (including stores & spares in transit) and loose tools at the close of the five years 1977-78 to 1981-82 had been around 10 months consumption or more, yet local purchases to the extent of over 50 per cent of the consumption had been made by the projects.

16.1.4 The Management intimated (March 1982) to the Ministry of Steel & Mines that such procurement at project levels are made based on non-availability certificate issued from Company's Headquarters due to non-availability of items in stock.

16.1.5 The Company has not so far (June 1983) prescribed any norms in respect of closing stock as number of months consumption. The Company has also not fixed the maximum and minimum levels of individual stores items. The Management stated (June 1983) as follows :—

> "........ classic methods of fixation of minimum and maximum limits do not appear to be strictly applicable to our type of working .... maximum/minimum limits are difficult to be prescribed in the first instance and if prescribed, difficult to be adhered to."

16.1.6 The above views of the Management are contradictory to the provisions contained in the Stores Manual which requires fixation of maximum and minimum limits for all items in the stores in order to avoid unnecessary accumulation of stores.

16.2 *Surplus Stores*

16.2.1 The Company declared 12036 stores items valuing Rs. 13.46 lakhs and 5053 items of spares valuing Rs. 3.39 lakhs as surplus between 1977-78 and 1978-79. Of these, the Company could dispose of only 230 stores items and 1228 spares items during three years from 1979-80 to 1981-82 and 11806 stores items and 3825 spares items valuing Rs. 9.11 lakhs and Rs. 3.15 lakhs respectively were lying in the stores as surplus items till 31st March 1982. In this connection, the Company stated (June 1983) as follows :—

> "A large number of surplus items as on date were inherited from G.S.I. Diamond bits are a case in point. These bits came in large number of sizes and standards and for the sake of uniformity and standardisation and also to optimise on tubulars and cut down inventory we had to decide not to put into use some of the uncommon sizes of bits."

16.2.2 *A.B.C. Analysis*

ABC Analysis of inventories has not been done in the Company so far. The Management stated (December 1982) that efforts were being made for making the analysis in this direction.

16.3 *Non-moving|Slow-moving Capital Stores*

16.3.1 The number of capital stores items, their value and the year from which these are non-moving|slow-moving are indicated in the following table :—

Particular items	Year from which non-moving/ slow-moving	Number of items	Value (Rs. in lakhs)
Drilling accessories	1973-74	200	0.21
	1974-75	4264	11.77
	1975-76	1364	3.54
	1976-77	1086	13.11
	1977-78	1480	5.98
	1978-79	1066	2.27
	1979-80	88	0.42
			37.30

16.3.2 Out of non-moving|slow-moving capital stores valuing Rs. 37.30 lakhs, the value of Core barrels, T.C. bits and Drill rods amounted to Rs. 19.22 lakhs, Rs. 8.23 lakhs and Rs. 7.40 lakhs respectively.

16.4 A review of some of the items included in the above non-moving|slow-moving items made in audit disclosed the following :—

(i) *Purchase of rods, casings etc., from USSR*

To accelerate the pace of mineral exploration to match the projected requirements of iron ore, coking coal, copper, manganese etc., during the Fifth Plan Period and keeping in view the existing drills and those to be procured shortly, Ministry of Steel and Mines, the Department of Mines decided to import drilling accessories from the USSR. In pursuance of this decision, the Company entered into (September 1973) an agreement with the USSR firm M|s. "MACHINOEXPORT" for importing rods, casings, barrels and bits costing Rs. 25.20 lakhs CIF. The material under contract was received by MECL between January 1975 to March 1976 at a total cost of Rs. 44.91 lakhs (including customs duty etc.) against the delivery period of 1st and 2nd quarter of 1974. Out of these items procured, the accessories and T.C. Bits valuing Rs. 12.94 lakhs were lying unused in the Stores of the Company till 31st March, 1982. Value of these items lying unused with the projects as on 31st March 1982 was not available with the Company.

(ii) *Purchase of seamless tubes*

Against a purchase order dated 13th April 1977 M|s. T. I. Exports, U.K. Birmingham supplied 480 cold drawn seamless tubes in November 1978 for Rs. 1.19 lakhs. Of these 20 tubes were issued to Rawanwara Camp in September 1980. 19 tubes were, however, returned in September 1981 by the Camp to the Central Stores as those were not required. Thus 479 tubes valued at Rs. 1.18 lakhs are lying in stores unused since their procurement till date (January 1983).

(iii) *Core Barrels*

Due to non-supply of drilling accessories for which bulk orders were placed on M/s. Voltas Limited in March 1974 and keeping in view the increase in activities of the Company, requirement of some of the items was reviewed and 250 each of 56 mm. and 66 mm. core barrels were purchased in 1976-77 at the cost of Rs. 4,50,000 and Rs. 5,00,000 respectively from M/s. Vulcan Level Limited, Bombay. Of these barrels, 186 barrels of 56 mm. and 68 barrels of 66 mm. valued at Rs. 3.66 lakhs and Rs. 1.51 lakhs respectively were lying (March 1982) in the stores.

With a view to equipping the Corporation with adequate number of drilling machines and accessories to cope up with the drilling work to be taken up during the subsequent years, a purchase order for Rs. 2,83,500 was placed on M|s. Engineering Tool Equipment Company, Bombay on 18th March, 1974 for the supply of 180 HWG Core barrels. 172 core barrels were received on 14th December, 1976 at a total cost of Rs. 3.00 lakhs While conducting the inspection at the time of receipt, it was noticed that core barrels were without core lifters. However, out of 172 core barrels, 50 core barrels were issued to Mohodo Stores and 19 core barrels to projects upto September 1980 and 103 barrels costing Rs. 1.76 lakhs were lying in the Central Stores, Nagpur upto 31st March 1982 for want of core lifters. The Corporation was not in a position to indicate whether 69 core barrels issued without core lifters were actually put to use in the projects.

In this connection, the Management stated (June 1983) as follows :—

> "This is yet another case where the inventory got built up because certain anticipations about work-load pattern did not come through with deepening oil crisis and coal having been declared as the primary source of energy, exploration emphasis got shifted to coal and continues to be so. Under the circumstances capital

items or accessories essentially required for proper core recovery in non-coal mineralised Zones continue to be under-utilised."

16.5 *Purchase of drilling machines and accessories*

16.5.1 In response to the tender issued by the Company, Messers Voltas Limited, submitted (September 1973) their offer for supply of drills, pumps, core-barrels, casings and drill rods. The offer, *inter alia,* stipulated that variations in the price of raw materials, customs and excise duties, sales tax, octroi would be to purchaser's account; any delay in receipt of material from the principal suppliers would affect the delivery quoted; an advance equivalent to 25 per cent of the value of the order was to be paid with the order and if full quantity of drills and atleast 30 of each type of pumps were ordered a suitable discount would be considered.

16.5.2 The Company placed between 29th January 1974 and 30th April 1974 seven orders on the firm for the supply of drills, core barrels, casings, pumps, wrenches and other ancillaries at a total cost of Rs. 317.90 lakhs on a firm price basis. The deliveries were to commence between May 1974 and March 1975 and were to be completed between December 1974 and March 1976. Failure to adhere to the delivery schedule was to render the supplier liable to pay the difference in cost with the lowest acceptable offer and in addition to pay liquidated damages at 2 per cent of the cost of stores for each month or part of a month of delay. A sum of Rs. 16.33 lakhs was paid in January 1974 as advance representing 5 per cent of the total value of orders without settling the final terms and conditions.

16.5.3 The purchase orders and the contract agreements did not stipulate any clause about price variation, quantum of discount to be allowed by the firm in terms of their offer and about the risk purchases. However, on 9th April, 1974 the

Company issued clarifications to the firm which, *inter-alia*, provided that :

(i) Any escalation in the costs on account of custom and/other statutory duties, exchange rates, freight charges, insurance charges and any reasonable increase in the principal supplier's prices of raw materials would be to purchasers account provided documentary evidence is furnished ;

(ii) Payment of advance was to enable the supplier to procure raw materials wherever possible and thereby hold the prices ;

(iii) Deliveries as stipulated are the essence of the contract but all force majeure conditions affecting delivery would be considered and the Company would grant exemption from liquidated damages under such express conditions.

16.5.4 The supplier did not, however, adhere to the quoted delivery dates. Drills and pumps supplied in July 1974, against the scheduled dates of May/June 1974, were not as per the specifications in the purchase orders. As the deliveries were getting late and goods supplied were not as per specifications the issues regarding changes in specifications of drills and pumps, delays in delivery etc. were discussed with the suppliers in the meeting held in September 1974, May 1975 and October 1975. The suppliers indicated in each meeting a revised delivery schedule. In the meeting held in October 1975, the escalation clause was further amplified as under :—

'Any escalations shall be duly considered by us provided documentary evidence (supported by your Chartered Accountant's certificate) is furnished in justification of your claim for revised rates. Such escalation claims shall be limited to a period not extending beyond the original scheduled date of delivery.'

16.5.5 As the supplies were getting late and the Company's progress of work was being affected adversely, it purchased during 1974-75 and 1975-76 drill rods, core barrels and casings at higher rates involving an additional expenditure of Rs. 79.51 lakhs; of these 525 10′ long drill rods were purchased from Messers Voltas Limited itself, at an extra cost of Rs. 1.30 lakhs.

16.5.6 While settling the claims of the supplier in respect of supplies made, the Company proposed to allow Rs. 6.54 lakhs on account of price escalation upto the original scheduled date of delivery and to deduct a sum of Rs. 4.29 lakhs as discount at 3 per cent in terms of the offer of the firm. A sum of Rs. 3.71 lakhs was also proposed to be deducted as liquidated damages.

16.5.7 The supplier did not accept the amount of price escalation allowed and recoveries made on account of liquidated damages and discount by the Company and submitted a counter claim of Rs. 54.00 lakhs.

16.5.8 The matter was referred to the Legal Advisor on 8-8-1978 who opined *inter-alia* that the MECL ought not have restricted the maximum amount of liquidated damages knowing fully the importance and consequence of delay in supply of vital machinery by the firm.

16.5.9 The Board in its Meeting held on 29th September 1978 constituted a sub-committee consisting of Chairman-cum-Managing Director, Joint Secretary, Department of Mines, Director (Technical) and Financial Advisor and Chief Accounts Officer and authorised the Committee to negotiate with the firm and arrive at a mutually acceptable amount to be paid to the firm.

16.5.10 The firm did not accept the offer made by the sub-committee on 13th February 1979 for settling the claim by payment of Rs. 13.54 lakhs to them as a package deal.

16.5.11 The sub-committee continued the negotiations. It decided on 19th June 1979 to pay Rs. 25 lakhs to M/s. Voltas Limited as escalation (Rs. 22.36 lakhs) and refund of discount (Rs. 3.05 lakhs) rounded-off to Rs. 25 lakhs on the following considerations :—

(i) Total escalation claims submitted by Messers Voltas Limited worked out to about Rs. 45 lakhs. With a view to getting compensation for delayed deliveries in the supply of equipment and to maintain good business relation with the firm it was agreed to share the liability on 50 : 50 basis.

(ii) Discount be recovered at 1 per cent of the value of the orders for drills and pumps.

(iii) The recovery of liquidated damages for late delivery of material would stand.

16.5.12 Extra expenditure borne by the Company worked out to Rs. 98 lakhs as below :—

	(Rupees in lakhs)
(*i*) Additional expenditure on purchase of items not supplied by origina' supplier	79.51
(*ii*) Escalation paid though not stipulated in original purchase orders/subsequent agreements.	15.45*
(*iii*) Refund of discount	3.05
	Rs. 98.01

*Rs. 15.45 lakhs has been arrived at by substracting the escalation payable for the originally stipulated period of delivery (6.55 lakhs) from the amount actually agreed for payment (Rs. 22 lakhs).

16.5.13 The Management stated that the decision arrived at regarding settlement of escalation claims was a package solution after considering all aspects.

16.6 *Physical Verification*

The figures of Stores & Spares appearing as closing stock at the end of each year from 1977-78 to 1981-82 as recorded in the books of accounts and the figures as reported by the Projects as stock in hand at the end of each year based on their physical verification showed difference as noted below :—

Year	Difference between physical inventory and financial ledger
	(Rupees in lakhs)
1977-78	Difference not worked out by the Company
1978-79	2.62
1979-80	16.57
1980-81	28.06
1981-82	4.13

These discrepancies were written-off as consumption at the end of each year without any reconciliation.

The corporation has not yet prescribed any system of reconciling the inventory at projects with the financial control accounts maintained at the Headquarters (November 1983).

17. Modernisation Research and Development

17.1 *Modernisation*

17.1.1 In order to reduce the cost of exploration and the time to a reasonable level, the Company has taken up modernisation in the fields of drilling, exploratory mining and geological data collection and interpretation as detailed below :—

Drilling

In order to have technology and equipment for controlling direction of drilling, speeding up the progress and improving the productivity, the Company is making efforts to introduce some of the useful features of oil well drilling technology (*viz.*, mud technology etc.) in mineral exploration drilling.

Mining

Efforts to use equipment like pitting sinking cranes, hydraulic excavators and hydraulic twin boom drills have been made; collaboration with USSR Government in high speed tunnelling technology has been made recently.

Geology

Efforts for modernisation in geological work and data interpreation are being made in the following directions :—

(i) Computerisation of processing of geological data;

(ii) Application of latest geo-statistical concepts for exploration and data evaluation including ore body modelling;

(iii) Geophysical bore-hole logging;

(iv) Surface Geophysical methods;

(v) Adopting electronic distance measuring equipment for surface survey ;

(vi) Advanced petrological and mineralogical studies.

17.1.2 It may, however, be mentioned that the modernisation schemes are yet in the process of implementation (August 1983).

17.2 *Research & Development*

Research and Development Schemes were submitted by MECL to the Government of India for approval for the first time in 1979. These schemes were generally concentrated on techniques, ideas, technology which would reduce the time taken for each component activity of mineral exploration and the cost thereof. Since then, the Company submitted proposals for 15 schemes of which only five have been approved. The Company intimated (July 1983) that eight more schemes were under preparation.

18. Overall Summary

Introduction

The Mineral Exploration Corporation Limited (MECL) was established on 21st October 1972 by transferring the function of mineral exploration and the related equipment and personnel from the GSI. The primary object of formation of the Company was to give a commercial bias to mineral exploration and to bridge the gap between initial discovery and eventual exploitation of mineral deposits.

Objectives and role of MECL

The Company was conceived as the sole agency of the Government of India to carry out detailed exploration of minerals through-out the country. The other public sector undertakings who are engaged in the exploitation of mineral deposits also carry out mineral exploration through their own agencies. Even though 11 years have elapsed since the formation of MECL, no exact line of demarcation between the public sector exploiting agencies and MECL has been determined so far. MECL is mainly dependent for orders on CMPDI who has also developed its own exploration wing to take up exploration work on behalf of its sister coal companies. According to MECL, the uncertainty of work has acted as a major constraint for the Company in planning on a long term basis. There is, therefore, a need for a clear definition of the role of MECL in mineral exploration *vis-a-vis* exploiting agencies.

Capital Structure

As on 31st March 1983, the paid up capital of the Company was Rs. 23.89 crores. Besides, a sum of Rs. 4.20 crores was paid by the Government as loan to the Company upto 1982-83 for purchase of capital equipment. The debt equity ratio as on 31st March 1983 was 0.18 : 1.

Mineral exploration work

Existing activities

The Company has done 12.10 lakh metres of drilling, 0.56 lakh metres of exploratory mining etc. upto 1982-83. It claims to have established 15,734 million tonnes of additional reserves of various minerals. The Company has accepted the suggestion of the Audit Board to introduce post-project coordination with the clients and association of its geologists at the stage of opening up of deposits with a view to providing feed back information to increase the confidence level of its exploration work.

Plan performance

The Company had prepared Fifth and Sixth Five Year Plan proposals. The Fifth year plan proposals (1973-78) envisaged 12,76,150 metres of core drilling and 54,604 metres of exploratory mining. The Company's achievement thereagainst was 32.87 per cent in core drilling and 30.20 per cent in exploratory mining. In Sixth Five Year Plan (1980-85) the Company envisaged 8,88,500 metres of core drilling, 50,500 metres of exploratory mining and 500 square kilometres of detailed survey and geological mapping, However, during first two ears of the plan, only 31 per cent of the total drilling targets, 26 per cent of total mining targets and 25.6 per cent of geological mapping and survey work set for the Sixth Plan period were achieved.

Operational Performance

The Company had not drawn up any long term programme in mineral exploration indicating *inter-alia* its drilling and mining capacities. According to the Management, the Company could not gear itself for a long term growth owing to the tendency on the part of other exploiting agencies to develop their own exploration wings and inability of CMPDI to indicate its long term plan for coal development. The Company is now preparing a plan for long term exploration of minerals in consultation with the concerned interests.

There was decrease in the metreage drilled during 1979-80, 1980-81 and 1981-82; the decrease compared to 1978-79 has been 21.61 per cent, 29.80 per cent and 22.46 per cent respectively. The metreage drilled, however, picked up in 1982-83. On mining work also, there was decrease during 1980-81 and 1981-82 as compared to the performance of 1979-80. The mining work done, however, increased in 1982-83.

There were delays in submission of geological reports. Of the 146 projects for which geological reports were to be submitted, geological reports in respect of 18 projects were submitted in time. There were delays of 1 to 6 months for submission of 36 geological reports and of six months and above in respect of 71 reports. As on 31st March 1983 there were 12 reports pending with the Company for submission to its clients.

The agreements for drilling entered into with the coal companies provide for levy of a penalty for delay in submission of geoglogical reports. The penalty deducted by the CMPDI from the bills of MECL amounted to Rs. 22.09 lakhs. Besides, work-in-progress-work done but not billed as on 31st March 1982 amounted to Rs. 191.08 lakhs. This was not billed mainly because relevant reports had not been prepared and submitted though the projects had been completed.

Review of individual projects

A review conducted in audit of certain promotional and contractual projects revealed that there was inadequate pre-project planning, inadequate project management and control reflected in large cost and time over runs, delay in closure of camps, low drilling per drill month, low productivity per worker per month, delay in submission of geological reports, idleness of equipment and manpower etc.

Non-fixation of Norms

The Company has not laid down any norms for consumption of various items of stores and spares, productivity of various types of drills, and manpower to be deployed on various machines. The overall capacity of the Company to take up mineral exploration works and other anciliary jobs has also not been laid down. In the absence of these norms, it has not been possible to analyse the performance of the Company in a systematic manner and to verify whether the available resources had been utilised to their optimum capacity and the Company's working had been economical.

Deployment efficiency and productivity of drills

The deployment efficiency of the drills available with the Company came down from 85 per cent in 1977-78 to 81 per cent in 1978-79 and 75 per cent in 1979-80 despite the fact that during 1978-79, 126 drills were 5 years or less old and during 1979-80, 105 drills were 5 years or less old. The deployment efficiency picked up to 89 per cent in 1980-81 but again it came down to 84 per cent in 1981-82 though it has again increased in 1982-83. Productivity in terms of metreage done per drill per shift and per drill month has shown continuous downward trend from 1978-79 except in 1982-83 when it has again improved. In the case of mining also, there has been a continuous decreasing trend in productivity from 1977-78 except in 1982-83 when it improved considerably. The manpower employed per drill in operation ranged from 20 to 28 during 1977-78 to 1982-83 and per shift it ranged between 21.11 and 26.48 during 1980-81 to 1982-83. MECL had not fixed any norms for deployment of manpower.

Utilisation of Shifts

The shifts available and shifts actually worked were considerably less than the shifts available worked out on the basis of two shifts operation per drill and 280 working days in a year.

Workshops

The Company is having a Central Workshop in Nagpur and one field workshop in Godhur (Dhanbad). The Company has neither laid down the installed capacity of the workshops nor has it fixed targets of various jobs to be undertaken by the workshops during a year. The performance of the workshops has been generally registering a downward trend both in manufacture as well as repairs year after year as compared to its performance in 1977-78. The Company has not made any analysis of man hours lost in the workshops due to various reasons.

Costing and Management Information Systems

The Company introduced a costing system in 1975-76. This system had many deficiencies. The Company introduced a modified costing system in April 1982. A comprehensive management information system was introduced in October 1982. The effectiveness of the modified costing system and the comprehensive management information system can be known only after these have been worked for some time.

Pricing Policy

Promotional work on behalf of Government is undertaken on GSI Schedule of rates plus escalation in costs and contractual work on behalf of clients is undertaken on estimated cost plus profit margin subject to settlement by negotiations.

It has been observed that while MECL has been making profit on promotional work done on behalf of Government, it was incurring losses on contractual works done on behalf of CMPDI.

Financial Management

The Company has suffered losses except during 1976-77 to 1979-80. As on 31st March 1983, the accumulated loss of the Company amounted to Rs. 796.52 lakhs. The accumulated loss is, however, likely to come down due to enhanced rates agreed to be paid by CMPDI for 1980-81 and onwards.

Inventory Control

The maximum and minimum limits for all items in the stores have not ben fixed. ABC analysis of inventories has also not been done. As on 31st March 1982, the Company had surplus stores and spares of the value of Rs. 12.26 lakhs and non-moving|slow-moving capital stock items of the value of Rs. 37.30 lakhs.

R C Suri

(R. C. SURI),
Chairman, Audit Board & Ex-officio
Additional Deputy Comptroller and
Auditor General (Commercial)

New Delhi.
The 12th January, 1984.

Countersigned

G Prakash

(GIAN PRAKASH),
Comptroller and Auditor General of India.

New Delhi
The 12th January, 1984.

ANNEXURE I

(Referred to in para 2.1.1)

Main objectives as per Memorandum of Association

(Article III A)

The Corporation was registered as a Limited Company on 21st October, 1972 under the Companies Act, 1956. While setting up the Corporation, the Government had approved the following main objectives for it :—

(i) to plan, promote, organise and implement programme for the exploration of mineral resources and to perform such functions as the Central Government may, from time to time, assign to the Company in connection with the exploration of the mineral resources in and outside the country;

(ii) to carry out geological, geochemical and geophysical surveys for exploration of minerals,

(iii) to carry out drilling and exploratory mining and prospecting operations to prove/estimate the reserves of minerals;

(iv) to undertake, encourage and promote such other activities as may lead to the establishment of such reserves;

(v) to carry out detailed exploration of mineral prospects by drilling and, in consultation with the designated exploiting agency, take up exploratory-cum-production mining so that the deposit when handed over to that agency, can be worked without delay;

(vi) to prepare feasibility reports on mineral prospects in consultation with the exploiting agencies;

(vii) to undertake contract jobs in various fields of mineral exploration; to take up drilling and mining contracts for purposes other than mineral exploration on payment of scheduled rates to be fixed by the Board of Directors of the Corporation;

(viii) to undertake contracts for mineral exploration outside India either for an Indian Company or a Foreign Company or Government on terms and conditions to be decided in each case in consultation with the Central Government;

(ix) to transport and dispose of any quantity of mineral products won during exploration for purposes of scientific work without paying any royalty and to dispose such production as may be incidental thereto to a Corporation, Government agency or State Government on payment of royalty by the actual user.

Micro objectives

In consonance with the above main objectives, the following Micro Objectives have been adopted by the MECL :—

(i) As the key national enterprise with the main functions of detailed mineral exploration and as the chief agency of the Government of India the Company will strive to serve the Nation's vital interests at all times in the discharge of its responsibilities and will constantly endeavour to earn the highest level of trust, esteem and respect for the organisation.

(ii) The Company will endeavour to function as an energetic promotional or quasi-commercial enterprise having due regard to its future expansion.

(iii) While engaged in the specialised field of mineral exploration, the Company will endeavour to use modern techniques of geophysical prospecting, computerised processing of data, etc., and keep itself abreast of technical and scientific developments in this field.

(iv) The Company will attempt to draw upon the best scientific and engineering talents available in the country in the field of mineral exploration.

(v) The Company will establish and maintain a dynamic organisation and infrastructure to meet the present and future needs of the Company and enable it to readily respond to the changing matrix of socio-techno-economic relationships.

(vi) To draw and execute Annual, Five-Year and other long-term plans and programmes of work for its main activities, identifying the Key Result Areas, concerning geology, drilling and exploratory mining work and install effective cost control and monitoring systems.

(vii) To undertake market surveys and other related works and execute projects|contracts both on short term as well as long term basis with Government (Central and State), Public and Private Organisations, etc.

(viii) To associate with all geological and related planning|programming bodies of the Central and State Governments, with a view to identifying areas that warrant detailed exploration.

(ix) To shift the inventory of mineral reserves from inferred, probable and other categories to the categories with higher confidence level, to expedite prefeasibility studies and taking of investment decisions.

(x) To extend its activities outside the country in the field of mineral exploration either independently or jointly with other organisations of repute (Indian and Foreign).

(xi) To induct the most advanced technology available either in India or abroad to increase its efficiency and reduce costs.

(xii) To undertake detailed exploration of vital/critical/strategic minerals with a view to have a shelf of proved deposits, capable of immediate exploitation.

(xiii) To organise comprehensive data collection on the state of the technology and market trends within the country and abroad and arrange its systematic classification, analysis, storage and dissemination.

(xiv) To undertake Research & Development programme relating to any or all aspects of mineral exploration, mineral economics, resource evaluation, exploration inputs, computer studies related to mineral exploration, etc. either independently or jointly with sister organisations, universities or research organisations.

(xv) To fabricate and manufacture drilling equipment and associated accessories, including camping equipment, normally needed in the Company's operational areas and to commercially market such items.

(xvi) Although a service organisation, the Company will make efforts to undertake exploration and other related activities including consultancy on promotional/quasi-commercial lines.

Towards employees :

(xvii) Developing and sustaining a favourable employee attitude and motivation for obtaining maximum productivity.

(xviii) To device and implement training programmes at different levels so as to develop technical, scientific and managerial skills, thereby continuously upgrading the level of competence in the Company.

(xix) To maximise job satisfaction and career opportunities for all levels of employees.

(xx) To extend social service to people in and around operational projects particularly isolated tribal|backward areas.

(xxi) To introduce facilities like housing, education, hostel, transport, entertainment, etc. for its employees and their children.

(xxii) To promte family planning among its employees.

Towards customers :

(xxiii) The Company will strive :—

(a) to serve the Government, Public Sector Undertakings and Enterprises, private sector and other customers requiring exploration service or consultancy by providing prompt, courteous, dependable and efficient services, adopting sound business and commercial practices;

(b) to prepare exploration and other reports of a quality comparable to international standards;

(c) to inspire confidence in the customers that the services rendered are the outcome of the latest methods of exploration practices, research facilities and the most competent skill available in the country.

Towards suppliers :

The Company recognises the important role of suppliers on whom it has to depend for its equipment, machinery, accessories, stores and spares of all description required in mineral exploration and other services including the small scale and ancillary industrialists and suppliers by ensuring prompt dealings based on integrity, impartiality and courtesy.

ANNEXURE II

(Referred to in Para 12.4.1)

Number of items completed during the years

Type of work items	Central Workshop						Field Workshop Godhur (Dhanbad)				
	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1977-78	1978 79	1979 80	1980-81	1981 82
1	2	3	4	5	6	7	8	9	10	11	12
Manufacture :											
T.C. Bits	17132	6288	4498	8145	6525	19070	..	..	..	..	..
Casing/Milling	143	415	25	79	36	12	..	..	..	..	..
Quill Bushes	7	20	24	24	13	10	..	..	..	..	..
Rig Spindles	7	22	24	24	11	12	..	..	..	..	..
Gears	675	203	50	164	161	155	..	..	..	..	..
Chuck Jans	860	936	768	336	636	120	..	..	..	..	..
Liners	222	126	125	47	77	50	..	..	..	..	..
Threading of Rods	1831	2880	4017	4667	4395	1921	..	..	..	..	..
Casings Valve & Valve Seat	254	682	186	16	..	32	..	..	..	..	..
Adopter/Couplings	2131	1832	5063	3705	4994	1946	84	170	111	18	1
Piston Rod/Assy	254	922	50	24	109	149	..	..	..	..	..
Core lifter Cases/Exten. Tube	890	..	..	..	..	..	2	..	73	2	..

1	2	3	4	5	6	7	8	9	10	11	12
Vehicle Body	11	8	9	10	14	26	..	..	..	..	..
Derrik/Derrik top	8	..	1	24	11	12	15	..	..	..	..
Skid for coupling of Engine pump	3	10	..	3	..	1	..	..	..	..	..
General Fabrication	234	116	..	85	139	60	19	38	4	23	1
Other Accessories (MFD)	5/8	502	412	104	158	..	25	50	..	14	..
Tabular Hutment	..	..	..	..	..	40	..	..	22	18	..
Repairs (Major) Heavy Vehicles	6	12	11	20	7	10	17	13	11	18	4
Light Vehicles	7	9	20	15	20	9	22	15	30	29	25
Rig with Prime Mover	14	18	34	44	19	15	21	21	29	20	50
Equip/Pump	25	32	31	37	39	32	7	8	4	4	1
Generating Set	53	7	9	8	10	6	..	..	..	..	..
Compressor/Air which/CP	28	22	18	12	23	13	..	..	..	..	..
Welden/Slunch/Air Log/Rec	23	14	2	..	3	..	..	..	..	..	..
Drill & Toto Pump	61	1	14	7	2	..	..	..	..	..	..
(Minor) Heavy Vehicle	83	58	78	54	68	58	31	21	60	58	43
Light Vehicle	60	57	69	65	58	55	64	96	82	78	83
Drill with prime mover	1	2	1	1	2	..	6	8	21	19	13
Rethreading of rods/Casings	1336	1039	2357	66	..	348	..	..	..	..	..
Air Coolers	122	70	131	69	90	5	..	..	..	..	..
Other accessories	319	240	94	50	125	163	45	..	..	..	..
Extraction of Diamonds salvaging	3985	2427	2700	3200	3006	3655	..	..	..	..	..

ANNEXURE III

(Referred to in para 12.7.1)

Type of Bit	1978		1979		1980		1981		1982	
	Month of manu-facture	Cost per item Rs.	Month of manu-facture	Cost per item Rs.	Month of manu-facture	Cost per item Rs.	Month of manu-facture	Cost per item Rs.	Month of manu-facture	Cost per item Rs.
1. HXTC casing shoe bits RHT	April	149	..	..	June	183	August	153	February	162
2. NX Casing bit . .	—		March	161	June Oct.	156 160	Oct. Nov. (17% increase over 1979)	189 157	January	191 (18.6 % increase over 1979)
3. BX Casing shoe bit . .	—		November	91	April (11% increase over 1979)	101	March	99 (9% increase over 1979)	—	—
4. NX Casing Shoe bit . .	—		June	133	Oct.	114	—		March	137

ANNEXURE IV

(Referred to in Para 14.3.1)

Promotion drilling (including Geology)

Year	Metreage Drilled	Total cost (Rs. in lakhs)	Bills raised i.e. realisation (Rs. in lakhs)	Profit (Rs. in lakhs)	Cost per metre drilled	Realisation per metre	Percentage profit to total cost
1977-78	15,398.90	54.52	100.72	46.20	354.04	654.07	84.74
1978-79	50,048.00	148.66	306.44	157.78	297.04	612.29	106.13
1979-80	43,355.00	144.29	267.58	123.29	332.81	617.18	85.45
1980-81	19,799.00	131.97	192.82	60.85	666.55	973.89	46.11
1981-82	18,300.40	142.77	183.61	40.84	780.16	1003.31	28.61

Note :—The amounts shown under bills raised are exclusive of income from chemical analysis.

Promotional Mining

Year	Metreage mined	Total cost (Rs. in lakhs)	Cost per metre (in Rs.)	Bill raised (i.e. realisation (Rs. in lakhs)	Realisation per metre (in Rs.)	Profit (Rs. in lakhs)	Percentage of Profit to total cost
1977-78	3281.5	63.22	1926.61	83.38	2540.91	20.16	31.89
1978-79	6657.5	107.58	1615.98	163.74	2459.48	56.16	52.20
1979-80	4807.7	93.98	1954.89	94.09	1957.08	0.11	0.12
1980-81	2773.5	77.15	2781.60	81.31	2931.67	4.16	5.39
1981-82	4207.3	120.62	2867.01	106.67	2535.34	(—)13.95 (loss)	– 11.57

Drilling work done for CMPDI

Year	Total cost Rs. in lakhs	Metres Drilled	Cost per metre	Amount Realised Rs. in lakhs	Reslisation per metre	Percentage of loss
1977-78	438.72	106783	410.85	424.13	397.19 old	(—)3.33
1978-79	500.72	130577	383.47	506.84	388.16 old	(+)1.22
1979-80	502.10	89389	561.70	324.24	362.73 old	(—)35.42
1980-81	635.15	92301	688.13	534.42	579.00	(—)15.86
1981-82	749.71	110403	679.07	639.23	579.00	(—)14.74
1982-83	852.39	143943	592.17	841.18	584.38	(—)1.32

MGIPRRND—TSS I—S/25 C&AG/83—23-4-83—2050