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STAFF APPRAISAL REPORT

INDIA

COAL SECTOR REHABILITATION PROJECT

July 31, 1997

Energy Sector Unit
South Asia Region

CURRENCY EQUIVALENTS
(As of June 30, 1997)

Currency units	=	Rupees (Rs)
One Rupee	=	US$ 0.03 (approx.)
One US Dollar (US$)	=	Rs35.8
One US Dollar (US$)	=	SDR 0.72

MEASURES AND EQUIVALENTS

1 metric ton of (Indian) coal	=	0.46 metric tons of oil
	=	1.9 metric tons of lignite
	=	570 cubic meters of natural gas
	=	1.0 metric ton of firewood
	=	2.0 metric tons of animal dung

ABBREVIATIONS AND ACRONYMS

BCCL	-	Bharat Coking Coal Limited
CCL	-	Central Coalfields Limited
CIL	-	Coal India Limited
CMPDI	-	Central Mine Planning and Design Institute
CPRA	-	Coal Price Regulation Account
CSRP	-	Coal Sector Rehabilitation Project
ECL	-	Eastern Coalfields Limited
ESMP	-	Environmental and Social Mitigation Project
GOI	-	Government of India
MCL	-	Mahanadi Coalfields Limited
Mt.	-	Million tons
MW	-	Megawatt
NCL	-	Northern Coalfields Limited
PAPs	-	Project-affected people
SAIL	-	Steel Authority of India Limited
SEB	-	State Electricity Board
SECL	-	South Eastern Coalfields Limited
tce	-	tons of coal equivalent (6,000 kcal/kg)
toe	-	tons of oil equivalent
WCL	-	Western Coalfields Limited

FISCAL YEAR

April 1 through March 31

Vice President:	Mieko Nishimizu
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Sector Unit Manager:	Alastair McKechnie
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INDIA
COAL SECTOR REHABILITATION PROJECT

LOAN /CREDIT AND PROJECT SUMMARY

Borrower:	India, acting by its President (IDA Credit) and Coal India Ltd. (IBRD Loan)
Implementing Agencies:	Government of India (The Ministry of Coal), Coal India Ltd., Central Coalfields Ltd., Mahanadi Coalfields Ltd., Northern Coalfields Ltd., South Eastern Coalfields Ltd., and Western Coalfields Ltd.
Beneficiaries:	Government of India, Coal India Ltd., Central Coalfields Ltd., Mahanadi Coalfields Ltd., Northern Coalfields Ltd., South Eastern Coalfields Ltd., Western Coalfields Ltd. and coal consumers.
Poverty:	Not Applicable
Env. Category:	A
Amount:	US$530 million IBRD loan and SDR1.5 million (US$2.0 million equivalent) IDA credit
Terms:	IBRD Loan: Repayment over a 20-year period, including five years of grace. Standard interest rate for LIBOR-based US$ single currency loans. IDA Credit: Standard with 35 years maturity
Onlending terms:	Coal India to its subsidiaries at same terms as above for the IBRD loan.
Commitment Fee:	IBRD Loan: 0.75 percent on undisbursed loan balances beginning 60 days after signing, less any waiver. IDA Credit: 0.50 percent on undisbursed credit balances beginning 60 days after signing, less any waiver.
Financing plan:	See para 4.15
Net Present Value:	The economic net present value is estimated at US$1,634 million and the corresponding financial net present value is estimated at US$945 million. A discount rate of 16% was used for the calculations of both net present values.
Project ID:	IN-PE-9979

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1. INDIA'S ENERGY SECTOR

INDIA'S ENERGY POLICY-HISTORICAL PERSPECTIVE

1.01 India needs additional energy in order to power its economic growth. Coal is both the most available and the least costly indigenous resource. Policy reforms that have liberalized other sectors of the country's economy are now coming to the energy field: to the companies that produce coal and electricity from coal. This chapter discusses the history of the public control of energy production, the reforms being undertaken, the broad energy strategy being pursued and the environmental and social impacts of mining and burning coal.

Public Sector Dominance

1.02 During the four decades before 1991, a broad consensus among the policy makers in India had established self-reliance and the provision of cheap energy as the twin goals of India's energy sector and made the Government the agent charged with providing the growing population's energy needs. Executing that mandate, India devoted roughly 30 percent of its budgetary resources to the energy sector, more than nearly every other developing country. Although public sector investment in energy is now declining, it still accounts for about 3.2 percent of GDP, with roughly 80 percent of the total public sector investment in energy going to expand power generation, transmission, and distribution capacity.

1.03 Initially, this public sector model achieved many of its social objectives. It provided more or less equitable access to energy services and, by capturing economies of scale, India developed and operated a sophisticated mid-sized energy supply system. During the 1970s and 1980s production capacity of the coal and oil sectors nearly tripled, while installed electric power generation capacity more than quadrupled. From 1973 to 1994, India's commercial energy production increased at a rate of about 5.8 percent a year to 171 million metric tons of oil equivalent (toe) (Table 1.1). In the early 1990s, however, the pace of growth in energy production began to slow. As increases in coal production only partially offset a sharp decline in crude oil output, production growth barely kept pace with the rising demand for energy driven by increasing population and incomes.

Table 1.1 Production of Primary Energy Sources in India, 1972-73 to 1993-94
(million tons of oil equivalent)

Energy	*1972-73*		*1980-81*		*1990-91*		*1993-94*	
	Output	*Percent of total output*	*Output*	*Percent of total output*	*Output*	*Percent of total output*	*Output*	*Percent of total output*
Coal	41.6	79.1	55.9	77.0	103.7	65.4	121.9	71.3
Crude oil	7.3	13.9	10.5	14.5	33.0	20.8	27.0	15.8
Natural gas	1.3	2.5	2.0	2.8	15.4	9.7	15.7	9.2
Primary Electricity	2.4	4.5	4.2	5.7	6.5	4.1	6.4	3.7
Hydro	2.3	4.4	3.9	5.4	6.0	3.8	5.9	3.4
Nuclear	0.1	0.1	0.3	0.3	0.5	0.3	0.5	0.3
Total	52.6	100.0	72.6	100.0	158.6	100.0	171.0	100.0

Source: Tata Energy Research Institute (1995-96)

1.04 The goal of self-sufficiency dictated heavy reliance on indigenous resources. Sharp increases in indigenous oil production brought a decline in energy import dependency from 22.5% in the early 1970s to around 10% in the mid-1980s. Nationalization of the energy sector – including a ban for all practical purposes on private investment – created large, publicly controlled monopolies such as Coal India Ltd. and its seven subsidiaries, which control more than 90% of India's coal production. Almost the entire power sector is controlled by the Central and State Governments which share responsibility for supplying power and account, respectively, for about 26% and almost 70% of total installed generation capacity. State-owned utilities also provide most of the distribution to consumers. Except for a few joint refining ventures, the Government owns and manages the entire oil and gas sectors.

1.05 To meet the policy of providing cheap energy, subsidies for agricultural (about 75%) and residential (about 22%) consumers became the rule, amounting to about US$3.7 billion in 1995-96, roughly 1.4% of GDP. That cost is expected to reach US$ 4.3 billion in 1996-97, according to the Indian Planning Commission. Subsidies have had a far reaching effect on the Indian economy: encouraging uneconomic consumption of energy, undermining the efficient development of domestic energy resources, imposing heavy financial burdens on Central and State Government budgets, exacerbating the poor financial and economic performance of public sector enterprises, and adversely affecting the environment.

Recent Developments

1.06 Driven by the scarcity of public funds and the rapid deterioration of energy services, the Government began to reform the energy sector as part of the fundamental policy shift toward economic liberalization triggered by the balance of payments crisis of early 1991. The reforms focus primarily on rationalizing prices, liberalizing trade and attracting private resources to new areas in the power, coal, and hydrocarbon subsectors in order to reduce the resource gap.

1.07 The State of Orissa, with support from the Bank-financed Orissa State Power Sector Restructuring Project (Loan 4014-IN), has pioneered power sector reform by eliminating vertical integration, inviting private participation, relying on competition where feasible, reforming tariffs, and introducing legislation to allow the creation of an independent regulator to set tariffs and regulate licenses. Haryana and Rajasthan are among the other states that have also recently adopted new power sector policies.

1.08 Progress has been similarly limited in the reform of other energy subsectors. Little private investment has materialized in the hydrocarbon sector. Government control remains tight in downstream refining and marketing subsector, characterized by a rigid system of product supply, distribution, and sales control and by guaranteed rates of return on investment in refining operations. Government efforts to divest shares of public sector enterprises operating in the oil and gas sectors have also been limited. There clearly remains much to be done. The status of coal sector reform is presented in Chapter 3.

INDIA'S COAL-BASED ENERGY STRATEGY

Resource Base and Energy Markets

1.09 Compared with other developing countries India's per capita energy use of roughly 243 kilograms of oil equivalent (kgoe) is low. For example, per capita energy consumption is roughly 647kgoe in China, 393kgoe in Indonesia, and 691kgoe in Brazil. Average per capita energy consumption

in high income countries is roughly 5168kgoe; the United States (7905kgoe) and Canada (7795kgoe) have the highest per capita energy consumption.[1] India emits roughly 770 million metric tons of carbon dioxide (about 4% of global carbon dioxide emissions). On a per capita basis India's CO_2 emission is about 0.9 metric tons, compared with 12 metric tons in high income countries and 19 metric tons in the United States.

1.10 As India's urbanization and industrialization accelerate, energy consumption is likely to rise rapidly, requiring the rapid development of indigenous energy reserves to advance India's sustainable economic development. With roughly 16 percent of the world's population, India's modest energy resource base – assessed below – amounts to only 0.6 percent of global hydrocarbon reserves and six percent of global coal reserves.

(a) At current rates of production – around 290 million tons a year, equivalent to about 145 million tons of oil – India's **coal** resources (200 billion tons of which 70 billion are proven) are large enough to meet India's commercial energy needs for the foreseeable future. At present coal meets two thirds of India's commercial energy needs. Coal demand is largely driven by the expansion of coal-based power generation. Coal market prospects are discussed in Chapter 2.

(b) Domestic crude **oil** production (at around 34 million toe in 1996-97) meets about 40% of the country's oil needs. Unless major new oil fields are discovered, existing reserves (800 million tons) will last only about 15 years. For 1996-97, the oil import bill is estimated to have reached US$ 9-10 billion (up from US$ 6 billion in 1993-94). Optimistic assumptions about the prospects for domestic oil supplies suggest that indigenous supplies could reach 40 million toe by the turn of the century and decline thereafter to 25 million toe in 2004-05 unless substantial private capital can be mobilized for oil exploration. Given these supply prospects, if oil demand increases at the historical rate of 5.5 percent per year, dependence on oil imports would double, making India's balance of payments and budget vulnerable to volatile international oil markets.

(c) Natural **gas** plays a relatively minor role in India's energy economy. Current domestic production accounts for only 9% of India's commercial indigenous energy supplies and existing reserves (765 million toe) will supply current consumers for about 20 years. India is now considering the import of gas from international markets.

(d) India has modest (an estimated 20 billion tons) resources of **lignite,** most of which are located in the south of India. Because of the relatively low calorific content of lignite, the demand for this fuel is restricted to the area around deposits.

(e) The potential for generating **hydroelectric power** is estimated at 100,000 Megawatts (MW); but only about 25% of this potential has been developed because of opposition from environmental groups, resistance to resettlement of potentially affected people, and disputes about riparian rights among states and with neighboring countries.

(f) India's **renewable energy** program is making progress in wind, solar-photovoltaic, bagasse and biogas, as well as mini-hydroelectric energy generation. As of October 1996, India's installed wind-power capacity of about 800 MW, with another 200 MW under construction, made it the world's second largest program after the United States. The renewable resource program is supported by the Bank Group under the Renewable Resources Development Project (US$115 million/Cr. 2449-IN), and a grant from the

[1] World Development Report (1996).

Global Environment Facility (US$26 million). But while yielding encouraging and locally significant results, renewable energy will not be able to cover India's projected energy supply shortfall in the foreseeable future.

Rationale for India's Coal-Based Energy Strategy

1.11 The Central Electricity Authority's Electric Generation Planning Analysis System (EGEAS)[2] indicates that coal is currently the least-cost option for base-load power generation in India. Given its cost advantage and India's large reserves, indigenous coal is likely to long remain the most stable and least-cost option for the bulk of India's energy needs. The comparative costs of electricity generation are provided in Table 1.2.

1.12 Other options, such as imported coal and petroleum products, natural gas and renewables, are supplements but not substitutes. Their development is constrained by (i) opposition to hydroelectric power from environmental groups and project-affected people and disputes about riparian rights; (ii) the inability of renewable energy to satisfy more than a fraction of future energy needs, except in rural areas where conventional energy costs are high and small hydro projects, biomass and wind energy power projects could prove viable sources; (iii) delays in power-sector reforms that have slowed realization of savings through demand-side management; and (iv) infrastructure bottlenecks (ports, railways, roads and pipe lines) which limit large-scale energy imports, such as gas, at least in the short and medium terms.

Table 1.2 Comparative Costs of Electricity Generation from Conventional and Renewable Energy Technologies (1997)
($/kilowatt hour)

Source	*1997*
Conventional sources[a/]	
Indian coal (conventional pulverized coal)[b/]	0.041
Imported coal (conventional pulverized coal)	0.046
LNG (combined cycle gas turbine, Indian norms)[c/]	0.057
LNG (combined cycle gas turbine, international costs)	0.048
Heavy fuel oil (steam with flue gas desulfurization)[d/]	0.048
Renewable energy technologies[e/]	
Wind	0.080
Solar photovoltaic	0.370
Solar thermal power	0.290
Biomass - combustion	0.047
Biomass - wood gasification	0.059

[a/] Estimate based on a plant load factor of 70%.
[b/] Includes the costs of mitigation measures to meet existing Indian environment standards (e.g. electrostatic precipitators on coal plants; wet ash ponds, effluent treatment and dust extraction and treatment.
[c/] Costs are based on Indian norms using Indian equipment. International costs of combined cycle gas turbine are lower and are provided for comparison.
[d/] Oil-fired steam plants do not have a history in India and there are no Indian 'norms.' The costs are indicative.
[e/] Costs of renewable technologies are highly dependent on applications and site conditions.

Source: Environmental Research Management Consultants

[2] EGEAS was developed for the Electricity Power Research Institute of the United States by the Massachusetts Institute of Technology and Stone & Webster Engineering Corporation.

CHALLENGES: MITIGATING ENVIRONMENTAL AND SOCIAL IMPACTS OF THE COAL-BASED ENERGY STRATEGY

1.13 India's coal-based energy strategy leads to significant local and regional pollution of land, air, and water; to long-term global climate change through the emission of greenhouse gases (primarily carbon dioxide and methane); and, among social concerns, particularly to resettlement. Committed to developing and burning coal, India faces an urgent challenge of reducing these adverse environmental and social impacts.

Environmental Impact at the Project Level and at the Regional Level

1.14 India's environmental regulations and laws formally require industries to meet strict environmental norms comparable to those in industrialized countries, but lack of institutional capacity results in inadequate enforcement. The Bank is assisting the Ministry of Environment and Forest and Central and State Pollution Control Boards through several operations[3] to develop their institutional and administrative capacity to plan and administer environmental policy and to implement environmental law, including monitoring and compliance in specific, high-priority problem areas.

Social Impact at the Project Level and at the Regional Level

1.15 To address the major social impacts of project-related involuntary resettlement and the adverse impact on surrounding communities, Coal India, during the preparation of the proposed Coal Sector Rehabilitation Project, adopted a Rehabilitation and Resettlement Policy and prepared Rehabilitation Action Plans and Indigenous People Development Plans, which are consistent with the Bank's relevant policies. These mitigation efforts, however, address mainly the project-specific social issues and do not extend to the surrounding region. Rapid development of energy-based industries in coal producing regions such as Singrauli has created acute social and demographic problems, including a sizable in-migration of people in search of better lives and job opportunities. These migrants are neither project-affected people nor indigenous people eligible for assistance under a specific project. Although they may benefit from formal and/or informal employment, their standards of living in rapidly expanding semi-urban situations is often characterized by poor housing and poor services.

1.16 No single enterprise or lender can deal adequately with these complex problems. Existing State-level institutions are weak. Although several studies of environmental and social effects in the Singrauli region have been undertaken, the State Governments concerned have not yet initiated actions based on them. A concerted effort under strong State Government leadership with the active participation of all stakeholders (including representatives of the affected people, the major enterprises located in the region, the local chamber of commerce, the development financial institutions, NGOs and academics) has to be developed to solve these problems. The Bank is considering providing both financial and technical assistance in developing and implementing required regional mitigation program in close consultation with the Central and State Governments and other stakeholders.

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[3] These operations include the Industrial Pollution Control Project (Ln. 3334-IN/Cr. 2252-IN), Industrial Pollution Prevention Project (Ln. 3780-IN/Cr. 2645-IN) and the Environmental Management Capacity Building Technical Assistance Project (Cr. 2930-IN).

Mitigation Activities at the Global Level

1.17 Among the adverse effects of India's reliance on coal, long-term global climate change through the emission of greenhouse gases is the most difficult to address effectively. Globally, the United Nations Framework Convention on Climate Change (UNFCCC) seeks to achieve "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate change." India is a member of UNFCCC. The Bank Group is actively engaged in developing an environmentally friendly renewable resource program under the Bank-financed Renewable Development Project and a grant from the Global Environmental Facility. The Bank is presently pursuing a Global Carbon Initiative (GCI), under which the Bank proposes to assist the development of carbon offset markets[4] for climate change mitigation.

Diversification of Energy Supply Mix

1.18 In developing its energy sector, India clearly needs to look more carefully at the fuel supply mix. Economic liberalization presents an opportunity to increase imports of environmentally friendlier fuels, such as gas, to supplement indigenous supplies. Deregulation of energy prices and access to better technology will ultimately improve the economics of non-conventional energy options (such as renewables) making them viable sources of energy supplies on a commercial scale.

Energy Efficiency Improvement Through Demand Side Management (DSM)

1.19 The Bank's 1991 study of long-term issues in the power sector estimated that full implementation of various measures to improve electricity end-use efficiency could save (theoretically) as much as 30% of maximum demand and 20% of electrical energy over the longer term. The study also estimated that raising electricity tariffs to long-run marginal cost levels over five years would reduce demand for generation capacity by about 8,700 MW (about 10 percent of the planned power generation capacity estimated for the end of the Ninth Plan). Since prices to industrial and commercial customers are already high, and pressure to improve productivity, including more efficient use of electricity, has increased rapidly under the Government's economic liberalization program, it is reasonable to expect progress in this area in the coming years. India's increasingly competitive business environment should also cause companies to pursue low-cost conservation measures more aggressively.

1.20 As long as the low and heavily subsidized residential and agricultural tariffs and relaxed bill collection continue, however, consumers are not likely to respond in the same way as industry and business. To realize the significant savings estimated in the 1991 Bank study, the majority of States would have to adopt reforms like those being implemented in Orissa (para 1.07). Recognizing the importance of the non-pricing measures of DSM, the Orissa State Power Sector Restructuring Project has identified promising conservation measures such as load management and power-factor compensation in industries; industrial cogeneration in sugar, chemicals and metallurgical units; vapor absorption refrigeration in hotels and commercial offices; rewinding of motors; and municipal water pumping. Other states are considering similar measures.

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[4] The UNFCCC provides for the probability of joint implementation of commitments (carbon offsets) between countries in which case industrialized countries would be permitted to meet their emissions requirements through greenhouse gas reduction investments in economies in transitions (EITs) and possibly also in developing countries. The joint implementation of commitments are based on the fact that the marginal cost of abatement of greenhouse gas emissions reductions is relatively higher in the OECD than in developing or EITs.

Electricity Provision to Rural Consumers

1.21 The issue of rural electrification is of great importance to India where about two-thirds of the population live in rural areas – many in abject poverty. Fuelwood, animal dung and agricultural residue account for about 90% of rural energy consumption. Although rural electrification covers 84% of Indian villages, only 27% of rural households are electrified, and supply is inadequate and unreliable. Among options to improve the availability of energy in rural areas are extension of the main grid, distributed generation, micro-turbine power plants, and stand-alone solar household systems. One important option element of rural electrification would be to encourage private entrepreneurs to become energy service providers. The options are examined under the power sector reform projects.

2. INDIA'S COAL SECTOR

DEMAND AND SUPPLY

Demand, Supply and Shortfalls

2.01 The Committee on Integrated Coal Policy (see Box 3.01) projected that coal consumption for generating electricity - 187 million tons or two thirds of the total demand in 1995/96 - would reach 350 million tons in 2001/02 and 500 million tons five years later - nearly 70 percent of all demand. While coal use by various industries such as cement, textiles, fertilizers, and brick kilns now amounts to 60 million tons a year (21 percent of all consumption) and will more than double within a decade to 136 million tons, its share of demand will actually drop while that of the power-generating industry will rise. The results shown in Tables 2.1 and 2.2 are based on estimates of the Ministry of Power and the Ministry of Steel and show a 122 million ton gap in coal supply at the end of the Xth Plan Period (2006/07), an amount almost equal to half of the 1991/92 supply. The extent of this supply gap, however, may be overestimated as the above mentioned expansion of power generation capacity seems to be ambitious, given the slow progress of the power sector reforms.

Table 2.1: Projected Coal Demand (1996/97-2006/07)
(million tons)

Sector		*(Terminal Years)*		
	91-92	*Eighth Plan 96-97*	*Ninth Plan 2001-02*	*Tenth Plan 2006-07*
Power	136.9	215.0	350.0	500.0
Steel	31.7	40.5	63.0	80.0
Others	62.7	77.2	100.0	136.0
Total	231.2	332.7	513.0	716.0

Source: Report of the Committee on Integrated Coal Policy, May 1996

2.02 The main reasons for the increasing shortfalls are that: (i) Coal India will no longer receive the Government's budgetary support in the IXth Plan Period and cannot internally generate sufficient resources to expand capacity as required; (ii) contributions from private sector will not be substantial until the price of steam coal is fully deregulated and an appropriate regulatory framework is in place; and (iii) areas where production can be increased rapidly do not have adequate transport infrastructure. It is worth noting that the coal supply projection (2001-02) in Table 2.2 includes 13.4 million tons of additional production in the 24 mines supported under the proposed project. The demand-supply situation would be further deteriorated unless the proposed project materializes quickly. The shortfall already affects the steel industry, which uses 36 million tons of Indian coal (13 percent of the total production) and imports about nine million more tons of coking coal a year in order to make up for inadequate domestic supplies and to blend with domestic coal to improve the quality of the input to coke ovens. Despite infrastructure bottlenecks, coal power plants and cement plants also imported four million tons of coal in 1995/96, an amount that is expected to grow rapidly as customs duties decline.

Table 2.2: Coal Supply Projections
(millions tons)

Producer		*(Terminal Years)*		
	1991-92	*Eighth Plan 1996-97*	*Ninth Plan 2001-02*	*Tenth Plan 2006-07*
Coal India	204.2	252.0	307.0	392.0
Other mines	25.2	36.7	78.0	202.0
Pvt. Sector	-	-	35.0	150.0
Total Supply	229.3	288.7	385.0	594.0
Total Demand	231.2	332.7	513.0	716.0
Gap	1.9	44.0	128.0	122.0

Source: Report of the Committee on Integrated Coal Policy, Government of India, May 1996

THE LEGACY OF GOVERNMENT CONTROL

2.03 The widening gap between coal production and demand in India is, ironically, in part the result of a Government decision to nationalize almost 1,000 privately held coal mines in the early 1970s when their output of some 78 million tons appeared to be lagging behind the needs for power generation and steel production. Facing the risk of nationalization, the reality of unprofitable regulated prices and of Government control of coal distribution, the mines' private owners had proved reluctant to invest actively in expanding capacity. Similar problems, however, beset Coal India, to which the Government in 1975 transferred control of the coking mines it nationalized in 1971 and the thermal coal producers it took over in 1973 -- 325 mines consolidated from the original thousand. As Annex 2.1 describes in detail, Coal India has acquired control of almost 90% of India's coal production and the Government of India has charge of almost all solid fuel production.

2.04 During the 25 years of Government control, it has been setting the industry's prices and production targets, approving investment budgets and programs, and deciding on the allocation of coal supplies to major consumers and the appointment of chief executives and directors of the companies. In practice, it kept coal prices low to avoid an inflationary ripple effect on the rest of the economy but also, bowing to powerful trade unions, it forced the industry to accept sizable real wage increases year after year. Because of Government control over coal distribution, moreover, Coal India sometimes had to supply coal to non-creditworthy State Electricity Boards, whether it was paid or not.

2.05 In this highly regimented environment, Coal India had three major objectives: (i) to meet the coal production targets of the five-year plans; (ii) to compensate for cost increases with production improvements and cost savings; and (iii) to provide employment and social infrastructure in rural areas. Until recently, it gave priority to meeting the demand for coal; financial considerations played a minor role. As a result, Coal India recorded profits in just six of the 21 years since its establishment, generating a modest up-trend in profits only for the last five years.

COAL INDIA

2.06 Coal India is the largest public sector enterprise in terms of employment and one of the world's largest coal companies in terms of production, employing 636,000 people and producing about 250 million tons of coal a year (1996/97 forecast). Structured as a holding company with eight subsidiaries, Coal India has total assets of Rs180 billion (US$5.1 billion), and an equity of Rs63 billion (US$1.8 billion). In 1995/96, its net sales were Rs104.1 billion (US$2.9 billion) and its profit after tax was Rs6 billion (US$168 million). Its productivity (1.77 tons output per manshift) is low by world standards. Figure 2.1 shows the basic

organizational structure of Coal India and its subsidiaries. The function and operations of Coal India and each subsidiary are shown in Annex 2.2. The summary of subsidiary operations is presented in Table 2.3.

Figure 1.1 Organizational structure of Coal India and its subsidiary companies

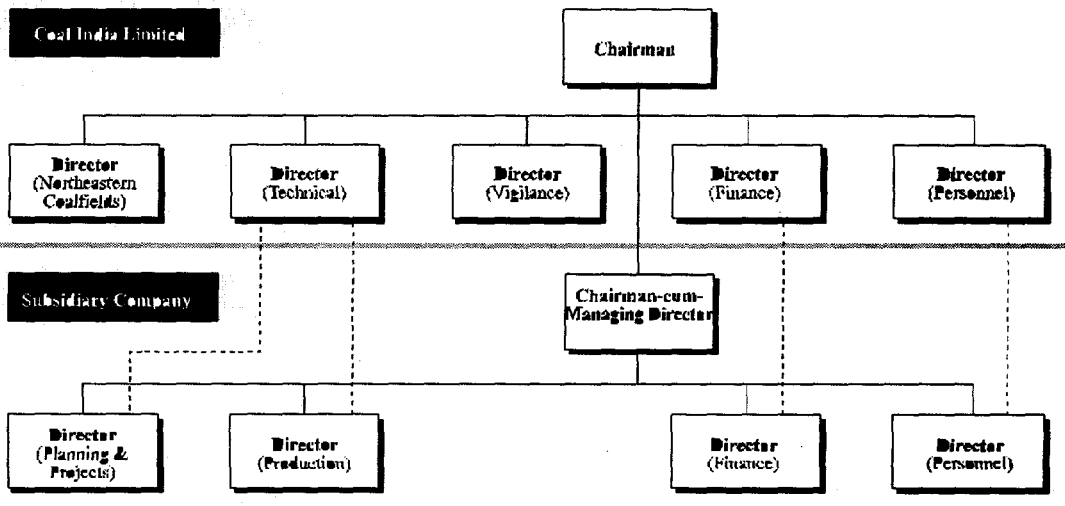


Table 2.3 Summary of Subsidiary Operations - 1995/96

Company	Profit/Loss (US$ million)	No. of mines U	O	U/O	Total	Production (million tons)	Manpower ('000)	OMS (million tons)
ECL	-111.0	104	23	-	127	27.8	161.7	0.76
BCCL	-60.0	57	13	23	93	27.8	147.4	1.00
CCL	-48.6	26	38	10	74	30.8	92.8	1.60
MCL	94.0	9	11	-	20	32.7	23.0	6.33
NCL	148.6	-	10	-	10	35.2	16.7	8.14
SECL	131.4	71	17	3	91	53.2	99.0	2.44
WCL	25.7	58	30	-	88	29.0	84.9	1.53
CIL, NEC, CMPDI & others	-14.3	4	2	1	7	0.8	11.1	0.91
Overall	165.0	329	144	37	510	237.3	636.6	1.77

Source: Coal India Ltd.
U: underground mines; O: Opencast mines; U/O: Mixed underground /opencast mines; OMS: Output per manshift

Financial Flows Between Coal India and Its Subsidiaries

2.07 The financial flows between Coal India and its eight subsidiaries follow a pattern similar to that of corporations whose operations are structured in divisions, with the central management transferring resources from profitable subsidiaries, such as MCL, NCL and SECL to the two major loss-making subsidiaries, ECL and BCCL. While this cross-subsidization deprives profitable subsidiaries of resources they could use to expand operations, it has in the past drastically reduced the overall tax burden on Coal India and its subsidiaries. To determine, regulate and manage these financial flows, Coal India uses the following practices:

(a) until recently, a retention price mechanism which authorized the Ministry of Coal to specify the retention price applicable for each subsidiary at levels below those realized by the profit-making subsidiaries and higher than those realized by loss-making subsidiaries. Profit-making companies were required to contribute the excess of the realized price over retention price to the Coal Price Regulation Account (CPRA), maintained centrally by Coal India. The aggregate of these credits was used to settle the claims of the loss-making subsidiaries under the scheme;

(b) cash surpluses of profitable companies used to accelerate loan repayments of these companies to Coal India which, in turn, used these sums to substitute, and in effect subsidize, the debt service obligations of the loss-making subsidiaries in order to keep them current;

(c) allocation of Coal India's aggregate interest liability to subsidiary companies on the basis of the proportionate investment made by Coal India in each of these subsidiaries;

(d) current account recording of all financial transactions between Coal India and its subsidiaries. Adjustments for CPRA or interest, as well as capital expenditure incurred by Coal India on behalf of subsidiaries, are made through credits/debits in this account; and

(e) issuance, upon receipt of equity capital from the Government, of equity to Coal India's subsidiaries. The current account balance at the end of each financial year, after adjustment, is considered as a loan.

2.08 The magnitude of financial flows between Coal India and its subsidiaries for the year ending March 1996 is summarized in Table 2.4, which highlights the substantial financial dependence of ECL and BCCL on the other companies and the continuing investment by Coal India in ECL and BCCL at the expense of the profit-making companies.

Table 2.4: Financial flows between Coal India and its subsidiaries, 1995/96
(Rs million)

	ECL	*BCCL*	*CCL*	*WCL*	*MCL*	*NCL*	*SECL*	*Total*
Financial flows from/(to) Coal India	339	(3,112)*	(60)	(2,126)	(3,192)	(6,043)	(3,981)	(18,175)
Represented by								
a. CPRA	5,424	3,172	1,718	(126)	(3,113)	(3,568)	(3,997)	(490)
b. interest	(1,720)	(2,854)	(1,125)	(382)	(786)	(639)	(198)	(7,704)
c. net flow equity + loan from Coal India	(3,365)**	(3,430)**	(653)	(1,618)	707	(1,836)	214	(9,981)

Source: Coal India Ltd.
* repayment of interest and principal of loan from BCCL to Coal India was larger than the subsidies received through CPRA in 1996.
** including transfer of interest waiver of Rs3,890 million and Rs5,028 million to ECL and BCCL out of the waiver received from the Government.

3. COAL SECTOR REFORM AND RESTRUCTURING OF COAL INDIA

COAL SECTOR REFORM

3.01 The foreign exchange and fiscal crisis of 1991 forced the Government to rethink the support it had long given chronically weak public enterprises such as Coal India and, in the case of the coal industry, to set out on a path of making it commercially and financially viable. Faced with budgetary constraints and huge investment requirements to meet the ever increasing demand for coal, over the period of 1993-96, the Government started to phase out its budgetary support to Coal India, lowered tariffs, gradually deregulated pricing and distribution and opened captive mines and washeries to private ownership, so as to set the stage for a competitive coal market (see Annex 3.1).

3.02 The framework for future reform is provided by the January 1997 Approach Paper to the Ninth Five Year Plan and the recommendations of the Government Committee on the Integrated Coal Policy (Chari Committee Report, see Box 3.01), the substance of which was approved by the Government on February 11, 1997. These reforms concern: (i) immediate deregulation of the price and distribution of grade-D steam coal; (ii) full deregulation of remaining regulated coal by January 1, 2000; and (iii) opening up non-captive undeveloped mine blocks to competitive bidding by the private sector. These substantial reforms, considered a major departure from traditional central planning policy, triggered the appraisal of the proposed CSRP. In light of India's short- and medium-term dependence on indigenous coal for energy and persistent pressures on budgetary resources, it is imperative that the Government and Coal India implement reforms that would put Indian coal operations on a commercial basis. Annex 3.1 presents the status of current and anticipated sector reforms.

Reduction of Import Tariffs on Coal

3.03 The quantity of coal imports was restricted until they were placed under the Open General License (OGL) category in 1993 and the tariff on coking coal was cut first (in April 1993) from 35% to 5% and then (in February 1997) to 3%. Imports of coking coal have increased from 5.3 million tons to 9.3 million tons. The Government also reduced the import tariff on steam coals from 85% to 35% in 1994, to 20% in July 1996 and to 10% in February 1997, resulting in an increase of imports from 3,000 tons in 1991/92 to over four million tons in 1995/96.

Deregulation of Coal Prices and Distribution

3.04 The Colliery Control Order of 1944 that gave the Government control over coal prices and distribution allowed the Ministry of Coal to influence Coal India's financial performance and the supply of coal to specific consumers. Political considerations often resulted in orders to sell coal below its economic price and to supply coal even to some of the SEBs which were unlikely to pay for it.

3.05 Having deregulated the price and distribution of coking coal and high-grade steam coals (A, B and C grades) in March 1996, the Government did the same for D-grade steam coal 11 months later, ending controls over 60% by quantity and 75% by value of Coal India's production. It further decided to fully deregulate the remaining low grade steam coal (E, F and G) by January 1, 2000 and to allow Coal India to revise its regulated prices every six months, beginning July 1997, based on the formulas developed by the Bureau of Industrial Cost and Prices (BICP) in 1987, until they are deregulated. ***The Government has agreed to deregulate pricing and distribution of remaining regulated low grade steam coal by January 1, 2000.***

Opening the Coal Sector to Private Investors

3.06 The 1973 nationalization of coal mines banned private investment until the Government's budget constraints and the sector's investment needs led to opening captive mines and coal washeries to private ownership in June 1993. The Government has identified 47 steam coal mining blocks with gross reserves of about 14 billion tons and nine coking coal mining blocks with gross reserves of about 2.8 billion tons for the purpose of captive mining. Further, the Government has allotted 15 steam coal blocks to mainly private power companies and five coking coal blocks to steel companies. These blocks should produce about 58 million tons per year when fully developed. In February 1997, the Government decided to open other non-captive undeveloped mining blocks (which public enterprises, including Coal India, do not require in order to meet current commitments) to competitive bidding with specific selection criteria. The Government is also considering allowing captive mines to sell surplus output to third party customers.

Improving the Regulatory Framework

3.07 The proposed IDA credit would finance a study on the rules and regulations governing the coal industry in order to improve its regulatory framework and bring it in line with international best practice. The draft terms of reference for this study has been prepared and finalized at negotiations. ***Invitation for "expressions of interest" is a condition for effectiveness. The Government has agreed to: (i) not later than July 31, 1999, complete the study in a manner satisfactory to the Association; (ii) not later than October 31, 1999, furnish to the Association for comments a draft timebound action plan regarding the implementation of the study's recommendations which are feasible; and (iii) not later than December 15, 1999, begin implementation of such action plan taking into account the Association's comments and in accordance with a timetable prepared in consultation with the Association.***

Box 3.01 Recommendations of the Chari Committee and Further Policy Reform Agenda

1. The Committee on the Integrated Coal Policy was set up under the Planning Commission's notification dated April 27, 1995 to formulate an integrated coal policy. The Committee, chaired by Mr. K. S. R. Chari (ex-Coal Secretary) consisted of the Secretaries of Coal, Power, Steel, Railway, the heads of Coal India, NTPC, SAIL, and an Adviser of the Planning Commission.

2. The Committee report of May 1996 made the following recommendations, adopted in substance by the Government in February 1997:

(i) opening up undeveloped blocks not required by the national coal companies to competitive bidding by both national and private companies;

(ii) immediately liberalizing coal prices of new mines* and phasing in price liberalization for existing mines; and

(iii) setting up an appropriate regulatory framework and body.

3. The following points discussed by the Committee were not reflected in the Government's decision taken in February 1997, but provide important guidance for further policy reform:

(i) liberalizing immediately all coal prices (Chairman's note);

(ii) reviewing the holding structure of Coal India and breaking up its subsidiaries in the aftermath of the deregulation of the coal industry and the restructuring of Coal India (Chairman's note);

(iii) reviewing the Forest Conservation Act (Acquisition & Development) Act, 1957 and the Contract Labor (Regulation & Abolition) Act, 1970 to address their legal and procedural constraints; and

(iv) developing an integrated coal transportation policy.

*The Government liberalized the price of D-grade coal in addition to A,B, C grades already liberalized.

3.08 The decision to put Coal India's operations on a commercial footing through comprehensive restructuring, including financial restructuring, full corporatization of its subsidiaries, productivity improvement measures, introduction of coal sales contracts and management training should allow Coal India to attain long-term financial viability, provided that the above-mentioned sector reforms take rapid effect and that the company receives the proposed loan.

Financial Restructuring of Coal India and its Subsidiaries

3.09 Financial Performance. As discussed in Chapter 2, since Coal India functioned mainly as a conduit for massive public investments to expand India's coal production, its investment decisions were driven primarily by demand and by technical and geo-mining conditions without rigorous financial scrutiny. As a result, it has accumulated a huge portfolio of unprofitable labor-intensive mines (see Box 3.02) supported by an elaborate system of cross-subsidization. Over time this practice severely eroded Coal India's financial independence, sustainability and capacity to finance investments and kept its financial performance weak for a company with total assets of US$5.1 billion. Annex 3.2 provides a detailed analysis of the financial performance of Coal India and its subsidiaries.

3.10 Capital Restructuring. As of March 1995, Coal India owed Rs49 billion (US$1.4 billion) to the Government, of which Rs22.3 billion (US$0.65 billion) were in the nature of unpaid arrears. This undermined its creditworthiness and borrowing capacity and impaired its ability to finance fully its investments. The capital structure of its subsidiaries at the end of March 1996 as shown in Table 3.1 reveals that ECL, BCCL and MCL[5] had already exhausted their ability to borrow. To alleviate this financial burden, the Government provided the company with a financial relief package of Rs22.3 billion comprising (i) a waiver of interest arrears; (ii) conversion of part of Coal India's repayment arrears into Preference Equity; and (iii) a moratorium on the remaining principal arrears. In exchange for the financial relief package, Coal India agreed to the phase out of all budgetary support. In order to restore each subsidiary's borrowing capacity, Coal India has decided (i) to allocate this financial relief specifically to BCCL, ECL and MCL and (ii) to strengthen their capital base through a debt-to-equity swap among its subsidiaries. Table 3.1 illustrates the effect of the combined capital restructuring on the FY1995/96 audited results, the details of which are presented in Annex 6.1

Table 3.1 Proposed change in the capital structure of Coal India and its subsidiaries
(Rs million)

as of March 30, 1996	*ECL*	*BCCL*	*CCL*	*WCL*	*NCL*	*SECL*	*MCL*	*TOTAL*
Before Restructuring								
a) Net Equity	2,028	-664	11,135	7,185	18,832	13,515	2,378	54,409
b) Debt	21,010	21,643	14,986	1,649	4,110	1,534	7,994	72,926
After Restructuring								
a) Net Equity	11,967	11,143	11,135	3,046	8,824	5,901	3,241	55,257
b) Preference Equity					4,000	3,000	2,043	9,043
c) Debt	7,180	4,808	14,986	5,787	10,118	6,147	5,088	54,114

Source: Coal India Ltd.

[5] MCL is a new operation in the process of expansion and the apparent problem of limited debt capacity is somewhat transitional.

3.11 Restructuring BCCL and ECL Coal India's losses are concentrated in BCCL and ECL, which jointly employ around 50% of Coal India's labor, but account for only 23% of its production (see cumulative cost curves in Box 3.02). The success of their restructuring depends, to a large extent, on reducing labor costs, which accounts for more than 60% of their operating costs. Under the proposed capital restructuring and price deregulation these subsidiaries, which have been using natural attrition and the Voluntary Retirement Scheme (VRS) to reduce the workforce, would have the necessary time to cut their labor force from 310,000 in 1996 to 256, 000 in 2002 in an orderly manner. In 1995, the Government, through the National Renewal Fund, gave Coal India a Rs1.2 billion (US$38 million) grant to finance VRS expenditures. ***The Government has agreed to take all necessary actions to obtain the relevant authorities' commitment to finance BCCL's and ECL's VRS through provision of the following amounts to, inter alia, the NRF by the following dates: (i) Rs0.8 billion by March 31, 1998; (ii) Rs1.6 billion by March 31, 1999; and (iii) Rs1.6. billion by March 31, 2000.*** Other restructuring measures, including the financial relief package and productivity improvement measures, are described in Annex 6.1. As a consequence of the price deregulation of grades which dominate the production mix of BCCL and ECL, the cross-subsidization mechanism through CPRA (see para 2.07) has been discontinued. The proposed loan will not finance any mine projects under BCCL and ECL.

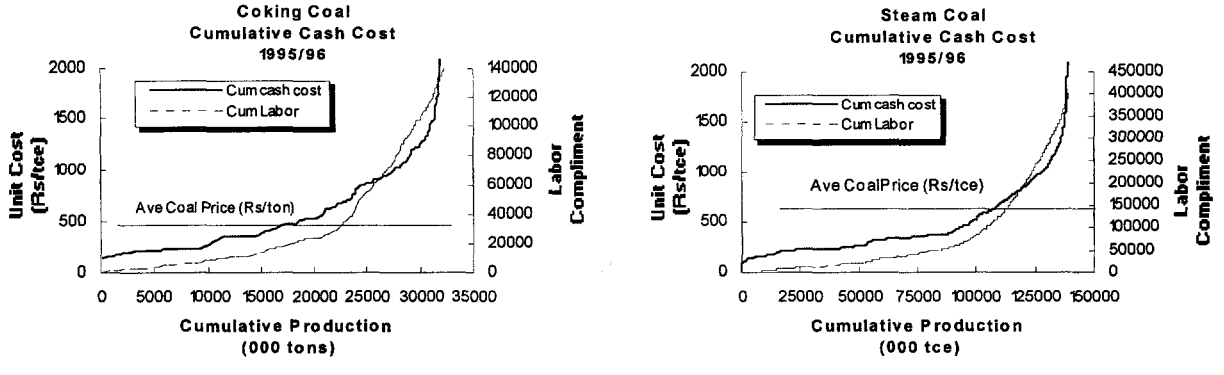
Corporatization of Coal India and its Subsidiaries

3.12 Coal India has decided to implement a program for corporatization of its subsidiaries, with effect from April 1, 1997. The objective is to enhance the financial independence of the subsidiaries and to insulate the profit-making companies from the unprofitable companies. Coal India will remain a holding company, while its subsidiaries transform into financial independent profit centers. The principles of the corporatization program, as adopted by the Board of Directors of Coal India in March 1997, are described in Annex 6.1. ***Coal India has agreed not to merge any of its subsidiaries and to cause each subsidiary not to merge without the consent of the Bank. Coal India has also agreed to: (a) conduct all financial transactions between itself and the subsidiaries, and cause the subsidiaries to conduct all financial transactions among themselves, based on written contracts; (b) limit all financial transactions between***

Box 3.02 Cumulative Cost Curves in Coal India's Mines

Figure 3.1, which shows the cumulative cost curves for thermal and coking coal in Coal India's mines, illustrates the cash cost in relation to the average price received and the labor complement of each colliery. It indicates that the production cost per ton of 100 million tons of coal equivalent (tce - one ton of Indian coal equals approximately 0.8 tce) of steam coal is under the average coal price (profitable operations), while the production cost of the remaining 40 million tce of steam coal is above the average coal price (non-profitable operations). The losses are concentrated in BCCL and ECL.

Figure 3.1: Cumulative 1995/96 Cash Costs of Production of Thermal and Coking Coal



itself and the subsidiaries and cause all financial transactions among the subsidiaries to be limited, to those relating to equity acquisition, loans and commitment, guarantee and service charges, which may be levied by Coal India on the subsidiaries and other incidental transactions, which are paid within a twelve month period; (c) not lend, or otherwise make available to any of the subsidiaries other than BCCL or ECL, funds obtained by Coal India from external sources: (i) for a time period different from that; and (ii) on terms more favorable than those, on which such funds shall have been so obtained by Coal India; and (d) limit its corporate guarantees, if any, to profit-making subsidiaries. The following financial covenants have been agreed: (a) Coal India shall cause BCCL and ECL to maintain a debt to total capitalization ratio of no more than 70% during the period from FY1998 through FY2000 and no more than 60% after FY 2000; (b) Coal India maintain and cause each subsidiary other than BCCL and ECL to maintain a debt to total capitalization ratio of no more than 60%; (c) Coal India shall cause BCCL and ECL from FY2001 to maintain a debt service ratio of at least 1.3; and (d) Coal India shall maintain and cause each subsidiary other than BCCL, ECL and CMPDI to maintain a debt service ratio of at least 1.3.

Productivity Improvement and Safe Mining Practices

3.13 The above capital restructuring and corporatization program will be complemented by various measures to improve labor productivity and capacity utilization and management training.

3.14 Increasing Labor Productivity. Although Coal India has gradually increased its Output per Man-Shift (OMS) from 1.46 tons in 1992/93 to 1.77 tons in 1995/96, its labor productivity, because of a large workforce (due to social constraints and inherent technical problems) in underground mines, is distinctly below that of other major world coal mining companies.[6] Average earnings for mine workers, who also receive benefits such as free housing, water, electricity and medical care, are estimated to be nine times higher than those of agricultural workers in the same region. Such generous compensation makes Coal India one of the most attractive employers in these regions. Coal India has not been able to reduce its payroll due to: (i) the social requirement that Coal India recruit family members of workers who die or are injured on the job; and (ii) the obligation to employ project-affected people under their compensation scheme.

3.15 Redundant workers account to a significant degree for Coal India's weak financial performance, particularly that of BCCL and ECL. Recognizing that this overstaffing cannot be sustained, the company's management has used natural attrition and the Voluntary (enhanced early) Retirement Scheme to reduce its labor force from about 673,00 in 1991 to about 636,000 in 1996. More rapid reduction, desirable from the financial restructuring point of view, would require management to upset the balance between its economic rationale and the protection of employment and risk industrial disputes. To avoid such disruption, Coal India intends to limit new intake rigorously and to promote more early retirements under the VRS with the financial support of the National Renewal Fund (NRF).

3.16 Experience in other countries has shown that coal-industry labor reduction is a costly and lengthy process. Given the acute social and political constraints and need for orderly shrinkage, the Bank supports Coal India's strategy. It is expected that this effort will improve labor productivity to the level of 2.24 tons of OMS by 2001/02. Success in reducing the workforce is crucial to the turnaround of BCCL and ECL.

3.17 Improving Capacity Utilization. Coal India's capacity utilization record, a main cause of its poor financial performance, is low by world standards, largely because of inadequate maintenance and the lack of spare parts which, as the performance and monitoring indicators in Annex 5.2 show, is being addressed by specific action programs at each subsidiary. Failure to meet these targets carries severe consequences, as

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6 In 1996, Coal India's Output per Man Shift (OMS) was 1.77 ton, while the United States average was 53.59 ton and United Kingdom average was 13.36 ton.

outlined in Figure 6.1.1 in Annex 6.1. The programs include: (i) equipment procurement through competitive international, rather than local, tenders; (ii) introduction of mobile canteens and workshops to reduce idle time; (iii) opening three major training centers for operators and maintenance workers; (iv) computerization of operating equipment and maintenance status in opencast mines; and (v) purchase of equipment with enough spare parts for two to three years.

3.18 Safe Mining Practices. Several project mines[7] suffer from shortfalls in overburden removal, which could result in safety hazards. In consultation with the Bank, Coal India has prepared timebound action plans for the removal of overburden arrears at each mine. The implementation of these plans will be closely monitored during project supervision.

3.19 Retraining Managers and Introduction of Quality Control Circles (QCC). The success of Coal India's effort to make its operations commercially viable and enhance its competitiveness will depend on support from middle and upper level management. Under the project, Coal India will implement a comprehensive management training program from March 1, 1998 through December 31, 2001, with the help of management training institutes using curriculum to be submitted by December 31, 1997 for Bank approval. Coal India also intends to further promote Quality Control Circles (QCC)[8] to enhance productivity and to improve coal quality.

Contractual Arrangements with Major Coal Consumers

3.20 Government regulation of coal price and distribution without contractual arrangements between Coal India and its consumers allowed the Ministry of Coal to order Coal India to supply coal to some of the SEBs, even if there was every indication that they could not pay. Lacking a way to measure objectively and precisely the quality of coal delivered, Coal India and its consumers have engaged in frequent disputes that often allowed SEBs to withhold or reduce payment for deliveries of supposedly lower quality coal. For its part, Coal India operates without the incentive that precise quality measurement rules and the possibility of penalties or bonuses would give it to improve coal quality by reducing the content of foreign materials. Entering into contractual arrangements with all its major consumers by September 30, 1998, Coal India will need to obtain contract provisions clearly specifying: (i) that payments for coal sales will be secured by commercially acceptable financial settlement measures including advance payment in cash or Letter of Credit ('cash and carry policy') and as per the credit terms; and (ii) a precise description of the quality of coal to be supplied and the arrangements for independent analysis of deliveries, together with penalty and bonus clauses.

ROAD TO FURTHER REFORM

3.21 During the policy dialogue, the Bank and the Government discussed the fundamental institutional change of Coal India, including the break up of its holding structure and privatization of its subsidiaries. The Bank's assessment is that the Government – whose public-enterprise reform policies do not include privatization – is not yet ready to proceed with this stage because of a lack of consensus among such stakeholders as Central and State Governments, Coal India and labor unions.

3.22 Although such institutional change would promote competition in the industry, the Bank has decided not to urge it as a condition of the proposed loan. Given the balance of political forces, the current

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7 Bina, Dudhichua, Jayant and Jhingurdah in NCL, Kusumunda in SECL and Sasti in WCL.

8 Quality Control Circles (QCC) is a system for achieving improvements in a great variety of corporate activities by initiating and sustaining the active participation of groups (QCC) of workers who are actually engaged in those activities. SECL has already introduced QCC, which helped it improve productivity and working conditions.

scope and timetable of the reforms are about the best that can be expected; anything more is likely to be counterproductive. Instead, the Bank has agreed with the Government and Coal India that: (i) the financial restructuring of Coal India, including its loss-making subsidiaries, be undertaken; and (ii) a full corporatization program be rigidly maintained. It is the Bank's position that these programs are the necessary steps toward the break up of the holding structure and eventual privatization. In the short term Coal India's critical roles as the main conduit for the financial restructuring and corporatization program and oversight implementing agency of the ESMP justify the current institutional structure. However, as the sector liberalization and the corporatization program further advance and the restructuring of the loss making subsidiaries is completed Coal India's relevance as a holding company would ultimately disappear. While supporting the implementation of the CSRP, the Bank will maintain the policy dialogue with the Government on this important institutional change.

IMPACT OF COAL SECTOR REFORM AND COAL INDIA'S RESTRUCTURING ON ENVIRONMENTAL AND SOCIAL ISSUES

3.23 The policy framework of coal sector reform, Coal India's restructuring program including its corporatization program, modernization investment and the technical assistance program supported by the CSRP would have substantial positive impact on environmental and social issues discussed in Chapter 1.

3.24 The CSRP policy reforms that aim to free coal prices and distribution and to liberalize trade and private-sector involvement in the industry would allow coal companies to set an economic (higher) price for coal and thereby improve the efficient allocation of scarce resources. Power companies that are major consumers of coal are also likely to raise their rates to reflect economic price of coals, contributing to the demand-side management. Price liberalization would also permit coal producers to internalize the costs required for coal improvement through washing or selective mining methods.

3.25 By promoting a greater role for private investors and the trade liberalization, the CSRP promotes competition that will stimulate Coal India to improve its efficiency and coal quality to maintain its market position. Commercial sales contracts with major clients, stipulating the precise quality of coal to be supplied and arrangements for analysis by independent agents will also provide Coal India with an incentive to providing a higher quality product that is lower in ash as well as more consistent in quality. Such an improvement in quality will reduce coal-related pollution (ash, particulate, sulfur and carbon release) per unit of heat or power generated by (a) reducing output of ash and particulate; (b) enabling power plants to achieve greatly increased efficiency from coal supplies of constant rather than widely varying quality. Furthermore, these coal quality improvements typically generate important cost savings, associated with lower transportation costs and improved power plant efficiency. The Government and the Bank have also agreed that a study to improve coal quality and the overall efficiency/environmental performance of the coal-energy chain is to be undertaken under an on-going Environment Management Capacity Building Technical Assistance Project (Credit 2930-IN) with the possibility of setting in motion a new Clean Coal Technology Project under the lending program.

3.26 While specific, project-linked social and environmental issues are addressed within the ESMP, Coal India's corporatization program and that of its subsidiaries will hold each subsidiary accountable for the full implementation of the environmental and social mitigation activities agreed under the ESMP. The proper implementation of ESMP will be closely supervised and safeguarded through the cross-conditionality between the ESMP Credit and the proposed CSRP loan. Since successful resettlement is a prerequisite for continuing Bank support of the CSRP loan, it is expected that the management of each subsidiary will give high priority and serious attention to ESMP's proper implementation.

Box 3.03 Quality of Coal in India

1. Indian steam coal, in general, is of inherently low quality (average ash content is about 30-35%). However, it has low sulfur content, few toxic elements and high ash-fusion temperatures. Although the boilers of Indian power stations are specifically designed to burn Indian coals, coal quality improvement is important for both economic efficiency and environmental management.

2. There are two ways to improve coal quality: (i) coal beneficiation by washing and (ii) selective excavation. In order to promote coal beneficiation and improved mining methods, proper incentives should equitably distribute the financial costs and benefits of cleaner coal to both producers and consumers and impose appropriate penalties for quality below agreed levels. Price deregulation and contractual arrangements specifying quality of coal would contribute to the creation of an incentive structure that would promote further coal beneficiation.

3. Since Coal India does not practice selective excavation, the CSRP would provide technical assistance (procurement of the required equipment) for four pilot projects to test such mining under different conditions. Annex 3.3 provides a detailed analysis of measures to improve coal quality.

4. THE COAL SECTOR REHABILITATION PROJECT

PROJECT OBJECTIVES

4.01 The main project objectives are to support the market-oriented reforms India is undertaking in the coal sector and, specifically, to provide financial and technical support to Coal India's efforts to make itself commercially viable and self-sustaining. Underpinning India's broad drive to achieve economic growth, the project also aims to increase domestic supplies of coal, by financing investment in the most profitable 24 opencast mines of Coal India, for the power sector and other industries until imports and production from private investments can fill the emerging supply gap.

RATIONALE FOR BANK INVOLVEMENT AND LINK TO COUNTRY ASSISTANCE STRATEGY

4.02 Link to Country Assistance Strategy. The project is consistent with the Country Assistance Strategy discussed by the Board on June 20, 1995 and the Progress Report discussed on September 5, 1996. The strategy emphasizes continued Bank/IDA support for India on: (i) the reform of policies in key sectors of its economy; (ii) the rationalization of energy policy, in particular the pricing policies for various energy resources; (iii) the reform of public sector enterprises; (iv) the enhancement of the social and environmental sustainability of the Government's investment program; and (v) improving environmental protection, by strengthening capacity to deal with environmental issues and to enforce environmental legislation.

4.03 Consistency with the Bank's Energy Environment Strategy. The World Bank is presently in process of preparation of a draft energy and environment strategy paper to be presented to the Board. The proposed project is in line with current strategy which:

(a) supports energy production, conversion and consumption that is efficient, private-sector oriented and environmentally and socially sustainable

The CSRP incorporates comprehensive policy reforms (such as price, distribution and trade liberalization) to promote the efficient extraction and use of coal. The price liberalization allows mining companies to adjust coal prices to economically valid levels, thus contributing to the efficient allocation of scarce resources. This expected allocative efficiency would promote the demand-side management of energy, because the coal price increase will be reflected in the tariff adjustment by power companies. Price liberalization would also permit coal producers to internalize the costs required for coal quality improvement through washing or selective mining methods.

(b) promotes implementation of efficiency and private-sector development through sectoral dialogue and commitment-based lending operations, as underpinned by economic and sectoral analysis

By promoting a greater role for private investors and trade liberalization, the CSRP promotes competition that will stimulate Coal India to improve its efficiency and coal quality. Commercial coal sales contracts, to be introduced under the CSRP, stipulating the precise quality of coal to be supplied will also provide Coal India with an incentive to providing a higher quality product. Such an improvement in quality will reduce coal-related pollution and improve the efficiency of power plants.

(c) promotes implementation of sustainability through environmental and social assessment practices prescribed in the relevant Bank operational polices

The ESMP addresses the specific, project-linked social and environmental issues. The corporatization program of Coal India and its subsidiaries will hold each subsidiary accountable for full implementation of the environmental and social mitigation activities agreed under the ESMP.

4.04 Rationale for the Bank's Involvement. The proposed project is a large, complex operation including sector reforms, corporate restructuring and environmental and social mitigation activities. The sector knowledge and experience that the Bank has accumulated through five previous lending operations with Coal India, as well as the extensive policy dialogue on sector reforms, would allow the Bank to effectively assist the Government and Coal India in implementing the comprehensive strategic approach which this project requires. Given the large financing requirement and the fact that Coal India's financial health depends upon the expeditious implementation of the proposed reforms and restructuring, only the Bank, together with the Export-Import Bank of Japan, has the resources to finance the proposed operations.

PROJECT DESIGN

4.05 Coal India's short-term strategy seeks to improve its financial performance, making investments without further Government support. In line with this strategy, the Bank's involvement would be limited to investments in highly profitable and economically viable opencast mines that have no major environmental or social problems. To minimize the investment costs and implementation period, only existing mines and projects under implementation are eligible for Bank support.

PROJECT COMPONENTS

4.06 To meet the above project objectives, the proposed project would consist of:

(a) **Investment Component:** high-return and quick-disbursing investments to maintain or improve the profitability of the 24 existing mine subprojects listed in Annex 4.1; and

(b) **Technical Assistance and Training Component:** a study of the rules and regulations governing the coal industry, in light of the Government's decision to open up the coal sector to private investors, and technical assistance to support Coal India's institutional capacity development in the project implementation and mining operations and management.

4.07 The IDA-financed Coal Sector Environmental and Social Mitigation Project (Cr. 2862-IN) is being implemented to assist Coal India in addressing environmental and social issues in the project areas.

Investment Component (US$1,364.3 million base cost)

4.08 Project Mines. The 24 project mines are opencast operations in ten coalfields under five subsidiaries in five States in east and central India. The Bank would finance the cost of a large fleet of heavy earth-moving equipment for replacement at 15 mines, for expansion at six mines, and for completion of construction in progress at three mines. Because of the emphasis on quick returns, no greenfield projects are included; the emphasis is on renewing and expanding existing opencast mines where the need for labor and production costs are low and where implementation is relatively quick. In 2001/02, the project mines would produce about 106 million tons of coal per year including added production of 13.4 million tons, about a third of Coal India's output in the same year. The criteria for selecting project mines are sufficient reserves, high productivity, short implementation period, no major environmental impacts, minimum requirement for resettlement and a financial rate of return above 16%. In addition to providing supplies for the cement industry, more than 85% of the planned increase in coal production is destined for use by existing power stations or new ones under construction in western, northwestern and southern states. Annex 4.1 lists the project mines, indicating location, mine profile, capacity, investment requirement and financial rates of return.

Technical Assistance and Training Component (US$14.0 million base cost)

4.09 The following technical assistance and training would be provided to support the sector reform program and to strengthen Coal India's capacity to implement the project and its restructuring program. The details of this component are presented in Annex 4.2:

(a) Rationalization of rules and regulations of the coal industry (US$1.70 million)

(b) Commercialization of coal sales (US$0.65 million)

(c) Improvement of CMPDI's design practices (US$1.65 million)

(d) Improvement in corporate financial planning and restructuring process (US$1.25 million)

(e) Training of Coal India's managers (US$0.75 million)

(f) Improvement of equipment utilization ratio (US$1.00 million)

(g) Procurement assistance (US$5.50 million)

(h) Coal quality improvement - mining methods (US$1.00 million);

(i) Assistance in project supervision (included in ESMP cost); and

(j) Studies already financed by the Project Preparation Funds (US$0.50 million).

COAL SECTOR ENVIRONMENTAL AND SOCIAL MITIGATION PROJECT (ESMP/CREDIT 2862-IN)

4.10 Given the social and environmental implications of the proposed project, agreement was reached in November 1995 with the Government of India and Coal India to package its social and environmental components as a free standing project for which IDA, in May 1996, approved a Credit of SDR 43.3 million (US$63.0 million equivalent). Through the implementation of high-priority environmental and social mitigation programs, the ESMP is assisting Coal India to strengthen its capacity to deal more effectively with environmental and social issues and to make coal production environmentally and socially sustainable. The results of environmental and social studies, the increase in staff with social and environmental expertise and enhancements to Coal India's policies for resettlement and rehabilitation, community development and environmental management (made by Coal India during preparation of this project to conform to the Bank Group's Operational Directives) will affect all of its 510 mining operations; they will be tested in the mines included under the proposed project. Details of the ESMP are available in the Staff Appraisal Report for the project (Report No. 15405-IN).

4.11 As requested by the Executive Directors during the Board presentation of the ESMP, the Region reported the implementation progress status of the ESMP (see Annex 4.3) to the Board on June 9, 1997, prior to the loan negotiations of the proposed project. With some delays, Coal India has met its undertakings under the ESMP Development Credit Agreement and put in place adequate structure and capacity for project implementation. The major challenges facing Coal India are implementing environmental remedial actions, internalizing a full-fledged community participation process, and developing and implementing a viable income restoration program. ***It has been agreed that Coal India shall, on the date on which the proposed loan and credit are declared effective, be in compliance with: (i) all obligations under the legal agreements pertaining to the ESMP; and (ii) all obligations relating to environmental and social mitigation set forth in Schedule 9 of the Loan Agreement and as also shown in Annex 4.4.*** It has been agreed that the Bank may suspend all or part of the proposed loan: (i) if Coal India shall have failed to perform any of the obligations relating to environmental and social mitigation shown in Annex 4.4; and (ii) if the Government or Coal India shall have failed to comply with their legal obligations under the ESMP. It has also been agreed that if the Bank determines that there is a breach of any of the obligations shown in

Annex 4.4 by any of Coal India's subsidiaries in respect of any one or more of the project mines, the Bank may decide not to finance from the proceeds of the loan the portion of any contract for goods or works that was allocated to such project mine or mines.

LESSONS LEARNED FROM PAST BANK PROJECTS

4.12 The Bank has made three loans to Coal India: in 1984, a loan of US$151 million for the development of the Dudhichua coal mine in Singrauli (Loan 2393-IN); in 1985, a loan of US$248 million for the development of the Jharia coalfield (Loan 2498-IN); and in 1987, a loan of US$340 million for the expansion of an opencast mine (Gevra) in the Korba coalfield, the construction of an opencast mine (Sonepur-Bazari) in West Bengal and imports of coking coal (Loan 2796-IN). In 1992, the Board approved a credit of US$12 million for a technical assistance project to deal with mine fires in the Jharia coalfield (Cr. 2450-IN). In May 1996, the Board approved a credit of US$63 million for the Coal Sector Environmental and Social Mitigation Project (Cr.2862-IN). Loan 2498-IN for the Jharia Coking Coal project was closed on December 31, 1992, Loan 2393-IN for the Dudhichua Coal project on March 31, 1993 and Loan 2796-IN for the Coal Mining Coal Quality Improvement Project on September 30, 1995. Implementation Completion Reports have been prepared for Loan 2393-IN, Loan 2498-IN and Loan 2796-IN and that of Loan 2393-IN has been audited by OED.

4.13 Several lessons can be drawn from these projects:

(a) Technical assistance greatly enhances chances of a project's being implemented properly and on time. That the Dudhichua mine is regarded as one of the most successful mines in the Singrauli coalfield is largely due to the considerable assistance and guidance from expatriate mining consultants during the initial construction of the mine;

(b) Project implementation units need to be strengthened, in particular to manage environmental and social action programs;

(c) Procurement under Bank-supported projects needs to be centralized and streamlined. Delays in procurement are the main cause for delays in implementation. All procurement should be carried out by a unit with specially trained staff to be established within Coal India on the basis of the Bank's standard bidding documents;

(d) Project-affected people must be informed about a project as soon as it is contemplated. Staff trained in community relations need to keep the affected people fully informed about a project and ensure full participation of all members of affected communities;

(e) If resettlement is involved, consultation with regard to rehabilitation options and the choice of resettlement sites needs to be substantially advanced before project start-up; and

(f) Community development and rehabilitation will go a long way towards reducing complaints and resolving existing problems; and

(g) Environmental management needs to be built into the design of the coal mine (e.g. plans for backfilling of overburden and reclamation of land).

ALTERNATIVE DESIGNS

4.14 Two alternative project designs were considered: a sector investment program loan without prior identification of subprojects and a fast-disbursing policy based loan to the Government in support of reforms in the coal sector. Experience with past projects in the coal sector have shown that delays in project implementation are quite common. To reduce the risk that the project would fail to achieve its objectives

due to implementation delays, the sector investment program loan option was discarded. A fast-disbursing policy based loan was also discarded because of India's improved balance of payment position.

PROJECT COSTS AND FINANCING

4.15 The total cost of the project would be about US$1.7 billion, including taxes and duties of US$238.2 million. Estimated foreign exchange requirements are about US$1.1 billion. The project cost estimates are shown in Table 4.1 and further details are shown in Annex 4.5. The proposed operation would be supported by a Bank loan of US$530 million to support the investment and technical assistance components and an IDA credit of US$2 million equivalent to finance the regulatory framework study. The Export-Import Bank of Japan is expected to provide co-financing with a loan to Coal India of US$530 million. ***The execution of the Development Credit Agreement and fulfillment of all the conditions precedent to its effectiveness or to the right of the Guarantor to make withdrawals thereunder, except only the effectiveness of the Loan Agreement are conditions for the effectiveness of the proposed loan. The execution of the Export-Import Bank of Japan Loan Agreement and fulfillment of all the conditions for its effectiveness, except only the effectiveness of the Bank Loan Agreement is a condition for the effectiveness of the proposed loan.*** Suppliers' credits of US$54 million will cover part of the investment costs, and Coal India will cover about US$500 million from internally generated resources and about US$82 million from borrowings in local capital markets. Details are shown in Table 4.2.

Table 4.1 Project Cost Estimates

Cost Components	*Foreign*	*Local*	*Total*	*Foreign*	*Local*	*Total*	*Foreign Exch*
		Rs million			*US$ million*		*Percent*
Civil works and coal handling plants	1,951.1	3,852.1	5,803.2	54.5	107.6	162.1	33.6
Equipment and vehicles	30,716.4	12,322.4	43,038.8	858.0	344.2	1,202.2	71.4
Technical assistance	408.1	93.1	501.2	11.4	2.6	14.0	81.4
Institution building	121.7	32.2	153.9	3.4	0.9	4.3	79.1
Policy support	50.1	14.3	64.4	1.4	0.4	1.8	77.8
Project implementation	236.3	46.5	282.8	6.6	1.3	7.9	83.5
Miscellaneous		179.0	179.0		5.0	5.0	
Base cost (1997)*	33,075.6	16,446.5	49,522.1	923.9	459.4	1,383.3	66.8
Physical contingencies	3,311.5	1,646.8	4,958.3	92.5	46.0	138.5	66.8
Price contingencies	3,243.5	3,050.2	6,293.6	90.6	85.2	175.8	51.5
Total project cost	39,630.6	21,143.5	60,774.1	1,107.0	590.6	1,697.6	65.2
Financing requirements	39,630.6	21,143.5	60,774.1	1,107.0	590.6	1,697.6	65.2

*Base cost includes taxes and duties of approximately US$238.2 million

Table 4.2 Financing Plan
(US$ million)

Source of Finance	*Foreign Cost*	*Local Cost*	*Total Cost*	*Shares*
IBRD	530.0		530.0	31
JEXIM	530.0		530.0	31
IDA	2.0		2.0	1
Coal India	10.2	571.4	581.6	34
Suppliers' Credits	34.8	19.2	54.0	3
Total	1,107	590.6	1,697.6	100

Source: Bank Staff Estimates

4.16 Proceeds of the proposed loan would be lent to Coal India for distribution as loans to five of its subsidiary companies: Central Coalfields Ltd. (CCL), Mahanadi Coalfields Ltd. (MCL), Northern Coalfields Ltd. (NCL), South Eastern Coalfields Ltd. (SECL), and Western Coalfields Ltd. (WCL) at the same terms as the Bank loan to Coal India plus service charges and guarantee fees. ***The execution of the subsidiary Loan Agreements on behalf of Coal India and the participating subsidiaries is a condition for the effectiveness of the proposed loan. Proceeds of the proposed credit would be lent to the Government of India.*** Moreover, It has been agreed that if the Government shall have failed to comply with its obligations under the Development Credit Agreement, the Bank may suspend all or part of the proposed loan.

5. PROJECT IMPLEMENTATION

IMPLEMENTATION ORGANIZATION

Implementing Agencies

5.01 While Coal India has overall responsibility, subproject implementation is the responsibility of its subsidiaries. The technical assistance and training component will be implemented by Coal India and the Government of India. The Ministry of Coal will be in charge of the study of the rationalization of the rules and regulations of the coal industry.

Coal India's World Bank Projects Division

5.02 To strengthen its project implementation and monitoring capacity, Coal India has set up a World Bank Projects Division which consists of: (i) a project implementation and monitoring cell; (ii) a procurement cell; (iii) an economic and financial evaluation cell; and (iv) an environmental and social cell. The division is headed by a Chief General Manager, assisted by 14 senior staff and a team of expatriate consultants for procurement. The Chief General Manager reports the activities of the economic and financial evaluation cell to the Director (Finance) and the activities of other cells to the Director (Technical). The functions of each cell are as following:

(a) **The project implementation and monitoring cell** is responsible for preparation of equipment specification and procurement schedules and monitoring subproject implementation;

(b) **The procurement cell** is preparing bid packages for the goods and services in line with the implementation schedules and will carry out all procurement activities in line with the Bank's procurement guidelines. The Bank-financed (PPF) expatriate consultant team is providing technical assistance.

(c) **The economic and financial evaluation cell** is responsible for the financial and economic evaluation of subprojects in line with Bank practices. It will assist in implementing the CSRP and monitor the financial and economic performance of the subprojects; and

(d) **The environment and social cell** is assisting each subsidiary in the implementation of environment and social mitigation and mine-safety activities under the ESMP.

Implementation Plan

5.03 Taking into account Coal India's experience with similar mine projects, implementation is estimated in five years. The implementation plan of each subproject is shown in Annex 5.1 In the past, delays in land acquisition, governmental clearance for environment, lack of effective social and environment policies and procedural delays in procurement of goods and services have been the main causes for slippage. Most of these issues are now being effectively dealt with under Environment and Social Mitigation Project (Cr.2862-IN). Bank staff, with assistance from foreign technical experts, have reviewed the mine design, equipment configuration and the design of the bid packages and found them acceptable.

Monitoring and Evaluation

5.04 Considering the large number of subprojects spread over ten coalfields in five States, it has been agreed that Coal India will maintain a project monitoring consultancy team, satisfactory to the Bank, for the duration of the project to assist the project implementation and monitoring cell in periodic review and assessment of the subprojects' progress in line with annual supervision plans acceptable to the Bank. The team would visit project sites quarterly and report to Coal India and the Bank. Coal India will submit comments based on the consultants' reports to the Bank within one month after receipt of the report.

BANK'S SUPERVISION STRATEGY

5.05 Since the Bank will be unable to carry out regular on-site supervision of each subproject, it will base its oversight primarily on the review of the consultant team's quarterly progress report. The Bank will concentrate its supervision efforts on: (i) supervision of major subprojects with investment costs exceeding US$50 million each, namely Nigahi, Dudhichua, Jayant (NCL), Dipka, Kusmunda, Gevra (SECL) and Rajrappa (CCL); (ii) the subprojects with major implementation problems identified by the supervision consultant team; (iii) the implementation of agreed sector reforms by the Government; (iv) implementation of the agreed financial restructuring, corporatization program and productivity improvement measures (in particular BCCL and ECL); and (v) implementation of the technical assistance and training component.

5.06 In addition to the detailed implementation plan (Annex 5.1), performance and monitoring indicators have been established to provide tools for monitoring the project's progress and the extent to which it is meeting its development objectives (see Annex 5.2). ***It has been agreed that the Government and Coal India will carry out a midterm review of the project before January 31, 2000 regarding the regulatory framework study component and before June 30, 2000 regarding the investment and other technical assistance components and thereafter implement their recommendations.*** An indicative supervision plan is provided in Annex 5.3.

PROCUREMENT

5.07 The proposed loan finances the procurement of mining equipment, surface infrastructure, telecommunication equipment and a technical assistance and training program. A summary of procurement arrangements for all goods and services is shown in Table 5.1, and the schedule of procurement is shown in Annex 5.4 along with details of the procurement arrangements. The Bank and the Export and Import Bank of Japan would finance the goods, infrastructure and services, in equal proportion, with the exception of the regulatory study to be financed by an IDA credit of US$2 million equivalent. The total value of all elements amounts to approximately US$1.7 billion out of which the proposed loan, together with the cofinancing loan of the Export and Import Bank of Japan, would finance US$1,060 million.

5.08 There are 44 equipment and infrastructure packages and nine consultant contracts. There are no civil works contracts, but four coal handling plants involving some civil works will be designed as turnkey contracts. All of the equipment and infrastructure packages will be subjected to ICB procedures as per Bank guidelines, and seven consultant contracts will be international requests for proposals as per Bank guidelines. Procurement of equipment will include spare parts and components for the first three years of operation, including float engines and major sub-assemblies which may be recommended by the manufacturers. Consultant contracts worth US$1.8 million financed by PPF have already been procured, and one consultant contract involving supervision common to the CSRP and the Coal Sector Environmental and Social Mitigation Project (Cr. 2862-IN) is being procured under the ESMP. Thirteen packages of mining equipment each valued at US$25 million or more account for 77% of all procurement values, and another 13

packages valued between US$7.5 and 25 million account for 14%. All equipment packages of US$5 million and above, all technical assistance proposals (none of them valued below US$0.5 million), and all of the turnkey contracts will be submitted to the Bank for prior review and approval before bid/proposals are let; the rest will be submitted to post review.

Table 5.1 Summary of Procurement Arrangements
(US$ million)

Project Components	*Procurement Method*			*N.B.F.**	*Total*
	ICB	*NCB*	*Other*		
Civil works and coal handling plants	65.6			125.2	190.8
	(28.3)				(28.3)
Equipment and vehicles	1,128.5			353.8	1,482.3
	(496.3)				(496.3)
Technical assistance			15.6	3.0	18.6
			(7.4)		(7.4)
Miscellaneous				5.9	5.9
Total	1,192.1		15.6	487.9	1,697.6
(Bank Loan/IDA Credit)	(524.6)		(7.4)		(532.0)

Source: Bank staff estimates
N.B.F.: Not financed by the Bank or Association

5.09 Standard bidding documents, agreed between the Government of India and the Bank and further modified to suit the coal mining industry and duly approved by the Bank, will be used for all procurement. As to foreign and local bids for plant and equipment and for infrastructure, domestic bidders will be allowed a margin of preference in accordance with the Bank's Procurement Guidelines. Consultant services for technical assistance (US$18.6 million) will be procured in accordance with the standard bid documents agreed between the Government of India and the Bank/IDA and following the "Guidelines for the Use of Consultants by World Bank Borrowers and by the World Bank as Executing Agency."

5.10 All awards of contracts for equipment over US$5 million equivalent, all turnkey contracts (coal handling plants), and all consulting contracts – about 97% of the project procurement packages – will be subjected to prior review by the Bank. In view of the large value of each procurement package, past Bank experience in coal mining projects, and considering Coal India's uneven performance record, such a high level of prior review is considered justified.

5.11 All bid documents for equipment required during the first two years (US$530 million) were submitted to the Bank prior to loan negotiations. A General Procurement Notice covering all goods and services was issued on April 16, 1997. Specific Procurement Notices will be issued after negotiations.

5.12 Inordinate delay involved in bid evaluation and award of contracts has marked past projects. According to Coal India's own procedures, award of all contracts over US$700,000 have to be approved by its Board that meets only once a month. Since the value of all the procurement packages will exceed that limit, Coal India's Board has decided to set up a subcommittee that will meet as often as is necessary to approve all procurement contracts under the World Bank project. This arrangement is considered satisfactory. Coal India will review the result of the streamlined procurement procedures by September 30, 1998. If this review reveals that Coal India cannot meet the standard period of 103 days between bid opening and contract award, Coal India will adopt further measures, satisfactory to the Bank, to address the identified deficiency.

DISBURSEMENTS

5.13 The proposed loan of US$530 million and the proposed credit of US$2 million equivalent are expected to be disbursed over a five-year period. Based on the assumption that the loan becomes effective on December 31, 1997, the loan and credit are expected to be fully disbursed by April 30, 2003. While the disbursement period of five years is substantially shorter than is indicated by the Bank's experience with earlier coal mining projects, the advanced stage of project preparation and procurement would permit Coal India to keep the expected disbursement schedules. The project is expected to be completed by December 31, 2002. The phasing of disbursements is shown in Table 5.2.

Table 5.2 Estimated schedule of disbursements
(US$ million)

Bank Fiscal	*IBRD*		*JEXIM*		*IDA*		*Coal India*		*Suppliers' Credits*	
Year	*Amt. Disb.*	*Cum. Disb*	*Amt. Disb.*	*Cum. Disb*	*Amt. Disb.*	*Cum. Disb*	*Amt. Disb.*	*Cum. Disb*	*Amt. Disb.*	*Cum. Disb*
FY 1998	2.3	2.3	0.3	0.3	0.2	0.2	41.6	41.6	24.1	24.1
FY 1999	121.1	123.4	121.1	121.4	0.6	0.8	155.6	197.2	29.9	54.0
FY 2000	226.2	349.6	226.2	347.6	1.0	1.8	188.4	385.6		54.0
FY 2001	90.8	440.4	90.8	438.4	0.2	2.0	96.6	482.2		54.0
FY 2002	73.6	514.0	73.6	512.0		2.0	79.4	561.6		54.0
FY 2003	16.0	530.0	18.0	530.0		2.0	20.0	581.6		54.0

Source: Bank Staff Estimates

5.14 The proceeds of the loan and credit would be disbursed within the categories in Table 5.3.

Table 5.3 Proposed Allocation of Bank Loan, JEXIM Loan and IDA Credit

Category	*IBRD*	*JEXIM*	*IDA*	*Percentage of Expenditures Financed*
Turnkey contracts (coal handling plants)	25.5	25.5		90% of expenditures
Equipment, vehicles and materials	446.6	446.6		100% of foreign expenditures
				100% of local ex-factory costs
				80% of other local costs
Technical Assistance*	5.0	5.0	2.0	100% of expenditures
Refinancing of PPF	2.0			
Unallocated	50.9	52.9		
Total	**530.0**	**530.0**	**2.0**	

Source: Bank Staff Estimates

5.15 To facilitate disbursements of the proposed loan a special account would be established with an authorized allocation of US$25 million, equivalent to about four months of average disbursements. Disbursements for contracts over the following limits will be on the basis of full documentation: consulting firms - US$200,000; individual consultants - US$50,000; equipment - US$5 million; and turnkey contracts. Disbursements for all other expenditures will be made on the basis of statement of expenditures (SOE) for both the credit and the loan. Documentation supporting SOEs would be made available for review by Bank supervision missions.

AUDIT

5.16 **Coal India.** Coal India's accounts are audited annually by the Comptroller and Auditor General of India. The audit, normally completed before September of the following year, must be submitted to Parliament for approval by November. Coal India's internal auditors carry out a continuous audit during the year, while the Corporate Management Group undertakes management audits on a regular basis. These arrangements are satisfactory. Coal India will submit to the Bank the audit report of the Special Account, Statement of Expenditures and project account and its audited financial statements (income statements, funds flow statement and balance sheet) and those of its subsidiaries within six months of the end of each fiscal year. Documentation supporting SOEs would be maintained at Coal India for at least one year after the completion of the audit for the fiscal year in which the last withdrawal was made.

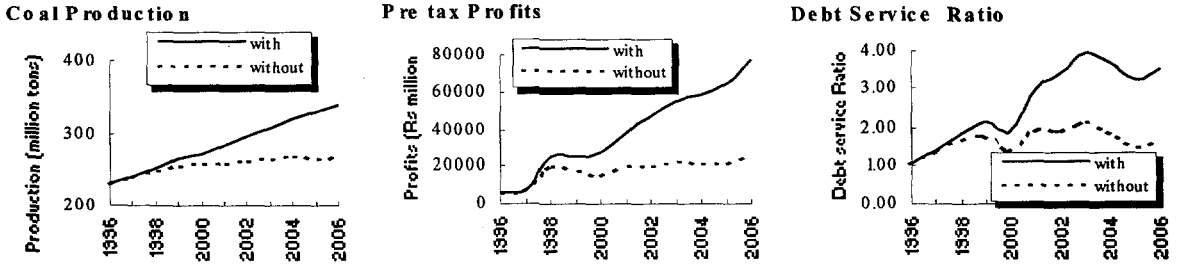
5.17 **Government of India.** Audits of the Central Account and financial statements of the project, including a separate opinion on Statement of Expenditures would be subject to normal Government accounting and auditing procedures which are considered satisfactory to IDA. Documentation supporting SOEs would be maintained at the Government of India for at least one year after the completion of the audit for the fiscal year in which the last withdrawal was made. The Government will submit to the Association the audit report of the Statement of Expenditures, if any, as well at the project account, within six months of the end of the fiscal year.

6. PROJECT JUSTIFICATION

MACRO-ECONOMIC CONSIDERATIONS

6.01 Until the last two years, when budgetary support was sharply cut, the Government financed between 70-90% of Coal India's investments. As a result, Coal India has had to curtail orders for equipment and shelve major expansion plans as well as investments in new mining projects; managers of many subsidiaries have been forced to cannibalize equipment for spare parts. Unless the company gains access to substantial external finance, our analysis shows Coal India losing significant capacity to meet projected coal demand over the next three years. Without a major injection of financial resources – such as the proposed project's support for mines that will produce about one third of Coal India's total output by the time the project ends, Coal India will enter a downward spiral of declining production and profits and a diminishing capacity to borrow (shown in Figure 6.1). Capacity constraints in ports and railroads, moreover, place a short-term ceiling on the volume of coal that can be imported. Since a decline in coal output would quickly lead to a drop in power generation [9] and eventually, a reduction in industrial output, efforts by the Ministry of Coal and Coal India to streamline performance and raise coal production without recourse to budget resources are therefore critical for the success of the Government's broader economic reform program.

Figure 6.1: The Impact of the Proposed Project



CORPORATE FINANCIAL ANALYSIS

Financial Projections

6.02 The financial model is structured to provide an income statement, balance sheet and cash flow in current prices for a 10 year period, the base year being 1996. Proforma statements are generated for each coal producing subsidiary. The results are consolidated to reflect the overall financial position of Coal India. The detailed basecase projections of this analysis are presented in Annex 6.1 and summarized in Table 6.1.

6.03 Notwithstanding the financial burden of ECL and BCCL, the base-case financial model demonstrates that Coal India as a whole can attain long-term financial viability if provided with sufficient loan capital and if sector reforms and restructuring measures are expeditiously undertaken. The major determinants of Coal India's financial health are an expected 8.8% annual increase rate in profits; the re-establishment of solvency with debt to total capitalization ratios (debt/debt+net equity) remaining below covenanted levels and debt service coverage rising fairly consistently; and operating efficiency improving with operation ratios declining to a level of around 0.8. Figure 6.2 is used to represent these trends as well as to outline the probable distribution of these results, in current terms, for each year over the period from 1997

[9] Partly because of coal shortage, the overall energy deficit has now reached about 14 percent with peak deficit getting close to 30%. This power shortage is estimated to cost India US$2-3 billion at least, about 1 percent of India's GDP.

to 2006. Notwithstanding the wide range of outcomes, it may be concluded within 90% confidence limits that the company will be able to:

(a) sustain the profitable trend established from 1991 to 1996;

(b) generate and reinvest sufficient internal resources to meet its debt obligations by maintaining a debt service ratio of at least 1.3 and sustain a reasonable capital expenditure program; and

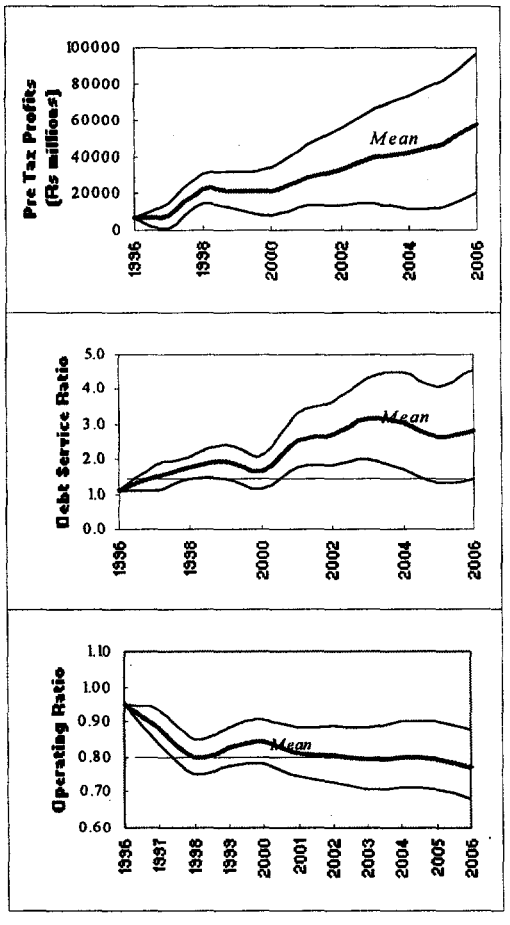
(c) improve its operating ratio from existing levels to around the target of 0.8. This target, however, will remain difficult to achieve as long as the excessive labor levels and operating ratios of greater than 1.0 are maintained at ECL and BCCL. Without substantial improvement in operational efficiencies, these operations will continue to struggle and undermine the financial performance of Coal India.

Table 6.1 Summary of Basecase Financial Projections
(Rs billions in current terms)

Year Ending March	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*
INCOME STATEMENT						
Coal Production (Mt)	248	259	270	279	290	302
Net Sales	126.5	157.9	174.1	190.8	208.9	229.6
Operating Income 1/	**25.5**	**47.9**	**49.8**	**53.6**	**66.5**	**76.8**
FUNDS FLOW						
Internal Resources	5.6	15.5	16.6	16.2	25.9	35.3
External Borrowings	2.2	4.6	12.8	12.5	10.2	11.4
Preference Capital	9.0					
NRF Grant		0.8	1.6	1.6		
Total Sources	**16.8**	**20.9**	**31.0**	**30.3**	**36.1**	**46.7**
Capital Expenditure	16.8	18.9	25.8	28.1	35.7	34.3
VRS Grant to Subsidiaries		1.2	2.4	2.4	0.7	0.8
Total Applications	**16.8**	**20.1**	**28.2**	**30.5**	**36.4**	**35.1**
BALANCE SHEET						
Current Assets	53.7	47.0	55.7	60.8	63.9	80.0
less Current Liabilities	52.1	39.1	43.2	46.8	45.6	45.8
Net Fixed Assets	125.0	130.4	141.3	152.6	169.5	182.6
Total Assets	**126.6**	**138.2**	**153.8**	**166.5**	**187.8**	**216.9**
Debt	62.8	61.1	63.8	62.3	61.1	62.4
Preference Equity	9.0	9.0	9.0	9.0	9.0	9.0
Equity	54.8	68.1	81.0	95.1	117.6	145.4
Total Capital Employed	**126.6**	**138.2**	**153.8**	**166.5**	**187.8**	**216.9**

Note 1. Profits are inflated in 1996 by the extraordinary write back of arrear interest waivers amounting to Rs8.9 billion.
Source: Coal India Ltd.

Figure 6.2 Results of Risk Analysis



Foreign Exchange Risk

6.04 The subsidiaries will bear the foreign exchange risk of the proposed Bank loan and JEXIM loan. This risk has been reflected in the projections by adjusting loan repayment by the differential exchange rate assumptions. Further devaluation is to large extent hedged, since its effects will be absorbed through the coal price mechanism as coal is internationally traded and denominated in US$.

FINANCIAL AND ECONOMIC ANALYSIS

Introduction

6.05 The Coal Sector Rehabilitation Project (CSRP) – specifically mentioned in the India Country Assistance Strategy (CAS), recent economic memoranda and several pieces of economic and sector works – is urgently needed to help India meet the growing needs of its power and industrial sectors. The CAS, the Country Economic Memorandum (CEM) and Economic and Sector Work (ESW) have clearly identified the need for increasing power production in India to support economic development. Since roughly two-thirds of India's power generation is coal-based thermal energy, coal will continue to play a dominant role in India's energy sector.

6.06 The CSRP contains a major policy component. As preconditions for Bank support, Coal India and the Government have taken steps to reduce the prevailing distortions in the coal sector. The price and the distribution of coking coal, and higher grades of non-coking coals have already been deregulated, and remaining grades will be deregulated by January 1, 2000. Duties on coal imports have been reduced drastically. There is a firm commitment to adopt measures to improve efficiency of operations of Coal India, including closing mines unlikely to become profitable and opening up the sector to private investors.

6.07 The involvement of public sector in the project is justified partly on the ground that it is a very important vehicle for promoting major reform in the coal sector and partly because coal-mining operations generate environmental impacts and involve resettling and rehabilitating people. The satisfactory implementation of the Coal Sector Environmental and Social Mitigation Project (ESMP) which deals with environmental and social concerns is a pre-condition for Bank support to CSRP. Without government involvement, much-needed policy reform would not advance, and coal sector development would be unlikely to follow an environmentally and socially sustainable path.

Factors Favoring the Project

6.08 There are several key factors that favor the project:

(a) Coal is the least-cost option: Based on Central Electricity Authority (CEA) planning studies, domestic coal is the least-cost option for base-load power generation in India, with imported

coal and petroleum products, natural gas and renewables supplementing rather than replacing domestic coal.

(b) Linkages between coal mines and power plants: Most of the coal mines included in the project would supply existing power plants and plants under construction. The location of the power plants has been selected on the basis of CEA's least-cost planning exercise, which takes into account all available options including imported coal. It correctly places power plants that burn imported coal at coastal sites in the Southern region -- locations where, because of high transportation costs, the incremental cost of imported coal is minimal at the minimum compared to domestic coal. The liberalization of coal imports will therefore, not change the location of relevant power plants. Given the fact that domestic coal is less expensive than imported coal, even after adjusting for coal quality, the domestic coal -- because of low production costs-- would remain the economic least-cost plan for base-load power generation.

(c) Plant specifications: Many of the coal users (mostly power plants) have equipment that is specifically designed to utilize domestic grades of coal, and would impose large costs on consumers if they had to reengineer in the short or medium term.

(d) The project benefits from large sunk costs. The projects are able to generate large benefits with incremental investments in existing facilities. Furthermore, subprojects are characterized by investments with short gestation periods in profitable mines involving the removal of bottlenecks to efficient and profitable operation and replacement of worn out equipment and expansion of mining operations in mines that are performing well. Selected from a large number of alternatives, the subprojects represent the best mines of Coal India.

Methodology and Results

6.09 The financial and economic rates of return for the core investment program were derived for each of the 24 subprojects and for the project as a whole. Using the expected net present value (NPV) as a criteria for acceptability, evaluation identified the subprojects that yielded non-negative NPVs at a risk adjusted rate of discount of 16% as qualifying for Bank financing. These projects would also yield economic and financial internal rates of returns that exceeded the opportunity cost of capital. Monte-Carlo simulation technique was used for analyzing risks, while net present values were calculated on the basis of incremental costs and benefit streams associated with each subproject and for the project as a whole. The assumptions underlying the financial and economic analysis are presented in Annex 6.2.

6.10 Project Costs. The capital cost is based on Coal India's and the mission's estimates of the cost component of each subproject. The cost estimates of equipment are based on the standard price list published yearly by CMPDI, a compilation of information based on the latest purchases by Coal India. In cases where no such purchases were made, budgeted prices from the suppliers formed the basis for the estimates using FY 1996-97 as the base year. The capital cost of individual subprojects include applicable taxes and duties and 10% physical contingency. All costs have been converted to their equivalent in 1996 US dollars.

6.11 The operating costs are based on Coal India's estimates of the operating costs for each subproject, derived from the schedule of additional coal production, overburden removal, and deployment of the machines and taking into account fixed and variable components of unit operating cost. The unit operating cost estimates, i.e. cost/m^3 are comparable with producing Coal India mines of similar nature. For replacement projects, however, the variable cost/incremental operating cost are company specific and are based on actual 1995-96 results. These costs reflect the variable costs per m^3 in opencast mines of Coal

India. Interest on working capital is based on historical levels of working capital requirements equivalent to four months operating cash expenses.

6.12 The financial costs were converted to economic costs by netting out duties and taxes, expressing the input content at c.i.f. prices and adjusting local cost components by applying the standard conversion factor of 0.8.

6.13 Environmental and Social costs. The project cost stream includes the environmental and social mitigation costs (including project implementation costs) as defined in the Coal Sector Environmental and Social Mitigation Project (ESMP). The main environmental effects identified under the ESMP include: air, water, and noise pollution; land degradation; and over burden dumps). The main social effect identified under the ESMP involves the resettlement and rehabilitation of people affected by the project (including land). A total of 16, 310 persons will be affected by land acquisition during project implementation. Of these 9,260 persons are above 18 years of age, and would be rehabilitated under the project. The environmental and social mitigation costs of 14 of the 24 subprojects are less than 5% of total project costs. For the project as a whole the environmental and social mitigation costs are also estimated to be under 5% of total project costs.

6.14 Project Benefits. Financial benefits are estimated on the basis of incremental coal production valued at prevailing prices – recently increased -- of specific grades of coal produced by the respective mines. In case of grade E and below, the prevailing price is the administered price. On April 1, 1997 Coal India increased prices of coal grades D, E, F, and G by 24-29% for all subsidiary companies, effectively narrowing the difference between the economic and financial prices. The most significant impact has been on MCL mines (producing grade F coal) and two WCL mines, viz., Durgapur and Padmapur (producing grade E coals) where the difference between the administrative prices and economic prices has come down to between 2% and 7%. Prior to the April 1, 1997 price adjustments economic prices were roughly 27% to 36% higher than financial prices for these mines.

6.15 Economic benefits are estimated on the basis of incremental coal production valued by using the lower of either, first, the imported price of Australian coal (c.i.f) at selected Indian ports plus inland freight costs to consumers, and adjusted for quality, less the freight charges for delivery of coal from mine mouth to the same consumer, or, second, the average incremental cost (AIC), appropriately adjusted for quality, reflecting willingness to pay. The AIC method estimates long run marginal cost (LRMC) by discounting all incremental costs (capital and operating) to be incurred to produce the estimated additional amounts of coal over a specified period of time, and dividing that by the discounted incremental output over that period. The AIC was used in cases where inland freight costs from ports to consumers were significantly higher than freight charges for delivery of coal from mine mouth to the same consumer. High transportation costs associated with land-locked mines preclude coal produced by these mines from being treated as a tradable commodity, especially because the quality of coal is poor. The derived economic price of steam coal produced from the project is roughly 2% to 58% higher than the prevailing financial prices. In the case of coking coal, which is treated as a tradable commodity, the resulting economic price comes out to between 16% and 20% higher than the prevailing financial prices.

6.16 For the economic analysis, the import parity price was used in the case of three mine projects, viz., Parej East, Rajrappa, and Umrer. The first two produce coking coal, while the last produces high quality non-coking coal. Incremental output from all other mines was valued at prices based on AIC, appropriately adjusted for heat content. The concept of pricing based on AIC was used because there is as yet no clear evidence of willingness to pay through a more market-determined pricing mechanism. The administered prices are low and distorted; while the recent price movements reflect the coal industry's transition, it will be a while before prices reach equilibrium.

6.17 Results. The price assumptions used in the financial and economic analysis and the base-case results are contained in Table 6.2 . Detailed results are in Annex 6.2. They show that investments for each of the 24 mines included in the proposed project yielded positive net present value at 16% discount rate and carried financial and economic rates of return in excess of 16%. The expected economic and financial NPVs of the overall project, at 16% discount rate, are US$1,634 million and US$945 million respectively. The main reason for the higher economic NPV *vis-à-vis* the financial NPV relates to the price assumptions used in the financial and economic analysis. Financial prices of coal are less than their economic value (discussed above), suggesting the prevalence of distortions in the pricing of coal.

Table 6.2: Financial and Economic Price of Coal
(Rs/ton)

Project Name	*Present Grade Price*[1]	*Economic Price*		*Financial NPV*	*Economic NPV*
		Import Parity Based	*AIC Based*[2]	*(at 16% discount) US$ Million*	*(at 16% discount) US$ Million*
CCL					
K.D. Hesalong	394.0	938.2	505.2	36.2	87.7
Parej East[3]	604.8	700.0	1087.4	32.7	65.6
Rajrappa[3]	848.0	1020.0	1279.3	81.2	116.1
MCL					
Lakhanpur	352.0	938.7	376.2	52.4	81.8
Samaleswari	352.0	526.0	376.2	28.9	41.5
Ananta	352.0	603.5	376.2	49.6	64.2
Bharatpur	352.0	553.4	376.2	80.6	104.6
Belpahar	352.0	1047.4	376.2	6.9	9.9
Jagannath	352.0	883.8	376.2	27.0	31.8
NCL					
Nigahi	524.9	1601.4	792.3	43.4	122.1
Dudhichua	535.4	1445.5	789.5	65.9	166.8
Bina	431.8	1428.3	622.4	7.6	28.1
Jayant	647.2	1757.6	1025.4	41.22	102.6
Jhingurda	436.0	1380.4	629.4	23.2	47.0
SECL					
Dhanpuri	536.8	1644.8	617.0	2.1	5.7
Dipka	352.0	1442.9	407.0	107.1	204.7
Kusmunda	402.4	1305.1	478.0	45.5	54.4
Manikpur	352.0	1306.7	407.0	8.3	13.8
Gevra	402.4	1442.9	478.0	34.5	51.7
WCL					
Durgapur	834.0	1391.1	846.9	44.0	50.2
Niljai	858.6	1389.7	1090.4	34.1	51.2
Padmapur	834.0	1391.1	846.9	33.6	38.1
Sasti	783.8	1426.4	1015.1	17.1	28.6
Umrer[4]	875.0	1163.8	1252.8	41.8	65.9
TOTAL				**945.2**	**1634.3**

[1] Refers to administered prices in case of Grade E, F and G (which are regulated). April '97 Wt. Av. Price.
[2] Based on AIC adjusted for heat content. It has been assumed that the stripping ratios of future mines of the coal companies are as under (m^3/T): MCL: 2.50, SECL: 3.00, CCL: 3.00, NCL: 4.00, WCL: 4.50.
[3] Economic analysis is based on import parity price calculated on the basis of netback price of low ash imported coking coal (adjusted for quality).
[4] Economic analysis is based on import parity price calculated on the basis of netback price of low ash imported steam coal (adjusted for quality).
Source: Coal India Ltd.

6.18 Impact of Demand adjustment to higher prices. A separate analysis observes changes in the overall project benefit stream as coal demand adjusts to increases in prices - from financial to economic levels. A medium-term price elasticity of coal demand of -1 was used. Results show that the economic NPVs, at 16% discount rate are reduced by US$51 million (to US$1,583 million).

6.19 Impact of environmental and social mitigation costs. Results show that internalizing the environmental and social mitigation costs in the economic analysis only marginally affects the economic costs of coal production, and therefore the economic viability of the project. Because of the high economic rates of return, the project could absorb additional environmental and social costs and still remain economically viable.

Risk Analysis

6.20 The financial and economic returns of the proposed investment program are subject to several uncertainties surrounding key variables – price, project implementation, capital and variable costs, and production. Based on the available information, a probability distribution for each of the variables was selected and a Monte Carlo simulation was carried out to generate a range of likely values. This simulation showed that investments for each of the 24 mines included in the program yielded positive economic and financial net present value at 16% discount rate after adjusting the opportunity cost of capital for the multiple and project-specific risks. The project as a whole yielded positive expected financial NPV (risk adjusted) of US$669 million, at 16% discount rate, and expected risk-adjusted economic NPV of US$1,282 million at the same discount rate. The Nigahi coal mine project is the only case where the risk adjusted financial NPV, at 16% discount rate, is break even. This project is justified on the basis of guarantees given by NTPC to pay a price that would enable Nigahi coal producers to earn a 16% financial rate of return at 85% capacity utilization. Assuming that NTPC fulfills its agreement, the financial viability of Nigahi is contingent on the fact that its capacity utilization, now 92%, will not slip below 85%. Experts estimate that new imported equipment made available under the project will allow further improvement in capacity utilization.

6.21 The possible financial internal rates of return, and net present values, and the likelihood of achieving them are presented in Annex 6.2. The Annex also summarizes the details of the probability distributions for different variables and the rationale for selecting them.

FISCAL IMPACTS

6.22 Although Government subsidy to Coal India has been eliminated, some Government support still flows in the form of loan. This project will not only allow Coal India to wean itself from public budgetary resources and mobilize resources on its own, but even to become a viable source of revenue. It is estimated that this operation will result in a net flow to the Government of about Rs30 billion (US$860 million) over the next ten years in nominal terms. Additionally, equipment purchases and coal sales under the project are estimated to generate revenue for the Government of up to Rs85 billion (US$2.4 billion) over the same period.

POLICY IMPLICATIONS

6.23 The higher economic returns vis-à-vis financial returns suggest the prevalence of policy distortions mainly in the pricing of coal which have the effect of taxing coal producers with a tax that varies across different qualities of coal. The main beneficiaries are coal users, mainly electric power producers, i.e., the state electricity boards (SEBs), and industries. Although, recent price increases have reduced distortions in

the pricing of coal, further steps are needed to eliminate the remaining distortions and narrow the difference between the financial and economic rates of return.

IMPACT ON THE POOR

6.24 Although the project is not directly targeted to the poor, it would help them indirectly by freeing up public resources for higher priority social expenditures and by accelerating economic growth through increased coal supplies to key power and industrial sectors.

PROJECT BENEFITS

6.25 In fostering coal industry reform by the Government and Coal India, World Bank support would

(a) significantly reduce the risk of lost momentum due to inadequate financial resources;

(b) further promote the critical deregulation of price and distribution controls and the opening of the sector to private investors;

(c) further facilitate the transformation of Coal India through technical and financial support into a commercially viable and financially self-sustaining coal company;

(d) safeguard in the short term the Government's broader economic reform effort by reducing the risk of a decline in indigenous capacity to supply the coal needs of the power sector and other industries until imports and production from private investments can fill the emerging supply gap;

(e) lend much-needed outside support to coal industry reforms by helping, *inter alia*, to attract financing from bilateral donors; and

(f) contribute to improving coal quality by assisting Coal India to introduce selective excavation methods and to develop coal supply contracts that reward providers of better quality coals and penalize suppliers of lower quality.

PROJECT RISKS

6.26 The proposed project faces three major risks: delays in implementing sector reforms, implementing the ESMP and in restructuring BCCL and ECL. These three concerns are discussed separately below.

Delays in Implementing Sector Reforms

6.27 Although the Government, by its actions, has clearly indicated a strong resolve to proceed with coal sector reform, some of the reform measures raise sensitive Central-State government issues, and some politicians and labor unions could resist opening the sector to private investors. Searching for consensus on these issues, the Government could temporarily slow the pace of the reforms. The timing of the full liberalization of coal prices could also be delayed if the SEBs were unable to improve their financial performance as a result of slow progress in the power sector reforms. Swift Government action to amend the laws in order to open up all undeveloped mines to private participation should preclude major delay in establishing the required legal framework, but actual private entry could be held up by the absence of clear, transparent procedures –unhindered by red tape -- to select licensees. These potential obstacles would not fundamentally affect either the financial and economic viability of the CSRP investment or the financial performance of Coal India. India's supply-demand gap of coal, however, would rise sharply if private investment is delayed. In such a case either energy imports would increase or, most probably, energy shortages would occur. Given India's reduced budget resources and the large investments needed to meet

the steadily increasing demand for coal, the reforms should continue without major delays in the medium and long term.

Delays in ESMP Implementation

6.28 Coal India is implementing with diligence the Environmental and Social Mitigation Project. However, CSRP is not totally free from the risk that the resettlement of project-affected people would not be implemented in a timely manner or – in the worst case facing 14 of 24 mines -- not implemented at all. If project-affected people refuse to move to the resettlement sites. In such a situation, Coal India would be obliged either to change the mining design and plan to avoid existing settlements while waiting the completion of the resettlement or to shift activities to other mining areas which would yield lower financial and economic net present value than the original subprojects. Coal India and its subsidiaries lack adequate experience in the implementation of Rehabilitation Action Plans and even more so, of the Indigenous Peoples Development Plans which are instruments new to Coal India. Beyond the agreements under the ESMP, Coal India has agreed to reinforce its capacity to deal with the social issues by significantly increasing its use of outside experts, appointing additional resettlement and rehabilitation/community development staff and reinforcing their training. The economic rehabilitation of project-affected people is the most difficult component of the Rehabilitation Action Plans. Assessment of progress of this component will be undertaken by an independent monitoring agency, review panel and supervision team. Under the supervision of the ESMP, the Bank is paying special attention to this component, where NGOs should help in candidly judging progress or its absence, and where, if required, reinforcement measures or alternative approaches would be proposed in a timely manner.

Delays in Restructuring BCCL and ECL

6.29. Provided that sector reforms and restructuring go ahead expeditiously and that it receives the proposed loan, Coal India as a whole can attain long-term financial viability. Further consolidating their financial positions, its profitable subsidiaries will generate sufficient internal resources to meet Coal India's debt obligation and maintain sustainable growth. However, the outlook for BCCL and ECL, where the success of restructuring depends on reducing surplus labor, is highly uncertain. The magnitude of the social constraint on their progress can be gauged by the fact that more than 1.5 million people -- assuming an average family size of five – depend on their economic activities. In addition, mining operations in remote areas provide primary job opportunities and most of the social infrastructure (housing, schools, hospitals, and water.) Experience in other countries has shown that a labor retrenchment program in the coal industry is a costly and lengthy process.

6.30 The pace of the restructuring of these subsidiaries will be constrained by their capacity to absorb adverse social impacts as well as that of the community and the Central and local governments. If they can reduce the labor beyond the level of the natural attrition through Voluntary Retirement Schemes, both BCCL and ECL should be able to turn around in five to six years. CIL and its two subsidiaries have chosen the proposed labor reduction plan based on a realistic assessment of their absorptive capacity, but if slow implementation of that plan or continued low capacity utilization ratio delay the turnaround, Coal India's agreed, "fire wall" corporatization program will effectively insulate its profitable subsidiaries from BCCL and ECL and their weak financial position. If the turnaround of these two companies is substantially delayed, the Government would either use dividend revenues from Coal India to cover their financial losses or take the hard decision to close these companies according to the Bureau of Industrial and Financial Restructuring (BIFR) rules. Further deterioration carries the risk that Coal India would increase its dividend payout ratio by depriving profitable subsidiaries of resources they need for growth. In any case, the proposed loan will not finance any investment in these two subsidiaries.

7. AGREEMENTS AND RECOMMENDATION

AGREEMENTS

7.01 The following agreements have been reached:

(a) Regarding the proposed credit, the Government has agreed to:

(i) deregulate pricing and distribution of remaining regulated low- grade steam coal by January 1, 2000(para 3.05);

(ii) a) not later than July 31, 1999, complete the study on the rules and regulations governing the coal industry in a manner satisfactory to the Association; b) not later than October 31, 1999, furnish to the Association for comments a draft timebound action plan regarding the implementation of the study's recommendations which are feasible; and c) not later than December 15, 1999, begin implementation of such action plan taking into account the Association's comments and in accordance with a timetable prepared in consultation with the Association (para 3.07);

(iii) take all necessary actions to obtain the relevant authorities' commitment to finance BCCL's and ECL's VRS through provision of the following amounts to, inter alia, the NRF by the following dates: a) Rs0.8 billion by March 31, 1998; b) Rs1.6 billion by March 31, 1999; and c) Rs1.6 billion by March 31, 2000 (para 3.11); and

(iv) carry out a midterm review of the regulatory framework study component of the project before January 31, 2000 and thereafter implement its recommendations (para 5.06).

(b) Regarding the proposed loan, Coal India has agreed that it will:

(i) not merge any of its subsidiaries and cause each subsidiary not to merge without the consent of the Bank (para 3.12);

(ii) conduct all financial transactions between itself and the subsidiaries, and cause the subsidiaries to conduct all financial transactions among themselves, based on written contracts (para 3.12);

(iii) limit all financial transactions between itself and the subsidiaries and cause all financial transactions among the subsidiaries to be limited, to those relating to equity acquisition, loans and commitment, guarantee and service charges, which may be levied by Coal India on the subsidiaries and other incidental transactions, which are paid within a twelve month period (para 3.12);

(iv) not lend, or otherwise make available to any of the subsidiaries other than BCCL or ECL, funds obtained by Coal India from external sources: a) for a time period different from that; and b) on terms more favorable than those, on which such funds shall have been so obtained by Coal India (para 3.12);

(v) limit its corporate guarantees, if any, to profit-making subsidiaries (para 3.12);

(vi) cause BCCL and ECL to maintain a debt to total capitalization ratio of no more than 70% during the period from FY1998 through FY2000 and of no more than 60% after FY 2000 (para 3.12);

(vii) maintain and cause each subsidiary other than BCCL and ECL, to maintain a debt to total capitalization ratio of no more than 60% (para 3.12);

(viii) cause BCCL and ECL from FY2001 to maintain a debt service ratio of at least 1.3 (para 3.12);

(ix) maintain and cause each subsidiary other than BCCL, ECL and CMPDI to maintain a debt service ratio of at least 1.3 (para 3.12); and

(x) carry out a midterm review of the investment and technical assistance components (except the study of the regulatory framework) of the project before June 30, 2000 and thereafter implement its recommendations (para 5.06).

7.02 The following conditions shall be met for the effectiveness of the proposed loan and credit:

(a) The Government has invited "expressions of interest" for the study of the rules and regulations governing the coal industry (para 3.07);

(b) Coal India is in compliance with: (i) all obligations under the legal agreements pertaining to the ESMP; and (ii) all obligations relating to environmental and social mitigation set forth in Schedule 9 of the Loan Agreement and as also shown in Annex 4.4 (para 4.11);

(c) the Export-Import Bank of Japan Loan Agreement has been executed and delivered, and all of the conditions for its effectiveness, except only the effectiveness of the Bank Loan Agreement have been fulfilled (para 4.15);

(d) the Development Credit Agreement has been executed and delivered and all conditions precedent to its effectiveness to the right of the Guarantor to make withdrawals thereunder, except only the effectiveness of the Loan Agreement, have been fulfilled (para 4.15); and

(e) the subsidiary Loan Agreements have been executed on behalf of Coal India and the participating subsidiaries (para 4.16).

RECOMMENDATION

7.03 On the basis of the project justification and the agreements reached during negotiations, the proposed project would be suitable for an IBRD loan of US$530 million to Coal India Ltd. on standard terms and, also on standard terms, an IDA credit of US$2 million equivalent to the Government of India.

ANNEX 2.1 HISTORY OF COAL INDUSTRY IN INDIA

1. Modern coal mining in India started nearly 200 years ago in Ranigunj coal field, about 120 miles west of Calcutta. Coal mining gradually spread to other parts of India as the railway networks developed. By 1900, almost 80% of the country's coal production of six million tons came from Jharia and Ranigunj coal fields. The principal consumers were the Calcutta based industries and shipping bunkers and the railways operating from Calcutta. Imported coal from the United Kingdom and South Africa was cheaper on the west coast. The two World Wars gave boosts to Indian production as imports from distant countries became uncertain. Production rose to 22 million tons at the end of the First World War and, after suffering during the depression, climbed to 26 million tons at the end of Second World War. The country suffered severely from a shortage of coal during the post war development period.

2. During the 1950's and 1960's (the post-independence period) coal production could not grow at more 2-3% per year due to infrastructure problems. In addition, the industry was severely constrained by Government intervention, which began during the Second World War and continued unabated long after the war emergency ended. Increasing production to meet the war time needs left many of the mines severely depleted of new development leading to slaughter mining, which endangered the safety of the mine and its workers.

3. Until the early 1970's coal production was mostly in the hands of privately owned mining companies. Selective mining of easily accessible high quality coal and the availability of inexpensive labor attracted a large number of small investors. Apart from the usual arrangements that entitled the mining lessees to operate in certain areas, neither the State governments nor the Government of India exercised any control over the welfare of the industry. With the Government program of industrialization, the growth of coal based power generation and the expansion of the steel industry, the Government became concerned about the willingness and the ability of the large number of small private owners to invest in their operations in order to meet the projected growth in demand.

4. Though the country was going through an acute shortage of coal, for decades the threat of nationalization kept private mine owners from making any new investments to expand production. Mining equipment which was severely overused during the war was not replaced. In addition, coal prices, which were set by the Government at levels that were barely remunerative or sufficient to cover the input costs, provided little incentive for the infusion of fresh capital. The resulting decline in investments and mechanization led to a drop in productivity and squeeze in profit; this in turn encouraged mine owners to cut corners. The results were appalling labor conditions and a disregard for sound mining practices in favor of short term profits.

5. These problems were compounded by the Government's policy of imposing state control on further development of power, steel, coal and other sectors which it considered core parts of the economy. Legislation restricting the private sector from opening new mines outside their existing leaseholds was passed. A new Government owned coal mining company was set up for further expansion of coal production. Though coal price regulation was temporarily withdrawn in 1967, the Indian Railways, which were the largest single consumer at that time, dictated the base price increase. The increase always fell short of cost escalations and led to unscrupulous mine owners not paying proper wages and welfare benefits to their workers. Many well intentioned welfare and safety laws remained only on paper, while the mine workers continued to be deprived of full and fair wages and benefits.

6. In 1971, to deal with the deteriorating situation, the Government of India took over the management of all mines producing coking coal, and in 1973, all mines producing thermal coal. These

were formally nationalized during the next two years. The ownership and management of all coking coal mines in Jharia coalfield feeding the steel plants and other metallurgical industries were placed under the Bharat Coking Coal Limited (BCCL), Dhanbad, and this company was placed under the overall control of the Steel Authority of India Ltd. (SAIL). The other mines were placed under the Coal Mines Authority Ltd., with its headquarters in Calcutta. The Government did not nationalize the coking coal mines captive to steel plants of Tata Iron and Steel Company, but those belonging to Indian Iron and Steel Company were later nationalized as a part of the steel plant itself. The Government also took interest in the State owned Singareni Collieries Co. Ltd. in Andhra Pradesh and started financing its large scale expansion program.

7. In 1975, the Government consolidated control over the coal industry by transferring the ownership and management of all nationalized coal mines to the newly established Coal India Ltd., headquartered in Calcutta. Today through its subsidiaries, Coal India controls almost 90% of the country's total coal production of 288 million tons. Lignite production, which amounts to about 19 million tons comes from Government-owned Neyveli Lignite Corporation Ltd. in Tamil Nadu, an integrated producer of lignite, power and fertilizer. A small quantity of lignite is also produced by the Gujarat State Mineral Development Corporation. These steps have ensured that the Government is in charge of almost all solid fuel production in India.

ANNEX 2.2 COAL INDIA

1. Coal India was established as a Government-owned private limited company, under the Indian Companies Act, in 1975. It is the largest public sector enterprise in terms of employment and one of the world's largest coal company in terms of production. It currently employs 636,000 people and produces about 250 million tons of coal a year. It is structured as a holding company with eight subsidiaries: Bharat Coking Coal Ltd. (BCCL), Central Coalfields Ltd. (CCL), Eastern Coalfields Ltd. (ECL), Mahanadi Coalfields Ltd. (MCL), Northern Coalfields Ltd. (NCL), South Eastern Coalfields Ltd. (SECL), Western Coalfields Ltd. (WCL), and the Central Mine Planning and Design Institute Ltd. (CMPDI). All of these except CMPDI are production companies. Coal India's headquarters is located in Calcutta, and they maintain offices in almost all State capitals. It has a staff of 1,600 and an annual budget of Rs1.8 billion (US$60 million). Coal India has total assets of US$5 billion, an equity of US$1.8 billion, and has achieved modest profits since 1990. In 1995/96, its net sales were Rs104.4 billion (US$2.9 billion) and its profit after tax was Rs6 billion (US$168 million).

Coal India's Function, Organization and Management

2. Important management decisions are taken by a Board of Directors, which consists of the Chairman of Coal India, three directors (Director (Technical), Director (Finance) and Director (Personnel)), two senior civil servants from the Ministry of Coal, one member each from the Railway Board and the Central Electricity Authority, one or two Managing Directors from the subsidiaries, and one or two well known management experts. (Figure 2.1 shows the basic organizational structure of Coal India and its subsidiaries. Board members are selected by the Government and appointed by the President of India. Coal India's main functions are to:

(a) advise the Government on policy matters related to the coal industry, the demand for coal, the investment program for the coal industry, coal production targets, and the implementation of the coal pricing policy;

(b) prepare and implement a long-term corporate policy, annual corporate production plans and budgets;

(c) oversee the operations of the subsidiaries, control inter company cash flows, and administer the investment fund;

(d) negotiate a national wage structure for coal miners with trade unions and liaise with them to ensure harmonious industrial relations;

(e) negotiate coal supply contracts with major consumers, such as State Electricity Boards and steel plants, monitor the distribution of coal and coal products throughout the country, and liaise with State Governments and coal consumers' associations;

(f) recruit, train and manage cadres of all executive staff;

(g) approve investment projects valued at Rs200-500 million (US$6-16 million) and review and recommend others exceeding these amounts for the Government's approval;

(h) monitor and review the progress of all projects with investment exceeding Rs200 million (US$6 million) and submit progress reports to the Ministry of Project Implementation for projects with investment of Rs1 billion (US$30 million) and above;

(i) procure all goods and services from abroad, some specified heavy earth-moving equipment and other goods in short supply within the country;

(j) negotiate World Bank and bilateral foreign collaboration project loans and monitor their implementation;

(k) plan research and development activities for the coal industry and promote introduction of new technology; and

(l) manage operations of mines in North East Coalfields and Dankuni Coal Complex near Calcutta which produces smokeless fuel and coal gas.

Roles of the Subsidiaries

3. Each subsidiary is managed by a Board of Directors with a Chairman-cum-Managing Director (who reports to Chairman, Coal India) as the Chief Executive. He is assisted by four full-time and four or five part time Directors that deal with production-related matters, the implementation of new projects, finance matters and personnel issues. The 'functional' directors report to the respective Coal India Directors on subject-related issues, but are placed administratively under the Chairman-cum-Managing Directors. The part-time directors represent the Ministry of Coal, the local railways, local State Electricity Boards (SEBs) and Coal India, and provide advice on management-related issues. All directors are nominated by the Government. The main functions of the subsidiary companies are to:

(a) manage all operations under their control and conduct mining operations with due regard to safety, conservation of resources, and workers' health and welfare;

(b) sell coal and realize proceeds, royalties, cesses and taxes on behalf of the Government;

(c) control service conditions and manage workers and non-executive cadres;

(d) acquire land and attend to resettlement and rehabilitation and environmental issues;

(e) liaise with local trade unions to maintain harmonious industrial relations;

(f) liaise with representatives of State Governments, railways and SEBs;

(g) approve projects with a capital investment up to Rs200 million (US$6 million), and implement, monitor and review the progress of all investment projects and submit periodic reports to Coal India;

(h) effect payment of wages and salaries to all employees and the bills of contractors; and

(i) procure all capital and consumable goods (other than those procured by Coal India) and supervise their efficient distribution and storage and utilization.

4. Subsidiary companies have three levels of management: Corporate level, Area level and Mine level. Each company is divided into a number of Areas and each Area has a number of operating mines and projects under implementation. The number of Areas in a company varies depending on the number of mines or project units, the type and complexity of the operations, and the manpower deployed. Larger mines or projects are often treated as an Area.

5. **Area Management.** Each Area is managed by an Area General Manager, usually a mining engineer with about 25 years of operational experience. He is assisted by a team of 10-12 engineers and other professional staff. They are responsible for the supervision and monitoring of all activities at the mine or project level. The Area office is also in charge of land acquisition and the implementation of Coal India's policy for resettlement and rehabilitation as well as its corporate environmental policy. The Area General Manager reports to the functional directors on the respective functions, but administratively he is answerable to the Managing Director of the subsidiary company.

6. **Mine Management.** Production mines and mines under construction are managed by Mine Managers, usually mining engineers with 15-20 years experience. The Mine Manager is the linchpin for all production and project implementation activities. Each manager is assisted by a Pit Manager and a number of assistant and undermanagers, all mining engineers. Their number is determined by Coal Mines Regulations and varies with the volume of production and the complexity of the operations. In addition, each Mine Manager is assisted by a number of other professionals in engineering, accounts, implementation of environmental and rehabilitation action plans and labor welfare measures.

Project Implementation Arrangement at Subsidiaries

7. Physical implementation of the projects is the responsibility of the subsidiaries. The Director (Planning and Project) at each subsidiary is in charge of all projects from planning to implementation. He is assisted by senior managers and a Mine Manager. These managers all have 15-20 years experience. The Mine Manager is assisted by a team of staff drawn from mining, excavating, electrical and mechanical, civil engineering, environment, social welfare and other disciplines. The office of the Area General Manager and the Chief General Manager for Planning and Projects (at the headquarters of the subsidiary) monitor the implementation of projects. The Project Monitoring Cells at Area offices are manned by two or three senior level engineers who visit the projects and assist in organizing resources.

Operations

8. Coal India has 510 mines, 16 coking coal washeries and several large workshops. Production totals about 250 million tons per year. Activities are spread over 18 coalfields in eight States in eastern and central India. The mines are regionally grouped together under seven subsidiaries. The operations of each subsidiary are outlined in the following paragraphs and detailed in Tables 2.2.1 and 2.2.2.

9. **BCCL** was created after the nationalization of coking coal mines in 1973 and was formerly a subsidiary of the Steel Authority of India Ltd. (SAIL), a wholly owned Government of India enterprise. It was transferred to Coal India in 1975 along with four coking coal washeries belonging to SAIL. With its headquarters at Dhanbad, Bihar, BCCL operates 93 mines (27.8 million tons) and nine coking coal washeries in Jharia and Mugma coalfields of eastern Bihar. The underground mines in Jharia are old and suffer from water and fire hazards. An IDA financed project, Jharia Mine Fire Control Technical Assistance Project (Cr. 2450-IN), is already studying the fire problems. Underground mines are old and not economical but they are the sole source of prime coking coal in India. After nationalization, a few mechanized surface mines operating in lower quality steam coal were opened. The overall productivity and efficiency are very poor, the company has not made any profit since its inception. It is now placed under BIFR, equivalent to Chapter 11 provisions of United States bankruptcy laws. With the recent deregulation of coking coal prices, the losses are likely to come down.

10. **CCL**, with its headquarters in Ranchi, Bihar, is the successor to the former Government owned National Coal Development Corporation (NCDC). CCL operates 74 mines (30.8 million tons) and five coking coal washeries (one more is under construction) in the Chotanagpur region, but most of the production (88%) comes from surface mines. The company is the major source of medium coking coal in India. The productivity of underground mines and many of the surface mines is low, but because of the high priced coking coal, the company has been making marginal profits or losses. With the recent deregulation of coking coal prices, the profitability of the company is expected to improve.

11. **ECL**, with its headquarters at Sanctoria, 120 miles north-west of Calcutta, is the biggest subsidiary in terms of employment. It has 127 mines (production 27.8 million tons) mostly located in the

Ranigunj coalfield of West Bengal and the adjacent coalfields of eastern Bihar. It has some of the oldest and the deepest mines in the country, which are the sole source of low ash high calorific value coal in India. The company produces a small quantity of semi-coking coal used by the steel plants for blending. The low ash steam coal is used for pulverized fuel injection in blast furnaces. The productivity and efficiency of underground mines are very poor; ECL has not recorded any profit during the last 20 years. A few opencast mines begun after nationalization show moderate profits, but overall the company sustains heavy losses and is subsidized by the profit making companies. With the recent deregulation of prices of higher grades of steam coal and semi-coking coals, the losses are expected to reduce.

12. **MCL** is the youngest coal company. It was carved out of CCL and SECL in 1992. It operates 20 mines (32.7 million tons) in Talcher and Ib Valley coalfields with its headquarters at Sambalpur, Orissa. MCL's underground mines are old and suffer from low production and productivity. Most of MCL's production (94%) comes from highly mechanized opencast mines operating in very thick seams close to the surface. The coal produced from these mines is inferior in quality and suitable only for power generation. The Ib Valley mines (on the east-west railway system from Calcutta to western India) are a major source of power grade coal for the western regions. Similarly, Talcher mines located closed to the east coast rail system from Calcutta to South India are the main source of steam coal for consumers in the south. Though the availability and utilization of opencast equipment is low by international standards, the company makes a profit due to very favorable working conditions at its surface mines.

13. **NCL** has its headquarters in Singrauli and has ten large highly mechanized opencast mines (35.2 million tons) and a steam coal washery in a Singrauli coalfield. The coalfield extends over the border of northeast Madhya Pradesh and southeast Uttar Pradesh. The company was carved out of CCL in 1985 with the mines formerly owned by NCDC. Most of the coal is medium to low quality, suitable for cement and power industries. It is the primary source of coal for the industries in north, northwest and west India. It has the only steam coal washery in India but the plant has not been commissioned due to the absence of any contract for the sale of washed coal. The company operates a large fleet of opencast equipment but availability and utilization are low by international standards. Despite that, because of the favorable working conditions and a high degree of mechanization, the company makes good profit.

14. **SECL** has its headquarters in Bilaspur, Madhya Pradesh and is the largest subsidiary company in terms of production (53.2 million tons). It was carved out of CCL and WCL in 1985 and consists of underground and opencast mines formerly owned by NCDC. Its 91 mines are spread over ten coalfields in eastern Madhya Pradesh. These coalfields are the only major sources of good quality steam coal outside of ECL. The geological conditions are favorable, so the productivity of underground mines is better than that of the other companies, and they yield marginal profit. But the majority (70%) of the production comes from highly mechanized opencast mines which produce lower quality coal. SECL is an important source of coal supply to the cement and power industries in the center, west and northwest of India. Since the opencast mines are highly profitable the company yields a profit. With the recent deregulation of superior grades of coal, the profitability of the underground mines is expected to improve.

15. **WCL** has its headquarters at Nagpur, in the eastern Maharashtra, about 450 miles east of Mumbai and operates 88 mines (29 million tons) and a coking coal washery. Situated close to the industrialized States of western India, its production is in great demand. The underground mines are beset with geological problems created by water bearing strata above the coal bed, and most of the opencast mines started after nationalization face similar problems. The opencast mines are important sources of power grade coal for western India. Despite difficult working conditions, the productivity at both underground and opencast mines is moderate, and the company has been making a small profit.

Under the recent notification on the deregulation of coal prices, WCL received two benefits: realizing higher prices for its small quantity of superior quality coal and a special regional price for its lower grades of steam coal. This will improve the profitability of the company. As a first step towards private sector entry into the coal sector, the Government has also recently agreed to divest ten percent of WCL equities to the private sector.

16. The **Central Mine Planning and Design Institute** (CMPDI), a wholly owned subsidiary of Coal India, plans and designs all Coal India projects in-house. It was designed and set up in 1970's in collaboration with similar institutions in Poland and the former Soviet Union. Most of its staff have been trained in those countries or by their experts in India. CMPDI employs about 4,000 people at seven regional centers and at its headquarters in Ranchi, Bihar. It is fully equipped to carry out virtually all aspects of mine design including geological exploration, environmental studies, and detailed design of underground and opencast mines, coal preparation plants, workshops, residential colonies for employees and all civil structures.

Table 2.2.1 Underground and Opencast Production by Company - 1995-96

Company	*Number of Mines*				*Production (million tons)*		
	Opencast	*Underground*	*Mixed*	*Total*	*Opencast*	*Underground*	*Total*
ECL	23	104	-	127	14.1	13.7	27.8
BCCL	13	57	23	93	17.7	10.1	27.8
CCL	38	26	10	74	26.9	3.9	30.8
MCL	11	9	-	20	30.8	1.9	32.7
NCL	10	-	-	10	35.2	-	35.2
SECL	17	71	3	91	37.9	15.3	53.2
WCL	30	58	-	88	19.4	9.6	29.0
NEC	2	4	1	7	0.5	0.3	0.8
CMPDI	-	-	-	-	-	-	-
CIL & others	-	-	-	-	-	-	-
Overall	144	329	37	510	182.5	54.8	237.3

Source: Coal India Ltd.

Table 2.2.2 Profits and Productivity by Company - 1995-96

Company	*Gross Sales*	*Profit/Loss*	*Manpower*	*Productivity (OMS)*		
	(US$ million)		*'000*	*Opencast*	*Underground*	*Overall*
ECL	553.6	-111.0	161.7	3.31	0.44	0.76
BCCL	523.7	-60.0	147.4	2.37	0.55	1.00
CCL	516.2	-48.6	92.8	2.55	0.45	1.60
MCL	353.3	94.0	23.0	12.77	0.69	6.33
NCL	544.7	148.6	16.7	8.14	-	8.14
SECL	784.8	131.4	99.0	8.84	0.86	2.44
WCL	516.1	25.7	84.9	3.83	0.69	1.53
CIL, NEC, CMPDI & others	56.7	-14.3	11.1	4.12	0.38	0.91
Overall	3,849.1	165.0	636.6	4.74	0.57	1.77

Source: Coal India Ltd.

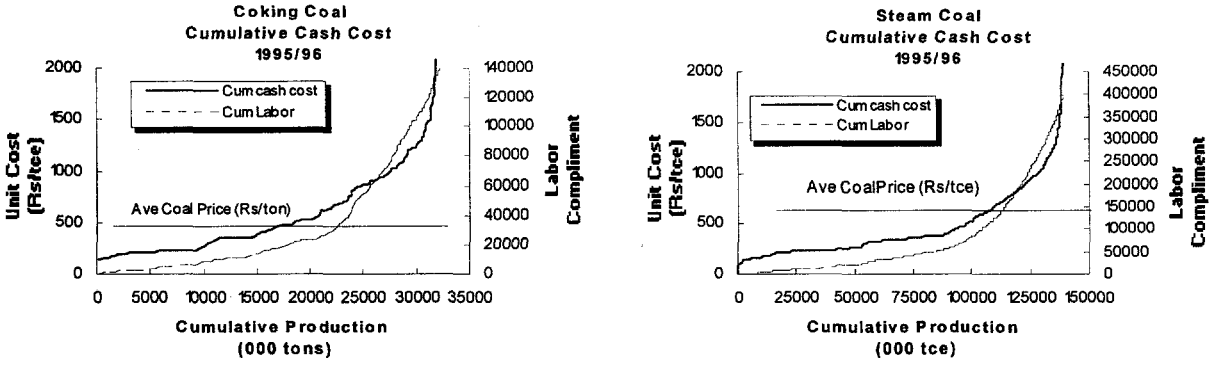
ANNEX 3.1 STATUS OF SECTOR REFORMS AND ANTICIPATED FURTHER REFORMS

Date	*Actions Taken by GOI*	*Recent Cabinet Decision on Further Reforms (February 11, 1997)*	*Proposed Dated Covenants Under the CSRP Loan*
1. Coal Price and Distribution Deregulation			
3/96	Deregulated pricing and distribution of coking coal & high-grade (A, B, C) steam coal.	Deregulated pricing and distribution of D grade steam coal. (Deregulated coal represents about 60% of India's coal production). Announced decision to fully deregulate prices and distribution of the remaining regulated coal by January 1, 2000.	Deregulate pricing and distribution of the remaining regulated coal by January 1, 2000.
2. Annual Revision of the Prices of Regulated Low-Grade Steam Coal			
6/94	*Revised prices of regulated low-grade* steam coal.	*Authorized CIL to revise prices of regulated low grade* steam coal every six months based on the normative costs developed by the Bureau of Industrial Cost and Prices (BICP), till full price deregulation of coal prices.	
12/95	Revised prices of the low-grade steam coal of WCL, Rajmahal mine.		
3. Coal Import Liberalization			
93/94	Ceased the quantity restriction of coal import and placed it under the Open General License Category.		
4/93	Reduced the import duty on coking coal from 35% to 5%. (Import of coking coal has increased from 5.3 Mt. in 1991/92 to 9.3 Mt. in 1995/96, creating competitive environment in coking coal market)		
94/95	Reduced the import duty on steam coal from 85% to 35%		
7/96	Reduced the import duty on steam coal from 35% to 20% (In 1995/96, import of steam coal reached 4 Mt. Imported steam coal is now competitive in the Southern Coast areas)		
2/97	Reduced the import duty on steam coal from 20% to 10% and on coking coal from 5% to 3%.		
4. Encouraging Private Investment			
6/93	Amended the Coal Nationalization Act to allow private investment for captive mining for power and cement (in addition to steel already allowed) and private investment for washeries. The Ministry of Coal granted 19 blocks mainly to private partners (16 to power companies), four coking coal blocks to SAIL and one non-coking coal block to another sponge iron company.	Announced the decision to open up undeveloped non-captive mining blocks other than those required by the public enterprises (including Coal India) for meeting their current commitment, to private investors, through competitive bidding.	Complete the study of the regulatory framework of the coal industry by July 31, 1999 and begin implementation of its recommendations, taking into account the Association's comments, by December 15, 1999.
2/96	Decided to disinvest Government's shares to private investors in Coal India's subsidiaries, starting with WCL.		

ANNEX 3.2 FINANCIAL PERFORMANCE OF COAL INDIA AND ITS SUBSIDIARIES

1. Coal India was formed in November 1975 to hold and manage Government's interests in the coal industry and acted essentially as a conduit for massive public investments to the sector. The primary objective of these investments was to accelerate the expansion of India's capacity to produce coal. Investment decisions were driven primarily by domestic demand and by technical and geo-mining conditions. The financial performance of these investments was of little concern. Consequently Coal India has accumulated a huge portfolio of unprofitable labor intensive mining projects which was supported by an elaborate system of cross-subsidization. Cumulative mine cash costs per ton of coal equivalent (6000kcal/kgm) and labor complement for 1995/96 is illustrated in Figure 3.2.1.

Figure 3.2.1 Cumulative 1995/96 Cash Costs of Production of Thermal and Coking Coal



Over time this severely eroded Coal India's financial independence, sustainability and its capacity to finance investments out of internally generated funds.

2. A number of factors which adversely affected Coal India's financial performance are:

(a) coal miners were regarded by Government as having been neglected by the previous private owners. To compensate them, a wage policy that ensured miners real wage increases was adopted and perpetuated without any reference to the increases in productivity and efficiency;

(b) the obligation and/or custom of providing employment to project affected people and dependents of employees suffering from death or debility; and

(c) the Government's efforts to control prices at levels below average costs in response to the perceived necessity to provide energy as cheaply as possible to the economy. The coal industry was regarded as a public utility whose sole function was to provide a service to the rest of the economy.

3. As a result Coal India incurred losses right from its inception. Because financial returns assumed a very low priority in the Government's investment strategy, the stage was set for a prolonged period of rising losses and increasing dependence on the Government for both investment funds and compensation for cash losses. The level of fiscal support for the compensation of cash losses is indicated in Table 3.2.1.

Table 3.2.1 Coal India's losses and budgetary support 1976-1981
(Rs million)

Year end March	*Cash losses*[1]	*Non-plan loan from Government*[2]		
		Drawal	*Repaid*	*Balance*
1976	202.2	599.8	245.2	886.5
1977	391.6	517.4	315.1	1088.9
1978	947.9	1270.0	375.1	1983.8
1979	1990.0	1730.0	507.4	3206.4
1980	302.3	750.0		3956.4
1981		370.0		4326.4

Source: Coal India Ltd.
Note: 1. Cash losses are before depreciation charges.
2. Since 1980-81 this non-plan loan has been under moratorium for repayment and is interest free.

4. Towards the end of 1970s the Government's substantial investment program and support for the coal sector began to pay off. Coal production and labor productivity increased and after two successive price increases in July 1979 and February 1981, Coal India's financial health experienced a temporary recovery. Its dependence on the Government for direct support for cash losses (i.e. non-planned loans) ceased permanently from 1981 and for the first time in 1982, Coal India earned a marginal pre-tax profit of Rs56 million (US$1.6 million in current terms).

5. The recovery was, however, short lived due to another round of steep wage increases in January 1983. The consolidated financial statements for the period 1987-1996 are shown in the tables at the end of this annex. Coal India once again incurred a loss in 1984 and resumed its downward trend thereafter. Despite a further coal price increase in January 1984 and again in January 1986, Coal India was unable to reverse the trend and its losses continued to increase. This reached a peak in 1986 at a level of Rs4,042 million (equivalent to US$126 million in current terms). Coal India did not, however, incur cash losses (before allowing for depreciation and interest charges) during this period. In 1987 GOI implemented BICP's price escalation formula (based on normative costs) . Thereafter, with more frequent BICP price increases (see para 14), Coal India staged a modest but persistent recovery as illustrated in Table 3.2.2.

Table 3.2.2 Trend of working results
(Rs million)

Year end March	*(Total loss)*[1] *profit*	*Depreciation*	*Interest Charges*	*Cash profit*
1983	(53)	1334	1110	2390
1984	(2427)	1716	1324	613
1985	(780)	2190	1811	3221
1986	(4042)	2655	2281	894
1987	(3322)	3068	1661	1407
1988	(2260)	3762	3195	4696
1989	(237)	4230	2795	6788
1990	763	4697	3678	9140
1991	(2538)	5787	4722	7971
1992	1666	6706	5670	14042
1993	2907	7861	7280	18048
1994	3994	9126	7089	20209
1995	291	9698	4980	9989
1996	5769	10898	1293	17960

Source: Coal India Ltd.
Note: 1. Profits are after tax but before providing for reserves.

6. This improvement was further enhanced by the growth in the power sector and other coal consuming industries which led to a significant increase in the demand for coal. To meet this demand Coal India gave priority to investments in high yielding and low cost mechanized opencast projects. Investments in underground mines were restricted largely to safety, ventilation, equipment replacement and only limited creation of new capacity to offset the effects of natural ore depletion. A large number of underground mines in ECL and BCCL were experiencing difficult geo-mining conditions and efforts to raise production from these mines by undertaking financially marginal investments were not successful.

7. Consequently Coal India maintained a high rate of growth in coal production of around 5.6 percent per annum from the latter part of the 1980s. Coal output increased from 131 million tons in 1985 to 237 million tons in 1996. The rapid shift to low cost opencast mining and the consequent opportunity to absorb, at least in part, surplus labor, helped to contain the increase in average unit costs of production. The compound rate of increase in the average cost of production per annum for the first time fell, albeit marginally, below the rate of inflation as indicated in Table 3.2.3.

Table 3.2.3 Coal India's increase in unit cash costs of production
(1980-1995)

Year end March	*Unit costs (Rs/ton)*	*Compound increase in unit costs (%pa)*	*WPI*	*Increase (%pa)*
1980	110		91	
1985	191	**9.1**	120	**5.6**
1990	265	**4.3**	166	**5.7**
1995	380	**6.5**	275	**8.5**

Source: Coal India Ltd.

8. This shift to opencast mining was, however, accomplished at the expense of a deterioration in coal quality in terms of ash content, calorific value and the unit price realized. The inherent problems of waste dilution (where certain amounts of overburden are mixed with coal during the process of mining) led to a further deterioration in coal quality. Despite the design and introduction of power house boilers that were capable of using these lower quality coals, disputes with large consumers over quality, together with the growing financial weakness of most State Electricity Boards (SEBs), aggravated the problems of non-payment for coal deliveries which emerged as a significant factor towards the end of the 1980's. More recently the introduction of the cash-and-carry component of the reform measures (see para 3.17) began to bear fruit in 1995/96 by reversing this adverse trend. The movement in receivables, expressed as the average number of days of sales, is illustrated in Table 3.2.4.

Table 3.2.4 Increase in amounts owing to Coal India
(Rs million)

Year end March	*Sundry Debtors*			*Months' gross sales*
	Total	*Prov. for doubtful debts*	*Net*	
1991	18950	4713	14237	2.68
1992	23153	9344	13809	2.19
1993	31271	10473	20798	2.60
1994	36965	12709	24256	2.64
1995	36706	12173	24533	2.50
1996	32491	11352	21139	1.90

Source: Coal India Audited Accounts

9. In 1985, for the second time the Government appointed the Bureau of Industrial Costs and Prices (BICP) to undertake; (i) an examination of the cost structure of the mines operated by Coal India; and (ii) recommend an appropriate price for the various grades of coal produced by Coal India (Annex 3.3). BICP recommended an overall average price for Coal India which was based upon:

(a) a norms related cost structure of specific inputs which assumed an efficient mining operation and a fixed ratio of opencast to underground production;

(b) an adjustment to ensure a pre tax return of 12 percent per annum on funds invested; and

(c) an escalation formula to provide for the periodic increase in the price of inputs.

These recommendations were accepted by Government in 1987 and since then coal prices have been administered on the basis of the BICP formula, although on occasion there was a considerable time lag in the implementation of these price revisions. The administered prices for coking coal and the higher grades of thermal coal were abolished in early 1996 in pursuance of the reform measures undertaken by the Ministry of Coal (para 2.09).

10. Although the formula was intended to compensate Coal India and its subsidiaries for all cost increases, until recently it had failed to the extent that:

(a) price adjustments were based on past cost increases. Coal India therefore was required to absorb all cost pressures between revisions; and

(b) the return on capital component of the price was related to the historic net fixed assets per ton of capacity which was substantially below the cost of new capacity creation.

This situation was alleviated to some extent by; i) the fact that the historic ratio of underground to opencast production has undergone a favorable change for Coal India, declining from 41% in 1987 to 23% in 1996; and ii) BICP's recommendation to narrow the price differential will favor the lower grades of coal.

11. Table 3.2.5 outlines the comparison of the updated normative cost based on the BICP formula with the average cost of production in the corresponding year. The actual cost of production was 14 percent higher than the normative cost in 1987. By 1995 the actual cost had fallen 9 percent below its normative equivalent. This was largely due to an improvement in labor productivity resulting from the higher proportion of production from opencast mines and Coal India's ability to sustain annual growth of 5.6 percent annum in production with a reduced labor compliment.

Table 3.2.5 Normative cost of production vs. Coal India's actual costs
(Rs per ton of coal)

Year end March	*Norm*	*Actual*	*% difference*
1988	210	229	-8.3
1989	236	253	-5.7
1990	260	265	-1.9
1991	270	277	-2.5
1992	306	302	1.3
1993	342	334	2.4
1994	360	364	-1.1
1995	416	380	9.5
1996	437	413	5.8

Source: Coal India Ltd.

12. Coal India had an aggregate manpower of 675,115 as at the end of 1987. Coal production in that year was 145 million tons resulting in the output per manshift being 0.99 tons. The trend in the level of manpower and productivity in terms of output per manshift since 1987 and the resulting unit cash cost of coal in constant 1995 terms is shown in Table 3.2.6.

Table 3.2.6 Labor compliment, productivity and cost/ton of coal
(1987-1996)

Year to March	*Manpower*	*Productivity (OMS)*			*Unit cost (Rs/ton)*
		underground	*opencast*	*total*	*1995 terms*
1987	675115	0.54	2.44	0.99	458
1988	674021	0.54	2.65	1.08	439
1989	670440	0.57	2.88	1.17	450
1990	667705	0.55	3.16	1.21	439
1991	673345	0.53	3.38	1.31	417
1992	671550	0.53	3.74	1.40	399
1993	663349	0.55	3.84	1.45	402
1994	655944	0.54	4.12	1.51	404
1995	641093	0.55	4.48	1.61	380
1996	636535	0.57	4.74	1.77	384

Source: Coal India Ltd.

13. The continued growth in production together with a marginal reduction in manpower resulted in the better utilization of surplus labor and consequently in an increase in labor productivity by approximately 79 percent on an overall basis. This, coupled with a shift in the production mix in favor of low cost opencast mining, has helped keep the aggregate unit cost of production under control. Nonetheless these costs vary considerably from company to company and indeed between collieries within each company. The 1996 cash costs for each company are illustrated in Table 3.2.7 as well as the average price realized by Coal India. ECL and BCCL continue to survive at the expense of the others. These two companies have limited capacity to expand and represent the most labor-intensive subsidiaries of Coal India employing 49 percent of its labor force while producing 23 percent of its production (see Table 3.2.2). Labor alone contributes 64 and 68 percent of the cash costs of BCCL and ECL respectively.

Table 3.2.7 Unit operating costs by subsidiary for the year ended March 1996
(Rs per ton)

Subsidiary	*Production. (Mt.)*	*Operating cost*	*Sales*	*Operating Income*
ECL	27.8	627	508	(119)
BCCL	27.8	661	532	(129)
CCL	30.8	416	451	35
NCL	35.2	209	441	232
WCL	29.0	404	481	77
SECL	53.2	291	410	119
MCL	32.7	140	290	150
CMPDI, CIL, NEC	0.8	793	684	(109)
Total	**237.3**	**374**	**440**	**66**

Source: Coal India Ltd.

14. Since December 1987, Coal prices which were fixed in terms of the BICP formula, have risen at an annual compound rate of 9 percent as outlined in Table 3.2.8. This compares with the average increase in costs of 7.1 percent per annum (see para 7) and has underpinned the improvement in Coal India's level of profitability over this period.

Table 3.2.8 Increase in average coal price

	Run of Mine Price of Coal (Rs/ton)	*Increase (percent)*
Dec 1987	219	4.3
Jan 1989	249	13.7
Dec 1991	322	29.3
Feb 1993	363	12.7
June 1993	381	4.9
June 1994	401	5.3
Dec 1995[1/]	437	9.0

Source: Coal India Ltd.
Note: 1. With effect from Dec. 95 premia for Slack coal, Steam coal and Long Flame coal were increased by Rs3, Rs10 and Rs35 per ton respectively resulting in an overall impact of about 4% on average coal price.
2. With effect from March 96 price for lower grade coals of WCL have been increased to the level at par with that of Singareni Coal Company Ltd. impact for which for WCL only, is about 25% per annum on average sales price.
3. With effect from April 1996 coking coals and higher grades of non-coking coals have been deregulated.

15. Despite the shortcomings of the BICP formula, Coal India was able to translate the shift in production mix, improvement in capacity utilization and increased labor productivity into a reduced loss in 1989 and thereafter into a rising trend in profits. Clearly 1992 represented the turning point in the financial position of Coal India (see the Income Statement for 1987 through 1996 on page 11 of this annex). Like operating costs however, operating profits vary considerably between companies (Table 3.2.9).

16. Although substantial profits of Rs14 billion were earned in 1996 by NCL, SECL, MCL and WCL, an analysis of the operating results indicate that a large part of this was dissipated by losses incurred by ECL, BCCL and CCL amounting to Rs7.6 billion, in spite of better coal quality and higher unit sales value.

Table 3.2.9 Income Statements for Coal India for the year ending March 1996
(Rs billion)

	MCL	*NCL*	*SECL*	*WCL*	*CCL*	*ECL*	*BCCL*	*OTHER*[1/]	*TOTAL Coal India*
Production (t mill)	32.7	35.2	53.2	29.0	30.8	27.8	27.8	0.8	237.3
Net Sales	9.5	15.5	21.8	13.9	13.9	14.1	14.8	0.6	104.1
less Expenses									
Wages	1.9	1.7	7.9	6.1	7.7	11.9	11.8	1.2	50.2
Variable costs	1.9	3.5	4.8	3.3	3.4	2.8	3.6	0.4	23.7
Other fixed costs	0.8	2.1	2.8	2.3	1.7	2.7	3.0	(0.9)	14.5
Operating Income	**4.9**	**8.2**	**6.3**	**2.2**	**1.1**	**(3.3)**	**(3.6)**	**(0.1)**	**15.7**
less									
Interest	0.8	0.6	0.2	0.4	1.1	(1.7)	(2.9)	0.2	(1.3)
Depreciation	0.7	2.2	1.4	1.0	1.7	2.3	1.4	0.1	10.9
Tax		0.2	0.1						0.3
Invest. Allw. Res.					(0.3)				(0.3)
Profit after tax	**3.3**	**5.2**	**4.6**	**0.8**	**(1.4)**	**(3.9)**	**(2.1)**	**(0.4)**	**6.1**
CPRA	(3.1)	(3.6)	(4.0)	0.1	1.7	5.5	3.2	0.2	
Adjusted Profit	**0.2**	**1.6**	**0.6**	**1.0**	**0.3**	**1.5**	**1.0**	**(0.2)**	**6.1**

Source: Subsidiaries' Audited 1996 Accounts
Note; 1. Includes CMPDI and NEC.

17. To provide for these loss making activities, the Government and Coal India created a retention price system (CPRA) (Annex 6.1 para 4). This approach clearly regarded each company as merely a division of Coal India and effectively:

(a) undermined corporate identity, independence and operating autonomy of each company;

(b) prevented the retention of sufficient income within each company and limited their ability to operate as commercial entities;

(c) caused taxation difficulties due to the disproportionate allocation of interest charges; and

(d) reduced management's incentive to control and reduce costs, clouded accountability and created an unwieldy conglomerate which was difficult to control and manage.

In view of the withdrawal of budgetary support and deregulation of the coal price, Coal India is decided to ensure its survival by (i) phasing out these practices; (ii) emphasizing the necessity to improve efficiency, eliminate waste and control costs throughout the group; (iii) restructuring its balance sheet to ensure the independent financial operation of each company; (iv) restricting its role to that of strategic direction and the receipt of dividends and debt servicing; and (v) ultimately allowing each company to compete freely and operate independently.

18. Coal India cannot rely on the high rate of demand growth and post liberalization real price increases to continue indefinitely. Consequently the company has little option but to pursue a vigorous cost cutting strategy and the development of cost conscienceness at all levels of the company. A comprehensive program designed to reduce the cost of sales and achieve a working ratio of no more than 0.8 is essential if the company is to become independent of budgetary support. This compares with the present ratio of 0.97 as indicated by the financial ratios on page 12 of this annex. With the deregulation of coal prices, the CPRA

process of internal cross subsidization has become obsolete as there are no longer any eligible recipients and will be discontinued from 1996/97.

19. The trend in internal cash generation within Coal India is shown in Table 3.2.10. Overall, Coal India has never generated sufficient cash to support its loss making operations and provide for the investment required to maintain and increase capacity. Coal India amassed arrears of Rs22 billion (US$630 million) at the end of March 1992, equivalent to 35 percent of the company's total long term liabilities (see para 12 Annex 6.1). As indicated in the Balance Sheet on page 14, Coal India is at present almost at the limit of its borrowing capacity with its debt to equity ratio standing at 53 percent of funds employed. In the absence of further budgetary support, Coal India can no longer afford to undertake uneconomic projects and support loss-making activities, carry excessive inventories or finance their customers (para 20) if it is to rebuild its financial resources, maintain its market share and become commercially viable and self sustaining.

Table 3.2.10 Coal India's cash generation compared with investment requirements
(Rs million)

Year end March	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*
Internal sources	3140	10836	9819	9910	7463	10394
Equity	4895	2875	971	70	2115	
Loans	5974	3841	7285	6899	6468	4642
Total for investment	14009	17552	18075	16879	16046	15036

Source: Coal India Audited Accounts

20. Despite the rising trend in profits, Coal India's liquidity position continues to remain under pressure. Over the period 1981 and 1996, net receivables increased from 43 days of sales to 80 days net before improving to 58 days of sales (89 days gross) at the end of March 1996 as shown in Table 3.2.11. The improvement results from the implementation of a strict "cash and carry policy" requiring customers to pay in cash or against a confirmed letter of credit for all coal shipments. Net receivables amounted to Rs21.1 billion (US$605 million), after providing for unsecured and doubtful debts of Rs11.4 billion (representing 35 percent of the total amounts outstanding). Amounts outstanding in excess of six months at the end March 1996 totaled Rs24.3 billion (US$695 million). The problem has occurred mostly with CCL whose net receivables have risen to Rs7.6 billion (US$215) or 154 days of sales in 1996.

Table 3.2.11 Consolidated debtors position at the end March 1996
(Rs million)

Subsidiary	*Sundry Debtors*			*Prov. for doubtful*	*Net Debtors*	*Months gross Sales*
	less 6 months	*more 6 months*	*Total*	*Debts*		
ECL	2082	1754	3836	1481	2355	**1.5**
BCCL	1350	6049	7399	5115	2284	**1.5**
CCL	1069	7415	8484	839	7646	**5.1**
NCL	520	2209	2729	854	1875	**1.2**
WCL	545	1675	2220	318	1902	**1.3**
SECL	2163	3100	5263	1845	3418	**1.5**
MCL	337	1965	2303	874	1429	**1.4**
CIL, NEC, DCC	101	155	256	26	231	**2.6**
Total	**8168**	**24323**	**32491**	**11352**	**21139**	**1.9**

Source Coal India Annual Accounts

21. Notwithstanding clear improvements in working capital management, Coal India's liquidity continues to be aggravated by the relatively high level of inventories, comprising mainly stores and to a lesser extent coal stocks. Table 3.2.12. shows this trend for the period 1987 - 1996.

Table 3.2.12 Level of stores and coal stocks
(Rs million in current terms)

Year end March	*Stores Inventory Level*		*Coal Stock Level*	
	Rs million	*Months*	*Rs million*	*Months*
1987	4512	10.4	5310	2.1
1988	4850	9.9	5858	2.0
1989	5301	9.8	7930	2.2
1990	5885	9.1	8752	2.1
1991	6802	9.1	9995	2.3
1992	7186	8.1	14047	2.6
1993	7861	7.5	16606	2.5
1994	8527	7.0	16564	2.2
1995	9428	7.1	13749	1.8
1996	9648	6.5	13639	1.6

Source: Coal India Audited Accounts
Note : Stores inventory level is in terms of months' consumption and Coal Stock inventory level is in terms of months' net sales.

Table 3.2.13 outlines the position at the end March 1996 for the company and its subsidiaries. Inventories amount to Rs23.3 billion (approx. US$667 million) which is 6.5 times the monthly consumption in the case of stores and 1.6 months of sales in the case of finished coal stocks. These levels are still excessive even allowing for the seasonal variation in coal stocks which traditionally peak in March of each year. Notwithstanding an impressive reduction in working capital of Rs13.9 billion in 1996, the proper management of working capital will need further attention and the development of the materials management system accelerated to the extent possible.

Table 3.2.13 Consolidated level of inventories at end March 1996

Subsidiary	*Stores Inventory Level*		*Coal Stock level*	
	Rs million	*Months*	*Rs million*	*Months*
Eastern Coalfields	1197	7.5	1380	1.2
Bharat Coking Coal	1143	5.6	4161	3.4
Central Coalfields	1183	5.4	2349	2.0
Northern Coalfields	2616	9.0	639	0.5
Western Coalfields	832	4.2	824	0.7
South Eastern Coalfields	2022	7.0	3064	1.7
Mahanadi Coalfields	593	5.1	778	.1.0
CMPDI	50	14.8	0	0.0
CIL, NEC, DCC	48	5.3	443	9.5
Coal India	**9684**	**6.5**	**13639**	**1.6**

Source: Coal India 1996 Audited Accounts
Note: Net of provision for obsolescence and deterioration

22. Coal India's cost of meeting the Government-imposed commercial and social objectives has been financed in the past in an arbitrary manner, reflecting the Government's policy toward all of its state-owned

enterprises (that is, using an equal proportion of debt and equity). The resulting debt burden amounted to Rs61.6 billion (US$1.8 billion) at the end of March 1996. Due to an investment policy which did not emphasize the financial viability of projects, equity (and consequently borrowing capacity) has been progressively reduced by accumulated losses to Rs53.2 billion (US$1.6 billion). The debt to equity ratio has been maintained at around the limit of 60 percent since 1985 as indicated by the ratio analysis on page 12 of this Annex. More recently the waiver of interest arrears of Rs8.92 billion by the Government as part of the capital restructuring has enabled Coal India to both increase its equity position and reduce its liabilities to Government resulting in an improved Debt to equity ratio of 54% as at end March 1996. Incremental borrowings will nonetheless be restricted in the longer term to 1.5 times the net earnings Coal India is able to generate and reinvest in the future.

23. Government contributions to the financing of Coal India's operations and investment have declined since 1981. Equity contributions that provided for 45 percent of funding in 1981 fell to 4 percent in 1993 and, after staging an odd increase to nine percent in 1995, declined to zero percent in 1996. Government loans were also reduced from 55 percent in 1981 to zero percent in 1996. Between 1981 and 1985, Coal India's internal cash generation (i.e. profits after taxes plus depreciation and less changes in working capital and debt service) was negative, but by 1990 it contributed 6 percent of capital expenditures. By 1996 it was able to meet 69 percent of its financial requirements for new investments. The improvement in self-financing was achieved in part by the improvement of Coal India's operating performance due to higher coal prices and , to a certain extent, by a cut back in capital expenditures pending finalization of the IBRD project and reduction in working capital.

24. Coal India has limited borrowing capacity. As a consequence the company implemented a Government sponsored debt forgiveness and financial restructuring program in 1996/97 (Annex 6.1, para 11). The company's viability depends on its ability to invest in the further expansion of productive capacity, improve the utilization of plant and equipment and close loss making operations. As a consequence, the restructuring of the company's balance sheet was a necessary step to enable Coal India to; i) proceed with the CSRP without breaching its existing loan covenants; ii) create new capacity to meet market growth and absorb surplus labor; and iii) finance an enhanced voluntary retirement scheme.

25. In addition to Government financed long-term loans, Coal India has in the past entered the domestic market and raised other long-term liabilities. It has issued bonds worth Rs15.0 billion (approximately US$417 million) in addition to other bilateral loans, excluding IBRD, amounting to Rs9.7 billion (US$343 million). Overdraft and revolving bank credits are being used to fund 60 percent of net current assets.

Table 3.2.14 Coal India Limited Income Statement (1987 to 1996)
(Rs million)

Year ending March	*1987*	*1988*	*1989*	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*
Production(tons million)	145	159	172	179	190	204	211	216	223	237
Net Sales	30,070	34,841	44,253	48,982	52,032	64,042	78,491	88,793	89,721	104,104
Operating Expenses:										
Wages	17,567	17,756	23,096	24,068	25,550	28,486	33,478	36,246	41,966	50,200
Variable Costs	6,481	7,648	8,531	9,981	10,896	12,856	16,083	19,476	21,326	23,720
Other Fixed Costs	4,312	5,325	6,199	5,757	7,609	8,654	10,461	13,246	11,480	14,462
Total Operating Costs	**28,360**	**30,729**	**37,827**	**39,806**	**44,055**	**49,996**	**60,022**	**68,968**	**75,240**	**88,718**
Operating Income	1,710	4,112	6,427	9,176	7,977	14,046	18,469	19,825	14,949	15,723
less										
Interest	1,661	3,195	2,795	3,678	4,722	5,670	7,280	7,089	4,980	(1,293)
Depreciation	3,068	3,762	4,230	4,697	5,787	6,706	7,861	9,126	9,698	10,898
Amortization of VRS										
Profit before Tax	**(3,019)**	**(2,845)**	**(599)**	**801**	**(2,532)**	**1,671**	**3,329**	**3,609**	**272**	**6,117**
CPRA	(298)	598	366				(416)	394	26	(3)
Tax	4	14	4	39	6	5	6	9	6	346
Inv. Allowance Reserve	422	0	423	1	(44)	216	312	728	(914)	(290)
PROFIT AFTER TAX	**(3,744)**	**(2,260)**	**(660)**	**762**	**(2,494)**	**1,450**	**2,594**	**3,267**	**1,205**	**6,059**
Details of variable and fixed expenses										
Stores Consumption	5,194	5,882	6,576	7,805	8,951	10,589	12,211	14,321	15,690	17,564
Power	2,206	2,484	3,147	3,294	3,767	4,480	5,372	6,442	7,072	8,146
Contractors	1,779	2,051	3,055	3,664	3,763	4,520	7,791	9,884	10,785	11,446
Miscellaneous	1,613	2,556	1,953	975	2,025	1,922	1,172	2,075	(741)	1,026
Total	10,793	12,973	14,731	15,738	18,505	21,510	26,544	32,722	32,806	38,182

Source: Coal India audited accounts 1987-1996

Table 3.2.15 Coal India Limited Source and Application of Funds (1987 to 1996)
(Rs million)

Year ending March	*1987*	*1988*	*1989*	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*
Sources of Funds										
Net Income	(3,744)	(2,260)	(660)	762	(2,494)	1,450	2,594	3,267	1,205	6,059
Depreciation	3,068	3,762	4,230	4,697	5,787	6,706	7,861	9,126	9,698	10,898
Amortization										
Interest	1,661	3,195	2,795	3,678	4,722	5,670	7,280	7,089	4,980	(1,293)
Int. Cash Generation	**985**	**4,696**	**6,365**	**9,136**	**8,015**	**13,825**	**17,735**	**19,482**	**15,883**	**15,665**
Adj. for Reserves	446	(62)	445	(88)	(36)	219	356	797	(897)	(2,790)
Depreciation	(461)	(257)	(170)	131	14	(265)	(569)	(995)	(1,066)	(2,386)
New Equity Capital	5,472	5,608	6,438	4,597	4,895	2,875	971	70	2,115	0
Long Term Loan	4,706	4,197	5,255	9,473	5,975	3,841	7,285	6,899	6,468	4,642
Total	**11,148**	**14,184**	**18,333**	**23,250**	**18,861**	**20,495**	**25,778**	**26,253**	**22,503**	**15,130**
Application of Funds										
Investment	10,170	10,582	13,111	13,908	14,009	17,552	18,075	16,879	16,046	15,036
Debt Service	4,872	479	4,440	4,500	3,220	4,629	6,279	13,848	9,362	14,010
Inc in Working Capital	(3,894)	3,122	782	4,843	1,632	(1,686)	1,425	(4,410)	(2,969)	(13,916)
Total	**11,148**	**14,184**	**18,333**	**23,250**	**18,861**	**20,495**	**25,778**	**26,318**	**22,439**	**15,130**
Financial Ratios										
Debt to Equity (%)	63	64	60	60	62	61	62	60	59	54
Current Ratio	1.28	1.52	1.46	1.58	1.54	1.42	1.35	1.20	1.12	0.83
Debt Service Coverage	0.31	0.91	1.27	1.48	1.03	1.62	1.74	1.70	1.69	1.71
Working Ratio	1.10	1.08	1.01	0.98	1.05	0.97	0.96	0.96	1.00	0.94

Source: Coal India audited accounts 1987 - 1996

Table 3.2.16 Coal India Limited Balance Sheets (1987 to 1996)
(Rs millions)

Year ending March	*1987*	*1988*	*1989*	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*[1/]
Equity	35,595	41,203	47,642	52,239	57,133	60,008	60,979	61,048	63,164	63,164
Reserves	2,514	2,452	2,896	2,810	2,773	2,992	3,348	4,145	3,248	3,167
NRF Grant (for VRS)										
Cum Profit/Loss	(20,337)	(22,598)	(23,257)	(22,496)	(24,990)	(23,540)	(20,945)	(17,679)	(16,474)	(13,123)
Total Net Worth	17,772	21,058	27,281	32,552	34,916	39,460	43,381	47,515	49,938	53,207
Long Term Borrowings										
Government	29,936	36,702	39,247	44,305	47,257	48,998	52,814	51,029	49,362	37,977
Others	255	402	1,467	5,060	9,584	12,725	17,195	19,120	22,872	23,597
Short Term Borrowings	2,003	1,896	1,684	3,340	3,550	3,419	4,551	6,989	4,724	5,619
Current Liabilities	16,458	15,147	19,073	21,424	24,782	28,391	37,671	42,782	48,164	59,470
Total Liabilities	**66,424**	**75,206**	**88,752**	**106,681**	**120,090**	**132,993**	**155,612**	**167,435**	**175,060**	**179,869**
Fixed Assets	58,807	69,389	82,500	96,408	110,417	127,969	146,044	162,923	178,968	194,005
less Depreciation	16,612	20,117	24,177	29,005	34,806	41,247	48,539	56,670	65,303	73,815
Net Fixed Assets	42,195	49,272	58,323	67,402	75,611	86,722	97,505	106,252	113,666	120,190
Current Assets	23,701	25,876	30,383	39,006	43,773	45,093	57,060	59,525	59,047	54,209
Misc. Assets	528	5	47	273	707	1,177	1,047	1,658	2,347	5,471
Total Assets	**66,424**	**75,206**	**88,752**	**106,681**	**120,090**	**132,993**	**155,612**	**167,435**	**175,060**	**179,869**
Details of : Current Assets										
Inventories	9,822	10,708	13,231	14,637	16,797	21,233	24,467	25,091	23,177	23,323
Receivables	4,655	7,227	9,885	14,419	14,338	13,903	20,907	24,433	25,556	21,680
Cash & Bank	1,417	1,424	1,617	1,749	1,818	1,463	1,866	2,181	3,406	2,552
Loans Advances	7,807	6,517	5,650	8,201	10,821	8,494	9,820	7,820	6,909	6,654
Total	23,701	25,876	30,383	39,006	43,773	45,093	57,060	59,525	59,047	54,209
Current Liabilities										
Trade Creditors	6,230	5,887	3,094	3,441	3,685	3,840	4,922	3,147	3,069	3,118
Statutory dues	1,434	2,030	2,354	5,218	6,204	7,171	9,619	11,385	10,514	6,616
Advances	1,974	2,076	2,525	2,930	4,299	4,845	3,687	4,148	6,822	7,305
Others	6,820	5,154	11,101	9,836	10,594	12,536	19,443	24,102	27,760	42,431
Total	16,458	15,147	19,073	21,424	24,782	28,391	37,671	42,782	48,164	59,470

Source: Coal India audited accounts 1987 - 1996
Note 1. Dividend of Rs2.5 billion declared by subsidiaries have not been accrued in the 1996 audited accounts.

ANNEX 3.3 IMPROVEMENT OF COAL QUALITY

1. Indian thermal coal, in general, is of inherently low quality. Its structure contains finely disseminated clays and shale which cannot be removed by low cost, gravity-based washing techniques. More expensive beneficiation techniques are required to improve its quality. The boilers of Indian power stations, however, are specifically designed to burn Indian coals. The boilers could operate efficiently with low quality coal, as long as its quality is consistent.

2. The single Indian criterion of thermal coal quality, its 'useful heat value (UHV),' is decreasing at the rate of about 2% per year. However, the purpose of this annex is not to comment on the inherent quality of Indian coal, but to discuss ways of improving the quality of the product delivered to power stations. This would result in higher efficiency and availability, a reduced requirement for rail transport and would reduce pollution.

3. The quality of Indian thermal coal is measured in terms of its 'useful heat value' in kcal/kg, claiming to be a relative index of the commercial value in marketing coal, although it is not physically measured as such but is determined by applying the more easily analytically determined ash and moisture content percentages to an empirical formula designed by the Central Fuel Research Institute in Dhanbad. This formula is taken as representative of all Indian thermal coals regardless of their area of origin[1]. The system has no parallel outside India and would not be accepted by foreign power companies since it has no direct correlation to delivered heat.

Pricing Structure

4. The 1996 coal price structure governing the selling prices of high-moisture (with an inherent moisture content greater than 2%) thermal coals, consists of a succession of seven unequally spaced and unequally wide steps defining the long-established coal grades, ranging from grade A (Rs 795 per ton) to G (Rs 2O3 per ton). The prices of the higher grades, A, B and C, have recently been decontrolled. Grade G is not known to be produced at this time since its value in power generation terms is considered to be negligible. Grades D, E and F constitute the majority of coals presently produced by Coal India for thermal power generation. Careless handling and inclusion of extraneous matter in the product can often be advantageous to a mine, since it can increase output tonnage, without incurring a penalty on the price per ton. At the same time, the costs of transporting the extraneous matter, handling it, crushing it, burning it, and disposing of the resultant ash are borne not by the mining companies, but by the power generating companies since the coal is sold on an ex-mine basis.

5. The stepped price structure actually encourages the production of dirty coal if that can be done without slipping into a lower-priced grade. This means variation of up to 10% in ash content within one grade. A straight line gradient (sliding scale) between the mid-points of the presently-defined steps would cost the power companies no more overall if qualities remained the same as before but would

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[1] Washing coal in a water-based medium would exacerbate a condition which is a regular source of complaint from the power companies. Coal in India is measured by UHV-IV, stated as a calorific value in kilocalories per kilogram but, in fact, determined only by ash and moisture percentages applied in the empirical formula, UHV = 8900-138(A+M), where A and M are percentages of ash and moisture respectively. Both of these constituents are determined analytically at 60% relative humidity and 40^0C temperature, thus most or all of any surface water attaching to coal, due to its being washed, would be evaporated prior to the determination of moisture content. Surface water on coal delivered to a power plant increases its weight and decreases its actual heat value without affecting the UHV, which determines its price per ton.

provide a clear incentive to produce cleaner coal since any effort to do so, however small, would result in a higher selling price per ton.

Inclusion Of Extraneous Matter

6. The code of practice laid down by Coal India's technical subsidiary, CMPDI in Ranchi, requires non-coal intercalation more than one meter thick to be excavated separately and disposed of in the backfilling of the mine. This means that, in practice, anything of one meter thickness or less is incorporated into the product sent to the power plant. At initial mine design stage, borehole cores of a coal seam and its associated partings, are analyzed for calorific value, ash, moisture, volatile matter, fixed carbon and sulfur content. These data are used to determine an optimal-value mix of coal (less than 40% ash), shaly coal (40% to 55% ash), carbonaceous shale (55% to 75% ash) and non-carbonaceous material, with the aim of maximizing revenue. In the actual mining process, however, careless cleaning of a coal seam surface prior to its excavation and the inclusion of partings, resulting from total-seam blasting, means that a significant quantity of foreign matter is routinely included in a mine's output, thus degrading the optimal mix and attracting justified penalties from the customer. Once mixed in with the product, these contaminants can only be removed by washing. However, if blasting is not used, they can, in many cases, be carefully separated and removed in the mine at the coal face by selective excavation, thus obviating the need for washing.

7. It is quite practical for Coal India to separate non-coal intercalation of 20cm or more, given the right equipment and an effective incentive to do so. In contrast, in British Coal opencast mining, the separation and discard of any non-coal intercalation of 5cm or more is mandated.

The Choice Of Mining Methods

8. It was stated above, that with proper care, foreign matter contained in seam partings can be separated and removed in the mine at the coal face by selective excavation, thus obviating any need for washing. This is routine operating practice in other countries. Such care would virtually eliminate the need for coal washers and coal washing. However, it will require a major change in operating procedures and an increase in cost. If a non-coal matter is visually distinguishable from coal and of a significant volume it can be excavated separately with appropriate mining equipment and discarded. Coal India's mines do not at present possess the appropriate equipment or expertise to do so. For soft, easy to mine coal, the equipment is relatively inexpensive (compared to the capital investment required for a washer) and the expertise is not difficult to develop. Indian thermal coals, are interbedded with finely disseminated non-coal matter and, as a result, do not shatter easily. They are tough, rather than brittle. At present, coal seams are drilled and blasted to make loading easier. Non-coal partings, where they exist, are thereby mixed with the coal and become extractable only by washing . Selective mining equipment may not always be the preferred choice over coal washing. Each mine should therefore be studied to determine the best to economic choice for coal mining method. Suggested selective mining equipment, if preferred, could be the US-built EasiMiner (restricted to near-horizontal formations) or large bulldozers equipped with heavy-duty, multi-tined rippers teamed with front-end loaders or hydraulic excavators. The latter two are being now in common use in India's mines.

9. Since coal seams and their partings generally occur in approximate horizontal book form, selective excavation involves sequential horizontal 'slicing' by a suitable excavator over an appropriately large area of coal and non-coal layers. In the event that either material is so resilient that it is not responsive to direct attack by an excavator bucket it must first be broken by some other means, such as a

bulldozer/ ripper designed to be normally capable of ripping and shattering hard rock. The broken material would then be bulldozed into stockpiles and loaded into trucks by excavator or front-end loader for sale or disposal. The method would additionally provide a primary coal crushing function. The 'EasiMiner', previously mentioned, is self-contained, actually milling or ripping the coal in thin horizontal slices and loading it onto an integral conveyor which, in turn, loads the now-broken coal into a truck moving alongside. However, its ability to excavate the tougher Indian coals is unproved and would have to be confirmed.

Inappropriate Working Practices

10. A working practice which should be discontinued is the blasting of coal seams that contain significant intercalation of non-coal matter acceptable by CMPDI's dimensional standards. Blasting effectively makes separation impossible since the non-coal matter is mixed inextricably with the coal itself.

11. Two areas contributing additional extraneous matter to the product are at the top and bottom of the coal seam. In the former case, insufficient attention is given to the careful cleaning off of the upper surface of the seam to remove material left by the overburden stripping excavators or spilled by dump trucks. In the latter case, it is very easy, when using a rope operated shovel, to excavate into the material below the floor of the coal seam and include that matter in the final product or to deliberately stop short of the floor and waste coal in the process.

Coal Beneficiation By Washing

12. All coals contain impurities to some extent. If these impurities reach proportions unacceptable to the available market they have to be reduced, otherwise the coal becomes unsellable. In the majority of cases this reduction will involve mechanically processing the coal in a liquid bath which will exploit the fact that coal-matter is lighter than most of its normal contaminants, i.e. shale, rock, pyrite, etc. This liquid based process is usually referred to as 'washing' although it can more accurately be described as 'separation' since in practice it separates heavier fractions from lighter fractions of the material input.

13. Both jig-washers and heavy-medium washers are primarily designed to separate distinct coal from distinct non-coal matter and are normally designed to wash material which has been crushed to a maximum screen size of around 50 to 100mm. In instances where the differences are not so distinct a third product, called 'middlings', is produced. Indian thermal coal, in its natural state uncontaminated by extraneous matter, is a matrix of finely disseminated coal matter and clay/shale particles. If excavated cleanly, i.e. without the inclusion of loose non-coal matter, it cannot be improved by the washing methods described above. In order to separate out the clay/ shale content the coal would have to be finely ground to liberate the coal from its matrix and then separated by froth-flotation, a mechanical and oil-based process not used for the preparation of low-value thermal coal of this type because of the high cost of doing so.

14. Coal washing can be justified only if the price structure will provide the economic incentives. This can be demonstrated by the following example: SECL is currently negotiating a contract proposal with the US-based Roberts and Schaefer for the building and operation of a washery capable of processing six million tons per year of raw coal from SECL's Dipka opencast mine, one of the Coal Sector Rehabilitation Project subprojects. Preliminary data indicate that ash content of the raw coal will be reduced from 38% to between 34% and 30% by washing, albeit with a 13% loss of input tonnage as

rejects. The data predict a contract washing cost of Rs115 per raw ton. Even if the washed coal were to be sold at the more advantageous sliding scale based on grade prices, as previously described, total sales revenues would decrease by the equivalent of around Rs100 per ton. Reducing the ash content further would result in a reduced yield, thus any further gain in UHV from ash reduction is likely to be compensated for by the reduction in yield. From the coal company's viewpoint, only if the price of washed coal was to be negotiated at an economic price, well above that fixed by the Government's present coal pricing structure (even if modified to a sliding scale), would coal washing be economically warranted.

15. It should be mentioned that any washing process will generate large volumes of high ash carbonaceous 'reject' residue. Indian coal, is very susceptible to spontaneous combustion. The residue, which includes fines, will also be susceptible to spontaneous combustion. If not disposed of properly, the pile of reject residue may become a source for major air pollution at the mine site.

The Benefits To The Power Plant

16. A short-term (one-month) exercise carried out in late 1987, where washed coal from Nandan washery was used in the Satpura power station. The coal in its raw state, had an 'inerts' (ash plus moisture) content of 48%. In its washed state its 'inerts' were 35%. The power plant showed cost savings of Rs55 per ton of raw coal, at that time. Selling prices of E and F grade coals have since escalated to 245% of those existing in 1987 which, if applied to Rs55, would equate with Rs135 per ton. From these figures and those predicted for SECL's Dipka washery there would appear to be adequate margin for the power companies to absorb an appropriate increase in price for washed coal in exchange for the benefits accruing to them consequent upon its use. However, the reported results in 1987 terms also included the figure for the purchase of landed raw coal as being Rs245 per ton, whereas the figure predicted for washed coal was Rs600 per ton. On those figures there is no economic basis for the washing of that particular coal.

17. The exercise referred to above resulted in significant operating improvements. The average plant-utilization and plant-load factors rose from 74% to 96%. MWH generated, per ton of coal used, were 40% higher. Fuel oil consumption dropped to only 4% of 'normal'. Specific coal consumption dropped by 28%. Dust concentration at the electrostatic precipitators dropped by 95% at the inlet and 98% at the outlet. In the coal handling units, shearpin failures, caused primarily by hard foreign matter contained in the coal, dropped to 0.3% of 'normal'. Other statistics showed similar improvement directly attributable to the use of washed coal.

18. The benefits to the generating companies are substantial; less wear on crushing equipment, less material to handle, less ash to dispose of, less rail transport cost and greater boiler efficiency. Pollution due to ash and its toxic constituents are severely reduced and less land is needed for ash disposal. A formula which equitably distributes the financial benefits of cleaner coal, in line with the landed price of imported coal, should be agreed and implemented, case by case, together with appropriate penalties for quality below agreed target values.

Incentives

19. As long as any efforts by the coal industry towards a cleaner product are likely to go unrewarded, the present situation will not change. There must be incentives or directives to implement changes in equipment and working practices to improve the overall product, as well as financial penalties

for not doing so. Remuneration should be based on actual heat quantities transferred from the coal company to the power company. This would necessitate the abandonment of the present UHV system and require determination of net calorific value (together with proximate analysis) carried out on a frequent and regular basis. Power companies regularly purchasing large quantities of coal should have the right to inspect coal in-situ and refuse shipment of coal at the mine if it can be seen to contain unacceptable levels of contaminants. Contracts between the companies should contain agreed payment rates, based on measured gross calorific values of coal received on a monthly average basis, and penalties for excessive ash content and inconsistencies in coal quality.

Conclusions

20. Large-scale washing tests need to be done at pilot-plants to determine economic viability. Detailed and comprehensive costing should be done and the effect of variables examined. All testing should be done with the cooperation of consumers so that their benefits, if any, can also be assessed in economic terms.

21. Selective excavation should be carefully tested and costed at the minesite and its results compared with washing predictions. Far greater discipline than is presently apparent in the separation of coal from non-coal will have to be imposed at the coal face and appropriate equipment will have to be procured or rented on a temporary basis.

ANNEX 4.1 DESCRIPTION OF THE 24 SUBPROJECTS

Mine and location	*Mine profile*	*List of main equipment under project*		*Investment (US$ million) and FIRR*	
Central Coalfields Ltd.					
K D Hesalong N. Karanpura Coalfield Ranchi, Bihar *Expansion*	Opencast mine in operation since 1968 with shovels and trucks; mining three seams - Bisrampur (7m), Bukbuka (16m) and Dakra (20-30m), reserves 50 Mt.; quality Grade E, stripping ratio 1.2:1; mine design capacity being increased from 1.5 to 4.5 Mt. per year; equipment required for expansion program and some replacement; 1997 production is 1.50 Mt.	5 m^3 shovel 50 ton truck 310 kW dozer 240 kW dozer 250 mm drill 160 mm drill 5.7 m^3 wheel loader 210 kW grader 30 ton crane Coal handling plant	4 15 10 3 4 4 1 2 1 1	Bank/JEXIM Supplier's credit Coal India Total FIRR PAPs	26.4 27.9 38.7 93.4 21.4 198
Parej East West Bokaro Coalfield Hazaribagh, Bihar *Under development*	Opencast mine under development since 1993 with shovel and trucks; mining four seams - Seam V, IV, III and II; reserves 41 Mt.; quality medium coking, suitable for steel plants after beneficiation; stripping ratio 2.7:1; mine design capacity 1.75 Mt. per year; 1997 production is 0.80 Mt.; requires equipment to reach target production.	5 m^3 shovel 3.5 m^3 hyd. shovel 50 ton truck 310 kW dozer 240 kW dozer 250 mm drill 160 mm drill 210 kW grader Coal handling plant	5 1 31 2 3 2 3 1 1	Bank/JEXIM Coal India Total FIRR PAPs	23.8 17.3 41.1 76.6 818
Rajrappa Ramgarh Coalfield Hazaribagh, Bihar *Replacement*	Opencast mine in operation since 1973 with shovels and trucks; mining three seams - VIIIA (3.4m), VII Top (4.5-15.8m) and VII Bottom (5.6-19.0m); reserves 97 Mt., quality medium coking suitable for steel plants after beneficiation in a captive washery; stripping ratio 2.91:1, mine design capacity 3.0 Mt. per year; 1997 production is 2.6 Mt.; equipment required for replacement and arrears of overburden removal.	5 m^3 shovel 5 m^3 hyd. shovel 3.5m^3 hyd. shovel 85 ton truck 50 ton truck 310 kW dozer 250 mm drill 160 mm drill	1 1 1 28 41 12 3 2	Bank/JEXIM Coal India Total FIRR	44.0 13.2 57.2 184.9
Mahanadi Coalfields Ltd.					
Ananta Talcher Coalfield Angul, Orissa *Expansion*	Opencast mine in operation since 1989 with shovel and trucks; mining two seams - Seam III (3-12 m) and Seam II (34 m); reserves 120 Mt.; quality Grade F; stripping ratio 0.52:1; design capacity being increased from 4.0 to 5.5 Mt. per year; 1997 production 4.9 Mt.; requires replacement and additional equipment	5 m^3 shovel 50 ton truck 160mm drill 310 kW dozer 2.5 m^3 hyd. shovel 210 kW grader	4 26 3 7 2 1	Bank/JEXIM Coal India Total FIRR PAPs	17.4 12.6 30.0 76.0 699
Belpahar Ib Valley Coalfield Sambalpur, Orissa *Replacement*	Opencast mine in operation since 1984 with dragline, shovels and trucks; mining two seams - Ib (5.3 m) and Rampur (8.2 m); reserves 35 Mt.; quality Grade F; stripping ratio 2.3:1: design capacity 2 Mt. per year; 1997 production 2.80 Mt.; requires replacement equipment to sustain production.	4 m^3 hyd. shovel 50 ton truck 310 kW dozer 160 mm drill 70 ton crane	3 9 4 2 1	Bank/JEXIM Coal India Total FIRR PAPs	9.4 2.8 12.2 35.0 4,021

Mine and location	*Mine profile*	*List of main equipment under project*		*Investment (US$ million) and FIRR*	
Bharatpur Talcher Coalfield Angul, Orissa *Expansion*	Opencast mine in operation since 1985 with shovels and trucks; mining three seams - Seam IV (8 m), Seam III (3-12 m) and Seam II (34 m); reserves 120 Mt.; quality Grade F; stripping ratio 0.52:1; design capacity is being increased from 3.5 to 5.0 Mt. per year; 1997 production 3.30 Mt.; requires replacement and additional equipment to increase production.	4m^3 hyd. shovel 50 ton truck 310 kW dozer 28 kL sprinkler 160mm drill 5.7 m^3 frt. end loader	7 44 10 1 3 1	Bank/JEXIM Coal India Supplier's credit Total FIRR PAPs	23.6 12.4 0.9 36.9 82.0 2,547
Jagannath Talcher Coalfield Angul, Orissa *Replacement*	Opencast mine in operation since 1971 with shovels and trucks; mining in 2 seams - Seam III (4 m) and Seam II (32 m), reserves 100 Mt.; quality Grade F; stripping ratio 0.52:1; design capacity 4 Mt. per year: 1997 production 5.0 Mt.; requires replacement equipment to sustain production.	4 m^3 hyd. shovel 50 ton trucks 310 kW dozer 160 mm drill 5.7 m^3 wheel loader	2 25 6 5 1	Bank/JEXIM Coal India Total FIRR PAPs	14.8 4.6 19.4 106.1 2,001
Lakhanpur Ib Valley Coalfield Jharsuguda, Orissa *Under development*	Opencast mine started in 1992 with trucks and shovels; mining a 30m thick seam; reserves 107 Mt. of Grade F quality; stripping ratio 1.01:1; design capacity 5.0 Mt. per year; 1997 production 2.6 Mt.; linked mainly to a local power station; requires equipment to reach target production.	3.5 m^3 hyd. shovel 50 ton truck 310 kW dozer 160 mm drill 210 kW grader 28 kL sprinkler tire handler 70 ton crane	1 17 8 5 2 1 1 1	Bank/JEXIM Coal India Supplier's credit Total FIRR PAPs	12.4 23.5 2.8 38.7 25.2 1,030
Samaleswari Ib Valley Coalfield Sambalpur, Orissa *Under development*	Opencast mine started in 1993 with dragline, shovels and trucks; mining 16m thick Lajkura seam; reserves 55 Mt.; quality Grade F; stripping ratio 0.87:1; design capacity 3.0 Mt. per year; 1997 production 3.05 Mt.; requires equipment to meet increased overburden removal.	4m^3 hyd. shovel 2.5 m^3 hyd. shovel 50 ton truck 310 kW dozer 250 mm drill 160 mm drill 210 kW grader 28 kL sprinkler	2 2 18 11 3 1 1 2	Bank/JEXIM Suppliers' credit Coal India Total FIRR PAPs	16.2 1.8 12.1 30.3 46.1 1,687
Northern Coalfields Ltd.					
Bina Singrauli Coalfield Sonebhadra, Uttar Pradesh *Replacement*	Opencast mine in operation since 1986 with draglines, shovels and trucks; mining 2 seams - Purewa Bottom (20 m) and Turra (11 m); reserves 105 Mt.; quality Grades E & F; stripping ratio 2.2:1; design capacity 4.5 Mt. per year; 1997 production in 5.6 Mt.; requires replacement equipment for maintaining production.	85 ton truck 310 kW dozer 250 mm drill 160 mm drill	8 11 5 1	Bank/JEXIM Coal India Total FIRR	13.8 4.1 17.9 34.8

Mine and location	*Mine profile*	*List of main equipment under project*		*Investment (US$ million) and FIRR*	
Dudhichua Singrauli Coalfield Sidhi, MP & Sonebhadra, UP *Expansion*	Opencast mine in operation since 1981 with draglines, shovels and trucks; mining three seams - Purewa Top, Purewa Bottom (27 to 44 m) and Turra (49 to 61m); reserves 345 Mt.; stripping ratio 3.29:1; quality Grades C, D, and E; design capacity being expanded from 5 to 10 Mt. per year; 1997 production 4.2 Mt., requires equipment for replacement and expansion.	24 m^3 /88 dragline 10 m^3 shovel 120 ton truck 85 ton truck 600 kW dozer 310 kW dozer 240 kW dozer 311 mm drill 250 mm drill 160 mm drill 210 kW grader Coal handling plant	1 9 53 13 5 8 2 2 4 6 5 1	Bank/JEXIM Supplier's credit Coal India Total FIRR	167.4 13.0 100.9 281.3 23.2
Jayant Singrauli Coalfield Sidhi, MP *Replacement*	Opencast mine in operation since 1975 with multiple draglines, and shovels and trucks; mining three seams - Purewa Top (7 m), Purewa Bottom (10 m) and Turra (17 m); reserves 322 Mt.; quality Grade C and D; stripping ratio 2.60:1 but heavy overburden backlog raised current ratio to 2.79:1; design capacity 10 Mt. per year; 1997 production 9.10 Mt.; equipment required for replacement as well as to deal with OB backlog.	10 m^3 shovel 120 ton truck 310 kW dozer 311 mm drill 250 mm drill 160 mm drill	2 28 21 2 8 3	Bank/JEXIM Coal India Total FIRR	63.8 19.2 83.0 48.9
Jhingurdah Singrauli Coalfield Sidhi, MP *Replacement*	Opencast mine in operation since 1965 with shovels and trucks; mining Jhingurdah Top seam (135 m); reserves 58 Mt.; quality Grade E and F; stripping ratio 1.6:1; design capacity 3 Mt. per year; 1997 production 3.6 Mt.; equipment required for replacement as well as to remove arrears of overburden.	10 m^3 shovel 2.5 m^3 hyd. shovel 85 ton truck 310 kW dozer 250 mm drill 160 mm drill	2 2 17 7 2 2	Bank/JEXIM Coal India Total FIRR PAPs	26.6 8.1 34.7 50.9 456
Nigahi Singrauli Coalfield Sidhi, MP *Expansion*	Opencast mine in operation since 1988 with multiple draglines and shovels and trucks; mining three seams.- Purewa Top (2.2-11m), Purewa Bottom (8.8-14.7m) and Turra (14-18m); reserves 492 Mt.; quality Grade C to E; stripping ratio 3.76:1; mine design capacity being increased from 4.2 to 10 Mt. per year; 1997 production 4.2 Mt.; equipment required to implement expansion program.	24/88 m^3 dragline 12.5/10/8 m^3 shovel 2.5 m^3 hyd. shovel 120 ton truck 85 ton truck 310 kW dozer 311 mm drill 250 mm drill 160 mm drill 210 kW grader Coal handling plant	2 11 1 81 32 35 4 9 3 12 1	Bank/JEXIM Coal India Total FIRR EXPANSION NOT YET APPROVED BY THE GOVERNMENT	276.6 160.6 437.2 21.7
South Eastern Coalfields Ltd.					
Dhanpuri Sohagpur Coalfield Shadohl, MP *Replacement*	Opencast mine in operation since 1987 with multiple draglines and trucks and shovels; mining mainly one seam (7m); reserves 45 Mt.; quality Grade C and D; stripping ratio 4.8:1; design capacity 1.25 Mt. per year; 1997 production 0.80 Mt. of Grade C; equipment required for additional overburden removal and for replacement for old items.	5 m^3 shovel 50 ton truck 310 kW dozer 250 mm drill 210 kW grader	3 11 2 2 1	Bank/JEXIM Coal India Total FIRR PAPs	8.8 2.6 11.4 23.0 230

Mine and location	*Mine profile*	*List of main equipment under project*		*Investment (US$ million) and FIRR*	
Dipka Korba Coalfield Bilaspur, MP *Expansion*	Opencast mine started in 1986 with trucks and shovels; mining 58m Lower Kusmunda seam, reserves 200 Mt.; quality Grade F; stripping ratio 0.75:1; design capacity increased from 2 to 10 Mt.; 1997 production 5.0 Mt.; equipment required to match higher level of production and for implementation of expansion project; two pit-head washeries of 6 and 2 Mt. per year raw coal capacity under private sector management are being negotiated.	10 m^3 shovel 120 ton truck 310 kW dozer 240 kW dozer 250 mm drill 160 mm drill 210 kW grader 70 ton crane 30 ton crane Tire handler	5 40 8 9 6 6 1 7 1 1	Bank/JEXIM Supplier's credit Coal India Total FIRR PAPs	84.2 7.5 80.0 171.7 32.5 1,200
Gevra Korba Coalfield Bilaspur, MP *Replacement*	Opencast mine operating since 1985 with trucks and shovels; mining two seams - Upper Kusmunda (27m) and Lower Kusmunda (34 -53m with thick dirt partings); reserves 487 Mt.; stripping ratio 1:1; quality Grade F; designed capacity 12 Mt. per year, 1997 production 16.80 Mt.; requires replacement equipment to maintain production.	10 m^3 shovel 120 ton truck 310 kW dozer 240 kW dozer 250 mm drill 160 mm drill 210 kW grader 28 kL sprinkler	1 18 11 9 7 4 6 5	Bank/JEXIM Coal India Total FIRR PAPs	43.0 13.2 56.2 49.8 412
Kusmunda Korba Coalfield Bilaspur, MP *Replacement*	Opencast mine in operation since 1978 with trucks and shovels; mining two seams - Upper Kusmunda (10-24m) and Lower Kusmunda (10-36m), reserves 311 Mt., quality Grade F; stripping ratio 1.41:1; designed to produce 6 Mt. per year, 1997 production 5.15 Mt.; requires equipment for replacement and to make up the arrears in overburden removal.	10 m^3 shovel 5 m^3 shovel 120 ton truck 310 kW dozer 240 kW dozer 250 mm drill 160 mm drill 210 kW grader 28 kL sprinkler	1 1 28 10 8 5 2 2 2	Bank/JEXIM Coal India Total FIRR PAPs	51.8 15.5 67.3 44.9 193
Manikpur Korba Coalfield Bilaspur, MP *Replacement*	Opencast mine operating since 1966 with trucks and shovels; mining in 30m thick Jatraj seam; reserves 30 Mt.; stripping ratio 1.75:1; quality Grade F; designed to produce 2 Mt. per year, 1996 production 2.12 Mt.; captive to MPEB local power station; replacement equipment required to maintain current production.	5 m^3 shovel 3.5 m^3 hyd. shovel 50 ton truck 310 kW dozer 240 kW dozer 250 mm drill 160 mm drill 210 kW grader 28 kL sprinkler	3 2 22 1 2 2 1 1 2	Bank/JEXIM Coal India Total FIRR	14.2 4.3 18.5 36.5
Western Coalfields Ltd.					
Durgapur Wardha Valley Coalfield Chandrapur, Maharashtra *Replacement*	Opencast mine in operation since 1981; mining in Wardha seam (14-18m); reserves 44 Mt., quality Grade E; stripping ratio 3.3:1, design capacity 1.8 Mt. per year; 1997 production 1.75 Mt.; production linked to local MSEB power station; requires replacement equipment to maintain production	5 m^3 shovel 2.5 m^3 hyd. shovel 50 ton truck 310 kW dozer 240 kW dozer 160 mm drill	9 2 39 2 5 1	Bank/JEXIM Coal India Total FIRR	25.2 7.4 32.6 80.6

Mine and location	*Mine profile*	*List of main equipment under project*		*Investment (US$ million) and FIRR*	
Niljai Wardha Valley Coalfield Yeotmal, Maharashtra *Replacement*	Opencast mine in operation since 1991 with trucks and shovels; mining Wardha seam (14-18m); reserves 65 Mt., quality Grade D/E, contains up to 1.2 % sulfur unlike normal Indian coal; stripping ratio 3.4:1; design capacity 1.9 Mt., 1997 production 1.95 Mt.; coal goes to local MSEB power station; mine originally started with used equipment diverted from other mines, urgently requires replacement equipment to maintain production.	5 m^3 shovel 2.5 m^3 hyd. shovel 50 ton truck 310 kW dozer 240 kW dozer 160 mm drill	2 7 28 2 12 2	Bank/JEXIM Coal India Total FIRR	19.0 5.8 24.8 96.0
Padmapur Wardha Valley Coalfield Chandrapur, Maharashtra *Replacement*	Opencast mine in operation since 1985 with trucks and shovels: mining in Wardha seam (14-18m); reserves 20 Mt., quality Grade E; stripping ratio 4.05:1; design capacity 1.2 Mt., 1997 production 1.25 Mt.; coal goes to local power station of MSEB; in-pit crushing is being tried, the need of additional transport equipment will depend on the results, otherwise, project requires replacement equipment to maintain production.	5 m^3 shovel 2.5 m^3 hyd. shovel 50 ton truck 310 kW dozer 240 kW dozer 160 mm drill	4 5 14 2 9 2	Bank/JEXIM Coal India Total FIRR	14.6 4.4 19.0 113.5
Sasti Wardha Valley Coalfield Chandrapur, Maharashtra *Replacement*	Opencast mine in operation since 1985 with a dragline and trucks and shovel; mining Wardha seam (13.5m), reserves 23 Mt., quality Grade D; stripping ratio 4.14:1; design capacity 1.25 Mt., 1997 production 1.90 Mt. at strip ratio of 2.0:1; equipment required for replacement to maintain production and to clear the arrears of overburden.	5 m^3 shovel 2.5 m^3 hyd. shovel 50 ton truck 310 kW dozer 240 kW dozer 160 mm drill	1 4 20 2 8 2	Bank/JEXIM Coal India Total FIRR	13.2 3.9 17.1 98.2
Umrer Umrer Coalfield Nagpur, Maharashtra *Replacement*	Opencast mine started in 1963 with multiple draglines and trucks and shovels; mining in three seams - Top (8m), Middle (5.5m) and Bottom (16-19m); reserves 37 Mt. (12 Mt. without diverting the Amb river); quality D to E, stripping ratio 2.7:1; design capacity 1.84 Mt. per year, 1997 production 2.55 Mt.; equipment required for replacement purposes to maintain production.	5 m^3 shovel 2.5 m^3 hyd. shovel 50 ton truck 310 kW dozer 240 kW dozer 250 mm drill 160 mm drill	4 4 14 4 6 3 3	Bank/JEXIM Coal India Total FIRR	15.4 4.6 20.0 191.6

Source: Coal India Ltd. and World Bank staff
Note: 1. Coal India finances most of the local procurement contracts, import duties and taxes and inland transport cost.
2. Stripping ratio means volume of-overburden (m^3) to be removed for one ton of coal
3. Indian steam coal quality grading:

Grade	*Ash & Moisture* (%)*	*Gross Calorific Value kilo cal./kg.(approx.)*
A	up to 19.6	Exceeding 6,450
B	+ 19.6 - 23.9	6,050 - 6450
C	+ 23.9 - 28.7	5,600 - 6,050
D	+ 28.7 - 34.1	5,090 - 5,600
E	+ 34.1 - 40.1	4,520 - 5,090
F	+ 40.1 - 47.1	3,870 - 4,520
G	+ 47.1 - 55.1	3,110 - 3,870

* Moisture content varies from 2 to 10%, mostly 5% or more.

ANNEX 4.2 TECHNICAL ASSISTANCE AND TRAINING COMPONENT

1. The past record of Coal India in project implementation has been uneven, often there are both time and cost overruns. Though production growth (about 6% per year) has been impressive, Coal India suffers from some inherent weaknesses, as does the system in which it operates. These may be broadly classified into weaknesses of policy environment, institutional strength and project implementation capacity. Technical assistance proposals are designed to strengthen the capabilities in each of these areas.

Policy Support

2. **Rationalization of rules and regulations of the coal industry.** Coal India's operations are affected by a myriad of mining and other statutes, rules and regulations, many of which are not always supportive of a mineral extraction industry. Over 20 Government agencies are involved in the process of overseeing, control and regulation of the industry. It takes lot of time and effort to get the requisite licenses, permits and environmental clearances; approvals to acquire land, especially forest land; open mine; produce and sell coal; and recover cesses, taxes, and royalties on behalf of the Government agencies and provide accounts for them. Further, Coal India is required to operate a number social welfare activities which were previously run by the Government directly. These problems would also become major bottleneck for the promotion of the private investment in the sector. The project provides a technical assistance program for a team of international and Indian experts to review the entire coal industry regulatory system, compare them with other leading coal mining countries abroad and recommend more suitable regulatory framework based on legislation in other countries.

Institution Building

3. **Commercialization of coal sales.** The price and distribution of coal are regulated by the Government under the Colliery Control Order. The recent Government decision to deregulate coal price and distribution seeks to replace these administered pricing and distribution mechanisms with market-determined mechanisms. Shifting from the centrally controlled practice to the market based one is a difficult and complicated task. In addition to the regulatory reform review mentioned above, this technical assistance component will help Coal India commercialize the sale of coal in the new liberalized sector environment. A team of international and local marketing and legal experts would provide technical assistance to Coal India in commercializing its coal sales, particularly in improving their tender method. Legal experts would help Coal India develop coal supply contracts.

4. **Improvement of CMPDI's design practices.** All Coal India projects are planned and designed in-house by the Central Mine Planning and Design Institute (CMPDI), a wholly owned subsidiary of Coal India. CMPDI employs about 4,000 people at seven regional centers and at its headquarters in Ranchi, Bihar. It is fully equipped to carry out virtually all aspects of mine design including geological exploration, environmental studies, and detailed design of underground and opencast mines, coal preparation plants, workshops, residential colonies for employees and all civil structures.

5. CMPDI designs tend to be repetitive and lack flexibility. They are mostly based on indigenously manufactured equipment or those imported from specified countries. Little attention is paid to alternative technologies utilizing other equipment to optimize production and productivity. The project provides expatriate technical assistance to review existing mine design and practices, including 24 subprojects under this loan, and recommend a timebound program to improve them. The program will also explore whether some current activities could be carried out more economically by private consulting firms.

6. **Improvement in corporate financial planning and implementation of the restructuring process.** Coal India is one of the largest business enterprises in India and has a turnover of almost US$4 billion. With the withdrawal of Government budgetary support, Coal India has to depend on internal resources and market borrowings to meet investment needs. The project provides technical assistance from international financial advisory services to enhance Coal India's capability in preparing financial models as a part of its ongoing commercialization process and to enable the company to borrow from international financial markets. This component also includes technical assistance to enhance Coal India's capability to implement the restructuring process.

7. **Training of Coal India's managers.** Since the nationalization, Coal India's efforts have been mainly directed at attaining the production targets set by the Government rather than any commercial objective of becoming a profitable company. It has been run by the Government similar to a utility to supply cheap power coal to the State Electricity Boards and others. Now that the company has to find its own investment funds by generating sufficient profit and through borrowing from the market on its own financial strength, managers require a new orientation to this commercial environment.

8. The success of Coal India's efforts to become more efficient and commercially viable will depend upon the support it can have from its middle and senior level managers. There are about 20,000 executives in the company of which about 10% are in the middle to higher level of line management. Bank has agreed to finance a training program to develop commercial orientation for these managers. Coal India has agreed to train them at different national management training institutes within three years, in line with a curriculum, acceptable to the Bank, that will familiarize these managers with the principles and techniques of managing commercial operations.

Project Implementation

9. **Improvement of equipment utilization.** Coal India is the owner of the largest opencast equipment fleet in the world, yet its record of equipment maintenance, availability and utilization is poor. Some of it is due to the lack of adequate supply of spare parts from indigenous equipment manufacturers or excessive duty on imported equipment and spare parts and shortage of foreign exchange (prior to 1992). However, the main reason is the poor repair and maintenance and operational practices in the field and at the workshops. Coal India has agreed to review its operations with a view to identifying activities which could be contracted to outside agencies for efficiency and cost saving. A panel of mining and other engineers and management experts, financed through the technical assistance program will assist the companies. Coal India has agreed to take whatever steps necessary to quickly phase out activities that can be carried out more profitably by outside agencies.

10. **Procurement assistance.** Procedural delays in the procurement of plant and equipment, finalization of contracts, lack of proper monitoring tools and lack of delegation of responsibility have been the bane of many projects' implementation. Coal India is aware of these shortcomings and sought technical assistance from the Bank in late 1993 to strengthen its organization for the preparation, implementation and monitoring of projects to minimize the risk of delays. In February 1994, the Bank approved the Project Preparation Fund to provided technical assistance for the preparation of:

(a) a Sectoral Environmental Assessment for the coal sector as a whole and Environmental Management Plans for each subproject;

(b) Rehabilitation Action Plans for project-affected people of each subproject in line with Coal India's Resettlement and Rehabilitation Policy, approved by the Government and Bank;

(c) optimizing the design of mine feasibility reports and equipment configuration; and

(d) scheduling of equipment procurement activities, standardizing equipment sizes, preparing technical specifications and suitably packaging the goods for inviting bids.

11. Activities (a) and (b) were completed in 1994-95 and formed part of the Environment and Social Mitigation Project (Cr. 2862-IN). An international consulting firm was selected in January 1994 to carry out the jobs listed in (c) and to submit their report in three months. Since there was a delay of more than 30 months in the appraisal of the project, the same consultants were again invited in September 1996 to update their earlier report and it was received in December 1996. Another group of international consultants was appointed to assist Coal India's procurement cell in June 1994 for the activities listed in (d). They will continue throughout the duration of the project to assist Coal India in the preparation of bid documents and the technical review of the bids received. The cell has already prepared a number of bid documents which are being reviewed by the Bank.

12. **Coal quality improvement.** Indian coal seams are very thick and often highly interbedded with sandstone and shale bands. The mining excavation techniques used by Coal India tend to disregard the presence of such incombustible materials, even when they are one or two meters thick. No efforts are made to separate them and they are loaded along with coal. Besides the inherent high ash content of these thick coal seams, the dirt bands and the other inert material from the roof and floor of the coal seams get mixed with coal further increasing the ash content.

13. Steam coal is rarely washed in India: run-of-mine coal is simply crushed and screened into sizes before being dispatched to the customers. There are complaints from consumers about high ash content and the visible inert material in the coal. Coal washing may not be always remunerative. Moreover, the Government regulated low price structure for power grade coal has not permitted any compensation for the beneficiation process.

14. Experts consider that some improvement in coal quality is possible if mine management takes specific inexpensive steps to separately excavate the thick inert bands. Technical assistance will include a feasibility study to determine four sites under different geological and mining conditions and identify the required equipment. The investment component will finance procurement of such equipment.

15. Technical assistance will also identify and prioritize technically feasible, and financially and economically viable, coal mining and coal preparation options to improve coal quality. It has been decided that a study will be conducted under the IDA-financed Environmental Management Capacity Building Project (Cr. 2930-IN) to examine the conditions under which measures to improve the overall efficiency and environmental performance of the coal-energy chain (mining-preparation-transportation-conversion) could be implemented.

16. **Assistance in project supervision.** The project has 24 mine subprojects spread over ten coalfields in five States. Some of them are located two days rail journey from Calcutta. It would be difficult for the Bank mission to visit even the seven major projects (with investments exceeding US$50 million each) once a year, let alone all the mines. Therefore, it is proposed to engage a team of local consultants with requisite experience in opencast mining operations to visit all the mines at least once in every quarter and independently report to the Bank and Coal India. The consultants will be treated as an extension of the Bank supervision mission. Both the Government of India and Coal India have agreed to a similar arrangement for the supervision of the Environment and Social Mitigation Project.

16. Table 4.2.1 presents a summary of all technical assistance proposals along with brief terms of reference and estimates of cost. The cost of all technical assistance proposals is estimated at US$13.3 million. Some will be completed in a few months and other will take the full duration of the project life. Some of the programs have already been completed and financed through the PPF.

Table 4.2.1 Summary of Technical Assistance Proposals

Borrower's objectives	*Terms of reference*	*Expected results*	*Timing*	*Implementing agency*	*Resources*	*Est. cost*	*US$ million*
Policy support							
1. To ensure that (a) existing rules and regulations encourage efficient and environmentally and socially sustainable coal mining operations; and (b) the industry will be able to operate at par with international coal companies and attract investment from private sources	Review laws, regulations and control system under which the Indian coal industry operates; review laws and regulations governing mining operations in major coal producing countries; and recommend improvements to regulatory framework based on the review of legislation in other countries	Report with recommendations for changes in the current regulatory framework that governs the operations of the coal mining industry	4/98 to 7/99	Government of India (Ministry of Coal) with the help of a team of international and Indian coal mining and legal experts.	A team of three expatriate & two Indian specialists to work for 12-15 months	60-70 manmonths, international and domestic travel, accom. and per diem expenses.	1.5
Institutional building							
2. Commercialization of coal sales	To help Coal India (a) commercialize coal sale, particularly the improvement of tender method; and (b) develop coal sales contracts.	(a) Improved coal sale practice and tendering methods; and (b) development of coal sale contracts with Coal India's consumers.	6/98 to 12/98	Coal India with the help of a team of international and Indian market experts and legal experts	(a) One expatriate and two local marketing experts for 6 months and (b) two expatriate and two local lawyers for four.	34 man-months, international and domestic travel, accom. and per diem expenses	0.5
3. Review and strengthening mine planning and design practices and capability in underground and opencast mines; introduce advanced computerized techniques for preparing environmentally benign mine design and optimizing mine planning, design and equipment configuration for optimum performance; study and introduce most appropriate state-of-the-art technologies for improvement of production and productivity and reduction of specific investment in underground and opencast mines in general and including the 24 opencast mines in the CSRP.	(a) To study existing methods used in CMPDI; (b) to depute expatriate staff in CMPDI for 'hands on' training to develop environmentally benign mine design and optimize mine design and equipment configuration with special reference to rehabilitation of 24 opencast mines in the Coal Sector Rehabilitation Project; (c) to review the design and suggest improvement, if necessary, of the 24 CSRP mines; (d) to identify activities which could be computerized, to reduce project report preparation time; and (e) to identify activities which could be off loaded to the private sector more economically.	(a) To improve capability of CMPDI staff; (b) to reduce specific investment in projects; (d) and to rationalize manpower in CMPDI.	3/98 to 6/99	CMPDI with the help of reputable mine planning and design consultancy companies abroad.	Expatriate consulting company with a team of 4-5 professionals experienced in underground and opencast mine planning and design.	40-45 manmonths over a period of twelve to fifteen months	1.3

Borrower's objectives	*Terms of reference*	*Expected results*	*Timing*	*Implementing agency*	*Resources*	*Est. cost*	*US$ million*
4. To enhance Coal India's capability to design corporate strategies, choose among alternative financing options and broaden perspective on modern management information systems (MIS) and to enhance Coal India's capability to implement the restructuring process.	(a) To prepare a detailed financial forecasting model for Coal India and its subsidiaries; (b) engage the services of an international financial advisory service and train Indian counterparts in Coal India and each of its subsidiaries; (c) training and international exposure to planning and MIS systems; and (d) other technical assistance related to any restructuring process.	(a) Through the financial forecasting model, Coal India will have a clearer picture of the needs for further changes in the ongoing commercialization process; (b) through the services of the financial advisory service, Coal India will be in a better position to tap international financial markets; (c) gain wider perspective of international practice; and (d) improvement of implementation of the restructuring process.	9/98 to 9/99	Coal India, Office of the Director (Finance)	(a) 3 financial/ accounting model builders from one of the big 6 account-ing firms with experience in models for the coal industry; (b) inter-national firm of accountants w/ management consultancy and active practice in coal sector.	18 manmonths, plus one manmonth for supervisory partner, including transport and subsistence. International study tour for two represent-atives from each operating company for a period of two weeks.	1.0
5. Training middle and senior level executives to become more commercially oriented, instead of focusing on production objectives alone and to improve the quality and efficiency with which mining operations are managed	(a) To study the existing methods of training middle and senior level executives; (b) devise a curriculum acceptable to the Bank to familiarize the managers with the principles and techniques of managing commercial operations; and (c) training at national level management institutes.	Coal India executives to become more commercially oriented where targets of production become less important than providing a fair financial return to the employer for the resources deployed.	1998 to 2001	Management training institutes in Calcutta, Delhi Hydrabad and elsewhere.	180 manmonths training executives in line management, spread over three years.		0.6
Project Implementation							
6. (a) To engage outside agencies to perform some of the jobs more economically than Coal India's in-house organization (b) to improve repair, maintenance and overhaul capability of unit, regional and central workshops and (c) to improve opencast plant, machinery and equipment utilization with a view to increasing their productivity.	(a) To review Coal India's operations and compare similar activities carried out by industries in India and abroad and identify activities that could be offloaded to outside agencies to effect more economy; (b) to study existing workshop facilities and suggest improvements in repair, maintenance and overhaul facilities and suggest feasibility of assigning some of the activities to outside agencies to effect economy; (c) to study existing operation and management practices in spare parts management and the introduction of incentive schemes and compare them with major coal companies abroad and recommend ways and means to improve equipment utilization by closely monitoring operations at mine sites; and (d) to organize training for about 16 Coal India staff in comparable facilities abroad.	(a) To rationalize manpower and to effect economy in cost of production and (b) & (c) to reduce down time and improve availability and utilization of HEMM, improve and modernize spare parts management for opencast machinery, reduce Coal India manpower and direct costs to effect economy and increased equipment utilization and lower capital investment and operating costs due to smaller amount of equipment; (d) to impart training to selected operating personnel for achieving higher performance levels.	3/98 to 9/99	Coal India with the help of a team of expatriate and Indian engineers & management experts.	(a) Consulting company with two expatriate and two Indian specialists for three months; (b) consulting company with two expatriate and two Indian specialists for four months; (c) consulting company with two expatriate and two Indian consultants for six months; and (d) training for 24 months.	50 manmths, international & local travel, accommo-dation, per diem, etc.	0.8

Borrower's objectives	*Terms of reference*	*Expected results*	*Timing*	*Implementing agency*	*Resources*	*Est. cost*	*US$ million*
7. To assist in (a) standardizing the types of opencast equipment in conformity with best equipment configuration; (b) preparation of a standard bidding document; (c) scheduling equipment procurement and assisting in technical evaluation; (d) preparing bid packages for all equipment required for all subprojects.	(a) To review the equipment specifications to rationalize and standardize the classes and sizes; (b) to draw up specifications for the best quality equipment; (c) to assist Coal India's Monitoring and Procurement cells in packaging the equipment in realistic sizes and scheduling dates for bid preparation, invitations and evaluation; and (c) to provide 'hands-on' training to Indian engineers to a computerized monitoring system.	(a) To minimize the variety of equipment used in Coal India; (b) to procure best quality equipment in the world market; (c) to assist Coal India Monitoring and Procurement Cells in packaging the equipment in realistic sizes and scheduling dates for bid preparation, invitations and technical evaluation; and (d) to provide 'hands-on' training to Indian engineers to a computerized monitoring system.	1995 to 2001	Coal India with help of reputable consultancy companies with expertise in coal mining, procurement under World Bank guidelines and in a major project implementation monitoring system.	Consultants have been appointed and are already working.	171 manmonths (91 manmonths have already been utilized)	4.4 (1.2 from PPF)
8. Independent local supervision of the implementation of the project including checking (a) status of mine development; (b) the physical preparedness of the mine to receive the equipment; and (c) status of equipment delivery, erection and commissioning.	To visit each subproject at least once in every quarter and review (a) the physical progress on mine development; (b) equipment delivery, erection and commissioning; and (c) results in the increase of production and productivity.	The consultants will submit quarterly reports to the Bank to help the Bank supervision missions to focus attention on implementation of policy reforms, institution building and on major projects.	1998 to 2002	Coal India with the help of local consultants with expertise in mining project implementation, coal mining, and the Bank's equipment procurement procedures.	One senior mining engi-neer with two teams. Each team with one sociologist, one excavating engineer and one environmental specialist.	420 manmonths, local travel, accom., per diem, etc.	Covered by ESMP - no separate fund or action is needed.
9. To assist in improving opencast mine coal quality with selective mining.	(a) To study current mining practices , to carry out a feasibility study to identify four pilot project sites under different geological and mining conditions, and to recommend suitable equipment for excavating and loading the coal free of dirt bands and other extraneous matter and (b) supervise implementation of four pilot selective mining schemes.	(a) Higher coal quality and resultant increase revenue and profit and improved customer satisfaction.	(a) 6/98 to 12/98 (b) 1/00 to 6/01	Coal India with consultants experienced in 'hands on' management of private company opencast mines.	(a) 3 expatriate consultants for 6 months (b) 2 specialists overseeing introduction of new technology and periodic supervision of work in progress during the first two years.	(a) 18 man-months, inter-national travel, accom., per diem, etc.; (b) 12 manmonths international travel, accom., per diem, etc.	0.8
10. To assist with preparation of the CSRP.	A number of studies have been done with funds from the PPF: a technical review, environmental and social impact assessment, Indigenous Peoples Development Plans, and a study of the safety of overburden dumps.	-	-	-	-	-	.56 (financed by the PPF)

Source: Coal India Ltd. and Bank staff

The following study will be conducted under the Environmental Management Capacity Building Project (Cr. 2930-IN):

Borrower's objectives	*Terms of reference*	*Expected results*	*Timing*	*Implementing agency*	*Resources*	*Est. cost*	*US$ million*
To improve coal quality and the overall efficiency/environmental performance of the coal-energy chain.	(a) To study Indian coal mining and coal preparation in relation to best practices including overseas study visits; (b) to identify technically feasible and financially and economically viable options at five selected coal areas; (c) identification of present incentives/disincentives in India for implementation of options; (d) bench-marking at five selected coal areas against international experience; (e) identification of efficiency/environmental costs and benefits across the coal-energy chain; and (f) develop implementation plan for pilot projects at five selected coal areas.	Definition of options and costs and benefits of improved coal quality.	1998 to 1999	Government of India (Ministry of Environment and Forest) with local and international experts.	A team of international and local multi-disciplined consultants for 12 months.	60-72 man-months international and domestic travel, accom. and per diem expenses.	1.0

ANNEX 4.3 COAL SECTOR ENVIRONMENTAL AND SOCIAL MITIGATION PROJECT (ESMP) STATUS OF IMPLEMENTATION NOTE

June 9, 1997

Background

1. Coal India has requested Bank assistance for the proposed Coal Sector Rehabilitation Project (CSRP). In mid-1995, Bank Management recognized that the social and the environmental risks of the proposed CSRP were of such a magnitude that they needed to be dealt with by a dedicated free-standing mitigation project which should start before the implementation of major investments under the CSRP. Thus, two projects – to be linked by adequate cross-conditionalities (see Table 4.3.1) – were identified: (a) ESMP, which supports Coal India's objective of making coal production environmentally and socially sustainable in the twenty-five mines and ensuring that possible negative effects of coal mining expansion are alleviated; and (b) the proposed CSRP which would support market-oriented coal sector reform, and investments in twenty-four[1] selected, highly profitable and economically viable mines. On May 16, 1996, when the Executive Directors considered the ESMP, they requested that a note on the status of implementation of ESMP be submitted before negotiations for the proposed CSRP are initiated.

Project Background

2. ESMP comprises: (i) a *capacity building component* which would enhance Coal India's environmental and social management capacity to deal effectively with the environmental and social issues of coal mining operations; (ii) an *investment component* which would support the implementation of Environmental Action Plans (EAPs), Rehabilitation Action Plans (RAPs) and Indigenous Peoples' Development Plans (IPDPs) for the twenty-five selected mines with the assistance of non-governmental organizations (NGOs) and community involvement; and (iii) a *social remedial action component* to review and, if necessary, implement a program of resettlement and rehabilitation (R&R) measures for three previously Bank-financed coal projects.

Status of Implementation

3. Coal India committed to undertake a number of specific activities associated with project launch and implementation. Table 4.3.2 shows that all actions which are covered by dated covenants have been achieved. Table 4.3.3 shows that most of the agreed Performance Indicators have been met. Achievement of indicators related primarily to community infrastructure have been delayed. This is because the Bank advised Coal India against proceeding with construction of physical works until consultative processes with the local communities have been completed. Five Bank supervision missions for ESMP were undertaken between February through May 1997, including a specific mission that focused on mines which have attracted NGO attention. As a result of this intensive effort, Bank staff have identified several additional actions to be taken by Coal India in order to improve results on the ground. These additional actions are listed in Table 4.3.4.

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[1] Coal India had withdrawn one of the ESMP project mines from the consideration of CSRP and will finance the investments with their own funds.

4. The supervision teams found more positive developments in Orissa compared to Bihar and also noted the great diversity of conditions and problems faced by different mining communities and mine sites. The inescapable conclusion has been that while it is possible to mitigate the negative social and environmental impacts of coal mining in regions which are already disadvantaged by poverty and other social complexities, it is likely to be a long and a continuing process.

5. The supervision teams also confirmed that Coal India and its subsidiaries have put in place an improved Resettlement and Rehabilitation policy, environmental standards for coal mining, and initiated the preparation of a remedial action plan – based on surveys and NGO-assisted consultation – for persons below poverty line who had been adversely affected by the three previously Bank-financed coal projects (the mines of Dudhichua, Gevra and Jharia). Coal India has reinforced this commitment by appointing the required staff, consultants, review and oversight panels, and the facilitating NGOs to ensure effective implementation of these new policies, standards and plans.

6. What now lies ahead for Coal India and subsidiaries is forging a more collaborative and effective partnership between themselves, local communities and other stakeholders. This too is likely to be a time-consuming process. The legacy of past mistakes – none of the twenty-five mines is a "greenfield site" – will not be easy to overcome. Ready-made solutions are not available, particularly as Coal India is no longer in a position merely to provide permanent employment to all comers. Responses tailored to the special social, cultural, and political circumstances and needs of particular communities and mines will have to be negotiated and implemented on a continuing basis in close consultation with those communities.

Future Challenges

7. The major challenges which remain to be addressed under ESMP include the implementation of environmental remedial actions, internalizing a full-fledged community participation process, and developing and implementing a viable income restoration strategy for the project affected people.

8. *Environmental Remedial Actions*. Coal India has met all of the targets agreed with the Bank to develop and introduce new policies and procedures for the implementation of EAPs (Tables 4.3.2–4.3.3). Despite this progress, Coal India still has to enhance capacity at each of the twenty-five mines to monitor various environmental parameters, share this information with the public, and, wherever necessary, implement environmental remedial measures such as reclamation of post-mine land, bioreclamation of overburden dumps, and top-soil conservation and utilization. Furthermore, in the course of supervision between February 5 and May 1, 1997, Bank staff identified the incompleteness in monitoring indicators for the environmental aspects of the project. This has also been noted by the NGOs. As a result and to remedy this, strengthened monitoring indicators are being incorporated into the CSRP as a part of the cross-conditionality.[2] Environmental conditions in and around the project mines remain sub-standard and pose other challenges. EAPs financed under the project are designed to address these problems.

9. *Community Participation* is an area of significant challenge. Coal India's management admits that its staff needs to develop a capacity for greater involvement of the project-affected people in the decision-making process. Coal India has initiated the measures to improve its performance in community involvement by establishing a continuous process of formal and informal training of staff, consensus building and awareness raising workshops for its personnel who work in the mines and at subsidiary

[2] Specific covenanted understandings on indicators and benchmarks will be agreed at negotiations for CSRP.

headquarters, and staff who are in the direct contact with project-affected people. NGOs which have credibility in the local communities have been retained by Coal India to facilitate the consensus building and partnership development between the project-affected people and the subsidiary staff.

10. Even with increased mobilization of Coal India staff and the involvement of NGOs, experience in India and elsewhere shows that the community participation process will not produce tangible results immediately: some time will be necessary for the process to be fully internalized by all the stakeholders and for it to take root in the day-to-day activities of project implementation at the village level. The Bank advised Coal India to defer civil works in the resettlement and IPDP villages until proper community participation processes were established to include the project-affected people, NGOs, and community based organizations (CBOs). These prerequisites – which include the posting of Resettlement and Rehabilitation and Community Development Officers and facilitating NGOs to all the mines, appointment of supervision and review panels – have been fulfilled and the process of construction can now proceed.

11. The lack of meaningful consultations between Coal India and its subsidiaries with project affected people and other stakeholders has led to several difficult situations. For example, the staff of Mahanadi Coalfields Ltd. (MCL) after little or no consultations with project-affected people, proceeded with the development of resettlement village. Plots have been laid out, and roads, storm water drains electricity supply, a school and village health center, and shops have been provided. However, very few families have moved to these villages, taken possession of their plots, or begun construction of their homes.

12. At Parej East coal mine of the Central Coalfields Ltd. (CCL), a conflict developed between CCL and project-affected people which necessitated police and court interventions. Project-affected people refused to move from the land acquired by CCL because they were not consulted on the location and site designed for the resettlement village. With enhanced consultations, two alternative sites have been identified and it appears that a solution is being found to this problem.

13. *Income Restoration Strategy.* The provision of permanent jobs for project-affected people has been the traditional means of rehabilitation used by Coal India. This is no longer possible because GOI has withdrawn subsidies to Coal India, and the corporation is in the process of reducing its labor force. In addition, because of the increasing scarcity of readily available land in many areas, the land-for-land option for rehabilitation is not likely to be a practical choice in many cases. Therefore, a significant challenge for Coal India is to develop a viable strategy for income restoration for project-affected people. Such a strategy, which is now being developed by Coal India with NGO assistance, will encompass a variety of options including: self-employment, training for project-affected people and their family members, funding for self-employment and community savings schemes, as well as targeted annuity programs which would, with proper design and safeguards, allow for the necessary support to project-affected people to regain their pre-project living standards. Income restoration strategy will also be applied to about one hundred persons identified to be below the poverty line who had been affected by the previously Bank-financed coal projects.

Lessons Learned

14. One of the major lessons learned so far from this experience is that the development of two free-standing operations to address environment, social, and sector rehabilitation issues in the coal sector, and the early approval of the mitigation project, provided an incentive for the Borrower to focus on those

aspects of coal sector development which may otherwise have received insufficient attention in the context of one large integrated project.

Information Sharing with NGOs

15. While preparing this Note, the Bank shared information on the ESMP implementation status with international and India-based non-governmental organizations. NGOs contributed to the Coal India's and the Bank's understanding of the problems by reporting on the developments and making suggestions for improving the situation in particular mines. Specific suggestions, to improve monitoring of the environmental aspects of the project, have been taken into account in devising the proposed cross-conditionalities between the ESMP and CSRP. As a part of this on-going process of outreach to, and sharing written materials with the NGOs, the Bank also organized a series of meetings:

(a) On April 16, 1997, the Office of the Indian Executive Director organized a briefing of the NGOs in Washington in relation to the visit to the World Bank by Mr. Bagchee, the Secretary for Coal, GOI, Mr. Sengupta, Coal India Chairman and the members of their team;

(b) On April 30, 1997, briefing of Chotanagpur Adivasi Sewa Samiti (CASS), a field NGO, by the Social Development Unit Chief, took place in Rajrappa, Bihar;

(c) On April 30, 1997, a briefing of NGOs by Bank staff on Indian energy policy issues and their relation to the ESMP and the proposed CSRP took place in Washington;

(d) On May 9, 1997, a meeting took place in the World Bank's Paris Office, attended by the representatives of, *inter alia*, Berne Declaration, Minewatch, Friends of the Earth, Amnesty International, Bretton Woods Project, and World Bank Reform.

Conclusion

16. Despite the remaining challenges noted and in view of the efforts made by CIL to establish an adequate structure for project implementation, momentum has been established and the prognosis for the successful implementation of the ESMP is favorable. Further delay in initiating the specific investments under the proposed CSRP is clearly no longer justified. Delay could only result in a loss of the momentum already gained in developing institutional capacity, and thus retard the progress on the operational framework for social and environmental remediation.

17. The Bank will invite GOI and Coal India to negotiate the proposed CSRP as soon as the conditions of negotiations relating to CSRP are met.

Table 4.3.1 Proposed Cross Conditionalities and Linkages between the ESMP and CSRP

A: Under the proposed CSRP the Bank will have the right to suspend all or parts of the proposed CSRP Loan if the Government of India or Coal India fail to comply with their legal obligations under the ongoing ESMP Credit.

B: In addition, agreements will be sought during the negotiations for the proposed CSRP, that the Bank may suspend all or parts of the CSRP Loan, if Coal India fails to perform in a satisfactory manner the areas listed below:

Environmental Mitigation Activities
Areas
Monitoring of blasting vibrations every six months
Standardization of air and water monitoring procedures
Commissioning of all mobile sprinklers
Commissioning of dust extractors in existing drills
Commissioning of sedimentation ponds and mine discharge treatment plants
Technical assistance study on disposal of oil/grease and water from workshops effluent
Technical assistance study on bio-contamination of subsoil water from domestic effluent
Tree planting for noise and dust suppression
Implementation of the recommendations of the overburden dump safety and stability study, if any

Social Mitigation Activities
Areas
Implementation of Indigenous Peoples Development Plans (IPDPs)
Implementation of the rehabilitation program for project-affected people (PAPs)
Strategy for income restoration for PAPs

Table 4.3.2 Status of Compliance with Legal Covenants

Item	*Covenanted Date*	*CIL Target Date*	*Status as of May 1997*
Maintenance of adequate policies and procedures to monitor and assess project implementation	**(a)** Report on Monitoring and Evaluation Activities by **09/30/98** **(b)** Report review by **12/31/98**	—	**On-going activity**
Review of mine emergency plans	**(a)** Appoint expert team to review emergency plans by **12/31/96** **(b)** Modify such plans, if needed, in line with expert advice	**07/16/97**	Team of experts appointed on **04/2/97** *Draft Report* expected by end of **06/97**
Safety engineering studies for reclamation of overburden dumps	**(a)** Studies to be carried out at all mines **(b)** Appoint expert panel by **08/15/96** to review and approve studies' recommendations **(c)** Implement recommendations approved by the panel	**04/17/97**	Studies completed Expert panel appointed on **03/15/97** The study was completed on **05/10/97** and accepted by CIL after review by Central Mine Planning and Design Institute Ltd. (CMPDI) engineers
Social and Environmental Supervision Panel	Panel to be appointed by **10/31/96**	**03/26/97**	Supervision panel appointed on **04/8/97** Panel team already visited Central Coalfields Ltd.
Social and Environmental Review Panel	Panel to be appointed by **08/31/96**	**03/25/97**	Review panel appointed on **04/11/97**
Appointment of community development/Resettlement & Rehabilitation Officer at each mine site	**12/31/96**	**04/30/97**	Completed **03/20/97**
Action Program to increase income of project-affected persons in previously Bank-assisted coal projects	**06/30/97**	**06/30/97**	**On-going activity**
Review and enhancement of CIL's environmental management capacity	**(a)** Review of environmental management capacity by **06/30/97** **(b)** Management enhancement program to be implemented for 18 months after review (to **12/31/98**)	**04/4/97** (start of study) **04/6/98** (study finished)	**On-going activity**
Facilitation of community participation in implementation of rehabilitation action plans (RAPs) and indigenous peoples' development plans (IPDPs)	**(a)** Invite proposals from certified NGOs by **09/30/96** **(b)** Appoint selected NGOs by **12/31/96**	**04/15/97** (all NGOs hired)	All NGOs appointed between **03/27** and **04/15/97**
Review of RAPs and IPDPs implementation at mine sites	**12/31/97**	**12/31/97**	**On-going activity**
Maintain up-to-date environmental clearances from appropriate authorities	—	—	**On-going activity**
Provide quarterly reports to the Bank on project progress	**09/30/96** (beginning date for reporting) Report due within 60 days after the end of each quarter	—	**On-going activity**

Table 4.3.3 Status of Achievement of Performance Indicators

Project Input

Environmental Component

Performance Indicators	*Actions to be taken*	*Status as of May 1997*
Preparation of Environmental Action Plans (EAPs)		Completed (94)
Framing of environment policy		Completed (95)
Standardization of monitoring procedures	Signing of contract (03/31/97); Completion of the study & adoption of the standard procedures (06/30/97)	Contract signed on 04/1/97 with *Steel Authority of India*; work started by consultant on 04/15/97; study will be completed by 06/30/97
Study of air quality		On-going activity
Study of water quality		On-going activity
Identification of villages affected by air, water & noise pollution and explosive vibration		Contract for the study on standardization of monitoring procedures includes the identification of affected villages; draft report to be submitted on 11/97; final report will be available on 12/97
Study of biocontamination of subsoil water from domestic effluents	Signing of contract (04/15/97)	Contract signed on 04/25/97 with *Consulting Engineering Services*
Overburden dump safety and stability study, review of study and recommendations for safety measures	Contract (done); Completion of the panel review (05/25/97)	Contract signed on 03/15/97 with *International Mining Consultants Ltd.*; Study completed on 05/10/97
Study of workshop effluent disposal arrangement	Contract signing (05/01/97); Study completion (06/30/97)	Contract assigned on 05/13/97 to *M/s PDIL*

Table 4.3.3 Status of Achievement of Performance Indicators (continued)

Project Input

Social Component

Performance Indicators	*Actions to be taken*	*Status as of May 1997*
Preparation of resettlement & rehabilitation policy		Completed (94)
Preparation of rehabilitation action plans (RAPs)		Completed (94)
Framing of community development policy		Completed (94)
Preparation of indigenous peoples' development plans (IPDPs)		Completed (95)
Community development/resettlement & rehabilitation officers posted in the 25 project mines	Posting (03/31/97)	Completed on 03/20/97
General Manager (Resettlement & Rehabilitation) of five subsidiaries trained	Initial orientation completed, further training program prepared (04/30/97); Community development/ resettlement & rehabilitation training program organized (12/31/97)	Orientation workshop given on 04/28/97; training plan and modules under preparation
Mine managers for the 25 project mines trained	Initial orientation completed, further training program prepared (04/30/97); Community development/ resettlement & rehabilitation training program organized (12/31/97)	Proposal to incorporate a community development/resettlement & rehabilitation module in regular training plans of managers will be finished on 06/30/97
Consultant hired for resettlement & rehabilitation cell	Signing of contract (04/30/97)	Contract signed with *Jayaprakash Institute of Social Change* on 04/30/97
Proposals invited from non-governmental organizations (NGOs) for 25 mines		Completed (97)
NGOs trained for the 25 project mines	Training (orientation) completed (04/30/97)	Orientation workshop held in Calcutta on 04/28/97
Monitoring/grievance committee formed at subsidiary or area level		Completed (96)
Resettlement & rehabilitation coordination committees formed in 14 mines		Completed (96)
Indigenous peoples' development plan (IPDP)/community development council formed in 24 mines		Completed (96)
Village working groups (VWG) for indigenous peoples' development plan (IPDP) formed and functioning in 24 mines	Signing of NGO contract (04/15/97); preparation of annual IPDP (10/31/97); Initiation of formation of VWG & functioning (08/30/97); Preparation of annual IPDP for 1998 (10/31/97)	Contracts signed with NGOs between 03/27 and 04/15/97

Table 4.3.3 Status of Achievement of Performance Indicators (continued)

Result of Project Implementation

Environmental Component

Performance Indicators	*Actions to be taken*	*Status as of May 1997*
Installation of four environment laboratories		Western Coalfields Ltd. (WCL) and Northern Coalfields Ltd. (NCL) construction contracts awarded on 01/97; Mahanadi Coalfields Ltd. (MCL) and Southeastern Coalfields Ltd. (SECL) outsourcing record submitted
Construction of 20 plant nurseries	Signing of contract for 4 nurseries (04/20/97)	Contract signed on 04/97
Installation of dust suppression system	Signing of contract (04/20/97)	Contract signed on 04/97
Construction of catch and garland drains, drains to catch mine water, and settling ponds		On-going
Construction of domestic effluent treatment plants		On-going
Reshaping overburden dumps for stability & safety		On-going
Tree plantation for noise and dust suppression		On-going
Vegetation of overburden dumps and mined-out acres		On-going
	Social Component	
Consultation with representatives of project affected people, local communities and non-governmental organizations (NGOs)		On-going
List of project-affected persons (PAPs) verified in 14 mines	Signing of NGO contract (04/15/97); list prepared (07/94); to be updated (09/30/97)	Contracts with NGOs signed
Photo ID cards (for project-affected persons) issued in 14 mines	15% already issued, 30% (06/30/97), 100% (09/30/97)	On-going
Information campaign (on indigenous peoples' development plan – IPDP) carried out in 25 mines	Preparation of annual IPDP (10/31/97)	On-going
Detailed IPDP implementation plan prepared	Preparation of annual IPDP (10/31/97)	On-going
Training and support for income restoration	Signing of NGO contract (04/15/97)	On-going
Community infrastructure initiated	Preparation of annual IPDP (10/31/97); first contract signing (09/30/97)	On-going

Table 4.3.4 Additional Actions

Performance Indicators	*Actions to be taken*	*Status as of May 1997*
Appointment of Assistant to General Manager for resettlement & Rehabilitation and General Manager for Environment		Completed (97)
Appointment of Communications Coordinator		Completed (97)
Delegation of powers to Chief General Manager of World Bank Division		Completed (97)
Preparation of a draft TOR for developing action plan for income restoration activities	TOR to be prepared (03/31/97)	TOR submitted on 03/31/97
Establishment of the cadre for Environmental Staff		Completed (97)
Establishment of the cadre for resettlement & rehabilitation staff	Draft to be prepared (04/30/97); Cadre to be established (06/30/97)	Proposal for resettlement & rehabilitation cadre submitted; proposal will be reviewed for approval by CIL's board in 06/97
Strengthening of management of the consultants and activities of the non-governmental organizations (NGOs)	Management Information System (MIS) to be installed (06/30/97)	On-going

ANNEX 4.4: COAL INDIA'S OBLIGATIONS RELATING TO ENVIRONMENTAL AND SOCIAL MITIGATION

Environmental Component

1. Coal India shall, in relation to each of the Projects Mines, carry out the following or cause the following to be carried out unless otherwise agreed with the Bank:

(a) By: (i) March 31, 1998, have in place in the Project Mines and begin operation of seven (7) mobile sprinklers; (ii) March 31, 1999, have in place and begin operation of an additional twenty (20) mobile sprinklers; and (iii) March 31, 2000, have in place and begin operation of a further additional twenty (20) mobile sprinklers.

(b) By September 1, 1998, install and begin operation of dust extractors in existing drills.

(c) By December 1, 1998, install or refurbish and begin operation of sedimentation ponds.

(d) By December 1, 1998, install or refurbish and begin operation of mine discharge treatment plants.

(e) By January 1, 1998, submit to the Bank the results of the ongoing study on the disposal of oil/grease and water from workshop effluent, and by September 1, 1998, complete implementation of the guidelines recommended in such study.

(f) By June 30, 1998, submit to the Bank the results of the ongoing study on bio-contamination of subsoil water from domestic effluent, and by June 30, 1999, complete implementation of the recommendations, if any, of such study.

(g) Carry out tree planting in the Project Mines in accordance with the following schedule: (A) 670,000 trees by June 30, 1998; (B) an additional 670,000 trees by June 30, 1999; (C) an additional 670,000 trees by June 30, 2000; and (D) an additional 670,000 trees by June 30, 2001.

(h) In the event that the ongoing study on overburden dump safety and stability makes recommendations, begin implementation of such study recommendations by January 1, 1998, and complete the implementation by September 30, 2000.

Social Component

2. Coal India shall, in relation to the Indigenous People's Development Plans ("IPDP") defined in the ESMP, carry out the following or cause the following to be carried out unless otherwise agreed with the Bank:

(a) Submit to the Bank by October 31st each year, 24 detailed mine-specific annual IPDP implementation plans, the first set of 24 plans for calendar year 1998 to be submitted by October 31, 1997.

(b) For each of the 24 mines with villages targeted for IPDP activities (as defined in the Borrower's Community Development Plan dated September 1995), subject to paragraph (d) below, begin IPDP activities that are agreed with concerned villages:

(i) by September 30, 1998, in the number of villages specified below, depending on the number of targeted villages at each mine site:

	For a mine with:	
	5 or fewer targeted villages	*more than 5 targeted villages*
Begin IPDP activities in:	at least 1 village	at least 2 villages

(ii) by March 31, 2000, in the number of villages specified below, depending on the number of targeted villages at each mine site:

	For a mine with:		
	4 to 6 targeted villages	*7 to 10 targeted villages*	*more than 10 targeted villages*
Begin IPDP activities in:	at least 2 villages	at least 3 villages	at least 6 villages

(c) Complete implementation of activities described in such IPDP implementation plans in accordance with a time schedule agreed between the Borrower and the Bank.

(d) (i) Notify the Bank promptly if, as a result of inadequate participation by inhabitants of the targeted villages, implementation of IPDP activities is not carried out in accordance with subparagraph (b) above, and such notification shall be accompanied by a certification to the Bank by the Environmental and Social Review Panel that the Borrower has made adequate efforts to disseminate information to and consult with the concerned villages on IPDP activities.

3. Coal India shall, in relation to the ESMP Project Affected Persons ("PAPs") defined in the Borrower's Resettlement and Rehabilitation Policy, April 1994, carry out the following or cause the following to be carried out unless otherwise agreed with the Bank:

(a) By October 31, 1997: (i) update and verify the list of PAPs compiled on the basis of the July 1994 census; and (ii) complete the issuance of photograph identification cards to entitled PAPs.

(b) By November 30, 1997, complete a database of PAPs based on the updated and verified list of PAPs referred to in paragraph 3(a)(i) above.

(c) Conduct an initial market survey and identify job opportunities and training needs for purposes of rehabilitating eligible PAPs by February 28, 1998.

(d) Submit to the Bank for approval by November 30 of each year, 14 annual mine-specific rehabilitation plans taking into account the time schedule and actions referred to in subparagraph (e) below, the first set of 14 plans for calendar year 1998 to be submitted by November 30, 1997.

(e) By December 31 of the following year: (i) complete implementation of all activities described in such rehabilitation plans; and (ii) complete actions relating to resettlement and rehabilitation to the satisfaction of the Bank.

(f) By March 31, 1998, submit to the Bank a strategy for the economic rehabilitation of and sustainable income restoration by PAPs.

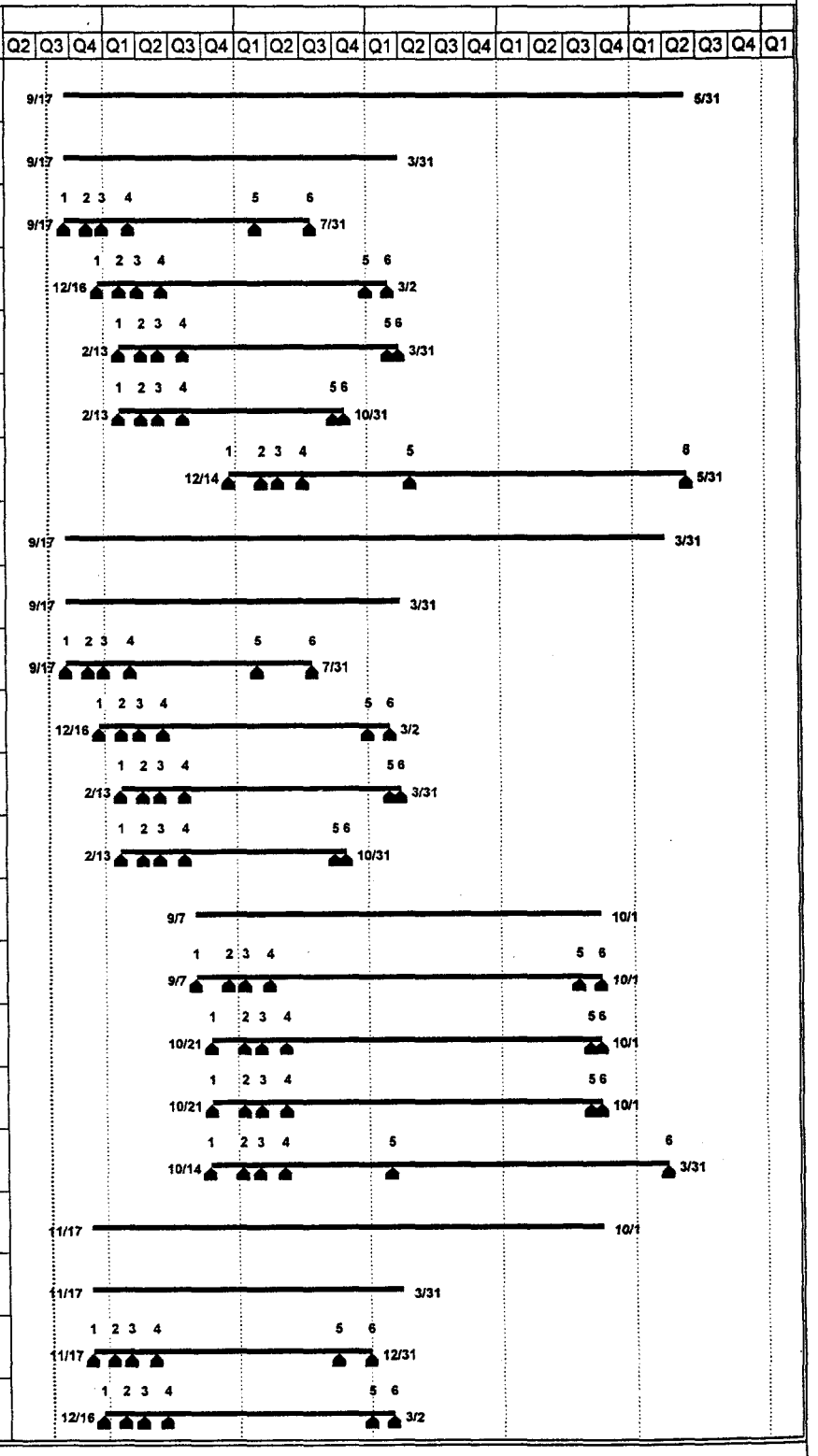
ANNEX 4.5 DETAILED PROJECT COST ESTIMATE

Cost Components	*Foreign*	*Local*	*Total*	*Foreign*	*Local*	*Total*	*Foreign exchange*
		Rs million			*US$ million*		*(%)*
Civil works and coal handling plants	1,951.1	3,852.1	5,803.2	54.5	107.6	162.1	33.6
Buildings		1,829.4	1,829.4		51.1	51.1	
Roads & culverts		429.6	429.6		12.0	12.0	
Water supply & sewerage systems		479.7	479.7		13.4	13.4	
Railway siding		282.8	282.8		7.9	7.9	
Coal handling plants	1,951.1	716.0	2,667.1	54.5	20.0	74.5	73.2
Other infrastructure		114.6	114.6		3.2	3.2	
Equipment and vehicles	30,716.4	12,322.4	43,038.8	858.0	344.2	1,202.2	71.4
Draglines	1,560.9	486.9	2,047.8	43.6	13.6	57.2	76.2
Shovels	6,569.3	2,233.9	8,803.2	183.5	62.4	245.9	74.6
Dump trucks	15,515.7	4,797.2	20,312.9	433.4	134.0	567.4	76.4
Drills	2,187.4	819.8	3,007.2	61.1	22.9	84.0	72.7
Dozers	3,794.8	1,159.9	4,954.7	106.0	32.4	138.4	76.6
Other opencast equipment	497.6	390.2	887.8	13.9	10.9	24.8	56.0
Electricals		1,084.7	1,084.7		30.3	30.3	
Workshops		572.8	572.8		16.0	16.0	
Pumps		218.4	218.4		6.1	6.1	
Equip. for coal quality improvement	401.0	111.0	512.0	11.2	3.1	14.3	78.3
Dispatch system and telecom	179.0	50.1	229.1	5.0	1.4	6.4	78.1
Misc. equipment	10.7	304.3	315.0	0.3	8.5	8.8	3.4
Vehicles		93.1	93.1		2.6	2.6	
Technical assistance	408.1	93.1	501.2	11.4	2.6	14.0	81.4
Institution building	121.7	32.2	153.9	3.4	0.9	4.3	79.1
Policy support	50.1	14.3	64.4	1.4	0.4	1.8	77.8
Project implementation	236.3	46.5	282.8	6.6	1.3	7.9	83.5
Miscellaneous		179.0	179.0		5.0	5.0	
Base cost (1997)*	33,075.6	16,446.5	49,522.1	923.9	459.4	1,383.3	66.8
Physical contingencies	3,311.5	1,646.8	4,958.3	92.5	46.0	138.5	66.8
Price contingencies	3,243.5	3,050.2	6,293.6	90.6	85.2	175.8	51.5
Total project cost	39,630.6	21,143.5	60,774.1	1,107.0	590.6	1,697.6	65.2
Financing requirements	39,630.6	21,143.5	60,774.1	1,107.0	590.6	1,697.6	65.2

* Base costs include taxes and duties of approximately US$238.2 million.

Implementation Plan

ID	Task Name
1	Parej-East
2	Procure HEMM - Stage A
3	Shovel, 5 M3 x 5
10	Dumper, 50 T x 31
17	Dozer, 310 KW x 2
24	Dozer, 240 KW x 3
31	Coal Handling Plant
38	K D Hesalong
39	Procure HEMM - Stage A
40	Shovel, 5 M3 x 4
47	Dumper, 50 T x 8
54	Dozer, 310 KW x 8
61	Dozer, 240 KW x 2
68	Procure HEMM - Stage B
69	Dumper, 50 T x 7
76	Dozer, 310 KW x 2
83	Dozer, 240 KW x 1
90	Coal Handling Plant
97	Rajrappa
98	Procure HEMM - Stage A
99	Shovel, 5 M3 x 1
106	Dumper, 85 T x 16

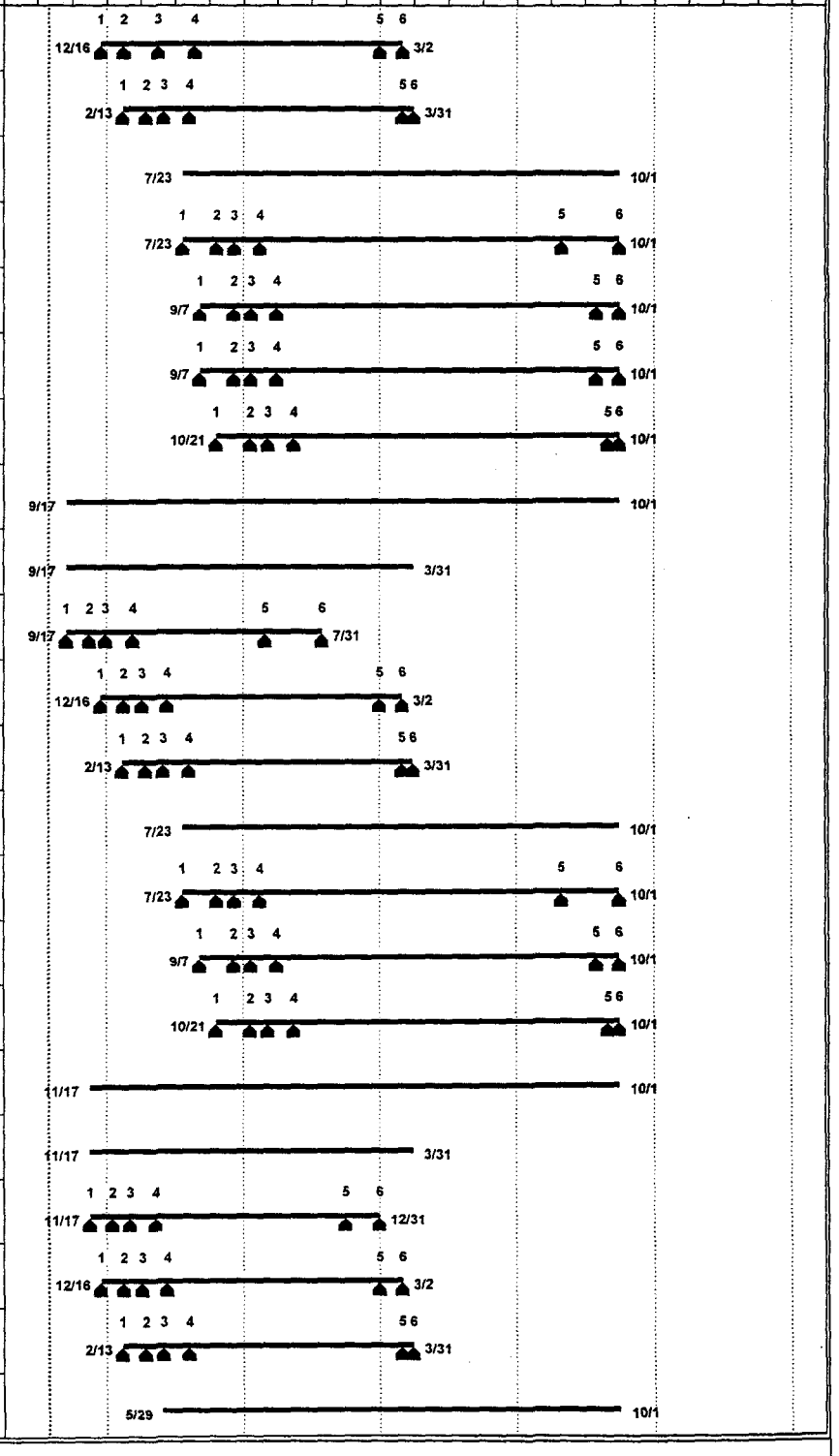


IFB-1, Bid Receipt-2, Bid Eval-3, Award-4, Last Supply-5, Final Payment-6.

Task
Milestone
Summary
Rolled Up Task
Rolled Up Milestone

Implementation Plan

ID	Task Name
113	Dumper, 50 T x 35
120	Dozer, 310 KW x 8
127	Procure HEMM - Stage B
128	Shovel, 5 M3 x 1
135	Dumper, 85 T x 12
142	Dumper, 50 T x 6
149	Dozer, 310 KW x 4
156	Ananta
157	Procure HEMM - Stage A
158	Shovel, 5 M3 x 1
165	Dumper, 50 T x 16
172	Dozer, 310 KW x 4
179	Procure HEMM - Stage B
180	Shovel, 5 M3 x 3
187	Dumper, 50 T x 10
194	Dozer, 310 KW x 3
201	Belpahar
202	Procure HEMM - Stage A
203	Shovel, 4 M3 x 2
210	Dumper, 50 T x 8
217	Dozer, 310 KW x 2
224	Procure HEMM - Stage B

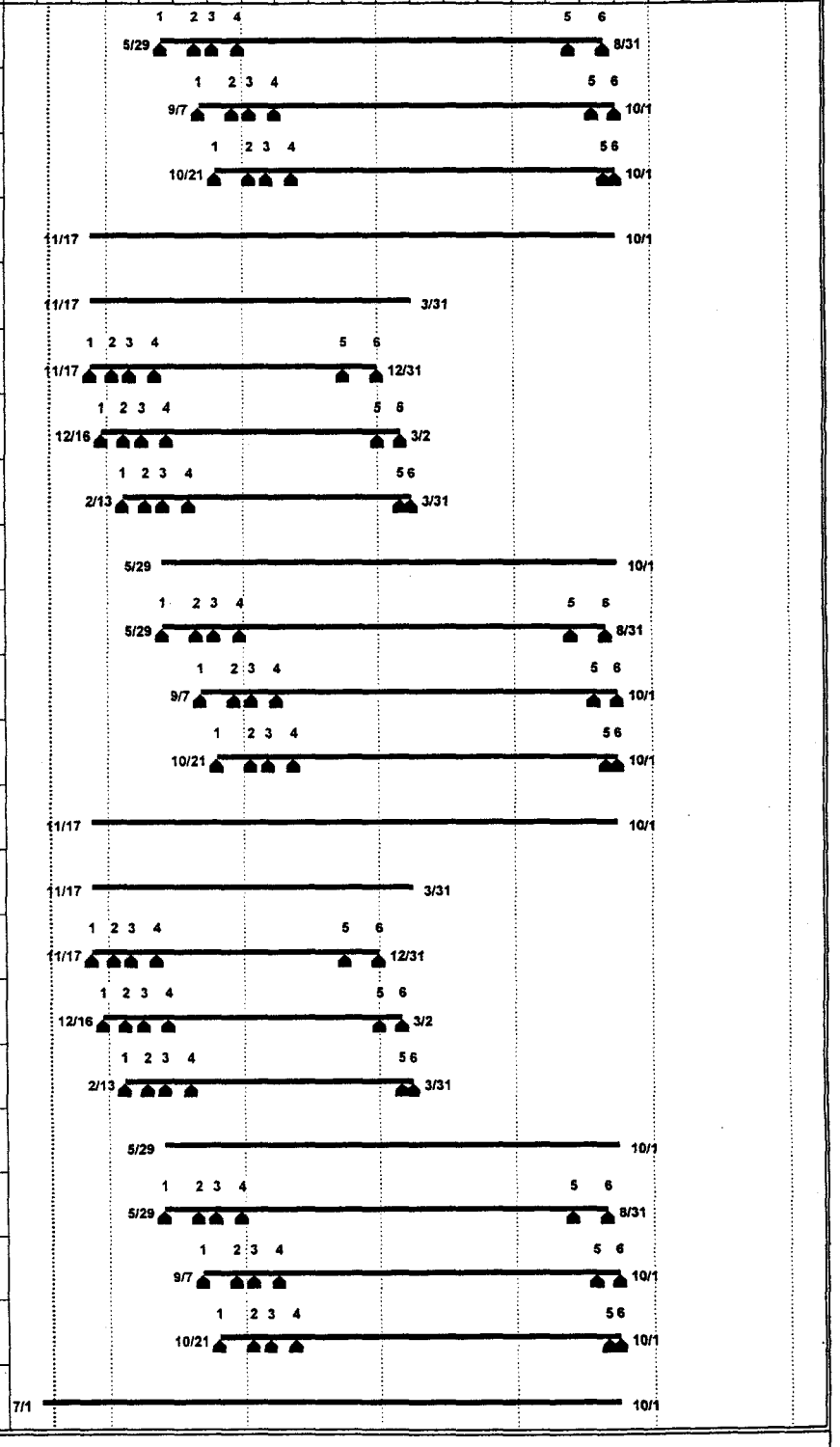


IFB-1, Bid Receipt-2, Bid Eval-3, Award-4, Last Supply-5, Final Payment-6.

Task
Milestone
Summary
Rolled Up Task
Rolled Up Milestone

Implementation Plan

ID	Task Name
225	Shovel, 4 M3 x 1
232	Dumper, 50 T x 1
239	Dozer, 310 KW x 2
246	Bharatpur
247	Procure HEMM - Stage A
248	Shovel, 4 M3 x 4
255	Dumper, 50 T x 25
262	Dozer, 310 KW x 8
269	Procure HEMM - Stage B
270	Shovel, 4 M3 x 3
277	Dumper, 50 T x 19
284	Dozer, 310 KW x 2
291	Jagannath
292	Procure HEMM - Stage A
293	Shovel, 4 M3 x 1
300	Dumper, 50 T x 3
307	Dozer, 310 KW x 3
314	Procure HEMM - Stage B
315	Shovel, 4 M3 x 1
322	Dumper, 50 T x 22
329	Dozer, 310 KW x 3
336	Lakhanpur

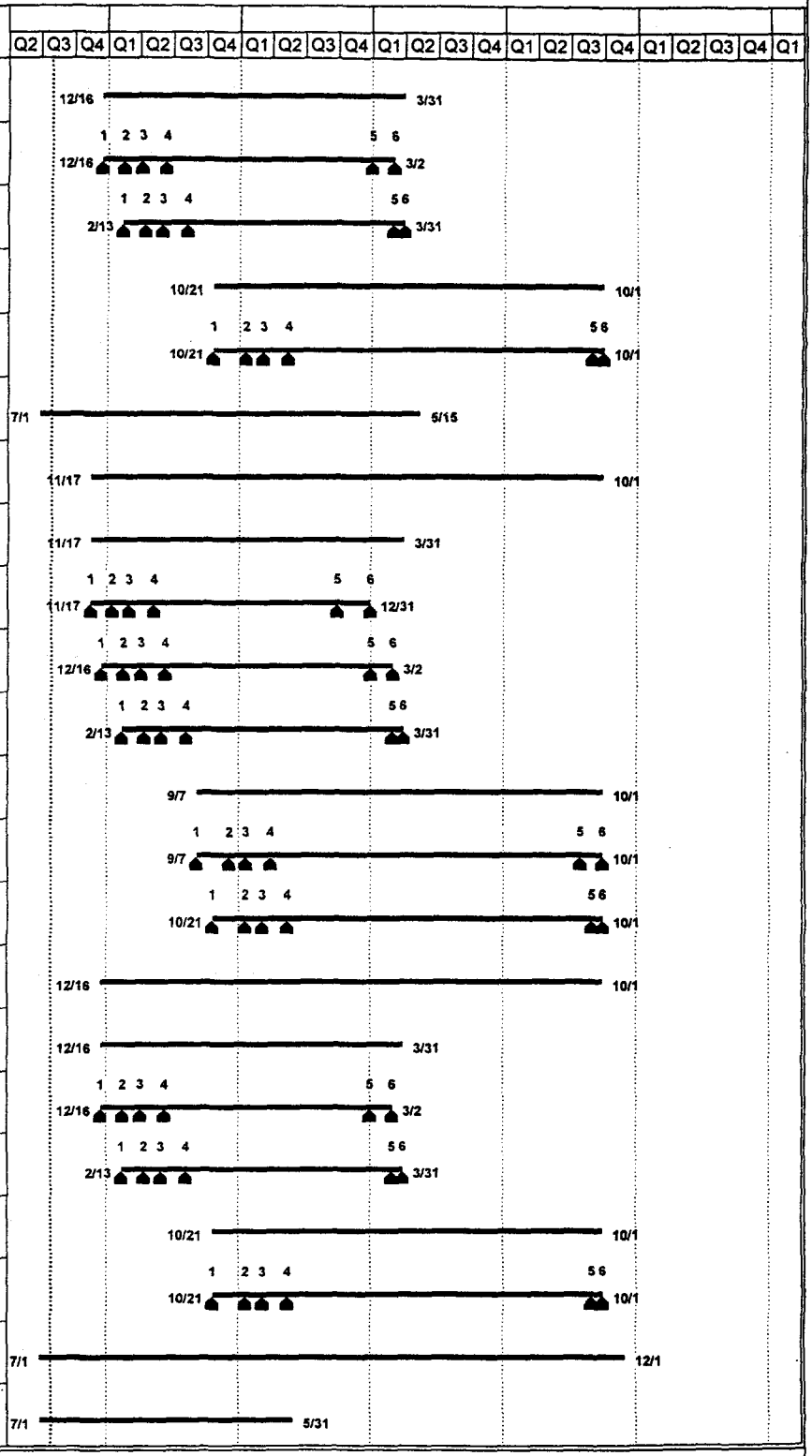


IFB-1, Bid Receipt-2, Bid Eval-3, Award-4, Last Supply-5, Final Payment-6.

Task — Rolled Up Task
Milestone — Rolled Up Milestone
Summary

Implementation Plan

ID	Task Name
337	Procure HEMM - Stage A
338	Dumper, 50 T x 17
345	Dozer, 310 KW x 7
352	Procure HEMM - Stage B
353	Dozer, 310 KW x 1
360	Railway Siding
361	Samaleswari
362	Procure HEMM - Stage A
363	Shovel, 4 M3 x 2
370	Dumper, 50 T x 12
377	Dozer, 310 KW x 7
384	Procure HEMM - Stage B
385	Dumper, 50 T x 6
392	Dozer, 310 KW x 4
399	Bina
400	Procure HEMM - Stage A
401	Dumper, 85 T x 8
408	Dozer, 310 KW x 9
415	Procure HEMM - Stage B
416	Dozer, 310 KW x 2
423	Dudhichua
424	Mine Development Activities

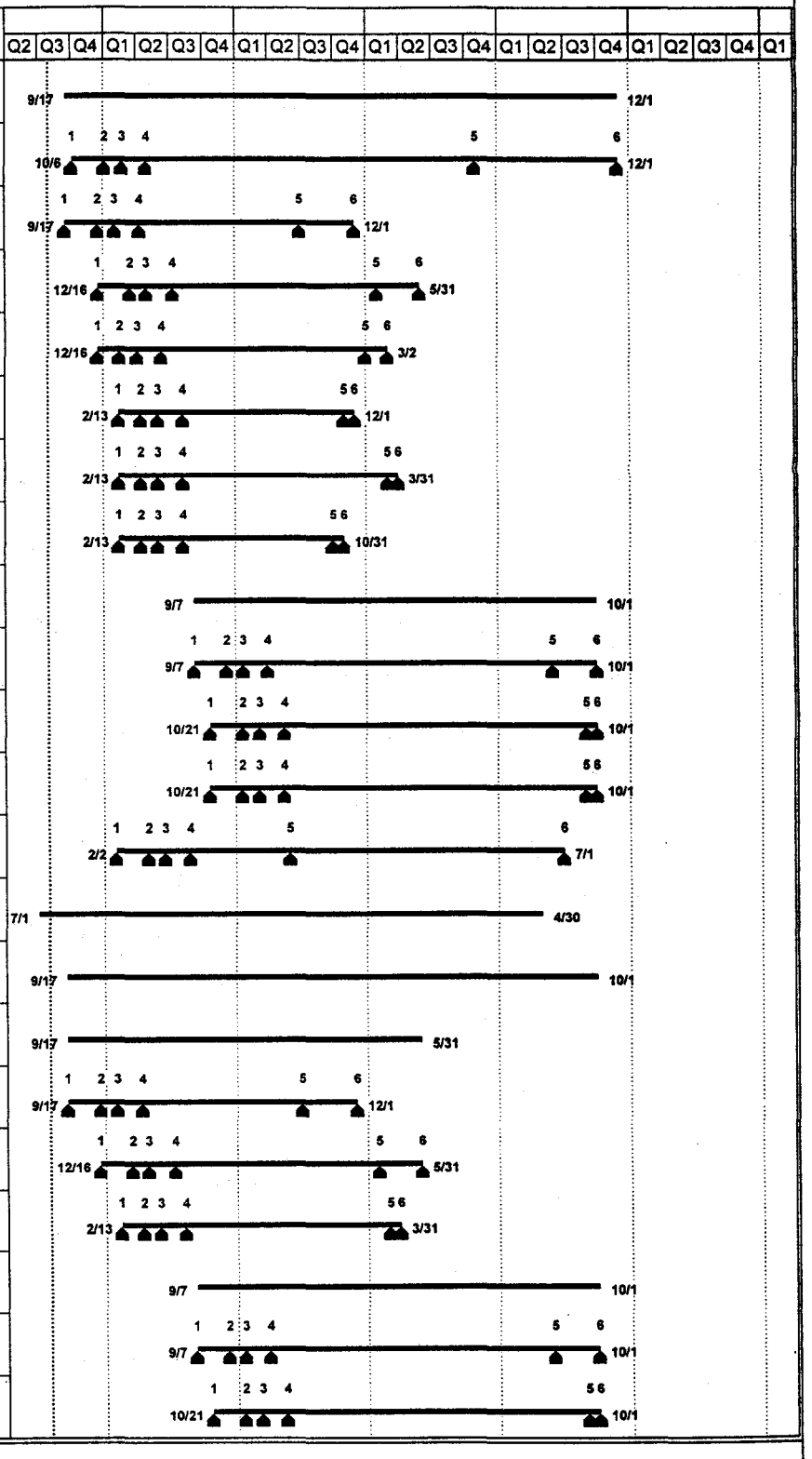


IFB-1, Bid Receipt-2, Bid Eval-3, Award-4, Last Supply-5, Final Payment-6.

Task
Milestone
Summary
Rolled Up Task
Rolled Up Milestone

Implementation Plan

ID	Task Name
425	Procure HEMM - Stage A
426	Dragline 24/88 x 1
433	Shovel, Electric Rope, 10 M3 x 9
440	Dumper, 120 T x 38
447	Dumper, 85 T x 13
454	Dozer, 600 KW x 5
461	Dozer, 310 KW x 3
468	Dozer, 240 KW x 1
475	Procure HEMM - Stage B
476	Dumper, 120 T x 15
483	Dozer, 310 KW x 5
490	Dozer, 240 KW x 1
497	Coal Handling Plant
504	Railway Siding
505	Jayant
506	Procure HEMM - Stage A
507	Shovel, Electric Rope, 10 M3 x 2
514	Dumper, 120 T x 22
521	Dozer, 310 KW x 18
528	Procure HEMM - Stage B
529	Dumper, 120 T x 6
536	Dozer, 310 KW x 3

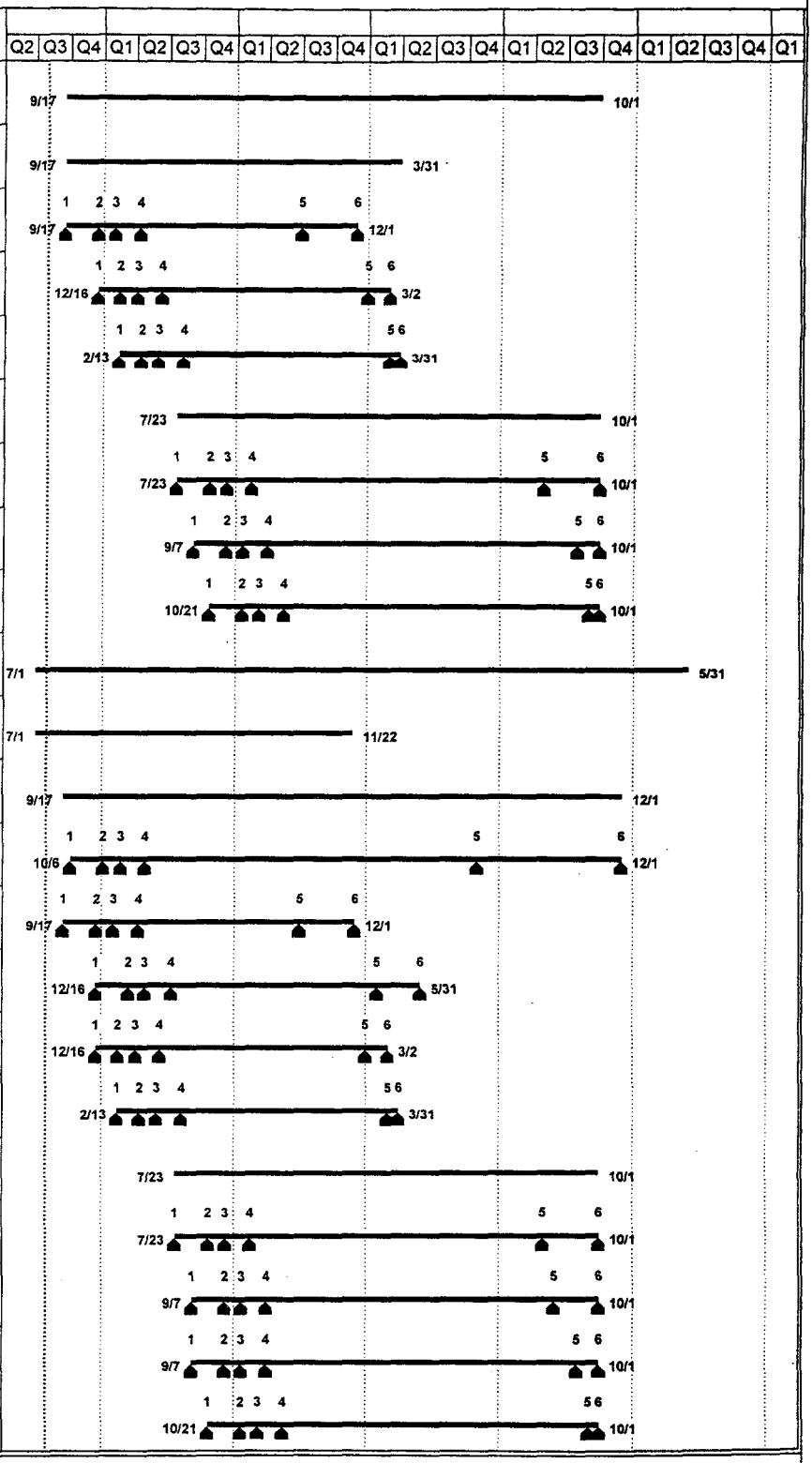


IFB-1, Bid Receipt-2, Bid Eval-3, Award-4, Last Supply-5, Final Payment-6.

Task
Milestone
Summary
Rolled Up Task
Rolled Up Milestone

Implementation Plan

ID	Task Name
543	Jhingurdah
544	Procure HEMM - Stage A
545	Shovel, Electric Rope, 10 M3 x 1
552	Dumper, 85 T x 16
559	Dozer, 310 KW x 6
566	Procure HEMM - Stage B
567	Shovel, Electric Rope, 10 M3 x 1
574	Dumper, 85 T x 1
581	Dozer, 310 KW x 1
588	Nigahi
589	Mine Development Activities
590	Procure HEMM - Stage A
591	Dragline 24/88 x 2
598	Shovel, Electric Rope, 10 M3 x 5
605	Dumper, 120 T x 36
612	Dumper, 85 T x 10
619	Dozer, 310 KW x 14
626	Procure HEMM - Stage B
627	Shovel, Electric Rope, 10 M3 x 6
634	Dumper, 120 T x 45
641	Dumper, 85 T x 22
648	Dozer, 310 KW x 21

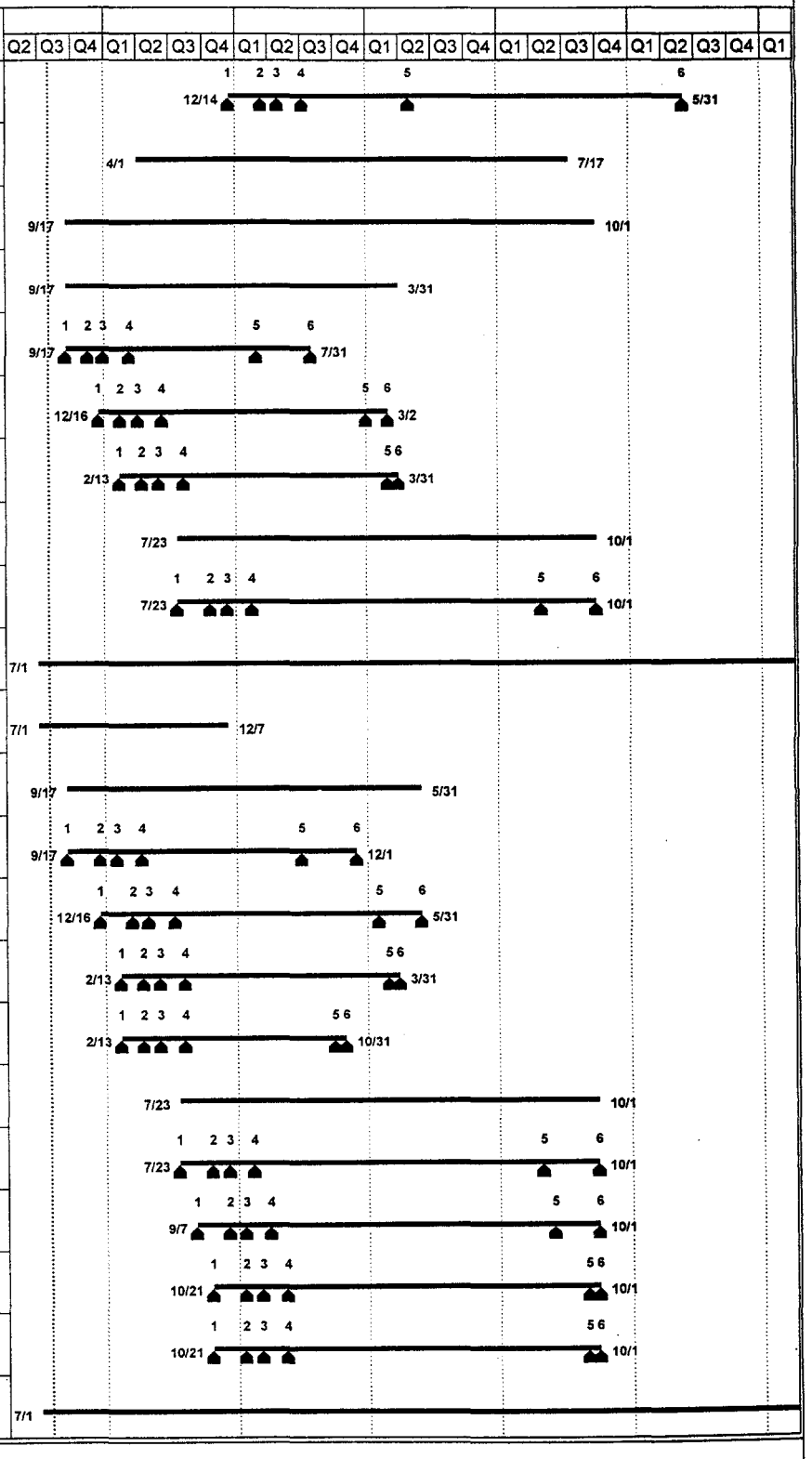


IFB-1, Bid Receipt-2, Bid Eval-3, Award-4, Last Supply-5, Final Payment-6.

Task — Rolled Up Task
Milestone — Rolled Up Milestone
Summary

Implementation Plan

ID	Task Name
655	**Coal Handling Plant**
662	Railway Siding
663	**Dhanpuri**
664	**Procure HEMM - Stage A**
665	**Shovel, 5 M3 x 2**
672	**Dumper, 50 T x 11**
679	**Dozer, 310 KW x 2**
686	**Procure HEMM - Stage B**
687	**Shovel, 5 M3 x 1**
694	**Dipka**
695	Mine Development Activities
696	**Procure HEMM - Stage A**
697	**Shovel, Electric Rope, 10 M3 x 4**
704	**Dumper, 120 T x 32**
711	**Dozer, 310 KW x 7**
718	**Dozer, 240 KW x 8**
725	**Procure HEMM - Stage B**
726	**Shovel, Electric Rope, 10 M3 x 1**
733	**Dumper, 120 T x 8**
740	**Dozer, 310 KW x 1**
747	**Dozer, 240 KW x 1**
754	CHP

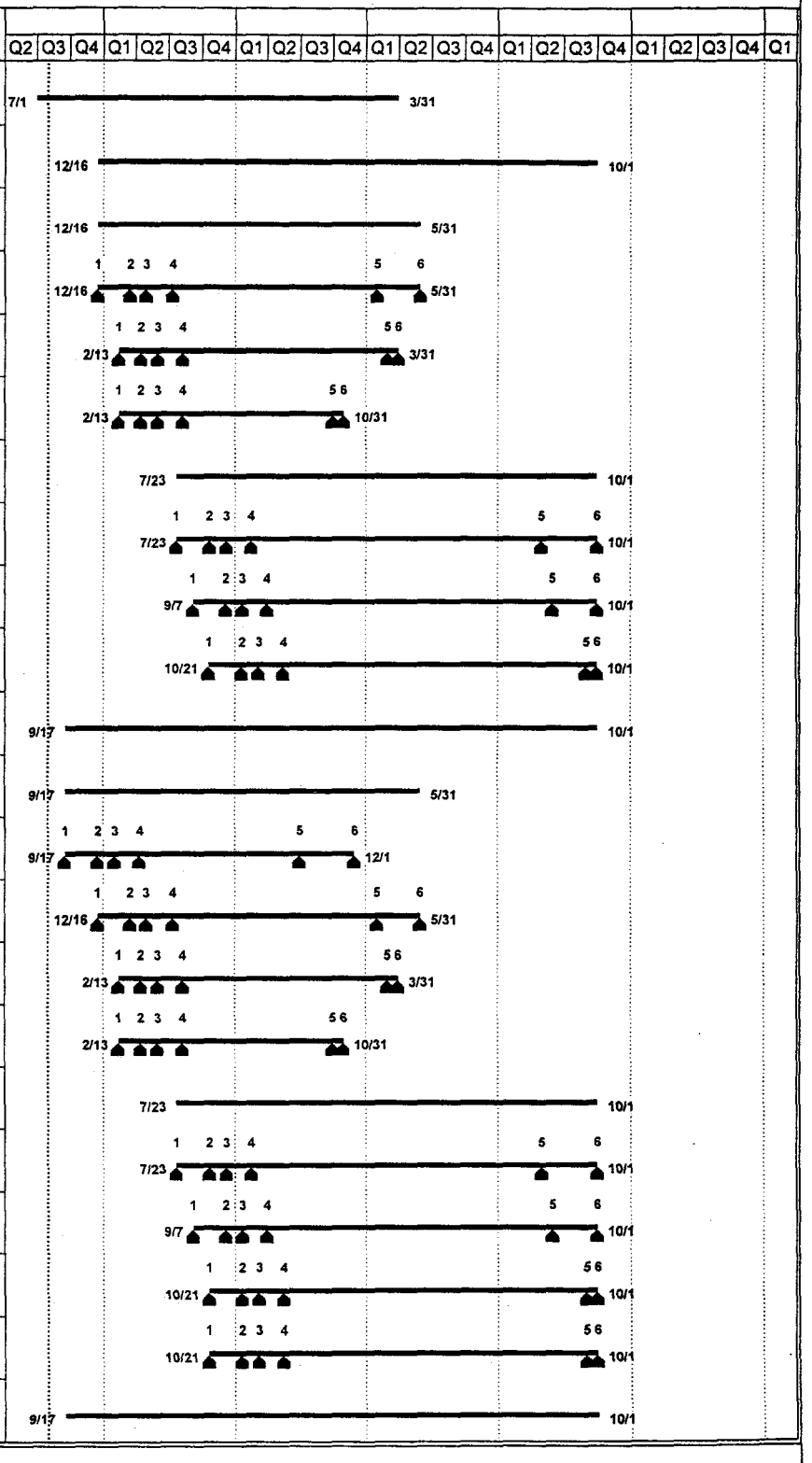


IFB-1, Bid Receipt-2, Bid Eval-3, Award-4, Last Supply-5, Final Payment-6.

Task — Rolled Up Task
Milestone — Rolled Up Milestone
Summary

Implementation Plan

ID	Task Name
755	Railway Siding
756	Gevra
757	Procure HEMM - Stage A
758	Dumper, 120 T x 9
765	Dozer, 310 KW x 7
772	Dozer, 240 KW x 9
779	Procure HEMM - Stage B
780	Shovel, Electric Rope, 10 M3 x 1
787	Dumper, 120 T x 9
794	Dozer, 310 KW x 4
801	Kusmunda
802	Procure HEMM - Stage A
803	Shovel, Electric Rope, 10 M3 x 1
810	Dumper, 120 T x 23
817	Dozer, 310 KW x 9
824	Dozer, 240 KW x 4
831	Procure HEMM - Stage B
832	Shovel, 5 M3 x 1
839	Dumper, 120 T x 5
846	Dozer, 310 KW x 1
853	Dozer, 240 KW x 4
860	Manikpur

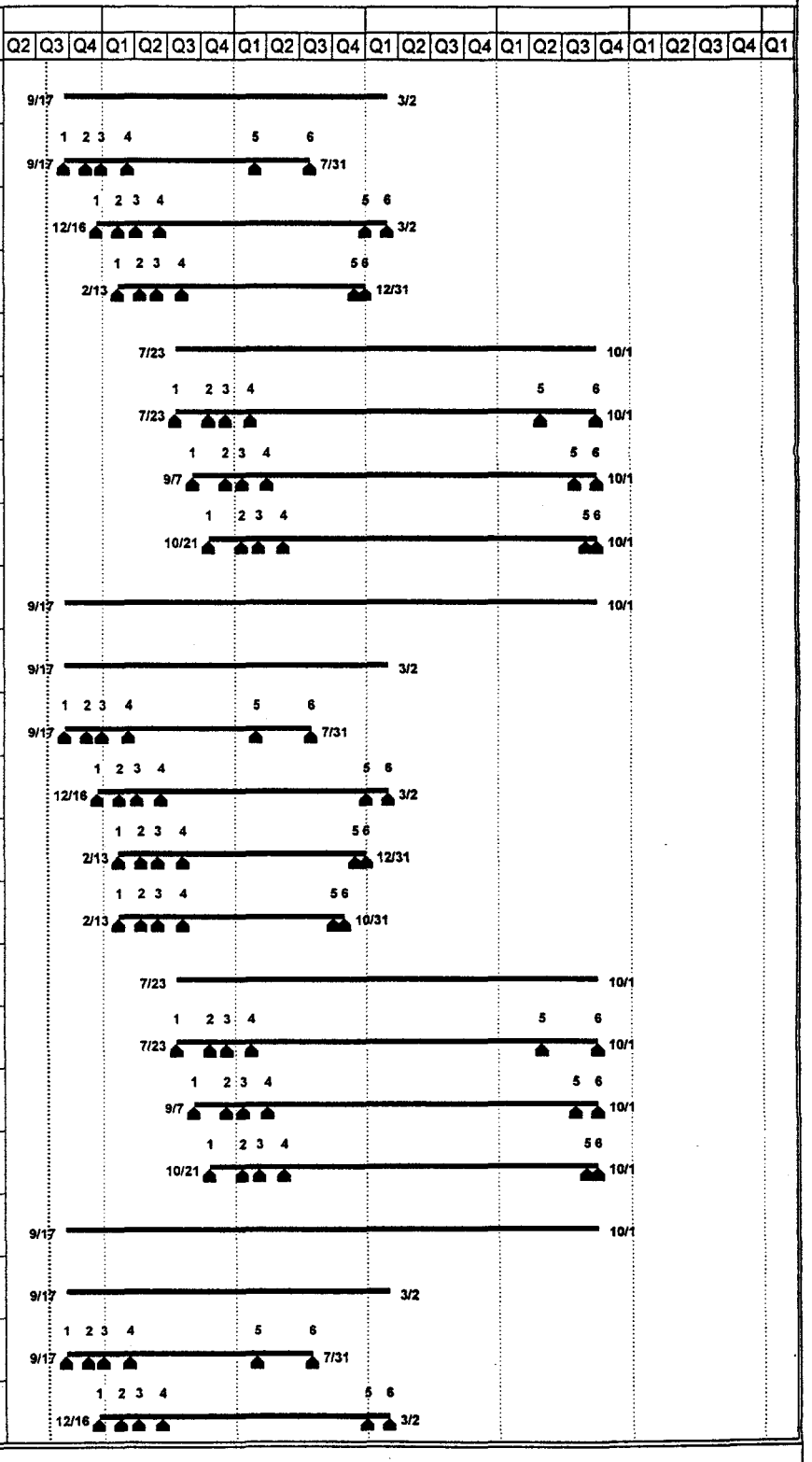


IFB-1, Bid Receipt-2, Bid Eval-3, Award-4, Last Supply-5, Final Payment-6.

Task — Rolled Up Task
Milestone — Rolled Up Milestone
Summary

Implementation Plan

ID	Task Name
861	Procure HEMM - Stage A
862	Shovel, 5 M3 x 2
869	Dumper, 50 T x 15
876	Dozer, 310 KW x 1
883	Procure HEMM - Stage B
884	Shovel, 5 M3 x 1
891	Dumper, 50 T x 7
898	Dozer, 240 KW x 2
905	Durgapur
906	Procure HEMM - Stage A
907	Shovel, 5 M3 x 8
914	Dumper, 50 T x 36
921	Dozer, 310 KW x 2
928	Dozer, 240 KW x 2
935	Procure HEMM - Stage B
936	Shovel, 5 M3 x 1
943	Dumper, 50 T x 3
950	Dozer, 240 KW x 3
957	Niljai
958	Procure HEMM - Stage A
959	Shovel, 5 M3 x 1
966	Dumper, 50 T x 14

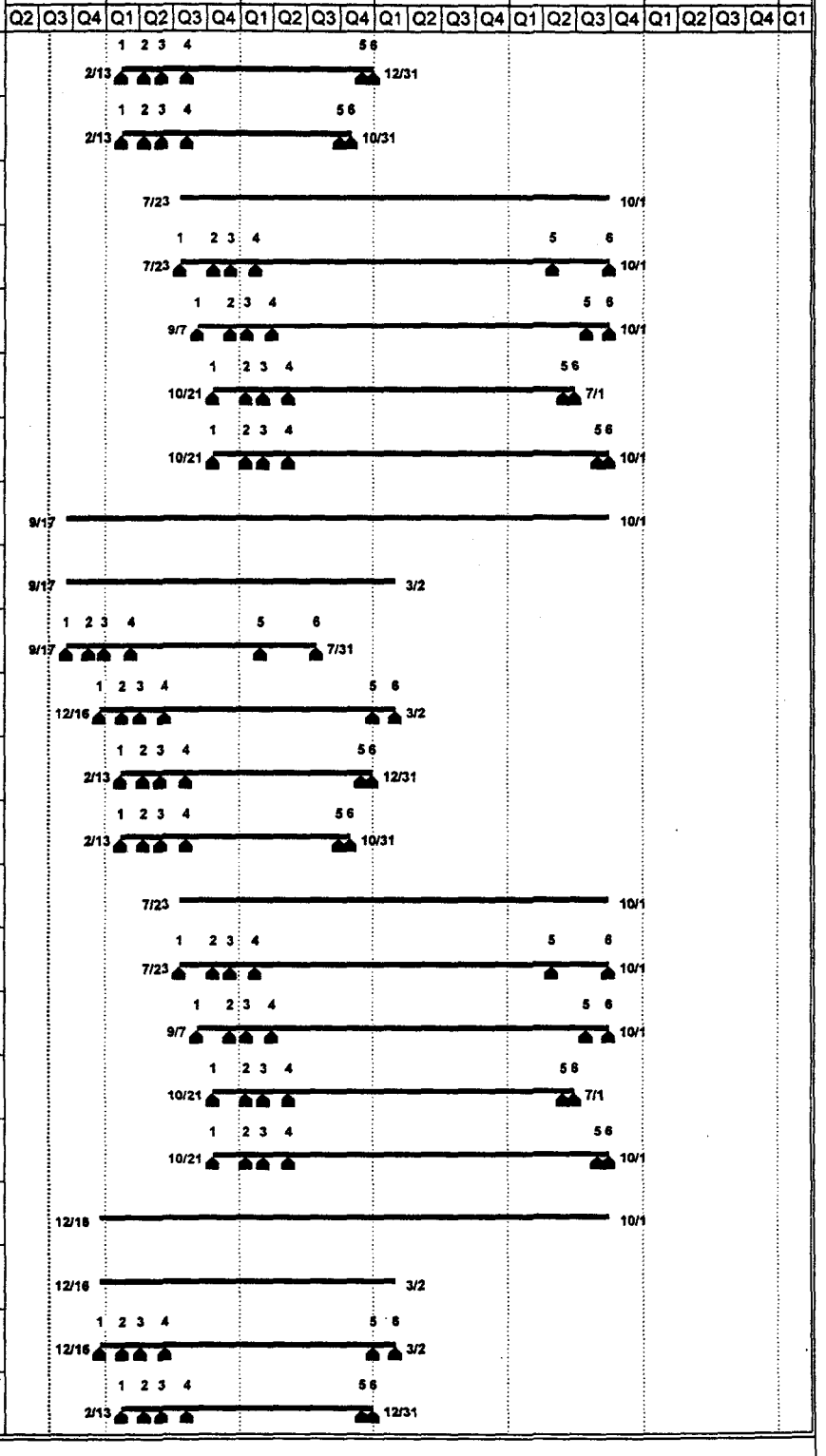


IFB-1, Bid Receipt-2, Bid Eval-3, Award-4, Last Supply-5, Final Payment-6.

Task
Milestone
Summary
Rolled Up Task
Rolled Up Milestone

Implementation Plan

ID	Task Name
973	Dozer, 310 KW x 1
980	Dozer, 240 KW x 4
987	Procure HEMM - Stage B
988	Shovel, 5 M3 x 1
995	Dumper, 50 T x 14
1002	Dozer, 310 KW x 1
1009	Dozer, 240 KW x 8
1016	Padmapur
1017	Procure HEMM - Stage A
1018	Shovel, 5 M3 x 3
1025	Dumper, 50 T x 13
1032	Dozer, 310 KW x 1
1039	Dozer, 240 KW x 6
1046	Procure HEMM - Stage B
1047	Shovel, 5 M3 x 1
1054	Dumper, 50 T x 1
1061	Dozer, 310 KW x 1
1068	Dozer, 240 KW x 3
1075	Sasti
1076	Procure HEMM - Stage A
1077	Dumper, 50 T x 10
1084	Dozer, 310 KW x 2

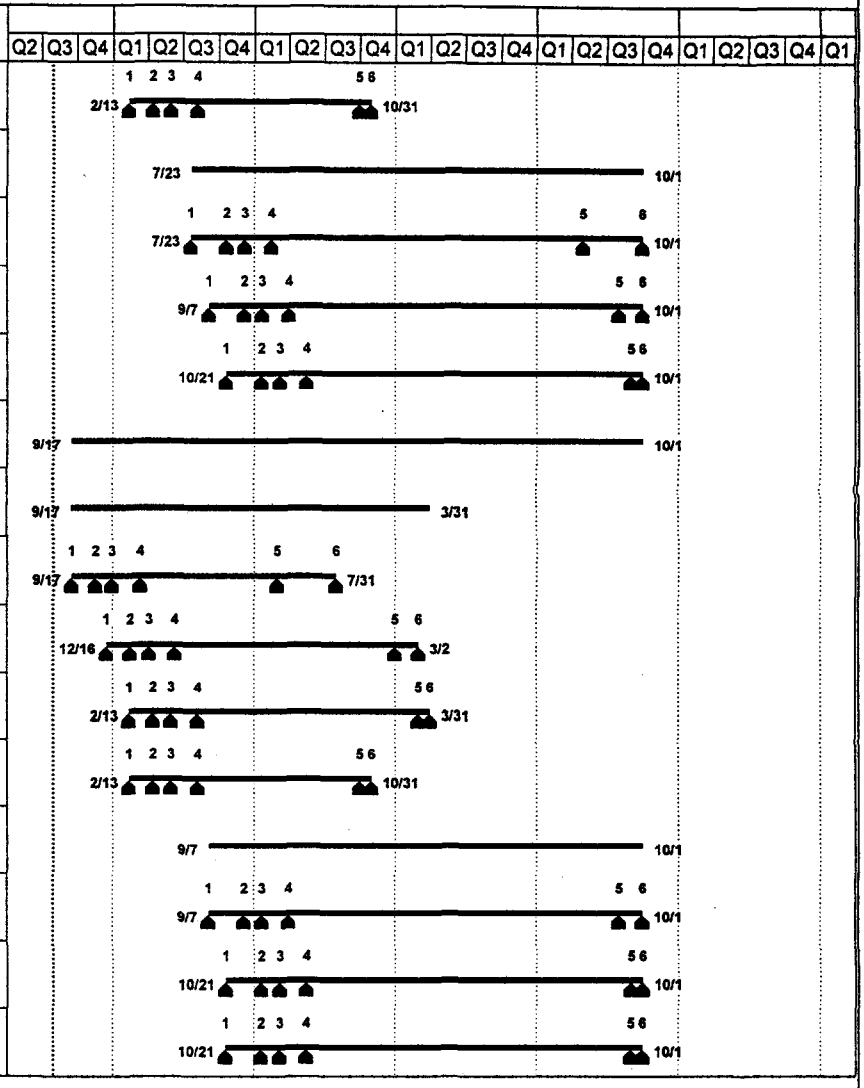


IFB-1, Bid Receipt-2, Bid Eval-3, Award-4, Last Supply-5, Final Payment-6.

Task
Milestone
Summary
Rolled Up Task
Rolled Up Milestone

Implementation Plan

ID	Task Name
1091	Dozer, 240 KW x 7
1098	Procure HEMM - Stage B
1099	Shovel, 5 M3 x 1
1106	Dumper, 50 T x 10
1113	Dozer, 240 KW x 1
1120	Umrer
1121	Procure HEMM - Stage A
1122	Shovel, 5 M3 x 4
1129	Dumper, 50 T x 5
1136	Dozer, 310 KW x 1
1143	Dozer, 240 KW x 2
1150	Procure HEMM - Stage B
1151	Dumper, 50 T x 9
1158	Dozer, 310 KW x 3
1165	Dozer, 240 KW x 4



IFB-1, Bid Receipt-2, Bid Eval-3, Award-4, Last Supply-5, Final Payment-6.

Task — Rolled Up Task
Milestone — Rolled Up Milestone
Summary

ANNEX 5.2 PERFORMANCE AND MONITORING INDICATORS

Corporate Financial Indicators

	Year ending March	*BCCL*	*CCL*	*ECL*	*MCL*	*NCL*	*SECL*	*WCL*	*CIL*
System Capacity Utilization	1998	78.4	72.4	82.1	93.8	83.5	94.2	88.3	**85.2**
(%)	1999	83.3	75.9	84.6	93.4	83.8	94.5	90.3	**87.0**
	2000	85.6	80.7	86.7	91.3	85.2	93.3	88.7	**87.9**
	2001	87.1	82.1	88.7	91.8	85.2	93.7	90.2	**88.9**
	2002	88.4	82.9	90.2	91.1	86.5	92.2	89.7	**89.1**
Coal Production	1998	30.7	34.0	31.0	39.0	37.5	55.5	30.5	**259.2**
(million tons)	1999	32.3	36.0	31.5	41.0	39.0	58.7	30.5	**270.0**
	2000	33.0	38.0	32.0	42.0	41.5	61.0	30.6	**279.1**
	2001	34.0	39.4	32.5	45.0	43.3	64.0	30.7	**289.9**
	2002	36.0	41.3	33.0	47.3	45.9	65.9	31.8	**302.1**
Labor Compliment	1998	141.1	91.3	153.8	23.8	17.3	101.4	84.4	**623.2**
('000)	1999	135.0	90.6	146.9	24.2	17.6	102.6	84.1	**611.1**
	2000	129.4	89.9	140.6	24.7	18.0	103.9	83.9	**600.3**
	2001	126.4	89.2	136.8	25.1	18.3	105.1	83.7	**594.5**
	2002	123.3	88.4	133.0	25.5	18.7	106.4	83.4	**588.7**
Accounts Receivable	1998	1.5	2.0	1.8	1.3	1.0	1.3	1.3	**1.4**
(months of turnover)	1999	1.5	2.0	1.8	1.3	1.0	1.3	1.3	**1.4**
	2000	1.5	2.0	1.8	1.3	1.0	1.3	1.3	**1.4**
	2001	1.5	2.0	1.8	1.3	1.0	1.3	1.3	**1.4**
	2002	1.5	2.0	1.8	1.3	1.0	1.3	1.3	**1.4**
Mine Site Coal Stocks	1998	1.7	0.8	1.0	0.7	0.4	1.5	0.5	**1.0**
(months of production)	1999	1.7	0.8	1.0	0.7	0.4	1.3	0.5	**1.0**
(mid year)	2000	1.7	0.8	1.0	0.7	0.4	1.3	0.5	**1.0**
	2001	1.7	0.8	1.0	0.7	0.4	1.3	0.5	**1.0**
	2002	1.7	0.8	1.0	0.7	0.4	1.3	0.5	**1.0**
Current ratio	1998	0.6	1.6	0.5	1.1	1.2	1.3	1.3	**1.1**
(cur. assets/cur. liabilities)	1999	0.6	1.4	0.6	1.2	1.8	1.4	1.4	**1.2**
	2000	0.6	1.4	0.6	1.2	1.8	1.4	1.4	**1.2**
	2001	0.6	1.4	0.6	1.2	1.8	1.4	1.4	**1.2**
	2002	0.6	1.4	0.6	1.2	1.8	1.4	1.4	**1.2**

Technical Assistance Indicators

	Disbursement (%)				
Year ending June	*1998*	*1999*	*2000*	*2001*	*2002*
Regulatory reforms *	20	100			
Commercialization of coal sales	20	100			
Strengthening design capability	20	100			
Financial planning		40	100		
Training of executives	20	50	80	100	
Repair and maintenance services, etc.	20	80	100		
Mine design optimization	Completed				
Equip. design optimization and procurement	40	75	85	100	
Local supervision	20	40	60	80	100
Coal quality improvement through selective mining	30	60	80	90	100

Remarks: * Government of India level

Production Indicators

(million tons)

	Mineable reserves	*Design capacity*	*Year ending March*					
			1997	*1998*	*1999*	*2000*	*2001*	*2002*
CCL								
K D Hesalong	50	4.50	1.50	1.80	3.00	4.50	4.50	4.50
Parej East	41	1.75	0.80	0.80	1.00	1.75	1.75	1.75
Rajrappa	97	3.00	2.60	3.00	3.00	3.00	3.00	3.00
MCL								
Ananta	120	5.50	4.90	5.50	5.50	5.50	5.50	5.50
Belpahar	35	2.00	2.80	2.00	2.00	2.00	2.00	2.00
Bharatpur	120	5.00	3.30	4.70	5.00	5.00	5.00	5.00
Jagannath	100	4.00	5.00	4.00	4.00	4.00	4.00	4.00
Lakhanpur	107	5.00	2.60	3.50	5.00	5.00	5.00	5.00
Samaleswari	55	3.00	3.05	3.00	3.00	3.00	3.00	3.00
NCL								
Bina	105	4.50	5.60	4.50	4.50	4.50	4.50	4.50
Dudhichua	345	10.00	4.20	5.80	5.80	7.00	8.50	9.25
Jayant	322	10.00	9.10	9.00	9.00	9.50	9.75	10.00
Jhingurdah	58	3.00	3.60	2.70	3.00	3.00	3.00	3.00
Nigahi	492	10.00	4.20	4.20	4.20	5.00	6.00	7.00
SECL								
Dhanpuri	45	1.25	0.80	1.00	1.20	1.20	1.20	1.20
Dipka	200	10.00	5.00	3.50	5.50	8.00	9.00	10.00
Gevra	487	12.00	16.80	16.00	16.00	15.00	14.48	12.00
Kusmunda	311	6.00	5.15	5.10	5.10	5.10	5.10	5.10
Manikpur	30	2.00	2.20	2.00	2.00	2.00	2.00	2.00
WCL								
Durgapur	44	1.80	1.75	1.80	1.80	1.80	1.80	1.80
Niljai	65	1.90	1.95	1.90	1.90	1.90	1.90	1.90
Padmapur	20	1.20	1.25	1.15	1.15	1.15	1.15	1.15
Sasti	23	1.25	1.90	1.25	1.25	1.25	1.25	1.25
Umrer	37	1.84	2.55	2.05	2.05	2.05	2.05	2.05
Grand Total	**3,309**	**110.49**	**92.60**	**90.25**	**95.95**	**102.20**	**105.43**	**105.95**

Reform Indicators

Reform	*Date completed*
Invitation for proposals for the study of the rules and regulations governing the coal industry	December 31, 1997
Submission of the draft amendment to the Coal Mines Nationalization Act to the Parliament	March 31, 1998
Signing of the contract for the study of the rules and regulations governing the coal industry	April 30, 1998
Completion of the study of the rules and regulations governing the coal industry	July 31, 1999
Completion of the implementation of the results of the study of the rules and regulations governing the coal industry	To be determined after completion of study
Announcement of the full deregulation of price and distribution of the remaining regulated low grade steam coal	January 1, 2000

Procurement Indicators

	Item	*Quantity*	*Percent complete - Year ending June*				
			1998	*1999*	*2000*	*2001*	*2002*
A	Dragline	3	45	63	80	97	100
	$5m^3$ rope shovel	30	45	80	100		
	$10m^3$ rope shovel	22	45	79	100		
	50 ton dump truck	259	45	81	100		
	85 ton dump truck	63	45	76	100		
	120 ton dump truck	160	45	76	100		
	240-600 kW dozer	185	25	88	100		
B	$5m^3$ rope shovel	11	-	45	50	78	100
	$10m^3$ rope shovel	9	-	45	63	87	100
	50 ton dump truck	115	-	45	50	64	100
	85 ton dump truck	35	-	45	50	73	100
	120 ton dump truck	88	-	45	61	86	100
	240-300 kW dozer	92	-	25	50	82	100
	KD Hesalong coal handling plant			50	65	80	100
	Parej East coal handling plant			50	65	80	100
	Dudhichua coal handling plant		25	50	70	80	100
	Nigahi coal handling plant			45	55	70	100

Note: The percentages were calculated as follows: Bid invitation - 10%; Bid receipt - 15%; Bid evaluation - 20%, Contract signing - 5%; Delivery start to finish (in case of coal handling plants, construction) - 40%; Final payment - 10%.

ANNEX 5.3 INDICATIVE SUPERVISION PLAN

Approx. date of supervision	*Main focus*	*Expected staff requirements*	*Staff inputs (staff weeks)*
September 1997	Implementation set up; organizing local supervision; procurement of goods and services; coal quality improvement; visit to a few important mines.	Task manager Mining engineer Procurement specialist Financial analyst Quality consultant	11
December 1997	Procurement of goods and services; financial issues; visit to a few important mines.	Task manager Mining engineer Procurement specialist Financial analyst Regulation specialist	10
May 1998	Overall review of project implementation; procurement of goods and services; training of mine managers and financial planners; regulatory frame work; coal quality; visit a few mines.	Task manager Mining engineer Procurement specialist Financial analyst Regulation specialist	14
October 1998	Procurement of goods and services; financial issues; TA program; visit to a few important mines	Task manager Mining engineer Procurement specialist Financial analyst Regulation specialist	10
March 1999	Procurement of goods and services; coal quality improvement; visit to a few important mines	Task manager Mining engineer Procurement specialist Consultant	9
January 2000	Midterm review of all aspects of project implementation; visit to a few important mines	Task manager Mining engineer Procurement specialist Financial analyst Economist Training specialist Regulation specialist	16
May 2000	Procurement of goods and services; coal quality improvement; visit to a few important mines	Task manager Mining engineer Procurement specialist Regulation specialist	10
November 2000	Procurement of goods and services; financial issues; TA program; visit to a few important mines	Task manager Mining engineer Procurement specialist Financial analyst Regulation specialist	10
March 2001	Procurement of goods and services; TA program; coal quality improvement; visit to a few important mines	Task manager Mining engineer Procurement specialist Regulation specialist	11
August 2001	Procurement of goods and services; financial issues; TA program; visit to a few important mines	Task manager Mining engineer Procurement specialist Financial analyst Regulation specialist	10
February 2002	Procurement of goods and services; coal quality improvement; visit to a few important mines	Task manager Mining engineer Consultant	9
July 2002	Preparation for ICR; procurement of goods and services; TA program; coal quality improvement.	Task manager Mining engineer Procurement specialist Financial analyst Economist Regulation specialist	15
		Total staff weeks	**135**

All supervision missions will be coordinated with the supervision of the Coal Sector Environmental and Social Mitigation Project (Cr. 2862-IN). Support from the resident mission will be sought.

ANNEX 5.4 PROCUREMENT ARRANGEMENTS

Procurement Arrangements

US$ million

Project Components	*Procurement Method*			*N.B.F.**	*Total*
	ICB	*NCB*	*Other*		
Civil works and coal handling plants					
Buildings				60.5	60.5
Roads & culverts				14.1	14.1
Water supply & sewerage systems				15.8	15.8
Railway siding				9.5	9.5
Coal handling plants	65.6			21.5	87.1
	(28.3)				(28.3)
Other infrastructure				3.8	3.8
Equipment and vehicles					
Draglines	60.6			10.1	70.7
	(26.1)				(26.1)
Shovels	235.9			65.2	301.1
	(98.0)				(98.0)
Dump trucks	570.0			132.2	702.2
	(253.9)				(253.9)
Drills	81.5			22.4	103.9
	(36.8)				(36.8)
Dozers	140.3			31.1	171.4
	(63.4)				(63.4)
Other opencast equipment	18.4			12.4	30.8
	(8.3)				(8.3)
Electricals				36.8	36.8
Workshops				19.4	19.4
Pumps				7.3	7.3
Equipment for coal quality improvement	14.9			2.6	17.5
	(6.7)				(6.7)
Dispatch system and telecom	6.5			1.2	7.7
	(2.9)				(2.9)
Misc. equipment	0.4			10.0	10.4
	(0.2)				(0.2)
Vehicles				3.1	3.1
Technical assistance					
Institution building			4.2	0.9	5.1
			(2.0)		(2.0)
Policy support			2.6	0.5	3.1
			(1.2)		(1.2)
Project implementation			8.8	1.6	10.4
			(4.2)		(4.2)
Miscellaneous					
Operating costs, etc.				5.9	5.9
Total	1,192.1		15.6	487.9	1,697.6
(Bank Loan/IDA Credit)	(522.6)		(7.4)		(532.0)

Source: Bank staff estimates
N.B.F.: Not financed by the Bank or the Association

Schedule of Procurement

Pkg. No	Description	Qty	Value (millions) Foreign $	Value (millions) Local Rs	Bid Issue Date	Contract Date	Delivery Date Start	Delivery Date Finish
1	Dragline, 24/88	3	43.6	486.0	10/16/97	6/11/98	12/1/98	11/1/01
2	Shovel, Electric Rope, $5m^3$	30	24.6	230.2	9/17/97	7/9/98	12/1/98	10/1/99
3	Shovel, Electric Rope, $10m^3$	22	79.7	822.7	9/17/97	7/2/98	12/1/98	1/1/00
4	Excavator, Hydraulic, $2.5/3.5m^3$	14	3.6	33.6	12/16/97	7/16/98	1/1/99	9/1/99
5	Excavator, Hydraulic, $4.0/5.0m^3$	10	8.2	76.6	12/16/97	7/23/98	1/1/99	1/1/00
6	Dumper 50ton	259	70.5	659.2	12/16/97	8/24/98	11/1/98	3/1/00
7	Dumper 85ton	63	38.2	357.2	12/16/97	8/17/98	12/1/98	11/1/99
8	Dumper 120ton	160	166.9	1,561.6	12/16/97	8/10/98	11/1/98	5/1/00
9	Dozer 240kW	48	12.5	117.2	2/13/98	9/30/98	12/1/98	10/1/99
10	Dozer 310kW	97	34.9	325.9	2/13/98	9/16/98	3/1/99	3/1/00
11	Dozer 600kW	5	6.6	61.5	2/13/98	9/9/98	3/1/99	11/1/99
12	Dozer-Wheeled	35	19.8	185.5	2/13/98	9/23/98	3/1/99	12/1/99
13	Drill 160mm	31	6.3	58.9	3/15/98	10/23/98	12/1/98	5/1/00
14	Drill 250mm	34	15.3	142.8	3/15/98	10/16/98	12/1/98	5/1/00
15	Drill 311mm	5	11.5	108.0	3/15/98	10/9/98	1/1/99	7/1/99
16	Front-End-Loader $5.7m^3$	3	0.6	5.8	4/15/98	11/22/98	5/1/99	5/1/99
17	Grader	26	6.8	63.4	4/15/98	11/15/98	5/1/99	11/1/99
18	Crane 30t	2	0.5	4.7	10/16/97	5/25/98	11/1/98	1/1/99
19	Crane 70t	3	2.2	20.7	10/16/97	5/25/98	11/1/98	10/1/99
20	Tire Handler	2	0.3	2.4	4/15/98	11/8/98	5/1/99	5/1/99
21	Water Sprinkler	11	1.8	16.7	12/16/97	8/31/98	1/1/99	10/1/99
22	Coal Handling Plant - KD Hesalong	1	7.7	64.4	10/14/98	7/8/99	4/1/00	4/1/02
23	Coal Handling Plant - Parej East	1	4.2	35.8	12/13/98	9/6/99	6/1/00	6/1/02
24	Coal Handling Plant - Dudhichua	1	12.6	103.82	2/1/98	4/7/99	1/1/00	1/1/02
25	Coal Handling Plant - Nigahi	1	29.9	247.0	12/13/98	9/6/99	6/1/00	6/1/02
26	Dispatch System	4	2.5	24.8	6/5/98	4/5/99	7/1/99	10/1/99
27	Telecommunication System	30	2.5	24.8	6/5/98	4/5/99	7/1/99	10/1/99
28	Coal Quality Mining Equipment	4	11.2	111.1	11/4/98	10/4/99	1/1/00	4/1/00
29	Shovel, Electric Rope, $5m^3$	11	9.0	84.4	7/23/98	5/4/99	5/1/00	9/1/00
30	Shovel, Electric Rope, $10m^3$	9	32.6	336.6	7/23/98	4/20/99	2/1/00	9/1/01
31	Excavator, Hydraulic, $2.5/3.5m^3$	20	5.2	48.6	5/29/98	2/24/99	4/1/00	9/1/01
32	Excavator, Hydraulic, $4.0/5.0m^3$	5	3.6	33.7	5/29/98	3/10/99	6/1/00	8/1/01
33	Dumper 50ton	115	31.3	292.7	9/6/98	7/2/99	3/1/00	9/1/01
34	Dumper 85ton	35	21.2	198.5	9/6/98	6/18/99	5/1/00	9/1/01
35	Dumper 120ton	88	91.8	858.9	9/6/98	6/4/99	3/1/00	9/1/01
36	Dozer 240kW	28	7.3	68.3	10/21/98	8/16/99	6/1/00	9/1/01
37	Dozer 310kW	57	20.5	191.5	10/21/98	7/19/99	4/1/00	9/1/01
38	Dozer-Wheeled	7	4.0	37.1	10/21/98	8/2/99	6/1/00	6/1/01
39	Drill 160mm	35	7.1	66.5	9/3/98	9/30/99	4/1/00	9/1/01
40	Drill 250mm	31	13.9	130.2	12/5/98	9/16/99	4/1/00	9/1/01
41	Drill 311mm	3	6.9	64.8	12/5/98	9/2/99	3/1/00	6/1/01
42	Front-End-Loader $5.7m^3$	1	0.2	2.0	1/19/99	10/31/99	9/1/01	9/1/01
43	Grader	9	2.4	22.0	1/19/99	10/17/99	6/1/00	9/1/01
44	Water Sprinkler	2	0.3	3.0	9/6/98	7/16/99	6/1/01	9/1/01

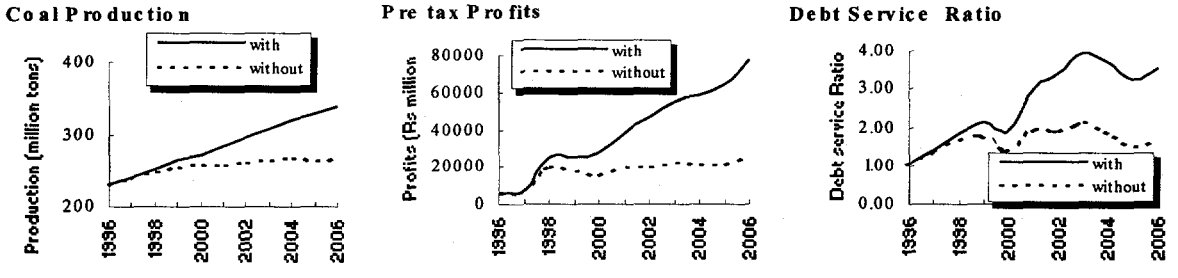
Source: Coal India Ltd.
Note: The above table includes taxes and duties, but does not include physical or price contingencies.

ANNEX 6.1 FINANCIAL MODEL, ASSUMPTIONS AND PROJECTIONS

Impact of Coal Sector Rehabilitation Project

1. It is apparent that significant external inputs are needed to transform Coal India into a commercially viable enterprise. These comprise an infusion of external finance of about US$1 billion, decontrol of domestic coal prices, phasing out of subsidies to loss-making subsidiaries, reduction of surplus labor, improvement in utilization of existing system capacity, and waiver and/or conversion of arrear loans and interest liabilities into equity by Government. These measures work together to ensure that the end objective of financial independence is achieved. None of these measures in isolation can produce the desired effect. Projections of production, profit before tax and the debt service coverage ratio and the financial importance of the project are illustrated in Figure 6.1.1. It is clear that without the loan Coal India's production will stagnate, its profits will decline and its ability to service its debt will be undermined. The loan program together with the other measures are all necessary and need to be implemented soon to enable Coal India to achieve long-term financial stability. In turn Coal India will need to revise many of its internal policies and practices if the beneficial effect of these measures are to be sustained.

Figure 6.1.1 Summarized Output from Financial Model
(Rs million)



Internal Financial Flows

2. The financial flows between Coal India and its eight wholly owned subsidiary companies have in the past been somewhat informal and were more akin to the practice followed by a corporation whose operations are structured in divisions. The sole principle governing the flows between Coal India and its subsidiaries can only be described as 'from each according to its ability and to each according to its requirement.' These arrangements blur the legal definition or boundary of each subsidiary, hide the extent of cross subsidization and undermine management incentive and staff morale. The subsidiary companies of Coal India comprise:

(a) profitable companies such as MCL, NCL and SECL

(b) marginally profitable companies such as CCL, WCL

(c) highly loss-making companies such as ECL and BCCL

CMPDI is an in-house planning and design institute which undertakes mine planning and geological exploration on behalf of the seven coal producing subsidiaries on a cost recovery basis.

3. The first group of companies remit to Coal India all surpluses comprising internal cash generation and disbursements from tied or project specific loans less any increase in capital investments and working capital. These resources, together with budgetary support from the Government and market borrowings

through the issue of bonds, fixed deposits, etc., and short-term bank credit for working capital, constitute the resource base for Coal India enabling it to meet the following commitments:

(a) consolidated debt service obligations to the Government, market indebtedness and bank credit and

(b) cash shortfall of loss-making companies resulting from both their capital expenditure program and operating losses.

4. The following practices have been used to determine, regulate and manage the financial flows between Coal India and its subsidiary companies:

(a) until recently, a retention price mechanism was in operation among the coal producing companies. The Ministry of Coal specified the retention price applicable for each subsidiary coal company. This price was below that realized by the profit-making companies and higher than that of loss-making companies. Profit-making companies were therefore required to contribute the excess of the realized price over retention price on the total outside coal dispatches to the Coal Price Regulation Account (CPRA) which was maintained centrally by Coal India. The aggregate of these credits was used to settle the claims of the loss-making subsidiaries under the scheme. The contributions to, or claims against, the CPRA were regarded as a tax deductible business expenditure or taxable income in the hands of the individual subsidiary companies and have been used by Coal India to minimize the group's tax liability;

(b) cash surpluses of profitable companies have been used to accelerate loan repayments of these companies to Coal India who in turn used these to substitute, and in effect subsidize, the debt service obligations of the loss-making subsidiaries in order to keep them current;

(c) Coal India's aggregate interest liability is allocated to subsidiary companies on the basis of the proportionate investment made by Coal India in each of these companies;

(d) all financial transactions between Coal India and its subsidiaries are recorded through current accounts. Adjustments for CPRA or interest, as well as capital expenditure incurred by Coal India on behalf of subsidiaries, are made through credits/debits in this account; and

(e) upon the receipt of equity capital from Government, Coal India issues equity to its subsidiaries. The current account balance at the end of each financial year, after adjustment, is considered as a loan from Coal India to its subsidiary companies.

5. The magnitude of the financial flows between Coal India and its subsidiary for the year ending March 1996 is summarized in Table 6.1.1. This table highlights:

(a) the substantial financial dependence of ECL and BCCL on the other companies, and

(b) the continuing investment by Coal India in ECL and BCCL at the expense of the profit-making companies.

Table 6.1.1 Financial flows from/(to) Coal India and its subsidiaries in 1995/96
(Rs million)

	ECL	*BCCL*	*CCL*	*WCL*	*MCL*	*NCL*	*SECL*	*Total*
Financial flows from/(to) Coal India	339	(3,112)*	(60)	(2,126)	(3,192)	(6,043)	(3,981)	(18,175)
Represented by								
a. CPRA	5,424	3,172	1,718	(126)	(3,113)	(3,568)	(3,997)	(490)
b. interest	(1,720)	(2,854)	(1,125)	(382)	(786)	(639)	(198)	(7,704)
c. net flow equity + loan from Coal India	(3,365)**	(3,430)**	(653)	(1,618)	707	(1,836)	214	(9,981)

Source: Coal India Ltd.
* repayment of interest and principal of loan from BCCL to Coal India was larger than the subsidies received through CPRA in 1996.
** including transfer of interest waiver of Rs3,890 million and Rs5,028 million to ECL and BCCL out of the waiver received from the Government.

6. One of the main objectives of the loan program (outlined in Annex 4.1) is to enable Coal India to consolidate its financial position and those of its subsidiary companies by commercializing its operations, preventing or limiting the transfer of resources from profitable subsidiaries to the two loss-making subsidiaries, BCCL and ECL and redirecting its resources into the development of profitable coal reserves. These financial transfers take place without the benefit of formal legal agreements, while the transactions are recorded in the current account. This cross subsidization deprives profitable companies of resources to expand their operations, prevents Coal India from holding each subsidiary accountable for its performance by obscuring financial performance of each subsidiary, does not provide positive incentive to profitable subsidiaries by limiting growth and undermines financial discipline on loss-making subsidiaries by allowing them to continue loss-making operations.

Corporatization of subsidiary companies

7. To address these deficiencies Coal India has decided to enhance the financial independence of its subsidiaries and financially segregate the loss-making subsidiaries from profit-making subsidiaries. Under this structure, Coal India will remain as a holding company, while its subsidiaries will become financially autonomous and operate as independent profit centers. This corporatization program will be implemented with effect from April 1, 1997 incorporating the following principles:

(a) all financial transactions between Coal India and its subsidiaries or between its subsidiaries will take place in terms of formal contractual arrangements specifying the terms and conditions of those transactions;

(b) financial transactions between Coal India and its subsidiaries will be limited to those relating to equity, loan and service charges that may be levied by Coal India;

(c) Merger of part or all of the operation is considered inappropriate and BCCL, ECL and MCL will instead be strengthened in 1997/98 by a once-off debt/equity swap (see para 13). This will be offset by the reverse swap in the other subsidiaries;

(d) Coal India and its subsidiaries will complete the debt/equity swap and prepare the new accounts by March 31, 1998.

(e) terms on loans from Coal India to its subsidiaries will be market-related with exception of specific loans to BCCL and ECL forming part of the financial restructuring packages;

(f) the repayment period of Coal India's loan to its subsidiaries will be identical to Coal India's original loans from external lenders;

(g) Coal India's subsidiaries will raise external resources directly from the market against their own creditworthiness, with Coal India acting as a facilitator;

(h) Coal India and its subsidiaries, excluding BCCL and ECL during their restructuring period (FY1998 - FY2000), will maintain a debt to total capitalization ratio of no more than 60 to 40 (debt/net equity+debt) and a debt service ratio (total cashflows/debt service) larger than 1.3;

(i) Coal India will limit its corporate guarantees to profit making companies and then only after consultation with the Bank; and

(j) the subsidiaries will be required to pay dividends out of profit within the framework of the dividend policy and resources in excess of investment requirements.

8. Redefining the relationship between Coal India and its subsidiaries in a manner that recognizes them as separate legal entities is an essential step in corporatizing the subsidiaries. Financial flows between Coal India and its subsidiaries should arise thereafter mainly because of specific debt servicing obligations, receipt of equity and the need to borrow from Coal India. Investment of funds borrowed by Coal India and on lent to subsidiary companies should entail a formal back-to-back debt servicing arrangement between Coal India and the recipient. Subsidiary companies' access to borrowed funds from Coal India (acting merely as an intermediary) must therefore conform to the constraints of their individual borrowing capacity and ability to service debt. The fundamental change in strategic direction assumes added importance in view the weakness of ECL and BCCL and of the Government's resolve to curtail all budgetary support to Coal India in the future.

9. The capital structure of the subsidiary companies at the end of March 1996 is shown in Table 6.1.2. On the basis of a 60% debt to total capital ratio, ECL, BCCL and MCL have exhausted their ability to borrow further funds. MCL is a new operation in the process of expansion and the apparent problem of limited debt capacity is therefore largely transitory. The situation for ECL and BCCL on the other hand will deteriorate further in view of the continued erosion in their net equity base as a result of projected ongoing losses. Without substantial restructuring, there is no possibility of these companies regaining their borrowing capacity or viability in the years to come.

Table 6.1.2 Capital Structure of Coal India's subsidiaries, 1995/96

	ECL	*BCCL*	*CCL*	*WCL*	*NCL*	*SECL*	*MCL*	*TOTAL*
Equity	10,390	11,220	9,400	7,110	11,785	11,215	1,000	62,120
Net Equity	2,028	-664	11,135	7,185	18,832	13,515	2,378	54,409
Debt	17,120	16,615	14,986	1,649	4,110	1,534	7,994	64,008
Debt/Total Cap (%)	89*	104 *	57	19	18	10	77*	54

* These companies have exhausted their borrowing capacity
Source: Coal India Ltd.

10. The second step in the corporatization process is to restore the company's borrowing capacity to the extent possible. This will require a comprehensive restructuring of the capital base of all subsidiaries as the ratio of debt to total capital for Coal India (including its subsidiaries) is 53.6% as of March 1996. The additional aggregate borrowing capacity available for the group as a whole is therefore 6.5% of its total capital base i.e. of the order of Rs8 billion. This together with the restructuring of Coal India's capital base by the Government in 1996/97 leaves some scope for improving the capital structure of ECL and BCCL and, to a lesser extent, MCL.

Restructuring of Coal India's capital base

11. A major component of Coal India's debt to the Government was represented by arrear repayments of loans and accrued interest, amounting to Rs13.37 billion (US$382 million) and Rs8.92 billion (US$255 million) respectively as at March 1996. This was mainly due to the administered coal price being historically inadequate together with the persistent default on coal sales by State Electricity Boards (SEBs). While fairly regular price increases and the price deregulation recently adopted by the Government has enabled Coal India to meet its current obligations (since 1992), the company was not able to settle its arrear liabilities. As a consequence, it sought and was given significant relief by the Government by way of:

(a) waiver of arrears of interests amounting to Rs8.92 billion (Rs5 billion for BCCL and Rs3.9 billion for ECL) effective March 31,1996;

(b) conversion of arrears in loan repayment amounting to Rs9.04 billion into 10% non-cumulative Preference Equity which are redeemable in 2004; and

(c) a moratorium of three years on repayment and accrued interest of outstanding non-plan loan of Rs4.3 billion (Totaling Rs1.7 billion and Rs2.6 billion BCCL for ECL respectively). The loan will to be repaid in three annual installments 1999/2000 onwards with interest accruing from April 1999.

12. The base case financial model accounts for the restructuring of Government debt of Rs22.29 billion and assumes that this relief has been specifically allocated to the financially weak companies with high levels of debt (ECL, BCCL and CCL). This, together with additional internal financial rearrangements described below, will strengthen the balance sheet of each subsidiary, reestablish their capacity to borrow within prudent limits and lay the foundation for independent operation and corporatization of each subsidiary.

13. Coal India has decided to further restructure the balance sheet of its subsidiaries during the course of 1997/98 and will comprise the transfers between debt and equity accounts within each subsidiary. This will not affect the interests of the Government or other parties and should therefore present little difficulty. Although debt to equity swaps can be implemented by Coal India without legal recourse, the corresponding equity to debt swap involves a reduction in equity capital in the case of WCL, NCL and SECL which will need formal sanction under the Companies Act (1956). The combined capital restructuring that has been used for the base case financial model is illustrated in Table 6.1.3.

Table 6.1.3 Proposed change in the capital structure of Coal India's subsidiaries
(Rs million)

as of end March 1996	*ECL*	*BCCL*	*CCL*	*WCL*	*NCL*	*SECL*	*MCL*	*TOTAL*
a) Equity	10,390	11,220	9,400	7,110	11,785	11,215	1,000	62,120
b) Net Equity	2,028	-664	11,135	7,185	18,832	13,515	2,378	54,409
c) Debt	21,010	21,643	14,986	1,649	4,110	1,534	7,994	72,926
d) External Restruc.[1/]	3,890	5,028						8917
e) Internal Restruc.[2/]	9,940	11,807	0	-4,139	-10,008	-7,613	864	851
After Ext. and Int. Restructuring:								
a) Equity	20,330	23,027	9,400	2,971	1,776	3,602	1,864	62,970
b) Net Equity	11,967	11,143	11,135	3,046	8,824	5,901	3,241	55,257
c) Pref. Equity[2/]					4,000	3,000	2,042	9,042
d) Debt	7,180	4,808	14,986	5,787	10,118	6,147	5,088	54,114

Source: Coal India Ltd.
Note: (1) External restructuring comprises debt waiver of Rs8.2 billion and conversion of preference shares of Rs9.0 billion.
(2) Is made up of a series of internal one time debt for equity swaps.

Reorganization Plan for ECL and BCCL

14. The financial weakness of BCCL and ECL has been recognized by GOI and Coal India for a long time (combined losses amounted to Rs8.2 billion, Rs11.4 billion and Rs6.1 billion in 1994, 1995 and 1996, respectively). Attaining financial viability of these companies is critical to the success of the corporatization program being pursued by Coal India. Jointly these two companies employ around 50% of Coal India's work-force (309,000 as of March 30, 1996) and produce only 23% of the Coal India's production (see cumulative cost curve in Figure 2.2). This situation is not sustainable, it represents a severe drain on resources, a risk to Coal India's financial stability and threatens the project objective of enhancing Coal India's ability to increase profitable coal production through proper commercialization of its operations.

15. Recognizing on the one hand that it can no longer afford the massive subsidies of the past and on the other its social responsibility to a bloated workforce, Coal India have decided to revive ECL and BCCL by undertaking major restructuring. This adjustment will be implemented over an extended period of 10 years given the acute social constraint. The magnitude of this constraint can be gauged by the simple fact that more than some 1.5 million people depend on the economic activities of these two subsidiaries, assuming an average family size of five. In addition, mining operations in remote areas provide most of the social infrastructure (house, schools, hospitals, electricity, fuel and water) and primary job opportunities.

16. Although the measures and financial relief approved by government and implemented in 1996/97 are necessary to create the financial capacity for change, they merely address past imbalances and are insufficient to stem the financial decline or provide the framework for a sustainable recovery. A comprehensive reorganization plan will further require (i) Government to fund a voluntary retirement scheme (VRS), (ii) CIL to undertake the recapitalization of ECL and BCCL, provide a grant for the implementation of well focused and rigidly applied VRS, provide interim bridging finance for replacement capital and a moratorium on debt service, and (iii) ECL and BCCL to reduce their labor force, improve operational efficiency and close uneconomic mines by introducing VRS to redundant labor. Under these conditions it is projected that these companies can be turned around over the next four to six years as outlined in Tables 6.1.4 and 6.1.5. This strategy will require considerable management commitment and attention to detail, a capital infusion and additional investment. The components of this plan comprise:

(a) **Cost Reduction Measures by ECL and BCCL.** In return for financial assistance from Coal India, ECL and BCCL have undertaken to:

(i) ensure productivity and cost improvements comprising:

a. progressive reduction of work-force through (i) natural attrition; (ii) implementation of voluntary retirements selectively applied to the redundancies arising from the closure of uneconomic operations by utilizing a Voluntary Retirement Scheme (VRS) which will be financed by way of a grant from Coal India, and (iii) limited recruitment. The rate of natural attrition is estimated to be 3% per annum. Recruitment will be strictly limited to a maximum of 20% of natural attrition and then only to provide for death-in-service, incapacitation or terminal illness and compensation for land acquisition needs. To restore their profitability it is estimated that they will require a sum of Rs3 billion each over the period 1997 to 1999 to be expended on VRS alone. Net labor compliment will as a result be reduced from 147,439 in 1996 to 114,500 in 2006 for BCCL and from 161,675 in 1996 to 132,957 in 2006 for ECL; and

b. Capacity utilization for each these companies was only 67% in 1995/96. There is significant scope for improvement to at least the levels prevailing in other subsidiaries. ECL and BCCL have undertaken to accelerate this

improvement over the next two years to reach a target of 85% and thereafter at a more gradual rate (see Table 6.1.4).

(ii) Improve working capital management. At present both companies are highly illiquid having amassed sizable wage and pension arrears, and are experiencing difficulty in meeting daily commitments. The estimated 1996/97 current ratio is only 0.51 and 1.02 for ECL and BCCL respectively; and

(iii) Restrict investment only to profitable projects (at least 16% FRR in real terms), and close uneconomic mines. This will permit the redeployment of mobile equipment in an attempt to increase the overall capacity utilization by reducing the existing imbalance in capacity between production and internal transport of coal.

(b) **Restructuring the liabilities to Coal India.** The waiver of interest of Rs8.92 billion received by Coal India from the Govt., has been passed on to ECL (Rs3.89 billion) and BCCL (Rs5.03 billion) in full. Besides Coal India has decided within its corporatization framework to:

(i) Convert debt amounting Rs9.94 billion for ECL and Rs11.81 billion for BCCL into equity which restores net worth, avoids technical bankruptcy, reduces future debt servicing and creates the capacity to borrow from the holding company without exceeding a debt/capitalization ratio of 60%; and

(ii) Charge ECL and BCCL GOI's original interest rates, which are lower than commercial rates of interest, on the residual of their existing loan account (capital restructuring) amounting to Rs7.18 billion and Rs4.81 billion for ECL and BCCL as at end March 1996 respectively);

(c) **Bridging Finance provided by Coal India.** Notwithstanding the capital restructuring, ECL and BCCL, without a reliable profit record, are unable to borrow in the market. In the absence of CPRA receipts and a corporate guarantee from Coal India (see para 7) these companies will require considerable financial support from their shareholders during the transition towards profitability. To ensure the survival of these companies Coal India has decided within its corporatization framework to:

(i) Extend short- to medium-term cash support either by way of loans or equity to enable ECL and BCCL to meet their debt service obligations to Coal India and undertake sufficient capital replacements to maintain the level of production. This support will be conditional upon ECL and BCCL achieving annual targets in respect of capacity utilization and labor reduction set by Coal India and will comprise:

a. Loan and equity in equal proportions to fund replacement capital expenditures. The loan portion will bear interest at the GOI rate of interest and will enjoy a moratorium until 2006 before being repaid out of surplus resources. These transfers will be financed out of dividends received from Coal India's more profitable subsidiaries; and

b. An additional revolving interest free bridging loan, financed from market borrowings, to enable the companies to meet in full their debt service obligations to Coal India, restore liquidity and settle arrears in wages, accrued staff gratuities and other current liabilities. Consistent with the corporatization program CIL will not issue any guarantees in respect of its loss making subsidiaries and conform to the accepted debt covenants i.e. D/E and debt service ratios 1.5 and 1.3 respectively.

(ii) Independent of the source of finance, provide a grant to finance the implementation of VRS amounting to Rs3 billion for each company. Although the rate of disbursement will depend on the success of the scheme, it is likely that Rs600 million will be expended in 1997/98 and Rs1.2 billion in each of the following two years. This will be financed partly from the NRF receipts and borrowings to the extent necessary.

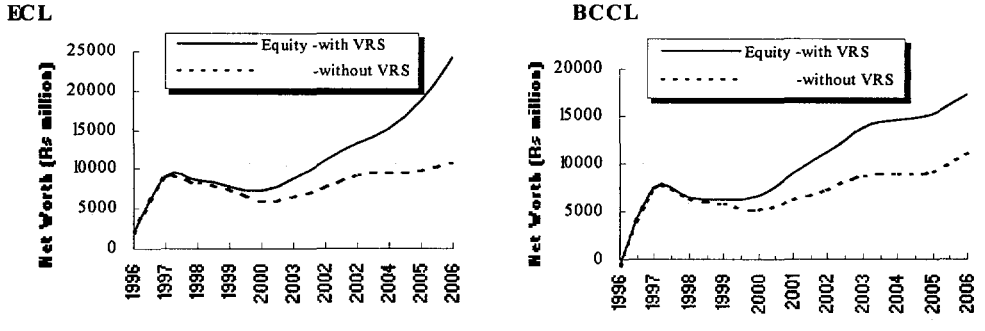
(d) **Government Support.** In acknowledging ultimate responsibility, Government have waived certain ECL and BCCL arrears, converted debt into preference equity, have provided a moratorium on the repayment of principal and interest, and will address its social commitment and the past financial distortions by:

(i) allowing Coal India to regularly increasing the price of regulated coal in accordance with the BICP pricing mechanism. An increase of 29% is scheduled for 1997/98 to offset the unrecovered cost increases since the last price revision in November 1993; and

(ii) providing a grant to Coal India to assist with the funding of a VRS in ECL and BCCL amounting to Rs4 billion (US$112 million) and financed out of the National Renewal Fund (NRF).

17. Although the success of the above measures would help ECL and BCCL substantially improve their financial performance, it will take a considerable time for these remedial measures to enable ECL and BCCL to regain their viability, restore their liquidity and capacity to access outside credit and invest in expanded productive capacity, and then only if these measures are rigidly adhered to and implemented without delay. Indeed if this is not done, ECL and BCCL will dissipate the benefits of the restructuring as indicated in Figure 6.1.2 below and almost certainly will continue to need support from Coal India.

Figure 6.1.2 Preservation of Net Worth



18. The projections show that both these companies can be expected to earn modest profits of about Rs1.0 billion per annum from 2001, repay inter-company borrowings by 2004 and begin to access external credit and expand production from 2005 onwards. This recovery, albeit modest, will substantially mitigate the financial risk which these companies pose to the other group companies, it provides the time to deal effectively with redundant labor and safeguards the livelihood of a substantial workforce dependent upon the survival of these companies. Prior to negotiations, Coal India submitted restructuring plans of BCCL and ECL, together with their action plans. Coal India intends to recruit a consulting team to further improve the plans and to prepare detailed implementation plans.

Table 6.1.4 Summary Financial Forecast - ECL
(Rs billions in current terms)

Year ending March	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*
	Actual	*Projection*									
Income Statement											
Coal Production (Mt.)	26.5	28.7	29.6	30.1	30.6	31.1	31.6	31.3	31.6	32.3	33.3
Net Sales	14.1	19.6	22.6	24.8	27.2	29.6	32.3	34.4	37.0	39.8	43.0
Operating Income	**(3.3)**	**0.6**	**2.7**	**2.8**	**3.1**	**5.2**	**6.1**	**7.2**	**7.1**	**7.0**	**9.6**
Interest Waiver	3.9										
Interest, Dep. and Tax	4.5	3.4	4.0	4.2	4.4	4.4	4.5	4.9	5.4	3.5	3.9
CPRA	5.5										
Net Profit	**1.5**	**(2.8)**	**(1.3)**	**(1.3)**	**(1.2)**	**0.7**	**1.6**	**2.3**	**1.8**	**3.5**	**5.7**
Cash Flow											
Internal Resources	1.9	(3.4)	(2.0)	1.0	0.3	0.9	2.1	3.5	3.1	3.6	5.8
New Equity		9.9	0.7	0.7	0.7	0.7	0.6				
Holding Company loans	0.5	(6.5)	2.7	(0.3)	0.4	(0.1)	(1.5)	(1.1)			
External Borrowings	1.4	2.0					1.5	1.5	1.5	1.5	1.5
VRS Grant			0.6	1.2	1.2	0.4	0.4	0.5			
Total Sources	**3.8**	**2.0**	**2.0**	**2.6**	**2.6**	**1.8**	**3.0**	**4.4**	**4.6**	**5.1**	**7.3**
VRS Payments			0.6	1.2	1.2	0.4	0.4	0.5			
Capital Expenditure	3.8	2.0	1.4	1.4	1.4	1.5	2.6	3.9	4.6	5.1	7.3
Total Applications	**3.8**	**2.0**	**2.0**	**2.6**	**2.6**	**1.8**	**3.0**	**4.4**	**4.6**	**5.1**	**7.3**
Balance Sheet											
Current Assets	7.3	8.6	8.8	9.5	10.3	11.1	12.1	12.7	13.6	14.5	15.4
less Current Liabilities	13.0	11.4	8.9	9.7	10.6	9.9	9.5	8.8	8.3	9.0	9.6
Net Fixed Assets	24.8	24.3	22.9	21.4	19.8	18.1	17.4	17.8	18.6	21.9	27.1
Total Assets	**19.1**	**21.4**	**22.8**	**21.2**	**19.5**	**19.3**	**20.0**	**21.7**	**23.8**	**27.4**	**32.9**
Debt	17.1	12.2	14.2	13.3	12.1	10.4	8.9	8.3	8.7	8.7	8.6
Preference Equity											
Equity	2.0	9.2	8.6	7.9	7.4	8.9	11.1	13.4	15.2	18.6	24.3
Total Capital Employed	**19.1**	**21.4**	**22.8**	**21.2**	**19.5**	**19.3**	**20.0**	**21.7**	**23.8**	**27.4**	**32.9**
Financial Ratios											
Debt/(Debt+Net Equity)	89.4%	57.2%	62.5%	62.5%	62.0%	53.9%	44.5%	38.4%	36.4%	31.9%	26.1%
Operating ratio	1.4	1.1	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.8
Debt Service Coverage	1.0	0.5	1.4	1.5	1.1	1.8	2.2	3.1	2.6	2.2	2.8
Current ratio	0.4	0.5	0.5	0.6	0.6	0.7	1.0	1.2	1.4	1.4	1.4

Table 6.1.5 Summary Financial Forecast - BCCL
(Rs billions in current terms)

Year ending March	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*
	Actual	*Projection*									
Income Statement											
Coal Production (Mt.)	27.1	26.5	29.9	31.4	32.1	33.1	35.1	35.6	35.8	35.4	35.0
Net Sales	14.8	18.1	22.1	25.2	28.1	31.1	34.6	37.0	39.3	41.2	43.2
Operating Income	**(3.6)**	**(1.2)**	**1.2**	**2.1**	**2.9**	**4.8**	**5.2**	**6.1**	**5.5**	**4.4**	**5.8**
Interest Waiver	5.0										
Interest, Dep. and Tax	3.6	2.5	3.0	3.2	3.5	3.6	3.7	4.2	4.6	3.7	3.7
CPRA	3.2										
Net Profit	**1.0**	**(3.7)**	**(1.8)**	**(1.1)**	**(0.6)**	**1.3**	**1.4**	**1.9**	**0.9**	**0.7**	**2.1**
Cash Flow											
Internal Resources	0.8	(3.4)	(1.4)	(0.1)	0.1	0.6	1.0	2.2	1.2	1.2	2.4
New Equity		11.8	0.9	0.9	0.9	1.0	1.0	0.4			
Holding Company loans	1.6	(8.4)	2.2	1.0	0.8	0.3	(0.0)	(1.8)	(0.9)		
External Borrowings		2.2	0.2	0.2			1.5	1.5	1.5	1.5	1.5
VRS Grant			0.6	1.2	1.2	0.4	0.4	0.5			
Total Sources	**2.4**	**2.2**	**2.5**	**3.2**	**3.1**	**2.3**	**3.9**	**2.8**	**1.9**	**2.7**	**3.9**
VRS Payments			0.6	1.2	1.2	0.4	0.4	0.5			
Capital Expenditure	2.4	2.2	1.9	2.0	1.9	1.9	3.5	2.4	1.9	2.7	3.9
Total Applications	**2.4**	**2.2**	**2.5**	**3.2**	**3.1**	**2.3**	**3.9**	**2.8**	**1.9**	**2.7**	**3.9**
Balance Sheet											
Current Assets	10.2	9.7	9.0	10.1	11.2	12.3	14.1	15.0	16.0	16.9	17.6
less Current Liabilities	12.1	10.7	9.3	10.2	11.1	10.6	10.7	9.9	9.3	10.0	10.5
Net Fixed Assets	17.9	18.4	18.5	18.4	18.1	17.6	18.5	18.0	16.7	17.4	19.2
Total Assets	**16.0**	**17.4**	**18.2**	**18.3**	**18.1**	**19.3**	**21.9**	**23.1**	**23.5**	**24.3**	**26.3**
Debt	16.6	10.0	11.7	12.0	11.4	10.4	10.6	9.4	8.9	9.0	9.0
Preference Equity											
Equity	(0.7)	7.4	6.5	6.3	6.7	8.9	11.3	13.7	14.6	15.3	17.3
Total Capital Employed	**16.0**	**17.4**	**18.2**	**18.3**	**18.1**	**19.3**	**21.9**	**23.1**	**23.5**	**24.3**	**26.3**
Financial Ratios											
Debt/(Debt+Net Equity)	104.2%	57.3%	64.2%	65.5%	63.1%	54.0%	48.3%	40.7%	37.8%	37.1%	34.1%
Operating ratio	1.3	1.2	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9
Debt Service Coverage	(0.2)	(1.0)	0.6	1.1	1.1	1.9	2.1	2.7	2.1	1.5	1.8
Current ratio	0.8	0.7	0.6	0.6	0.7	0.8	1.0	1.4	1.7	1.7	1.6

Coal India's base case financial projections

19. **Assumptions**. The financial model is structured to provide an income statement, balance sheet and funds flow in current prices for a 10 year period, the base year being 1996/97. These statements are generated for each coal producing subsidiary. The results have been consolidated to reflect the overall financial position of Coal India. The financial model is based on:

(a) Estimated production capacity, manpower, stripping ratio, labor productivity, average coal price realized, wage cost per employee, variable and fixed operating expenses, interest and depreciation, and a provision for compensation per person for accepting early retirement. The average coal price includes the value added resulting from washeries and other downstream operations. Production capacity is identified separately for underground and

opencast mines and includes, in some cases such as ECL, uncommissioned capacity created through substantial investments in prior years.

(b) Assumptions have been made regarding likely trends of physical performance, manpower reduction, the cost of creating new capacity and servicing of existing capacity through replacements, working capital management and likely enhancement of bank credit, various sources of borrowing and other financial assumptions relating to the impact of the expected change in average quality of production on realizable price, tax adjustment for depreciation, and capital restructuring.

(c) Coal prices which are progressively being deregulated: coking coal and superior grade non-coking coal from March 1996 and other grades within the next three years. Price increases due to Coal India's ability to capture part of the existing market premium for coal quality, has been assumed for each subsidiary company as a result of decontrol of coking coal and superior grade non coking coal. The regulated grades D, E, F and G are priced according to Government notification dated June 1994 which reflects costs as prevailing in November 1993. Following deregulation of Grade D and the issue of Government notification empowering Coal India increase prices of other grades on BICP formula, a major increase in prices of these grades was approved in 1997. An increase of 29% has been used for the purpose of projection.

(d) The cost of new capacity creation is estimated to be Rs330 per cubic meter in opencast mines and Rs950 per ton in underground mines at 1996 prices. The capacity creation cost per ton in opencast mines is determined on the basis of the stripping ratio and specific gravity of coal. The weighted average cost takes into account the future profile of opencast/underground projects in each company.

(e) cross-subsidization (CPRA) will be discontinued from the current year as a consequence of price decontrol of certain grades which dominates the production mix of the loss making companies receiving subsidies through the CPRA mechanism. With claims under CPRA restricted only to coal of regulated grades becoming marginal for ECL & BCCL, the CPRA has ceased to be an effective vehicle of cross- subsidization. The success of other measures, such as the release of grants for implementing Coal India's voluntary retirement program, debt forgiveness, price increases due to decontrol, and the internal steps initiated by Coal India to improve efficiency, may not enable ECL and BCCL to become profitable companies unless these measures are complimented by a program to phase out uneconomic operations and provide golden hand shake to the resultant surplus workforce. Coal India's strategy in this regard is to extend as much support as possible as a one time measure by way of capital restructuring and partial price decontrol, phase out cross subsidization thereafter and require the companies to set their own survival strategies in consultation with BIFR which could include closure of uneconomic operations, accelerated VRS, limiting or deferring wage revisions and redundancies. Indeed such decisions will need high degree of political consensus and should be dealt with the prime agency in the country responsible for handling potential insolvency, namely BIFR. This intervention is considered essential to ensure the expeditious and smooth implementation of such actions.

(f) Coal India's access to operating surpluses of the profitable companies shall be strictly restricted to receipt of dividends on a reasonable payout ratio and interest bearing loans under formally executed contracts. A payout ratio (dividend/PAT) of 40% is provided for NCL, WCL, MCL and SECL on the basis of sustainability of profit growth. On the same basis, the payout ratio for CCL has been limited to 10%. In addition, 10% dividend on preference equity is provided for MCL, NCL and SECL for back-to-back payment by Coal India to the Government. Out of dividends on ordinary equity, Coal India shall, for the time

being, retain 80% for providing support in various forms to ECL and BCCL as part of the reorganization plan. The balance of 20% shall be paid by way of dividend to the Government.

(g) besides being subject to a limit of 60% of debt to total capital, it has been assumed that the borrowing capacity for each subsidiary will be constrained by an annual borrowing limit which will be significantly lower if the coal sector loan does not take place.

(h) the model provides for estimates of domestic and foreign inflation, inflationary adjustment of coal price, and a wage index reflecting adjustment for inflation and the possible outcome of wage negotiations which are held once every four years. Further exchange rate depreciation arising from differential rates of inflation has also been taken into account.

20. Other quantitative assumptions are shown in Table 6.1.6.

Table 6.1.6 Summary of Assumptions

		BCCL	CCL	ECL	MCL	NCL	SECL	WCL
Demand	1996/97	7.50	6.00	9.00	12.00	9.00	8.00	6.00
(%)	Thereafter	5.00	5.00	4.50	9.00	5.50	4.00	4.00
Improvement in existing capacity utilization (%)								
Underground	1996/97	1.50	1.50	3.50	1.00	0.00	1.00	1.00
	Thereafter	1.00	1.00	1.50	1.00	0.00	1.00	1.00
Opencast	1996/97	2.50	2.00	7.50	1.50	3.00	1.00	1.50
	Thereafter	1.50	1.00	3.00	1.00	1.00	1.00	1.25
Utilization of new capacity	First year	50.00	50.00	50.00	50.00	50.00	50.00	50.00
(%)	Thereafter	95.00	95.00	95.00	95.00	95.00	95.00	95.00
Natural wastage	1996/97	2.00	2.00	2.50	2.36	0.18	0.80	0.56
(%)	Thereafter	3.00	2.00	3.00	3.21	0.48	1.50	1.38
OMS	Existing	0.62	1.17	0.44	3.67	6.48	1.62	1.04
(tons)	New capacity	3.50	4.00	4.00	8.00	8.00	2.50	1.50
Unit cost of new capacity (Rs/ton)	Total	930	920	1180	660	1180	850	1030
Grade mix decline in price	1996/97	0.20	1.50	3.0	1.00	1.00	0.00	0.10
(%)	Thereafter	0.20	1.00	0.5	1.00	1.00	0.28	0.0
Deregulation effect	tons	19.62	13.02	15.65	1.75	16.07	14.60	9.06
	% new capacity	60.00	-	60.00	-	40.00	20.00	-
	premium (Rs/tons)	148.98	138.2	184.2	57.49	77	95.24	149.16
	additional premium	-	-	97.82	-	-	-	156.00
Average coal price 1995/96 (Rs/ton)		546.43	457.21	523.82	301.83	441.24	418.34	503.18
Costs	Variable	3,568	3,370	2,833	1,923	3,451	4,765	3,340
(Rs million)	Fixed	3,034	1,688	2,490	735	2,152	2,720	2,090
	Depreciation	1,436	1,679	2,333	754	2,169	1,361	986
Current manpower		147,439	92,816	161,675	22,983	16,661	99,028	84,857
Annual loan ceiling (Rs million)		1,500	1,500	1,500	2,000	2,000	2,000	1,500
Working Capital								
Receivables to net sales								
(months)	Present (1996)	1.85	6.63	2.03	1.82	1.45	1.89	1.65
	Projected (1998)	1.5	2.00	1.75	1.25	1.00	1.25	1.25
Coal stock to net sales								
(months)	Present (1996)	3.38	2.04	1.19	0.99	0..49	1.69	0.72
	Projected (1998)	1.65	0.79	1.01	0.67	0.43	1.48	0.48
Stocks of stores and spares to variable expenses								
(months)	Present (1996	3.63	3.79	4.58	3.68	8.88	4.88	2.93
	Projected (1998)	3.00	1.50	3.50	3.68	4.00	2.00	1.50
Other current assets to operating expenses								
(weeks)	Present (1996)	6.56	13.08	2.25	12.12	12.80	3.28	-5.56
	Projected (1998)	4.00	6.00	2.00	6.00	4.00	2.00	2.00
Payables to operating expenses other than wages								
(months)	Present (1996)	1.66	0.90	2.10	0.99	1.12	0.00	0.22
	Projected (1998)	1.00	0.50	1.25	1.00	0.5	0.00	0.22
Statutory liabilities to net sales								
(months)	Present (1996)	0.60	1.87	0.85	0.91	0.30	0.60	0.44
	Projected (1998)	0.50	1.00	0.50	0.50	0.30	1.50	0.40
Other liabilities to operating expenses								
(months)	Present (1996)	6.38	5.64	7.22	5.61	4.55	5.57	4.03
	Projected (1998)	4.00	2.00	4.00	2.00	2.00	2.00	2.00
	Projected (2004)	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Dividend distribution (% net profits)		0.00	10.00	0.00	40.00	40.00	40.00	40.00

Note: Other current assets include adjustment for overburden removal.
Source: *Coal India Ltd.*

21. **Financial projections**. On this basis and the assumptions outlined in Table 6.1.6, detailed projections for each subsidiary company have been made and are contained in the project file. The consolidated results for all producing companies are given in detail on pages 22 to 24 of this annex and summarized in Table 6.1.7. Although the financial ratios indicate a steady return to financial health for the group as a whole, it is apparent that ECL and BCCL, although regaining profitability, will need to eliminate its loss making activities and carefully review is labor requirements.

Table 6.1.7 Coal India Consolidated Financial Forecast
(Rs billion in current terms)

Year Ending March	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*
INCOME STATEMENT						
Coal Production (Mt.)	248	259	270	279	290	302
Net Sales	126.5	157.9	174.1	190.8	208.9	229.6
Operating Income 1/	**25.5**	**47.9**	**49.8**	**53.6**	**66.5**	**76.8**
FUNDS FLOW						
Internal Resources	5.6	15.5	16.6	16.2	25.9	35.3
External Borrowings	2.2	4.6	12.8	12.5	10.2	11.4
Preference Capital	9.0					
NRF Grant		0.8	1.6	1.6		
Total Sources	**16.8**	**20.9**	**61.0**	**30.3**	**36.1**	**46.7**
Capital Expenditure	16.8	18.9	25.8	28.1	35.7	34.3
VRS Grant to Subsidiaries		1.2	2.4	2.4	0.7	0.8
Total Applications	**16.8**	**20.1**	**28.2**	**30.5**	**36.4**	**35.1**
BALANCE SHEET						
Current Assets	53.7	47.0	55.7	60.8	63.9	80.0
less Current Liabilities	52.0	39.1	43.2	46.8	45.6	45.8
Net Fixed Assets	125.0	130.4	141.3	152.6	169.5	182.6
Total Assets	**126.6**	**138.2**	**153.8**	**166.5**	**187.8**	**216.9**
Debt	62.8	61.1	63.8	62.3	61.1	62.4
Preference Equity	9.0	9.0	9.0	9.0	9.0	9.0
Equity	54.8	68.1	81.0	95.1	117.6	145.4
Total Capital Employed	**126.6**	**138.2**	**153.8**	**166.5**	**187.8**	**216.9**
Financial Ratios						
Debt/(Debt+Net+Equity)	56.7%	50.7%	47.3%	42.9%	37.4%	32.9%
Operating Ratio	0.89	0.78	0.80	0.81	0.77	0.76
Debt Service Coverage	1.39	1.87	2.16	1.90	3.01	3.43
Current Ratio	0.93	1.03	1.06	1.08	1.19	1.28

Note 1. Profits are inflated in 1996 by the extraordinary write back of arrear interest waivers amounting to Rs8.9 billion.
Source: Coal India Ltd.

Table 6.1.8 Projections of consolidated covenanted financial ratios for CIL

Year ending March	*Debt to total capital (%)*	*Debt service coverage ratio*	*Current ratio*
1996(act)	52.5	1.07	0.87
1998	50.7	1.87	1.03
2000	42.9	1.90	1.08
2002	32.9	3.43	1.28
2004	22.4	3.73	1.50
2006	15.6	3.56	1.51

Source: Coal India Ltd.

22. The financial model has been structured in a manner which provides an opportunity for Coal India to identify factors which are of critical importance for the financial health of Coal India and the success of the CSRP. These comprise:

(a) **CAPITAL RESTRUCTURING BY GOVERNMENT.** Government conversions of arrear liabilities into equity was a necessary but not sufficient condition to fully mitigate the financial distress of ECL and BCCL and to provide time for them to be transformed into commercially self-sustaining and viable units. The model assumes that further support is made by way of equity and concessionary loans derived from a portion of the dividends received by Coal India from its other subsidiary companies and recourse by Coal India to external credits. The magnitude of this transitional support is outlined in Table 6.1.9.

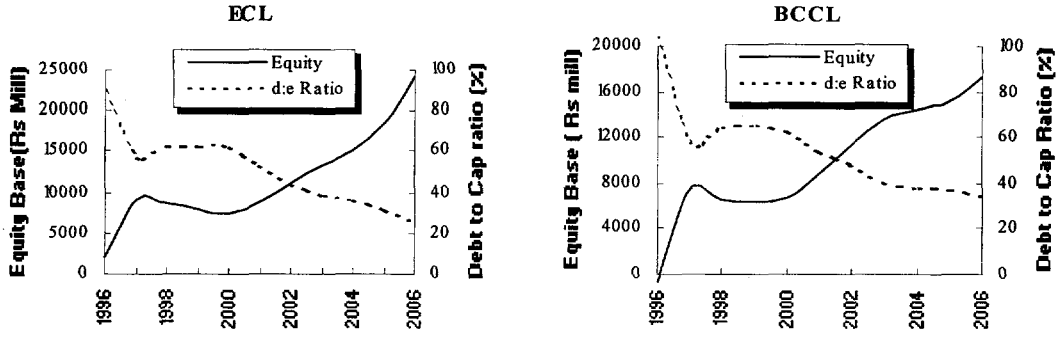
Table 6.1.9 Projected Net Loan Disbursements from Coal India to ECL and BCCL
(Rs million)

Year ending March	*ECL*	*BCCL*	*TOTAL*
1996(act)	-3,409	-3,451	-6,860*
1998	3,376	3,093	6,468
2000	1,116	1,736	2,853
2002	-938	956	18
2004	0	-851	-851
2006	0	0	0

Source: Coal India Ltd.
* After accounting for interest waiver of Rs3,890 million and Rs5,027.5 million for ECL and BCCL, respectively.

Given sufficient operational improvement, financial restructuring and adequate transitional support, ECL and BCCL should be able to avert bankruptcy, restore positive net worth and remain within prudent borrowing limits as highlighted in Figure 6.1.3.

Figure 6.1.3 Projected Equity Base and Debt Equity ratio of ECL and BCCL



(b) **SUBSTANTIAL IMPROVEMENT IN PRODUCTIVITY IN ECL AND BCCL.** One of the main factors contributing to the improvement of ECL and BCCL is the better utilization of existing capacity. The utilization of the existing capacity is planned for improvement on an accelerated scale to 85% and thereafter on a moderated scale to 95% (90% for ECL and BCCL). The measures being implemented for achieving these improvements include:

(i) upgrading the quality of productive assets by global sourcing of equipment;

(ii) improving machine availability by proper management of spares and workshop facilities;

(iii) improving operator availability by introducing "hot seat change" and mobile canteens; and

(iv) in ECL and BCCL, redeployment of productive assets from uneconomic operations identified for closure, to other mines with a need for such assets.

(c) **DECONTROL OF COAL PRICES.** Price decontrol will be a major contributing factor to the process of attaining long-term commercial viability by the coal companies. Decontrol enables the companies to charge a price which is related to the net back import price adjusted for variations in coal quality and will enable ECL and BCCL in particular to benefit substantially from 1997 onwards.

(d) **GROWTH IN DEMAND.** To support the country's economic reforms and its projected growth in GDP and exports of 5% and 20% respectively, the coal sector will need to expand at the rate of 8% per annum (see para 1.06). The base case projections indicate that Coal India will be unable to satisfy this demand and it is assumed that 40% of the incremental increase will be met by the private sector and imports. Allocation among individual companies is based upon regional opportunity and comparative economics. As a consequence, the growth of MCL with easy mining conditions, availability of viable projects and spare capacity, has been favored at the expense of SECL and WCL. In the longer term however, Coal India is unable to finance in full the required increase in capacity and is projected to produce only 323[1] million tons per year in 2006 against a market demand of 420 million tons.

23. In addition to these critical factors requiring appropriate action, the company needs to undertake the following internal measures and reforms:

(a) restrict the intake of fresh manpower,

[1] Net of production derived from hired earth moving machinery and contractors amounting to around 23 million ton per annum.

(b) improve the collection of revenue receipts,

(c) reduce the inventory of coal and stores and spares,

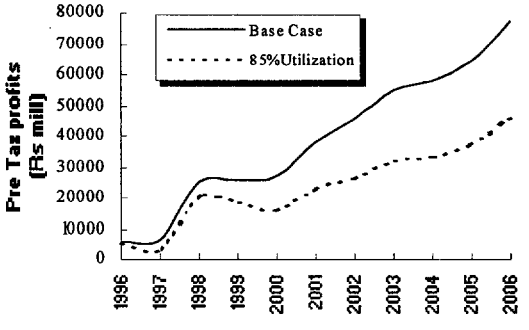
(d) avoid time and cost over run in implementing projects, and

(e) close unprofitable operations and restrict new investments to commercially viable projects.

Improvement of operating efficiency

24. The existing levels of operating efficiency in most cases is around 70%-85% of the corporate norm defined by CMPDI. The reasons for this suboptimal performance are numerous and include: the low level of capital replacement in recent years and the tacit requirement that Coal India buys equipment from indigenous manufacturers in the public and private sectors. This has severely restricted Coal India's ability to access international technology and equipment of global quality standards. CSRP will allow Coal India to replace existing equipment in large mines with units of globally accepted quality and specifications. This process should enable the coal companies to improve the utilization of existing capacity progressively to a level of 95% of the normative capacity. Coal India has undertaken to develop an action plan outlining in detail how these levels are to be achieved. The disproportionate impact and importance of these efficiency improvements on the projected consolidated net profits of Coal India is shown in Figure 6.1.4.

Figure 6.1.4 Profit before tax, Coal India



25. The survival of the marginal companies of ECL and BCCL are particularly sensitive to these improvements. To the extent that these are not achieved and production falls short of the levels projected, a further reduction in the labor compliment will be required to levels which may well be beyond Coal India's capacity to achieve without additional assistance or support from the Government.

Restricted intake of fresh manpower

26. All coal companies and ECL and BCCL in particular, must seek every opportunity to redeploy surplus labor within and between group companies before the fresh intake of manpower is considered. In order to achieve this objective, it is necessary that the recruitment policy of each company is significantly revised. The components of the existing policy that should be abolished are the employment of: (i) a dependent of any employee suffering from "general debility;" and (ii) land losers as compensation for land acquired for new projects. Without budgetary support, the company can no longer afford to perpetuate these policies. Adoption of a revised policy for resettlement and rehabilitation of project-affected people will provide Coal India with an ideal opportunity to cease the practice of hiring land losers by offering them attractive cash alternatives. Employment of dependents of existing employees as a social security measure

should be limited and ultimately replaced by other means such as life insurance, pension provisions or other lump-sum cash alternatives. Existing wage agreements will need to be renegotiated and amended to effect this as early as possible.

27. A reduced labor compliment and an increase in operating efficiencies will lead to a reduction in costs and enable the company to approach a working ratio of 0.8 over a period of five years. The financial consequences of not achieving this goal are severe and will almost certainly result in the insufficient internal generation of cash, reinvestment of funds in productive capacity and inability to meet debt obligations. Consequently, each of the subsidiary companies should be obligated under the terms of the CSRP to achieve and maintain a working ratio of 0.8.

Project implementation

28. In the past, the implementation of projects by the coal companies resulted in delays and cost overruns. It is essential for individual coal companies to have adequate project management and on-line systems for monitoring project implementation so that capital costs are contained within the budget. The cost of capacity creation has been assumed as Rs930/ton in underground mines and Rs330/m^3 for opencast mines - both at 1995/96 prices. These are reasonably comfortable estimates although cost overrun arising from time overrun may push costs beyond these estimates which in turn may jeopardize financial viability.

29. The base case financial model demonstrates the possibility of all the companies, with the exception of ECL and BCCL, Coal India as a whole attaining long-term financial viability, provided the following remedial measures are taken by the Government and Coal India:

Action by the Government

(a) deregulation of coal price of lower grades of coal within the next three years;

(b) indirect support by permitting the controlled use of a portion of the dividend flow to finance loans to ECL and BCCL, and the implementation of a voluntary retirement scheme;

(c) systematic application of the BICP pricing mechanism to provide a regular and adequate increase in regulated coals; and

(d) continue to ensure and enforce noninterference in Coal India's efforts to regulate coal supplies on commercial considerations, i.e. timely payment and insistence on inventory buildup by consumers.

Action by Coal India

(a) ensure the independent operation of each subsidiary and eliminate cross subsidization;

(b) devise and implement a time bound action plan for improving equipment utilization to level of 95% for each company;

(c) regulate coal supplies and ensure payment of dues by entering into legally enforceable supply contracts with penalty/bonus provisions;

(d) encourage inventory buildup by consumers;

(e) adopt a system of identification and disposal of non-moving items in stores and spares on a continuous basis;

(f) enter into long-term contracts with equipment manufacturers for supply of spares on a 'as and when required' basis; and

(g) enforce improved system of project implementation.

Critical performance indicators

30. To realize Coal India's financial, economic and operating objectives as outlined in the consolidated financial projections will require each subsidiary to achieve and maintain a minimum level of performance. These performance factors have been identified and are tabulated for 1997 to 2002 in Annex 5.1 for each subsidiary company and for Coal India as a whole.

Financial and corporate risk

31. The more significant factors impacting the base case financial forecast are the deregulated coal price; unit capital cost, capacity utilization and production levels; funds tied up in working capital, particularly accounts receivable; and differential cost increases. Table 6.1.10 summarizes the probability distribution associated with each of these factors and the motivation for its selection. A detailed risk analysis, using probabilistic simulation techniques, was performed on each of the six subsidiary companies in an attempt to quantify to the extent possible:

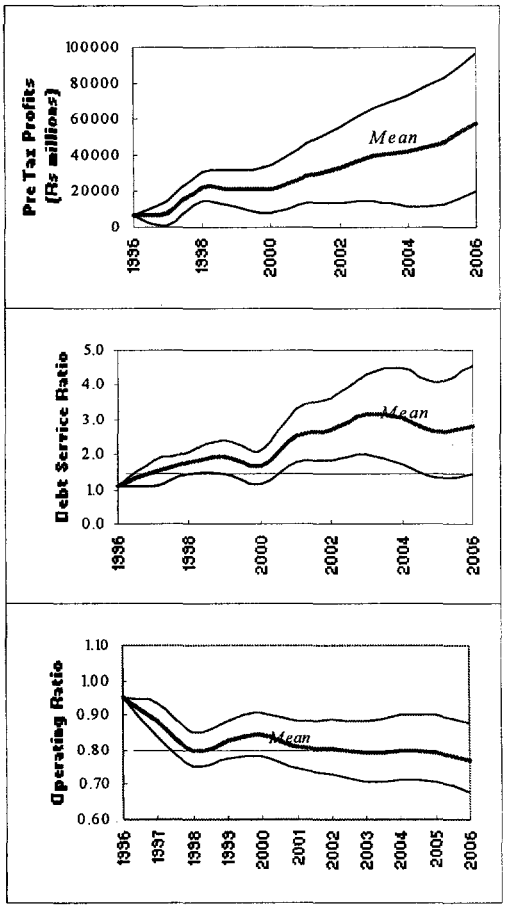
(a) the financial impact of the risks to which the company is exposed;

(b) the areas in which Coal India management must concern itself in order to reduce the company's exposure and safeguard its commercial viability;

(c) the company's credit worthiness; and

(d) its potential to transform itself into a commercial operation free of future Government support.

Figure 6.1.5 Results of Risk Analysis



32. The detailed results of this analysis are contained in the project file and summarized in Figure 6.1.5.

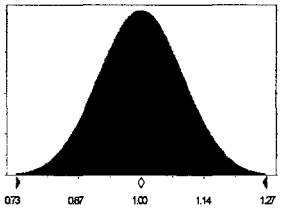
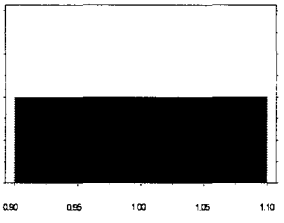
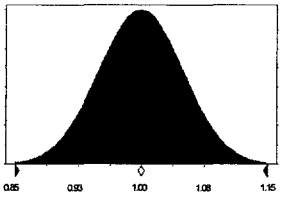
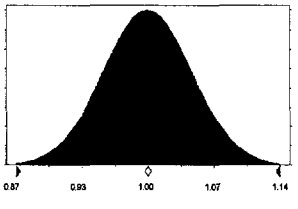
33. These charts are used to represent the major determinants of Coal India's financial health (profits, solvency and operating efficiency). They also outline the probable distribution of these results, in current terms, for each year over the period from 1997 to 2006. From this it may be concluded, notwithstanding the wide range of outcomes, that within 90% confidence limits, the company will be able to:

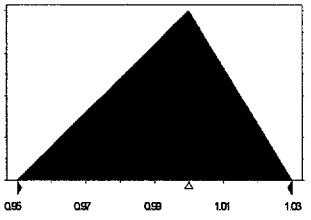
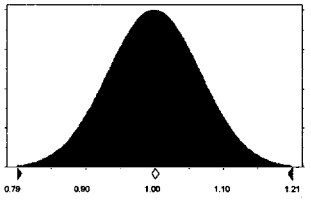
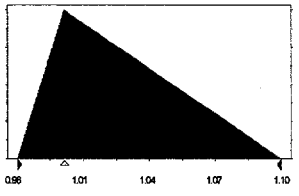
(a) sustain the profitable trend which was established from 1991 to 1996 with a reasonable degree of confidence;

(b) generate and reinvest sufficient internal resources to meet its debt obligations by maintaining a debt service ratio of at least 1.3 and sustain a reasonable capital expenditure program; and

(c) improve its operating ratio from existing levels to around the target level of 0.8 are somewhat remote in the short to medium term. This target, however, will remain difficult to maintain as long as the excessive labor levels and operating ratios of greater than 1.0 are maintained at ECL and BCCL. In the absence of substantial improvement in operational efficiencies, these operations will continue to struggle and undermine the financial performance of Coal India.

Table 6.1.10 Selection of Probability Distributions

Input Variable	*Distribution*	*Motivation*
1. Price increase.		The full impact of deregulation of the coal market will evolve slowly. As a consequence the range of variation about the assumed in price increase is likely to be narrower in 1997 with a standard deviation of 3 percent and rising to ± 10 percent by 2006.
2. Unit Capital cost.		The unit capital cost assumption in the base case is regarded as somewhat conservative. Nonetheless a uniform distribution of ± 10 percent has been used.
3. Annual increase in capacity utilization.		Notwithstanding intense management effort to increase capacity utilization, there exists the possibility of the program taking longer and peaking at a different level than projected. The assumed annual increases have accordingly been varied by a factor contained in the adjacent distribution.
4. Limit in capacity utilization		The target utilization rate is 95 percent. Although this is a normative rate, it is regarded as an ambitious goal to achieve on a consistent basis. Since there is a greater possibility of falling short of the target, a triangular distribution skewed somewhat to the left has been adopted.
5. Wage increase.		A normal distribution varying within a narrow range of 5 percent of those projected in the base case.

Input Variable	*Distribution*	*Motivation*
6. Periodic wage adjustment.		The base case assumes a wage adjustment of 8 percent will be negotiated with the unions every four years. Management's strenuous efforts to relate wage increases to productivity gains is likely to result in these adjustments being lower than projected. As a consequence a distribution skewed slightly towards the lower levels has been used to factor the base case assumption.
7. Increase in unit costs.		The annual increase in unit cost is expected to vary by ± 7 percent of that originally assumed.
8. Accounts receivable.		The projected reduction in, and maintenance of, accounts receivable is considered to be fairly ambitious given the weak nature of the power sector. Accordingly the chances of more modest decreases are more likely and the base case assumption has been factored accordingly.

32. **EXCHANGE RATE RISK.** Coal India and its subsidiaries will bear the exchange rate risk of the IBRD US$ based single currency loan. Its ability to absorb this risk has been reflected in the projections by adjusting the loan repayments by the differential exchange rate assumptions. Further devaluations are to a large extent hedged. Its effects will be absorbed through the coal price mechanism since coal is internationally traded and denominated in US$.

Coal India Ltd.
Consolidated Income Statement
(Rs millions)

Year Ending March	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*
	Actual		*Projection*									
Gross Sales	118,439	133,003	159,496	199,044	219,457	240,550	263,303	289,453	317,088	343,077	368,616	396,081
Less : Taxes & Duties	27,083	27,307	33,036	41,101	45,330	49,701	54,422	59,823	65,427	70,791	76,063	81,729
Net Sales	89,721	104,104	126,459	157,943	174,127	190,849	208,881	229,630	251,661	272,287	292,553	314,352
Less:												
Wages	41,966	50,200	52,825	55,469	62,750	70,242	69,297	72,762	76,397	87,191	98,855	98,334
Variable Expenses	20,977	23,720	31,032	36,291	42,114	46,334	51,081	56,710	61,801	66,958	72,217	77,897
Other Fixed Expenses	11,829	14,462	17,091	18,281	19,511	20,700	21,973	23,320	24,748	26,260	27,861	29,557
Total Op. Expenses	74,772	88,382	100,948	110,041	124,375	137,276	142,351	152,792	162,945	180,409	198,934	205,788
Op. Income	14,950	15,723	25,512	47,901	49,752	53,573	66,530	76,838	88,716	91,878	93,619	108,564
Add : Credit & Waivers		8,918										
Less:												
Interest	4,980	7,625	6,937	9,073	8,924	9,172	8,917	8,864	9,469	9,909	10,288	10,465
Depreciation	9,698	10,898	11,993	13,399	14,912	16,789	18,799	21,212	23,573	23,490	18,486	20,370
Amortization				100	300	500	675	775	575	375	200	
Profit Bef. Tax	272	6,117	6,582	25,330	25,617	27,112	38,139	45,987	55,100	58,104	64,645	77,729
CPRA Adj./Subsidy	26	(3)										
Tax	6	346	5,880	9,666	10,441	10,625	12,982	15,195	18,033	19,793	21,661	25,052
Inv. Allowance Res.	(914)	(290)										
Pat	1,205	6,059	701	15,663	15,176	16,487	25,157	30,792	37,066	38,311	42,985	52,677
Appropriation Of PAT												
Dividend On Pref. Equity			904	904	904	904	904	904	904			
Dividend On Equity			726	1,393	1,407	1,442	1,774	2,078	2,434	2,636	2,885	3,314
Transfer To Gen. Reserve		209		787	794	811	977	1,129	1,308	1,318	1,443	1,657
Retained PAT	1,205	5,850	(929)	12,579	12,071	13,329	21,501	26,681	32,420	34,357	38,656	47,706
Cum. Retained PAT	(16,474)	(10,623)	(11,553)	1,026	13,098	26,427	47,928	74,609	107,029	141,386	180,042	227,748
In Rupees Per Ton :-												
Net Sales	414	451	528	626	662	701	739	779	819	855	891	931
Wage Cost	193	217	221	220	238	258	245	247	249	274	301	291
Operating Cost	345	383	421	436	473	504	504	518	530	566	606	609
Total Cost	412	463	501	525	564	602	604	623	640	672	694	700
P/L Before Cpra	1	26	27	100	97	100	135	156	179	182	197	230
Addl. Rev.(Prem) Rs Mill			16,408	18,937	19,426	20,765	22,083	23,683	25,499	27,094	28,822	30,736
Op. Costs/Net Sales Ratio	0.9	1.0	0.9	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.7	0.7

Source: Coal India and Bank Staff

Coal India Ltd.
Consolidated Source And Application Of Funds
(Rs Millions)

Year Ending March	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*
	Actual		*Projection*									
Ret. Earn.+Res.+Int+Dep	15,883	15,665	18,001	35,938	37,001	40,601	50,870	58,661	67,344	69,449	69,073	80,198
Increase In W.C	(5,170)	(10,521)	4,076	5,000	1,381	1,294	4,634	4,378	4,911	5,331	1,736	3,026
Overdraft To Cover Deficit			5,102	3,792	(1,898)	(1,699)	(3,426)	(1,872)				
Debt Servicing (*)	8,828	14,648	12,976	19,241	17,168	21,397	16,919	17,122	17,179	18,634	21,170	22,558
Add:												
S.T. Credit For W.C	(2,200)	895	(500)									1,500
Redmptn Of Pr. Equity												
Int. Resources Available For Investment	10,025	12,433	5,550	15,489	16,554	16,212	25,890	35,288	45,253	36,441	46,167	56,113
External Borrowings												
---GOI	1,080	2,887	(9,043)									
---Tied Up Domestic	691	375		200	170							
---Domestic	3,500	2,028	11,039	0	2,044	3,085	3,070	7,052	7,583	8,500	8,500	8,500
---Tied Up Foreign	598	365										
---IBRD Loan			179	4,427	10,624	9,395	7,159	4,340				
Total	5,869	5,655	2,176	4,627	12,838	12,479	10,229	11,393	7,583	8,500	8,500	8,500
Pref. Equity From GOI			9,043									
Equity From GOI	2,115											
NRF Grant For VRS	1,200			800	1,600	1,600			900			
Surplus B/F				0	850	3,668	3,479	3,150	14,727	31,233	42,829	57,910
Total Investible Funds	19,209	18,088	16,769	20,916	31,842	33,959	39,598	49,831	68,462	76,174	97,496	122,523
Actual Investment:												
In Replacement												
CSRP			66	1,847	4,637	5,029	4,955	2,482				
Non CSRP			10,994	9,252	6,843	6,772	7,177	9,991	12,825	12,942	13,561	13,936
Total	3,633	4,428	11,061	11,099	11,480	11,801	12,132	12,473	12,825	12,942	13,561	13,936
In VRS	1,200			1,200	2,400	2,400	700	800	900			
In New Capacity												
CSRP			2,461	7,080	11,671	8,548	5,040	3,460	26			
Non CSRP			3,247	687	2,623	7,731	18,577	18,371	23,479	20,402	26,026	32,225
Total	14,376	13,659	5,708	7,767	14,294	16,279	23,616	21,831	23,505	20,402	26,026	32,225
Total Investment	19,600	17,516	16,769	20,066	28,174	30,480	36,448	35,104	37,229	33,345	39,587	46,162
Surplus C/O			0	850	3,668	3,479	3,150	14,727	31,233	42,829	57,910	76,362
(*) Debt Servicing:												
Interest	4,980	7,625	6,937	9,073	8,924	9,172	8,917	8,864	9,469	9,909	10,288	10,465
Repayment Of Loan												
---Domestic	3,848	7,023	4,930	9,059	7,135	11,203	6,981	7,237	6,673	7,283	8,420	8,657
--- Loan For Deficit												
---Foreign			1,109	1,109	1,109	1,022	1,022	1,022	1,038	1,442	2,462	3,436
Total	3,848	7,023	6,039	10,168	8,245	12,225	8,003	8,259	7,711	8,725	10,882	12,093
Total Debt Servicing	8,828	14,648	12,976	19,241	17,168	21,397	16,919	17,122	17,179	18,634	21,170	22,558
DSCR	1.8	1.1	1.4	1.9	2.2	1.9	3.0	3.4	3.9	3.7	3.3	3.6

Source: Coal India and Bank staff

Coal India Ltd.
Consolidated Balance Sheet
(Rs Millions)

Year Ending March	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*
	Actual		*Projection*									
Net Worth:-												
Equity	63,164	63,164	63,164	63,164	63,164	63,164	63,164	63,164	63,164	63,164	63,164	63,164
Reserves	3,248	3,167	3,167	3,953	4,747	5,558	6,536	7,665	8,973	10,291	11,733	13,390
Cum. Retained PAT	(16,474)	(10,623)	(11,553)	1,026	13,098	26,427	47,928	74,609	107,029	141,386	180,042	227,748
Total Net Worth	49,938	55,707	54,778	68,143	81,008	95,149	117,628	145,438	179,165	214,840	254,940	304,303
Pref. Equity			9,043	9,043	9,043	9,043	9,043	9,043	9,043			
Long Term Borrowings	72,235	61,574	57,710	52,169	56,762	57,017	59,243	62,378	62,249	62,025	59,643	56,049
Short Term Borrowings	4,724	5,619	5,119	5,119	5,119	5,119	5,119	5,119	5,119	5,119	5,119	6,619
Loan To Cover Deficit			5,102	8,895	6,997	5,299	1,872					
Current Liabilities												
Accounts Payable	3,069	3,118	3,050	2,642	2,930	3,171	3,500	3,947	4,245	4,561	4,887	5,239
Dividend Payable			1,631	2,297	2,311	2,346	2,678	2,982	3,339	2,636	2,885	3,314
Statutory Liabilities	10,514	6,616	6,652	6,843	7,566	8,305	9,096	10,000	10,902	11,772	12,615	13,501
Other Liabilities	34,582	44,736	35,564	22,237	25,233	27,891	25,210	23,725	21,421	21,780	23,589	22,599
Total Current Liabilities	48,164	56,970	46,897	34,020	38,040	41,713	40,484	40,653	39,906	40,750	43,977	44,653
Total Liabilities	175,060	179,869	178,648	177,388	196,969	213,339	233,389	262,631	295,483	322,733	363,678	411,624
Gross Fixed Assets	155,700	171,191	187,960	206,826	232,600	260,680	296,428	330,732	367,062	400,406	439,993	486,154
Less cum Depreciation	65,303	73,815	85,808	99,207	114,119	130,908	149,707	170,919	194,492	217,982	236,468	256,837
Net Fixed Assets	90,398	97,376	102,152	107,619	118,481	129,772	146,721	159,813	172,570	182,424	203,525	229,317
Capital W.I.P	23,268	22,814	22,814	22,814	22,814	22,814	22,814	22,814	22,814	22,814	22,814	22,814
Carry Forward Surplus			0	850	3,668	3,479	3,150	14,727	31,233	42,829	57,910	76,362
Current Assets												
Receivables	25,556	21,680	16,004	11,405	13,272	15,089	15,554	16,486	17,175	19,440	20,508	20,837
Coal Stock	13,749	13,639	13,349	13,013	14,425	15,821	17,345	19,017	20,677	22,278	23,775	25,380
Stores & Spares	8,967	9,222	9,786	7,988	9,184	10,118	11,140	12,333	13,469	14,630	15,819	17,116
Other Current Assets	10,776	9,668	9,072	7,929	8,854	9,674	10,069	10,820	11,500	12,647	13,857	14,328
Total Current Assets	59,047	54,209	48,212	40,335	45,736	50,704	54,108	58,656	62,820	68,995	73,958	77,660
Misc. Assets Including Unamortized VRS	2,348	5,471	5,471	5,771	6,271	6,571	6,596	6,621	6,046	5,671	5,471	5,471
Total Assets	175,060	179,869	178,648	177,388	196,969	213,339	233,389	262,631	295,483	322,733	363,678	411,624
Debt/(Debt+Net Equity)	59.1%	52.5%	56.7%	50.7%	47.3%	42.9%	37.4%	32.9%	28.5%	22.4%	19.0%	15.6%
Current Ratio	1.12	0.87	0.93	1.03	1.06	1.08	1.19	1.28	1.40	1.50	1.51	1.51

Source: Coal India and Bank staff.

ANNEX 6.2 FINANCIAL AND ECONOMIC ANALYSIS

1. The following summarizes: (a) the methodology and assumptions that were used to estimate financial and economic rates of return and net present value of the individual mine-specific investments and for the Coal Sector Rehabilitation Project as a whole and; and (b) the results of the analysis. The risks each mine-specific investment faces are taken explicitly into account.

Methodology and assumptions

2. The financial and economic analysis of each mine subproject was carried out based on real prices (1996-97). Cost and revenue streams were estimated for the project implementation period 1997/98 to 2001/02. The major variables affecting the cash flows are, *inter alia,* the capital cost, operating cost, annual production and the selling price of coal.

3. Table 6.2.1 summarizes the assumptions that have been used for carrying out the financial and economic analysis of the mine-specific investments.

4. The financial internal rate of return (FIRR), and the net present value (NPV) have been calculated on the basis of incremental cost and benefit streams associated with each of the 24 mines included in the proposed project. In addition to the fixed and variable costs affecting the cash flows, project specific environmental and social mitigation costs have fully been taken into account in the economic evaluation of the project.

5. Financial benefits are estimated on the basis of incremental coal production valued at prevailing coal prices. These prices reflect recent coal price increases. On April 1, 1997 Coal India increased prices of coal grades D, E, F, and G by 24-29% for all subsidiary companies. With these price increases the difference between the economic and financial prices for these mines has narrowed -- in the case of MCL mines (producing grade F coal) and two WCL mines, viz., Durgapur and Padmapur (producing grade E coals) the difference between the administrative prices and economic prices has come down to between 2% and 7% (from 27% to 36%).

6. Economic benefits are estimated on the basis of revenue generated based on incremental coal production valued at the lower of the following two ways. First, at the imported price of Australian coal (c.i.f.) at selected Indian ports plus inland freight costs to consumers, and adjusted for equivalent heat values, less the freight charges for delivery of coal from mine mouth to the same consumers. Second, on the basis of Average Incremental Cost (AIC), appropriately adjusted for quality, to reflect consumers willingness to pay. With the exception of two coking coal mines (Parej East, and Rajrappa) and one non-coking coal mine (Umrer) producing high grade coal, incremental output of all other mines was valued at prices based on the AIC method.

7. The import parity price and the economic price based on AIC were calculated as follows.

Import Parity Price: The following formula was used to compute the price.

$$Pi = I_p*E*(G_2/G_1) + X[(G_2/G_1)*F_1-F_2]-X(K+A)$$

Where:

I_p	CIF price of imported coal in US$
E	Exchange rate
F_1	Freight/Ton (financial prices) from port to consumer (market) in Rs
G_1	Gross calorific value of imported coal (kcal/kg)
Pi	Import parity price of ith Indian coal at mine gate in Rs./Ton
G_2	Gross calorific value of Indian coal (kcal/kg)
F_2	Freight/Ton (financial prices) from mine to consumer in Rs.
K	Marketing margin (financial prices) as percentage of grade price /Ton
A	Ash handling cost/Ton (financial prices) in Rs.
X	Standard conversion factor

8. Average incremental cost (AIC) based price: The AIC method has been used to calculate long-run marginal cost (LRMC), taking into account specific characteristics of each mine as advised by mining experts. It is calculated as a ratio of the total discounted value of yearwise cash outflows and the total discounted production. It was assumed that the future projects of Coal India would be opencast mines. These mines would apply technologies that ensure cost minimization (a least-cost program) and take advantage of economies of scale by employing predominantly, equipment of higher capacities.

9. The cashflows of capital investment and operating cost have been estimated on the basis of information available on specific investment in mines of comparable size. Appropriate contingency provisions have been made to take into account the various uncertainties. Ash handling cost has been added to the operating cost to reflect the externality associated with higher ash coal. The financial costflows were converted into economic costflows by netting out taxes and duties and by employing the standard conversion factors where necessary. A key variable in the derivation of AIC is the stripping ratio. It is recognized that future mines will likely have different geo-mining conditions than at present. Based on the expected geo-miming conditions the following stripping ratios (cubic meter/ton) were assumed in the calculation for each company: MCL (2.5); SECL (3.0); CCL (3.0); NCL (4.0); and WCL (4.5).

10. Since costs do not vary with coal quality, the economic value to coal for each mine was derived by adjusting for the heat value of coal. It was assumed that the base cost estimates represented the costs of producing grade E coal.

11. The derived economic price of steam coal produced from the project ranges from Rs376/ton to Rs1,090/ton. For steam coal, these prices are roughly between 2% to 58% higher than the prevailing financial (administered in the case of coal grades E and lower) price levels. Prior to the April 1, 1997 price adjustments economic prices were roughly 27% to 84 % higher then financial prices. In the case of coking coal, the resulting economic price comes out to be about 16% to 20% higher than prevailing prices. A separate analysis has been done to observe how the overall project benefit stream is altered as coal demand adjusts to increases in prices (from administered to economic levels).

Risk analysis

12. The financial and economic returns of the proposed investment program are subject to several uncertainties. To the extent that these uncertainties can be foreseen and quantified, they have been taken into account in the financial and economic evaluation of the individual mine-specific investments. The results of this analysis provide an indication of the risks that are associated with the investment program. In addition, this analysis highlights areas where the implementing coal company can take steps to reduce known risks. The following variables were taken into account in carrying out the risk analysis:

(a) changes in the price of coal,

(b) delays in implementation of the projects,

(c) changes in capital cost,

(d) changes in operating cost, and

(e) changes in coal output

13. Based on the available information on the nature of the variables and also on judgment, a probability distribution for each of the variables was selected to reflect the uncertainty. A Monte Carlo simulation was then carried out to generate a range of likely values for the different variables. The simulation yielded a range of possible financial and economic internal rates of return and net present values, and the likelihood of achieving each of them. Table 6.2.2 summarizes the details of the probability distributions for different variables and the rationale for selecting them.

Results

14. Tables 6.2.3 and 6.2.4 summarize the results of the financial and economic analysis respectively, taking into account the risks described above. Results show:

(a) that the investments for each of the 24 mines included in the project carry financial and economic rates of return well in excess of 16% per year. The project as a whole yielded positive expected financial NPV of US$945, at 16% discount rate, and expected economic NPV of US$1,634 at the same discount rate.

(b) that adjusting the economic benefit stream to include the impact of price increase (from financial to economic levels) on coal demand reduces the economic NPVs, at 16% discount rate by US$51 million (to US$1,583 million). A medium-term price elasticity of coal demand of -1 was used.

(c) that 'internalizing the environmental and social mitigation costs have only a marginal effect on the cost of coal production, and therefore, the economic viability of the project. The main environmental effects identified (and assessed) under the ESMP include: air, water, and noise pollution; land degradation; and overburden dumps. The main social effect identified under the ESMP involves the resettlement and rehabilitation (including land) of the project affected people. A total of 16, 310 persons will be effected by land acquisition during project implementation. Of these 9,260 persons are above 18 years of age, and would be rehabilitated under the project. The environmental and social mitigation costs of 14 of the 24 mine subprojects and for the project as a whole are less then 5% of total project costs. The high economic returns suggest that, if necessary, the project can absorb additional environmental and social costs and still remain economically viable.

(d) that the project as a whole yielded (at 80% probability) positive expected financial NPV (risk adjusted) of US$669, at 16% discount rate, and expected economic NPV of US$1,282 at the same discount rate.

(e) that all the subprojects yielded (at 80% probability) positive expected financial and economic NPVs at 16% discount rate after taking into account multiple and project specific risks using Monte Carlo simulations. The exception is the Nigahi coal mine project which yielded a risk adjusted financial NPV (at 16% discount rate) of zero. This is because the pricing of Nigahi output has been done in a way that would yield a 16 percent rate of return at 85% capacity utilization. The financial viability of Nigahi is thus, contingent on it maintaining a capacity utilization rate in excess of 85%. Presently, Nigahi is operating at 92% capacity, and experts estimate that with the application of new imported equipment made available under the project, capacity utilization will improve further.

Table 6.2.1: Assumptions underlying the financial and economic analysis

Item	*Financial analysis*	*Economic analysis*
Capital cost	The capital cost is based on Coal India's and the mission's estimates of cost components in subprojects. The cost estimates of equipment are based on the standard price list published by CMPDI every year. This list is a compilation of information based on the latest purchases by Coal India. However, in cases where no such purchases were made, budgeted prices from the suppliers formed the basis of estimates. The base year for the estimate 1996-97. The capital cost of individual subprojects includes applicable taxes and duties and 10% physical contingency. All costs have been converted to their equivalent in 1996 US dollars.	The financial costs were converted to economic costs by netting out duties and taxes, expressing the input content at c.i.f. prices and adjusting local cost components by applying the standard conversion factor of 0.8.
Operating cost	The operating costs are based on Coal India's estimates of the operating costs for each subproject. These have been derived from the schedule of additional coal production, overburden removal, and deployment of the machines and take into account fixed and variable components of unit operating cost. The unit operating cost estimates, i.e. cost/m^3 are comparable with mines of similar nature currently in production in Coal India. For replacement projects, however, the variable cost/incremental operating cost are company specific and are based on actual results of 1995-96. These costs reflect the variable costs per m^3 in opencast mines of Coal India. Interest on working capital is based on historical levels of working capital requirements equivalent to 4 months operating cash expenses.	The cost was derived from the financial cost by excluding all taxes and duties and a standard conversion factor of 0.8 was applied to the local cost component.
Coal production	For mines under construction and expansion mines, the expected increase of coal output was taken as the major benefit from the subprojects. For projects where replacement equipment is proposed to be financed, the likely shortfall in coal output that would occur if equipment was not replaced was taken as the major benefit. The assessment of the shortfall in production was based on the recent average annual productivity of each type of equipment in Coal India.	
Coal price	Expected revenues are based on ex-mine selling prices authorized as of April 1997 and additional coal production attributable to the investment in the project. Revenues for Nigahi are based on the price negotiated with NTPC.	Benefits were calculated on the basis of additional coal production, valued at the lower of the following two ways. First, at c.i.f. import prices of coal at selected Indian ports plus inland freight costs to consumers and adjusted for equivalent heat values, less freight charges for delivery of coal from mine mouth to the same consumers. Second, on the basis of average incremental cost, appropriately adjusted for quality, to reflect consumers willingness to pay.

Source: Coal India Ltd.

Table 6.2.2: Selection of probability distribution

Variable	*Selected probability distribution*	*Reasons for selection*
Coal price	Normal	The current selling price is the most likely value and any small increase or decrease above or below the current price is equally likely. In constant terms the price is more likely to be in the vicinity of its current value than far away from it.
Project implementation delay	Triangular	In the present analysis, delay has been defined through a factor which slows down the pace of the year-wise capital investment and as a result, in extreme case, the coal production program is deferred by one year. This factor can thus have a minimum, maximum and most likely value. The values near the minimum and maximum are less likely to occur than those near the most likely value.
Capital cost	Custom	This variable cannot be described by any known distribution. There is a higher probability of completing the project at an investment lower than the estimated capital cost. This assumption was based on the earlier experience of Coal India where procurements were made through ICB.
Operating cost	Normal	At constant prices, the present cash cost of production is the most likely value, and a small increase or decrease about this mean is equally likely. Though the overall cost of production in Coal India has been falling in real terms for the last three years, it is felt that this downtrend may be offset by higher costs of working deeper reserves of coal.
Production	Custom	Because of the uniqueness of each project and different factors affecting production, this variable could not be defined through any known distribution. Therefore, a custom distribution was chosen to reflect the specific nature of the variable. In all cases production lower than the target was assigned a much higher probability compared to production above the target.

Source: Coal India Ltd.

Table 6.2.3 Economic Analysis
US$ million

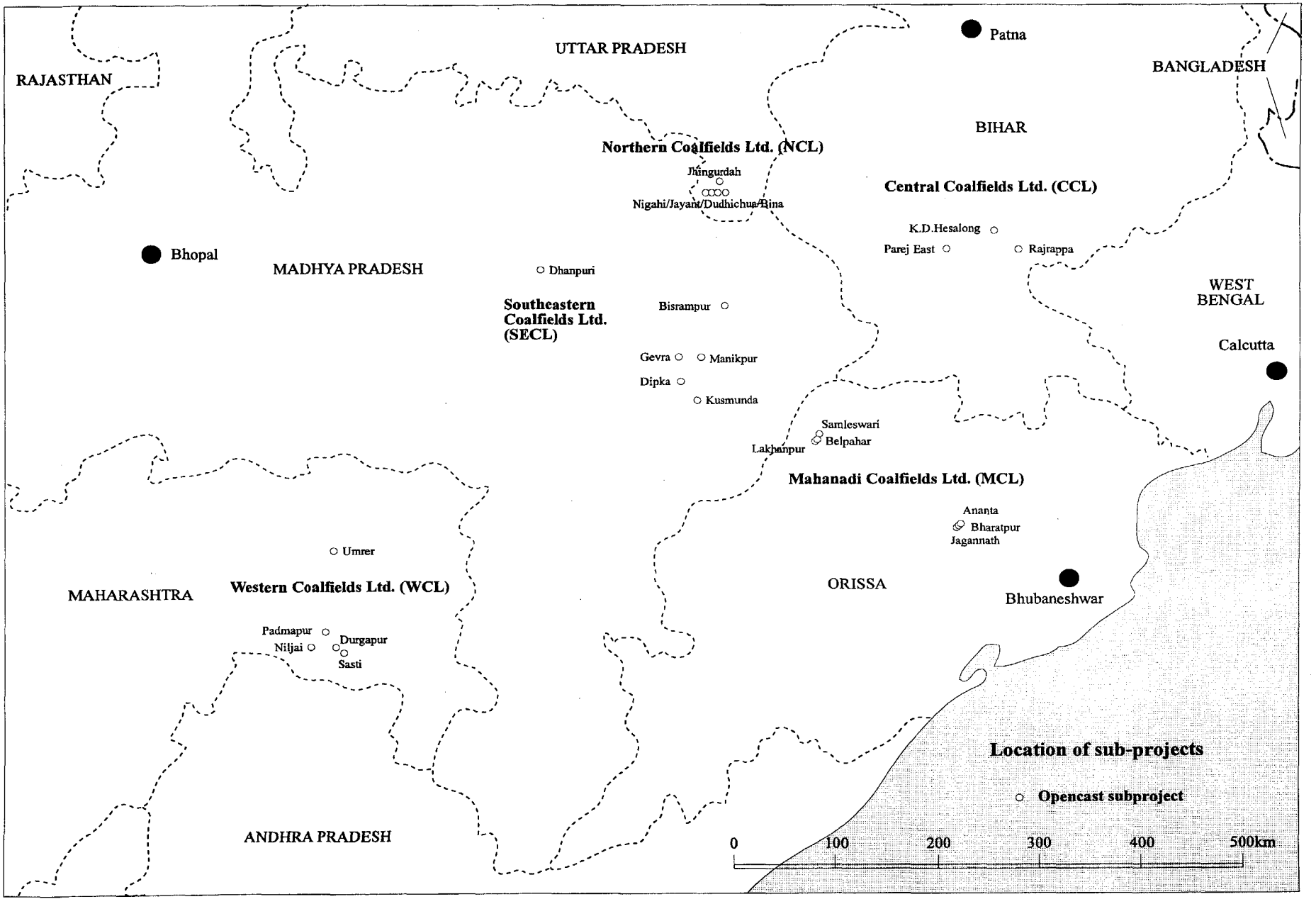
Company/mine	*Base case NPV at 16%*	*Risk analysis (at 80% prob) NPV at 16%*
CCL		
KD Hesalong	87.7	67.8
Parej East	65.6	50.9
Rajrappa	116.1	94.6
MCL		
Ananta	64.2	51.7
Belpahar	9.9	8.3
Bharatpur	104.6	60.9
Jagannath	31.8	29.6
Lakhanpur	81.8	59.3
Samleswari	41.5	29.7
NCL		
Bina	28.1	25.6
Dudhichua	166.8	128.2
Jayant	102.6	81.4
Jhingurda	47.0	40.2
Nigahi	122.1	82.4
SECL		
Dhanpuri	5.7	4.4
Dipka	204.7	144.7
Gevra	51.7	46.7
Kusmunda	54.5	53.8
Manikpur	13.8	12.7
WCL		
Durgapur	50.2	43.5
Niljai	51.2	47.1
Padmapur	38.1	31.3
Sasti	28.6	26.2
Umrer	65.9	61.1
Total	**1634.3**	**1281.8**

Source: Coal India Ltd.

Table 6.2.4 Results of the Financial Analysis
FIRR in % and NPV in US$ million

Company/mine	*Base case*		*Risk analysis (at 80% prob)*	
	FIRR	*NPV at 16%*	*FIRR*	*NPV at 16%*
CCL				
KD Hesalong	32.8	36.2	28.0	23.0
Parej East	76.6	32.6	39.8	19.7
Rajrappa	184.9	81.2	144.2	64.9
MCL				
Ananta	114.2	46.3	58.1	38.6
Belpahar	51.8	8.9	44.0	5.6
Bharatpur	120.0	80.6	57.1	42.0
Jagannath	141.7	27.0	135.9	25.2
Lakhanpur	125.3	52.4	59.5	33.4
Samleswari	106.8	28.9	48.3	19.2
NCL				
Bina	62.8	7.6	55.9	6.6
Dudhichua	28.1	65.9	23.8	40.7
Jayant	53.4	41.2	43.5	30.0
Jhingurda	80.5	23.2	67.0	19.1
Nigahi	21.7	43.4	16.0	0.0
SECL				
Dhanpuri	30.7	2.1	24.0	1.1
Dipka	72.2	107.1	41.7	78.0
Gevra	70.3	34.5	64.8	30.9
Kusmunda	53.8	45.5	50.8	33.0
Manikpur	59.0	8.3	54.3	7.4
WCL				
Durgapur	109.4	44.0	97.0	37.8
Niljai	121.3	34.1	115.6	31.3
Padmapur	162.5	33.6	133.9	27.5
Sasti	133.1	17,1	115.2	15.6
Umrer	191.6	41.8	182.7	38.9
Total		945.2		669.5

Source: Coal India Ltd.


RAJASTHAN
UTTAR PRADESH
Patna
BANGLADESH
BIHAR
Northern Coalfields Ltd. (NCL)
Jhingurdah
Nigahi/Jayant/Dudhichua/Bina
Central Coalfields Ltd. (CCL)
K.D.Hesalong
Parej East
Rajrappa
Bhopal
MADHYA PRADESH
Dhanpuri
Southeastern Coalfields Ltd. (SECL)
Bisrampur
WEST BENGAL
Calcutta
Gevra
Manikpur
Dipka
Kusmunda
Samleswari
Belpahar
Lakhanpur
Mahanadi Coalfields Ltd. (MCL)
Ananta
Bharatpur
Jagannath
Umrer
MAHARASHTRA
Western Coalfields Ltd. (WCL)
ORISSA
Bhubaneshwar
Padmapur
Durgapur
Niljai
Sasti
Location of sub-projects
Opencast subproject
ANDHRA PRADESH
0
100
200
300
400
500km

IMAGING

Report No.: 16473 IN
Type: SAR