Coal processing in Indian context

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INTRODUCTION :

Coal processing in the Indian context as projected till the turn of the country requires to be viewed in consideration of the various factors viz. (i) the type and quality of coal likely to be available including its production source i.e. whether from underground or open cast mine; (ii) the reserve potential of coal resources that may have to be progressively consumed by the consumer sectors; (iii) the coal demand forecast for the various sectors for tie-up with indigenous coal sources for such uses; (iv) industrial application prospects of new technologies since developed (for maximised use of indigenous coal resource) etc.

Further, coal has to be progressively introduced as a feedstock for coal chemicals and not merely as an energy source, the practice which had been hitherto mainly followed.

With the above objective generally in view, while coal has to meet the specific demand of the various consumer sectors amongst which the single largest sector is the thermal power generation followed by steel, emphasis has been laid in this technical paper in highlighting some of the action programmes that are under way from the coal processing angle in different directions.

Coal Demand Projections :

It may be of interest to note that the overall coal demand (All India) is projected to increase from the current level of offtake of about 135 m.t. in '83-84 to about 237 m.t. in '89-90, 317 m.t. in '94-95 and about 372 m.t. by the end of the century. Consumer sectorwise, the break-up of the likely coal demand pattern as against the off-take for the year '83-84 is shown in Table 1. It may be noted from this table that coal demand for the growth of the power generation programme has been the steepest followed by the sector comprising steel and merchant cokeries. While there has been generally a declining trend in coal demand projected for the railways, progressive increase in coal demand for the other consumer sectors is, however, noted to be of not much significance.

Coal Production Strategy :

The strategy adopted by the coal industry in drawing up the production programme has been to provide for a marginal surplus over the estimated demand levels and to attain basically the objective of higher productivity (through greater recourse to mechanisation).

Interestingly, for maintaining the required pace of higher productivity and production also, while mechanisation is proposed to be adopted for extraction of coal both from surface and underground mines, the endeavour has been to convert as much of the in-situ resource as is feasible to mineable reserves. From this angle, emphasis has been on resorting to more of open cast coal production practice. Relative breek-up of projected coal output from underground and open cast mines has been shown in Table 2.

It may be taken note of from Table 2 that progressively the percentage of open cast coal production will increase and attain a figure of 60% (225 m. t. out of total 375 m.t. in '99-2000) from about 46% (64 m.t. out of total 138 m.t. in 1983-84).

Perhaps it is not out of context to mention here that open cast coal production is sought to

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be achieved (in terms of the coal production projections) by having larger capacity mines (upto 14 m.t. annual production) and that this type of larger capacity open cast mine will come off for production of both coking and non-coking categories of coal envisaged to meet the respective coal requirement of the steel and power sectors.

COAL BENEFICIATION :

Coking Coal Washeries :

While, hitherto, there has been a normal practice in Indian context to beneficiate most of the coking coal supplies to the steel plants (comprising prime coking, medium coking and semi-coking coal) prior to their use in coal blends with increased contribution of coking coals in future years, mainly from open cast mines, the problems get aggravated in maintaining a consistent quality of coal supplies to the steel sector. Reference may please be made to Table 3 showing the current status of the coal washeries already existing along with their annual raw coal input capacity in million tonnes. In terms of this table, there are currently 19 Nos. of plants already working, all for beneficiation of coking coal (comprising both prime coking and medium coking categories of coal) having an annual raw coal input capacity of 32.86 m. t. Of these, 13 Nos. are owned by CIL.

While currently three Nos. of coking coal washeries are under construction for meeting the progressive demand of washed coking coal of the steel plants, raw coal input capacity for all these medium coking coal washeries along with their likely commissioning dates are shown in Table 4.

To take care of the variations in quality and washability characteristics of raw coal as currently being fed to the existing washeries which were planned and designed mostly during the 1950's and 1960's, necessary modification and modernization schemes are also being undertaken for most of these washeries in a bid to incorporate the corrective measures suited to the coal feedstock. Besides the other changes in basic designs that are being taken care of in the modernization schemes, mention may be made specifically on the provision being included now for upgradation of the fine coal below 0.5 mm.

It may be noted that in view of relatively better quality of coal for the fines (below 0.5 mm coal) during initial planning of such washeries, no beneficiation circuit was included earlier for upgradation of that fine coal fraction. But due to various reasons including the changes effected in the coal source/seam/section/underground/ open cast mining, this size fraction of coal was found to be comparatively dirtier now. Hence inclusion of flotation facilities for beneficiating fine coal fraction are being adopted not only for the existing washeries but also are given due weightage for the planning and design of the future coking coal washeries.

On assessment of the likely coal demand of the steel sector, potential coking coal blocks along with the coking coal washeries have been identified for meeting the projected coal requirement by 2000 AD. Table 5 shows the proposed coking coal washeries (24 in No.) with total raw coal input capacity of about 45 m. t. per annum which are currently at various stages of implementation.

For the planning and designing of the various coking coal washeries that are currently being pursued by CEMPDIL, due weightage is provided to all the probable issues including mainly the washability characteristics of the typical coal resources likely to be beneficiated, the proper type of flow scheme for maximised clean coal output, lower level of investment leading to obviously relatively lower operational and maintenance expenditures etc. It may be of interest to note that for safeguarding these points, there has been certainly some variation in between the different flow schemes proposed for the group of the most recent washery planning efforts, some of which are now in the different stages of implementation.

In suggesting the proper flow-schemes as per the adove guidelines, the entire raw coal has either been crushed to below 80 mm or even to below 13 mm (adopting two-stage crushing with top size of coal upto 1200 mm) followed by further processing. For the group of washeries viz. Pootkee, Dharmaband, Madhuband, Bhalgora (a typical example is shown as Drg. No. 1), the general approach for further processing has been to take the entire feed (below 13 mm) through centrifugal dedusters for dry separation of below 0.5 mm fines to the extent possible prior to feeding the material into three product improved type jigs with electronically controlled systems for separation of cleans, middlings and rejects besides the residual fines (below 0.5 mm) in the form of slurry. For improving upon the recovery of total cleans, middlings as recovered from the jig system, are treated further in heavy medium cyclone and the coal slurry in the froth flotation circuit.

For some other type of flow schemes suggested for processing of coking coals say, from Rajrappa mines, the total coal is crushed to below 80mm and is screened at the first instance in dry state for obtaining two different size fractions of coal viz. 80 mm—10 mm and below 10 mm. The coarse coal fraction(80—10mm) is treated in modern jigs with electronically controlled systems for sepration of basically four different products viz. cleans, middling II (relatively lower ash middlings), middling I (comparatively higher ash middling) and rejects (with ash in the range of 55 to 60%). Below 10 mm coal fraction is passed through centrifugal dedusters for dry separation of below 0.5 mm size coal whereafter 10 mm — 0.5 mm material is processed in fine coal jigs having all the facilities for any improved system. Here also, 4 product separation as in the earlier case is effected and for improving upon the clean coal yield in totality, provision exists for the below 10 mm middling mixed with the coarse coal middling (80 — 10 mm) crushed to below 10 mm to be treated combinedly in heavy medium cyclones. Residual quantity of below 0.5 mm size coal findings way through the jigs in the form of slurry is treated at a suitable consistency in the froth flotation circuit for supplementing the clean coal output from the washery. Drawing No. 2 representing this type of flow scheme is enclosed for ready reference.

Non-coking Coal Washeries :

The general approach so far in our country has been to make use of non-coking coal in raw state (without beneficiation). The single non-coking coal washery that was run for several years at Nowrozabad with 0.5 m.t. annual raw coal input capacity has since been stopped. However, as observed earlier, since the single largest coal consuming sector will continue to be the thermal power sector and the coal requirement of this sector is proposed to be met mostly from large mechanised opencast mines in the future, it is proposed that for maintaining consistency in the quality of coal supplies, most of the open cast mines may have to be linked ultimately with the thermal power stations through the necessary coal beneficiation facility. In this direction, atleast some beginning could be noted through the measures taken by the National Aluminium Company (NALCO) for going ahead with the construction programme of the Bharatpur washery in Talcher Coalfield of Orissa.

While the relevance of the issue concerning beneficiation of non-coking coals has been favourably assessed by CEMPDIL, reference may please be made on Table 6 showing a list of the proposed non-coking coal washeries (as indentified by CEMPDIL) mostly for meeting the coal requirement of thermal power sector. Around 16 Nos. of such washeries with annual raw coal input capacity of about 88 m.t. are envisaged for ensuring elimination of extraneous dirt from the raw coal supply due to mechanised extraction in the mines.

For meeting the quality parameters of the coal for use in the thermal power generation, normally a high-gravity cut will be resorted to with a view to eliminate mostly the obvious

dirt finding its way along with raw coal due to mechanised mining/open cast working of the mines. For beneficiation of coking coal however, to make it suitable for steel sector usage, more careful planning and designing has to be undertaken keeping in view the technological advancement attained through the industrialisation of latest beneficiation techniques as may be applicable to typical Indian coals (occuring in the various resource blocks) which exhibit very difficult washability characteristics in general due to presence of intergrown dirt within the coal matrix itself. However, CEMPDIL has been constantly examining the planning and design necessities of each of these washeries and have been suggesting suitable beneficiation schemes that may be appropriate for the nature and type of the coal resource. With a view to obtaining economic recovery of clean coal, depending upon the raw coal characteristics (including washability), these are resorted to different degrees of crushing for effecting necessary release of the impurities from the coal matrix prior to its treatment in washeries.

CEMPDIL has also been co-ordinating the various developmental activities undertaken in this area including innovation of improved techniques of coal preparation and feed back information on commercial application of such activities pursued in other countries. Such progresses are being constantly monitored with a view to meet the challenges of supplying washed coal to the consumer sector making the best use of the modern techniques.

To highlight the nature and type of flow schemes proposed by CEMPDIL for beneficiation of non-coking coals, depending upon the coal characteristics and the specific consumer requirements, there has also been divergence in the flow schemes which normally centered round as follows :

For some of the non-coking coal resources, the proposed flow scheme is to crush the total coal either to below 200mm or to below 125mm (keeping in view the extent of release of the dirt expected from the coal), screen out in dry state the below 13 mm/below 25 mm fraction (without getting this fraction to any further treatment) and get only the oversizes viz.+13 mm/+25 mm fraction processed either in jigs or heavy medium baths for separation of clean coal and dirt. This clean coal (+ 13 mm/ + 25 mm) is mixed with unwashed smalls (– 13 mm/ – 25 mm) for providing the total supplies to the respective consumers.

While generally this type of flow scheme has been proposed for processing of coals from some of the mines in Singrauli coalfield, the flow scheme as suggested for beneficiation of coal from Bharatpur colliery in Talcher coalfield (reference Drg. No. 3) has however, been some what different in view of the necessities for removel of dirt from even undersizes (where there is sufficient concentration of dirt from these coals). For this washery, total raw coal is crushed to below 100 mm and screened in the dry state to seperate below 20 mm fraction. 100 – 20 mm size coal is treated in coarse coal modern jigs and the below 20 mm size coal is taken through dedusters for dry separation of below 0.5 mm fines at the first instance. The below 20 mm product from the dedusters is processed after desliming in the fine coal jig with improved control systems for separation into mainly clean coal and rejects. The clean fraction from the coarse coal and the fine coal jigs ultimately get mixed with the upgraded fines (below 0.5mm size) as recovered from hydraulic cyclones on treatment of the deslimed below 0.5 mm slurry and the fines (below 0.5 mm) reclaimed from the dedusters. This overall product is considered for supplies.

Coal Utilisation

While the coal beneficiation proposal is a part of the overall activity on coal processing that may be deemed necessary for meeting the specific requirement of mainly the steel sector (as it stands now), keeping in view the alarming resource position (indigenous) of coking coals, many developmental programmes are currently

being pursued by R & D Centre of SAIL in association with CEMPDIL, aiming at maximised use of sub-standard coking coals/non-coking coals in the steel sector. In this area, developmental studies are reportedly under progress on briquette blend process, stamp charging, coal dust injection and even for making of directly reduced iron (DRI). Though these studies are currently under various stages of implementation, they appear to hold much potential on prospects of their industrial application in not-too-distant-future leading to conservation of scarce coking coal resource through its substitution by sub-standard coking coals/non-coking coals.

With a view to make available various types of coal-based fuels in the domestic sector, making the best use of the different types of coal feed stock spread over the country, a beginning was made with the installation of Coal Complex units (as at Ramakrishnapuram and Dankuni) for production of domestic coke. For the Dankuni Coal Complex, which is now under construction, medium calorie gas as fuel will also be additionally available. The list of the various products obtainable from the Dankuni Coal Complex are shown in Drg. No. 4.

Some mechanised process system has also been developed by CEMPDIL for conversion of low grade coking coals into domestic coke with recovery of tar and minimised air pollution as a substitute for the Bhatta coke. Some commercial plants based on this technology are in various stages of implementation. Indigenous technologies have also been developed for production of diverse types of domestic fuel in shaped/nodular form using varied types of coal feed stock.

To highlight the basic features of the newly developed process (by CEMPDIL) for the mechanised production of domestic coke these are shown in Drg. No. 5. Basically, sized coal (say, 80—30 mm), as prepared appropriately by mere screening and crushing, is taken to the service bunker placed over the retorts-system for feeding into the retorts where coal is carbonised under a pre-determined condition for bringing down the volatile content of the domestic coke within the ISI specified limits of 3 to 10%. Coke, discharged from the retorts periodically, is subjected to water quenching on metallic conveyors prior to its despatch to the coke banker through coke conveyor. Gaseous products are processed normally through hydraulic main, cooler, exhauster and scrubber system for recovery of tar. The tar-free gas which is, however, of very poor quality, is used to a limited extent for under-firing in the shallow depth internal heating retort system for maintaining maximised domestic coke output.

It may be noted with interest that through the installation of coal-based fertilizer plants as coal complexes at Ramakrishnapuram and Dankuni, a beginning has been made in the area of production of chemicals from coal. In terms of a recent assessment done by an Expert Group, coal gasification route holds much promise for production of coal chemicals as well as power generation, in which areas more concerted efforts are now being made for effecting the best use of non-coking coal resource available indigenously.

The other area that may require specific mention is the growing importance of the fluid-bed combustion technology for making the best use of not only low grade non-coking coal but also enormous quantity of washery by-products likely to be produced from the various coal beneficiation plants. Some active steps have already been taken in this area for installation of a demonstration scale captive thermal power plant (7.5 MW) utilising Kathara washery rejects as feed stock. Subject to successful trials with this demostration unit, wide scope exists for deployment of that technology liberally on industrial uses for thermal power generation/ steam raising purpose.

Table—1 : Sectorwise coal demand projections.

(In million tonnes)

Sl. No.	Sector	Coal off-take in 1983-84.	1989-90	1994-95	1999-2000
1.	Steel and hard coke	24.47	44.6	60.0	75.0
2.	Power generation (including middlings)	56.11	121.5	169.5	195.0
3.	Railways	10.35	8.0	6.0	3.0
4.	Cement	7.27	12.7	16.0	20.0
5.	Fertilizer	4.21	6.8	11.0	16.0
6.	Domestic Coke	1.98	4.7	6.5	8.5
7.	Export	0.08	0.6	1.0	1.5
8.	Other industries	25.83	34.3	42.0	48.0
9.	Colliery consumption	4.22	4.2	5.0	5.0
	Total	134.52	237.4	317.0	372.0

Table—2 : Coal output from underground and opencast mines.

(In million tonnes)

Year	Total coal production.	Coal production from underground mines.	Coal production from opencast mines.
1960-61	55.67	44.81 (80.5)	10.86 (19.5)
1970-71	72.95	58.27 (79.9)	14.68 (20.1)
1980-81	114.00	72.85 (63.9)	41.15 (36.1)
1983-84	138.30	74.30 (53.7)	64.00 (46.3)
1989-90*	239.80	102.80 (42.9)	137.00 (57.1)
1994-95*	318.00	126.00 (39.6)	192.00 (60.4)
1999-2000*	375.00	150.00 (40.0)	225.00 (60.0)

* Projections.

Figures in brackets indicate percentage of total production.

Table—3 : Current status of existing washeries with annual coal input capacity.

(In million tonnes)

Type of coal	No. of plants	Annual raw coal input capacity.
I. Coking coal :		
A. Prime coking coal	12	20.69
B. Medium coking coal	7	12.17
C. Semi-coking coal	—	—
Total	19	32.86
II. Non-coking coal	—	—
Total (I + II)	19	32.86

Table—4 : Washeries under construction.

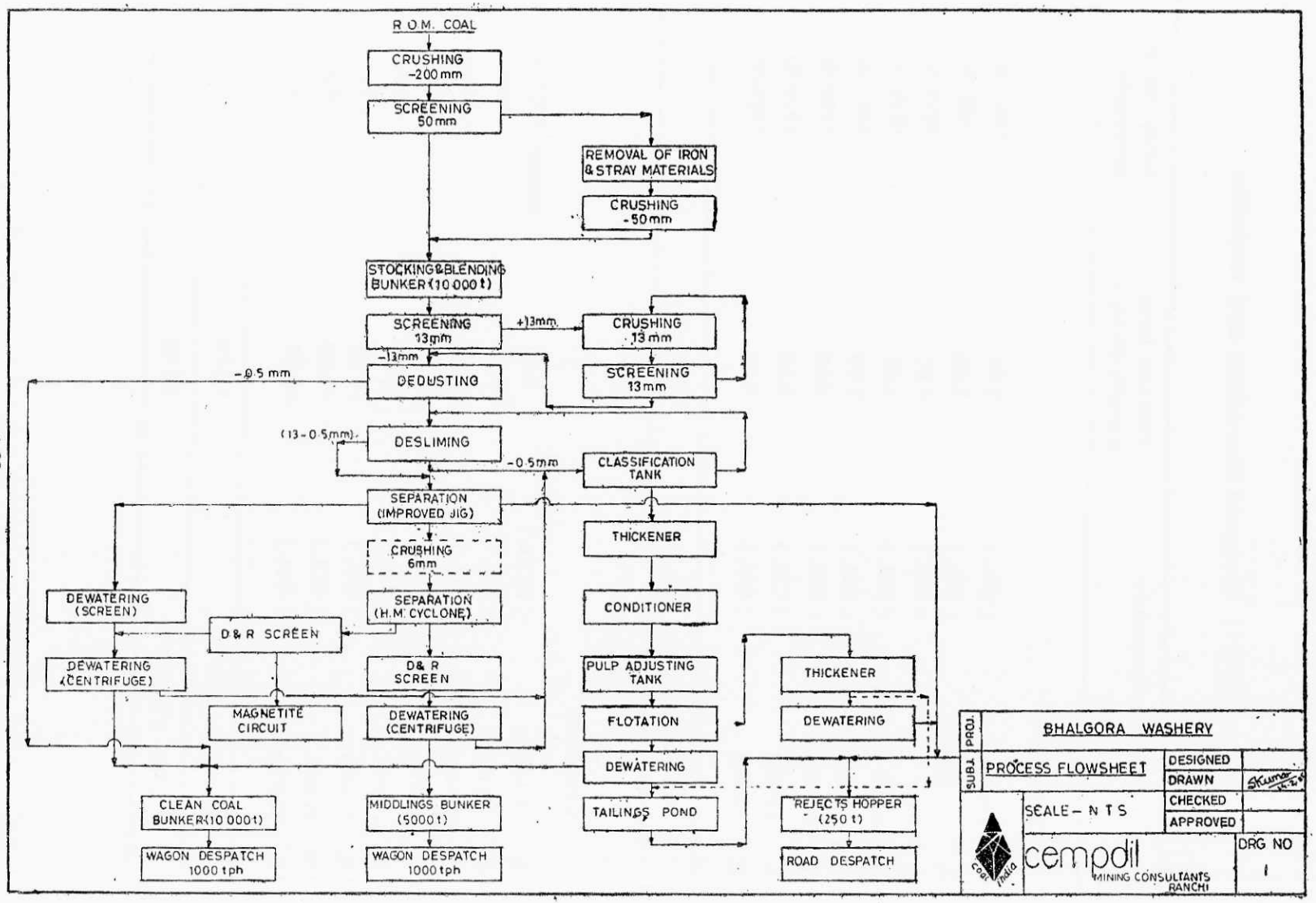
Sl. No.	Name of the washery	Coalfield	Raw coal input (million tonnes)	Likely year of commissioning
	Medium coking.			
1.	Mahuda (BCCL)	Jharia	0.63	1984-85
2.	Rajrappa (CCL)	Rajrappa area.	3.00	1984-85
3.	Kedla (CCL)	West Bokaro	2.60	1987-88
	Total :		6.23	

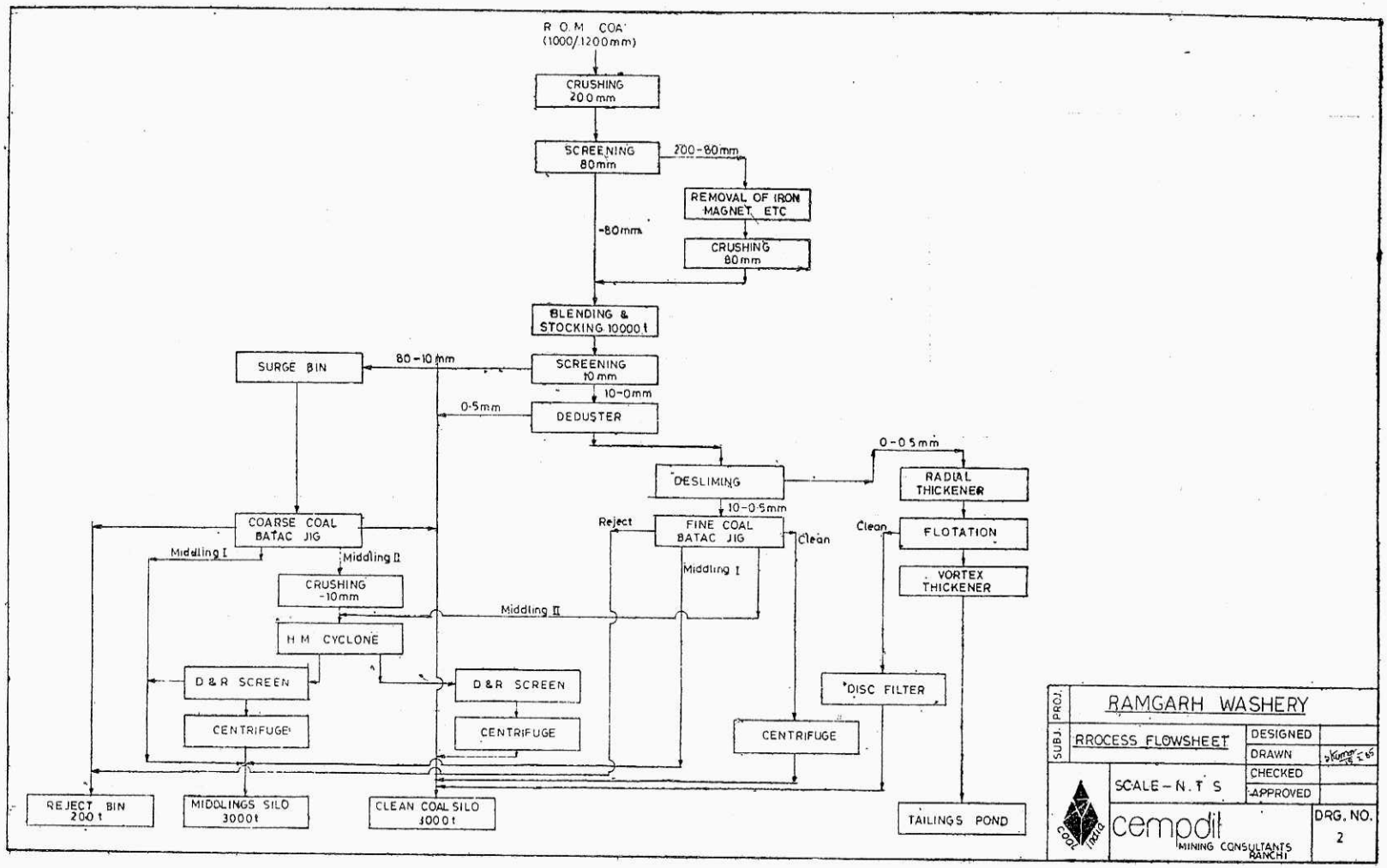
Table—5 : Proposed coking coal washeries

Sl. No.	Name of the washery		Coalfield	Raw coal input capacity(m.t./y)	Likely year of commissioning.
(i)	**Prime coking coal :**				
1.	Madhuband	(BCCL)	Jharia	2.50	1988-89
2.	Bhalgora Phase I	(BCCL)	—do—	2.50	1988-89
3.	Pootkee	(BCCL)	—do—	3.00	1989-90
4.	Dharmaband Phase I	(BCCL)	—do—	2.50	1989-90
5.	Mukunda I	(BCCL)	—do—	4.00	1989-90
6.	Bhalgora Phase II	(BCCL)	—do—	2.50	1989-90
7.	Dharmaband Phase II	(BCCL)	—do—	2.50	Beyond 1989-90
8.	Damuda Block I	(BCCL)	—do—	1.25	1989-90
9.	Jharia I, Block VIII	(BCCL)	—do—	1.20	1989-90
10.	Kapuria	(BCCL)	—do—	1.00	1989-90
11.	Parbatpur	(BCCL)	—do—	2.00	1989-90
12.	Kusunda (Modular Washery)	(BCCL)	—do—	0.48	Not yet decided
	Sub-total (i)			25.43	
(ii)	**Medium coking coal :**				
1.	Parej	(CCL)	West Bokaro	2.50	1989-90
2.	Mukunda II	(BCCL)	Jharia	3.00	Beyond 1989-90
3.	Behraband	(WCL)	Central India	0.60	1989-90
4.	Pundia	(CCL)	West Bokaro	2.60	1989-90
5.	Gobindpur	(CCL)	East Bokaro	2.00	1989-90
6.	Muraidih, Block	(BCCL)	Jharia	2.50	1989-90
7.	Chanch/Jograd	(BCCL)	Raniganj	1.50	1989-90
8.	Mohuda II	(BCCL)	Jharia	1.50	1989-90
9.	Chanch-Victoria (Modular Washery)	(BCCL)	Raniganj	0.54	Not yet decided.
	Sub-total (ii)			16.74	
(iii)	**Semi-coking coal :**				
1.	Sodepur	(ECL)	Raniganj	0.95	1986-87
2.	Ledo	(NEC)	North-Eastern	0.50	1987-88
3.	Baragolai	(NEC)	—do—	1.35	1988-89
	Sub-total (iii)			2.80	
	Total (i + ii + iii)			44.97	

Table –6 : Proposed Non-coking coal washeries.

Sl. No.	Name of the washery		Raw coal input capacity (m.t./y.)	Likely year of commissioning
	Group (A)			
1.	Bharatpur	(CCL)	3.50	1987-88
2.	Jhingurdah	(CCL)	3.00	1988-89
3.	Bina	(CCL)	4.50	1988-89
4.	South Balanda	(CCL)	1.65	1989-90
5.	Jagannath	(CCL)	2.00	1989-90
6.	Piperwar	(CCL)	5.00	1989-90
7.	Kalinga	(CCL)	5.00	1989-90
8.	Ananta	(CCL)	4.00	1989-90
	Sub-total (A)		28.65	
	Group (B)			
9.	Mukunda	(BCCL)	5.00	Beyond 1989-90
10.	Rajmahal	(ECL)	10.00	—do—
11.	Selected Dhori	(CCL)	2.25	—do—
12.	Kakri	(CCL)	2.50	—do—
13.	Jayant	(CCL)	10.00	—do—
14.	Khadia	(CCL)	10.00	—do—
15.	Nigahi	(CCL)	10.00	—do—
16.	Dudhichua	(CCL)	10.00	—do—
	Sub—total (B)		59.75	
	TOTAL (A + B)		88.40	


R.O.M. COAL
CRUSHING -200 mm
SCREENING 50 mm
REMOVAL OF IRON & STRAY MATERIALS
CRUSHING -50 mm
STOCKING & BLENDING BUNKER (10 000 t)
SCREENING 13 mm
+13 mm
CRUSHING 13 mm
-13 mm
-0.5 mm
DEDUSTING
SCREENING 13 mm
(13 - 0.5 mm)
DESLIMING
-0.5 mm
CLASSIFICATION TANK
SEPARATION (IMPROVED JIG)
THICKENER
CRUSHING 6 mm
DEWATERING (SCREEN)
SEPARATION (H.M. CYCLONE)
CONDITIONER
D & R SCREEN
DEWATERING (CENTRIFUGE)
D & R SCREEN
PULP ADJUSTING TANK
THICKENER
MAGNETITE CIRCUIT
DEWATERING (CENTRIFUGE)
FLOTATION
DEWATERING
DEWATERING
CLEAN COAL BUNKER (10 000 t)
MIDDLINGS BUNKER (5000 t)
TAILINGS POND
REJECTS HOPPER (250 t)
WAGON DESPATCH 1000 tph
WAGON DESPATCH 1000 tph
ROAD DESPATCH
PROJ. BHALGORA WASHERY
SUBJ. PROCESS FLOWSHEET
DESIGNED
DRAWN
CHECKED
APPROVED
SCALE - N T S
cempdil MINING CONSULTANTS RANCHI
DRG NO 1


R.O.M. COAL
(1000/1200 mm)
CRUSHING
200 mm
SCREENING
80mm
200-80mm
REMOVAL OF IRON
MAGNET ETC
CRUSHING
80mm
-80mm
BLENDING &
STOCKING 10000 t
SURGE BIN
80-10 mm
SCREENING
10 mm
10-0mm
0-5mm
DEDUSTER
DESLIMING
0-0.5mm
RADIAL
THICKENER
10-0.5mm
COARSE COAL
BATAC JIG
Reject
FINE COAL
BATAC JIG
Clean
Clean
FLOTATION
Middling I
Middling II
Middling I
CRUSHING
-10mm
VORTEX
THICKENER
Middling II
H M CYCLONE
D&R SCREEN
D&R SCREEN
DISC FILTER
CENTRIFUGE
CENTRIFUGE
CENTRIFUGE
REJECT BIN
200 t
MIDDLINGS SILO
3000t
CLEAN COAL SILO
3000 t
TAILINGS POND
PROJ.
RAMGARH WASHERY
SUBJ.
PROCESS FLOWSHEET
DESIGNED
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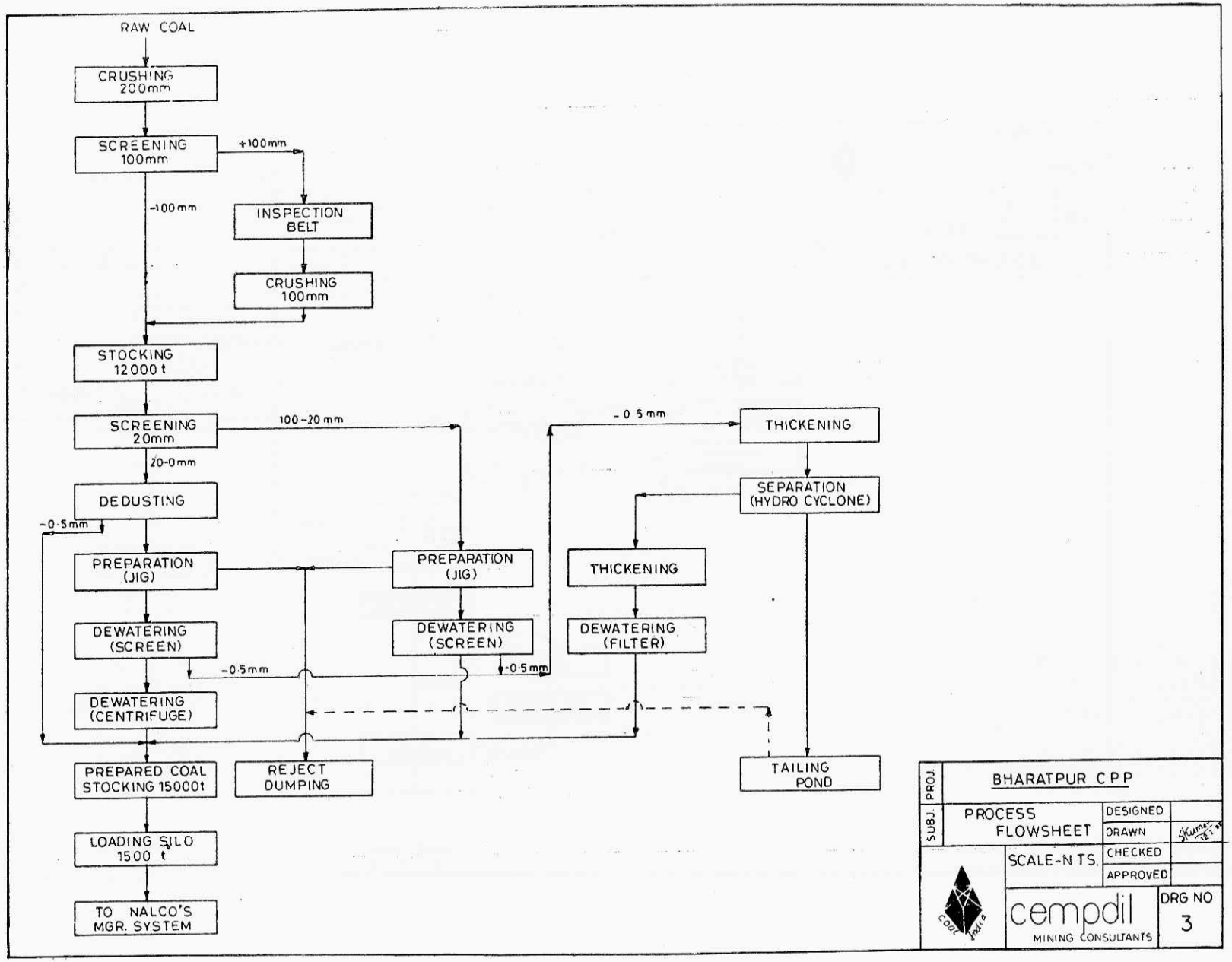
SCALE - N.T.S
cempdi
MINING CONSULTANTS
RANCHI
DRG. NO.
2


RAW COAL
CRUSHING 200mm
SCREENING 100mm
+100mm
-100mm
INSPECTION BELT
CRUSHING 100mm
STOCKING 12000 t
SCREENING 20mm
100-20 mm
20-0mm
DEDUSTING
-0.5mm
PREPARATION (JIG)
PREPARATION (JIG)
DEWATERING (SCREEN)
DEWATERING (SCREEN)
-0.5mm
-0.5mm
DEWATERING (CENTRIFUGE)
PREPARED COAL STOCKING 15000t
REJECT DUMPING
LOADING SILO 1500 t
TO NALCO'S MGR. SYSTEM
-0.5mm
THICKENING
SEPARATION (HYDRO CYCLONE)
THICKENING
DEWATERING (FILTER)
TAILING POND
PROJ
BHARATPUR CPP
SUBJ
PROCESS FLOWSHEET
DESIGNED
DRAWN
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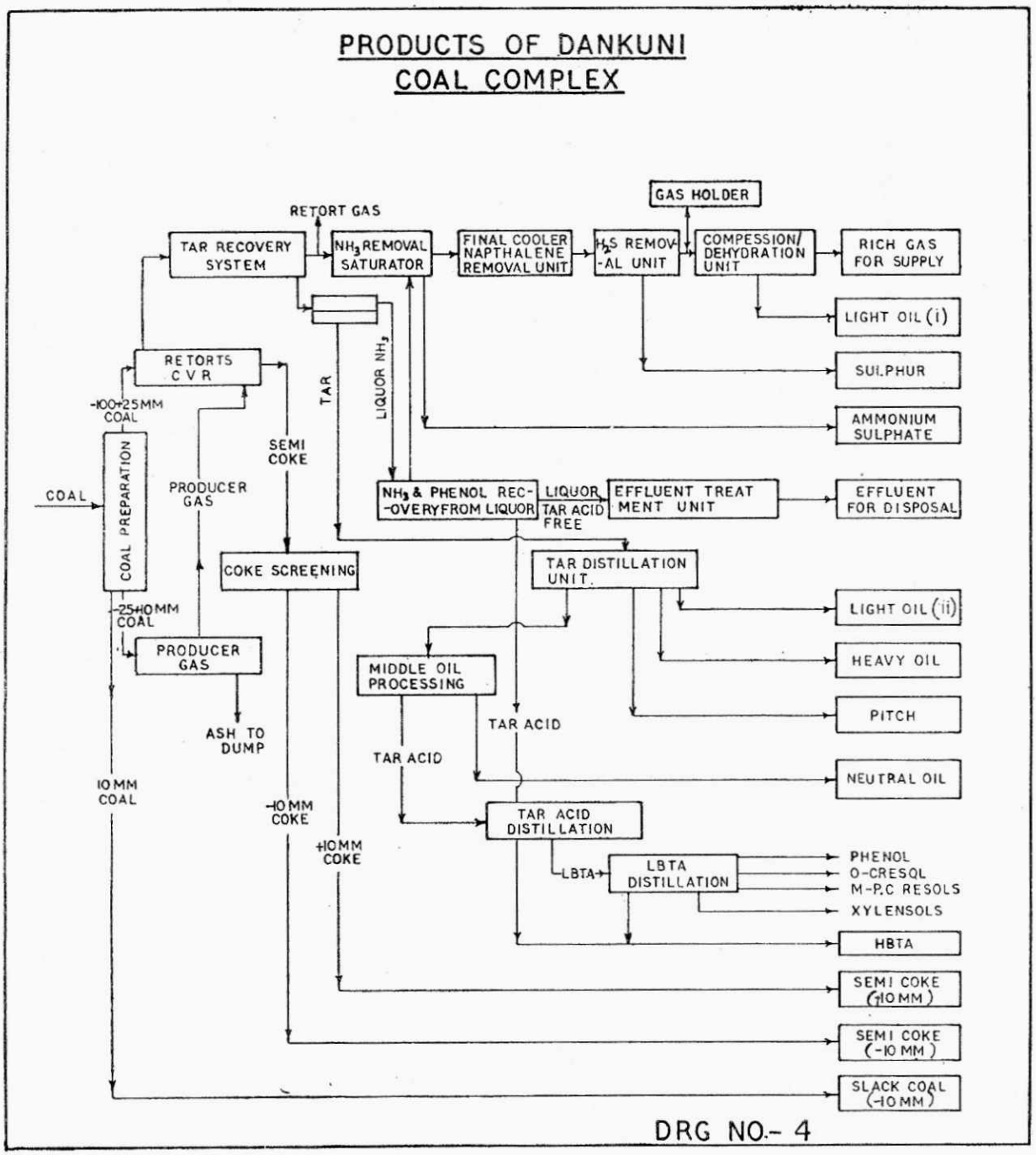
MINING CONSULTANTS
DRG NO
3

PRODUCTS OF DANKUNI COAL COMPLEX

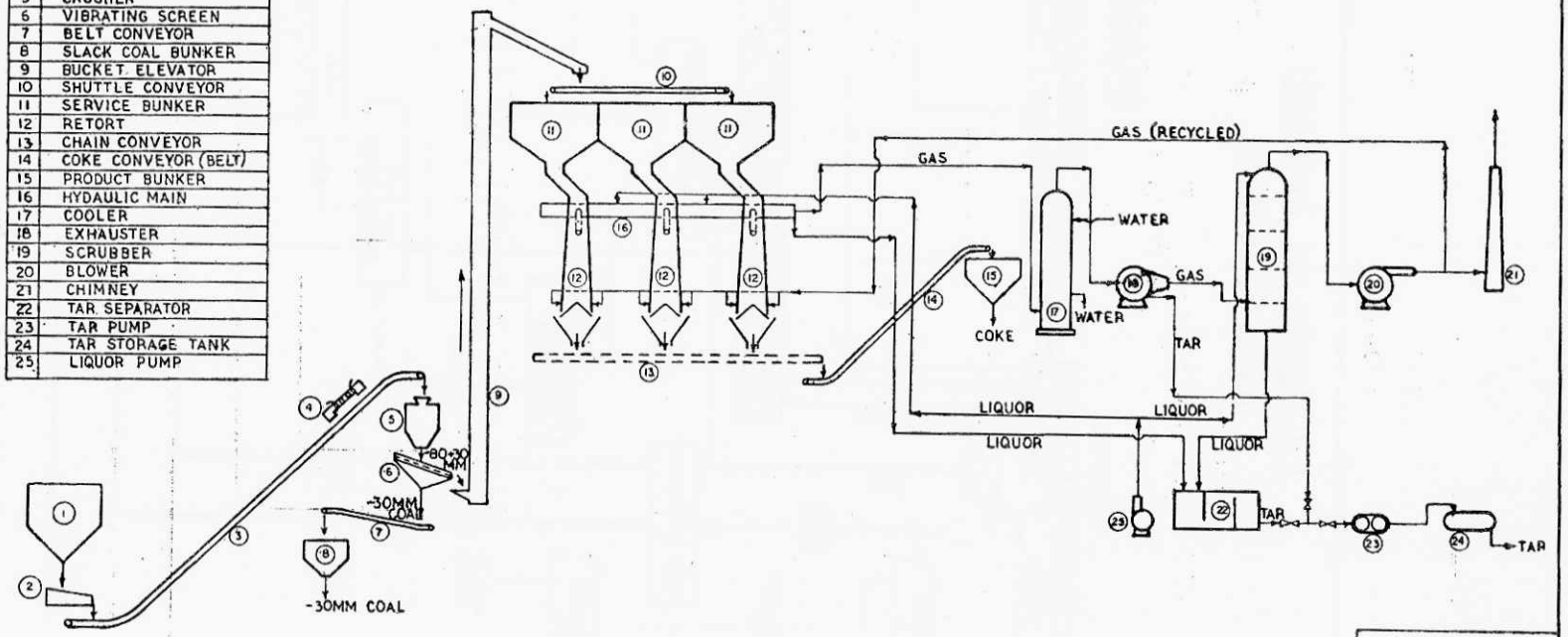


DRG NO.- 4

SCHEMATIC FLOW DIAGRAM OF EXPERIMENTAL MECHANISED SOFT COKE PLANT AT MUGMA.

LEGEND

Sl. No.	DESCRIPTION
1	UNDER GROUND BUNKER
2	VIBRO FEEDER
3	BELT CONVEYOR
4	TRAMP IRON SEPARATOR
5	CRUSHER
6	VIBRATING SCREEN
7	BELT CONVEYOR
8	SLACK COAL BUNKER
9	BUCKET ELEVATOR
10	SHUTTLE CONVEYOR
11	SERVICE BUNKER
12	RETORT
13	CHAIN CONVEYOR
14	COKE CONVEYOR (BELT)
15	PRODUCT BUNKER
16	HYDAULIC MAIN
17	COOLER
18	EXHAUSTER
19	SCRUBBER
20	BLOWER
21	CHIMNEY
22	TAR SEPARATOR
23	TAR PUMP
24	TAR STORAGE TANK
25	LIQUOR PUMP



DRG NO. 5

Conclusion :

Summing up therefore, keeping in view the qualitative and quantitative projections of coals likely to be available progressively till the turn of this century, CEMPDIL has been making a cautious approach in the planninng and designing of not only the future coal beneficiation plants but also the other coal processing units. To keep pace with the technological development in the various coal processing areas, specially in the context of the progressive deterioration in the quality of coals, concerted effort has also been directed in continuing developmental work for improving upon the existing technologies and also in application of new technologies. CEMPDIL has also been working as the co-ordinating link in between the various organisations pursuing currently the R & D programmes in the coal sector.

As has been presented in this technical paper, priority action is being taken by CEMPDIL for discharging its role as consultants in helping the coal companies for installation of coal beneficiation plants specially for meeting almost the total requirement of coal for the steel sector and to some extent for meeting the coal requirements of the thermal power sector as well. In the coal utilisation area also, commercial scale plants specially in carbonisation and gasification areas have started coming in with equal emphasis being laid on development of indigenous technology and its commercial application that may be manifest in the installation of mechanised domestic coke plants. However, with much promise centering round the coal gasification route and fluid-bed combustion technology, more revealing developments are likely to come up within the next few years which in reality may prove to be of much significance in making the best use of abundant indigenous coal resource, though of relatively inferior quality including washery by-products.

Acknowledgement

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2. Coal Mining in India — a CEMPDIL Publication dt. Nov. '84.
3. Published and unpublished reports from the Coal Preparation and Coal Utilisation Deptts. of CEMPDIL, Ranchi

DISCUSSION :

Shri D. Basu, CMPDIL, Ranchi.

Question 1 : What is the delay in coming up of Kedla Coal Washery of West Bokaro Coalfield ?

Author : The project got delayed due to abnormal delay in acquisition of land due to administrative problems. As per revised schedule the plant is expected to be commissioned by 1987-88.

Question 2 : What is the planned quality of input to this washery ?

Author : Planned quality of input to this washery is as follows :

(a) Type of coal : Medium coking
(b) Ash % : Average about 31.5%
(c) Moisture % : Average 1 – 1.5%

Question 3 : What is the effort of CEMPDIL as regards the upgradation of Talcher Non-coking coal ?

Author : CEMPDIL has already prepared the project reports for installation of coal preparation plants at Bharatpur, Jagannath and South Balanda collieries of Talcher coal-field which are under consideration by the concerned company/ authorities.

The feasibility study of Ananta and Kalinga is also in progress.