DIRECTORATE OF FACTORIES & BOILERS, ODISHA, BHUBANESWAR-751001
PH-2396070

No. IV (IH)(3)-83/11/19175 /Dt. 28/11/15

To

The Occupier,
M/s.Global Coal And Mining (P) Ltd,
AT-Plot No.23 & 24,Industrial Estate,
P.O.-South Balanda, Talcher,
DIST-Angul-759116 (Odissa).

Sub:- Acceptance of On-Site Emergency plan

Sir,

In supersession to this office letter No. 4008 dt. 13.03.12, the updated On-Site Emergency Plan submitted to this office vide your letter GCMPL/TAL/15-16/742 dt.10.11.15 for mitigation of identified **HAZARD** due to **HSD & TRANSFORMER OIL** stored/handled in the factory bearing receipt serial number **77** is provisionally accepted this day **27th of November, 2015** and copy thereof is sent here with for your record.

CONDITIONS

1. The occupier shall ensure that the document is updated taking into account any modification in the industrial activity/changes in inventory of hazardous substances/changes in key personnel before it is taken up and submitted for acceptance
2. The occupier shall put up prominent hoarding adjacent to the entrance gate (s) indicating the possible hazards associated with the factory and the "Dos" and "Don't" and also display at conspicuous places inside the factory together with measures to be taken in case of such incident.
3. The occupier shall ensure that every key personnel of the emergency command structure is provided with a "**WORKSHEET**" containing his duties & responsibilities.
4. The occupier shall ensure that a **MOCK DRILL** of the On -Site Emergency Plan is conducted involving Zonal Asst. Director of Factories and Boilers once in every six months to review the activation and closing procedure laid down therein and also shall ensure that a **MOCK DRILL** is reviewed by the District Administration in the month of May every year.

You are requested to forward an accepted copy of the updated On-Site Emergency Plan to each of the following authorities under intimation to this office.

- Asst. Director of Factories and Boilers, Angul Zone-II
- Deputy Director of Factories & Boilers , Angul Division

Receipt of this letter may be acknowledged.

Yours faithfully,

28/11/15

Director of Factories & Boilers, Odisha

Memo No_____/Dt_____

Copy forwarded to the Asst .Director of Factories & Boilers , , Angul Zone-II / Dy. Director of Factories & Boilers, Angul Division for information and necessary action.

Director of Factories & Boilers, Odisha

28/11/15

Sl No 77

ON-SITE EMERGENCY PLAN

OF

DIRECTORATE OF FACTORIES & BOILERS ★ ACCEPTED Date 27-11-15 ★ ORISSA, BHUBANESWAR

M/s. GLOBAL COAL & MINING PVT. LTD.

AT -PLOT NO. 23 & 24, INDUSTRIAL ESTATE
P.O-SOUTH BALANDA, TALCHER,
DIST – ANGUL -759116 (ODISHA)

FOR

27.11.18
Director of Factories & Boilers
Odisha, Bhubaneswar

BENEFICIATION RAW COAL OF CAPACITY 4 MILLION TONNES PER ANNUM

CONTENTS

01. GENERAL INFORMATION ABOUT THE FACTORY

M/s GLOBAL COAL & MINING PVT. LTD. is located in Talcher Area, which is 155 km west of Bhubaneswar in the District of Angul. The nearest Railway Station is Talcher at 7 km in the South East of the plant. The N.H 23 is about 10 km East passing through Talcher Town and N.H 42 is at 15 KM South leading from Bhubaneswar to Sambalpur.

- Proximity to the Coal Mines of MCL within 10 KM.
- Proximity to the Railway network linking with Talcher Station within 2 KM.
- Accessibility by road (N.H 23, N.H 42, N.H 5 & N.H 6) Keonjhar, Rourkela, Cuttack, Sambalpur are well connected.
- Transportation of Beneficiated Coal right from the source of mining is resulted in freight saving.
- Proximity to source of power i.e. electric substation which is about 11 km for the plant.
- Situated on Govt. Land and at a distance from the local habitation / villages etc.

The Company has vast experience in coal related activities and is currently focussing its attention on mining of coal and its beneficiation.

In view of Ministry of Environment and Forest (MOEF), Govt. of India Gazette Notifications GSR560 (E) and 378 (E) dated September 1997 and June 1998 respectively on use of beneficiated Coal containing ash not more than 34 % w.e.f. June 2002 and MoEF Notification G.S.R. 552(E) dared 11th July' 2012 in the following category of power plants.

- Power plants located beyond 1000 km from pithead.
- Any standalone thermal power plant located beyond 500 km from the pit-head.
- Power plants located in critically polluted areas, urban areas and in ecologically sensitive areas.

M/s Global Coal & Mining Pvt. Ltd. has set up a beneficiation plant (Washery) at Industrial Area, South Balanda, Talcher in technical collaboration with M/s NEDECO of China. The Plant is fully operational with an initial capacity of 1.0 Million Tonnes per Annum. One Pneumatic Jig is operational. The capacity of the plant is now 2.7 Million Tonnes per annum with H.M Bath Expansion Plant of 1.3 Million Tonnes of H.M Cyclone is nearing completion making it 4 Million Tonnes Per Annum capacity.

FACTORY ADDRESS:-

M/s GLOBAL COAL & MINING PVT. LTD.

PLOT NO. 23 & 24, INDUSTRIAL ESTATE,

P.O-SOUTH BALANDA, TALCHER

DIST-ANGUL-759116 (ODISHA)

PHONE: 06760-268901, 268902, 268982, 268983

1.1 GEOGRAPHICAL LOCATION:

Latitude - 20^0 – 55′ – 36″ N

Longitude - 85^0 – 10′ – 05″ E

Altitude - 110 to 115 mt. above mean sea level

The site covered under survey of India Toposheet No. 73H/1

Factory Licence No. – AN-87 dt. 15.09.2003 under Factories Act, 1948

1.2 METEOROLOGICAL DATA :

Parameters	Summer		Monsoon/Winter		Remarks
	Max.	Min.	Max.	Min.	
Temp (°C)	45^0 C	21^0 C	30.8^0 C	9.9^0 C	
Relative Humidity	78 %	29 %	83%	46%	Highest in August and Lowest in April
Wind Speed (m/s)	5.65	0.60	2.6	0.55	Highest wind velocity Varies from 17 m/s and more some times
Wind Direction	W-NW		N-NE & W-NW		

1.3 BRIEF MANUFACTURING PROCESS:

PNEUMATIC SEPARATION:

- Raw coal is fed into the beneficiation bed that has crosswise and vertical slope.
- The beneficiation bed is kept vibrating with the help of vibration feeding machine.
- Air is then supplied in the air rooms, which are located below the beneficiation bed by a centrifugal ventilator and is blown through the air holes in the beneficiation bed.
- The air current through the air holes goes upward to agitate the raw coal.
- Under the joint performance of vibration and air current the raw coal becomes loose and stratification of coal takes place as per its relative densities.
- Lighter raw coal forms the upper layer and the heavier raw coal forms the bottom layer.
- The air current along with the coal fines form suspension media, which is helpful in improving the beneficiation efficiency.
- The upper layer of good coal goes to the conveying trough via the side-leasing block of the beneficiation bed.
- The higher density raw coal is gathered at the bottom of the beneficiation bed and it moves to the waste side under the performance of the guiding block and it ultimately goes to the falling trough.
- As much as 75% of the air with the dust goes to the centrifugal ventilator to be recycled by spinning dust remover through the dust collecting guide.
- The remaining 25% is cleaned with the rotary reverse baggage type dust remover and is released to the atmosphere with dust content less than 150 mg/m^3.

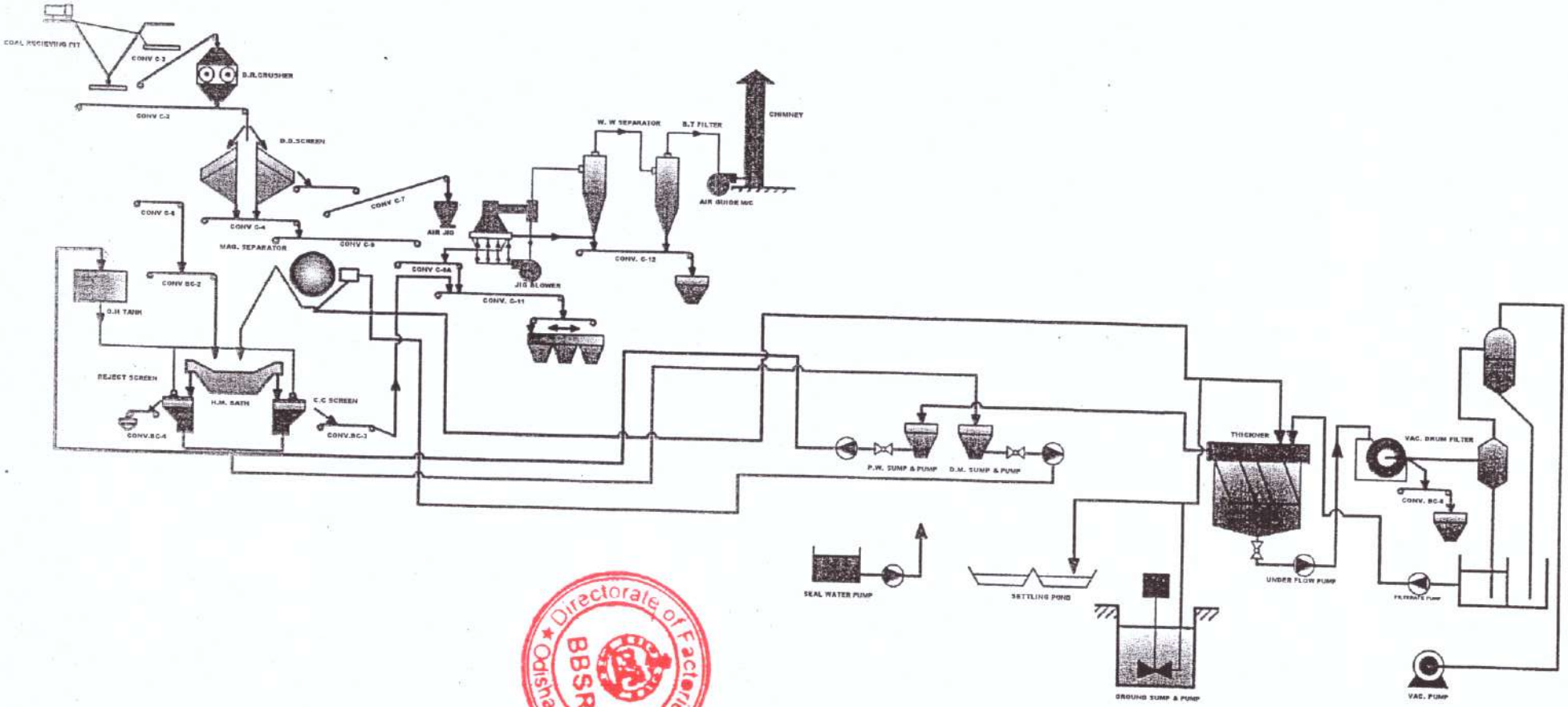
HEAVY MEDIA BATH :

The raw coal received from mines is being passed through a slow moving conveyor where the hand pickers are engaged. The hand picking of raw stones/shales are being done in this picking conveyor. The coal then crushed by double roller crusher and size separation is done in vibrating screens. The coal then allowed to fall in a Heavy Media Bath in which the liquid median having predetermined specific gravity is kept for beneficiation of coal. The coal particles having specific gravity lower than the specific gravity of media will float and the particles having specific gravity higher than medial will sink. The floats are having low ash content and called washed coal or clean coal. The sinks are having high specific gravity is called reject coal. Both the clean coal and reject coal are removed from Heavy Media Bath by means of the suitably designed scraper conveyor. After dewatering and washing with water in the D/R screens, both the products are collected in the hoppers for disposal by Trucks and Tippers.

H.M CYCLONE:

Raw Coal received from mines is feed to the receiving pit having 0 to -100 mm size with 42 to 45% ash. Then -50 is directly separated in fixed grizzly and +50 -100 is feed through primary and secondary crusher sequentially. After crushing -50 mm is feed to Heavy Media Cyclone through desliming screen mixed with magnetite powder with proper portion of specific gravity. Specific gravity is decided in laboratory by float and sink test and the cut-off point is decided in which the H.M. Cyclone is operated. The coal and media is feed to cyclone by a High Gravity Pump. In the Heavy Media Cyclone coal and media feed tangentially on the top of the cylindrical portion. In the cyclone coal separated accordingly to their relative density. The high relative density materials are flow along the wall of the cyclone and discharge at the underflow orifice called the spigot. Then it is feed to a D/R Screen and washed by fresh water and having an ash of more than 60% is reject. On the other hand the lower density coal is migrated towards the longitudinal axis of the vessels and exist through the overflow orifice called the vertex finder and discharge through a D/R screen and further washed by fresh water having a ash of 32 to 32.5% ash and is Clean Coal. In the circuit the magnetite is collected by primary and secondary magnetic separator or LIMS for re-use and to maintain the cut-off density.

After desliming screen the slurry of 0 to - 0.5 mm is collected by a fines coal tank and then it is feed to classifying cyclone. In the classifying cyclone the coarser particles are in the under flow and feed to a guard screen for further dewatering and mixed with clean coal. Then the overflow of the classifying cyclone & underflow of guard screen is feed to a lamella thickener. In the thickener the slurry water settled down and the overflow of the thickener is fresh water and re-use on the circuit. The underflow of the thickener is feed to a rotary vaccum drum filter. In the filter the cake is collected and it is then feed to the reject conveyor.

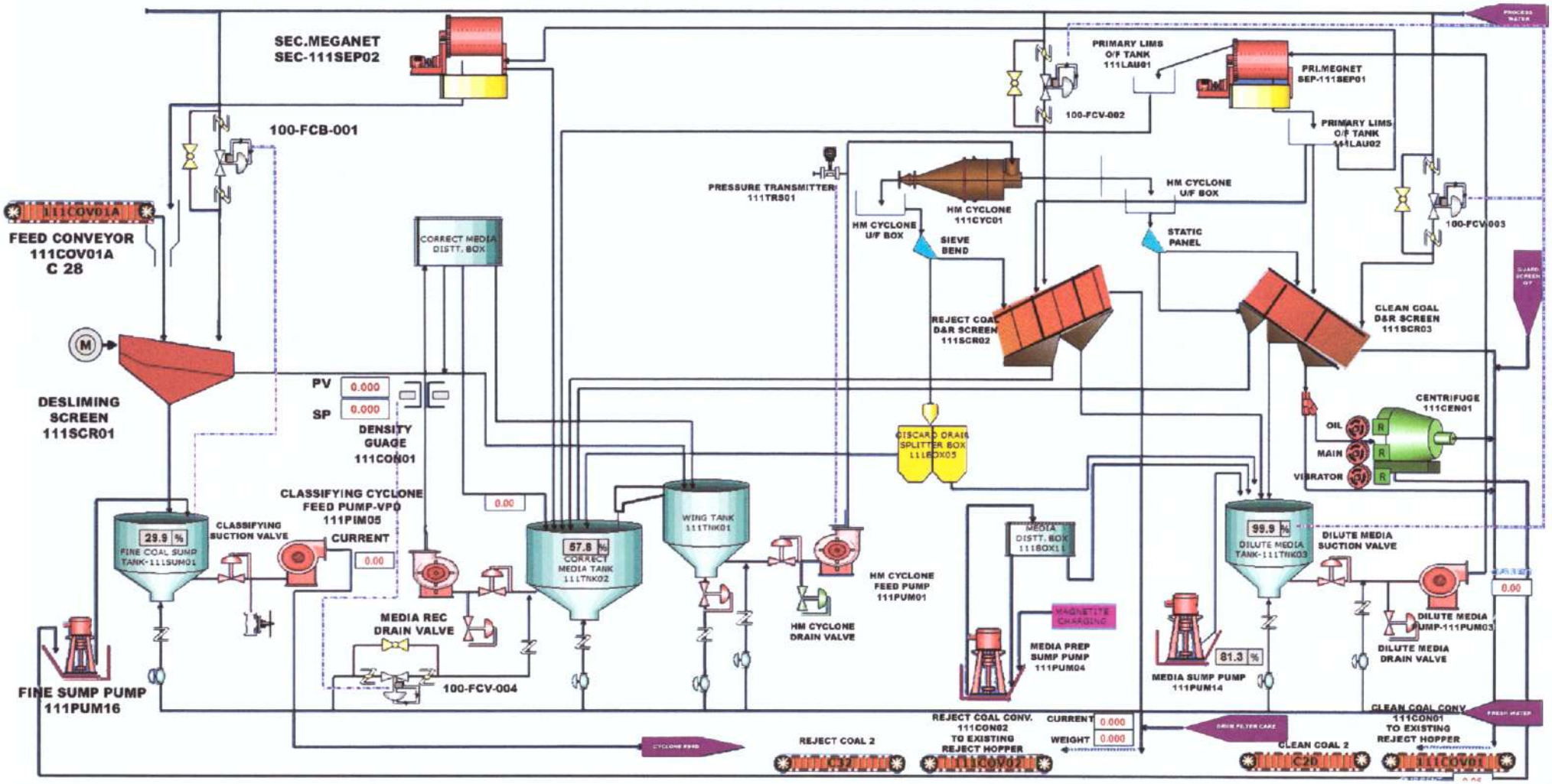


GLOBAL COAL & MINING PVT. LTD.

PROCESS FLOW DIAGRAM
COAL BENIFICIATION PLANT
TALCHER

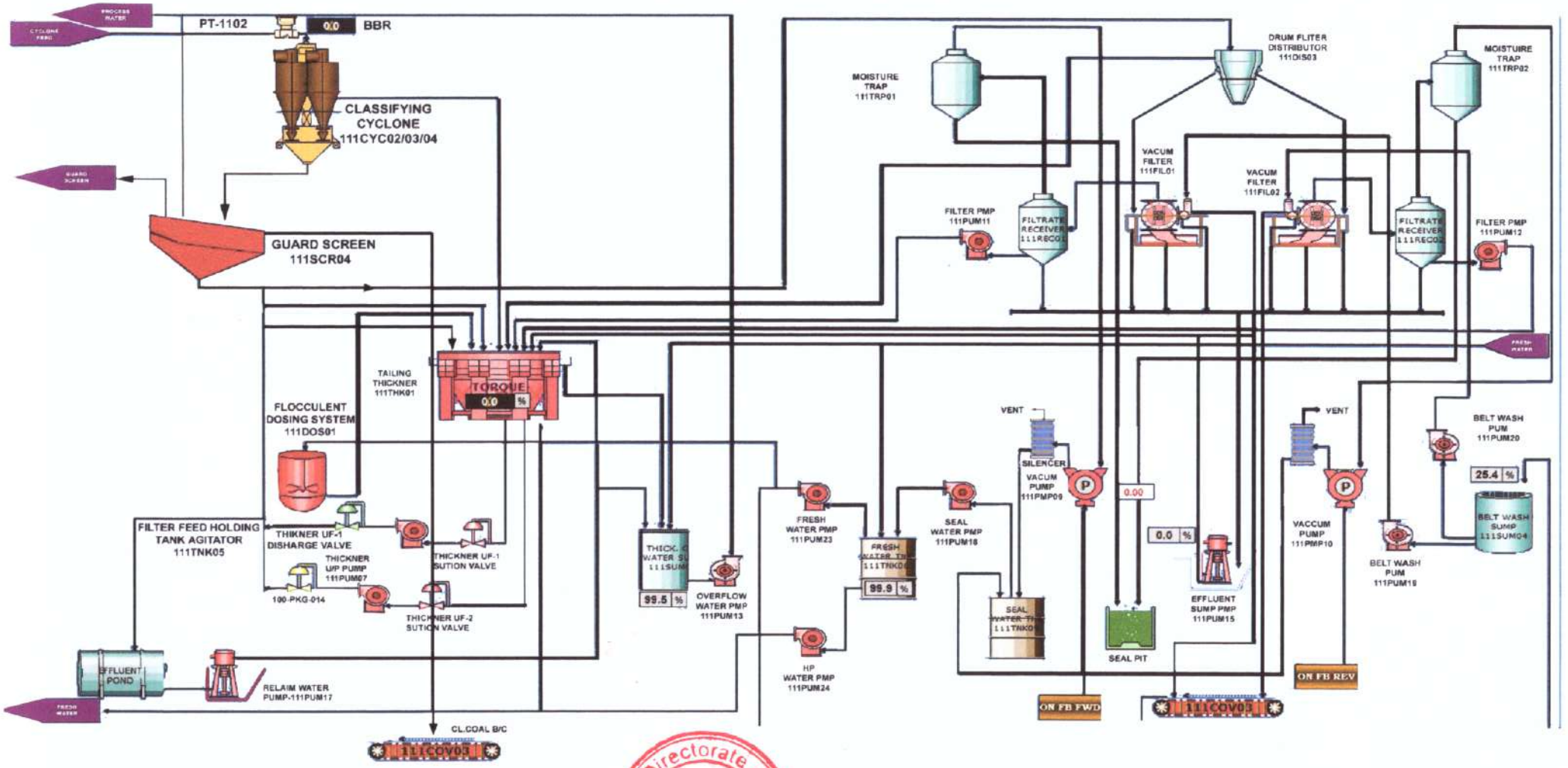
EXISTING PLANT

FLOWSHEET OF H.M CYCLONE SECTION



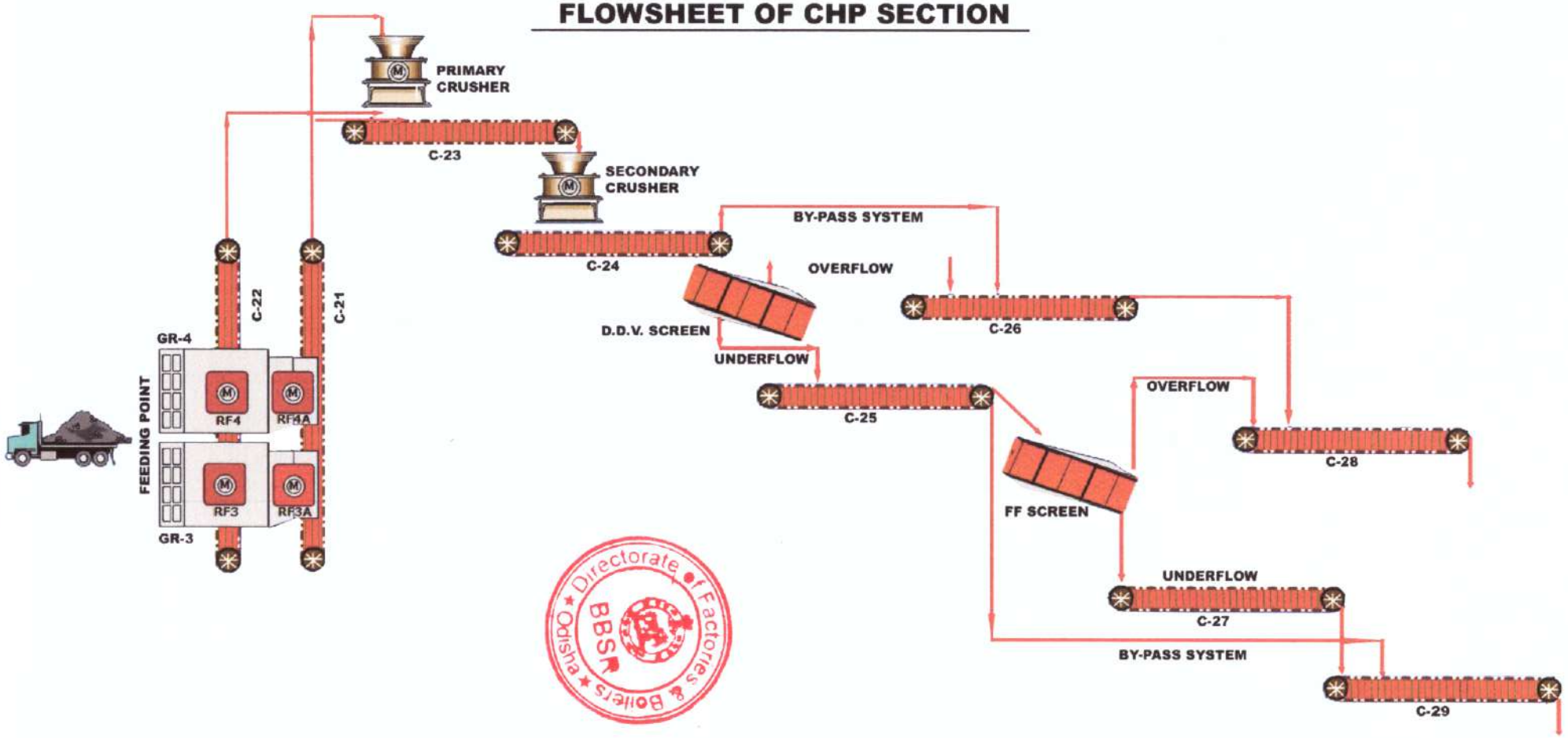
EXPANSION PLANT

FLOWSHEET OF FINE COAL SECTION



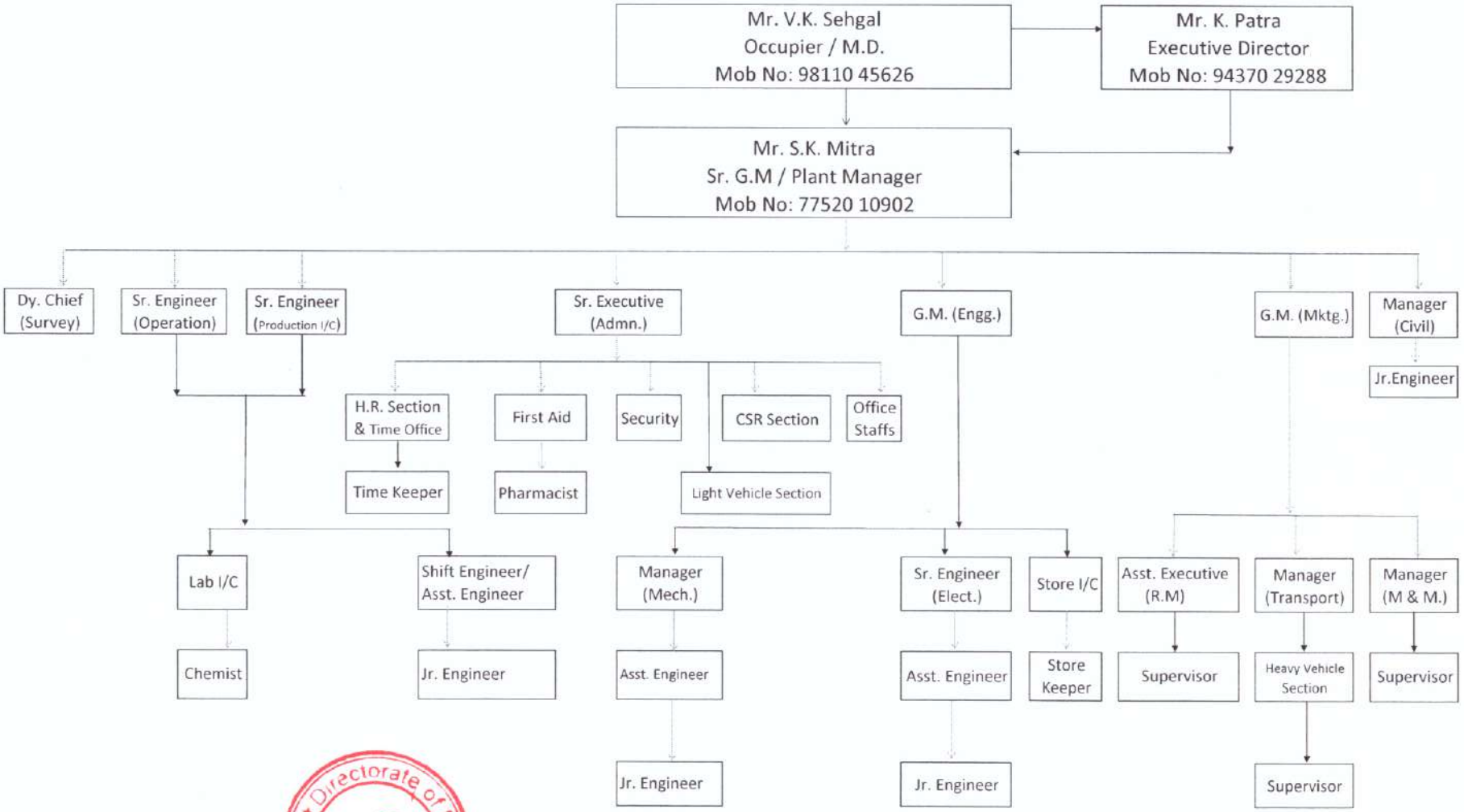
EXPANSION PLANT

FLOWSHEET OF CHP SECTION

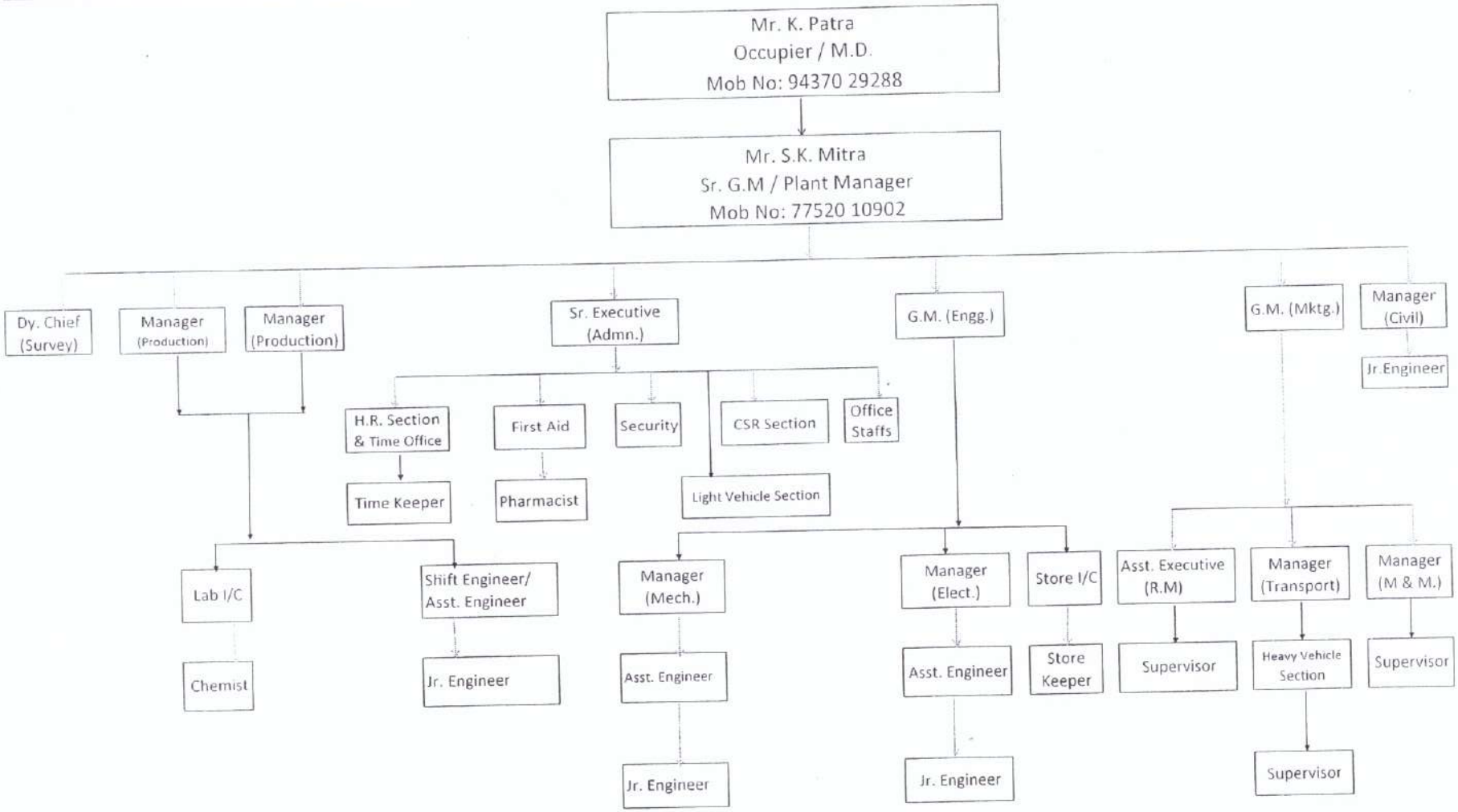


EXPANSION PLANT

2.0 ORGANISATION SET UP OF GLOBAL COAL & MINING PVT. LTD., TALCHER



2.0 ORGANISATION SET UP OF GLOBAL COAL & MINING PVT. LTD., TALCHER



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3.0 MANPOWER:-

Manpower as per license is 450. However the shift wise manpower is detailed below.

CATEGORY	"A" SHIFT 6.00 AM – 2.30 PM	"B" SHIFT 2.00 PM – 10.30 PM	"C" SHIFT 10.00 PM – 6.30 AM	GENERAL SHIFT 8.30 AM – 1.30 PM & 4.30 PM – 7.30 PM	TOTAL
Production/Maintenance	32	32	31	24	119
Weigh Bridge	4	3	3	2	12
Time Office	1	1	1	1	4
Store	1	1	1	2	5
Laboratory	2	2	2	4	10
Office	-	-	-	16	16
Security	5	4	4	1	14
Executives	1	1	1	8	11
Drivers & Operators	34	34	34	18	120
Supervisors	10	10	10	5	35
Others	-	-	-	24	24
Contractual Workers	20	20	20	20	80
Total	**110**	**108**	**107**	**125**	**450**

Depending on the requirement, the employees are called in different shifts and some employees are called on duty in National / Festival holidays and off-days.

Directorate of Factories & Boilers BBSR Odisha

3.0 MANPOWER:-

As per Factory Act, our license for manpower is 700 nos.. However the shift wise manpower at present is detailed below.

CATEGORY	"A" SHIFT 6.00 AM – 2.30 PM	"B" SHIFT 2.00 PM – 10.30 PM	"C" SHIFT 10.00 PM – 6.30 AM	GENERAL SHIFT 8.30 AM – 1.30 PM & 4.30 PM – 7.30 PM	TOTAL
Production/Maintenance	34	33	34	34	135
Weigh Bridge	3	2	2	2	9
Time Office	1	1	1	1	4
Store	1	1	1	2	5
Laboratory	2	2	2	4	10
Office	-	-	-	16	16
Security	5	4	4	1	14
Executives	1	1	1	8	11
Drivers & Operators	32	32	32	16	112
Supervisors	8	8	8	5	29
Others	-	-	-	17	17
Contractual Workers	55	55	55	14	179
Total	**142**	**139**	**140**	**120**	**541**

Depending on the requirement, the employees are called in different shifts and some employees are called on duty in National / Festival holidays and off-days.

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4.0 PRODUCT:-

Sl No.	Name of Product	One Time Storage Capacity	Type of Storage	Size of Yard Area
1	Clean Coal Size (-50mm to +0mm)	5000 MT	Open Yard	2000 Sq. Mtr (100 Mtr x 20 Mtr

4.1 BYE PRODUCT:

Sl No.	Name	One Time Storage Capacity	Type of Storage	Size of Yard Area
1	Reject Coal Size (-50mm to +0mm)	25000 MT	Open Yard	4375 Sq. Mtr (125 Mtr x 35 Mtr

5.0 INVENTORY OF RAW MATERIALS:

Sl No.	Name	One Time Storage Capacity	Type of Storage	Size of Yard Area
01	Raw Coal	30000 MT	Open Yard	7700 Sq. Mtr (110 Mtr x 70 Mtr

6.0 INVENTORY OF HAZARDOUS SUBSTANCE:

Sl No.	Name	One Time Storage Capacity	Type of Storage	Size of Yard Area
01	High Speed Diesel (HSD)	20000 Ltr	Underground Tank	21.72 Cu Mtr (6.270 Mtr Length x 2.100 Mtr Dia)
02	Transformer Oil	2100 Ltr	Transformer and its storage	(i) 1.6 MVA (ii) 3.0 MVA Total capacity 2100 Ltr

7.0 INVENTORY OF HAZARDOUS GASES / SUBSTANCES PRODUCED / GENERATED

Sl No.	Name	Quantity of One Time Storage	Type of Storage
No hazardous substances/gases are produced/generated during the process.			

8.0 IDENTIFICATION OF HAZARDS:-

Due to handling/storing of Raw Coal, Clean Coal and Reject Coal, the fire hazards may occur in the following area within the factory premises:

Sl. No.	Area / Hazard Zone	Hazard	Impact
1	Raw Coal Storage Yard	Fire may occur due to spontaneous ignition of raw coal	Fire may propagate within the Raw Coal Storage Yard.
2	Clean Coal Storage Yard	Fire may occur due to spontaneous ignition of Fine coal.	Fire may propagate within this Coal Storage Yard.
3	Reject Coal Storage Yard	Fire may occur due to spontaneous ignition of Fine coal.	Fire may propagate within this Coal Storage Yard.
4	High Speed Diesel (HSD) Storage Yard	Fire ball may occur in case of direct contract with flame.	Fire may propagate to the near by storage area.
5	Transformer Oil Storage Yard	Fire ball may occur in case of direct contract with flame.	Fire may propagate to the near by storage area.

Fire on coal yard:

During storage of coal in the coal yard, weathering of coal takes place due to mild oxidation, which is an exothermic process. If the heat liberated is not completely dissipated, the temperature of coal rises as coal is a bad conductor of heat. The rate of oxidation is doubled with 10 ^{0}C rising temperature. The bulk of coal may reach critical temperature i.e. its ignition point 50-80^{o}C and may burst into flame.

Significant heat radiation experienced at distance in case of fire on coal yard

Mass of coal	Significant heat level Kw/m^2	Experience at distance in Mtrs.			Indication
		Summer	Rainy	Winter	
Raw Coal 30000MT	4.5	19	16	18	Causes pain if unable to cover the body within 20 seconds. However blistering of the skin (2nd degree burn) is likely caused with no lethality.
	12.5	15	12	14	Minimum energy required for melting of plastic
	37.5	10	7	9	Sufficient to cause damage to the equipment.
Clean Coal 5000MT	4.5	19	15	17	Causes pain if unable to cover the body within 20 seconds. However blistering of the skin (2nd degree burn) is likely caused with no lethality.
	12.5	15	11	13	Minimum energy required for melting of plastic
	37.5	10	6	8	Sufficient to cause damage to the equipment.

FIRE MODELING FOR COAL IN RAW COAL YARD:

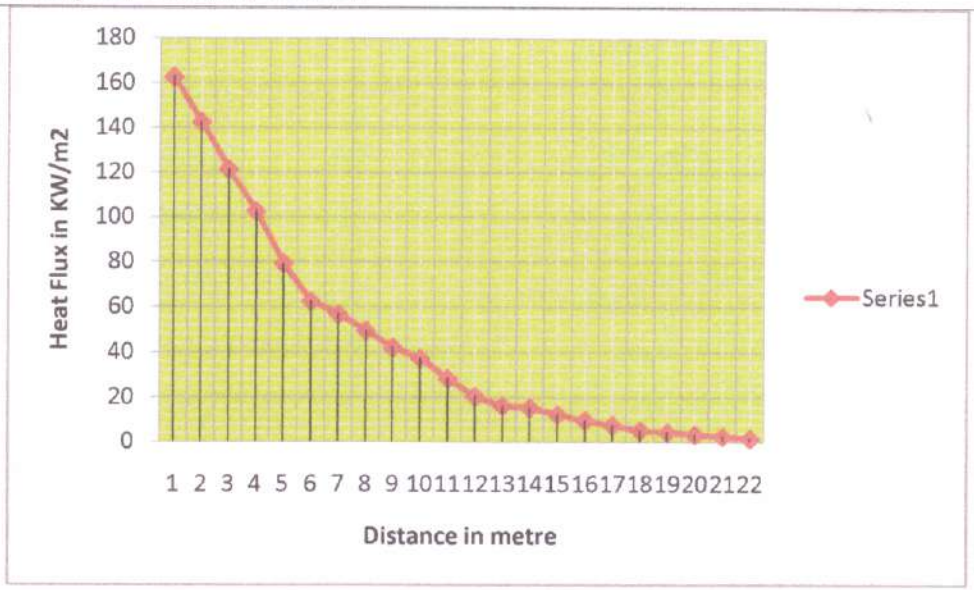
Storage detail			Input data for Summer Season
Storage type	Coal yard		
Capacity	30000 MT		
Size	L-110m, B-70m		
Meteorological data	Season		
Parameter	Summer	Rainy	Winter
Average wind speed m/sec	5.65	2.6	2.6
Average wind direction	W-NW	N-NE & W-NW	N-NE & W-NW
Humidity (%)	78	83	80
Average ambient air temperature (^{0}C)	45	30.8	9.9

HEAT FLUX DATA FOR SUMMER SEASON :

Distance (M)	Heat Flux (KW/m^2)
1	162.8
2	142.6
3	121.5
4	102.6
5	79.3
6	62.6
7	56.8
8	49.6
9	42.3
10	37.5
11	28.6
12	20.5
13	16.4
14	15.6
15	12.5
16	9.8
17	7.6
18	5.2
19	4.5
20	3.4
21	2.6
22	1.6

Heat propagation Curve

Coal yard- Summer season



SIGNIFICANT "HEAT LEVEL" EXPERIENCED AT DISTANCE DUE TO FIRE ON COAL YARD IN SUMMER SEASON

Significant Heat Level Value (KW/M^2)	Distance (M)	Indication
37.5	10	Causes pain if unable to cover the body within 20 seconds. However blistering of the skin (2nd degree burn) is likely caused with no lethality.
12.5	15	Minimum energy required for melting of plastic
4.5	19	Sufficient to cause damage to the equipment.

Directorate of Factories & Boilers BBSR Odisha

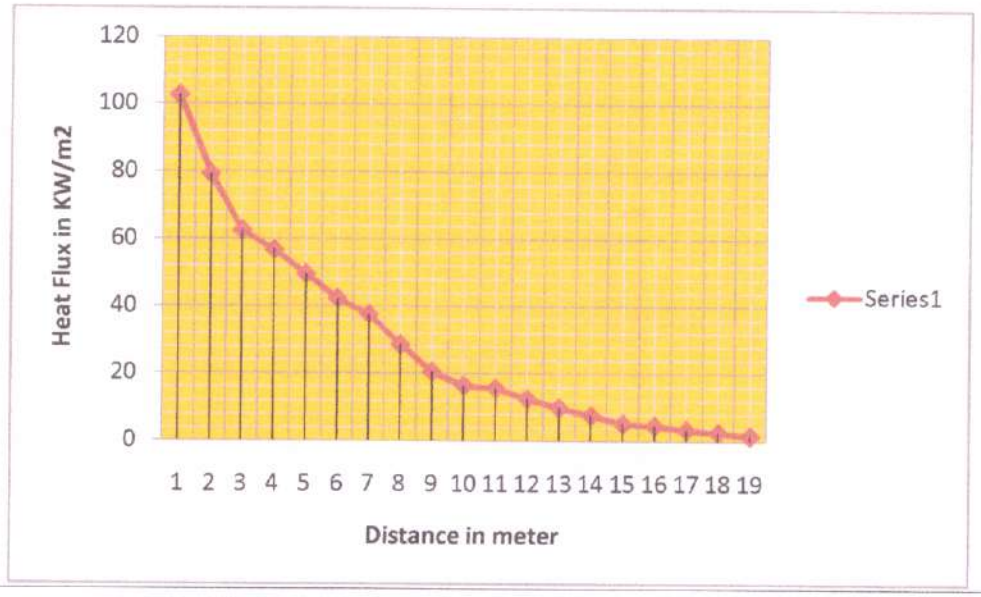
Storage detail		Input data for Rainy Season
Storage type	Coal yard	
Capacity	30000 MT	
Size	L-110m, B-70m	

Meteorological data	Season		
Parameter	Summer	Rainy	Winter
Average wind speed m/sec	5.65	2.6	2.6
Average wind direction	W-NW	N-NE & W-NW	N-NE & W-NW
Humidity (%)	78	83	80
Average ambient air temperature (^{0}C)	45	30.8	9.9

Distance (M)	Heat Flux (KW/m^2)
1	102.6
2	79.3
3	62.6
4	56.8
5	49.6
6	42.3
7	37.5
8	28.6
9	20.5
10	16.4
11	15.6
12	12.5
13	9.8
14	7.6
15	5.2
16	4.5
17	3.4
18	2.6
19	1.6

Heat propagation Curve

Coal yard- Rainy season



SIGNIFICANT "HEAT LEVEL" EXPERIENCED AT DISTANCE DUE TO FIRE ON COAL YARD IN RAINY SEASON

Significant Heat Level Value (KW/M^2)	Distance (M)	Indication
4.5	16	Causes pain if unable to cover the body within 20 seconds. However blistering of the skin (2nd degree burn) is likely caused with no lethality.
12.5	12	Minimum energy required for melting of plastic
37.5	7	Sufficient to cause damage to the equipment.

Directorate of Factories & Boilers ★ Odisha ★ BBSR

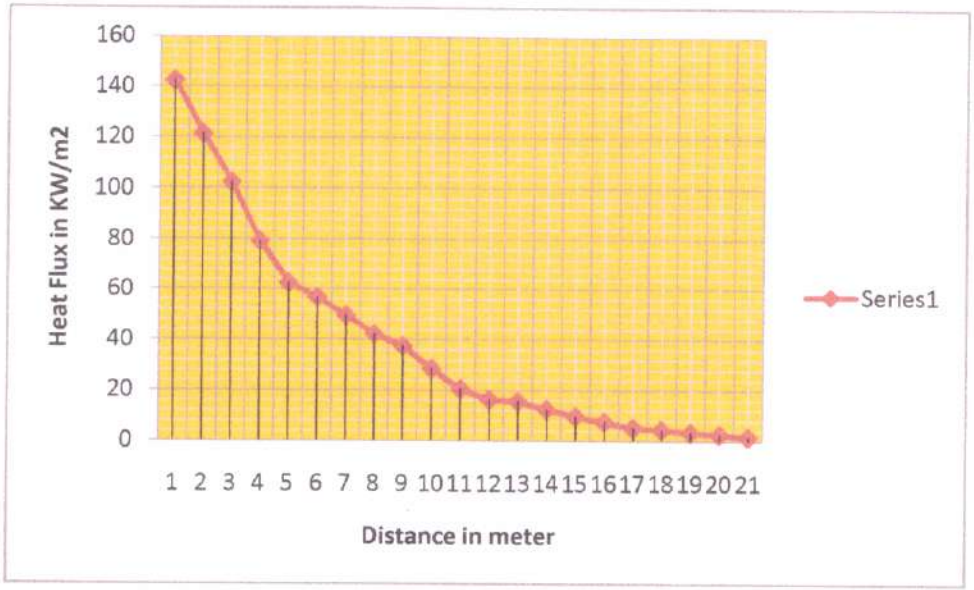
Storage detail		Input data for Winter Season	
Storage type	Coal yard		
Capacity	30000 MT		
Size	L-110m, B-70m		
Meteorological data	Season		
Parameter	Summer	Rainy	Winter
Average wind speed m/sec	5.65	2.6	2.6
Average wind direction	W-NW	N-NE & W-NW	N-NE & W-NW
Humidity (%)	78	83	80
Average ambient air temperature (^{0}C)	45	30.8	9.9

HEAT FLUX DATA FOR WINTER SEASON:

Distance (M)	Heat Flux (KW/m^2)
1	142.6
2	121.5
3	102.6
4	79.3
5	62.6
6	56.8
7	49.6
8	42.3
9	37.5
10	28.6
11	20.5
12	16.4
13	15.6
14	12.5
15	9.8
16	7.6
17	5.2
18	4.5
19	3.4
20	2.6
21	1.6

Heat propagation Curve

Coal yard- Winter season



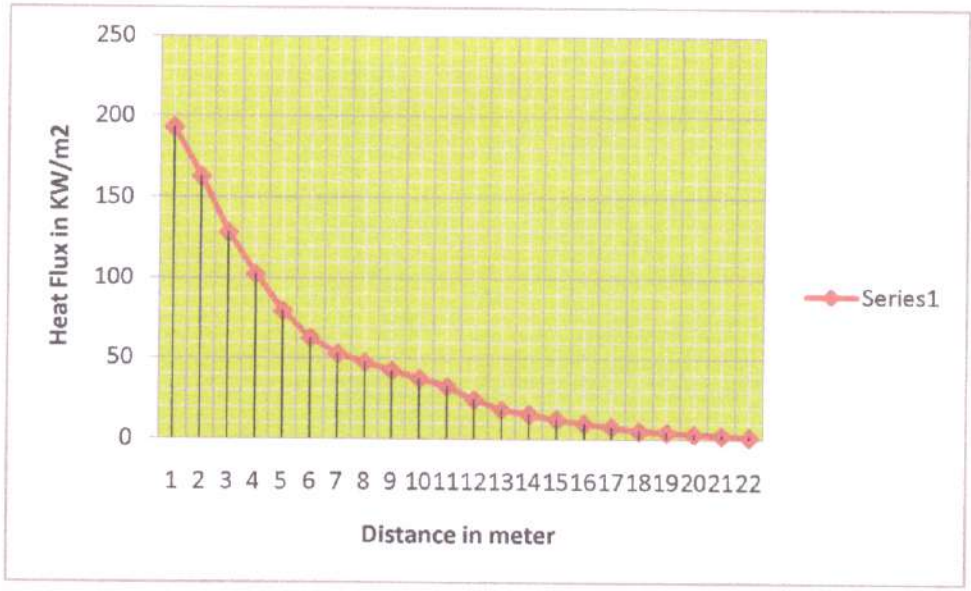
SIGNIFICANT "HEAT LEVEL" EXPERIENCED AT DISTANCE DUE TO FIRE ON COAL YARD IN WINTER SEASON

Significant Heat Level Value (KW/M^2)	Distance (M)	Indication
4.5	18	Causes pain if unable to cover the body within 20 seconds. However blistering of the skin (2nd degree burn) is likely caused with no lethality.
12.5	14	Minimum energy required for melting of plastic
37.5	9	Sufficient to cause damage to the equipment.

Directorate of Factories & Boilers BBSR Odisha

FIRE MODELING FOR CLEAN COAL

Distance (M)	Heat Flux (KW/m^2)	Heat propagation Curve
1	192.8	Clean Coal yard- Summer season
2	162.6	
3	128.5	
4	102.6	
5	79.3	
6	62.6	
7	52.8	
8	47.6	
9	42.3	
10	37.5	
11	32.6	
12	24.5	
13	18.4	
14	15.6	
15	12.5	
16	9.8	
17	7.6	
18	5.2	
19	4.5	
20	3.4	
21	2.6	
22	1.6	

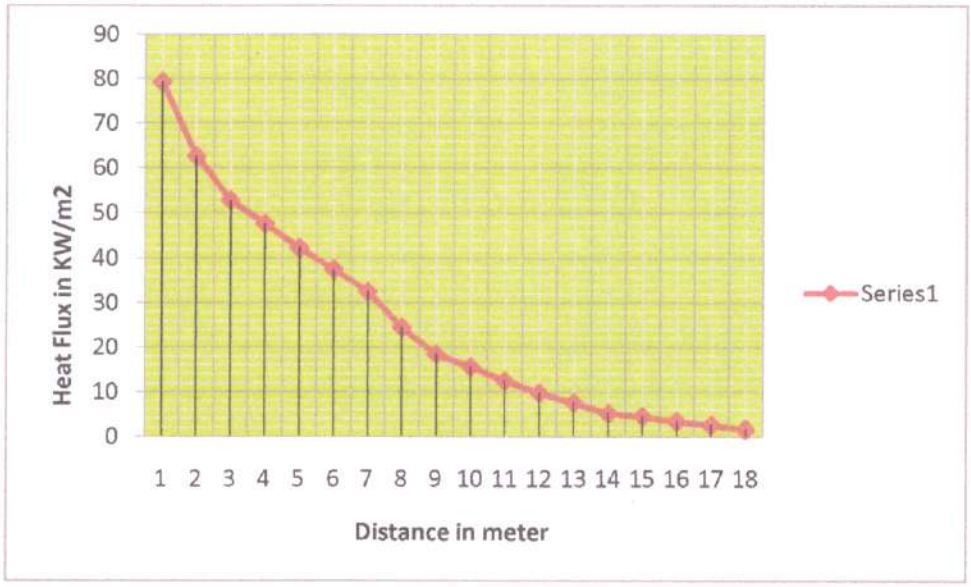


SIGNIFICANT "HEAT LEVEL" EXPERIENCED AT DISTANCE DUE TO FIRE ON COAL YARD IN WINTER SEASON

Significant Heat Level Value (KW/M^2)	Distance (M)	Indication
4.5	19	Causes pain if unable to cover the body within 20 seconds. However blistering of the skin (2nd degree burn) is likely caused with no lethality.
12.5	15	Minimum energy required for melting of plastic
37.5	10	Sufficient to cause damage to the equipment.

Directorate of Factories & Boilers BBSR Odisha

Distance (M)	Heat Flux (KW/m^2)	Heat propagation Curve
1	79.3	Clean Coal yard- Rainy season
2	62.6	
3	52.8	
4	47.6	
5	42.3	
6	37.5	
7	32.6	
8	24.5	
9	18.4	
10	15.6	
11	12.5	
12	9.8	
13	7.6	
14	5.2	
15	4.5	
16	3.4	
17	2.6	
18	1.6	

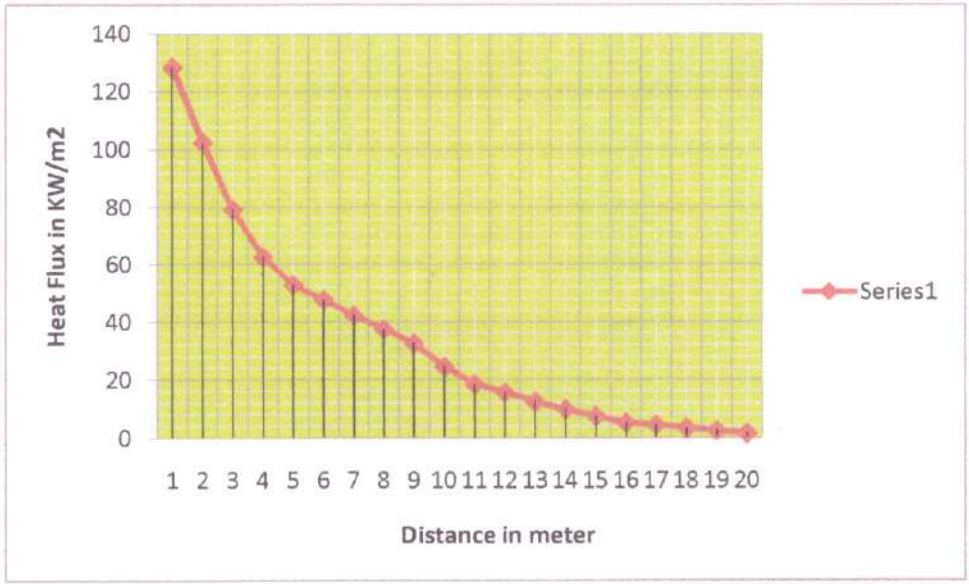


SIGNIFICANT "HEAT LEVEL" EXPERIENCED AT DISTANCE DUE TO FIRE ON COAL YARD IN WINTER SEASON

Significant Heat Level Value (KW/M^2)	Distance (M)	Indication
4.5	15	Causes pain if unable to cover the body within 20 seconds. However blistering of the skin (2nd degree burn) is likely caused with no lethality.
12.5	11	Minimum energy required for melting of plastic
37.5	6	Sufficient to cause damage to the equipment.

Directorate of Factories & Boilers ★ BBSR ★ Odisha

Distance (M)	Heat Flux (KW/m^2)	Heat propagation Curve
1	128.5	Clean Coal yard- Winter season
2	102.6	
3	79.3	
4	62.6	
5	52.8	
6	47.6	
7	42.3	
8	37.5	
9	32.6	
10	24.5	
11	18.4	
12	15.6	
13	12.5	
14	9.8	
15	7.6	
16	5.2	
17	4.5	
18	3.4	
19	2.6	
20	1.6	



SIGNIFICANT "HEAT LEVEL" EXPERIENCED AT DISTANCE DUE TO FIRE ON COAL YARD IN WINTER SEASON

Significant Heat Level Value (KW/M^2)	Distance (M)	Indication
4.5	17	Causes pain if unable to cover the body within 20 seconds. However blistering of the skin (2nd degree burn) is likely caused with no lethality.
12.5	13	Minimum energy required for melting of plastic
37.5	8	Sufficient to cause damage to the equipment.

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FIRE HAZARD IN HSD STORAGE TANK

HSD is a flammable liquid as per schedule-1, Part-II (b) (v) having flash point of 66^0C and auto ignition temperature of 256^0C and explosive limit of 5-7% volume in air. So, it is susceptible to fire hazard. Whenever HSD catches fire it shall manifest in the form of pool fire. The significant heat flux that spread from the source in case of pool fire in HSD tank is mentioned below.

Significant heat flux experienced at distance due to pool fire on HSD in different season. (By using ALOHA Software)

Storage details	Significant heat level Kw/m^2	Experience at distance in Mtrs.			Indication
		Summer	Rainy	Winter	
HSD 20KL	4.5	12	12	11	Causes pain if unable cove the body within 20 seconds. However blistering of the skin (2nd degree burn) is likely caused with no lethality.
	12.5	8	8	7	Minimum energy required for melting of plastic
	37.5	3	3	2	Sufficient to cause damage to the equipment.

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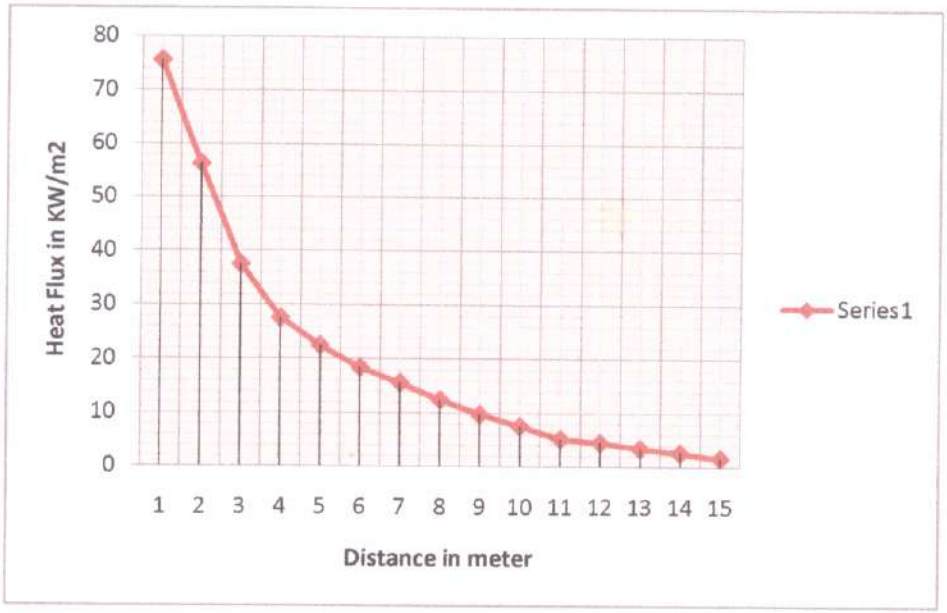
Distance (M)	Heat Flux (KW/m^2)	Heat propagation Curve
1	75.6	HSD- Summer season
2	56.3	
3	37.5	
4	27.6	
5	22.5	
6	18.4	
7	15.6	
8	12.5	
9	9.8	
10	7.6	
11	5.2	
12	4.5	
13	3.4	
14	2.6	
15	1.6	



SIGNIFICANT "HEAT LEVEL" EXPERIENCED AT DISTANCE DUE TO FIRE ON COAL YARD IN WINTER SEASON

Significant Heat Level Value (KW/M^2)	Distance (M)	Indication
4.5	12	Causes pain if unable to cover the body within 20 seconds. However blistering of the skin (2nd degree burn) is likely caused with no lethality.
12.5	8	Minimum energy required for melting of plastic
37.5	3	Sufficient to cause damage to the equipment.

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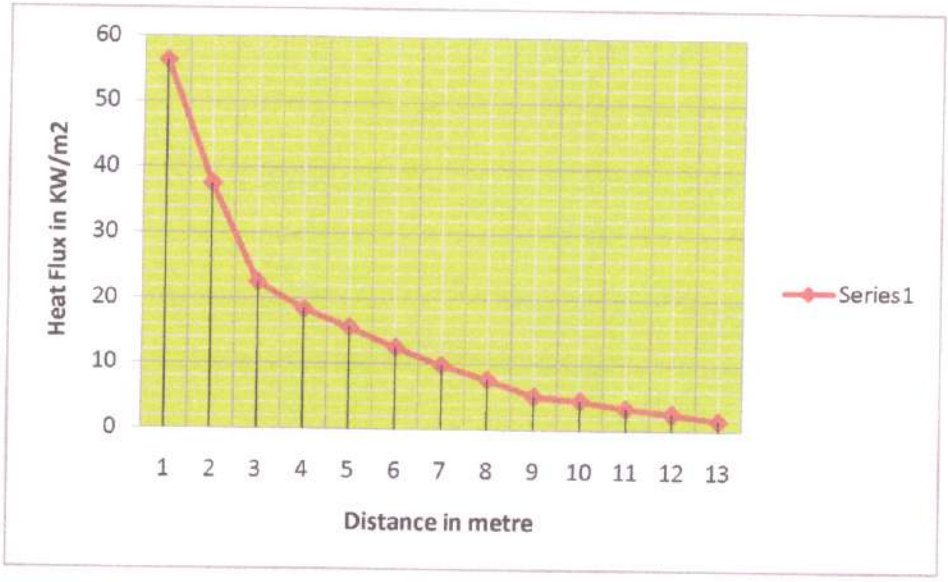
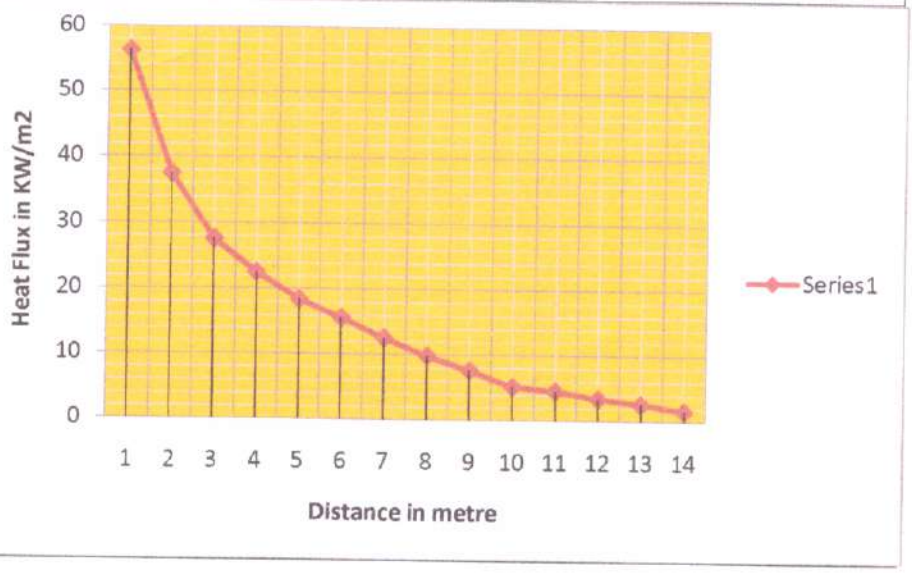
Distance (M)	Heat Flux (KW/m^2)	Heat propagation Curve
1	75.6	HSD- Rainy season
2	56.3	
3	37.5	
4	27.6	
5	22.5	
6	18.4	
7	15.6	
8	12.5	
9	9.8	
10	7.6	
11	5.2	
12	4.5	
13	3.4	



SIGNIFICANT "HEAT LEVEL" EXPERIENCED AT DISTANCE DUE TO FIRE ON COAL YARD IN WINTER SEASON

Significant Heat Level Value (KW/M^2)	Distance (M)	Indication
4.5	12	Causes pain if unable to cover the body within 20 seconds. However blistering of the skin (2nd degree burn) is likely caused with no lethality.
12.5	8	Minimum energy required for melting of plastic
37.5	3	Sufficient to cause damage to the equipment.

Distance (M)	Heat Flux (KW/m^2)	Heat propagation Curve
1	56.3	HSD- Winter Season
2	37.5	
3	27.6	
4	22.5	
5	18.4	
6	15.6	
7	12.5	
8	9.8	
9	7.6	
10	5.2	
11	4.5	
12	3.4	
13	2.6	
14	1.6	



SIGNIFICANT "HEAT LEVEL" EXPERIENCED AT DISTANCE DUE TO FIRE ON COAL YARD IN WINTER SEASON

Significant Heat Level Value (KW/M^2)	Distance (M)	Indication
4.5	11	Causes pain if unable to cover the body within 20 seconds. However blistering of the skin (2nd degree burn) is likely caused with no lethality.
12.5	7	Minimum energy required for melting of plastic
37.5	2	Sufficient to cause damage to the equipment.

Fire hazard in transformer oil in transformer

Transformer oil is a flammable liquid as per schedule-1, Part-II (b) (v) having flash point of 144^{0}C, auto ignition temperature of >270^{0}C and explosive limit of 0.7% volume in air. So, it is susceptible to fire hazard. Whenever Transformer oil catches fire it shall manifest in the form of pool fire. The significant heat flux that spread from the source in case of pool fire in transformer is mentioned below.

Significant heat flux experienced at distance due to fire on transformer containing transformer oil in different season. (By Using ALOHA Software)

Storage details	Significant heat level Kw/m^2	Experience at distance in Mtrs.			Indication
		Summer	Rainy	Winter	
Transformer Oil	4.5	17	15	16	Causes pain if unable cove the body within 20 seconds. However blistering of the skin (2nd degree burn) is likely caused with no lethality.
	12.5	10	8	9	Minimum energy required for melting of plastic
	37.5	5	3	4	Sufficient to cause damage to the equipment.

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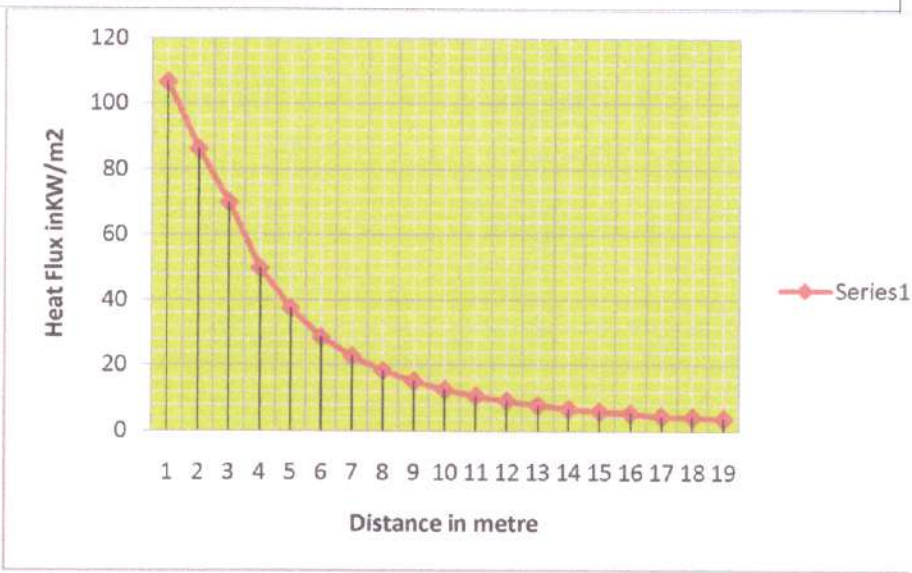
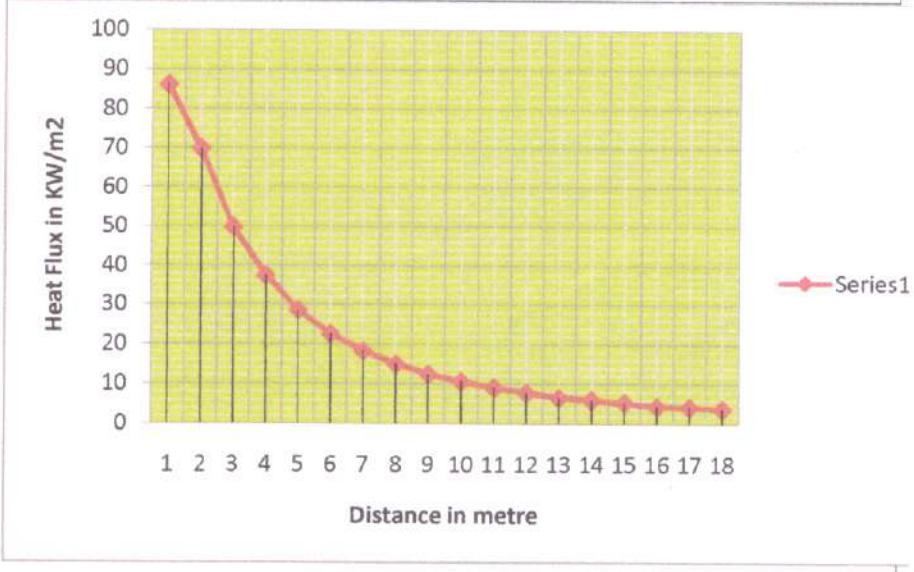
Distance (M)	Heat Flux (KW/m^2)	Heat propagation Curve
1	106.6	Transformer Oil- Summer Season
2	86.2	
3	69.93	
4	49.85	
5	37.5	
6	28.63	
7	22.68	
8	18.33	
9	15.1	
10	12.5	
11	10.69	
12	9.15	
13	7.91	
14	6.69	
15	6.06	
16	5.36	
17	4.5	
18	4.27	
19	3.84	



SIGNIFICANT "HEAT LEVEL" EXPERIENCED AT DISTANCE DUE TO FIRE ON COAL YARD IN WINTER SEASON

Significant Heat Level Value (KW/M^2)	Distance (M)	Indication
4.5	17	Causes pain if unable to cover the body within 20 seconds. However blistering of the skin (2nd degree burn) is likely caused with no lethality.
12.5	10	Minimum energy required for melting of plastic
37.5	5	Sufficient to cause damage to the equipment.

Distance (M)	Heat Flux (KW/m^2)	Heat propagation Curve
1	86.2	Transformer Oil- Winter Season
2	69.93	
3	49.85	
4	37.5	
5	28.63	
6	22.68	
7	18.33	
8	15.1	
9	12.5	
10	10.69	
11	9.15	
12	7.91	
13	6.69	
14	6.06	
15	5.36	
16	4.5	
17	4.27	
18	3.84	



SIGNIFICANT "HEAT LEVEL" EXPERIENCED AT DISTANCE DUE TO FIRE ON COAL YARD IN WINTER SEASON

Significant Heat Level Value (KW/M^2)	Distance (M)	Indication
4.5	16	Causes pain if unable to cover the body within 20 seconds. However blistering of the skin (2nd degree burn) is likely caused with no lethality.
12.5	9	Minimum energy required for melting of plastic
37.5	4	Sufficient to cause damage to the equipment.

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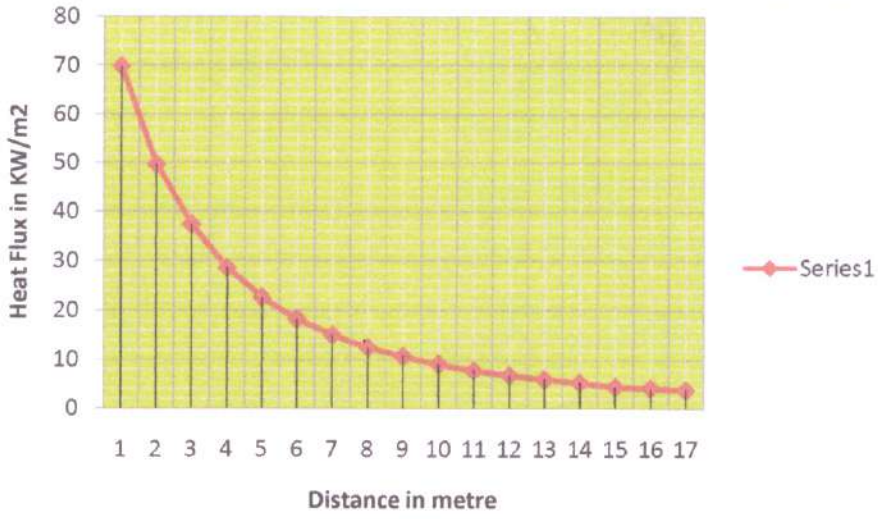
Distance (M)	Heat Flux (KW/m^2)	Heat propagation Curve
1	69.93	Transformer Oil- Rainy Season
2	49.85	
3	37.5	
4	28.63	
5	22.66	
6	18.33	
7	15.1	
8	12.5	
9	10.69	
10	9.15	
11	7.91	
12	6.9	
13	6.06	
14	5.36	
15	4.5	
16	4.27	
17	3.84	



SIGNIFICANT "HEAT LEVEL" EXPERIENCED AT DISTANCE DUE TO FIRE ON COAL YARD IN WINTER SEASON

Significant Heat Level Value (KW/M^2)	Distance (M)	Indication
4.5	15	Causes pain if unable to cover the body within 20 seconds. However blistering of the skin (2nd degree burn) is likely caused with no lethality.
12.5	8	Minimum energy required for melting of plastic
37.5	3	Sufficient to cause damage to the equipment.

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10.0 PLOT PLAN:

The plot plan showing the followings is given in **Annexure.**

(i) Hazard Zone (HZ)

(ii) Iso-risk Contour around Hazard Zone

(iii) Emergency Control Room (ECR)

(iv) Assembly Point (AP)

(v) Emergency Exit (EE)

(vi) Fire Hydrant line

11.0 EMERGENCY COMMAND STRUCTURE

Works Main Controller
Sri K.Patra
Executive Director
Mob: - 9437029288
Alternate
Sri S. K. Mitra
Sr. G.M / Plant Manager
Mob:-7752010902

↓

Site Incident Controller
Sri K. Banarjee
General Manager (Engg.)
Mob:- 7752010903
Alternate
Sri P.C. Sahoo
Manager (Mech.)
Mob:-7752010932

↓

Combat Team Leader
Sri N Dehury
Sr. Engineer (Prod.)
Mob:-7752010931
Alternate
Sri S.K. Pradhan
Sr. Engineer (Elect.)
Mob:-7752010907

↓

Members of Combat Team
1. Sri Susil Ku. Sahoo
   Mob:-7752012864
2. Sri Ajay Ku. Choudhury
   Mob:-7752010954
3. Sri Bikash Ku. Sahoo
   Mob:-7752010957

Rescue Team Leader
Sri M. Singh
Security I/c
Mob:-9861352500
Alternate
Sri Prashant Ku. Pradhan
Sr. Engineer (Operation)
Mob:-7752012870

↓

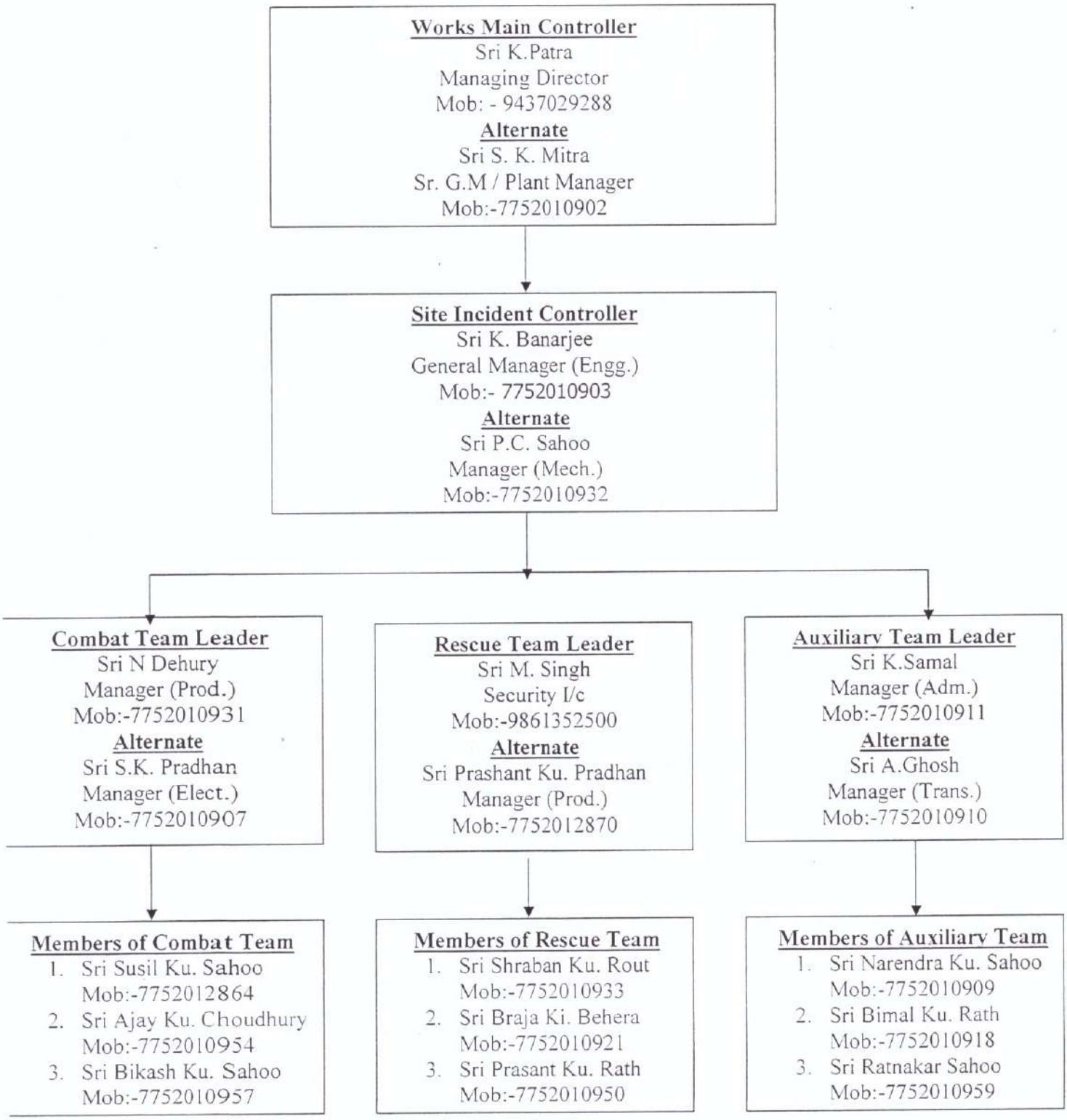
Members of Rescue Team
1. Sri Shraban Ku. Rout
   Mob:-7752010933
2. Sri Braja Ki. Behera
   Mob:-7752010921
3. Sri Prasant Ku. Rath
   Mob:-7752010950

Auxiliary Team Leader
Sri K.Samal
Sr. Executive (Adm.)
Mob:-7752010911
Alternate
Sri A.Ghosh
Manager (M&M)
Mob:-7752010910

↓

Members of Auxiliary Team
1. Sri Narendra Ku. Sahoo
   Mob:-7752010909
2. Sri Bimal Ku. Rath
   Mob:-7752010918
3. Sri Ratnakar Sahoo
   Mob:-7752010959

11.0 EMERGENCY COMMAND STRUCTURE



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12.0 ROLE OF KEY PERSONS OF EMERGENCY COMMAND STRUCTURE

WORKS MAIN CONTROLLER (WMC):-

- On being informed, rush to the scene and take overall charges of the situation.
- Make quick assessment of the situation and decide declaration of emergency by blowing the siren in appropriate code [intermittent three times with half minutes interval].
- Make continuous review and asses the possible developments to determine the extent of damage to plant and human beings.
- Shut-down the plant, if necessary.
- Ensure that casualties are receiving adequate attention.
- Liaise with the fire services, police services and other statutory authorities.
- Declare closure of the emergency by blowing the siren [only once long siren for 25 seconds].
- Issue the authorized statements to the media services.
- Report all statutory authorities in the prescribed manner.
- Communicate to employees about the mishap, measures taken and giving confidence to employees for avoiding recurrence of the incident by investigation and ordering preventive measures to be implemented.

SITE INCIDENT CONTROLLER:-

- On hearing Emergency siren, rush to the scene and report to the Works Main Controller.
- Make quick assess about the gravity of the situation and appraises Works Main Controller.
- Extend all sorts of help through different agencies to minimize the damage to human beings, plant, property and environment.
- Shutdown of Plant & Machinery.
- Undertake continuous review of the situation time to time and appraise to Works Main Controller.
- Provide the required information to the fire brigade team for fire fighting.
- Preserve the evidences for the subsequent inquiries.
- He will liaison between the various working teams.
- He will extend all possible help needed during the Emergency.
- Organize various teams by calling the team leader.

COMBAT TEAM LEADER:-

- On hearing the emergency siren, rush to the scene with fire fighting team with sufficient equipment in the minimum possible time.
- Ensure the team members resume their position with appropriate equipment.
- Monitor the fire fighting operation to control the situation.
- Ensure that the situation is controlled by arresting, spillage, fighting fire, shutting of the value and equipment by the team in consultation with Site Incident Controller.
- Alerts the entire employees through PA System.
- Command fire fighting activities. Also review and decide fire-fighting strategies.

COMBAT TEAM MEMBERS:-

The team members will assist the team Leader to ensure.

- Shutdown the Plant and machinery & Isolate the effected area.
- Arrange of Isolation of Electrical Power Supplier all around the affected area.
- Alert the entire employees through PA system.
- Operating the fire fighting equipments and materials and also to shift to effected site.

RESCUE TEAM LEADER:-

- On hearing the emergency siren, rush to the scene.
- Ensure the arrival of his team members.
- Keep necessary equipments of first-aid for preliminary treatment.
- Keep the ambulance ready to carry the injure persons to the hospital.
- Ensure the proper personal protective equipments lead the team for rescue operation.
- Guide the mutual aid partners for their course of action at the site.
- Guide the non-essential persons to reach assembly point.
- Search the missing person on the roll call basis.
- Rescue all the effected persons.
- Search for causalities and evacuate non-essential person from spot.

RESCUE TEAM MEMBERS:-

- On hearing the emergency siren, rush to the scene with appropriate personal protective equipments.
- Rescue all the effected persons.
- Search for casualties and evacuate non-essential person from spot.
- Arrange to send emergency case to hospitals.

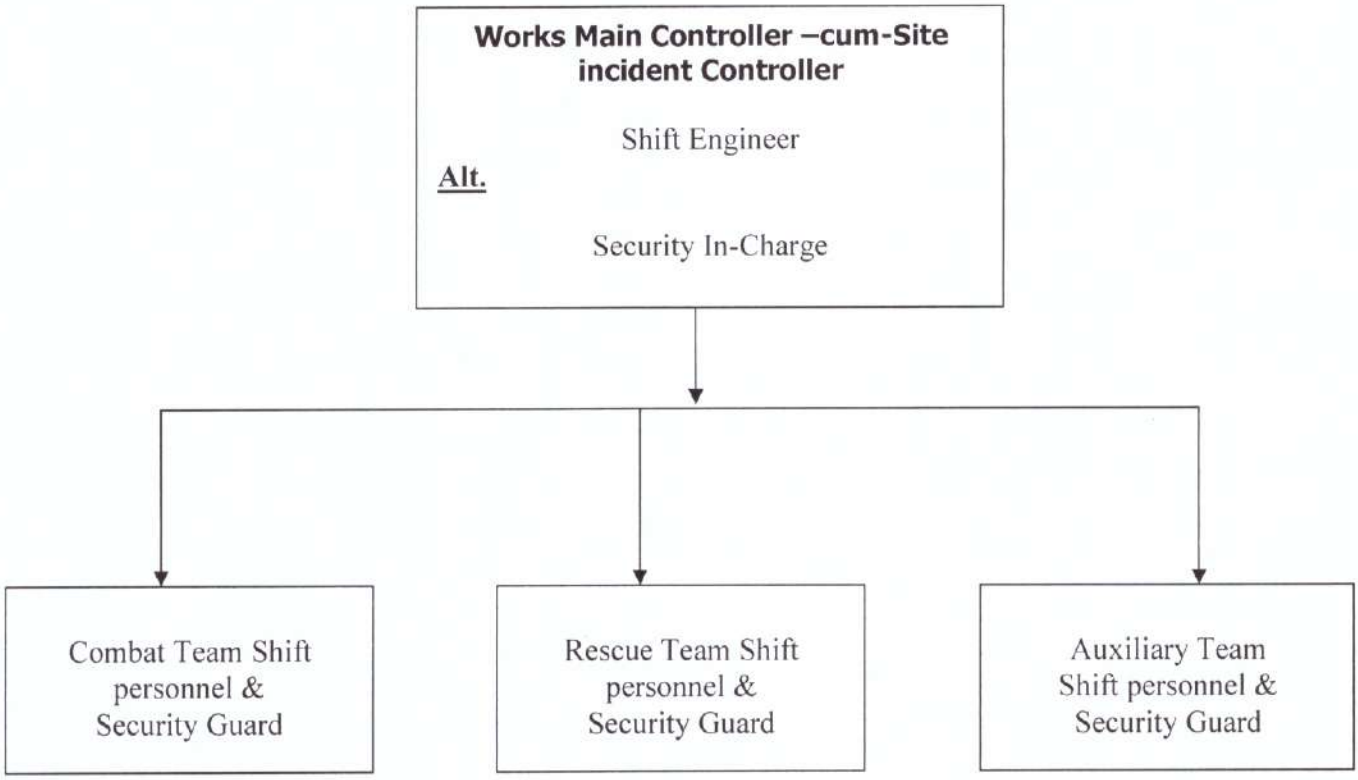
AUXILIARY TEAM LEADER:-

- On hearing the emergency siren rush to the scene.
- Ensure the arrival of his team members.
- Intimate mutual-aider over phone.
- Keeps the first-aid and primary health center staff, equipment ready to take care of immediate medical needs.
- Takes care of victims' family.
- Make all arrangement like transport, other needs, arrange finance.
- Ensure all casualties are shift to hospital for medical treatment.
- Keep records of casualties and provide information of the matter to Works Main Controller.

AUXILIARY TEAM MEMBERS:-

- On hearing emergency siren, rush to the scene.
- Carry out the orders of the team leader.
- Provide immediate first-aid treatment to the victims.
- Ensure ambulance vehicle ready.
- Coordinate with combat team, rescue team, statutory authorities and mutual-aid partners.
- Takes care of victims' family.

13.0 SILENT HOUR COMMAND STRUCTURE



13.1 ROLE OF KEY PERSONS IN SILENT HOUR COMMAND STRUCTURE

- Silent Hour is the time when General Shift people are not available.
- The command structure for silent hour shall be same as during normal hour, however, during the silent hour the Shift Engineer/Security In-Charge shall act as Works Main Controller-cum Site Incidence Controller, till the arrival of the Works Main Controller.
- Works Main Controller-cum Site Incidence Controller (Silent Hour) shall inform Works Main Controller, Site Incident Controller, Combat Team Leader, Rescue Team Leader and the Auxiliary Team Leader by telephone or by sending special messenger to their residences.
- On receiving the information the Works Main Controller, Site Incident Controller, Combat Team Leader, Rescue Team Leader and Auxiliary Team Leader shall reach the site at the earliest and simultaneously Combat Team Leader, Rescue Team Leader and Auxiliary Team Leader shall ensure the presence of their respective team members.
- Thereafter the action plan as well as the role of key persons shall be same as the normal hour execution of Command Structure.

14.0 ACTION PLAN FOR ON-SITE EMERGENCY:

STEP NO.	INITIATOR	ACTION TO TAKE
1.	The parson noticing the emergency	➢ Inform the Security Gate and the concerned Shift-in-charge who in turn will inform Works Main Controller immediately regarding the fire hazard.
2.	Works Main Controller (WMC)	➢ On being informed, rush to the Emergency Control Room. ➢ Declare of emergency by blowing the siren in appropriate code [intermittent three times with half minutes interval]. ➢ Make continuous review and assess the possible developments to determine the extent of damage to plant and human beings. ➢ Shut-down the plant if necessary. ➢ Ensure that casualties are receiving adequate attention. ➢ Liaise with the fire services, police services and other statutory authorities. ➢ Declare closure of the emergency by blowing the siren [only once long siren for 25 seconds]. ➢ Issued the authorized statements to the media services. ➢ Report all statutory authorities in the prescribed manner. ➢ Communicate to employees about the mishap, measures taken and giving confidence to employees for avoiding recurrence of the incident by investigation and ordering preventive measures to be implemented.

STEP NO.	INITIATOR	ACTION TO TAKE
3.	Site Incident Controller (SIC)	➢ On hearing Emergency siren, rush to the scene and report to the Works Main Controller. ➢ Make quick assess about the gravity of the situation and appraises Works Main Controller. ➢ Extend all sorts of help through different agencies to minimize the damage to human beings, plant, property and environment. ➢ Shutdown of Plant & Machinery. ➢ Undertake continuous review of the situation time to time and appraise to Works Main Controller. ➢ Provide the required information to the fire brigade team for fire fighting. ➢ Preserve the evidences for the subsequent inquiries. ➢ Make liaison between the various working teams. ➢ Extend all possible help needed during the Emergency.
4.	Combat Team	➢ On hearing Emergency siren, rush to the scene. ➢ Shutdown the Plant and Machinery & Isolate the affected area. ➢ Arrange of Isolation of Electrical Power Supplier all around the affected area. ➢ Alert the entire employees through PA System. ➢ Operating the fire fighting equipments and materials and also to shift to effected site.

STEP NO.	INITIATOR	ACTION TO TAKE
5.	Rescue Team	➢ On hearing Emergency siren, rush to the scene. ➢ Guide the non-essential persons to reach assembly point. ➢ Search the missing person on the roll call basis. ➢ Rescue all the effected persons. ➢ Search for casualties and evacuate non-essential person from spot.
6.	Auxiliary Team	➢ On hearing Emergency siren, rush to the scene. ➢ Inform about the emergency to Statutory Authorities depending upon the situation. ➢ Shift the injured persons to hospital by ambulance after providing necessary first aid. ➢ Seek help of Mutual Aid Partners and Coordinate with Mutual Aid Partners to render their service if required. ➢ Arrange to inform the relatives of Casualties. ➢ Take care of visit of the authorities to the Emergency Site.

15.0 ACTIVATION AND CLOSING PROCEDURE FOR ON-SITE EMERGENCY

- **Anybody** notices FIRE, shout "FIRE, FIRE", "FIRE" and informs to Shift-in-charge [or Smoke detector indicates fire alarm installed in the emergency control room].

- Being informed about fire, the **Shift-in-charge** informs **Works Main Controller** and **Site Incident Controller.**

- On hearing about the fire, Works Main Controller and Site Incident Controller rush to the scene and make quick assessment of the situation.

- On quick assessment of the situation, the Works Main Controller rush to the emergency control room and declare emergency by blowing appropriate siren code **[intermittent three times with half minutes interval].**

- On hearing of Emergency siren the key personnel of Emergency Combat structure perform their duties and responsibility as per the worksheet.

- During the emergency operation, the Works Main Controller keeps records of activities carried on, supervises overall, maintain liaison with mutual aiders, statutory authorities.

- After being controller the situation, the Works Main Controller declares normalcy by blowing appropriate siren [three minutes continuously].

ANNEXURE-1

DETAILS OF FACILTIES AVAILABLE

EMERGENCY CONTROL ROOM

- P&T phone – 2 nos.
- Wind direction and speed indicator
- Windsock
- Wallboard for fixing up drawings and drawing pins. Flip charts, drawing sheets and sketch pens.
- Switch for actuating the siren, drinking water arrangement, tables, chairs, etc.
- Details of address and telephone numbers of key personnel of emergency command structure statutory authorities and mutual aiders.
- Worksheet of key personnel of emergency command structure.
- Applicable siren code.
- Safety manual.
- Material safety data sheets of HSD.
- List of emergency telephone numbers (external and internal).
- Local P & T telephone directories.
- List of people working in the installation, location wise.
- List of residential addresses of employees / contract workers and casual workers.

ASSEMBLY POINTS:-

In an emergency, it will be necessary to evacuate people from the affected zones or the zones likely to be affected, to safe areas. The safe areas are identified and designed as Assembly Points (AP). The location of the assembly point is the vacant space shown in the Plot Plan. Arrangements for taking head count of persons, reconciling the head count with the attendance rolls, temporary shelter and further evacuation if necessary to safer place outside factory campus can be made.

WIND SOCKS:-

During emergencies, the knowledge of exact wind direction helps the factory personnel to decide on the escape route to be taken for safe evacuation of personnel and also the safe assembly point and Emergency Control Centre. Therefore, the windsock is provided at the top-most point of the factory building for easy identification of the wind direction.

COMMUNICATING THE EMERGENCY AND MEDICAL AID

For communicating the declaration of emergency and evacuation decision to the plant personnel. It is envisaged that the siren would be utilized.

Declaration of emergency	:-	Intermittent three times with Half-minute interval
Normal factory siren	:-	Continuous for 30 secs.
All clear signal	:-	Continuous for 1 mins.

EMERGENCY MEDICAL ARRANGEMENT:-

- The first-aid box is available in each department; viz main store, sponge side, furnace side, control room, office room.
- First-aid boxes are maintained in each department.
- Adequate stock of essential medicines, bandages and other appliances are being maintained.

FIRE HYDRANT SYSTEM

Fire Hydrant points are provided inside the plant as shown in plot plan. Fire Hydrant hoses are 63mm, dia in size. Two motors along with two suitable pumps which can discharge 60 m^3 of water per hour are provided to main header to maintain a pressure of 7 Kg/cm^2. In case of temporary power failure, the fire pumps are run through DG. One water reservoir is supplying water to the fire main line and is connected to the nearby bore well.

FIRST AID CENTRE

One First Aid Room with facilities of Oxygen fittings, Stretchers, Thermometer, First Aid Kits, Blankets, Kidney Tray and a team of First Aiders is available.

FIRE EXTINGUISHERS

Required types of fire extinguishers have been provided at different locations of the plant as given below.

Sl No.	Location	Particulars	Quantity	Remarks
1 & 2	Sub-Station	Halotron 2.0 kg	2 Nos.	At the time of Emergency any nos. of equipments can be used collecting from any place point as per requirement
3 & 4	D.G Room	DCP 5.0 kg	2 Nos.	
5	Heavy Media Control Room	Halotron 2.0 kg	1 No.	
6	Store	DCP 5.0 kg	1 No.	
7	Jig Control Room	Halotron 2.0 kg	1 No.	
8	Main Control Room	Halotron 1.0 kg	1 No.	
9	Office	Clean Agent 1.0 kg.	1 No.	
10	Weigh Bridge	Clean Agent 1.0 kg	1 No.	
11	Canteen	Clean Agent 1.0 kg	1 No.	
12	Laboratory	Clean Agent 1.0 kg	1 No.	
13	Heavy Media Compressor Room	DCP 5.0 kg	1 No.	
14	Heavy Media 5.00 M. Level	DCP 5.0 kg	1 No.	
15 & 16	Heavy Media 9.00 M Level	DCP 5.0 kg	2 Nos.	
17	Heavy Media 16.50 M. Level	DCP 5.0 kg	1 No.	
18	Screening Plant 1st Floor	DCP 5.0 kg	1 No.	
19 & 20	Screening Plant 2nd Floor	DCP 5.0 kg	2 Nos.	
21	Screening Plant 3rd Floor	DCP 5.0 kg	1 No.	
22	Crusher House 1st Floor	DCP 5.0 kg	1 No.	
23	Crusher House 2nd Floor	DCP 5.0 kg	1 No.	
24	Diesel Tanker	DCP 5.0 kg	1 No.	
25 & 26	Sub-Station	DCP 5.0 kg	2 Nos.	
27	Diesel Section Room	Halotron 2.0 kg.	1 No.	
28 & 29	Diesel Pump	DCP 5.0 kg.	2 Nos.	
30	Heavy vehicles workshop	DCP 5.0 kg.	1 No.	
31	Electrical workshop	DCP 5.0 kg.	1 No.	
32	Mechanical workshop (new)	DCP 5.0 kg.	1 No.	
33	Mechanical workshop (old)	DCP 5.0 kg.	1 No.	
34	Pay loader 203 (OR19-6604)	DCP 5.0 kg	1 No.	
35 & 36	Electrical Workshop	DCP 6.0 kg	2 Nos.	
37 & 38	Mechanical Workshop	DCP 6.0 kg	2 Nos.	
39	Pay Loader 204 (OR19E 6606)	4 kg ABC	1 No.	
40	Pay Loader 205 (OR19G 2336)	4 kg ABC	1 No.	
41	Pay Loader 206 (OR19C 0327)	4 kg ABC	1 No.	
42	Pay Loader 207 (OR19F 2070)	4 kg ABC	1 No.	
43	Pay Loader 208 (OR19F 3325)	4 kg ABC	1 No.	
44	Pay Loader 209 (OR19F 3326)	4 kg ABC	1 No.	
45	Pay Loader 210 (OR19F 3327)	4 kg ABC	1 No.	

Sl No.	Location	Particulars	Quantity	Remarks
46	Pay Loader 211 (OR19F4270)	4 kg ABC	1 No.	At the time of Emergency any nos. of equipments can be used collecting from any place point as per requirement
47	Proclain -1	4 kg ABC	1 No.	
48	Proclain -2	4 kg ABC	1 No.	
49	Grader- 2943	4 kg ABC	1 No.	
50	JCB- (OR19A 1156)	4 kg ABC	1 No.	
51	AMW- (OR19G 1862)	4 kg ABC	1 No.	
52	AMW- (OR19G 1863)	4 kg ABC	1 No.	
53	AMW- (OR19E 7427)	4 kg ABC	1 No.	
54	AMW- (OR19E 7428)	4 kg ABC	1 No.	
55	HYVA- (OR23C 1518)	4 kg ABC	1 No.	
56	HYVA- (OR23D 1864)	4 kg ABC	1 No.	
57	HYVA- (OR23E 6915)	4 kg ABC	1 No.	
58	Service van- (OR19E 5315)	4 kg ABC	1 No.	
59 & 60	Pay Loader Section	4 kg ABC	2 Nos.	
61 & 62	Substation Yard	4 kg ABC	2 Nos.	
63	Light Vehicle Section	4 kg ABC	1 No.	
64	Store Extension	4 kg ABC	1 No.	
65 & 66	Electrical Building- Ground floor (DG room & Cable room)	4 kg ABC Dry Powder (stored pressure type) map 90%	2 Nos.	
67& 68	Electrical Building- MCC & PLCC room (3.00 Mtr. Level)	4 kg ABC Dry Powder (stored pressure type) map 90%	2 Nos.	
69	Electrical Building- Soft started room (5.60 Mtr. Level)	-do-	1 No.	
70 & 71	Electrical Building- Control room, PLC room, Battery room & Engineer room (10.10 Mtr. Level)	-do-	2 Nos.	
72 & 73	Washery Building Ground Floor (0.00 Mtr. Level)	-do-	2 Nos.	
74 & 75	Washery Building Ground Floor 4.50 Mtr. Level	-do-	2 Nos.	
76 & 77	Washery Building Ground Floor 9.50 Mtr. Level	-do-	2 Nos.	
78 & 79	Washery Building Ground Floor 14.50 Mtr. Level	-do-	2 Nos.	
80 & 81	Washery Building Ground Floor 20.00 Mtr. Level & 22.50 Mtr Level	-do-	2 Nos.	
82 & 83 & 84	Screen House	-do-	3 Nos.	

FIRE EXTINGUISHERS

Required types of fire extinguishers have been provided at different locations of the plant as given below.

Sl No.	Location	Particulars	Quantity	Remarks
1.	Sub-station	(Halotron 2.0 kg)	1 No.	At the time of Emergency any nos. of equipments can be used collecting from any place point as per requirement
2.		(Halotron 2.0 kg)	1 No.	
3.	D.G Room	(DCP 5.0kg)	2 Nos.	
4.				
5.	Heavy Media control Room	(Halotron 2.0kg)	1 No.	
6.	Store	(DCP 5.0 kg)	1 No.	
7.	Jig Control Room	(ABC 4.0kg)	1 No.	
8.	Main Control Room	(Halotron 1.0kg)	1 No.	
9.	Office	(Clean Agent 1.0kg.)	1 No.	
10.	Weigh Bridge	(Clean Agent 1.0kg)	1 No.	
11.	Canteen	(Clean Agent 1.0kg)	1 No.	
12.	Laboratory	(Clean Agent 1.0kg)	1 No.	
13.	Heavy Media compressor room	(DCP 5.0kg)	1 No.	
14.	Heavy Media 5.00M. Level	(DCP 5.0kg)	1 No.	
15&16	Heavy Media 9.00M.	(DCP 5.0kg)	2 Nos.	
17.	Heavy Media 16.50M.	(DCP 5.0kg)	1 No.	
18.	Screening Plant 1st Floor	(DCP 5.0kg)	1 No.	
19&20	Screening Plant 2nd Floor	(DCP 5.0kg)	2 Nos	
21..	Screening Plant 3rd Floor	(DCP 5.0kg)	1 No.	
22.	Crusher House 1st Floor.	(DCP 5.0kg)	1 No.	
23.	Crusher House 2nd Floor	(DCP 5.0kg)	1 No.	
24.	Diesel Tanker	(DCP 5.0kg)	1 Nos.	
25&26	Sub-Station	(DCP 5.0kg)	2 No.	
27.	Diesel section room	(Halotron 2.0kg.)	1No.	
28&29	Diesel pump	(DCP 5.0kg.)	2Nos.	
30.	Heavy vehicles workshop	(DCP 5.0kg.)	1No.	
31.	Electrical workshop	(DCP 5.0kg.)	1No.	
32.	Mechanical workshop	(DCP5.0kg.)	1No.	
33.	Mechanical workshop	(DCP 5.0kg.)	1No.	
34.&35	Electrical Workshop	(DCP 6.00kg)	2Nos.	
36.&37	Mechanical Workshop	(DCP 6.00kg)	2Nos.	
38.	Pay loader 204 (OR19E 6606)	4kg ABC	1no.	
39.	Pay loader 205 (OR19G 2336)	4kg ABC	1no.	
40.	Pay loader 206 (OR19C 0327)	4kg ABC	1no.	
41.	Pay loader 207 (OR19F 2070)	4kg ABC	1no.	
42.	Pay loader 208 (OR19F 3325)	4kg ABC	1no.	
43.	Pay loader 209 (OR19F 3326)	4kg ABC	1no.	
44.	Pay loader 210 (OR19F 3327)	4kg ABC	1no.	

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Sl No.	Location	Particulars	Quantity	Remarks
1. 2.	Electrical Building – 0.000 M.Lvl. (D.G Room & Cable Room)	4.00Kg. ABC	2 Nos.	At the time of Emergency any nos. of equipments can be used collecting from any place point as per requirement
3. 4.	Electrical Building – 3.000 M. Lvl. (MCC & PLCC Room)	4.00Kg. ABC	2 Nos.	
5.	Electrical Building – 5.600 M.Lvl. (Soft Starter Room)	4.00Kg. ABC	1 No.	
6. 7.	Electrical Building – 10.100 M. Lvl. (Control Room, PLC Room, UPS & Battery Room and Engrs. Room)	4.00Kg. ABC	2 Nos.	
8. & 9	Ground Floor / 0.000 M.Lvl.	4.00 Kg. ABC	2 Nos.	
10&11	4.500 M. Lvl.	4.00 Kg. ABC	2.Nos.	
12	9.500 M. Lvl.	4.00 Kg. ABC	1 no..	
13	9.500 M. Lvl.	4.00 Kg. ABC	1 no.	
14	14.500 M. Lvl.	4.00 Kg. ABC	1 No.	
15.	17.000 M. Lvl.	4.00 Kg. ABC	1 No.	
16.	20.000 M. Lvl	4.00 Kg. ABC	1 No.	
17.	1st Floor (5.00 M. Lvl.)	4.00 Kg. ABC	1 No.	
18&19	2nd Floor (9.500M Lvl.)	4.00 Kg. ABC	2 Nos.	
20.	3rd Floor (12.00M.Lvl.)	4.00 Kg. ABC	1 No.	

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FACILTIES FOR EMERGENCY COMBAT & RESCUE

SL. NO.	EQUIPMENT	QUANTITY	LOCATION
1.	Portable Hydrant Pump with all accessories	2 Set	Security
2.	Portable Fire Extinguishers	84 Nos.	List Enclosed
3.	Breathing Apparatus	1 Set	First Aid Room
4.	Manila Rope	50 mt	Security
5.	Emergency Light	4 Set	Adm. Office, Time Office, Control Room, Store
6.	Portable P.A system- Battery operated	1 Set	Security
7.	Rescue Ladder	1 Set	Store
8.	Safety Gloves	5 Nos.	Store
9.	Safety Belt	5 Nos.	Store
10.	Siren (Plant)- Plant Control Room	1 No	Plant
11.	First Aid Box	6 Nos.	Time Office, Store
12.	Ambulance Van	1 No.	In the Plant Site/ Main Gate
13.	First Aid Room	1 No.	Main Gate/Security
14.	Sufficient Sand Buckets	10 Nos.	At Location Point of fire Extinguishers

❖ SIREN

Company has Siren/hotter arrangement, which can be activated manually during fire related emergency.

COMMUNICATION

Public address system and EPABX telephone is available for effective communication inside the plant. Telephone directory is available in the entire department.

- General Safety Precaution to Hazards:

1. Wear only cotton/approved work clothes while on duty in the plant.
2. Don't resort to short cuts.
3. Don't attempt to operate any equipment to which you are not specially assigned.
4. Don't use the defective equipments of any kind.
5. Use the PPE to work safely.
6. Insist your fellow workers to observe the safety rules.
7. Take instruction from your superior before starting any new works.
8. Report all injuries/dangerous occurrence to your superior.
9. Curing emergency be strictly guided by the emergency action plan.

ANNEXURE-II

MUTUAL AGREEMENT

Between **M/s Global Coal & Mining Pvt. Ltd., Talcher** & **M/s Aryan Energy Pvt. Ltd., Talcher**

1.	**Name of the factory which will receive mutual aid** M/s Global Coal & Mining Pvt. Ltd. Plot No. 23 & 24, Industrial Estate, PO-South Balanda, Talcher, Dist-Angul (Odisha)-759116	1.	**Name of the factory which will provide mutual aid** M/s Aryan Energy Pvt. Ltd. Plot No. 25, Industrial Estate, PO-South Balanda, Talcher, Dist-Angul (Odisha)-759116
2.	**Hazards associated with the factory** Fire Hazard due to Coal, HSD & Transformer Oil	2.	**Hazards associated with the factory** Fire Hazard due to Coal, HSD & Transformer Oil
3.	**Facilities available** (1) Fire Extinguisher (2) Breathing Apparatus (3) Emergency Light (4) First Aid (5) Ambulance Van (6) Water Tanker with Pump (7) Trained First Aid Persons	3.	**Facilities available** (1) Fire Extinguisher (2) Breathing Apparatus (3) Emergency Light (4) First Aid (5) Water Tanker with Pump (6) Water filling point at Pond (7) Trained First Aid Persons
4.	**Facilities to be provided during emergency** (1) Fire Extinguisher (2) Breathing Apparatus (3) Emergency Light (4) First Aid (5) Ambulance Van (6) Water Tanker with Pump (7) Trained First Aid Persons	4.	**Facilities to be provided during emergency** (1) Fire Extinguisher (2) Breathing Apparatus (3) Emergency Light (4) First Aid (5) Water Tanker with Pump (6) Water from the Pond (7) Trained First Aid Persons
5.	**Contact person with designation and Mobile No.** Mr. S.K. Mitra Sr. General Manager / Plant Manager Mobile No-7752010902	5.	**Contact person with designation and Mobile No.** Mr. S. C. Dey, General Manager (Washery) Mobile No-7752014905

For Global Coal & Mining Pvt. Ltd.

(S. K. MITRA)

Sr. General Manager / Plant Manager

Signature of Occupier / Manager with seal

Directorate of Factories & Boilers BBSR Odisha

Occupier / Director

Aryan Energy (P) Ltd.

Signature of Occupier / Manager with seal

ANNEXURE-III

(A) DETAILS OF TELEPHONE NUMBERS OF KEY PERSONNEL

TELEPHONE NUMBERS OF KEY PERSONS TO DEAL WITH EMERGENCY / DANGEROUS OCCURENCE			
Sl. No.	Name & Designation	Designation as per emergency command structure	Telephone Numbers
1.	Sri K. Patra Executive Director	Works Main Controller	9437029288
2.	Sri S.K Mitra Sr. General Manager	Alternate Works Main Controller	7752010902
3.	Sri K. Banerjee General Manager (Engg.)	Site Incident Controller	7752010903
4.	Sri P.C Sahoo Manager (Mech.)	Alternate Site Incident Controller	7752010932
5.	Sri N. Dehury Sr. Engg. (Prod)	Combat Team Leader	7752010931
6.	Sri S.K Pradhan Sr. Engg. (Elect.)	Alternate Combat Team Leader	7752010907
7.	Sri M.Singh Security I/c	Rescue Team Leader	9861352500
8.	Sri Prashant Ku. Pradhan Sr. Engineer (Operation)	Alternate Rescue Team Leader	7752012870
9.	Sri K. Samal Sr. Executive (Adm.)	Auxiliary Team Leader	7752010911
10.	Sri A. Ghosh Manager (M & M)	Alternate Auxiliary Team Leader	7752010910
11.	Sri Susil Ku. Sahoo Asst. Engineer	Member of Combat Team	7752012864
12.	Sri Ajay Ku. Choudhury Asst. Engineer	Member of Combat Team	7752010954
13.	Sri Bikash Ku. Sahoo Jr. Engineer	Member of Combat Team	7752010957
14.	Sri Shraban Ku. Rout Asst. Engineer	Member of Rescue Team	7752010933
15.	Sri Braja Ki. Behera Jr. Engineer	Member of Rescue Team	7752010921
16.	Sri Prasant Ku. Rath Asst. Chemist	Member of Rescue Team	7752010950
17.	Sri Narendra Ku. Sahoo Asst. Exec. (R.M.)	Member of Auxiliary Team	7752010909
18.	Sri Bimal Ku. Rath Heavy Vehicle I/c	Member of Auxiliary Team	7752010918
19.	Sri Ratnakar Sahoo Asst. Supervisor	Member of Auxiliary Team	7752010959

ANNEXURE-III

(A) DETAILS OF TELEPHONE NUMBERS OF KEY PERSONNEL

TELEPHONE NUMBERS OF KEY PERSONS TO DEAL WITH EMERGENCY / DANGEROUS OCCURENCE			
Sl. No.	Name & Designation	Designation as per emergency command structure	Telephone Numbers
1.	Sri K. Patra Managing Director	Works Main Controller	9437029288
2.	Sri S.K Mitra Sr. General Manager	Alternate Works Main Controller	7752010902
3.	Sri K. Banerjee General Manager (Engg.)	Site Incident Controller	7752010903
4.	Sri P.C Sahoo Manager (Mech.)	Alternate Site Incident Controller	7752010932
5.	Sri N. Dehury Manager (Prod)	Combat Team Leader	7752010931
6.	Sri S.K Pradhan Manager (Elect.)	Alternate Combat Team Leader	7752010907
7.	Sri M.Singh Security I/c	Rescue Team Leader	9861352500
8.	Sri Prashant Ku. Pradhan Manager (Prod)	Alternate Rescue Team Leader	7752012870
9.	Sri K. Samal Manager (Adm.)	Auxiliary Team Leader	7752010911
10.	Sri A. Ghosh Manager (Trans.)	Alternate Auxiliary Team Leader	7752010910
11.	Sri Susil Ku. Sahoo Asst. Engineer	Member of Combat Team	7752012864
12.	Sri Ajay Ku. Choudhury Asst. Engineer	Member of Combat Team	7752010954
13.	Sri Bikash Ku. Sahoo Asst. Engineer	Member of Combat Team	7752010957
14.	Sri Shraban Ku. Rout Asst. Engineer cum Shift Incharge	Member of Rescue Team	7752010933
15.	Sri Braja Ki. Behera Asst. Engineer	Member of Rescue Team	7752010921
16.	Sri Prasant Ku. Rath Asst. Chemist	Member of Rescue Team	7752010950
17.	Sri Narendra Ku. Sahoo Sr.. Exec. (R.M.)	Member of Auxiliary Team	7752010909
18.	Sri Bimal Ku. Rath Asst. Executive (HV)	Member of Auxiliary Team	7752010918
19.	Sri Ratnakar Sahoo Supervisor	Member of Auxiliary Team	7752010959

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(B). DETAILS OF TELEPHONE NUMBERS OF STATUTORY AUTHORITY

Sl. No.	Authority	Telephone Number (Office)	Telephone Number (Residence)
1.	Addl District Magistrate, Angul	06764-230491,233609	06764-231252
2.	Sub-Collector, Talcher	06760-240720	06760-240444
3.	Fire Brigade, Talcher	06760-240222	
4.	Deputy Superintendent of Police, Talcher	06760-240657	06760-240337
5.	C.I of Police, Talcher	06760-240364	06764-236094
6.	OIC,4 Nos. Colliery P.S	06760-240278	9437090019
7.	Asst. Director of Factories and Boilers, Angul	06764-220164	
8.	Director of Factories & Boilers, Odisha, Bhubaneswar	0674-2396070	

(C) MEDICAL

Sl. No.	Name & address	Distance from the plant	Contact telephone number
1	District Hospital, Angul	15 KM	06764-230333
2	N.S. Central Hospital, MCL, Talcher	01 KM	06760-269183
3	Govt. Hospital, Talcher	07 KM	06760-240440

MATERIAL SAFETY DATA SHEET FOR HIGH SPEED DIESEL

1.	Physical State	Liquid
2.	Colour	Straw red
3.	Specific Gravity	0.86
4.	Flash Point °C	66
5.	Boiling Point °C	149
6.	Auto ignition Temperature °C	256
7.	Vapour Pressure	< 1 mm
8.	Solubility	NO
9.	Explosive Limit (% Volume in air)	5 – 7

A. POTENTIAL HEALTH EFFECTS

- **Inhalation:** - Irritation of the upper respiratory tract and eyes, with possible euphoria, dizziness, headache, dis co-ordination, ringing in the ears, convulsions, coma, and respiratory arrest.

- **Ingestion:** - Irritation of the mucous membranes of throat, esophagus and stomach which may result in nausea and vomiting; central nervous system depression may occur, if absorbed (see inhalation symptoms above). If aspirated, chemical pneumonitis may occur with potentially fatal results. Possible kidney and liver damage may be delayed.

- **Skin Contact:** - Defeating of the skin may occur with continued and prolonged contact. Irritation and burning sensation may occur on exposure to the liquid or mists.

- **Eye Contact:** - Severe burning sensation with temporary irritation and swelling of lids.

B. FIRSTAID MEASURES

- **Inhalation:** Get person out of contaminated area to fresh air. If breathing has stopped resuscitate and administer oxygen if readily available. **SEEK MEDICAL ATTENTION IMMEDIATELY.**
- **Ingestion:** Never give anything by mouth to an unconscious person. If swallowed, do not induce vomiting. If vomiting occurs spontaneously, keep airway clear. SEEK MEDICAL ATTENTION IMMEDIATELY.
- **Skin Contact:** - Wash contaminated areas with plenty of soap and water. A soothing ointment may be applied to irritated skin after thoroughly cleansing. Remove contaminated clothing and footwear.
- **Eye Contact:** - Immediately flush eyes with large amount of water for at least 15 minutes holding lids apart to ensure flushing of the entire eye surface. **SEEK IMMEDIATE MEDICAL ATTENTION.**
- **Note to Physician:** Do not induce vomiting, use gastric lavage only. Aspiration of liquid into the lungs could result in Chemical pneumonitis. Use of adrenaline is not advised. Treat symptomatically.

C. FIRE FIGHTING MEASURES

- Fire Fighting Instructions:- Use water fog, C02, foam, dry chemical or Halon to extinguish. Keep personnel removed from and up-wind of fire. Cool adjacent structures and storage drums with water spray. Evacuate area. Prevent runoff from fire control dilution from entering streams or drinking supply.

D. HANDLING AND STORAGE

- Store only in approved containers. Protect containers against physical damage. Outside or detached storage is preferred. Separate from oxidizing materials. Store in cool, well ventilated area of non-combustible construction away from possible sources of ignition. Keep away, from incompatible materials.
- **Product Use:** This product is intended for use as a fuel in engines and heaters designed for kerosene or diesel fuels, and for use in engineered processes. Use in other applications may result in higher exposure; and require additional controls, such as local exhaust ventilation and personal protective equipment.

E. PERSONAL PROTECTION

- **Airborne Exposure Limits:** None established.
- **Ventilation System:** Not expected to require any special ventilation.
- **Personal Respirators:** Respiratory protection is not required unless product is sprayed or heated. Use approved respiratory protection following manufacture's recommendations where spray, mists, or vapors may be generated. Supplied air respiratory protection is required for IDLH (immediately dangerous to life and health) areas.
- **Skin protection:** Wear protective glove and clean body-covering clothing.
- **Eye protection:** Face shield and goggles or chemical goggles should be worn where mist or spray may be generated, and where splashing occurs. Shower and eyewash facilities should be accessible.

ACCIDENTAL RELEASE MEASURES

- If material is spilled, steps should be taken to contain liquid and prevent discharges to streams or sewer systems and control or stop the loss of volatile materials to the atmosphere. Spills or releases should be reported, if required to the appropriate local, state and federal regulatory agencies.
- **Small Spills:** Remove ignition sources. Absorb spilled material with non-combustible materials such as cat litter, dirt, sand, or petroleum as sorbent pads/pillows. Do not use combustible materials like rags, wood chips, or saw dust. Remove contaminated materials to an appropriate disposal container.
- **Large Spills:** Remove ignition sources. Dike spill area with sand or dirt to contain material and cover sewers/drains. Remain upwind and keep unnecessary people away. Contact trained emergency response team for cleanup. Remove liquid using grounded suction pumps, isolate hazard area and deny entry.

G. TRANSPORTATION

- It is transported as combustible liquid following the transport rules of hazardous chemicals

MATERIAL SAFETY DATA SHEET

DURALIFE® TRANSFORMER OIL- ALL GRADES

MSDS Number : 12038

1. PRODUCT AND COMPANY IDENTIFICATION Revision Date : 8/09/2010

Product Name : DURALIFE® TRANSFORMER OIL- ALL GRADES

2. HAZARDS IDENTIFICATION:

IMMEDIATE HEALTH EFFECTS:

EYE: Not expected to cause prolonged or significant eye irritation.

SKIN: Contact with the skin is not expected to cause prolonged or significant irritation. Not expected to be harmful to internal organs if absorbed through the skin.

INGESTION: Not expected to be harmful if swallowed.

INHALATION: This product is not expected to pose an inhalation hazard under conditions of normal use. This product has a low vapor pressure and is not expected to present an inhalation hazard at ambient conditions. Caution should be taken to prevent aerosolization or misting of this product. Acute and chronic overexposures generated under unusual conditions may be irritating to the respiratory tract.

3. FIRST AID INFORMATION:

EYE CONTACT: Immediately flush eyes with large amounts of water and continue flushing until irritation subsides. If material is hot, treat for thermal burns and seek immediate medical attention.

SKIN CONTACT: No treatment is necessary under ordinary circumstances. Remove contaminated clothing. Wash contaminated area thoroughly with soap and water. If material is hot, submerge injured area in cold water. If victim is severely burned, move to a hospital immediately.

INHALATION: This material has a low vapor pressure and is not expected to present an inhalation exposure at ambient conditions. If vapor or mist is generated when the material is heated, and the victim experiences signs of respiratory tract irritation, remove to fresh air.

INGESTION: No treatment is necessary under ordinary circumstances. Do not induce vomiting. This material does not present any known ingestion hazard.

4. FIRE AND EXPLOSION INFORMATION :

Flammable Properties :

Flash Point : > 293 °F (145 °C) Test Method : ASTM D 92 (C.O.C.)

Flammable Limits in Air

Upper Percent: NA

Lower Percent: NA

Auto-ignition Temperature: > 270 °C

Test Method: NA

NFPA Classification: Health: 0 Flammability: 1 Reactivity: 0

Extinguishing Media: Use dry chemical, foam, or carbon dioxide.

Fire Fighting Measures

Special Fire Fighting Procedures and Equipment: Water may be ineffective but can be used to cool containers exposed to heat or flame to prevent vapor pressure buildup and possible container rupture. Caution should be exercised when using water or foam as frothing may occur, especially if sprayed into containers of hot, burning liquid.

Unusual Fire and Explosion Conditions: Dense smoke may be generated while burning. Carbon monoxide, carbon dioxide, and other oxides may be generated as products of combustion.

Hazardous Combustion By-Products: None

5. ACCIDENTAL RELEASE MEASURES:

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.

Accidental Release Measures: Stop the source of the leak or release. Clean up releases as soon as possible, observing precautions in Exposure Controls/Personal Protection. Contain liquid to prevent further contamination of soil, surface water or ground-water. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil.

6. HANDLING AND STORAGE INFORMATION :

Handling : Fire extinguishers should be kept readily available.

STORAGE: Do not transfer to unmarked containers. Store in closed containers away from heat, sparks, open flame, or oxidizing materials. See also additional information section below.

Empty Container Warnings

DRUMS: Empty drums should be completely drained, properly bunged and promptly returned to a reconditioned drum, or properly disposed. Empty containers retain product residue and can be dangerous.

PLASTIC: Do not reuse this container. Empty container may retain product residues.

7. EXPOSURE CONTROLS/PERSONAL PROTECTION:

Exposure Limits and Guidelines: This product does not contain any components with OSHA or ACGIH exposure limits.

Personal Protective Equipment

EYE/FACE PROTECTION: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as good safety practice.

SKIN PROTECTION: No skin protection is required for single, short duration exposures. For prolonged or repeated exposures, use impervious clothing (boots, gloves, aprons, etc.) over parts of the body subject to exposure. If handling hot material, use insulated protective clothing (boots, gloves, aprons, etc.). Launder soiled clothes. Properly dispose of contaminated leather articles including shoes, which cannot be decontaminated.

RESPIRATORY PROTECTION: Respiratory protection is not required under conditions of normal use. If vapor or mist is generated when the material is heated or handle, use an organic vapor respirator with a dust and mist filter. All respirators must be NIOSH certified. Do not use compressed oxygen in hydrocarbon atmospheres.

PERSONAL HYGIENE: Always wash hands and face with soap and water before eating, drinking, or smoking. Consumption of food and beverage should be avoided in work areas where this product is present.

ENGINEERING CONTROL/WORK PRACTICES: Use in a well-ventilated area. If user operations generate an oil mist, use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended mineral oil mist exposure limits.

8. PHYSICAL AND CHEMICAL PROPERTIES:

Appearance: Bright Yellow Pour Point : < -40 oF (- 40 oC)

Odor: Petroleum – mild Solubility in Water: Negligible in water

Physical State: Liquid Vapor Pressure : < 0.1 mm Hg

Boiling Point: > 482 oF (250 oC) Vapor Density (air=1): NA

Melting Point: -59.8 oF(-51 oC) pH : NA

Specific Gravity: < 1 Viscosity @ 40 oC: 12 c St m

9. STABILITY AND REACTIVITY INFORMATION:

Chemical Stability: : Stable

Condition to Avoid: High heat and open flames

Incompatible Materials to Avoid: May react with strong oxidizing agents

10. TOXICOLOGICAL INFORMATION:

Primary Eye Irritation	:	NA
Primary Skin Irritation	:	NA
Acute Dermal Toxicity	:	NA
Subacute Dermal Toxicity	:	NA
Dermal Sensitization	:	NA
Inhalation Toxicity	:	NA
Oral Toxicity	:	NA
Mulagenicity:	:	NA

11. DISPOSAL INFORMATION:

Regulatory Information: All disposals must comply with federal, state, and local regulations. The material, if spilled or discarded, may be a regulated waste. Refer to state and local regulations. Department of Transportation (DOT) regulations may apply for transporting this material when spilled

Waste Disposal Methods: Waste material may be land filled or incinerated at an approved facility. Materials should be recycled if possible.

12. TRANSPORTATION INFORMATION:

Highway / Rail (Bulk): Not Regulated

Highway / Rail (Non-Bulk): Not Regulated

The DOT description is provided to assist in the proper shipping classification of this product and may not be suitable for all shipping descriptions .Health and Environmental Label Language

CAUTION: Contains Petroleum Lubricant. Repeated skin contact can cause skin disorders.

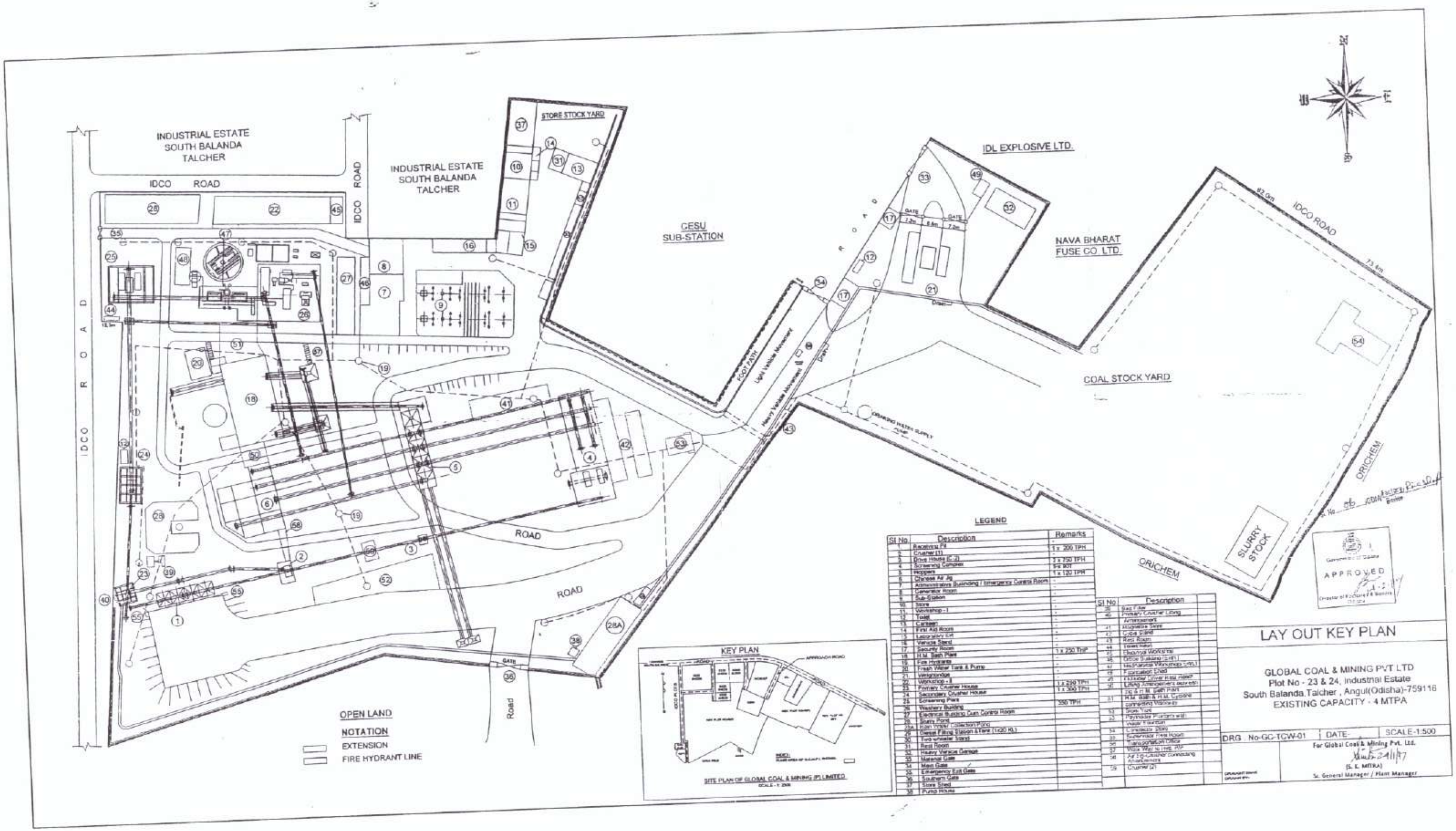
ATTENTION: Used motor oil is a possible skin cancer hazard based on animal data. Repeated

Exposure to oil mist in excess of the OSHA limit (5mg/m3) can result in accumulation of oil

Droplets in pulmonary tissue.

PRECAUTIONARY MEASURES: Avoid excessive & prolonged skin contact. Wash thoroughly after handling. Avoid generation and inhalation of oil mists.

INSTRUCTIONS IN CASE OF FIRE OR SPILL : In case of fire, use water spray, foam, dry chemical or carbon dioxide. Water spray may be ineffective, but can be used to cool containers. In case of spill, do not use water, soak up with absorbent material.



* Current Lay out is updated.