

CODE OF PRACTICE FOR HANDLING SMS/SME

- 1.0 OPERATION OF DELIVERY SYSTEM (STRAIGHT TYPE)
 - 1.1 Collect Gate pass and other relevant documents from the Sales Engineer or other concerned person and take the delivery system to the specified location of weighment.
 - 1.2 Get the weighment (as the case may be) done by appropriate Mines Authority, collect the relevant slip/documents and drive the BDS to the charging site.
 - 1.3 Collect the loading sheet from the Sales Engineer and ensure that every bore-hole is marked with distinct number and have been primed already.
 - 1.4 Ensure that individual bore-holes as mentioned in the loading sheet are properly primed, if not bring it to the notice of Sales Engineer and get it primed.
 - 1.5 Park the BDS near the borehole and earth the system with the chain link provided.
 - 1.6 Keep Density Test Kit, for checking density of the finished product, ready and handy.
 - 1.7 Helmet MUST be worn in Mines area and use PVC gloves and goggles for handling premix.
- 2.0 **CHARGING THE BORE HOLES IN THE MINES:**
 - 2.1 Park the BDS near the first bore hole. Ensure that earthing chain link touches the ground.
 - 2.2 Ensure that the coupling of the drive of the Explosive Pump is suitably guarded.
 - 2.3 Open Hydraulic Tank Valve.
 - 2.4 Start Engine.
 - 2.5 Engage the PTO(Power Take Off)
 - 2.6 Set the engine acceleration to 1200 rpm as indicated in the appropriate indicator on the dashboard.
 - 2.7 Energize the panel by switching if ON.
 - 2.8 Start the Hydraulic pump, check and ensure that all the motors are functioning properly.
 - 2.9 Open the premix tank outlet valve.
 - 2.10 Lower the delivery hose and make sure that it reaches the bottom of the hole. Lift the hose by about 4m from bottom and allow the hose to hang.
 - 2.11 Build up pressure in the Gassing Agent solution tank and open the valve to check and ensure that the Gassing agent Rotameter is working properly.
 - 2.12 Set FCVs of different drives with respect to product delivery rate as per chart available at site.

- 2.13 Put switch on "auto" mode. Check the counter setting to "zero" and then set the counter as per loading sheet.
- 2.14 As soon as the Sales Engineer gives clearance, start charging by switching ON the appropriate button on the panel, when will start Product Pump and Water Lubrication Pump, simultaneously open the Gassing Agent injection valve and Water Lubrication valve.
- 2.15 Monitor the pumping pressure 6 to 10 kg/cm² by controlling flow of lubricating water.
- 2.16 Fine tune the dose of Gassing Agent(GA) by adjusting the GA control valve to get the desired flow (0.8 lt/min for 100 kg/min delivery rate – indicative figure) in the Rotameter and ensure the following while charging is in progress:
 - (a) GA flow constant at the desired level.
 - (b) Lifting the hose to commence ONLY after one minute of product charging the rate of lighting/retrieval NOT to exceed 2 to 3 m per minute.
 - (c) ¼ m of of the end hose remains immersed in the explosive column during charging.
 - (d) The speed of hose lifting should never be increased unless the end of the hose is completely detached from the explosive column.
- 2.17 In "auto" mode the charging will stop as soon as the counter mechanism reaches the setting made earlier.
- 2.18 Take out the delivery hose, take sample from the deliver hose (finished product) for checking "Cup Density" for adjustment of dose of GA in subsequent bore holes "Cup Density" should be maintained at, 1.00(+/-) 0.15 gm/ml for dry holes and 1.15 (+/-) 0.05 gm/ml for wet holes.
- 2.19 If the drop in Cup Density with time (25-35) minutes – indicative figure) is as desired then proceed to the next bore hole. Repeat all the operations 2.2, 2.7, 2.8, 2.10 & 2.11 till charging of all the bore holes is completed.
- 2.20 If the drop in Cup density with time is not as required, then adjust GA dosing level to achieve desired cup density and repeat as above. Even after adjusting the GA dosing if final cup density is not achieved within range, check and repair the hardware.
- 3.0 **CONCLUDING JOBS:**
- 3.1 Flush the delivery hose with compressed air, after completion of charging operation of the day.
- 3.2 Shut off the premix tank outlet valve and GA tank outlet valve etc. clean the PC pumps finally with water to clear all premix, flush the system with compressed air again.
- 3.3 Ensure that all spilled emulsion and left over samples of finished are either charged into a bore hole before stemming or bagged to bring back to the site.
- 3.4 Load all safety appliances, test kit tools, tape etc. back in the trunk.
- 3.5 Disengage the PTO and stop the hydraulic pump, oil system, valves, etc.
- 3.6 Take (with the permission of the Sales Staff) the delivery system to the Weigh bridge; the weight, record and return back to the site. Park it at its designated place.
- 3.7 Clean the vehicle, equipment with moistened cloth.
- 3.8 Inform the site in-charge of any special cleaning, repairs to be done.

- 3.9 Fill all appropriate documents and hand them over to the site incharge or keep these at designated places.
- 4.0 **OPERATION OF EMULSION (PROGRESSIVE CAVITY/RATIO) PUMP:**
- 4.1 NEVER run the pump DRY (when there is no flow of material into the suction line, indication will be drop and fluctuation in pressure) or DEADHEAD (When there is no flow due to blockage in the delivery line).
- 4.2 PREVENT ingress of foreign material into the pump, keep the hopper on the suction side of the pump covered all the time.
- 4.3 NEVER bypass, defeat or alter the set valves of the trips provided on the delivery line of pump, without proper authorisation.
- 4.4 NEVER blank off the line after the Bursting disc. It defeats the safety device. DO NOT carry out any modification without authorisation.

Director of Mines Safety
Raigarh Region

SYSTEMATIC SUPPORT RULES

Enclosure to letter No.....Dated

These Systematic Support Rules shall apply for extraction of pillars by Limited Span Caving Method in Panel 50 Level South of Upper Patpahari Seam of Bhatgaon Colliery of M/s SECL.

2.0 SUPPORT AT GOAF EDGES:

- (a) Cogs shall be set skin to skin at all goaf edges at intervals of not exceeding 30 cm.
- (b) A row of steel pit props/Rigid props shall be set as breaker props at strategic points and also at immediately behind the goaf edge cogs.
- (c) Two rows of roof bolts at an interval of not more than 0.6 m between the bolts in a row and 1.2 m interval in between rows shall be set to form first line of breaker support line in addition to a row of props as breaker props.
- (d) Indicator props shall also be fixed in the goaf for predicting the goaf moment to take safe withdrawal of persons during the goaf fall.

3.0 SUPPORT OF WORKING FACES:

- a) A row of cogs shall be set at intervals not exceeding 2.4 m along side the rib of the slice. Pit props shall also be set in between the cogs in the same row at intervals not exceeding 1.2 m from the cogs. In addition, remaining part of the slice and other area under actual extraction shall be supported with two/three rows of full column grouted roof bolts in such a way as to ensure that the interval between the bolts in the same row and between the rows shall not exceed 1.2 m so however that the front row of support shall not be kept more than 0.6 m away from the face before blasting.
- b) Cogs shall be set at all entrances to the areas under extraction and also at intervals of not more than 2.4m in the area under actual extraction.

Or

all entrances to the areas under extraction shall be kept supported by full column grouted roof bolts with W-straps at an intervals of not exceeding 1.0 m and distance between the bolts in the same row as well as between the rows shall not exceed 1.0 m .

- (c) Cross bars shall be set as and when required.

4.0 SUPPORT OF GALLERIES AND THE SPLITS:

- a) **Galleries and Splits:** All galleries and splits within a distance of 30m or a distance of two pillars from the pillar under extraction/splitting, whichever is greater, shall be kept supported by three rows of full column grouted roof bolts set at an intervals not exceeding 1.2 m between the same row and also between the two rows of bolts.

- b) **Support at junctions:** Cogs shall be set at all junctions of galleries and splits within a distance of two pillars from the pillar under extraction or a distance of 30m, whichever is greater.

Or

All junctions of galleries and splits within a distance of 30m or a distance of two pillars from the pillar under extraction/splitting, whichever is greater, shall be kept supported by full column grouted roof bolts with W-straps at an intervals of not exceeding 1.0 m.

- (c) All junctions either about to be formed while starting a gallery or a split gallery or when gallery or a split gallery is about to join a original gallery or a split gallery shall be supported either with a type of cogs which will not get easily dislodged due to the effects of blasting or by conventional timber chocks set on either side of such a junction with cross bars across them and kept tightly lagged or shall be kept supported by full column grouted roof bolts with W-straps at an intervals of not exceeding 1.0 m.

5.0 OTHER PROVISIONS:

SYSTEM OF SUPPORT FOR HAULAGE AND TRAVELLING ROADWAYS:

(a) The roof of all roadways used for haulage or tramming purpose and situated within a distance of two pillars from the pillar under extraction shall be kept supported by full column grouted roof bolts of length not less than 1.5 m set at intervals not exceeding 1.2 m in the same row and also between the rows.

(b) The junctions of galleries which cannot be supported by cogs due to the presence of tracks shall be kept supported with one cog on either side of the track with two or more cross bars at intervals not exceeding 1.2 metres or shall be kept supported by full column grouted roof bolts of length not less than 1.5 m set at an interval not exceeding 1.0 m between the bolts in the same row and also between the two rows.

(c) SUPPORT OF WIDE GALLERIES:

Galleries exceeding 4.8m in width shall be supported with cogs at intervals not exceeding 2.4m between the cogs and between rows of cogs in addition to the support specified under rules 4(a) & (b).

(d) Support of sides, faults, slips, cleats, etc.:

(i) All ledges in the roof shall be kept supported by at least two cross bars set over cogs.

or

Ledges formed during the extraction shall be supported by rope stitching at an interval of 1 m distance across the ledges. The stitched rope shall be kept tight against roof/ledge by placing wooden laggings therein.

(ii) Wherever the sides of the pillar have tendency to spall, those shall be kept supported by vertical props set at intervals not exceeding 1.2 m with suitable laggings put tight against the sides of the pillars. These props may be set in recesses cut in floor and roof close to the sides.

(e) Where the seam is traversed by prominent cleats or cleavage planes etc., the sides of the roadways shall be stitched effectively with steel wire ropes with lagging not more than 0.6m apart put tightly against the pillars. All overhangs which cannot be dressed and made safe shall be kept supported by inclined stay props at intervals not exceeding one metre. Such stay props shall be provided to support each overhang at two suitable horizons. The lid on top of each such inclined prop shall be not less than one metre in length.

(f) All the faults, visible slips, breaks or other geological disturbances in the roof shall be supported by cogs set at intervals not exceeding 2.4 m on either side of such disturbances and with cross bars set across them at intervals not exceeding 0.6 m which shall be set tight against the roof.

6.0 MISCELLANEOUS:

a) In addition to the supports referred at rule 2, props shall be set in between cogs and in between cogs and coal sides.

b) All cogs shall always be set with four corner props. In case of steel chocks, arrangements shall be made to provide stability of the chocks against oblique loading.

c) Before engaging work persons at a working place or face after every round of blasting thereat, all supports set in the vicinity of the same or upto the danger zone specified by the manager shall be tightened again and re-rected, if the same is dislodged or loosened due to any reason whatsoever. Temporary supports shall always be provided at the face during drilling holes for roof bolts, roof bolting or any other operation being carried out at the face.

- d) No timber less than 15cm in diameter shall be used for supports. No damaged props or chocks shall be used.
- e) The lids and wedges used with the props shall have a width not less than the diameter of the props, a thickness not less than 8cm. and a length not less than 0.5m.
- f) Where floor coal is taken, props shall not be left on coal stumps and the shorter props shall immediately be replaced with longer props. Where roof coal is taken, the shorter props shall immediately be replaced with longer props and the lip of coal shall be supported with a cog.
- g) The timber used in the construction of cog shall be not less than 1.2m in length and shall have at least two opposite sides joggled flat to provide suitable bearing surface.
- h) Props shall be set on solid floor and not on loose pack or material. They shall be kept tight against the roof. Where props are to be set on sand, a flat base piece not less than 5cm.thick 25cm. wide and 0.75m long shall be used.
- i) Cross bars shall be supported on props or in 0.5m deep holes and made in the sides of pillars. Every cross bars shall be made tight against the roof and if lagging is necessary for the purpose, the number of lagging used on a cross bar shall be not less than one for every one metre length of the bar, and the lagging shall be kept tight.
- j) Cogs shall be set on solid floor and not on loose packing or materials. They shall be kept tight against the roof to ensure maximum contact between the timber and the roof.
- k) If Intergrated Steel framed cogs are used, the same shall be topped by wooden sleepers not less than 30% of total height of the cog. The load bearing capacity of such integrated steel framed square steel cog stool/Chocks and that of steel pit props/Rigid props shall not be less than 500 kn and 200 Kn respectively, as specified in DGMS (TECH) (S&T)/Circular No.1, dated 05.01.2007.
- l) Support material used for roof bolting shall conform to the specifications laid down in DGMS(Tech)(S&T) Circular No.3 of 1996.

7.0 **MONITORING OF THE ROOF BOLTS:-**

- a) Anchorage testing of not less than 10% of the roof bolts shall be carried out upto a minimum load of 6 tonnes. The results of such tests shall be recorded in a bound paged book kept for the purpose.
- b) The roof bolts on which anchorage testing have been carried out shall be distantly marked and recorded.
- c) Anchorage testing shall be carried out under the personal supervision of an Overman authorised by the manager in writing. Only authorised person shall record the data of anchorage testing and sign therein which shall be countersigned by the manager.
- d) All the precautions and recommendations, as applicable, of the Technical Circular No.3 of 1996 regarding roof bolting shall be complied with.

8.0 All the provisions of Regulations 108(6), 109 and 110 of the Coal Mines Regulations, 1957 regarding setting and withdrawal of supports as and when applicable herein shall be complied with.

9.0 SUPPORT MATERIALS:-

- a) Adequate stock of support materials shall be kept in the stores in order to ensure availability thereof at the mine.
- b) The assessment of the support requirement shall be done by the manager of the mine and proper requisition in advance shall be made to ensure that at least adequate quantity of supports required are always kept in the mine.
- c) Owner and Agent including chief General manager/General manager of the Area, shall each be responsible for adequate supply of required quantity of support materials and trained manpower at the mine. A system of monitoring of the supply of supports and their performance shall be evolved in order to ensure that no workings are kept without or inadequately supported.
- d) Owner and Agent, including Chief General Manager/General Manager of the area, shall each be responsible for adequate supply of required quantity of support materials and trained manpower at the mine. A system of monitoring of the supply of supports and their performance shall be evolved in order to ensure that no workings are kept without or inadequately supported.
- e) All types of steel supports, cable & roof bolts, cement & resin grouts to be used for the purpose of securing roofs and sides of workings in the mine shall be of such types, standards and makes as approved by the Chief Inspector of Mines, as required by DG'S (Tech) (S&T) Circular No.3/703, Dhanbad, dated 14.08.2008.

10.0 MISCELLANEOUS:

- a) Additional supports shall always be provided to secure roof and sides of the working places during bolting, stitching or any other operation incidental therein.
- b) Additional supports shall be erected as and when required.

Modified

**Director of Mines Safety,
Raigarh Region, Raigarh.**

Manager
Bhatgaon Colliery

The following precautions shall be taken: [(Reg.100A of CMR,57 to Extract coal by Longwall Retreating with Caving Method deploying Powered Supports and Double Ended Ranging Drum (DERD) Shearer]

1. No body shall remain in underground during blasting. Immediately before and after blasting, readings of legs pressure shall be recorded. The atmospheric condition behind chock shield powered supports shall be checked by MSA Methanometer/other automatic recording instrument of approved type. If inflammable gas is detected, blasting shall not be done.
2. Tests for presence of CO shall be done by automatic CO detector of approved type and blasting shall not be done if CO is detected behind the chock shield powered supports.
3. The goaf shall be heavily treated with incombustible dust from a safe distance before blasting. Treatment of coal dust shall also be done in goaf and gate roadways as a regular practice. Stone dust barrier shall be installed at the gate roadways of the panel.
4. The drilling and blasting operation shall be placed under the charge of a 1st class assistant Manager. Operations in underground and on surface during blasting shall be coordinated by the Manager of the Mine.
5. No body shall enter in underground within one hour of blasting and before the fumes are cleared by adequate ventilation and the longwall face is declared safe.
6. Before entering into the panel, presence of CO & CH₄ and other noxious gases shall be checked in the return of the longwall panel by the Assistant Manager.
7. Longwall crew and any other person shall be allowed to enter the face only after checking of face & gate roadway supports, ventilation and atmospheric condition by the Assistant manager.
8. Details of blasting, inspection results, legs pressure reading and convergence at face and gate roadways etc. shall be recorded in bound paged book by the Assistant Manager and it should be countersigned by the Manager.

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