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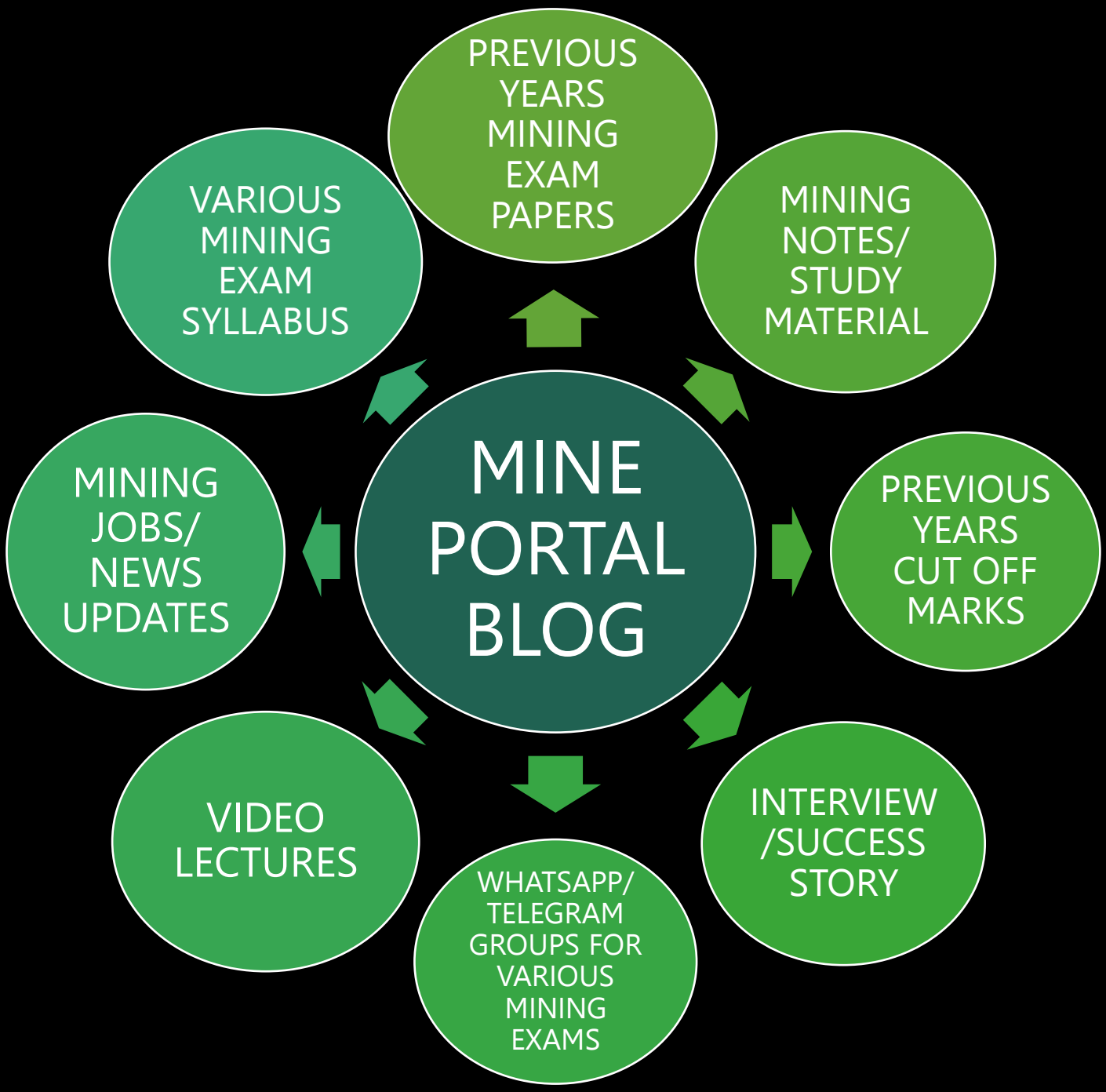

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NOTES ON
STONE DUST BARRIERS

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NOTIFICA TION

Dhanbad, the 1st October, 2018

G.S.R. 979(E).—In exercise of the powers conferred on me as Chief Inspector of Mines, under sub-regulation (2) of Regulation 146 of the Coal Mines Regulations 2017, I, Prasanta Kumar Sarkar, Chief Inspector of Mines, also designated as the Director General of Mines Safety, hereby, specify the type of stone dust barrier to be provided in a belowground coal mine as follows:

1. GENERAL:

- 1.1 Stone dust barriers shall be placed in the full path of the explosion and the shelves shall be so arranged that their collapse in the event of an explosion is not impeded.

- 1.2 Barriers shall be sited as low as convenient within the upper third of the roadway; and no part of any shelf and no stone dust on it shall be less than 10 cms. from the roof or sides of the roadway or any roadway support. In addition, the shelves shall be constructed and installed that, in the event of an explosion, they fly without obstruction along the roadway.

2. DESIGN OF BARRIERS:

- 2.1 The stone dust shall rest on boards which run longitudinally in the roadway and whose length equals the width of the shelves. These boards shall rest on a rigid frame, the two members of which shall be at least 15 cms. in depth and rest on their edge on two fixed rigid brackets.

- 2.2 Neither the boards nor the frame shall be fastened either to each other or to the fixed brackets.

- 2.3 Primary or first or light barriers which are intended to be installed nearest to be a possible point of ignition, when installed, shall consist of lightly loaded shelves (see below) not more than 35 cms. in width.

- 2.4 The distance between two shelves of a light barrier shall be not less than 0.9 m. and not more than 2.0 m.

- 2.5 The shelves of a light barrier shall be loaded with not more than 30 kg. of dust per metre of shelf length and the total quantity of stone dust in the barrier shall be less

than 110 kg. of stone dust per sq. metre cross-section.

- 2.6 Secondary or heavy type of barriers (see below) intended for use further outbye shall consist of one third of its shelves lightly loaded and spaced (see below) as in case of primary barriers.

- 2.7 The loading for a heavy barrier shall be 390 kg. per sq. metre of the cross-section. The shelves shall not exceed 50 cms. in width and their loading shall not exceed 60 kg. per metre of shelf length.

- 2.8 The distance between heavily loaded shelves or between a heavily loaded shelf and a lightly loaded shelf shall not be less than 125 cms. and not more than 270 cms.

- 2.9 The lightly loaded shelves shall be adjacent to each other and placed at the in bye end of the barrier.

- 2.10 Where circumstances require intermediate barriers, such barriers shall be loaded with 195 kg. of dust per square metre of roadway, half the dust being placed on lightly loaded shelves and half of heavily loaded shelves. The lightly loaded shelves being arranged at the inbye end, as in the case of heavy barriers.

- 2.11 When calculating the quantity of stone dust in a barrier, cross sectional area shall mean the average cross sectional area determined by an offset survey of the roadway where the barrier is installed. The amount of stone dust in the lightly loaded shelves in a heavy barrier shall be calculated proportionately on the basis of average length of the shelf as determined from the offset survey plan.

- 2.12 For maximum dispersibility the dust shall be piled loose on the shelves. The dust shall also be of a type that will not cake in use; in damp or wet condition water-proofed stone dust shall be used.

- 2.13 Where a roadway has to be enlarged to provide sufficient height to accommodate a barrier, the ripping shall extend over a distance on each side of the barrier equal to at least 20 times the difference between the height of the top of the stone dust on the barrier and the height of the unripped roadway.

- 2.14 When sitting a barrier, the distance as specified shall be measured from the shelf nearest to the face.

3. BOARD AND PILLAR WORKINGS:

- 3.1 The workings in the mine shall be divided into sections so that an explosion occurring in one section may not spread to another. The barriers may be sited in relation to group of adjacent headings.

- 3.2 In board and pillar working, only a heavy type barrier may be provided at a suitable site in relation to the groups of headings in a district intended to be served by the barrier. Such a barrier shall be provided at a distance of not less than 135 metres from the nearest working face and not more than 365 metres from the farthest face.

- 3.3 Heavy barriers shall be provided in all the entries to the district. When in any entry a stopping is to be provided instead of a dust barrier, such stopping shall be explosion proof. If any dispute arises whether a stopping is explosion proof, it shall be referred to the Chief Inspector for decision so, however, that such stopping shall be of strong construction with brick in cement and not less than 1.8 metres in thickness and located at a position corresponding the inbyeend of the barriers. The gallery outbye of such stoppings shall be kept cleared of coal dust heavily stone-dusted and adequately ventilated.

- 3.4 The barrier including the explosion proof stoppings, if any, shall be provided at fresh sites as the faces advance, in order to comply with the conditions mentioned under para 3.2 above.

- 3.5 The sites of stone dust barriers shall be predetermined at the time of planning the mine and the pillars at such sites shall be of adequate size so that the shelves of the barriers are included in about one pillar length. Where the shelves of a stone dust barrier extend through a junction of galleries, either the cross galleries shall be blocked off by stopping and such galleries kept adequately treated with stone dust and ventilated, or the shelves extended into the cross galleries for a length on either side which is not less than the length of barrier extending over the junction and outbye of it.

- 3.6 Where it is impracticable to site a barrier within the upper limit of 365 metres, the matter may be referred to the Chief Inspector.

- 3.7 When a new district is being developed, a barrier or barriers shall be sited in the adjacent transport road within the distance mentioned under para 3.2 to give protection in relation to the group of newly started headings.

- **4.0 SINGLE HEADINGS IN COAL:**

- 4.1 When a single heading is driven from an existing main roadway, a barrier of heavy type shall be sited in the main road at a distance specified under para 3.2 measured from the face of the heading.

- **5.0 LONGW ALL WORKINGS:**

- 5.1 A barrier of light type shall be installed in all longwall gate conveyor roads within the range of 45-110 metres from the nearest point of the face.

- 5.2 A second barrier of heavy type shall be installed in longwall gate conveyor roads at a distance of 180-320 metres from the face.

- 5.3 When a conveyor gate is being developed and the road is too short to accommodate barriers, a light and a heavy barrier shall be sited on the trunk conveyor road outbye of the transfer point at the respective distances mentioned under para 5.1 and 5.2.

- 5.4 Where the trunk conveyor road passes inbye of the transfer point to other districts, two more such barriers shall be provided in the corresponding positions, inbye of the transfer point.

- 5.5 For a newly developed face which does not have a separate ventilating split, a pair of barriers shall be sited on the trunk road at the distances specified above.

- 5.6 Where a number of longwall faces are being developed from a relatively short length of trunk road, protection shall be provided to prevent an explosion occurring at any face from spreading to other parts of the mine and also as far as practicable, so as to prevent an explosion from spreading to an adjacent face. Where practicable, this protection shall be provided by a system of light and heavy barriers.

- **6.0 SHAFT INSETS:**

- 6.1 Where more than one seams are worked from the same shafts, heavy type of barriers shall be sited in the roads adjacent to the shaft landings in each seam at a distance of 90 m. to 150 m. from the landing. These barriers shall, as far as possible, be so arranged that they are in the middle of a straight stretch, at least 180 m. in length.

- **7.0 BARRIERS IN THIN SEAM:**

- 7.1 In thin seam where the roof condition does not allow heightening of roadways to accommodate barrier shelves in the manner specified under paragraph 1.1 and 1.2, stone dust barriers may be provided in the following manner:-

    - (a) In the travelling roads and airways other than haulage roads, the stone dust barrier shelves may be provided of shorter length, leaving a clear space of at least 10 cms. on one side, and up to 90 cms. on the other side for passage of men, provided that the length of the shelves shall not be less than 180 cms. suitable type of fencing shall be provided between the travelling passage and the part of the roadway containing barrier shelves.

    - (b) In the haulage and tramming roads, the stone dust barrier shelves may be provided on either side of the track leaving a clear space of at least 10 cms.

from the side of a tub and a shelf. Provided that the length of the shelf shall not be less than 90 cms. and where the roadway cannot be safely widened to accommodate such shelves, the shelves may be located on the side of the track.

- (c) The total quantity of stone dust in the stone dust barrier shall be at least 1-1/2 times of that required in normal cases, the rate of loading of shelves remaining the same.

- (d) The part of the roadway containing the stone dust barriers shall be kept clean of coal dust and adequately treated with stone dust on roof, floor, and sides including cogs and other supports.

- **8.0 MAINTENANCE:**

- 8.1 For proper discharge of his statutory duties, the Ventilation Officer shall ensure proper construction and maintenance of the barriers in the following manner :-

  - (a) He shall examine the stone dust barriers once at least in every week. As a part of this examination, dispersability of the dust shall be tested by taking some dust in hand and blowing on it. If this shows that the dust has tended to cake or consolidate, the dust in the barrier shall be removed and replaced by fresh dust.

  - (b) He shall arrange for repair of any damage to the shelves or other parts of the barrier.

  - (c) He shall supervise the erection of new barriers as required.

  - (d) He shall write a report on such inspection and on any action taken or required. The report shall be countersigned by the manager. In the book maintained for such reports, there shall also be recorded all data concerning position, quantity of stone dust, cross section of the road in which the dust barrier is situated, date of inspection and renewal of stone dust and any other relevant particulars.

  - (e) If at any time, the Ventilation Officer is not in a position to rectify any defect, or damage to a barrier, he shall report the matter to the manager who shall take immediate action to put the barrier in proper order.

- 8.2 If any defect in the stone dust barrier is not possible to be removed forthwith, shotfiring shall be stopped in the district or districts concerned, pending remedy of the defect as early as possible.

- 8.3 The barriers, as required, shall be moved at necessary intervals to ensure that they are maintained constantly within the recommended range of distance from the face.

- **9.0 CHECK BOARDS :**

  - 9.1 A board shall be provided near each barrier on which the following information shall be recorded.

    - (a) Cross-section of the roadway.
    - (b) Total dust loading on the barrier.
    - (c) Number and loading of shelves.
    - (d) Date of last removal of stone dust.
    - (e) Reference number of the barrier.
    - (f) Date of last inspection by the Ventilation Officer.
    - (g) Signature of the Ventilation Officer.

  - 9.2 The following particulars in respect of stone dust barrier shall be shown on the rescue and stone dusting plans :-

    - (a) Position, type of barriers, and date of their construction.
    - (b) Projection for next position of the barriers, and the likely date of their installation.

These Plans shall be brought up-to-date not less than once in three months and copies of the stone dusting plan shall be provided to the officials and competent persons responsible for examining and maintaining the barriers.

Q. What should be the minimum gap between stone dust loaded on the shelves of stone dust barrier and roof of the gallery :

(a) 20 cm
(b) 15 cm
(c) 10 cm
(d) 05 cm

Ans - c (Cir Leg 1.2 0f 06/1975)