DIRECTORATE-GENERAL OF MINES SAFETY

DGMS (Tech)(SOMA) Circular No.1 of 2001 Dhanbad,dated the18.01.2001

To
All Owners. Agents & Managers of all mines.

Sub: Recommendations of Gaslitand Court of Inquiry

The Court of Inquiry appointed under Section 24 of the Mines Act, 191 to enquire into causes and circumstances attending the accident that occur in Gaslitand Colliery of M/s. Bharat Coking Coal Limited on 27th September 1995 causing loss of 64 lives due to inundation, made the following recommedations.

(1) Before the onset of monsoon, mines situated by the side of the river other water sources should be inspected by the Directorate-General Mines Safety along with the mine management.

(2) The feasibility of reclamation of opencast workings including the discus ones, near rivers and major source of water, particularly those, have connections to belowground workings either directly or through subsidence cracks and fissures may be examined to prevent inundation in sub mines.

(3) Detailed precautionary measures against danger of inundation should be laid down while working beneath or in the vicinity of rivers and major surface water bodies, particularly during the rainy season. This may include framing, and implementing standing orders for safe withdrawal of person provision of float alarm as a means of warning in case of rise in water level in the river in addition to river guards and an effective and speedy communication system which can function even independent of electricity and work in adverse conditions.

(4) The need for fore warning the mines about possible impending heavy rain similar to the warning of impending cyclone issued in costal areas, mines perhaps go a long way in ensuring safety of mine workers from inundation. The feasibility of linking the coalfields to the local meteorological observatories tones for timely dissemination of information may be examined,

(5) The possibility of stoppage of winders due to non-availability of motive force be it steam or electricity, particularly in adverse weather conditions continue to exist in the mine. Therefore, mines which have pits as the only means of exit may require captive generators in working conditions to run the winders in case of emergency. In case of steam boilers, basic precau-tionary measures like-keeping the boilers under proper shed, providing sufficient insulation around the boilers and the pipelines as well as attend-ing the boilers constantly particularly in adverse weather need to be religiously followed:

(6) The need for an effective communication system over and above the signaling system between the surface and belowground which shall remain in operation even with failure of electricity and also be rugged enough to remain operative in adverse conditions has been felt strongly. Suitable system may be developed, if not already available and used in belowgiound mines.

(7) Interline barrier is an effective means to prevent transference of danger from one mine to another, in mines where the barrier have become ineffective due to interconnections or otherwise, the same may be restored early, even artificially, by constructing suitable dams, explosion roof stoppings and other methods.

(8) All disused pits. potholes and surface subsidence existing in the vicinity of river or surface source of water and where there is a danger of inundation present, shall be sealed by reinforced concrete sealsor other suitable effective means.

Proper implementation of safety measures in accordance with these recommendations can bring about definite improvement in the safety standards in the mines as far as danger of inundation is concerned .

You are requested to take suitable steps to implement the recommendations of the Court of Enquiry in the mines under your control.

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(Director-General of Mines Safety)

DIRECTORATE _GENERAL OF MINES SAFETY

DGMS(Tech) (SOMA)Circular No 2 of 2001 Dhanbad, Dated The 13.02.2001

To.

The Owners, Agents & Managers of all Mines

Sub: Recommendations of Gaslitand Court of Enquiry.

The Court of enquiry appointed -under Section 24 of the Mines Act, 1952 to enquire into the causes & circumstances attending to the accident that occured in Gaslitand Colliery of M/s Bharat Coking Coal Limited on 27.9.1995 causing loss of 64 lives

made the following recommendation in addition to those circulated vide DGMS(Tech) (SOMA) Circular No 1 of 2001 dt 18.1.2001.

1) Sanicity of Mine boundary : A Mine boundary should be such as to contain hazards caused due to mishap in a neighbouring mine with the help of suitable where such barriers do not exit, neighbouring mines will have to isolated and protected with construction of suitable protective measures along the boundary in all seam workings keeping in view of the nature of the hazard. There should be no horizontal transfer of property between two mines.

2) Embankment: Construction of embankment is an engineering activity meant to provide protective measures against hazard of inundation from surface water. The current practice of embankment construction is limited to the geometric dimensions only. There are no guidelines regarding the foundation design, the material of construction, nature of slope facing and the procedure of construction. There is an urgent need for modification and framing guidelines concerning the above parameters for embankment construction.

3) River channel: In the jharia coalfield with a high concentration of coal seams being worked in the neighbourhood and under the river channels, the later are found perched at higher levels compared to the post-mining depressed surface topography of the immediate neighbourhood. In case of breach of embankments constructed to provide preventive measures against inundation, the river course finds its way to the adjacent depressed land thereby providing a large source of water supply adding to the magnitude of the problem. Such topographic changes in the surface profile need to be prevented and/or remedied by suitable corrective action.

4) Highest known flood level (H.F.L): The height of a protective embankment is related to the HFL. The HFL on the other hand is related to the amount of water flow in the river channel during a particular year. This however, presupposes the cross section of the river channel remaining undisturbed. In reality this gets disturbed due to mining activity as well as considerable amount of sitting. Thus it would be necessary to adjust the HFL according to the changed river channel cross section.

5) Abandoned pits : All pits proposed to be abandoned pits are to be properly secured at the collar level against hazards of inundation by surface water.

You are requested to take suitable steps, to implement the recommendation of the court of Enquiry in the mines under your control.

ADDITIONAL DGMS CIRCULARS ISSUED RECENTLY

D.G.M.S. Cir (Tech.) dt. 18.6.2001 to u.g. metalliferous mines

Use of vital safety items in mines

There are certain vital safety items like winding rope, cage suspension gears etc. which are required to be approved by this Directorate if used in coal mines but there is no provision in the Metalliferous Regulations, 1961 for according DGMS approval for such items.

Since any failure of rope/cage suspension gear in shaft/winze in any mine may prove disastrous, user mines, in metalliferous sector, must ascertain that items like ropes/cage suspension gears conform to relevant Indian Standards and are manufactured in workshops of repute having adequate manufacturing and testing facilities.

Some basic guidelines to assess the competency of the manufacturers and expected standards/quality of such items are given below.

Winding Ropes

(i) Design/construction should conform to BIS 1855 of 1977 for round strand and flattened strand ropes and the design/construction of locked coil ropes should conform to BIS 3626 of 1978.

(ii) All indigenous manufacturers of winding ropes shall be BIS Licensee.

(iii) Foreign manufacturers who are not BIS Licensee must possess ISO 9002 quality standard or its equivalent as acceptable in India.

Cage Suspension Gears

(1) Design/construction of cage suspension gears shall conform to BIS 7587 (Part 1 to Part 8) in general. If the design/ construction of the items are not covered under BIS, such design/construction must be proven from past performance.

(2) The material of cage suspension gear components shall be conforming to BIS 7587.

(3) The heat-treatment of the items shall also be in accordance with the guidelines stipulated in BIS 7587.

(4) Factor of safety of the cage suspension gear components shall be atleast 10. Threaded joints shall be avoided as far as possible but if the same can not be avoided, factor of safety of the threaded joints shall be atleast 15.

(5) All tests are to be carried out as prescribed in BIS 7587 Part 1 (general requirement) and certificate of test to be submitted in the proforma prescribed in the standard. User Industry and the manufacturer may decide where such testing shall be carried out.

(6) Manufacturer must have adequate manufacturing facilities and forging facilities.

For forging, the recommendation of hammer capacities are as follows—

(i) upto 10 tonne SWL - minimum 250 kg. Hammer.

(ii) upto 12 tonne SWL - minimum 500 kg. Hammer.

(iii) upto 20 tonne SWL - minimum 1000 kg. Hammer.

(7) Manufacturer must have adequate testing facilities manned with qualified personnel to ensure quality.

Minimum qualification for carrying out NDT for Magnetic Particle Flaw Detection and Ultrasonic Flaw Detection shall be Level II competency certificate issued by ISNT/ASNT . I

Permissible imperfections for magnetic particle inspection are given at Annexure-A.

(8)Manufacturer must have sufficient experience in the trade.

(9)Surface finish of the various parts of the Cage Suspension Gears shall be as follows—

(i) for pins and holes - 0.8 to 1.6 Micron

(ii) for mating surfaces - 1.6 to 3.2 Micron

(iii) for outside surface - 3.2 to 6.4 Micron

(10) Ductility properties- Izod impact test values of the standard specimen as per IS 1598 of 1977 shall not be less than 4, 8 kgf. mtr.

(11) Non metallic inclusion rating in the steel not be more than type 1.5 as described in IS 4163 of 1982.

(12) Hardness for the various materials shall be as follows—

(i) 11Mn2 -190 to 220 HV

(ii) 20 Mn2 - 200 to 230 HV

(iii) 20 Ni 55 Cr M0 20 -250 to 280 HV

You are requested to comply with the above requirement in the interest of safety.

Appendix - A

Permissible Imperfections for Magnetic Particle Inspection

Al. Magnetic particle flaw detection shall be carried out as per IS 3703. The type of defects and their limits are given below.

A2. Imperfections in components may be in the form of :

(a) non-metallic inclusions which are inherent in steels : and

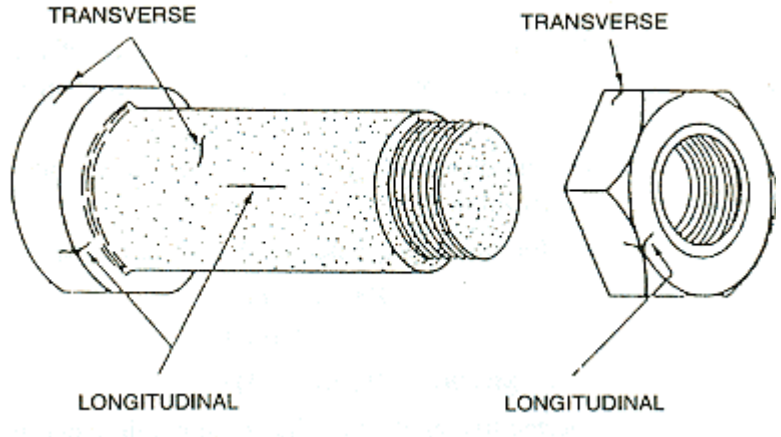
(b) cracks.

Note : Magnetic particle inspection will reveal these imperfections when they are on or just below the surface.

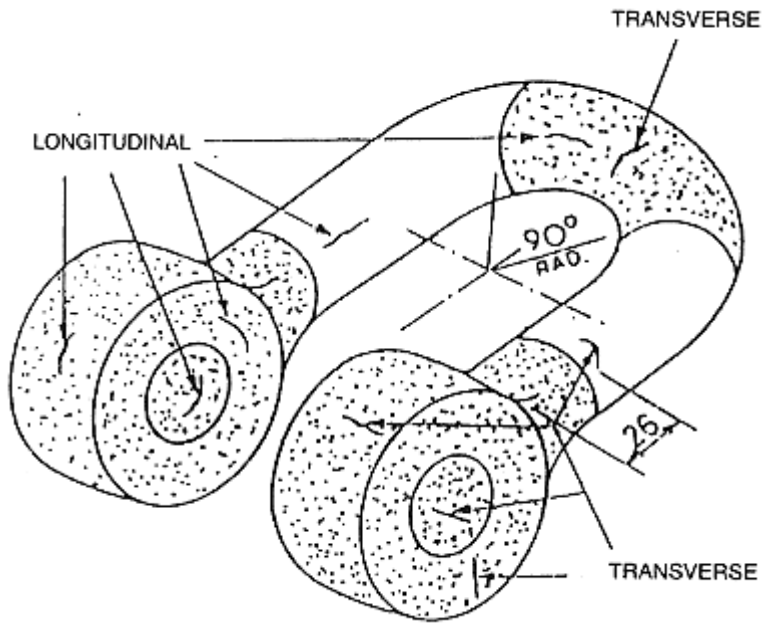
A3. Limits of Permissible Imperfections—Tables given under Figures Al to A11 show the limits of permissible inclusions. Cracks shall not be permitted.

A4. A longitudinal imperfection is one which generally runs parallel to the major dimension of the component: a transverse imperfection is one which runs at right angles to the line defined for a longitudinal imperfection.

A5. Record. Imperfections which, although within the permissible limits, are of a large number, unusual pattern or direction, should be recorded on the component certificate.

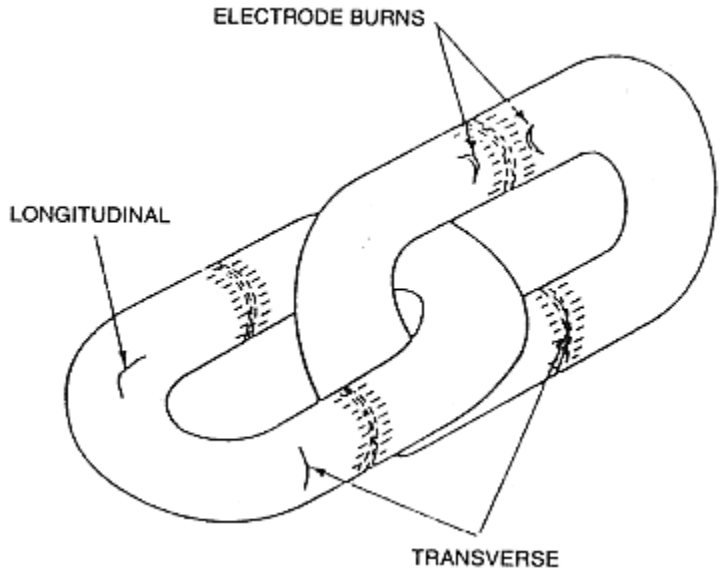


PART	TYPE OF IMPERFECTION	PERMISSIBLE IMPERFECTIONS
PIN: BARREL & THREAD	SHADED AREAS TRANSVERSE	NONE
	LONGITUDINAL	NONE > 32mm ($1^{1/4"}$)
PIN HEAD & NUT	UNSHADED AREAS TRANSVERSE	NONE > 10mm (3/8")
	LONGITUDINAL	NONE > 10mm (3/8")



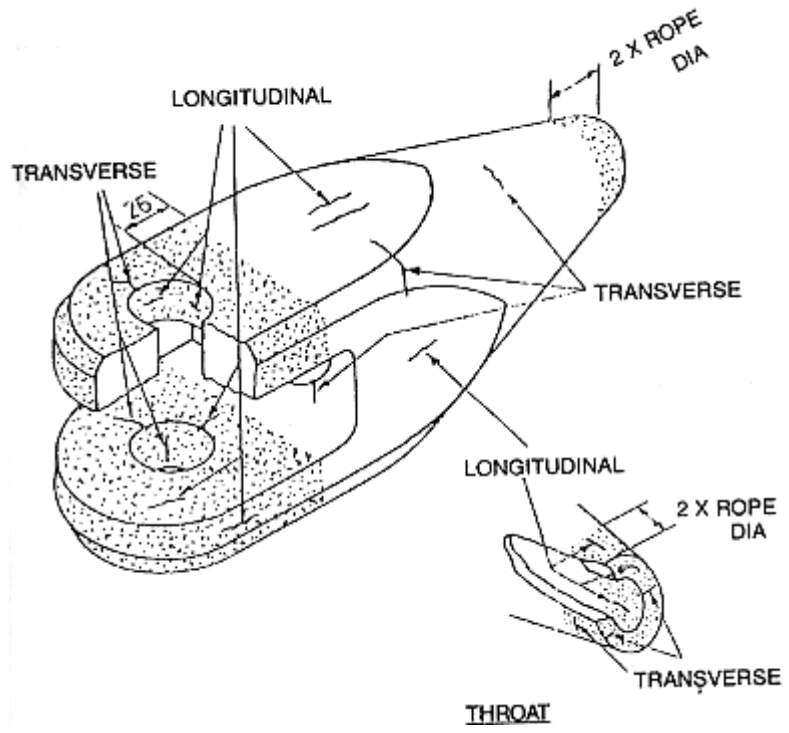
ALL DIMENSIONS IN MILLIMETRES

PART	TYPE OF IMPERFECTION	PERMISSIBLE IMPERFECTIONS
SHACKLE BODY	SHADED AREAS TRANSVERSE	NONE
	LONGITUDINAL	NONE > 10mm (3/8")
SHACKLE BODY	UNSHADED AREAS TRANSVERSE	NONE
	LONGITUDINAL	NONE > 32mm ($1^{1/4}$")



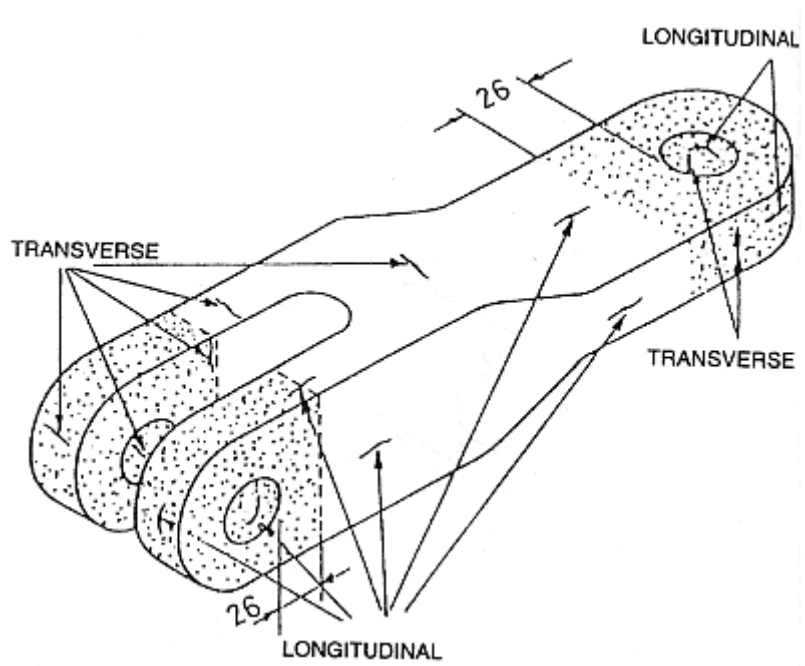
ALL DIMENSIONS IN MILLIMETERS

PART	TYPE OF IMPERFECTION	PERMISSIBLE IMPERFECTIONS
CHAIN LINK	ALL AREAS TRANSVERSE	NONE
	LONGITUDINAL	NONE > 10mm(3/8”)
	ELECTRODE BURNS	NONE



ALL DIMENSIONS IN MILLIMETRES

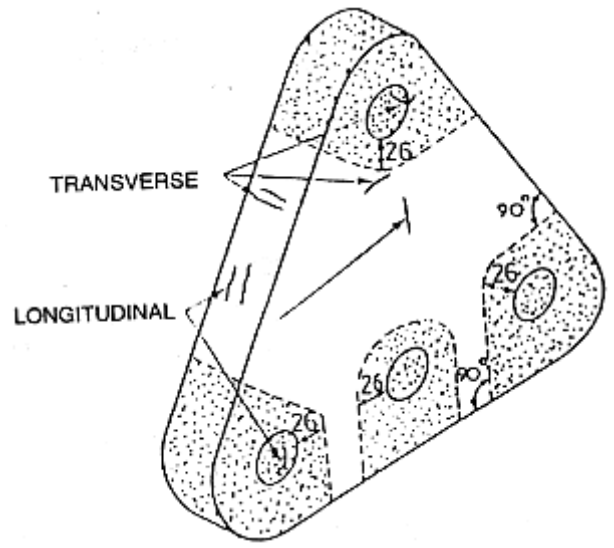
PART	TYPE OF IMPERFECTION	PERMISSIBLE IMPERFECTIONS
SURFACES & THROAT	SHADED AREAS TRANSVERSE	NONE
	LONGITUDINAL	NONE > 10mm (3/8")
HOLES & EDGES	TRANSVERSE	NONE
	LONGITUDINAL	NONE > 16mm (5/8")
BODY & EDGES	TRANSVERSE	NONE
	LONGITUDINAL	NONE > 32mm ($1^{1/4}$")



ALL DIMENSIONS IN MILLIMETERS

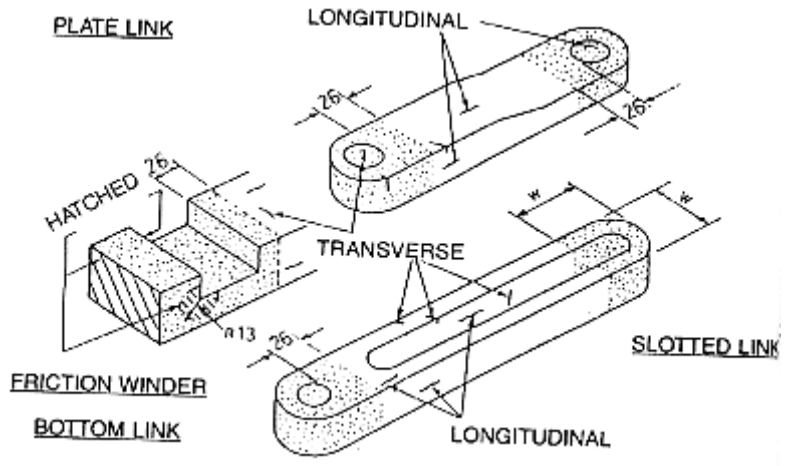
PART	TYPE OF IMPERFECTION	PERMISSIBLE IMPERFECTIONS
SURFACES	SHADED AREAS TRANSVERSE	NONE
	LONGITUDINAL	NONE > 10mm (3/8")
HOLES &	TRANSVERSE	NONE

EDGES	LONGITUDINAL	NONE > 16mm (5/8")
BODY & EDGES	UNSHADED AREAS TRANSVERSE	NONE
	LONGITUDINAL	NONE > 32mm ($1^{1/4}$")



ALL DIMENSIONS MILLIMITERS

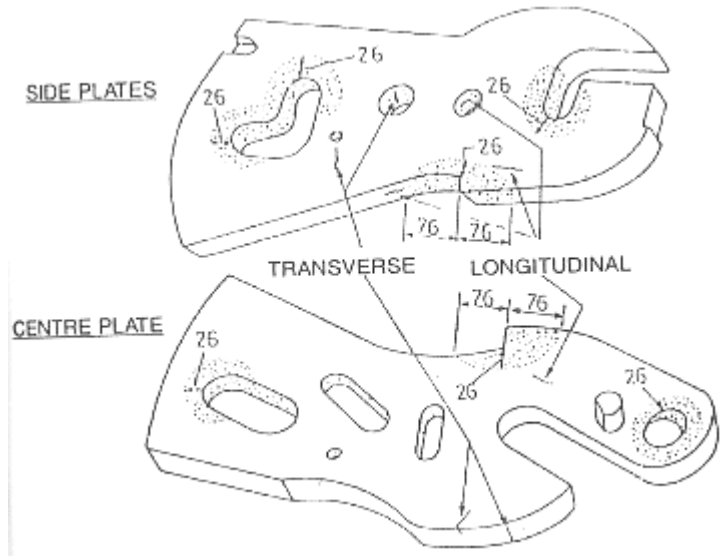
PART	TYPE OF IMPERFECTION	PERMISSIBLE IMPERFECTIONS
PLATE SURFACES	SHADED AREAS TRANSVERSE	NONE
	LONGITUDINAL	NONE > 10mm (3/8")
PLATE EDGES	TRANSVERSE	NONE
	LONGITUDINAL	NONE > 32mm ($I^{1/4}$")
HOLES	TRANSVERSE	NONE
	LONGITUDINAL	NONE > 16mm (5/8")
PLATE SURFACES	UNSHADED AREAS TRANSVERSE	NONE
	LONGITUDINAL	NONE > 32mm ($I^{1/4}$")
PLATE EDGES	TRANSVERSE	NONE
	LONGITUDINAL	NONE > 54mm ($2^{1/z}$)



ALL DIMENSIONS IN MILLIMETRES

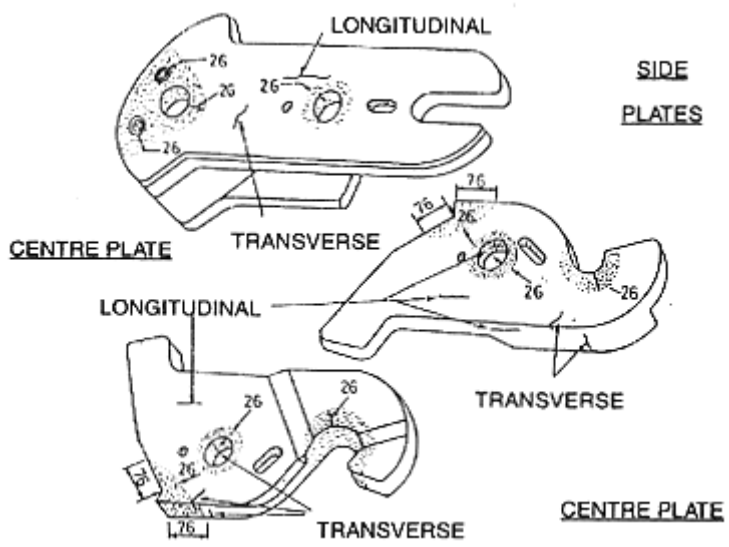
PART	TYPE OF IMPERFECTION	PERMISSIBLE IMPERFECTIONS
PLATE SURFACES	SHADED AREAS TRANSVERSE	NONE
	LONGITUDINAL	NONE > 10mm(3/8”)
PLATE EDGES	TRANSVERSE	NONE
	LONGITUDINAL	NONE > 32mm($1^{1/4}$”)
HOLES &	TRANSVERSE	NONE

SLOT END	LONGITUDINAL	NONE > 16mm(5/8")
SURFACES	UNSHADED AREAS TRANSVERSE	NONE
	LONGITUDINAL	NONE > 32mm(1 1/4")
PLATE EDGES & SLOTS	TRANSVERSE	NONE
	LONGITUDINAL	NONE > 64mm(2 1/2")
CANTILEVER FACES	HATCHED AREAS TRANSVERSE OR LONGITUDINAL	NONE



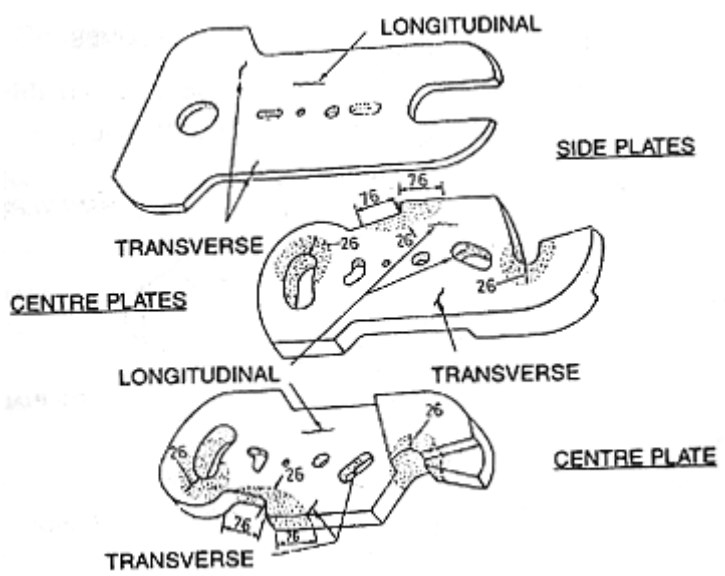
ALL DIMENSIONS IN MILLIMETRES

PART	TYPE OF IMPERFECTION	PERMISSIBLE IMPERFECTIONS
PLATE SURFACES	SHADED AREAS TRANSVERSE	NONE
	LONGITUDINAL	NONE > 10mm (3/8")
PLATE EDGES	TRANSVERSE	NONE
	LONGITUDINAL	NONE > 32mm (1 1/4")
HOLES & SLOTS	TRANSVERSE	NONE
	LONGITUDINAL	NONE > 16mm (5/8")
PLATE SURFACES & SLOTS	UNSHADED AREAS TRANSVERSE	NONE
	LONGITUDINAL	NONE > 32mm (1 1/4")
PLATE EDGES	TRANSVERSE	NONE
	LONGITUDINAL	NONE > 64mm (2 1/2")



ALL DIMENSIONS IN MILLIMETRES

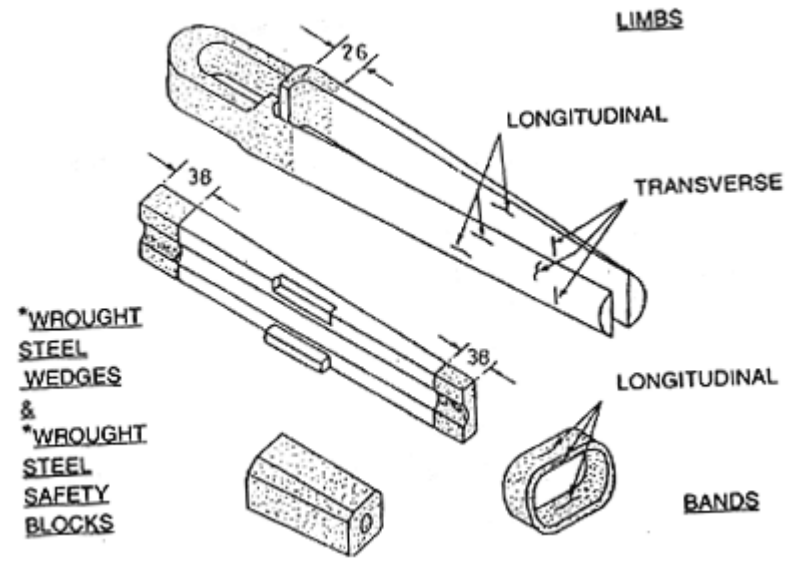
PART	TYPE OF IMPERFECTION	PERMISSIBLE IMPERFECTIONS
PLATE SURFACES	SHADED AREAS TRANSVERSE	NONE
	LONGITUDINAL	NONE > 10mm(3/8”)
PLATE EDGES	TRANSVERSE	NONE
	LONGITUDINAL	NONE > 32mm($1^{1/4”}$)
HOLES & SLOT	TRANSVERSE	NONE
	LONGITUDINAL	NONE > 16mm($5/8^{”}$)
PLATE SURFACES & SLOTS	UNSHADED AREAS TRANSVERSE	NONE
	LONGITUDINAL	NONE > 32mm($1^{1/4”}$)
PLATE EDGES	TRANSVERSE	NONE
	LONGITUDINAL	NONE > 64mm($2^{1/2”}$)



ALL DIMENSIONS IN MILLIMETRES

PART	TYPE OF IMPERFECTION	PERMISSIBLE IMPERFECTIONS
PLATE SURFACES	SHADED AREAS TRANSVERSE	NONE
	LONGITUDINAL	NONE > 10mm(3/8”)
PLATE EDGES	TRANSVERSE	NONE
	LONGITUDINAL	NONE > 32mm($1^{1/4”}$)
HOLES & SLOT	TRANSVERSE	NONE
	LONGITUDINAL	NONE > 16mm($5/8^{”}$)
PLATE SURFACES & SLOTS	UNSHADED AREAS TRANSVERSE	NONE
	LONGITUDINAL	NONE > 32mm($1^{1/4”}$)
PLATE	TRANSVERSE	NONE

EDGES	LONGITUDINAL	NONE > 64mm($2^{1/2"}$)



ALL DIMENSIONS IN MILLIMETRES

PART	TYPE OF IMPERFECTION	PERMISSIBLE IMPERFECTIONS
BANDS SAFETY BLOCK & WEDGES	SHADED AREAS TRANSVERSE	NONE
	LONGITUDINAL	NONE > 10mm(3/8")
LIMBS	TRANSVERSE	NONE
	LONGITUDINAL	NONE > 16mm(5/8")
WEDGES	UNSHADED AREAS TRANSVERSE	NONE
	LONGITUDINAL	NONE > 32mm($1^{1/4"}$)
LIMBS	TRANSVERSE	NONE
	LONGITUDINAL	NONE > 64mm($2^{1/2"}$)

* CAST STEEL WEDGES & SAFETY BLOCKS SHOULD BE EXAMINED FOR SIGNIFICANT CASTING DEFECTS

Cir (Tech.) (S & T) 2 dt. 20.6.2001 to all coal mines.

Accident due to failure of slope in an opencast coal mine

In one opencast mechanized coal mine, while 16 workers under supervision of two (2) mining sirdars and one (1) overman were working at the bottom of a 15m high coal bench, the overlying benches in sandstone and black cotton soil failed trapping the workers in debris, 10 of whom asphyxiated to death while the remaining six (6) persons escaped with minor injuries.

The immediate combined bench above coal was about 52m high with individual width of only 8-10m, this was overlain by benches in black cotton soil as high as 15m but with width of only 4-8m. The coal seam was earlier developed in two sections by underground workings and the coal was also on fire. The benches were formed against a fault plane along a barrier with the adjoining mine.

Inquiry into the accident revealed that if the workings were properly benched and special care taken while working near the fault plane and in coal benches affected by fire as required under statute, the disaster could have been averted.

The accident described above leaves no doubt about the fact that the design and workings in opencast mines need to be reviewed seriously. In this particular case design of a safe slope and the method of working practiced left much to desire. It is emphasized here that proper design of benches and ultimate pits based on slope stability considerations is a must for safe working of an opencast mine.

A basic guideline for a scientific approach towards design of open pit slopes is given in the following paragraphs.

Systematic detailed works need to be undertaken for solving or understanding the problems of slope failure in open pit mines. The objective of such type of work could be, (1) increase the knowledge of the behaviour of mine slopes, (2) improve the ability to estimate rock mass strength for such slopes, and (3) develop an improved design methodology for forward design of rock slopes in the open pits. The fourth objective could be formulation of a detailed slope monitoring protocol for such slopes.

A geomechanical model needs to be developed based on extensive field work and review of previous studies at the sites. The model may comprise of a detailed description of the geology, joint sets and structures, mechanical properties of intact rock and joints, geohydrological conditions, and virgin stress state. From this, a

representative design cross-sections and parameter values need to be established which could later be used as input to stability analysis of the pit slopes.

Assessment of representative rock mass strength need to be addressed through the use of appropriate failure criterion in conjunction with rock mass classification. By comparing back-calculated strengths available from old case studies a reliable estimate may be established. Failure mechanisms need to be studied preferably by means of numerical modeling. For this purpose the finite difference code FLAC and the distinct element code UDEC can be used. The work must be aimed at inverstigating failure mechanisms in detail, at the same time developing a reliable modeling technique for the pit slopes.

No discussion about slope stability in open pits can conclude without discussing the effect of groundwater. In the following para a general discussion about groundwater problems has been attempted. This most important parameter must be fully understood before any attempt is made to model or to study the slope stability problems in mines.

Rainfall and subsequent movement of groundwater greatly affect slope stablity. The groundwater regime is considered the most changeable natural parameter which affects slope stability in several ways:

- by generating pore pressure, both positive and negative, which alter stress conditions,
- by changing the bulk density of the materials forming the slope,
- by both internal and external erosion, and
- by changing the mineral constituents of the materials forming the slope.

Groundwater in soil may be of two types, occurring above or below the water table (phreatic surface) respectively. Water above the water table may be transient percolation moving downwards to join the phreatic water below the water table or capillary water held above the water table by surface tension. Phreatic water below the water table is subject to gravitational forces and saturates the pore space in the material below the water table.

Usually three water zones below ground surface can be identified, (1) zone of permanent saturation—where pore spaces are always filled with water, (2) zone of intermittent saturation— where pore spaces are filled with water only after heavy rains and (3) zone no-saturation—where pore spaces are never saturated, though water may pass through. Water table is the upper surface of the zone of permanent saturation. Its level changes from season to season.

Water flows through soil or rock in different ways depending on the nature of ground material.

Aquifer refers to any water-transmitting soil or rock. Aquifers have various modes of ground water flow, such as homogeneous (inter-granular) flow and path-preferential (either fissure or conduit-flow). The latter tends to be more rapid and can therefore significantly influence slope stability.

Flow in soil is more likely to be inter-granular, although fissure or conduit flow can also occur via fissures, pipes and drying cracks. Flow in rock can be inter-granular, but is more common through joints and other discontinuities. It is remarkable that joints in rock may get filled with water during intense rainfall, inducing high hydraulic pressure on the rock mass and therefore adversely affecting stability.

While designing an open pit mine slope, it is essential to consider all the issues discussed above. Moreover, it may be borne in mind that only designing is not enough and comprehensive design, implementation and monitoring protocol needs to be developed by every opencast mine operator in order to achieve, safe working conditions in such mines.

Cir (Tech.) (S &T) 3 dt. 20.6.2001 to all coal mines.

Dealing of fire in opencast coal mines

In the recent past, in one opencast coal mine while a 20m-bucket capacity shovel was excavating burning coal from the bottom of a coal bench, 15m in height, and two persons were in the process of fighting the coal fire with water jet standing 10m away from the face on the floor of the bench, burning coal slid from top of the bench engulfing the fire fighters in hot coal, ash and steam. One person could escape with burn injuries but other person unfortunately received 60% burns and succumbed to his injuries later.

In another case, while a shovel was deployed at the bottom of a coal bench on fire in a quarry, fall of side occurred forming thick cloud of hot dust. A shovel operator and an overman got trapped and received serious burn injuries to which the shovel operator succumbed later.

Other similar cases have also come to the notice of this Directorate where no persons were involved. In all these cases it, could be observed that the system established for fire fighting was directing water jets on the fire standing away from the face on the bottom bench. Some of the shortcomings of such systems were,

1. the distance at which the fire fighters were positioned from the face was less than the height of the bench/face or the persons dealing such fires were positioned at an unsafe distance from the burning coal face;

2. no personal protective equipment like protective clothing for dealing fire were provided to the persons employed for fire fighting;

3. there was no established system, i.e. code-of-practice was not framed to deal with such situations;

In all these cases, the system itself was fraught with danger and circumstances were created at the work place where the accidents were waiting to occur.

In this context, attenton is also drawn to regulation 119(2)(b) of CMR 1957 which requires adequate precautions to be taken to prevent danger to persons from flame, steam and ejected or rolling down hot material, explosion of water gas, etc. among other things.

Considering that establishment of a good system of fire 3 fighting in opencast coal mines could and may save valuable life workings where danger of fire exists should frame a comprehensive plan for fighting fire the workings. Such mines should also frame site specific Code-of-practice for fire fighting under different circumstances in the mine. The code-of-practice may include interalia the following :

a. the process of dealing with different types of fires under different circumstances at the mine in a manner which is safe,

b. responsibility of all concerned persons starting from the workers at grass root levels to supervisors, managers and higher management at the mine and of the company,

c. outline of the training needs of various concerned persons,

d. details of appropriate personal protective equipment for fire fighting.

I am sure that appropriate steps taken as detailed above would go a long way in preventing accidents from dealing fire in opencast coal mines.

Cir (Legis.) 2 dt. 4.7.2001 to all coalmines.

Workload of mining sirdars

It has been observed that the workload on mining sirdars in some of the mines is so high that it is physically not possible for them to perform their statutory duties properly. The matter has been examined in light of mechanisation in belowground working viz. development with SDL/ L HD/Road header, gallery blasting etc., and shot firing capacity of an official as required under Regulation 166 of Coal Mines Regulations 1957.

To enable the mining sirdar to carry out the statutory duties effectively it is recommended that:

(i) In case of mechanized mines, competent person appointed under Regulation 113 shall not be authorised to perform the duties of a shotfirer even if the number o person in belowground district under his charge at any one time is less than 30.

(ii) In case of manual working where less than 30 persons are employed at any one time in any mine or district under the charge of any official who is qualified to perform the duties of the shotfirer, such official shall not fire or be permitted to fire more than half the maximum no. of shots specified in clause (a), (b) and (c) of Sub-Regulation 5(iv) of Regulation 166 of CMR 1957 depending on the category of the seam or mine specific therein.

Necessary action to amend the relevant provision of the Regulation will be taken in due course. In the meantime, you are requested to implement the above stipulations in your mines in the interest of safety.

Cir (Genl.) 1 dt. 19.4.2001 to all coal mines.

Re-oraganisation of Eastern Zone, Sitarampur & Nagpur Region under Western Zone, Nagpur

For the purpose of convenience and better administration of the MinesAct, 1952 the Eastern Zone of the Directorate-General of Mines Safety with its headquarters at Sitarampur has been re-organised into three regions against the existing four regions. These regions have been named as Sitarampur Region No. I, Sitarampur Region No. II & Sitarampur Region No. III. The regional office a Nagpur under the jurisdiction of western Zone has been also re organised into two regions. These regions have been named as Nagpur Region No. 1 & Nagpur Region No. II.

The revised jurisdiction of these regions are given in appendix below. This partially modifies DGMS (Genl.) Circular No. 1 o 1987 and DGMS (Genl.) Circular No. 1 of 1988.

The revised jurisdiction will come in force from 16th of May, 2001.

All correspondence in the matter may henceforth be carried out with the regional office as constituted.

APPENDIX

Eastern Zone with Headquarter at Sitarampur comprising Sitarampur No. I, Sitarampur No. II (including Digboi Sub-Region) and Sitarampur No. III Regions .

SITARAMPUR REGION NO. I	
HQ at Sitarampur State of West Bengal	(a) All mines in the district of Burdwan situated on the south of G.T. Road & bounded by Burnpur Road leading from G.T. Road on the East and Neamatpur, Radhanagar and Chinakuri Ghat Road on the West. (b) All mines in the district of Burdwan in the area bounded by G.T. Road on the South, road leading fromAndal turning on the G.T. Road to Khandra, Ukhra, Haripur, Krishnanagar, Jamuria and Chanda more on G.T. Road.

SITARAMPUR REGION NO. II
HQ at Sitarampur

(a) State of West Bengal	(a) All mines in the state of West Bengal except those included in Sitarampur Region Nos. I & III.
(b) State of Jharkhand & W.B	(b) Oil Pipeline extended from the Oilfields in the state of Assam upto the refineries situated in the state.
(c) State of Assam	All Mines
(d) State of Nagaland	All Mines
(e) State of Meghalaya	All Mines
(f) State of Manipur	All Mines
(g) State of Tripura	All Mines
(h) Union Territory of Andman and Nicobar Island	All Mines
(i) Union Territory of Amnachal Pradesh	All Mines
(j) Union Territory of Mizoram	All Mines

DIGBOI SUB-REGION HQ at Digboi

(a) State of Assam	All Mines
(b) State of Nagaland	All Mines
(c) State of Meghalaya	All Mines
(d) State of Manipur	All Mines
(e) State of Tripura	All Mines
(f) Union Territory of Andaman & Nicobar Island.	All Mines
(g) Union Territory of Arunachal Pradesh	All Mines
(h) Union Territory of Mizoram	All Mines
(i) State of West Bengal.	All Mines
(j) State of West Bengal & Jharkhand.	Oil pipeline extending from the oild fields in the State of Assam upto the refineries situated in the state.

SITARAMPUR REGION NO. Ill
HQ at Sitarampur State of West Bengal.

(i) State of West Bengal,	(a) All mines in the District of Burdwan situated on the South of G.T. Road except those includeed in Sitarampur Region No. I .
	(b) All mines in the district of Burdwan bounded by road leading from Pandaveswar ghat to Haripur, Krishnanagar, Jamuria and Darbardanga.
(ii) State of Jharkhand.	(a) All mines in the district of Dumka, Deoghar, Godda and Sahibganj.
	(b) All mines in the district of Dhanbad lying South of G.T. Road and to the East of North-South line drawn through mine post 150 on G.T. Road.

Nagpur Region No. I & Nagpur Region No. II under Western Zone with Headquarter at Nagpur.
NAGPUR REGION NO. I
HQ at Nagpur
(including Parasia Sub-Region)

State of Maharashtra	All mines in the Districts of Nagpur.
State of Madhya Pradesh	All mines in the Disricts of Betui, Balaghat, Bhopal, Seoni, Hoshangabad, Raisen, Vidisha and Sehore.
PARASIA SUB-REGION HQ at Parasia.	All mines in the district of Chhindwara.

NAGPUR REGION NO. II HQ at Nagpur.

State of Maharashtra.	All mines in the districts of Chandrapur, Yavatmal, Amravati, Wardha, Bhandar, Gondia, Akola, Buldhana, Gadhchiroli, Beed, Aurangabad, Osmanabad, Nanded, Latur, Washim, Jalana and Parbani.

Cir (Genl.) 2 dt. 2.7.2001 to belowground coal and non-coal mines

Maintenance of Flame Safety Lamps

Inflammable gas and deficiency of Oxygen in mine atmosphere is conventionally detected by the use of flame safety lamp. However, use of flame safety lamp is fraught with danger, unless it is used and maintained in good standards. The Coal Mines Regulation 1957 and the Metalliferous Mines Regulation, 1961 and DGMS Circulars issued from time to time stipulate the precautions that should be taken in the maintenance of flame safety lamps. However inspite of it certain serious irregularities were observed in maintenance and upkeep of flame safety lamps in certain mines. Some of these were in respect of:

- Wire Gaugaes—Inferior quality wire gauges were being used which did not comply with the requirement of IS 7577-86.
- Gaskets—Gaskets of inferior quality were being used which tend to harden with time and thus allow leakage of air.
- Lock Bolts—The lock bolts are usually being repaired and used in the lamp in contravention of Regulation 157(4) of CMR, 1957 and Regulation 151(4) of MMR 1961.

- Wick—Special type of wick is required for flame safety lamp. Improper type of wick may result in irregular flow of oil through wick, resulting in formation of inaccurate flame and gas cap and consequent error in testing of inflammable gas.
- Bonnet—Mishandling of the Safety lamp leads to the damage of the bonnet.
- Snuffer device—Both GL 50 & GL 60 lamps are incorporated with safety snuffer device (for extinguishing flame). Often it is found that the snuffer device is removed from the lamp and such lamps are being used for detection of gas.

In order to ensure safety in use and maintenance of safety lamp it is necessary that only genuine spare parts as recommended by the manufacturer are used. No flame safety lamps shall t repaired by the mine management. They shall set up proper facility with well-trained and duly authorized persons and follow manufacturer's guidelines on use and maintenance of flame safety lamp.

Cir (Tech.) 4 of 2001 dt. 6.8.2001 to all All owners, Agents and Managers of belowground Coal Mines.

Fatal Accidents due to fall of roof in belowground coal mines

In a recent accident due to roof fall in a belowgroud coal mines it was revealed that while six coal fillers were engage in loading coal by the Overman in his presence in a slice in depillaring district, a mass of roof measuring 6.5m x 4.2m 0.5-2.5m thick fell from roof at a height of about 2.5m trapping the Overman and four coal fillers. While the Overman and two coal fillers died instantly, third coal filler died soon after he was rescued and the fourth died after about five hours of the accident.

The enquiry further revealed that the Overman ignored the cracking sound of the impending fall and the coal fillers were asked to fill the tubs in his presence. As the sound due to goaf movement is a clear phenomenon, the supervisors have to take the decision of withdrawal. This was ignored in this case which could have saved the valuable lives.

It is therefore reiterated that the workers and the supervisors engaged in the depillaring district shall be trainee to make them conversant with the working of the depillaring including timely withdrawal of work persons during impending, fall.

I sincerely believe that the management will make all out efforts to train and retrain the workers and supervisors which
will definitely make headway in eliminating similar type of accidents in future.

DIRECTORATE GENERAL OF MINES SAFETY

D.G.M.S (tech,) Circular No. 5
Dhanbad Dated, the 3rd September.. 2002

T0,
All Owners, Agents and Managers of Underground Coal and Non-coal Mines.

SAFE USE OF GUIDE ROPES:

A number of accidents/dangerous occurrences have taken place during winding shafts due to either snapping of guide rope or bird caging of the such ropes due to breakage of rod in the past. Major accident has also taken place when two cages collided at the mid-shaft due to slack-ness in the guide rope tension caused due to the cheese weights at the pit bottom not hanging freely.

In supersession of DG's (Technical) Circular No.11 of 1976 and DG's (Technical) Circular No. 6 of 1982, the following guidelines are being given for proper selection. installation, maintenance and other safe practices are being recommended :-

(1) **Construction of Guide Ropes:**

Guide ropes shall be either 6 over 1 type of construction or half -locked coil as described in BIS 3623 of 1978. No guide rope in non- conformity to the above standard shall be used in winding shaft.

(2) **Selection of proper Guide Rope:**

For optimum life of guide rope and safety, the following norm is recommended:

2.1 Up to 50m depth-minimum requirements is 29 mm dia.6 over 1 type of guide ropes.

2.2 Above 50m and up to 250 mtrs–Minimum requirement is 32 mm dia. Of 6 over 1 type of guide ropes /29 mm dia. Half locked construction guide ropes.

2.3 Above 250 mtrs. and Up to to 500 mtrs .Minimum requirement is. 38mm dia. Of over 1 type of guide ropes/32mm dia half locked construction guide ropes.

2.4 Above 500 mtrs. - Minimum requirements is 38mm of half locked coil type of guide ropes.

2.5 It may be noted that half locked coil guide rope smay be preferred in any watery shafts because they have a smooth and larger wearing surface and offer a greater resistance to corrosion as it is hot so easy for water to enter the interstices between the wires. In addition, half locked guide ropes are having higher breaking load compared too 6 over 1 construction guide ropes .

2.6 Number of guide ropes-

Normally four guide ropes shall be arranged at four corners of each cageb to provide maximum resistance against the tendency of stranded winding ropes to untwist and to reduce swinging.

(3) Selection of proper tensioning arrangement:

In vertical shafts a guide rope must be anchored at one end tensioned by suitable means at the other end.

Guide rope attachment at the top and bottom should be of adequate strength to not only safely suspend the rope but to withstand normal and abnormal vibration /jerks likely in the guide from various factors .

Two basic types of guide ropes attachments are being recommended.

3.1 Weight loading in the sump:

Where there is adequate space in the sump and there is provision to keep the sump clear, such weight loading of guide ropes in the sump are found satisfactory. If the weightsare not hanging freely and not kept expose for regular inspection, the system may prove disastrous.

The most common type guide ropes arrangement is shown in Drawing No. 1
(Courtesy -M/s reliance Barker Davis, U.K.).

3.2 Spring loaded Tensioning at the head frame

Where the space at the sump is not adequate or else the sump can not be maintained clean there it is recommended that the guide rope is anchored at the pit bottom as per the enclosed Drawing No. 2 (Courtesy - M/s Reliance Barker Davis. U.K.) and the spring loaded tensioning arrangement may be provided at head frame. With spring tensioning in the head frame, the spring capacity has to be large enough to negotiate for the weight of the rope in addition to tensioning load.

The correct tension of the rope is obtained by screwing the adjusting nut. A tension scale is to be provided to know the tension of the guide ropes at any time.

3.3 Advantages of Spherical Seat:

Spherical Seating have been shown in both types of guide rope tensioning arrangement (In drawing No. 1 &2).

The Spherical Seat allows the top anchorage to swing and adjust itself to any twisting which may be imposed upon the guide rope during conveyance movement through the shaft. This form of seating also permits, easy and ready and radial adjustment of the guide rope. The rope and attachment can be lifted and turned to present a new wearing surface to the conveyance guide shoes should any particular part of the rope's surface be showing signs of unequal wear.

3.4 Guide rope Tension :

The following tension Is recommended in the guide ropes :

Up to 500 mtrs. depth = 1.25 Tonne per hundred meters.

From 501 mtrs. to 800 mtrs depth = 6.25 Tonne + 0.75 tonne per additional 100 meters beyond 501 mtrs.

From 801 mtrs. and above = 8.5 Tonne + 0.5 tonne per additional 100 meters beyond 801 mtrs.

It may be noted that for the weight loading tensioning arrangement the tension to be given a above include guide rope weight also. For illustration in a 200 mtrs. shaft, the weight to be attached at the sump = 2 Tonne - Wt. of 200 mtrs,. of guide rope used . But in the case of tensioning from top, the tension to be given as per the above norm shall be in addition to the rope weight. For illustration in a 200 mtrs shaft the tension applied by adjusting the nut shall be 2 Tonne + Wt. of 200 mtrs. of guide rope used which may be read from the tension scale provide.

It may be noted that weight of guide ropes indicated in the test certificates issued by the rope manufactures.

3.5 The tension in various guide ropes in the shaft shall be varied to avoid vibration caused due to resonance.

4.0 Code of practice for installation of guide rope:

Lot of dangerous occurrences/accidents also do occur during replacement of old guide rope by new ones. Each mine must establish their own code of practices for the guide rope installation jobs where method of removing the old guide rope and installation of new guide rope shall be clearly described. A hand winch without separate braking arrangement is not considered safe for lowering of guide rope in the shaft.

Such codes of practice may be asked for from mine management by the officers o this Directorate during their inspections.

The following additional care shall be taken during installation:

(i) Suitable extra length of guide rope should be kept on top for future lowering and the extra length should be securely clamped on the headgear so that the fixture can safely withstand the load of the guide rope during examination of its suspension fixtures or during tensioning of the guide rope.
(ii)Guide rope must be installed to remain vertical. Verticality of rope is very important.

5.0 Storage:

Guide rope shall be stored in reeled condition under covered shed for a period not more than two years. Enquiry into a premature snapping of guide rope n a deep shaft had revealed that the installation and the guide rope get corroded during storage.

6.0 Use of rubbing Ropes:

Rubbing ropes are special guide ropes provided between the cages in shafts where clearances are Small .

The construction of rubbing ropes are same to that of the guide ropes. Conforming to IS 3623 of 1973 but the tension given in the rubbing ropes shall be atleast 10% more than the tensions given in the guide ropes. Use of half locked Coil construction as rubbing ropes is preferred.

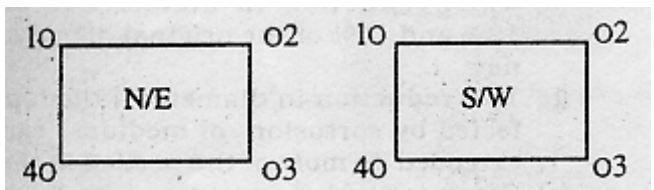
7.0 <u>Maintenance:</u>

(i) Bottom attachment whether cheese weights or clamps should be kept exposed for which suitable arrangements must be provided through drains, etc.. and suitable inspection gallery, ladderway etc.. for regular inspection for the attachments.

(ii) Guide ropes should be properly lubricated at regular intervals. Frequency of lubrication will depend upon the shaft condition and the lubricant. In fairly dry shaft the frequency may be one month. Suitable lubricant adhesive to the steel rods should be used. Lubricant should be free from acid. Properly lubricated guides will be not only protected against corrosion but also reduce abrasive wear.

(iii) Each guide rope should be properly inspected at regular intervals but not exceeding one month. Inspection of the portions where the cage / means of conveyance normally rests on landing, where guide Is exposed to ventilation exhaust, mid shaft position, top and bottom portions in or about the fixtures should be specially inspected for wear, corrosion, broken wire etc.

(iv) Proper record of each guide should be maintained in separate bound register where proper identification of guide shall be shown; by a sketch such as:-



Reference of guide rope of North/East cage may be given in inspection report as N1. N2, or El. E2 etc.. similarly for the other cage.
In inspection report, suitable columns should be made on following heads :

(1) Name of mine and pit number.
(2) Name of supplier of guide rope.
(3) Original actual diameter (mm.), construction of guide rope and date of installation.
(4) Type - Galvanised / ungalvanised.

(5) Pit condition :
- (a) Dry/Wet
- (b) Down casting / up casting
- (c) Pit water - (PH value) when last tested

(6) Top and bottom fixtures - clamps/cheese weights/ spring loaded tensioning arrangement

(7) Measurement of diameter of rope
- (a) Portions where measurements taken
- (b) Maximum and minimum diameter (mm.)
- (c) Broken wire if any
- (d) Pitting/Corrosion
- (e) % reduction in diameter with respect to original diameter when new.

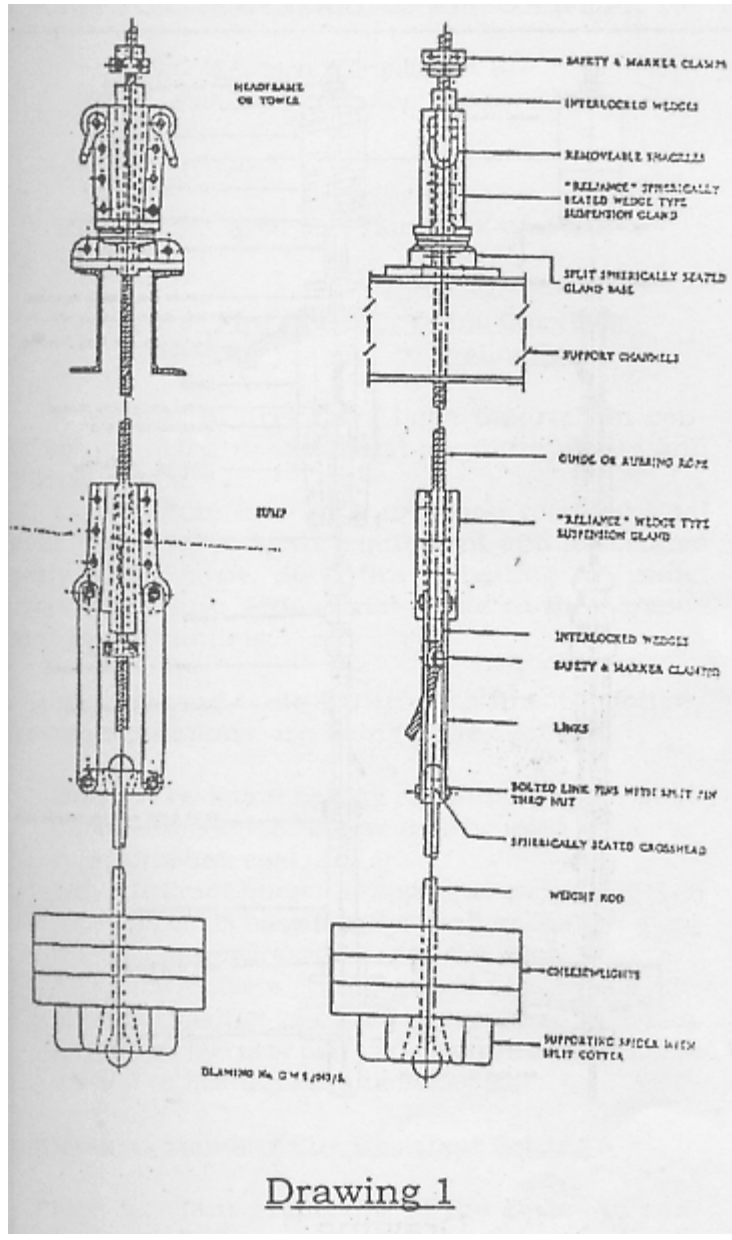
8.0 <u>Discard Norm :</u>

Guide rope should be replaced :-
(a) when reduction in diameter is between 12% and 15% of the original diameter when new.
(b) 12% reduction in diameter if the rope is effected by corrosion of medium degree and extended to most of the portion in the shaft.
(c) Corrosion of heavy degree.
(d) 15% reduction in diameter of the rope any where along the length.
(e) When the outer rods have lost more than one third (35%) of their depth by wear or corrosion or both or the rope no longer appears safe for use due to any defect such as broken wires etc.

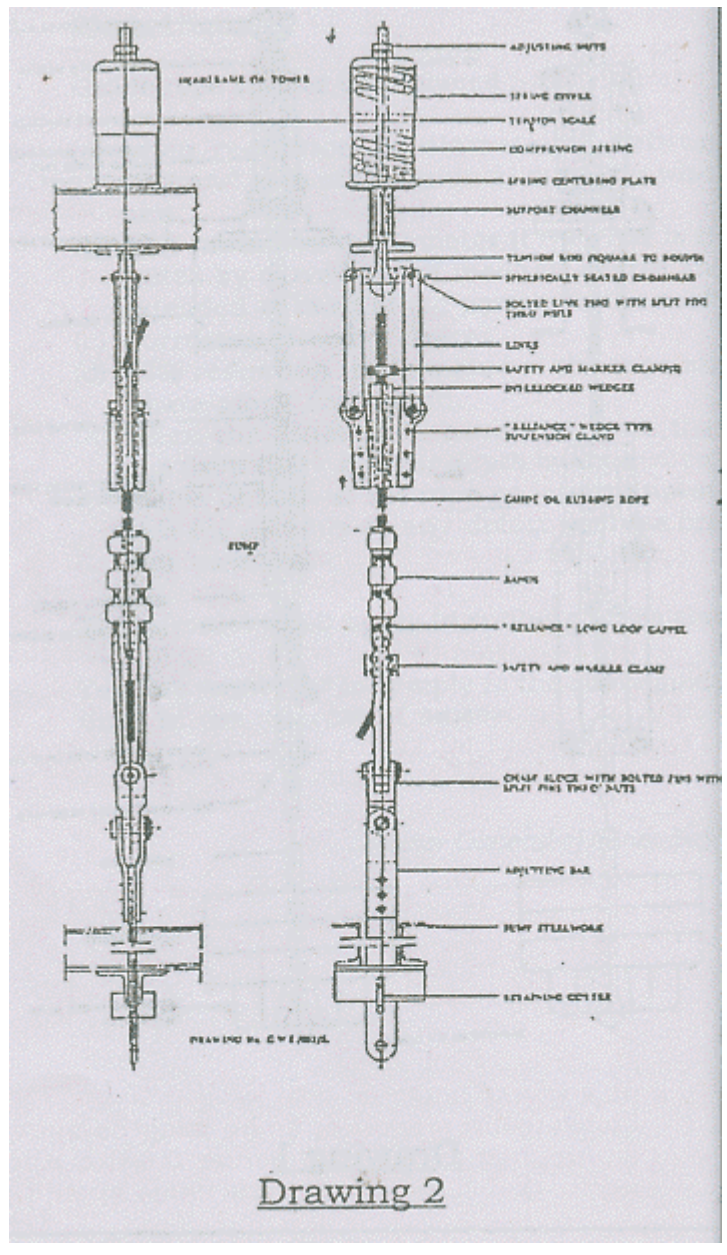
This circular shall apply to rubbing ropes also .

You are requested to comply to the above guide lines in the interest of safety.

Director General of Mines Safety



Drawing 1



Drawing 2

DIRECTORATE GENERAL OF MINES SAFETY

D.G.MS (tech.) Circular No. 6
Dated, Dhanbad the 6th September,. 2001

To

The Owner. Agent and Manage of coal Mines

Sub : <u>Use of Fire resistant Grade Conveyer Belting for surface application</u>

A number of fires have been reported in conveyor belting being used in coal handling plants and open cast mines.

Enquiry into into such fires had revealed total devastation of the conveyor equipment and associated properly of the mine. Such fire in belting in tunnel coveyors may cause serious rist of life to the persons present in the tunnels.

To avoid and to deal with such fire, the following recommendations are being done:

i) Only fire resistant belting conforming to the standard recommended below shall be used while carrying crushed coal.
ii) Water hydrant line with tapping at every 40 meters with sufficient hose lengths shall be laid all along the belt conveyors working in the mine.
iii) All defective idlers,, bearings and defective lengths of belting shall be identified and replaced forthwith. Any other objects or parts of structure likely to cause friction or heating shall be removed.

<u>Recommended Standard Fire Resistant Belting:-</u>
(1) Fire resistant properties of the cover- to conform ISO 340
(2) Drum Friction Test - to conform IS 1891. (Part-V) of'1993
(3) Max. Surface Electrical Resistant - to conform IS 1891 (Part V) of 1993
(4) Cover Abrasion Loss (when tested as per DIN 53516) - 175mm3 (Max.)

The above values are applicable for all types o Textile Conveyor Belting and Steel Cord coveyor Belting to be used on surface in coal mines. Other mechanical properties like Adhesion PLY/PLY. Adhesion Cover/PLY, Cover thickness and cover tensile strength etc. may be fixed by the user indistry in consultation of the belting s manufacturer. No DGMS approval of the above belting is necessary.

However, any belting used in underground coal mine shall be of the type approved in writing by Director – General of Mines Safety as required under Regulation 181(3) of Coal Mines Regulations. 1957.

You are requested to comply to the above recommendations in the interest of safety.

Director General of Mines Safety

DIRECTORATE GENERAL OF MINES SAFETY
D.G.M.S (tech.)/SOMA Circular No. 7
Dated, the 10th July,. 2001

To

All Owners/Agents/Managers of mines.

Sub: Accident due to explosives.

In a recent accident in an opencast mine it was revealed that while two persons were charging, shot holes with the help of an iron rod in close vicinity of another five persons who were engaged in drilling holes, explosive inside the shot hole got exploded causing fire and explosion to uncharged explosive kept near the face. Flying fragment and burning materials caused by the explosion inflicted serious bodily injuries to all the seven persons two of whom succumbed to their injuries.

The extant regulation under CMR' 1957 & MMR’1961 provide for the following :

1) Before a shot hole is charged stemmed or fired. the shot firer/blaster is required, to see that all the persons in the vicinity have taken proper shelter.
2) In charging or stemming a shot hole no metalic tool/scraper or rod is to be used.

In the instant accident it is evident that the accident happened merely due to negligence and human failure. Inspite of specific provision of law, the persons in the vicinity were not removed before commencement of the charging operation and an iron rod vas used for charging the shot holes, which resulted into loss of two precious lives and serious injuries to five persons.

All concerned are therefore advised to take utmost care during charging charging a shot hole so that similar accident do not re-occur. It is sincerely believed that management will spare no efforts eliminate accident due to above causes.

Director General of Mines Safety

DIRECTORATE GENERAL OF RUNES SAFETY
DGMS (TECH)/Circular No.8
Dhanbad Dated: 26th Sepetember, 2001

To

The Owner, Agent and Manager of all the Mines under the Central Government Undertaking.

Sub : Jurisdiction of Electrical accidents in residential areas.

In supersession of Circular No.29 of 1972 and 23 of 1973 and as per the Notification No.S.0.659 Dated - 20.1.82 issued by the Central Electricity Authority the following Circular is issued for observance of all the mines under the Central Government Undertaking. For the general information of the managements of all mines and for removing doubts whether the residential areas, pertaining to a mine, if fed from a Power Station or sub-station situated in or around a mine and forming art thereof, come within the jurisdiction of Electrical Inspectors of Mines, Govt. of India, or they come within the jurisdiction of Electrical Inspectors of the concerned Inspectorate of the Central Electricity Authority the following clarification is issued after duly consulting the Central Electricity Board, in the matter :

(1) If any power station/sub-station/switch station which supply electricity mainly for the purpose of working a mine or a number of mines under the same management, also supplies electricity to the residental areas of the mine or mines reffered to, the supply to the residential areas shall be given from a separate control gear and only that portion from such control gear to the residential areas, shall fall within the jurisdiction of Electrical Inspector of the concerned Inspectorate of Central Electricity Authority.

(2) Whereas, if the supply of electricity at a mine is obtained from a power station/sub-station switch station which supplies electricity besides the mine to other places as well. Only that portion from the switch gear or gears which are feeding the mines shall fall within the jurisdiction of the Electrical Inspector Mines. Govt. of India.

(3) In cases falling under clause (1) above.the power station/sub-station/switch station shall fall within the jurisdiction of the Electrical Inspector of Mines. Govt. of India whereas, in case falling under clause (2) above, such station shall fall within the jurisdiction of the Electrical Inspectors of the concerned Inspectorate the Central Electricity Authority.

Above circular laid down that down that lighting installations including overhead lines for the purpose of non-mining operation such as quarters, shall come within the purview of inspection of Electrical inspectorate of the Central Electricity Authority concerned. It is. however, being noticed inspite of the aforesaid Circular notices of accident pertaining to lighting lines are still being forwarded to the Electrical Inspector of Mines (Now Director of Mines Safety/Dy.Director of mines Safety. Electrical). Therefore, in future such notices must be sent to Electrical Inspectorate of the Central Electricity Authority concerned. A copy. however, may be to the Director of Mines Safety (Electrical) for information only.

Director General of Mines Safety

DIRECTORATE GENERAL OF MINES SAFETY
DGMS (Tech) Circular No. 9
Dated the 20th September. 2001

To

The Owner, Agent & Manager of all Mines & oil fields
Sub : System of earthing in power supply system for under ground Mines & oil fields :

There was a national workshop on choice & standardization of electrical power supply system in mines on 11th and 12th May 1990 at Dhanbad Representatives of Mining Insdustries, National Laboratories statutory Authorities. Academic Institutions attented the above workshop & thorough Discussion was made regarding the suitable system of earthing the neutral point of the transformer of the power supply system both at surface & at underground feeding power to the electrical equipments in the mines & on fields. After detailed deliberations it was decided that the restricted neutral system of earthing with a suitable impendence between the neutral point & earth is safest system for the power supply system in themines. The recommendation of the national workshop as therefore:

(a) with increase in degree of mechanization of power under coal mines, it has been felt necessary to limit the earth leakage current at not more than 750 milliampere.
(b) Compared to solidly earthed neutral system the insulted & restricted neutral power supply system for mines have distinct advantages in, reducing the hazards from the electrical sources.
(c) Restricted neutral system can be conveniently adopted in mines. This is also in accordance with I.S. code of practise.
(d) Solidly earthed neutral system supply in coal mines is to be discontinued accordingly.

With the above background the provision of the Rule 116(1) of the Indian Electricity Rules 1956 was accordingly amended as "In the insterest of safety appropriate equipment shall be suitably placed in the mines for automically disconnecting supply to any part of the system where a fault including an earth fault occurs. Fault current shall not be more than 750 milliampere in 550/1100 Volt systems in the underground/oil fields. The magnitude of the earth fault current shall be limited to these specified values by employing suitably designed restricted neutral system of power supply."

It is therefore, requested that mine management take suitable action to convert the underground /oil field power supply system from solidly earthed system restricted neutral system within a year.

Director General of Mines Safety

DIRECTORATE GENERAL OF ACNES SAFETY

DGMS (Tech / SOMA) Circular No. 10
Dated: 12th October, 2001

To

The Owners. Agents and Managers of all Coal and Metalliferious Mines.

Sub: Accident due to misfired charges:

Accidents due to misfired charges continue to occur in mines even though clear and detailed precautions have been stipulated in the statue and Circulars issued from time to time recently two such accidents took place due to this cause and persons received serious injuries. These accidents are described below: -

Case 1. In an underground coal mine while a coal utter was digging floor in a blasted muck for making buffer hole by a pick axe .the misfired shot of earlier blast got exploded inflicting injuries on faces and eyes to the shot firer and another coal cutter standing near by

Case 2. In another underground coal mine while four coal cutters were engaged in drilling holes from over the top of a coal heap covering a portion of the face in a development district, the drill rod came in contact with the misfired charge of the previous blast and the charge exploded. The coal cutter and one of his helpers sustained serious serious injuries when hit by flying fragments projected by the blast.

The investigations into the above accidents revealed that the blasted material and loose rocks were not moved from the floor before digging into the floor by a pick axe in the first case and all the coal from the face were not cleaned before drilling further round of shot holes in the second case.

The investigatis also revealed that the site of accident has not carefully examined for the presence of misfires.

The above accidents and injuries could have been avoided if the safety provisions as provided for by Regulation 178 (a) of Coal Mines Regulation 1957 & DGMS Tech. Circular No.2 of 1983 were complied with.

It is, therefore, advised to all concerned to ensure that the precautions stipulated for eliminating such accidents are strictly complied with and also a suitable code of practise mentioning specific duties of shot firer/blaster, sirdar/mate and overman / foreman shall be formulated and enforced so that similar accidents do not recur.

Director General of Mines Safety

DIRECTORATE GENERAL OF MINES SAFETY

DGMS (Tech) Circular No. 11 Dated :8th Nov. 2001

To,

Owners of all Coal and Metal Mines.

Sub: Safe practice of repairing Hydraulic System in boom of Side discharge loader.

A fatal accident took place in a below ground coal mine using side discharge loader under the following circumstances.

While a mechanical fitter was engaged in repairing the spring loaded cartridge valve of lift cylinder of a side discharge loader by working underneath It without locking the same but resting it on a single vertical wooden sleeper, the load, cartridge valve flew off causing sudden lowering of the bucket breaking the sleeper and inflicting serious bodily injuries which proved fatal.

The inquiry revealed that had the bucket boom been kept secured in "lift" position by locking arrangement so provided and had the unsafe method of using wooden sleeper to support the bucket in lift position not been followed, this accident could have been averted.

The practice of supporting the bucket in "lift" position by wooden sleeper is in vogue in many mines engineers and yet this practice is allowed to continue against the interest of safety, therefore it is necessary to stop this practice forthwith,

It is requested that while repairing the hydraulic system in the boom or near by area care shall be taken to keep the bucket in the floor as far as practicable or otherwise the boom shall be locked by the locking arrangements provided by the manufacturer and such arrangement shall be kept readily available in the machine at all times. These steps will help in preventing recurrence of such accidents in future.

Director-General of Mines Safety