



भारत सरकार / Govt. of India  
श्रम एवं रोजगार मंत्रालय  
Ministry of Labour and Employment  
खान सुरक्षा महानिदेशालय  
Directorate General of Mines Safety



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**DGMS (Tech.) (S&T) Circular No. 06 of 2016 Dhanbad, dated 08/04/2016**

To

All Owners, Agents and Managers of Coal Mines

**Subject: Standards of illumination in opencast coal mines**

Sir,

**Abbreviations** - DGMS: Directorate General of Mines Safety; S&T Division: Science & Technology Division; DDG(HQ): Deputy Director General (Head Quarter); CIL: Coal India Limited; SCCL: Singareni Collieries Company Limited; CIMFR: Central Institute of Mining and Fuel Research; ISM: Indian School of Mines; lux: SI unit of illuminance and luminous emittance, measuring number of lumens per square metre; H: Horizontal illuminance, the measure of illuminance taken through a light meter's sensor at a horizontal position on a horizontal surface ; V: Vertical illuminance, the measure of illuminance taken through a light meter's sensor at a vertical position on a vertical surface.

Proper illumination is desirable and can be an effective aid to tackle hazards in coal mines. Existing illumination standards are several decades old, necessitating a comprehensive review in the backdrop of recent developments in mine technology and lighting.

For appraisal of present status of illumination in coal and metalliferous mines, and formulation of draft revised standards thereof, a project was undertaken by Science & Technology Division of DGMS. As a part of the project, illumination surveys were carried out in coal and metalliferous mines. Based on the inputs derived from illumination surveys and also from international best practices, a draft illumination standard for opencast coal mines was prepared.

A meeting was convened on 17.02.2016 at DGMS, Dhanbad, under the chairmanship of Shri P. Ranganatheswar, DDG(HQ), with a view to review and finalize the standard of lighting to be provided in the specified areas or places of opencast coal mines, earlier stipulated and specified vide Govt. Notification No. GSR-804, dated 18.06.1975, published in the Gazette of India, dated 28.06.1975, Part-III Section 3(i), also reproduced by the DGMS Circular (Legis.) No. 1/1976 under Regulation 154(2) of the Coal Mines

Regulations, 1957, in which twenty-four officials from different stake holders, like DGMS, CIL, SCCL, ISM and CIMFR participated.

After detail discussions and deliberations, the minimum illumination levels to be provided at different places of working in opencast coal mines along with general guidelines for mine lighting were suggested and finalized by the participating members, which are detailed below:

**STANDARDS OF ILLUMINATION IN OPENCAST COAL MINES**

<b>Serial No.</b>	<b>Places to be illuminated</b>	<b>Minimum standards of illumination to be provided (in lux)</b>
1	Work place of Heavy Machinery	15 H, 25 V (so as to cover depth and height through which the machine operates.)
2	Drilling operations	
	(i)Area where drilling rig works	25 V (so as to illuminate full height of the drilling rig)
	(ii)Area where drill holes exists	15 H
3	Places where manual work is done	15 H, 25 V
4	Places where loading, unloading or transfer, loading of dumpers, trucks or train is carried on (including OB Dump and Coal Stack Yard)	15 H, 15 V
5	Operators cabins of machines or mechanisms	50 H at all places of operation
6	Haul roads for Trucks and Dumpers	10 H
7	Rail haulage track in the pit	10 H
8	Roadways and foot paths from bench to bench	10 H
9	Permanent paths for use of persons employed etc.	10 H
10	In-pit Crusher/Feeder Breaker	40 H
11	Hand Picking Points	50 H
12	Conveyers	
	(a) Transfer points and drive/tail end area	40 H
	(b) Along conveyor	20 H

13	Coal Handing Plant	
	(a) Places of crushing, screening, segregation and loading/unloading	40 H
	(b) Operation points	50 H
	(c) Other places (in general)	20 H
14	Pumping Station	40 H
15	(i) Electrical Sub-station	100 H, 50 V
	(ii) Other places of operation of electrical apparatus/equipment	20 H, 20 V
16	First Aid station	50 H
17	Rest shelter	30 H
18	Workshop	100 H, 50 V
19	Parking Yard	50 H
20	General working areas as determined by the Manager in writing	10 H at the level of surface to be illuminated

### **Guidelines for mine illumination**

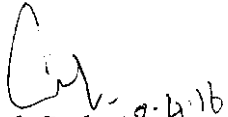
1. The mine lighting should be designed and installed with proper lamps and fixtures in regard to height, orientation, spacing and reflectors or other accessories, so as to secure a uniform distribution of light on the work area for visual comfort and avoiding objectionable shadows, sharp contrasts of intensity, glare, light clutter (excessive groupings of light) and light pollution to prevent strain on the eyes of the workmen, work fatigue and medically defined stress.
2. Portable lighting shall be provided at places, where the permanent/fixed lighting is not possible.
3. At strategic locations like electric substation, and any other places as determined by the Manager, emergency lighting arrangement by separate source shall also be provided.
4. In case of haul roads, orientation of light fittings should be kept so adjusted as to have emittance of light across the road and not along the road. Where the width of haul roads is more, the lighting arrangements shall be provided either by rows of lights erected on both sides of the road or by a centrally erected row, so as to maintain illumination as per standard.

5. Lighting arrangement at working places of heavy machineries, dump/stack yard and other loading/unloading areas shall be such that the formation of dark zone is avoided.
6. Considering high mobility of hydraulic excavators, the faces/benches worked by such machineries shall, as far as practicable, be illuminated by light source of matching mobility so as to avoid chances of lag for want of shifting.
7. Dump/stack yards shall be illuminated by suitable numbers of high mast towers/light source. It shall also be ensured that adequate light reaches up to edges of the active dump.
8. For better implementation of these standards, the manager of every mine shall formulate a detailed written "Illumination Scheme", which may include an "Illumination Plan" and duties and responsibilities of key officials for the purpose.
9. In respect of any particular place or operation in a mine, where due to existence of some special conditions the manager is of the opinion that compliance as per stipulated minimum standard is not reasonably practicable, he may provide illumination in variance thereof, if he has indicated the modified minimum illumination to be provided for such place or operation, as the case may be, in the "Illumination Scheme" with proper justification for the same and submitted a copy thereof to the Regional Inspector.
10. Illumination Survey:
  - (i) The manager of every mine shall arrange to conduct Lighting Survey once at least in every month to ensure adequacy of illumination.
  - (ii) While making such survey, the measurement of lighting shall also be taken at the point farthest from the source of light lying within the limit of the work place or in haul road or travelling or haulage roadway, as the case may be.
  - (iii) A record of every such survey shall be maintained and signed by the competent person making the survey and countersigned and dated by the manager.
11. Illumination Plan:
  - (i) The manager of every mine shall ensure that an Illumination Plan, indicating the location of places, type of illuminating devices, fixtures, lamps, supports, any other devices for illumination and showing required as well as measured value of light at various places to be illuminated, is maintained. Where any area of the mine is not in use or not needed to be lighted, the same shall be clearly marked and demarcated on the plan with reasons to be recorded. The plan shall be kept signed and dated by the surveyor and the official authorized for maintaining the lighting standard and countersigned and dated by the manager.

- (ii) The Illumination Plan shall be brought up to date in every month based on the monthly illumination survey and considering the current status of workings.

This circular supersedes the DGMS Circular (Legis.) No. 1/1976. Action is also being taken to forward a copy of this revised standard for notification in the Gazette of India.

All Owners, Agents and Managers of coal mines are advised to ensure strict compliance with this circular.



(Rahul Guha) 8.4.16

Director General of Mines Safety