



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. 07 of 2016 Dhanbad, dated 08/04/2016**

To

All Owners, Agents and Managers of Coal Mines

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

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**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 underground 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 existing guidelines issued on standards of illumination under regulation Reg.151 of Coal Mines Regulations, 1957 vide DGMS circular No. 14/1964 for underground coal mines, in which twenty-four officials from different stakeholders, 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 underground 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 UNDERGROUND MINES**

<b>S.N</b>	<b>Important places to be illuminated</b>	<b>Minimum level of illumination to be provided (in lux)</b>
1	At every shaft landing and shaft bottom or siding which is in regular use	50 H
2	Travelling roadway and Haulage road way, including Man-riding roadway and every incline in use	10 H, 10 V
3	Haulage Roadway (junctions) at which tubs are coupled or uncoupled	30 H
4	At every places of loading and unloading	30 H, 20 V
5	At every room and place containing any engine, motor or other apparatus in regular use	30 H
6	Any working face and Goaf Edges of depillaring panels	20 H, 30 V
7	Ladder way/Man way	15 H
8	Pumping Station	30 H
9	Area under filling /stowing	10 H
10	Conveyors	
	(i) Transfer points and drive/tail end area	40 H
	(ii) Along conveyor	20H
11	Hand picking points	50 H
12	Loco charging station	50 H
13	Underground Garage/workshop	50 H
14	(i) Electrical substation	100 H, 50 V
	(ii) Other places of operation of electrical apparatus/equipment	20 H, 20 V

15	At every First -aid station	50 H
16	Miners station/ Rest shelter	25 H
17	Coal Handling Plant	
	(i) Places of crushing, screening, segregation and loading/unloading	40 H
	(ii) Operation points	50 H
	(iii) Other places (in general)	20 H
18	workshop at surface	100 H, 50 V
19	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, winding engine room and any other places as determined by the Manager, emergency lighting arrangement by separate source shall also be provided.
4. 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.
5. 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.
6. 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 roadways and work place, 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.

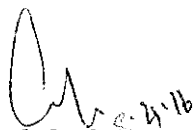
7. Illumination Plan:

- (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.

In addition to the above, the roof and sides of the aforesaid places belowground shall also be kept effectively whitewashed as required under Reg. 150 of Coal Mines Regulations, 1957 or such other corresponding regulations which may come into force in future, which would further help in significantly improving the underground visual environment and level of illumination.

This circular supersedes the DGMS circular No. 14/1964.

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



(Rahul Guha)

Director General of Mines Safety