SAFETY & RISK ASSESSMENT

1 Safety & Risk assessment

Outside agency deploying HEMM or any equipment in the mine for excavation of coal shall plan their activities in conformation with the prevailing statutory provisions as per Mines Act 1952 and CMR 1957 applicable for safety in opencast mines. However, all statutory rules, regulations, applicable laws etc. and statutory requirement related to Govt. licenses, workers compensation, Insurance, etc., including minimum wage act for workers employed by the outside agency shall have to be adhered to. Rules if any imposed by local/State/Central authorities should also be complied by leaser of HEMM/equipment and then shall have to supply various protective equipments viz. helmet, shoes etc. to the workmen at their cost.
All the regulations & schedules of coal mines Regulations 1957 relating to opencast mining have to be adhered to and implemented in order to maintain day to day safety precautions as per stature.

SAFETY ASPECTS FOR OUTSOURCING/HIRING OF HEMM/ EQUIPMENT

Special precaution should be taken while deploying workers in the mine. Before employing any labour to the mine proper vocation training should be imparted and recommendations of VIII Safety Conference should be strictly followed. Terms and conditions shall be fixed by management for deployment of labourers by outside agency. Some of the major aspects are as follows:-

A) For persons :

i) No persons shall be deployed unless he is trained at VTC
ii) Records in Form-B Form-D shall be maintained.
iii) Records of Vocational training Certificate and driving license of operators shall be kept by HEMM outsourcing agency and shall be made readily available for inspection by management.
iv) No person shall be employed unless person holds VTC certificate and Management is informed. A record of it shall be maintained.
v) Adequate supervision shall be maintained by qualified competent persons.
vi) Outside agency shall follow safety guidelines and safety instructions from Project Authorities.

B) For Machineries as recommended by DGMS Cir. (Tech.) 1 of 1999:

i) All the machineries to be deployed in mines should be checked before deployment by competent authority.
ii) Regular checking of m/c deployed by outside agency shall be done. No unfit machine shall be deployed before the defect is rectified.
iii) A proper record of repair and maintenance along with inspection done by management and defect pointed out shall be maintained and signed by authorized person.

iv) The trucks deployed by outside agency shall be provided with Audio-visual alarms, proper light for use at night and period when natural light is not sufficient. Also audio-visual alarms for reversing on trucks shall be provided.

Other Precautions for machines

i) RTO certificate photo copies of all vehicles shall be submitted to management
ii) Daily welding, monitoring, inspection shall be done by the agency's mechanic as directed by management.
iii) Machine manufacturers should be asked to give risk analysis details in respect machines deployed by outside agencies..
iv) Suitable type of the fire extinguishers shall be provided in every machine.

C) General :

i) No person/vehicle shall be deployed at any place other than authorized place.
ii) All workers should obey lawful instruction of mine management.
iii) Risk Management Plan of tipper/pay loader shall be made and implemented.
iv) All drivers shall obey systematic traffics rules prepared by management
v) Before deploying workers they must be trained and briefed about safety aspects in opencast mine. However during course of execution of the work, if any accident occurs whether major or minor, the matter shall have to be immediately informed to mine management i.e. Colliery Manager/Agent/GM of Area so that Notices of accidents in a accordance of (Reg.9 of CMR 1957) and Section 23 of Mines Act 1952 may be given and other necessary steps may be taken in accordance with the Mines Act 1952.
vi) Outside Agency shall operate transport system in such a way so as to minimize pollution in the mine.

Stability of Benches, Quarry High walls and Spoil Dumps:

During quarry operations, it is necessary to adopt required mining parameters for the stability of benches, high walls and spoil dumps. It is also mandatory to examine systematically the fencing of mine workings, land slides and cracks between benches. It is required to maintain well graded and wide roads on benches keeping the width of working areas sufficient for spreading of blasted rock and movement of the mining and transport equipment.
During actual mining operation, systematic observations of the condition of benches, high wall slopes and spoil dumps should be carried out and the dimensions be modified if necessary to suit the local conditions.

Precautions against Danger of Inundation from Surface Water:

1) A careful assessment is to be made against the danger from surface water before the onset of rainy season. The necessary precautions should be clearly laid down

and implemented. Garland drains need to be provided to drain away the surface rain water from coming into the mine.

2) Inspections for any accumulation of rain water, obstruction in normal drainage and weakening in embankment.

3) Standing order; for withdrawal of working persons in case of apprehended danger.

4) During heavy rain inspection of vulnerable points is essential. In case of any danger persons are to be withdrawn to safer places.

5) Nallah or water inlets may be diverted or isolated by embankments if so required.

Prevention of Flooding of Equipment Deployed at Bottom Horizons:

During the heavy monsoon period, the mining operation in the lower-most bench may have to be stopped. Therefore, it is proposed to drown the lower-most bench, which would work as a sump. The water will be pumped out and discharged into the nearby Nalla.

For ensuring safety of the equipment while working out bottom horizons with no access to surface profile, the following measures should be taken:

1) Drivage of initial trenches and coal cutting on bottom benches should be done during the dry period of the year.

2) Ramps should be made for quick shifting of equipment from bottom horizons, liable to be flooded during monsoon period, to the top horizons.

Prevention of Electric Shocks:

During mining operations, all the statutory provisions of the Indian Electricity Rules 1956, and Indian Standards for installation and maintenance of electrical equipment etc. should be observed.

1) For protection from electric shocks to persons, from electrical equipment with voltage up to 1000V Earth Leakage Relay should be provided which will automatically disconnect electrical circuits.

2) Closed mobile substations and switchgears should be mechanically interlocked which exclude the possibility of opening the door when oil switch and air circuit breakers are in operation.

3) All metal parts of electrical equipment should be properly earthed to avoid failure of insulation.

4) All H.T lines and cables located within the blasting zones should be disconnected during blasting operations.

Dust Suppression & Dilution of Exhaust Fumes:

The following measures should be adopted for dust suppression at all quarry working places, dumps, haul roads, CHP and near other auxiliary mining operations.

1) Spraying with water on all working faces & haul roads, by special spraying machines or water-sprinkler. Dust suppression & extraction system in washery premises.

2) While drilling holes, it is necessary to use dust extraction devices.
3) Installation of local dust suppression and air conditioning devices in cabins of excavators and drilling rigs may be considered.
4) Levelling of spoil dump surface.
5) Separate dust suppression arrangement should be provided for CHP and washery.

To prevent collection of harmful mixtures in the atmosphere, from the different sections of quarry workings, it is recommended: -

1) To spread out the sources of dust formation and omission of harmful gases throughout the working area of the quarry.
2) Drilling & blasting operations should be timed for periods of maximum wind activity during the day.
3) Dumpers may be provided with purifiers for exhaust gases.

Measures to be taken for Fire Fighting and Fire Prevention:

In addition to statutory provisions, the measures for fire fighting and prevention of fires are as follows:

1) Organisation of special cell for systematic observations to examine and prevent fire
2) Removal of spillage of coal on benches, cleaning of coal horizons, cleaning of coal on coal gantries & washery premises to prevent cases of coal heating.
3) Storage of lubricants and cotton waste in enclosed fireproof containers in working places.
4) Provision of fire extinguishers at different locations.

Measures to be taken while Drilling Blasting:

Following measures should be taken while drilling and blasting operations in the quarry:

1) Drilling and Blasting in quarry should be done in accordance with the provisions of Mines Safety Act, rules and regulations.
2) Adequate safety measures have to be taken during blasting operation in the quarry so that men/machine is not affected.

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