

1.0 RISK ASSESSMENT

Risk assessment has been carried out for Sukurangi Mining Project of OMC and based on the same comprehensive disaster management plan has been prepared.

During the operation of the open-cast mine, following risks have been identified.

1. Failure of Slope in the pits.
2. Failure of slope of external dumps
3. Fly rock from blasting operations
4. Surface fire (electrical and oil).
5. Possible Danger due to storage and handling of explosives
6. Opencast Inundation

1.0.1 Failure of Slope in the pits

In order to allay dangers due to open cast slope failure slope stability estimations have been made for the existing quarries after determining various physical parameters of the ground mass like uni-axial compressive strength, tri-axial compressive strength, cohesion, angle of friction, specific gravity of the rock, water pressure etc. Besides, all the discontinuities have been plotted in stereo plots, which indicates that there is no chance of any planer failure, or wedge failure. Even then, factor of safety has been determined against overall slope failure as well as against individual bench slope by circular failure, planer failure, wedge failure. Besides determining factor of safety the slopes are monitored at regular intervals to check for any possible failure. The well-developed drainage system over the lease area ensures that storm water does not accumulate in the lease area and therefore hydrostatic pressure remains at a low level.

Moreover, a slope stability study was conducted by Central Institute of Mining and Fuel Research, Dhanbad for quarry AC & DE during 2014-15. Recommendations stipulated in the report should be implemented in total under the supervision of a competent research oriented agency, like CIMFR.

For future workings also similar measurements and inspection shall be carried out. The mine has been designed based on the above considerations with sufficient safety margins to eliminate any chances of slope failure in the pit.

1.0.2 Failure of Slope of External Dumps

The slopes of external dumps shall be planned at an overall angle of less than 28° with individual lifts at less than 37° . As the dumps attain final position, the slopes will be terraced and proper vegetation will be laid which will cause binding of the soil preventing any slope failure. Retaining walls will be built all-around the external dumps which will have weep holes for passage of storm water to join garland drains.

1.0.3 Fly Rock from Blasting

Trial blasting results of a nearby mine (with similar geo-mining characteristics) have been used to arrive at the field empirical equations based on which the charge per delay has been regulated to protect the nearby structures. All precautions related to



control of fly rock will be taken during the blasting operations (described in chapter 6 of EIA report). Safety zone of 300m as per statutes shall be maintained.

1.0.4 Surface Fire

Spillage of HSD and resultant fire constitutes a potential risk. The quantity of the maximum oil, which can spill, is not much and can be easily controlled. Sufficient nos. of portable fire extinguishers has been provided at strategic locations to take care of any eventuality.

There are risks of fire at the electrical substation and transformers. Dry and foam type portable fire extinguishers shall be made available at the electrical substation and control room. In case of any electrical fire, the personnel on duty shall shut down the electrical fire and inform the shift-in-charge. Personnel trained in dealing with electrical fires will be summoned. The fire area will be cordoned off till the fire is fully extinguished and remain so until all wreckage and debris is cleared away. After effecting necessary repairs the power will be restored. The clearance for restoration of power shall be given only by the shift-in-charge.

As soon as any fire is reported the shift-in-charge shall assume the function of disaster controller. In case of serious fire and depending on the gravity of the situation, the Mines Manager may be summoned to assume charge. Personnel trained in dealing with fires will be summoned. Meanwhile the hospital will be informed to handle casualties. The fire area will be cordoned off till the fire is fully extinguished and remain so until all wreckage and debris is cleared away.

1.0.5 Danger due to Storage and Handling of Explosives

An explosive magazine exists in the mine. Adequate safety zone has been provided as per statutory requirements while locating the magazine. The magazine has been constructed as per plan approved by Dept. of Explosives. The following have been considered in the design of the magazine.

- All dry vegetation within a 15 m radius cleared.
- Lightning arrestor installed on the magazine roof.
- A safety zone around the magazine created.
- In summer, the temperature inside the magazine is monitored to guard against spontaneous fire.
- The manufacturing dates of all explosives stored in the magazine are carefully recorded so that no explosive whose shelf life has expired is kept in stock.

In case of any fire, whosoever notices the fire will sound the alarm and inform the shift-in-charge. The shift-in-charge will inform security personnel and arrange to evacuate all personnel, except those who are required for fire fighting, from the area. The fire brigade shall be summoned to deal with the emergency. Concerned district officials will be informed. Nearby hospitals will be informed to standby to handle casualties.



Since there are no major water bodies around the mines, chances of flooding of mine does not exist.

1.0.6 OPENCAST INUNDATION

Following precautionary measures shall be undertaken:

- A careful assessment of the danger of inundation from surface water shall be made before onset of monsoon season every year and adequate precautions against such dangers shall be implemented.
- Effectiveness of precautions, obstructions in normal drainage system etc. shall be checked regularly. During rainy season, blockage of nala / stream may occur, which needs to be cleared.
- Every entrance into the mine shall be at least 3.5 m above the High Flood Level (HFL) at that point.
- Fixation of danger mark of water level and effectiveness of communication shall be taken care of.
- The mine shall have adequate pumping capacity and standby pumping arrangements shall be made ready

1.0.7 Pit Safety Committee

A pit safety committee (PSC) has been constituted, headed by the Mines Manager. The Senior Manager (Safety) will act as the Secretary of the PSC.

The functions of the PSC are as follows:

- Visit various working areas of the mine (mine pits, ore handling plant, workshop, electrical premises, loading area etc.) regularly (at least once a month) and meet the workers to discuss matters regarding safety and invite their suggestions on the same.
- Review all accidents (including minor ones) reported since the last visit and suggest measures to prevent recurrence of the same.
- Enquire into all serious accidents that are referred to PSC by the Mines Manager for enquiry.
- Discuss recommendations of Inspector of Mines on matters of safety and DGMS violations placed by the Mines Manager before the PSC for information and necessary action.
- Take active part in organizing and observing Mines Safety Week.
- Undertake publicity and propaganda work at the mine for creating safety consciousness amongst the workers.

