

1. Scope

This standard applies to all underground mining operations managed by Vedanta businesses and specifies mandatory requirements for all existing operations, new acquisitions, shafts and adits including those developed for exploration or mine construction purposes. This standard applies to all business partners. The Explosives and Blasting Guidance Note provides additional guidance.

The objective of the standard is to eliminate the risk of fatalities and serious incidents resulting from any activities related to explosives and blasting in mines across Vedanta.

The term explosive includes both high explosives products, such as emulsion, stick powder (packaged emulsion), cartridge explosive, Ammonium Nitrate Fuel Oil (ANFO), PETN & Emulsion boosters, all types of detonators and other blasting accessories. The term generally refers to explosives, but in some cases explicitly states detonators.

2. People

The Mine Manager is responsible to ensure that all statutory duties as outlined in the local legislation are strictly followed. The Mine Manager shall ensure that there are appropriate SOPs in place for delivery, transport, storage, issuing/ returning, handling, use and destroying of explosives, to ensure that explosives usage can be achieved in a safe and sustainable manner. The Mine Manager must ensure that:

- 2.1. There is a list of personnel who are authorised to transport and handle explosives and to carry out blasting.
- 2.2. There are authorised shotfirers, who must be certified as required by local legislation, as well as other education and training requirements for the role. This shall be clearly defined in the SOP.
- 2.3. Training for all mine personnel on dealing with explosives, and tasks, such as delivery, handling, storage and blasting.
- 2.4. Annual training programmes for all users of explosives.
- 2.5. All personnel working in the mine are required to have general awareness of risks associated with explosives and blasting in their induction.
- 2.6. Training records shall be kept by the training/HR department for a period of no less than 24 months.

3. Process

The processes below shall be put into place:

- 3.1. Each operation must ensure that a Hazard Identification and Risk Assessment (HIRA) system is in place to ensure that all hazards associated with explosives and blasting are identified, the risks are assessed, and appropriate controls are in place to ensure safe and sustainable blasting operations. This shall be recorded on a risk register and the Mine Manager shall review and approve the risk register annually.
- 3.2. Identify approved explosives suppliers and ensure that only legally approved explosives are used.
- 3.3. Establish a Scheme of Transit for the safe transport and distribution of explosives throughout the mine site.
- 3.4. Ensure that vehicles used for transportation of explosives have flashing lights, in the colour listed in the SOP when explosives are on board.
- 3.5. Only use vehicles that are licenced and constructed as per the approved legislation of the country.
- 3.6. Establish a system, so that high explosives and detonators are always kept separate until they are being loaded into the drill holes. This includes transportation, storage, and handling.
- 3.7. Design and construct enough licenced explosives magazines and storage facilities or day boxes required for the works.
- 3.8. Clearly identify explosives magazines and reserve stations or day boxes and display the maximum allowable quantities and types of explosive permitted at each location.
- 3.9. Install a suitable and approved security system for the storage of explosives at magazines. The reserve stations to be kept under lock and the key to remain with the authorised blaster.

- 3.10. Establish a recording system for explosives for all stages of handling and transport by use of a logbook. The records must be kept for a minimum of 24 months.
- 3.11. Ensure that loading and unloading of explosives is managed to comply with legislation and company standards and approved by the mine manager.
- 3.12. Ensure that when explosives are delivered to the working faces, they are received only by authorised personnel and are stored safely and securely in accordance with local legislation and Vedanta standards.
- 3.13. Ensure that explosives handling and usage at the working faces is only carried out by authorised shotfirers / blasters and personnel under their direct control. All personnel shall be certified for the type of blasting being done.
- 3.14. Ensure that all charged faces are barricaded to prevent unauthorised access.
- 3.15. Ensure that all ignition sources are removed from any area where explosives are present.
- 3.16. Ensure that prior to initiating a blast there is a warning system; a physical check of the area; and a system of barricading and signage to prevent inadvertent entry.
- 3.17. Devise and implement a system where unused explosives are safely removed from the working area to either a reserve station.
- 3.18. Disposal of any recovered old or used explosives shall only be destroyed in a manner allowed by local legislation.
- 3.19. Ensure that firing of shots is carried out by authorised personnel, as per the approved blasting schedule.
- 3.20. Ensure that blasts are checked by 'competent' persons after an appropriate time, ensuring that ventilation requirements for air clearance and air quality test have been made and proven to be safe before re-entry is allowed.
- 3.21. Install barricades and signage at all areas where explosives are stored, handled, transported and used.
- 3.22. Ensure blasting SOPs cover the management of misfires, including a minimum time before re-entry; a risk assessment prior to re-entry; and procedures for the safe removal of explosives. There must be a process and accountabilities assigned to ensure that these requirements are diligently followed.
- 3.23. Ensure that production blasting is designed by mining/blasting engineers, trained in drill & blast operations. A plan for each production blast shall be issued to mining personnel, including the diameter, depth and direction of every hole to be drilled, details of individual holes to be charged, type and amount of explosives to be used in each hole, timing of initiation, tonnage expected and; power factor used. Copies of blasting plans shall be kept for a period of no less than 3 months:

4. Review

- 4.1. The items included in this Standard must be reviewed annually by the mining, engineering and safety departments.



Phillip Turner
Group Head HSE & Sustainability