VSS 8 Machine Guarding Safety Performance Standard

1. Scope

This standard is applicable to all business units and managed operations, including new acquisitions, admin/corporate offices and research facilities located off site; during exploration, through all development phases and construction, operation to closure and, where applicable, for post closure management. Machine guarding is the elimination of access by people to moving parts of a machine that may present a hazard to those people. This includes hazards of rotating equipment, nip points, conveyors, V-drives and chain drives, shaft ends, couplings, rotating and oscillating levers and other rotating parts.

1.1. This standard applies to the design, construction, installation, maintenance, inspection, and operation of machine guards.

1.2. This standard is to prevent access to dangerous parts of machinery or stop their movement before any body part of a person enters a danger zone.

1.3. Businesses must also comply with local machine guarding related laws and regulations.

2. People

2.1. Equipment guarding should be designed and installed by the equipment OEM, noting that such guarding must be in accordance with GN18 – Machine Guarding. Where guarding is designed by other agencies or by Vedanta personnel, those persons must be certified as competent by respective business.

2.2. Each person removing a machine guard must be trained in the requirements of this Standard and the expectations of GN18 and designated as competent by the respective business. Such designation will include as appropriate any redesign, construction, installation, maintenance, inspection, cleaning and operation of the equipment and its guards.

2.3. The project engineer is responsible for ensuring proper machine guarding in the case of new projects/installations.

3. Process

3.1. No activity should be carried out on machinery or its danger points while it is in operation or motion, except as described in 3.2 below. The machine must be isolated in accordance with the specific requirements and the work must be approved through a permit to work. Specifically, every operation must:

- 3.1.1. Eliminate the need to work and working alone on a machine while it is in motion.
- 3.1.2. Ensure that all dangerous parts and nip points are guarded so that no one can be injured by the machine during operation.
- 3.1.3. Implement a robust interlock protection system on all machine guarding wherever practicable to ensure the machinery will stop if the guarding is removed or tampered with.
- 3.1.4. Revoke the Isolation and Permit to work only after completion of the job.

3.2. For any task such as machine testing, adjustment etc. that requires the machine to be in operation while work is taking place, a safe operating procedure for the specific task(s) shall be developed and all personnel involved shall be certified as competent on the SOPS. Such work must be approved on a case by case basis by the Engineering Head or the SBU Head.

3.3. Every business must ensure that machine guards:

- 3.3.1. Are of sufficiently robust construction to prevent ejected machine parts or material penetrating the guard.
- 3.3.2. Do not give rise to additional hazards.
- 3.3.3. Are not easily bypassed or made non-operational.
- 3.3.4. Are located at an adequate distance from the danger zone.
- 3.3.5. Do not inhibit the operator's ability to operate the machine safely, e.g. by obstructing essential visibility.
- 3.3.6. Enable essential work to be done without guard removal.

3.4. Fixed guards must be installed such that guard removal/ opening is impossible without using tools, either by permanent means (e.g. welding) or by means of fasteners (bolts etc.).

3.5. Ensure systems and equipment are in place for the safe start-up of conveyors, which may include engineering controls such as interlocks and conveyor logic systems.

3.6. Ensure systems and equipment are in place that provide positive feedback for the safe start-up of conveyors, such as audio warning, radio communication, CCTV and visual display for the operator.

3.7. Ensure adequate illumination during machinery inspection, maintenance, cleaning and operation.

3.8. Before starting equipment, physically inspect to ensure:

- 3.8.1. Nobody is working on the equipment;
- 3.8.2. Access platforms are clear;
- 3.8.3. Guards are fitted and tightly secured; and
- 3.8.4. Permit to work and isolation are surrendered.

4. Review

4.1. All Vedanta operations are required to develop and document inspection, maintenance and testing procedures to ensure that guards and protection devices are maintained in good working order and are in good repair.

4.2. Machine guarding inspection must be part of the Preventive Maintenance schedule of equipment.

4.3. Periodic internal and external audits covering machine guards must be undertaken at all locations to ensure compliance with this Standard.

4.4. Regional legislation and regulations; local and international standards; codes of practice and guidance notes specific to the unit or operation must be followed.

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