



Entanglement and crushing

1. INTENT

This standard identifies the controls required to manage the risk where personnel are required to work on or near rotating equipment.

2. APPLICATION

This Standard applies to all Perenti Group projects.

3. REQUIREMENTS

3.1 PEOPLE

- Induction training must include the use of isolations, e-stops, pullcords, guards, interlocks, barriers and barricades, etc.
- All persons who are required to perform isolations must be deemed competent and authorised.

3.2 SYSTEMS AND PROCEDURES

- All plant and equipment must be risk assessed to identify where guarding and interlocks are required.
- Where guarding and interlock systems are insufficient to protect personnel, access to plant and equipment must be controlled with isolations which are conducted as per the requirements of the Perenti Isolation and Control of Hazardous Energy Critical risk Standard.
- There must be a system for the design, procurement, installation, commissioning and maintenance of all plant and equipment that considers all energy sources and the requirement for guarding or barricading. Where practicable, plant and equipment design should seek to eliminate the need for guarding. Any changes to the system need to follow the Change Management Procedure prior to implementation or removal.
- A formal system must be in place to ensure the integrity of plant and equipment guarding.
- Guards must only be removed for maintenance, repair, cleaning, clearing, etc., and only after plant and equipment has been isolated, locked and tested in line with the isolation requirements above.
- Where the temporary removal of guards is necessary on operating plant and equipment for the purposes of fault-finding, testing and commissioning, the task must be conducted under a "live work" risk-based procedure, following the required authorisation and approval process.
- Guards must be replaced prior to plant and equipment being put back into operation.
- A procedure must be developed and implemented for the use of hand tools under mechanical or hydraulic power on drill strings, including the requirements for hands off controls.

3.3 PLANT AND EQUIPMENT

- Guarding must be designed such that it can only be removed with the use of tools.
- Crush prevention systems must be fitted to work boxes, elevated work platforms (EWPs), or equivalent. These must include consideration of operator protective structures, electronic warning devices, retraction devices and other protection technologies.
- Crush prevention devices must be routinely inspected, tested and maintained.
- Equipment controls must be designed to prevent inadvertent operation and must be clearly labelled in the local language.
- Where identified as being required by risk assessment safety interlocks must be fitted and operate to restrict equipment and machinery movement when activated. Safety interlocks must be fail-safe and be designed to prevent them being bypassed.
- Start-up audible alarms with appropriate delays must be fitted to conveyors and large moving equipment where persons may be present at start-up.
- Emergency stop functionality, e.g., pull cords, must be fitted, and located for easy access and operation.
- Fail-to-safe switches or devices must be installed on all manually operated rotating plant and equipment and power hand tools (e.g., saws, lathes, drill presses).
- Deadman switches, emergency stops and pull cords, safety interlocks and start-up alarms must be routinely tested, inspected and maintained.