

MOBILE EQUIPMENT



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4 MOBILE EQUIPMENT

Intent

The intent of this Protocol is to eliminate or minimise the potential for fatalities, injuries and incidents arising from risks related to mobile equipment.

Related Life-Saving Behaviours

1. Always come to work drug and alcohol free.
2. Always use or wear critical safety equipment.
4. Only operate equipment if trained and authorised.
6. Never modify or over-ride critical safety equipment without approval.
7. Always seek and obtain clear approval before entering mobile equipment operating zones.
8. Never enter danger zones without approval.
9. Always report injuries and HPRI's.

Key actions

1. Conduct a risk assessment of mobile equipment collision and pedestrian interactions for your asset.
2. Develop a Transport/Traffic Management Plan and apply associated procedures.
3. Identify and introduce fatigue management and collision avoidance technologies.
4. Develop equipment specifications and procurement criteria.
5. Monitor that controls continue to deliver all required outcomes.

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4.1 General requirements

- 4.1.1 A risk assessment must be conducted and documented that identifies mobile equipment interaction risks and their controls for:
- a) Vehicle to pedestrians;
 - b) Vehicle to vehicle, including heavy to light vehicle;
 - c) Vehicle interactions with fixed structures and the operating environment.
- 4.1.2 A Transport/Traffic Management Plan or equivalent must be developed for surface and underground locations which:
- a) Meets or exceeds regulatory and legal obligations;
 - b) Documents the means to minimise risk required when working with or around mobile equipment;
 - c) Details how the controls from the risk assessment are implemented and maintained;
 - d) Confirms how the status of controls are monitored.
- 4.1.3 Site rules and procedures which must be referenced in the Transport/Traffic Management Plan for mobile equipment must include:
- a) Mobile equipment being used within approved design parameters;
 - b) Operator prestart equipment inspection and technology checks, based on original equipment manufacturer or approved engineering advice, and operating requirements;
 - c) Method of fundamentally stable parking of mobile equipment e.g. park brake, chocks, spoon drains, humps (between front and rear axles), turning vehicle steering to the wall when parking on grades in underground mines;
 - d) The safe refuelling of the mobile equipment;
 - e) Stopping mobile equipment when boarding or dismounting;
 - f) Loading and unloading of mobile equipment methods detailing:
 1. Load security and stability;
 2. Precautions to be taken when tipping loads.
 - g) Mobile equipment limitations including the maximum loads that may be carried or towed;
 - h) Expected operator responses to mobile equipment faults, alerts and alarms;
 - i) Stability related hazards when operating ancillary equipment such as for forklifts, scissor lifts and similar items, including vehicles with quick detach systems (QDS);
 - j) Transport of personnel rules and procedures covering:
 1. Only mobile equipment with designed and approved seating, including seatbelts or other restraints devices, can be used to transport personnel;
 2. Seat belts and /or restraints must be worn where fitted;
 3. Personnel must never be transported in workbaskets, buckets, or any other machine locations without seating. An exception may apply to tramming approved mobile lifting

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- equipment where the operator is secured with a safety harness.
- k) Speed limits by equipment type, location and conditions;
- l) Managing changes in road surfaces;
- m) Operating around fixed structures, such as conveyor and bin trestles, building supports, power poles etc.;
- n) Loading from bins, if relevant;
- o) Entering potentially explosive atmospheres, if relevant;
- p) Access to operational areas including positive communication methods;
- q) Minimum PPE requirements including high visibility clothing;
- r) Identification and communication of mobile equipment sight lines and blind spots;
- s) Provision of walkways and means of maintaining clearance from pedestrians and other vehicles;
- t) Give way requirements for mobile equipment operators and pedestrians;
- u) Managing road repair works, including grader operations;
- v) Radio (or other communications) call up protocols where used;
- w) Procedures for approaching mobile equipment;
- x) Procedures for towing;
- y) Parking in operational areas including the means of isolating of equipment and activity from danger of collision during breakdowns, emergencies, infield servicing, refuelling and maintenance;
- z) Handheld mobile phones must not be used when operating mobile equipment;
- aa) An effective fatigue management system must be applied which includes:
 1. Education and awareness for workers;
 2. Shift roster design;
 3. Defined hours of work and rest requirements, including travel time and a process to manage additional hours of work;
 4. Advice and support for supervisors including fatigue call-ups during shift and how to manage fatigued persons from the workplace.
- 4.1.4 A plan for the introduction of technology to support existing fatigue management approaches must be developed including:
 - a) A baseline assessment of existing mobile equipment fatigue controls;
 - b) Assessment of the potential benefits of technology to support or replace existing fatigue management controls for mobile equipment operators;
 - c) Establishing functional and performance requirements of the technology to achieve desired outcomes.
- 4.1.5 Mobile equipment related potential emergency scenarios must be identified and emergency

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response procedures must include equipment and response requirements e.g. fire response, trauma first aid, extrication of trapped or pinned personnel; power line contact and potential tyre explosion etc.

4.2 Mobile Equipment specification and maintenance

4.2.1 As a minimum, the following must be in place:

- a) Mobile equipment specifications must be prepared by knowledgeable and experienced people who are familiar with production and operating environment demands;
- b) Mobile equipment specifications must be applied when:
 1. Purchasing new or used equipment;
 2. Transferring equipment to site;
 3. Hiring equipment;
 4. Assessing contractor equipment.

4.2.2 As a minimum, mobile equipment specifications, with reference to Glencore procurement standards, must be established for:

- a) Operator access and egress;
- b) Maintainer access;
- c) Towing hooks/lugs designed to handle expected loads;
- d) Brakes;
- e) Steering;
- f) Tyres;
- g) Head lights and clearance lights;
- h) Indicators, warning lights, horns and alarms of sufficient volume to be heard in the operating environment;
- i) Vehicle identification numbers (unique, clear and visible) for Surface Operations;
- j) Mirrors and cameras (where fitted);
- k) Communications equipment;
- l) Where implemented, operator proximity alerts, advisory and intervention technology;
- m) Fire suppression;
- n) Roll Over Protection System (ROPS);
- o) Falling Object Protection System (FOPS) that exceed the maximum expected object force e.g. when loading in pit or from under an ore or reject bin;
- p) Internal load barriers that protect operators and passengers;
- q) Mobile equipment reversing alarms;
- r) Stability requirements for equipment fitted with quick detach systems (QDS);

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- s) Stability requirements for ancillary equipment such as forklifts, scissor lifts etc.
- t) Emergency escape and rescue for credible emergency scenarios e.g. managing void hazards for dozers working on stockpiles with underground reclaim hoppers which require:
 1. The fitting of tilt switches;
 2. Installation of laminated glass while maintaining an emergency escape;
 3. The installation of oxygen generating self-rescuers.
- 4.2.3 Mobile equipment maintenance processes must include:
 - a) Operator pre-use inspections including highlighted critical “No Go” items;
 - b) Method of notifying and managing equipment failures during operations;
 - c) Scheduled inspection, servicing and maintenance programs for mobile plant and support equipment, e.g. radio communication system including networks; and key systems e.g. proximity detection systems, brakes, tyres and lubrication;
 - d) Cause analysis of serious and recurring failures of the equipment in order to avoid repetition and exposure.

4.3 Establishing a safe operating environment

- 4.3.1 Assets must establish minimum dimensions and conditions for roadways and mobile equipment work areas within their Transport/Traffic Management Plan that specifies:
 - a) Surface operations road width normally of at least three times the width of the widest vehicle regularly using two-way haul roads;
 - b) The construction and maintenance of safety berms or windrows alongside roadways edges or areas where there is a sudden change in terrain, e.g. drop off, water body, or other hazard. The safety berms or windrows must be constructed using suitable (solid) materials, be of a height, density and profile to enable an effective barrier. The minimum height required is half the wheel height of largest vehicles using road;
 - c) The design and use of safety berms or windrows for delineation and segregation e.g. at intersection approaches, corners etc. so as not to impede visibility;
 - d) Physical barrier design and locations used to protect against access to unprotected benches or trenches, and to underground draw points and open voids such as the overcuts of mined out Stopes
 - e) Road Maintenance practices that will maintain a proper road surface (e.g. snow removal, sanding, managed roadway watering for dust control, etc.)
 - f) The design and use of bumper blocks at underground dump locations such as open stopes and ore passes;
 - g) Maximum grade;
 - h) Curvature and line of sight;
 - i) Pavement shape and material;
 - j) Guideposts spacing relative to the distance required between travelling vehicles;

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- k) Guidepost reflector specification e.g. red on driving side and white on off side;
- l) Signs and barriers;
- m) Lighting standards;
- n) Intersections designed as far as practical with a ninety degree angle of approach;
- o) Vehicle parking requirements that include parking distances from other equipment and structures;
- p) Dust control;
- q) Lightning and other extreme weather event precautions;
- r) The protection of fixed structures, including overhead power lines, buildings, refuelling areas, elevated structures, bins etc. during mobile equipment operations;
- s) Loading from a reject or ore bin detailing requirements for access, loading and equipment design minimum standards including preventing any unprotected mobile equipment cabin from entering the material loading zone under a loading bin;
- t) The approach to bridges and tunnels must clearly signpost the maximum height and width, and if relevant the maximum load capacity of vehicles that may transit;
- u) Operational practises that prevent vehicles from entering or operating in explosive (e.g. methane rich) atmospheres.

4.4 Mobile equipment interfaces with pedestrians and other equipment

4.4.1 As a minimum, the following must be established and included within the Transport/Traffic Management Plan:

- a) Travelling and clearance distance between equipment and people;
- b) Workplace design that, as far as practical, eliminates the interaction between pedestrians and mobile equipment, or assists in maintaining awareness using:
 1. Segregated or dedicated walkways for pedestrians protected by windrows, bunds or other physical barriers;
 2. Delineation of no-go and danger zones for pedestrians;
 3. Pedestrian crossings in high pedestrian traffic areas;
 4. Horn signals to indicate vehicle operation prior to starting the vehicle, before forward movement, and before reversing (except in operating environments where this may create a hazard);
 5. Establishing protocols for persons who work around operating mobile equipment to have Positive Communication with the equipment operator e.g. cap-lamp signals in an underground, in a surface mining environment at least one member of the work party has an operating two-way radio;
 6. Stopping vehicles on underground roadways when pedestrians cannot move to a position of safety i.e. a defined distance or location. This means:

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- i) The vehicle must stop;
- ii) The operator must acknowledge the pedestrians' presence and allow the pedestrians to walk past the vehicle before continuing.
- c) Workplace design and operational practice that manages mobile equipment interactions where practical using:
 1. Separation of light and heavy vehicles using segregated roads;
 2. Use of remote bays, portable remote stands designed to withstand vehicle contact, and sensors that stop equipment when allowable proximity distances are breached for remote controlled mobile equipment
 3. Park up areas with one-way traffic flow and segregated parking areas for heavy plant and equipment, light vehicles and pedestrians;
 4. Establishing park up areas with spoon drains, humps (between front and rear axles) or some other method to prevent uncontrolled movement of vehicles;
 5. Establishing one-way traffic in high traffic areas, or installing centre berms or windrows;
 6. The installation of one way block lights or other control system for high traffic intersections and drifts in underground mines;
 7. Applying Positive Communication where the caller and receiver identify vehicle and clearly respond, before:
 - i) Entering an active work area;
 - ii) Overtaking.
- 4.4.2 A review and planning exercise must be conducted to introduce collision warning and avoidance technology for priority equipment.

4.5 Training and Competency

- 4.5.1 Personnel who operate or work around mobile equipment must be trained, competent and authorised. A training plan must be developed and include:
 - a) Criteria for selecting and appointing mobile equipment operators. This must include a physical assessment of capability to reach an operator all controls;
 - b) Training needs based on work role, site rules and procedures, licensing requirements, Original Equipment Manufacturer (OEM) guidance and other recognised standards;
 - c) Competency assessment criteria, with records retained;
 - d) A periodic review and update of competency requirements, Training needs, Training content and methods.

4.6 Additional Requirements for Catastrophic Risk (PMC 5) Situations

- 4.6.1 Wherever there is a potential for a catastrophic incident related to mobile equipment e.g. transportation using buses:

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- a) A risk assessment must be conducted to identify specific hazards and controls;
- b) In-vehicle monitoring systems must be used to monitor driver behaviour;
- c) Controls must consider the separation of buses from heavy vehicles or the requirement to stop operation of heavy vehicles when buses pass;
- d) Critical controls must be identified and monitoring and verification processes must be implemented as per Glencore’s Catastrophic and Fatal Hazard management Policy.

4.7 Definitions

Management plan

Formal process for management of a particular activity, task or area of the business, which articulates management activities and roles and responsibilities.

Mobile Equipment

Includes all self-propelled tyred, tracked equipment including light and heavy vehicles (trucks excavators, loaders, draglines, graders, dozers etc.), ancillary equipment (forklifts, scissor lifts, elevated work platforms, tyre handlers etc.), and trains/locomotives

Surface Operations

Includes all surface areas relating to all activities (Surface Mines, Process Plants, Warehouses or Ports).
Excludes underground locations

Positive Communication

Includes the active communication between both mobile equipment operators and/or pedestrians where the caller and receiver identify one another, their intentions and clearly respond

Training

Refers to the initial training to verify competence and subsequent refresher training to verify that the competencies have been retained.

Tools (See Glencore HSEC Intranet)

Tools provided include:

- Glencore Mobile Equipment Self- Review Spreadsheet Tool;
- Protocol Audit Workbook;
- Protocol Toolbox Talk.

Note: Application of this Protocol must also comply with the General Mandatory Requirements outlined in Section II of the Glencore Life-Saving Behaviours and Fatal Hazard Protocols publication.

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4.8 Other applicable documents and web sites of interest

- Glencore Mobile Equipment Control Implementation Guideline
- Glencore Mobile Equipment Interaction (MEI) Control Improvement Procedure
- <https://emesrt.org/design-philosophies/>
- <https://www.icmm.com/en-gb/health-and-safety/safety/vehicle-interaction-controls>

4.9 Accountabilities

Team	Accountabilities
Glencore Corporate	<ul style="list-style-type: none"> • Maintain and update this protocol. • Use the protocol as a basis for relevant corporate audits. • Develop minimum procurement specifications for key mobile equipment types
Department	<ul style="list-style-type: none"> • Oversee the implementation of this protocol within the Department and apply assurance processes.
Asset management	<ul style="list-style-type: none"> • Apply the requirements of this protocol to their Management Plans
All employees/contractors	<ul style="list-style-type: none"> • Comply with relevant requirements of site Management Plans and procedures related to this protocol.

4.10 Control and Revision History

4.10.1 Document Information

Property	Value
Approved by:	Lucy Roberts
Document owner:	David Mellows
Effective date:	23/03/2020

4.10.2 Revision

Version	Date Reviewed	Review Team	Nature of Amendment(s)
1-0	29/10/2013	HSEC Corporate Leads.	First published version.
2-0	16/3/2020	Vehicle Interaction working group, HSEC Leads, VI-WG, Mick Buffier and David Mellows. Glencore legal	Major restructure and update incorporating outcomes of various Glencore working groups, ICMM and EMESRT as well as recommendations from Business Departments. Legal review completed

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