

DEBSWANA DIAMOND COMPANY

Fatal Risk Control Standards

STD/SHE/SH/016

Outcome Statement

The risk of fatalities and injuries from high-level hazards is eliminated or minimized.


Signed

12 Nov. 2013
Date

Debswana



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OUTCOME STANDARD

Experience has showed that we are susceptible to a number of high-level hazards that may lead to death or serious injury. Debswana has adopted a set of mandatory standards, developed by Anglo American, to address these high-level hazards and to eliminate or minimize the risk of fatalities and injuries.

PERFORMANCE STANDARD

POLICY STATEMENT

The following Debswana Safety and Health Policy statements apply:

“Debswana will continuously identify safety and health hazards, assess the associated risks and reduce risks to an acceptable level through the application of the hierarchy of controls”.

GUIDING PRINCIPLES

The Debswana Fatal Risk Standards represent current best practice in the control of the specific identified fatal risks and have been derived from detailed risk assessments, investigations into fatal incidents and the experiences of other industry leaders.

The Debswana Fatal Risk Standards form only a part of the requirements to prevent fatal incidents. The ongoing risk-management processes will assist in identifying the additional controls and associated management activities required to facilitate effective management of fatal risks. These controls shall be implemented in addition to the Debswana Fatal Risk Standards to ensure they remain appropriate and effective.

The risk management approach adopted must follow the Hierarchy of Controls as shown below:



- **Elimination** - Where possible, remove the hazard or the need to complete tasks at risk (e.g., eliminating toxic substances, hazardous equipment or processes that are not necessary).
- **Substitution** – Complete the task in a less hazardous location or manner (e.g., building as much of a structure on the ground in preference to at height).
- **Engineered Solutions** – Engineer or redesign the structure or equipment to reduce the hazard involved in the task (e.g., move valves from height to a lower level for operation or install remote valve operation devices), or install devices to **separate** the people from the hazard (guards, barriers, ...)

- **Administration** – Establish policies, procedures and work practices to reduce employees' exposure to risk (e.g., provide training, use warning signs, and reduce time spent in noisy areas).
- **Personal Protective Equipment (PPE)** – The provision of personal protective equipment does not eliminate the hazard but only shields the individual from it. Such action will have to be coupled with training in the correct use of the equipment. PPE should be used only as a last resort.

When applying procedures and practices to meet the requirements of these Standards, all relevant local and national legislation shall be complied with. Where the local legislation prescribes standards that are below the requirements of Debswana (including the Debswana Fatal Risk Standards), the Debswana Fatal Risk Standards will take precedence and be applied.

AFFECTED ENTITIES

The standards apply to all Debswana managed business and operations, including contractors and visitors when involved in controlled activities

SCOPE

The Debswana Fatal Risk Standards are specific controls associated with identified fatal risks. They include the infrastructure, systems and behaviours required to encourage effective management of fatal risks. They do not represent comprehensive coverage of all fatal risks faced by the operations.

Application of the Debswana Fatal Risk Standards is mandatory at all Debswana managed businesses and operations. This mandatory nature is indicated by the use of the word "shall" within the Standards.

In some places, the word "should" is used. This means that the primary intent remains, but specific circumstances may mean that implementation of the requirements is not reasonably practicable.

Any deviation from the specifications set forth in these Standards should be formally approved following an exemption procedure.

The exemption procedure comprises the following steps:

- 1) documented and detailed description of the implementation difficulties
- 2) documented and detailed risk assessment of the situation under proposed alternative control measures
- 3) documented formal approval from the operation's General Manager that the level of risk as a result of the alternative control measures is understood, tolerable for the organisation and in line with the vision of Zero Harm.

STRUCTURE OF THE DEBSWANA FATAL RISK STANDARDS

The requirements of these Standards are classified in three broad focus areas:



- A. System and Procedural Requirements
- B. Plant and Equipment Requirements
- C. People Requirements

These three areas cover the essential controls that must be in place in order to manage these risk categories comprehensively.

1. LIGHT VEHICLES STANDARD

1.1 AIM

To eliminate or minimise the risk of fatalities, injuries and incidents arising from the use of light vehicles in surface operations.

1.2 APPLICATION

This Standard applies to all light vehicles used for work-related activities and for transporting people and light loads. Examples of light vehicles covered by this Standard are passenger cars, four-wheel drives (including all-wheel drives), sports utility vehicles (SUVs), pickups (utilities, bakkies) and mini-buses.

This Standard applies to all Debswana managed businesses and operations, including contractors and visitors when involved in controlled activities.

1.3 DEFINITIONS

A "light vehicle" is a vehicle which:

- can be licensed and registered for use on a public road
- has four or more wheels
- seats a maximum of 12 adults (including the driver)
- when registered, can be driven legally on a public road by a driver issued with a standard basic-level public road driver's licence
- does not exceed 4.5 tonnes gross vehicle mass (GVM), which is the maximum loaded mass of the motor vehicle as specified by:
 - the vehicle's manufacturer or
 - an approved and accredited automotive engineer, if the vehicle has been modified to the extent that the manufacturer's specification is no longer appropriate.

Any light vehicle falling outside of this group should refer to the Surface Mobile Equipment standard.

Light vehicles may include the following categories of vehicles being used for work-related activities:

- Debswana owned or leased vehicles
- hire vehicles (for example Budget or Hertz rental vehicles)
- contractor or supplier vehicles operating on company property
- private vehicles (personal or hired) used for work-related activities.

1.4 REASON FOR INCLUSION

Light vehicles have been involved in a significant proportion of our fatal and high-potential incidents. Identified causes and contributing factors include:

- inappropriate speed for conditions
- driver fatigue
- vehicle instability
- driver distraction
- poor vehicle condition (tyres, brakes, etc.)
- driver under the influence of alcohol or drugs

- poor visibility
- lack of vehicle separation from other mobile equipment, plant and pedestrians
- risk-taking behaviour by the driver
- driver inexperience/incompetence.

1.5 REQUIREMENTS

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1.6 PLANT AND EQUIPMENT REQUIREMENTS

1. Light vehicles shall have the following minimum safety features:

- suitable seat belts for all occupants
- roll-over protection for all vehicles intended to be driven on dirt or steep roads
- cargo barriers and load restraints for all vehicles designed for carrying loads (other than passengers), or that are unable to have cargo separated from the vehicle’s occupant-carrying space
- driver-side air bag.

2. Light vehicles that interact with heavy mobile equipment and/or plant shall have:

- systems that enable positive communication with the equipment and/or plant
- high-visibility flag (e.g. a whip flag or buggy whip)
- flashing, revolving or strobe light
- high-visibility colour
- reflective taping.

3. Light vehicles operating on site should be fitted with signage allowing for easy and positive vehicle identification from a reasonable distance.

4. Light vehicles should have:

- first aid kit
- emergency roadside triangles or beacons (three of either)
- survival or emergency equipment suitable for the operating environment.

5. A change management process shall accompany all vehicle modifications, including the attachment of any equipment. Examples of changes or modifications may include, but not be limited to:
 - any change or modification made to the overall vehicle body structure or design
 - any change or modification made to the original manufacturer fitted type of tyres or wheels
 - any change or modification made to the vehicle suspension system
 - any change or modification made to the vehicle's mechanical system
 - any change or modification that may alter adversely the vehicle's centre of gravity
 - any change or modification that alters the vehicle's load-carrying capacity
 - any change or modification that may affect the vehicle's ability to withstand a crash (e.g. the fitment of a "bull bar").

1.7 SYSTEM AND PROCEDURAL REQUIREMENTS

6. Vehicle selection shall be based on risk assessment taking account of tasks, application, environment, roll-over protection and rating of sturdiness in the event of a crash.
7. A formal inspection and preventative/condition-based maintenance system shall be in place to ensure that vehicles are maintained in a safe and roadworthy condition and, as a minimum, are serviced in line with the vehicle manufacturer's service schedule. Inspection and maintenance shall be undertaken on critical items such as:
 - wheels and tyres
 - steering, suspension and braking systems
 - seats and seat belts
 - lamps, indicators and reflectors
 - windscreen and windows, including windscreen wipers and washers
 - the vehicle structure itself
 - other safety-related items on the vehicle body, chassis or engine, including instrumentation.
8. Seat belts shall be used in all cases by all occupants.
9. A pre-operation vehicle safety check and familiarisation system shall be in place and used by the driver.
10. Systems shall be in place to ensure that risks associated with vehicle journeys are managed and controlled. The systems shall include, but not be limited to:
 - journey management plans in place prior to commencement of new or changed travel activities
 - identification and monitoring of the risks associated with the number of journeys, routes, intersections, etc. to ensure that the overall exposure is reduced
 - assessment and communication of changed environmental and road conditions at the time of travel
 - outline of actions required in the event of an emergency (e.g. collision or breakdown)
 - provision to manage driver fatigue.

11. Light vehicle running lights (low-beam headlamps) shall be switched on at all times when the vehicle is in operation.
12. Mobile telephones, whether hands-free or not, shall be used by the driver of a vehicle only when the vehicle is stationary and in a safe location.
13. Controls shall be in place to ensure the safety of people working on roads, including those working on broken-down vehicles.
14. A site-based review of pedestrian interaction, road design and layouts (including entrance and exit points, intersections and other potential points of interaction between light vehicles and other mobile equipment) shall be conducted and shall be updated when changes to layouts are required. Where possible, traffic segregation should be used to separate pedestrians, light vehicles and other mobile equipment.
15. A site-based traffic management plan shall be in place including, but not limited to:
 - setting of appropriate speed limits for vehicle types, road surfaces and environmental conditions
 - overtaking standards
 - procedures for light vehicles entering hazardous or restricted areas
 - clear communication protocols
 - standards for safe following distances based on operational circumstances, environmental conditions and near sight (blind spot) limitations of other mobile equipment
 - installation and maintenance of road traffic control signs as appropriate to the work site
 - parking procedures (e.g. safe parking distances/locations) and required barriers from heavy mobile equipment and pedestrians.

1.8 PEOPLE REQUIREMENTS

16. All employees, contractors and visitors shall be inducted in appropriate road safety and site vehicle hazards.
17. A permit or certification system shall be in place to ensure drivers are competent to operate the type of vehicle/s in the intended environment, whether that is internal or external to a Debswana site.
18. A system shall be in place to verify that drivers of Debswana vehicles have a valid and appropriate level public road driver's licence prior to being allowed to operate a Debswana vehicle off site.
19. A system shall be in place to ensure that drivers receive adequate training to ensure that the vehicle intended to be operated or driven can be operated or driven safely. As a minimum, training should include:
 - behaviour-based defensive driving principles
 - vehicle familiarisation, taking into account the vehicle's handling dynamics, maximum number of passengers, load limits and various features
 - loading and restraining principles where the vehicle to be operated is designed for carrying cargo loads

- education about and awareness of driving and travel risks that may be encountered within the environment where the vehicle may be operated or driven and the requirements of keeping to traffic rules and speed limits
 - securing (locking) equipment to prevent unauthorised use
 - emergency crash and breakdown procedures
 - basic mechanical principles, including how to change a tyre and perform an adequate pre-operation check.
20. A system shall be in place to ensure that persons operating any equipment associated with a light vehicle (e.g. vehicle-mounted cranes and winches) are suitably trained and accredited.
21. Behaviour-based observations shall include the operation of light vehicles. Any need for additional specific retraining shall incorporate the results of these observations.
22. A fit-for-work policy shall be in place, incorporating the clearly-defined maximum levels of drugs (including prescribed medication) and alcohol allowed in the system of drivers/operators.
23. A system shall be in place to manage driver fatigue, including:
- a formal system to be used on site
 - a risk assessment and procedures for off-site driving.

2. SURFACE MOBILE EQUIPMENT STANDARD

2.1 AIM

To eliminate or minimise the risk of fatalities, injuries and incidents arising from the use of surface mobile equipment.

2.2 APPLICATION

This Standard applies to surface mobile equipment such as rear dump, belly dump and water trucks, graders, dozers, loaders and pressurised road and rail tankers. Where surface mobile equipment falls outside these groups (e.g. draglines, shovels, excavators, forklifts, mobile cranes, buses, backhoes, bobcats and other trucks larger than light vehicles), the application of some requirements of this Standard may not be practicable. In these cases, a risk-based approach shall be used to determine the level of compliance needed for each of the specific requirements.

This Standard applies to all Debswana Group managed businesses and operations, including contractors and visitors when involved in controlled activities.

2.3 REASON FOR INCLUSION

Surface mobile equipment has been involved in a significant proportion of our fatal and high-potential incidents. Identified causes and contributing factors include:

- overtaking
- ineffective communications
- loss of traction
- poor visibility
- overturning
- dropped loads
- reversing
- structural failure
- unplanned movements on slopes and inclines
- brake failure
- operator error due to fatigue and substance abuse
- parking protocols
- non-adherence to operating procedures.

2.4 REQUIREMENTS

Application of the Debswana Fatal Risk Standards is mandatory at all Debswana managed businesses and operations. This mandatory nature is indicated by the use of the word “shall” within the Standards.

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The exemption procedure comprises the following steps:

- 1) documented and detailed description of the implementation difficulties

- 2) documented and detailed risk assessment of the situation under proposed alternative control measures
- 3) documented formal approval from the Operation's Head of Safety and General Manager that the level of risk as a result of the alternative control measures is understood, tolerable for the organisation and in line with the vision of Zero Harm.

2.5 PLANT AND EQUIPMENT REQUIREMENTS

1. Surface mobile equipment shall have the following minimum safety specifications:
 - seat belts for all occupants
 - adequate lighting (e.g. headlights, tail, turn, brake, strobe, flashing lights)
 - identified isolation/lockout point in accordance with the Isolation Standard
 - adequate walkways, railing, steps/grab handle combinations and boarding facilities, including an alternative path of disembarking in case of emergency
 - collision-avoidance technology and/or procedures
 - reversing alarms
 - chock blocks for rubber-tyred surface mobile equipment
 - horn
 - effective windscreen wipers
 - effective guarding on accessible moving parts (consistent with the Equipment Safeguarding Standard)
 - signage on the equipment that allows clear and easy identification from a distance
 - security systems to prevent unauthorised operation.
2. Surface mobile equipment should have the following minimum safety specifications, unless exempted by risk assessment:
 - approved or certified roll-over protection (ROP)
 - fail-to-safe breaks
 - a fire-detection and suppression system capable of being activated from both ground and cabin levels
 - non handheld two-way radio or other forms of communication
 - falling object protection (FOP)
 - enclosed and tightly-sealed air-conditioned cabins, with consideration of requirements for noise and dust suppression systems and suitable protective glass (e.g. toughened, laminated, shatterproof)
 - a method for transporting supplies and personal items to and from the operator cabin (e.g. a back pack or shoulder strapbag) to enable drivers to maintain three points of contact continuously while mounting and disembarking from the equipment
 - safety checks, supports, interlocks, etc. to be used when working on the machine.
3. Advances in technology for collision avoidance, safety management systems, fleet management and visibility improvement shall be monitored and appropriate engineering reviews should be conducted to determine whether new technology should be implemented or used.

4. Design, inspection and maintenance requirements should be in place for all roadways including collision protection of hazardous and critical plant and equipment. Risk assessments should be carried out prior to any changes to traffic movements.
5. Systems (such as safety berms) shall be in place along roadways, excavations and dump areas to prevent vehicles from entering dangerous areas as determined by risk assessment.
6. Layout of cabins should take into consideration the ergonomics of seating, operator controls and retrofitted devices.
7. Fleet and control consistency should be considered, where possible, to minimise operator error when changing machines.
8. All pressurised road and rail tankers shall be subjected to a biannual inspection in accordance with Debswana specifications and local health and safety regulations. The manufacturing certificate and inspection records shall be submitted to the access control point prior to entering a Debswana site.

2.6 SYSTEM AND PROCEDURAL REQUIREMENTS

9. Seat belts shall be used in all cases by all occupants.
10. A formal risk-based selection and acceptance process shall be in place for all new (to site) and modified surface mobile equipment prior to commencement of work on site.
11. Selection of equipment, and any modification to equipment, shall be subjected to a rigorous change management process.
12. A procedure and checklist system, including a brake functionality test, shall be in place for pre-operation inspection by the operator. Logs shall be maintained on the machine and audited.
13. Procedures shall be in place to ensure vehicles are not overloaded.
14. Procedures shall be in place to ensure surface mobile equipment operates only on sufficiently stable surfaces and on gradients that are within the limits of safe operation.
15. A post-maintenance (scheduled or breakdown) machine test shall be conducted.
16. On-the-job risk assessments shall be conducted as part of the planning process for surface mobile equipment operations, including maintenance and other activities.
17. Adequate road maintenance, dust control and water management plans for roads, mining and haulage operations shall be in place. Consideration shall be given to extreme wet weather and the over-watering of roads.
18. Parking standards shall include requirements for the immobilisation of surface mobile equipment (e.g. chocking or the use of ditches/trenches) and consideration for breakdown maintenance activities.
19. An inspection and maintenance programme shall be in place for surface mobile equipment, including critical equipment and components.
20. A site-based traffic management plan should be in place including, but not limited to:

- segregation of pedestrians, light vehicles and heavy mobile equipment, where possible
 - clear instructions about where pedestrians must give way to vehicles
 - systems to alert mobile equipment operators of the presence of pedestrians
 - setting of appropriate speed limits and the installation and maintenance of road signage
 - right-of-way rules (including overtaking restrictions)
 - access planning in areas identified as hazardous and having significant associated risks
 - systems to control movement of mobile equipment in areas accessible to pedestrians, into and out of workshops, and for controls on pedestrian and light vehicle movement around mobile equipment
 - designated parking areas for heavy vehicles and light vehicles, including around maintenance areas
 - systems to control approaching, refuelling, parking, boarding, disembarking and isolation by production and maintenance crews and other pedestrians
 - clear instructions that equipment operators or drivers shall be out of the cabin and dismounted to ground level when their direct involvement with maintenance or servicing is not required
 - guidelines for abnormal road conditions (e.g. rain, high winds) giving “go/no go” criteria and stating the responsible person for this decision
 - clear communication procedures for interactions between all vehicles
 - truck loading/unloading procedures to avoid material or objects falling from the vehicle
 - guidelines for wide or abnormal loads, including off-site transport
 - systems to control equipment use within the vicinity of overhead power lines.
21. Risk assessments shall be carried out prior to any changes to traffic movements or road systems.
22. Procedures should be in place to provide details of the maintenance tasks that an operator is allowed to perform and the operations that maintenance personnel can carry out under testing conditions.
23. A tyre management system shall be in place to address issues including fire, heating, explosion, electrical contact, separations, maintenance, tyre changes, etc.
24. Mobile telephones, whether hands-free or not, shall be used by the driver of surface mobile equipment only when it is stationary and in a safe location.
25. A procedure shall be in place for the checking and verification of inspection records of pressurised road and rail tankers prior to such vehicles accessing an Anglo American site.

2.7 PEOPLE REQUIREMENTS

26. Recruitment and induction processes for surface mobile equipment operators shall encompass past work history, site testing and comprehensive medical examinations that confirm fitness for work.
27. Site and area induction of operators shall be performed prior to starting work in a new area.

28. A permit or certification system shall be in place to ensure drivers are competent to drive on site, including the ability to respond under emergency conditions. In addition, a system shall be in place to verify that operators of Debswana vehicles have a valid driver's license prior to operating Debswana vehicles off-site.
29. A fit-for-work policy shall be in place, incorporating the clearly-defined maximum levels of drugs (including prescribed medication) and alcohol allowed in the system of drivers/operators.
30. A system shall be in place to manage driver-fatigue.
31. Behaviour-based observations shall include the operation of surface mobile equipment. Any need for additional specific retraining shall incorporate the results of these observations.

3. HAZARDOUS MATERIALS MANAGEMENT STANDARD

3.1 AIM

To eliminate or minimise the risk of fatalities, illnesses, injuries and incidents arising from the storage, handling, production, transport, recycling and disposal of hazardous materials.

3.2 APPLICATION

This Standard applies to hazardous materials in Major Hazard Installations (MHI) that, in one or more of their forms (solid, liquid or gas), have the potential to lead to harm to people, the environment or community (all stakeholders), either in an incident involving loss of control or in normal, controlled activities (e.g. storage, handling, production, transport, recycling and disposal). Where hazardous materials, processes or facilities do not qualify as Major Hazard Installations, some requirements of this Standard may not be practicable. In these cases, a risk-based approach shall be used to determine the level of compliance required. This Standard does not cover handling of explosives or radioactive materials, for which specific procedures shall be in place.

This Standard applies to all Debswana managed businesses and operations, including contractors and visitors when involved in controlled activities.

3.3 DEFINITIONS

- HAZOP: A HAZard and OPerability study is a useful tool in evaluating any inherent hazards or operational problems. The technique enforces a structured, systematic examination of complex process facilities.
- HAZID: A high-level HAZard IDentification typically addresses the overall project, not only the process equipment.
- MSDS: A Material Safety Data Sheet is a document that contains information on the potentially hazardous effects on health of exposure to chemicals or other potentially dangerous substances, and on safe working procedures when handling chemical products. Each MSDS must contain a minimum of sixteen sections, as prescribed by international standards.
- HAZCHEM: This is a code system developed to provide immediate action/advice when dealing with a chemical incident. Chemicals are assigned a code (e.g. 3Y) on the basis of the hazard that they represent and the required emergency response.
- MHI is a Major Hazard Installation that holds a quantity of a hazardous substance which may pose a risk that could fatally affect the health and safety of employees and the public.

3.4 REASON FOR INCLUSION

Hazardous materials are associated with uncontrolled releases and have the potential to affect a wide area around the incident (e.g. gases can travel significant distances). It is, therefore, essential to ensure that equipment, processes and behaviours are developed and adopted to manage the risks associated with these materials. The causes of and factors contributing to these incidents have been:

- failure to recognise the risk/at-risk maintenance activities
- lack of understanding of chemical properties and reactions
- at-risk manual handling activities
- insufficient management of risk/lack of change management
- inadequate emergency response

- equipment failure
- inadequate design.

3.5 REQUIREMENTS

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- 1) documented and detailed description of the implementation difficulties
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3.6 PLANT AND EQUIPMENT REQUIREMENTS

1. The basis of design of a facility or process, whether permanent or temporary, which transports, produces, stores, uses or disposes of hazardous materials shall be reviewed (preferably with the vendor), amended as necessary and documented, utilising a process risk assessment tool such as HAZOP, HAZID, etc. As-built design drawings (e.g. process and instrumentation diagrams, process flow diagrams, layout drawings, isometrics, software upgrades, etc.) shall be updated as a result of these reviews.
2. All specifications for the location, design and/or modification of hazardous materials facilities shall be subjected to risk assessment that includes materials selection, site conditions, transport, production, storage, handling, use and disposal. Previous incidents shall be reviewed.
3. All facilities which have a significant risk from hazardous substances shall provide a risk-based emergency response plan which includes:
 - emergency response procedures appropriate to the hazardous materials and the risk
 - emergency equipment/facilities (e.g. oxygen, antidotes, showers, etc.) on location where hazardous materials are stored or used
 - means of escape in an emergency situation
 - clearly marked emergency isolation valves
 - emergency response teams appropriate to the risk
 - appropriate use of safe refuge and assembly areas for people
 - emergency response equipment for spillage containment, fires, explosions, burns, etc.
 - appropriate response arrangements with external emergency services (e.g. ambulance, hospitals, fire brigade, medical personnel, etc.)

- impact minimisation including spill clean-up and dust suppression
 - recovery procedures and disposal of the hazardous material.
4. Provisions shall be made for the safe venting, drainage and containment required during normal operations and in emergency situations, based on a process risk assessment tool such as HAZOP and HAZID.
 5. Labelling shall be in place on all storage vessels, containers and tanks, as per appropriate national or international standards. This labelling shall clearly identify the carried or stored material. Supporting information (e.g. material safety data sheets [MSDS]) shall also be readily available at the point of use and storage to identify appropriate first aid/spill response procedures.
 6. Piping containing hazardous substances shall be clearly marked so that the contents and direction of flow can be identified.
 7. Security and access control systems and hardware shall be in place, appropriate to the risk, to manage access to areas where hazardous materials are stored and used.
 8. Process control systems shall ensure that the potential for personnel to be exposed to hazardous materials is eliminated, wherever possible, or reduced.
 9. Automatic plant control systems should be in place in hazardous material facilities to eliminate the need for operator intervention and to maintain operation within the required parameters. Such systems shall incorporate fail-to-safe systems in the event of emergencies. Where automatic control is not practicable, risk assessment shall be used to identify and implement operational options that reduce the risk.
 10. Fixed detectors and personal detection devices shall be considered as options in the selection of potential risk reduction measures.

3.7 SYSTEM AND PROCEDURAL REQUIREMENTS

11. Management of risk associated with hazardous materials shall be supported by a documented process that incorporates risk reduction using the Hierarchy of Controls, applied in the following order (a number of these options may be considered and applied individually, or in combination):
 - ELIMINATE – the complete elimination of the hazard
 - SUBSTITUTE – replace the material or process with a less hazardous one
 - RE-DESIGN – re-design the equipment or work processes
 - SEPARATE – isolate the hazard by guarding or enclosing it
 - ADMINISTER – provide controls such as training, procedures, etc.
 - PERSONAL PROTECTIVE EQUIPMENT (PPE) – use appropriate and properly fitted PPE where other controls are not practicable.
12. A risk assessment process shall be in place to identify:
 - the selection criteria and life cycle analysis for all hazardous materials
 - the level of risk associated with the hazardous materials
 - controls required to manage the risk
 - the performance requirements (reliabilities and capacities) of specific equipment and systems included in these controls.

13. A system shall be in place to identify and document maintenance, inspection and testing schedules and procedures for critical equipment associated with hazardous materials.
14. A system shall be in place to ensure that the introduction and disposal of hazardous materials, including containers, shall be approved by the site Hazardous Materials Co-ordinator (refer Element 29) prior to introduction or disposal.
15. A system shall be in place for the management of change of equipment and/or processes for transportation, storage, handling, use and disposal of hazardous materials. The system shall include specific steps to assess the impact of changes on the risks associated with hazardous materials.
16. A site register shall be in place for all hazardous materials, and include the following:
 - name
 - HAZCHEM/United Nations (UN) code
 - MSDS
 - summary of maximum inventory
 - storage requirements and precautions
 - location and physical properties of the materials when they are in use
 - inventory of special emergency items held for handling of spillages, fires, etc. (e.g. reagents to neutralise spillages and accidental releases, fire fighting foam, etc.)
 - approved disposal methods.
17. A system shall be in place to ensure that MSDS are available to all personnel (including emergency response, first-aid and medical personnel) involved in the transportation, storage, handling, use and disposal of hazardous materials on site.
18. A system shall be in place to ensure that all relevant design documents and drawings associated with this Standard are up to date, controlled and available.
19. Critical activities, which involve hazardous materials and have the potential for immediate or long-term harm, shall be identified and safe operating procedures shall be documented, including transportation, storage, handling, use and disposal of incompatible hazardous substances.
20. Safe operating limits for plant and equipment handling hazardous materials, which have the potential for immediate or long-term harm, shall be clearly defined, documented and available to operational and maintenance personnel.
21. Monitoring systems for hazardous materials shall be in place to ensure that the status of operation is understood and shown clearly at all times. These monitoring systems shall include the procedure for a documented hand-over to the next shift, recording any relevant information/changes in operating status.
22. A permit-to-work system, in line with the definition in the Isolation Standard, shall be in place to ensure proper decontamination of plant and equipment, isolation, use of the correct personal protective equipment, and any special requirements or precautions (e.g. requirements for testing, venting, clearing of piping or when using naked flames) where the occupational exposure limit to a hazardous substance could be exceeded.
23. A system shall be in place to control simultaneous operations involving hazardous materials to avoid mixing of incompatible materials.

24. Emergency response plans for incidents involving hazardous materials shall be in place and reviewed, tested and documented annually. These shall include external support services such as local ambulance and hospitals, as appropriate to the risk.
25. A system shall be in place to control and monitor access to areas where hazardous materials are stored and handled. This shall also identify process areas where hazardous materials may be released under certain operational circumstances (e.g. vent opening during process upset, infrequent discharge points) and what restrictions are placed on access to those areas.
26. A system shall be in place to authorise and control the training of appropriate personnel in normal transportation, storage, handling, use and disposal of, and emergency response procedures for, hazardous materials.
27. A system shall be in place to monitor short and long-term exposure of personnel to hazardous materials which have the potential for immediate or long-term harm. This system shall ensure that any potential for a fatality is also addressed.
28. The following procedures shall be in place to protect communities and the environment during the transport of hazardous materials:
 - establish clear lines of responsibility for safety, security, release prevention, training and emergency response in written agreements with producers, distributors and transporters
 - require that hazardous material transporters implement appropriate emergency response plans and capabilities, and employ adequate measures for hazardous material management
 - where required, a hazardous material manifest and supporting documentation shall be completed and shipped with the hazardous material. This documentation shall comply with local legislation.

3.8 PEOPLE REQUIREMENTS

29. A person shall be assigned as the site Hazardous Materials Co-ordinator at those sites where hazardous materials are processed, stored and handled. This person shall be trained and competent to understand and evaluate the risks associated with a wide variety of substances, and be able to identify where additional expert advice can be sourced. The site Hazardous Materials Co-ordinator shall be responsible for assessing the hazardous properties and disposal requirements of materials used, monitoring the consumption and management of inventory, and providing an “as needed” service to supply, warehousing, operational and the Sustainability personnel.
30. The risk assessment process shall include people with appropriate expertise. Consideration should be given to the inclusion of external people (e.g. suppliers’ technical officers) in the risk assessment process.
31. A competency-based training system shall be in place for operational, maintenance and emergency response roles involving hazardous materials. Use should be made of supplier expertise to supply this training, with annual refresher courses, if required.
32. Behaviour-based observations shall include the operation of equipment and systems handling hazardous materials. Any need for additional specific retraining shall incorporate the results of these observations.

33. All personnel shall be trained to understand the potentially hazardous effects on health of their working conditions and the materials handled.
34. Regular appropriately staged emergency drills shall be held and lessons learnt shall be incorporated into the emergency response plan.

4 MOLTEN MATERIALS MANAGEMENT STANDARD (not applicable)

The Anglo standard on Molten Materials does not apply to Debswana as Debswana does not have such processes.

5 EQUIPMENT SAFEGUARDING STANDARD

5.1 AIM

To eliminate the risk of fatalities and injuries where and when there is the potential for human interaction with moving parts or potential moving parts of plant and equipment.

5.2 APPLICATION

This Standard applies to safeguarding of people from moving parts of plant, mobile machines, equipment and power tools, including moving equipment, high pressure equipment and applications, electrical and other energy sources with the potential to move, and objects falling or projecting from moving parts.

This Standard applies to all Debswana managed businesses and operations, including contractors and visitors when involved in controlled activities.

5.3 REASON FOR INCLUSION

A number of high-potential and fatal incidents have been associated with inadequate and inappropriate safeguarding. The causes of and factors contributing to these incidents have been:

- absent, damaged or inadequate guarding in place
- working alongside unguarded moving parts
- no process to identify guarding needs
- objects falling or projecting from moving parts
- ineffective guarding standards in place
- equipment mobilised by high-pressure equipment
- working on moving parts with guarding removed
- lack of guarding interlocks on potential high-risk plant and equipment
- non-adherence to existing procedures
- uncontrolled release of pressure (oil/water) and temperature.

5.4 REQUIREMENTS

Application of the Debswana Fatal Risk Standards is mandatory at all Debswana managed businesses and operations. This mandatory nature is indicated by the use of the word “shall” within the Standards.

In some places, the word “should” is used. This means that the primary intent remains, but specific circumstances may mean that implementation of the requirements is not reasonably practicable.

Any deviation from the specifications set forth in these Standards should be formally approved following an exemption procedure.

The exemption procedure comprises the following steps:

- 1) documented and detailed description of the implementation difficulties
- 2) documented and detailed risk assessment of the situation under proposed alternative control measures
- 3) documented formal approval from the Operation’s Head of Safety and General Manager that the level of risk as a result of the alternative control measures is understood, tolerable for the organisation and in line with the vision of Zero Harm.

5.5 PLANT AND EQUIPMENT REQUIREMENTS

1. New plant and equipment shall consider all energy sources and be designed to eliminate the need for guarding where practicable. Safeguarding shall be selected where other potential mitigation measures do not adequately protect personnel as identified in the risk assessment in line with Element 7 of this Standard.
2. Plant and equipment safeguards shall be designed and constructed to comply with relevant legislation, standards, codes of practice and relevant recognised leading industry practices, with due consideration for maintainability and operability.
3. A formal system shall be in place to ensure the integrity of plant and equipment safeguarding.
4. Where safeguarding and interlock systems are insufficient to protect people, access to plant and equipment shall be controlled and monitored.
5. Fail-to-safe switches or devices shall be installed on all manually-operated rotating plant and equipment and power hand tools (e.g. saws, lathes, drill presses, etc.).
6. Guards shall only be removed for maintenance, repair, cleaning, clearing, etc. after plant and equipment have been isolated, locked out and tested in line with the Isolation Standard. Where the temporary removal of safeguards is necessary on operating plant and equipment for the purposes of fault-finding, testing and commissioning, a risk-based procedure shall be in place. Guards shall be replaced prior to plant and equipment being put back into operation.

5.6 SYSTEM AND PROCEDURAL REQUIREMENTS

7. A risk-based process shall be used to identify where safeguarding and interlocks are required on plant and equipment.
8. A risk-based process shall be used to identify safeguarding hazards that require interlock systems for additional control.
9. All documentation related to the risk-based process for the selection and modification of safeguarding requirements shall be retained and controlled.
10. A change management system shall be used to ensure the integrity of safeguarding is optimal when change occurs.
11. No guarding shall be modified or altered except through the application of a risk-based change management process.
12. Procedures shall be defined for entry to plant, equipment, etc. in a designated safeguarded area.

5.7 PEOPLE REQUIREMENTS

13. A competency-based training system that includes the requirements of this Standard shall be in place for relevant personnel involved in the design, purchase, construction, operation and maintenance of plant and equipment.

14. Behaviour-based observations shall include work activities associated with plant and equipment safeguarding. Any need for additional specific retraining shall incorporate the results of these observations.

6 ISOLATION STANDARD

6.1 AIM

To ensure that all machinery and equipment is isolated, locked out and made safe (all energy released) prior to any access, work or repair being carried out, in order to protect the health and safety of persons.

6.2 APPLICATION

This Standard is applicable, but not limited to all sources of energy including potential kinetic, elastic, chemical, electrical, mechanical, thermal (e.g. hot liquids, solids, gases), nuclear, static, rotational, out of balance, light and gravitational. Energy associated with processes such as materials handling, transport, pressure, vacuum, hydraulic, pneumatic and chemical processes, are also included. Moving and stationary machinery is included. This Standard stipulates the minimum requirements to which the isolation, lock-out and making safe procedures must comply.

This Standard applies to all Debswana managed businesses and operations, including contractors and visitors when involved in controlled activities.

6.3 DEFINITIONS

- **AUTHORISED PERSON** means a competent person tested and appointed in writing by the responsible supervisor to do specific operations (i.e. operating electrical switchgear).
- **RESPONSIBLE SUPERVISOR** is the manager/engineer in charge of the Operations as per legal definitions or internal regulations.
- **OPERATOR** means the person in charge of the operation of some specific equipment or machinery.
- **DE-ENERGISE** means to remove effectively all possible sources of energy from the item, system, process, area or equipment in question.
- **EARTHED** means connected to the general mass of earth in such a manner that will ensure at all times an immediate discharge of electrical energy without danger.
- **ISOLATION** means to physically remove any connection or means to supply any form of energy to equipment in order to make energisation of such equipment impossible.
- **LOCK OUT** means to put a personal lock or appropriate device on to equipment in such a way that it would be impossible to connect, switch on or start, utilise or energise the equipment without removing the lock or device.
- **MAKE SAFE** means to remove any threat or potential threat to health and safety posed by the source of energy, equipment, any equipment in the vicinity, any other substance or charge in the immediate area. This includes, but is not limited to, barricading, clamping, chocking, constraining, deflating, earthing, neutralising, purging and ventilating.
- **PERMIT-TO-WORK** means a form of written declaration signed and given by the person legally responsible for the Plant to the person in charge of work to be carried out on machinery or equipment that has been isolated, locked out and made safe.

6.4 REASON FOR INCLUSION

A significant proportion of our potential fatalities have included cases where sources of energy were not isolated adequately. The causes of and factors contributing to these incidents have been:

- failure to identify or recognise a source of potential or stored energy
- inadequate training or lack of competence
- inadequate lock-out/tag-out systems
- complacency
- working on, or isolation of, the wrong equipment
- inadequate design/maintenance of isolators.

6.5 REQUIREMENTS

Application of the Debswana Fatal Risk Standards is mandatory at all Debswana managed businesses and operations. This mandatory nature is indicated by the use of the word “shall” within the Standards.

In some places, the word “should” is used. This means that the primary intent remains, but specific circumstances may mean that implementation of the requirements is not reasonably practicable.

Any deviation from the specifications set forth in these Standards should be formally approved following an exemption procedure.

The exemption procedure comprises the following steps:

- 1) documented and detailed description of the implementation difficulties
- 2) documented and detailed risk assessment of the situation under proposed alternative control measures
- 3) documented formal approval from the Operation’s Head of Safety and General Manager that the level of risk as a result of the alternative control measures is understood, tolerable for the organisation and in line with the vision of Zero Harm.

6.6 PLANT AND EQUIPMENT REQUIREMENTS

1. All equipment, whether purchased or constructed (including hired and contracted equipment), shall have the capability of being isolated physically from all energy sources and shall meet the requirements of this Standard.
2. Isolation shall provide positive protection against harm and shall be achieved by the use of locking devices or the establishment of a physical barrier or separation.
3. Personal locking devices shall be unique and:
 - not be combination locks
 - not have an unauthorised second-party master override key
 - be kept under the exclusive control of the owning individual, and key(s) shall not be transferred to another person for lock removal.
4. Designated isolation points shall be labelled clearly to identify the circuit or system being isolated or locked out. These labels shall be applied following a process of pre-isolation identification using the lock-out procedure.
5. All designated isolation points fitted with personal locking devices shall be tagged. The isolation tagging system shall ensure that:
 - isolation points are identified positively, including the name of the person locking out

- the reason for the isolation is identified clearly
- isolation tags are highly visible to prevent inadvertent operation.

6.7 SYSTEM AND PROCEDURAL REQUIREMENTS

6. An isolation, lock-out and making safe procedure shall be in place to ensure correct isolation and that all equipment is made safe prior to gaining access or commencing any operation, cleaning, maintenance or repair work requiring access to parts of a machine or removal of a guard or interlock. The procedures shall define clearly the responsibilities of all parties involved.
7. The lock-out procedure shall include the following:
 - visible indication of isolation
 - clear identification of the machinery or equipment to be locked out by the operator
 - formal hand-over of the control of the equipment from the operator to the authorised person
 - duties and responsibilities of both the operator and the authorised person
 - sequence of events to be followed during the procedure
 - formal hand-over of the control of the equipment back from the authorised person to the operator
 - as determined by risk assessment, isolation of high-energy sources or other high-risk work requires a “permit to work”. When permits are required, the authorised person must isolate, test for dead and earth the equipment before issuing a “permit” to the person responsible for the work. This person then completes the lock-out according to the applicable procedure
 - a list of site-specific procedures for which a “permit to work” is required should be approved and communicated by the responsible supervisor.
8. The lock-out procedure shall begin with a risk assessment to ensure that work is undertaken safely.
9. All parties involved shall identify the equipment before the authorised person de-energises, isolates or locks out equipment. All parties involved shall ensure that the equipment cannot be energised or operated inadvertently. There shall be provision for multiple locks, if required. Each person working on the equipment shall apply his own personal lock to prevent the isolation being removed.
10. Once equipment has been isolated and locked out, it shall be the responsibility of the authorised person to safely test that the equipment is made safe (all energy is discharged). The type of test shall depend on the equipment but, in all cases, all energy shall be discharged or controlled. This test shall be described in the lock-out procedure. Only instruments approved for this purpose shall be used for these tests. The tests shall include, but not be limited to:
 - pressure
 - voltage, including induced voltage
 - redundant charges
 - elevated equipment
 - enclosed areas
 - hazardous chemicals (particularly in confined spaces)

- stored electrical energy
 - temperature
 - equipment under tension (e.g. conveyor belt)
 - equipment requiring regular operator access (e.g. chutes, screens)
 - sources of gas
 - mobile equipment.
11. All machinery or equipment that can cause harm in the immediate area shall also be made safe.
 12. Confirmation of isolation, lock-out, appropriate testing and making safe shall be recorded and signed for by all affected parties.
 13. A warning sign, stating that specific machinery has been de-energised because work is in progress, shall be posted at the points of isolation.
 14. Only after all these procedures (Elements 7-13) have been adhered to, shall work commence on the equipment.
 15. After completion of the work, a hand-over procedure back to the operator shall be in place.
 16. For audit trail and risk management, the responsible supervisor shall, on a regular basis:
 - re-assess the competence of the authorised persons
 - audit the lock-out records and “permit to work” documents
 - undertake a risk assessment on the lock-out procedure
 - undertake planned task observations.
 17. All safety incidents, including near hits, shall be reported, investigated and analysed. Corrective and preventative actions shall be taken and closed out and the learnings shared as per the DEBSWANA INCIDENT NOTIFICATION AND INVESTIGATION STANDARD.

6.8 PEOPLE REQUIREMENTS

18. The person in charge of the operation of the equipment shall be clearly identified and this shall be recorded. This person shall be identified as the operator for the purposes of this Standard.
19. All individuals issued with personal locking devices shall be provided with training and have their competence assessed on a regular basis.
20. The responsible supervisor is the person appointed in terms of applicable legislation or internal regulations. The responsible supervisor shall:
 - ensure that all lock-out operations are carried out in terms of the lock-out procedure
 - authorise suitably competent persons in accordance with requirements
 - ensure and record that all authorised persons remain competent (by means of observation audits and re-training) to carry out their duties
 - ensure that the lock-out procedure remains current and that it is updated when necessary (e.g. annually) to provide for equipment and/or process modifications
 - ensure that the lock-out procedure is adhered to continually by conducting verification exercises such as planned task observations.

21. The authorised person shall be responsible for the safe execution of isolation and lock-out duties as per the lock-out procedure (Element 7).

7 WORKING AT HEIGHTS STANDARD

7.1 AIM

To eliminate or minimise the risk of fatalities, injuries and incidents arising from working at heights.

7.2 APPLICATION

This Standard applies wherever there is potential for any person to fall 2 metres or more, or to gain access to within 2 metres of an open edge from where there is the potential to fall 2 metres or more, including working from various forms of portable and moveable elevated work platforms, cages, ladders, scaffolding and where objects could fall and cause injuries. Risk assessment may identify high potential fall hazards when working at heights of less than 2 metres, in which case this Standard shall be applied. (Note: if local legislation requires more stringent controls, then those controls shall be implemented.) This Standard does not apply to rope rescue situations and abseiling, which are regarded as specialist functions.

This Standard applies to all Debswana managed businesses and operations, including contractors and visitors when involved in controlled activities.

7.3 DEFINITIONS

- **BARRICADING** means a physical barrier that prevents inadvertent access to an area (e.g. handrails, access doors and gates or similar installations, whether temporary or permanent). Barrier tape does not qualify as barricading.
- **DEMARCATION** means any method that indicates that an area is used for a specific purpose or that access is restricted (e.g. barrier tape, painted lines on floor surfaces, portable signs denoting drop zones or no access past a specific point).
- **FALL ARREST SYSTEM** means the use of multiple, approved safety equipment components such as body harnesses, lanyards, deceleration devices, droplines, horizontal and/or vertical lifelines and anchorages, interconnected and rigged to arrest a free fall.
- **FALL PREVENTION** means the design and use of a fall prevention system which ensures no exposure to an elevated fall hazard. This may require more than one fall prevention system or a combination of prevention or protection measures.
- **FALL RESTRAINT** means an approved device and any necessary components that function together to restrain a person in order to prevent that person from falling to a lower level.
- **FIXED LANYARD** is a line used as part of a lanyard assembly to connect a harness to an anchorage point or a static line in situations where there is risk of a fall.
- **INERTIA REEL** (also known as a self-retracting lanyard or fall-arrest block) is a mechanical device that arrests a fall by locking onto a drop line and, at the same time, allows freedom of movement.
- **SUSPENSION TRAUMA** is the effect that can occur when a person hangs for a prolonged period in fall-arrest equipment. The restriction of blood flow, especially from the legs, can cause serious cardiovascular problems within five minutes and become fatal shortly thereafter.

7.4 REASON FOR INCLUSION

Falls from heights have contributed to a significant proportion of our fatal and high-potential incidents. The causes of and factors contributing to these incidents have been:

- lack of job planning and job assessment, including inspection of working areas
- failing to wear a harness
- wearing the wrong sort of harness
- the use of a damaged harness
- wearing the harness incorrectly
- wearing a harness but not attaching the lanyard or fall restraint to an anchor point, or attaching it to an unsuitable anchor point
- unstable set-up of elevated work platforms
- degeneration of elevated platforms (e.g. corrosion)
- inadequately-guarded or unbarricaded hole, edges, voids, excavations or walkways
- unsafe planking and scaffolding.

7.5 REQUIREMENTS

Application of the Debswana Fatal Risk Standards is mandatory at all Debswana managed businesses and operations. This mandatory nature is indicated by the use of the word “shall” within the Standards.

In some places, the word “should” is used. This means that the primary intent remains, but specific circumstances may mean that implementation of the requirements is not reasonably practicable.

Any deviation from the specifications set forth in these Standards should be formally approved following an exemption procedure.

The exemption procedure comprises the following steps:

- 1) documented and detailed description of the implementation difficulties
- 2) documented and detailed risk assessment of the situation under proposed alternative control measures
- 3) documented formal approval from the Operation’s Head of Safety and General Manager that the level of risk as a result of the alternative control measures is understood, tolerable for the organisation and in line with the vision of Zero Harm.

7.6 PLANT AND EQUIPMENT REQUIREMENTS

1. All equipment for working at heights shall comply with, and be used in accordance with, relevant approved design standards and manufacturer’s specifications.
2. Single person anchor points shall be capable of withstanding 15kN (approximately 3,372lbf). Where it is not practicable to install dedicated anchor points (i.e. ad hoc work), anchor points capable of withstanding 15kN shall be identified through a risk assessment process and shall be approved by a competent person prior to commencement of work.
3. Where personnel are required to work within 2 metres of an opening where they could fall, they shall use personal fall restraint equipment, such as a fixed lanyard and harness as a minimum, which will prevent them from falling over the edge.
4. Where there is potential to fall more than 2 metres, personnel shall wear appropriate personal fall arrest equipment. In such circumstances, the use of a full body harness, including shock- absorbing lanyard or inertia reel is mandatory. The use of body belts for fall arrest is prohibited, except for specialised tasks such as pole-climbing belts worn by specially-trained linesmen.

5. All forms of portable and movable elevated work platforms and suspended work cages shall conform to relevant approved design standards. People in the work platform basket shall each wear a correctly-fitted harness attached by a lanyard to a suitable anchor point. This does not apply to people working within a properly-constructed and certificated scaffold or other structure at height with the requisite handrails and toe boards.
6. Where there is potential to fall more than 2 metres in unprotected areas, access shall be restricted and controlled through risk assessment (e.g. stockpile feeder chutes, highwalls, water hazards, wharves, etc.).
7. Where operators need to gain access regularly to places at height on large plant and mobile machinery (e.g. to clean windscreens or filters), then access ways should be provided. Ideally, these access ways should have handrails. Where handrails cannot be installed, then fall restraint or fall arrest equipment should be considered, dependent on the outcome of a risk assessment of each situation.

7.7 SYSTEM AND PROCEDURAL REQUIREMENTS

8. The risk of fall shall be eliminated where reasonably practicable utilising the Hierarchy of Controls.
9. Standard work procedures shall be in place for the correct wearing and use of personal fall arrest and fall restraint equipment.
10. There shall be a “permit to work” system in place to control all non-routine working at heights not covered by written procedures.
11. A documented risk assessment shall be conducted before the commencement of working at heights and at any time the scope of work changes or the risk of a fall increases. The risk assessments shall include:
 - consideration for the potential of objects, as well as personnel, to fall
 - selection of appropriate control measures using the Hierarchy of Controls
 - the possibility for weather and other environmental conditions to influence the working conditions (e.g. wind, rain, snow, dust, gases, poor lighting, temperature, etc.)
 - selection of appropriate equipment
 - selection of anchor and tie-off points
 - condition of supporting structures such as roofs
 - selection of appropriate barricading and/or demarcation
 - fall clearances i.e. length of lanyard + tear-out distance + height of user + safety margin.
12. All platforms, scaffolds and any other temporary structures shall be constructed only under the direction of competent and authorised persons.
13. All equipment shall be fit-for-purpose and undergo pre-use checks and a minimum of six-monthly (bi-annual) documented inspections by a competent authorised person. An equipment register and tagging system shall be in place to indicate compliance with this inspection. Testing shall be done in accordance with recognised standards.

14. Where the work method requires persons to detach and re-attach at height, a dual lanyard system shall be utilised to ensure that at least one connection point is maintained at all times.
15. Where the use of personal fall arrest equipment is required, a person shall not work alone.
16. Persons working at height shall ensure that their safety helmets are secured by using a helmet chinstrap to retain the helmet on the head.
17. A system should be in place to prevent tools, materials and other objects from falling from height.
18. Barricading and warning signage should be placed on all lower levels where personnel or objects may fall.
19. Personnel operating elevated work platforms and cages shall be trained and certificated for the specific equipment they are using.
20. Emergency response plan/s should be available for the rapid retrieval of personnel in the event of a fall from height as response time is critical if a person is to avoid suspension trauma.

7.8 PEOPLE REQUIREMENTS

21. Sites shall provide for systems to ensure selected personnel are fit to work at heights. Specific attention shall be given to potential risk factors (e.g. personnel who suffer medical conditions, such as vertigo and epilepsy, and to personnel who are overweight). Note: many harness systems have a maximum weight limit of 136kg/300lbs.
22. A competency-based training programme, which includes provisions for maintaining competence, shall be in place for employees and supervisors. All persons engaged in work covered by this Standard shall receive appropriate training and be assessed for competence.
23. Behaviour-based observations shall include activities and tasks associated with working at heights. Any need for additional specific retraining shall incorporate the results of these observations.

8 LIFTING OPERATIONS STANDARD

8.1 AIM

To eliminate or minimise the risk of fatalities, injuries and incidents arising from the performance of lifting operations.

8.2 APPLICATION

This Standard applies wherever lifting operations are undertaken. It includes lifts involving Anglo American owned, hired or contracted cranes and lifting machines such as mobile, crawler, tower, derrick, portal and pedestal-type equipment (e.g. cherry pickers), vehicle loading cranes, electric overhead travelling cranes, hoisting blocks/tackle and monorail cranes. The Standard also applies to lifting equipment including slings, chains, wire ropes, shackles, pad-eyes, containers, baskets, tuggers, winches, man-riding winches, jacks, work-belts, harnesses and transfer baskets for equipment and personnel.

In addition to the manufacturer's standard safety features, local statutory requirements or, in the absence of these, ISO Standards, the minimum safety features indicated in this Standard shall or should be included.

This Standard applies to all Debswana managed businesses and operations, including contractors and visitors when involved in controlled activities.

8.3 DEFINITIONS

- **COMPETENT PERSON** means a person who has the right training and experience to be regarded as competent under relevant legislation and/or internal regulations.
- **EXTERNAL RATED CAPACITY LIGHTING** refers to clearly- visible green, amber and red lights mounted externally to the crane: green to indicate safe operating range, amber when approaching maximum rated capacity and red when maximum rated capacity has been exceeded.
- **LIFTING CREW** are persons working directly with a crane operation.
- **LIFTING EQUIPMENT** refers to any device which is used or designed to be used directly or indirectly to connect a load to a crane and which does not form part of a load (e.g. wire rope slings, chain slings, man-made fibre slings, hooks and fittings, swivels, shackles, eye bolts, rigging screws, wedge sockets, plate clamps and lifting beams).
- **LIFTING OPERATIONS** refer to any operation using a crane and lifting equipment that involves the raising and lowering of a load, including the suspension of a load.
- **WORKBASKET** refers to a personnel-carrying device designed to be suspended from a crane or other lifting machine.

8.4 REASON FOR INCLUSION

A significant proportion of our fatal and significant incidents have occurred in the course of lifting and crane operations. Identified causes and contributing factors include:

- lack of job planning and hazard assessment
- incorrect selection of cranes and lifting equipment for the task
- inadequate knowledge of lifting operations by personnel involved
- inadequate inspection, maintenance, tagging and storage of cranes and lifting equipment

- lack of training in correct use of lifting equipment
- lack of competence in lifting operations
- incorrect use of cranes and lifting equipment, including poor practices such as out-of-vertical loading and over-loading
- poor recognition of unsafe conditions, including environmental conditions
- operation of cranes and lifting equipment with safety and warning devices overridden, inoperable or illegible
- incorrect design of cranes and lifting equipment.

8.5 REQUIREMENTS

Application of the Debswana Fatal Risk Standards is mandatory at all Debswana managed businesses and operations. This mandatory nature is indicated by the use of the word “shall” within the Standards.

In some places, the word “should” is used. This means that the primary intent remains, but specific circumstances may mean that implementation of the requirements is not reasonably practicable.

Any deviation from the specifications set forth in these Standards should be formally approved following an exemption procedure.

The exemption procedure comprises the following steps:

- 1) documented and detailed description of the implementation difficulties
- 2) documented and detailed risk assessment of the situation under proposed alternative control measures
- 3) documented formal approval from the Operation’s Head of Safety and General Manager that the level of risk as a result of the alternative control measures is understood, tolerable for the organisation and in line with the vision of Zero Harm.

8.6 PLANT AND EQUIPMENT REQUIREMENTS

1. All electrical cranes shall have power supply isolation points capable of being positively locked out and isolated.
2. Cranes shall have their operability assessed against site conditions and workforce (e.g. language for the controls) and have fall protection systems provided for people in charge of their operation, maintenance and inspection.
3. Cranes shall not be used without a physical locking system that disables and isolates their free-fall capability.
4. Electric overhead travelling and portal cranes should have overload protection.
5. Crane cabins should be air-conditioned or heated in accordance with environmental conditions.
6. All crane cabins shall have signs to warn against interruption of the operator.
7. Vehicle loading cranes shall have sufficient engineering controls to prevent the operator from being crushed during lifting operations.
8. All crane hooks shall be fitted with a positive locking safety catch.

9. The safe working load (SWL) shall be clearly identified and marked on all cranes and relevant lifting equipment and shall not be exceeded.
10. For cranes, the following should be made available:
 - load cells
 - load moment indicators
 - external rated capacity lighting
 - stability monitoring devices (to prevent overturning).
11. All cranes and lifting equipment shall comply with the requirements of the relevant approved design standard. The minimum acceptable design standard shall be the relevant ISO Standard. In countries where the requirements of the relevant national standard exceed the requirements of the ISO Standard, the national standard shall apply.
12. All cranes and lifting equipment shall be identifiable with a unique identity code and its rated capacity should be visibly displayed.
13. A competent person shall determine the maximum environmental conditions under which cranes and lifting equipment can be used safely. Except in the event of an emergency, cranes and lifting equipment shall not be put into service if the maximum environmental conditions are exceeded. Risks shall be assessed in emergency situations.
14. Items of lifting equipment that are subject to wear and frequent replacement (e.g. slings, shackles, pad-eyes, shipping and handling baskets) or are used to transport equipment to and from sites, shall be colour-coded to confirm compliance with inspection requirements.
15. Lifting by the use of a block and tackle, for example, shall only be done from designated lifting points or be authorized by a competent person.
16. All lifting equipment shall be maintained in good condition with inspection maintenance log books. Proof-loading shall be undertaken as appropriate.

8.7 SYSTEM AND PROCEDURAL REQUIREMENTS

17. A formal selection and acceptance process based on risk assessment shall be in place for all new (to site) and modified lifting equipment, taking into account the crane's various safety features and cabin ergonomics, prior to commencement of work.
18. Manufacturer's crane and lifting equipment operating instructions and load charts shall be available to the crane and lifting equipment operator. These should be in the language of the country in which the lifting equipment is being used.
19. Where crane and lifting equipment operators are not conversant with the language of the country, provisions shall be made to ensure that the operators can understand the operating manuals and load charts.
20. A procedure shall be in place to address:
 - that the load and reach do not exceed the capacity of the lifting equipment
 - lifting operations when the arcs of operation of two or more cranes can overlap*
 - stationary multiple crane lifting operations*
 - that "pickup and carry" operations using multiple mobile cranes is prevented

- the danger to lifting operations when adverse weather conditions are present or imminent (e.g. electrical storm, high winds and sea state)
- the safety of personnel when cranes and lifting equipment are operating in the proximity of live electrical conductors*
- lifting operations when lifting near or over unprotected plant, equipment or services, including live process or hydrocarbon processes*
- the effective hand-over, from one operator to another, of cranes with complex boom, jib or tower configurations
- availability and use of check-lists for pre- and post-operational inspections.

* Detailed lifting plans are required for these procedures and shall be approved by a competent supervisor. Co-ordination meetings shall be held prior to such lifts to ensure all personnel understand how they are to be executed.

21. Cranes shall not be used for lifting operations until crane operators have been given sufficient time to familiarise themselves with relevant aspects of the crane.
22. Risks associated with all lifting, crane maintenance, assembly activities and environmental conditions shall be assessed as part of the planning process. Barricading, warning signs or other means of ensuring personnel protection shall be in place during lifting operations and for those cranes left unattended in wind vane mode.
23. Side loading of crane booms should be prevented according to the manufacturer's specifications.
24. With the exception of pick and carry operations, no lifting shall be carried out without outriggers being deployed and locked.
25. Controls shall be in place to prevent the falling of objects from lifting equipment and suspended loads.
26. The lifting of personnel with cranes shall be carried out only with the use of approved workbaskets or cages. Cranes used for this purpose shall be approved as suitable for man-lifting operations. A recovery plan should be in place before personnel are lifted.
27. The elimination of the need to work under or in the drop zone of suspended loads shall be pursued. Where working under suspended loads is unavoidable, controls shall be in place to eliminate or minimise the risks to personnel.
28. Any modification to cranes and lifting equipment shall be subjected to the original equipment manufacturer's approval and to a rigorous change management process.
29. A preventative maintenance system should be in place to ensure that all cranes and lifting equipment are maintained and in a serviceable condition, with appropriate records being kept.
30. All cranes and lifting equipment shall be inspected and tested to ensure all safety devices are working (including non-destructive testing as required by the relevant standard) prior to being operated or put into service. After any repair and/or modification, cranes and lifting equipment shall be inspected (and non-destructively tested as required by the relevant standard) prior to being returned to service.

31. A system of periodic inspection shall be in place for all cranes and lifting equipment. Lifting equipment shall be inspected visually and confirmed fit for purpose prior to being put into service. Visual inspection of lifting equipment by an approved competent person shall be performed on a regular basis (e.g. six monthly) unless regulations in the local area require examination more frequently.
32. A register of all lifting equipment (including slings) should be maintained. This should include:
 - equipment's unique identification number
 - documentary evidence of all inspections
 - certifications
 - maintenance
 - modifications and tests.

8.8 PEOPLE REQUIREMENTS

33. Suitably qualified, certified and competent person/s shall be involved in the planning, supervision and implementation of the lifting operations.
34. The roles and responsibilities of personnel engaged in lifting operations shall be defined clearly.
35. A competency-based training programme for contractors, employees and supervisors shall be in place. An approved examiner should assess the competence of trainers performing such training.
36. A competent inspector shall perform inspections of cranes, lifting machines and lifting equipment. An approved examiner shall assess the competence of the lifting and handling equipment inspector.
37. Crane operators and crew shall be able to communicate in a common language and to use the correct crane signals.
38. Sole crane operators shall be trained in slinging practices.
39. A fit-for-work policy shall be in place, incorporating the clearly- defined maximum levels of drugs (including prescribed medication) and alcohol allowed in the system of drivers/operators, and a system shall be in place for fatigue management.
40. Behaviour-based observations shall be performed and any need for additional specific training shall incorporate the results of these observations.

9 UNDERGROUND GROUND CONTROL STANDARD

9.1 AIM

To eliminate or minimise the risk of fatalities, injuries and incidents resulting from falls of ground and collapse in underground operations.

9.2 APPLICATION

This Standard applies to all underground ground control planning and activities.

This Standard applies to all Debswana managed businesses and operations, including contractors and visitors when involved in controlled activities.

9.3 DEFINITIONS

- SECURE GROUND is ground that is supported in accordance with the ground control plan, or unsupported ground which has been assessed, by a competent person, as not requiring support in accordance with the ground control plan.
- A MULTI-TIERED GROUND SUPPORT RESPONSE PLAN is a plan in which additional levels of support may be added according to triggers defined in that plan.
- A GROUND CONTROL PLAN is a plan that details prevailing geological and mining conditions and the resultant support requirements. The standards for support required for the various trigger levels of ground condition shall be stipulated.
- A COMPETENT PERSON is a person with specific graduate training in rock/geotechnical engineering, or a government certificated equivalent, with suitable experience in the field of application/operation and a member of a professional body whose continuous professional development (CPD) points are up-to-date.

9.4 REASON FOR INCLUSION

A significant proportion of fatalities and potentially fatal events in underground mines are connected with falls of ground and isolated rock falls. The causes of and factors contributing to these incidents have been:

- inadequate knowledge of ground stability characteristics at site
- inadequate understanding of the in situ and induced stress regimes
- inadequate integration of support systems into the overall mine design
- inadequate control of applied ground support measures
- lack of monitoring of ground conditions and support systems
- working under unsupported ground
- at-risk barring and scaling-down practices
- at-risk installation of support practices
- carrying out remedial support activities
- failure of ground support systems
- poor/non-implementation of risk management standards and procedures
- poor hazard identification
- at-risk behaviour and non-adherence to standards
- non-compliant mining layouts, including inadequate pillars, incorrect leads and lags, failure to overstop, and overbreak

- failure to identify and recognise the impact of site geology.

9.5 REQUIREMENTS

Application of the Debswana Fatal Risk Standards is mandatory at all Debswana managed businesses and operations. This mandatory nature is indicated by the use of the word “shall” within the Standards.

In some places, the word “should” is used. This means that the primary intent remains, but specific circumstances may mean that implementation of the requirements is not reasonably practicable.

Any deviation from the specifications set forth in these Standards should be formally approved following an exemption procedure.

The exemption procedure comprises the following steps:

- 1) documented and detailed description of the implementation difficulties
- 2) documented and detailed risk assessment of the situation under proposed alternative control measures
- 3) documented formal approval from the Operation’s Head of Safety and General Manager that the level of risk as a result of the alternative control measures is understood, tolerable for the organisation and in line with the vision of Zero Harm.

9.6 PLANT AND EQUIPMENT REQUIREMENTS

1. Mining equipment design and use shall incorporate removal or separation of the operator from unsecured ground, or the equipment shall provide a physical barrier to protect the operator in the event of an uncontrolled ground movement from hanging-wall/roof or walls.
2. The mining equipment design should take into account the forceful ejection of material into the working areas by seismicity and/or fall from a significant height (i.e. energy absorption capacity).
3. The design of mine support equipment shall be capable of installing support as per the specifications of the ground control plan without necessitating modification of the ground control plan. In other words, the ground control plan shall be suitable to the support equipment.
4. The performance specifications of materials selected for the ground control system should take into account the possibility of seismic events and the potential dynamic effect of fall of ground incidents.
5. Materials used in the ground support system should be designed and manufactured to audited standards to ensure they meet the required specifications of the ground control plan and performance specifications developed by the competent person.
6. Equipment used in the ground control system shall be maintained and tested on a regular basis to ensure that it meets the ground control plan requirements and performance specifications. A register and record of maintenance and testing by a competent person shall be kept.
7. Advances in worldwide ground control technology shall be monitored, and appropriate engineering reviews should be conducted to determine whether new technology should be implemented or used.

8. Support systems should be “self-auditing” from an installed quality control perspective.
9. Equipment to be used for barring shall be appropriate and persons involved should be standing at a safe distance.

9.7 SYSTEM AND PROCEDURAL REQUIREMENTS

10. An underground ground control plan specific to the commodity being mined shall be developed for all underground mines. This shall be approved by a competent person and signed off by the most senior manager of the operation.
11. All mines shall have access to a competent person who has relevant understanding of the conditions at the mine.
12. All local legislative requirements shall be used as a minimum standard for the ground control plan. In the absence of such a requirement, a generic ground control plan should be developed in consultation with national or international best practices.
13. Any ground control system shall be designed as an integral part of the mine design process.
14. Design and selection of equipment and materials used in ground control applications shall meet the requirements specified in the ground control plan and support performance specifications. Selection of such equipment shall be approved by a competent person.
15. Initial and on-going geotechnical analysis and assessment shall be integral parts of the mine design process and shall be carried out by a competent person.
16. As part of a change management process, a documented risk assessment shall be undertaken prior to any non-routine modification of the mine operation or design, with specific consideration to the geotechnical impacts, and shall be signed off by a competent person.
17. In developing, implementing or altering any ground control system, a geotechnical risk assessment process shall be undertaken and documented, with relevant level of sign off.
18. Adequate contingency for ground control systems shall be provided by a multi-tiered ground support response plan.
19. A process shall be in place for assessing that ground is secure.
20. No person shall go beyond the area of secure ground except in specific emergency situations as declared by an appropriate level of supervision. An emergency response plan to recover trapped workers (e.g. trapped under a fall of ground (FOG) or isolated by a collapse) shall be in place at every underground operation and practice drills/simulations shall be undertaken on a regular basis. A register and records shall be kept of such simulations.
21. Systematic collection and analysis of data shall be in place for the management of prevailing and predicted conditions and to assist with pre-empting changes to the physical conditions. Such information shall be communicated to all relevant personnel in advance of any change.
22. If the support system installed is not self-auditing, then systematic and ongoing monitoring shall be in place to assess the implementation and effectiveness of the ground control system and integrity (from a geotechnical perspective) of the mining layout.

23. Where there is potential for seismic, airblast or open cast blast damage to occur, seismic and/or vibration monitoring shall be carried out and, where possible, timeous warning should be provided to all personnel.
24. Documented procedures shall be in place to ensure the safe and effective installation and removal of ground support and recovery of trapped equipment/resources.
25. A documented risk assessment shall be conducted before any remedial work is carried out to improve or regain stability, and appropriate risk reduction measures shall be adopted.

9.8 PEOPLE REQUIREMENTS

26. The most senior manager of the operation shall authorise the ground control plan and shall be accountable for its implementation and on-going effectiveness in accordance with this Standard and with local regulations.
27. Roles and responsibilities shall be assigned to ensure implementation and management of the ground control plan by competent persons.
28. A competency-based training programme shall be in place and shall be cascaded to all underground operating personnel. The training programme shall include, but not be limited to, the following criteria:
 - identification of geological anomalies which contribute to weaker ground conditions
 - support design principles
 - the ground control plan
 - placement and removal of supports
 - recognition of indicators of change that may affect ground stability
 - on-the-job training and assessment
 - requirements for reporting changes
 - barring and scaling.
29. Sufficient, suitably qualified, competent and experienced person/s shall be involved in the integrated risk management process of design, planning and implementation of the ground control and mining plan.
30. A process shall be developed and maintained for on-going communication between the geotechnical function, operations management and operators.
31. Shift change procedures shall include the requirement to document and notify relevant personnel of changes to ground conditions and control.
32. Behaviour-based observations shall include work and tasks associated with ground control systems. Any need for additional specific retraining shall incorporate the results of these observations.

10 UNDERGROUND EQUIPMENT STANDARD

TRANSPORT

10.1 AIM

To eliminate or minimise the risk of fatalities, injuries and incidents arising from the use of transport equipment underground.

10.2 APPLICATION

This Standard applies to all underground transport equipment, including rubber tyre mounted and rail mounted equipment designed specifically for underground use. Examples of underground transport equipment covered by this Standard include rail bound locomotives, load haul dump machines, personnel transporters, multi-purpose vehicles, graders and all transport machinery with a machine-mounted operator.

NOTE – Where vehicles/equipment would be required for both underground and surface work, the most stringent control would apply as stipulated in either the Light Vehicles or the Underground Equipment Standard.

Where underground transport machinery falls outside those mentioned above, a risk-based approach should be used to determine the level of compliance needed for each of the specific requirements of this Standard. Examples of underground transport machinery excluded from this Standard include crawler mounted development loaders, continuous miners and face production equipment without a machine-mounted operator.

This Standard applies to all Anglo American Group managed businesses and operations, including contractors and visitors when involved in controlled activities.

10.3 REASON FOR INCLUSION

Underground transport equipment is a core risk for underground operations. Several fatalities and high-potential incidents have occurred involving underground transport equipment. The causes of and factors contributing to these incidents have been:

- interactions between equipment/equipment and equipment/pedestrians (e.g. passing or working close by)
- speeding
- non-adherence to operating procedures
- falling objects
- unplanned/inadvertent movements of equipment down inclines and slopes
- operator error due to fatigue or substance abuse
- failure of braking systems
- poor visibility and noise
- poor/faulty trackwork and road conditions
- overturning, overbalancing.

10.4 REQUIREMENTS

Application of the Debswana Fatal Risk Standards is mandatory at all Debswana managed businesses and operations. This mandatory nature is indicated by the use of the word “shall” within the Standards.

In some places, the word “should” is used. This means that the primary intent remains, but specific circumstances may mean that implementation of the requirements is not reasonably practicable.

Any deviation from the specifications set forth in these Standards should be formally approved following an exemption procedure.

The exemption procedure comprises the following steps:

- 1) documented and detailed description of the implementation difficulties
- 2) documented and detailed risk assessment of the situation under proposed alternative control measures
- 3) documented formal approval from the Operation’s Head of Safety and General Manager that the level of risk as a result of the alternative control measures is understood, tolerable for the organisation and in line with the vision of Zero Harm.

10.5 PLANT AND EQUIPMENT REQUIREMENTS

1. Underground transport equipment shall have the following minimum safety requirements unless otherwise stated as “should”:
 - should have falling object protection system (e.g. canopy or cab structure) as determined through the risk assessment process
 - automatic reversing alarm for non-track and track-bound machinery, except for bi-directional machines, which shall be fitted with an automatic system to indicate direction of travel (e.g. alternating light system)
 - flashing light/s mounted on personnel transport equipment and underground light vehicles
 - should have seat belts and/or passenger restraints
 - fail-to-safe brakes (excluding underground light vehicles with emergency brakes) and train brake systems, the design of which shall be based on risk assessments that consider runaway trains, decoupling, etc.
 - a combined automatic and manual fire suppression system, in addition to a portable fire extinguisher (with the exception of electrically-operated equipment, for which a risk-based approach shall be used)
 - restricted area and/or pinch point access controls or guarding where practicable (e.g. articulation locks for all articulated equipment, coupling devices for trains, with the locking mechanism able to be applied from a position of safety)
 - equipment should be fitted with a speed limiting device (the specific design requirements for this system should be determined using a risk assessment)
 - appropriately specified collision-avoidance technology and/or procedures
 - security systems to prevent unauthorised operation.
2. Design, selection, maintenance and operation criteria shall be in place for all remote controlled equipment.

3. Design and maintenance requirements shall be in place for all transport roadways and railways. Requirements shall include, but not be limited to, the following:
 - safe operating width, height, inclination, gradient, surface
 - regular measurement of track gauge and super-elevation, and rail head wear
 - demarcation of changed/special conditions
 - traffic flow and control
 - signage
 - shaft station and intersection stopping devices.
4. Risk assessments shall be undertaken as part of the design (due consideration to ergonomics), selection, commissioning, operation, modification and maintenance processes for all underground transport equipment.
5. Design, selection, maintenance and operation criteria shall be in place for all trailers (e.g. interactive braking systems). Where towing is to be considered, a risk assessment process shall be followed to ensure safe operation.
6. Underground transport equipment should be fitted with prime power isolation mechanisms.
7. Fail-to-safe equipment control systems (e.g. battery locomotive controllers) shall be in place.
8. Underground transport equipment should be fitted with roadway and haulage illumination capabilities.

10.6 SYSTEM AND PROCEDURAL REQUIREMENTS

9. A formal selection and acceptance process in accordance with these Standards shall be in place for all new (to site) and modified underground transport equipment prior to commencement of work on site.
10. A procedure shall be in place to address right of way between equipment and pedestrians.
11. A procedure shall be in place to ensure that no person rides illegally on any transport equipment.
12. A procedure shall be in place to ensure safe shunting for rail bound equipment.
13. All people underground shall wear full personal protective equipment and effective reflective clothing.
14. Parking rules shall be in place including, but not limited to, the following:
 - engine should be shut down before the operator leaves the machine, except where safe operating procedures are authorised by the most senior manager of the operation, supported by documented risk assessment (e.g. changing from manual to remote operation)
 - parking brakes shall be applied
 - wheels should be turned into the rib/wall or chocked, and positioned as close as possible to the rib/wall
 - all lifting and elevating attachments should be lowered or secured in the parked position when not in use and all stored energy should be released as per OEM recommendations.

15. A system shall be in place to identify the maintenance and inspection requirements for underground transport equipment. The system shall ensure that records are kept of all maintenance and inspection.
16. A process shall be in place for pre-use and operational checks, including appropriate brake tests (e.g. brake tests on a ramp) to define clearly that transport equipment is safe to operate.
17. Controls shall be in place to ensure the safety of people working in roadways and railways, including work in and around unexpected breakdowns. The controls shall include requirements for unattended broken-down equipment. The risk to employees and/or contractors shall be addressed specifically.
18. A system shall be in place to ensure compatibility between transport equipment, route, road and work area, load, traffic congestion and environmental conditions. The system shall cater for changes to any of the above or changes to a combination of any of the above.
19. A system shall be in place to ensure that transport equipment is controlled with the principle of NO operation when the driver/operator is not in full control of the machine (either directly or remotely).

10.7 PEOPLE REQUIREMENTS

20. All employees, contractors and visitors shall be inducted in appropriate road safety and site equipment/vehicle hazards.
21. A permit or certification system shall be in place to ensure drivers are competent to operate the type and class of underground transport equipment in its intended environment.
22. A system shall be in place to ensure that drivers receive adequate training to ensure that the equipment intended to be operated or driven can be operated or driven safely. As a minimum, training should include:
 - behaviour-based defensive driving principles
 - equipment familiarisation, taking into account the handling dynamics, maximum number of passengers, load limits and various features
 - loading and restraining principles where the equipment intended to be operated is designed for carrying cargo loads
 - education and awareness of driving and travel risks that may be encountered within the environment where the equipment may be operated or driven and the requirement of keeping to traffic rules and speed limits
 - securing (locking) equipment to prevent unauthorised use
 - emergency crash and breakdown procedures
 - basic mechanical principles including tyre changing and how to perform an adequate pre-operation check
 - pre-use equipment check, including brake testing.
23. A system shall be in place to ensure any person operating any equipment (e.g. vehicle-mounted cranes and winches) is suitably trained and accredited.
24. Behaviour-based observations shall include the operation and maintenance of underground transport equipment. Any need for additional specific retraining shall incorporate the results of these observations.

25. A fit-for-work policy shall be in place, incorporating the clearly defined maximum levels of drugs (including prescribed medication) and alcohol allowed in the system of drivers/operators.
26. A system shall be in place to manage driver fatigue.

SCRAPER WINCHES AND ATTACHMENTS

The Anglo standard on Scraper Winches and Attachments does not apply to Debswana as Debswana does not have such processes.

ROLES AND RESPONSIBILITIES

Head of Departments are responsible for the implementation of the FRCs in their area of control.

The DCC Sustainability Department is responsible for organising self-audits on annual basis.

RELEVANT GUIDELINES AND TOOLS

Anglo Fatal Risk Standards, version 2- May 2008

AA_AFRG_000001 Anglo Fatal Risk Guideline: Light Vehicles

AA_AFRG_000002 Anglo Fatal Risk Guideline: Surface Mobile Equipment

AA_AFRG_000003 Anglo Fatal Risk Guideline: Hazardous Material

AA_AFRG_000005 Anglo Fatal Risk Guideline: Equipment Safeguarding

AA_AFRG_000006 Anglo Fatal Risk Guideline: Isolation

AA_AFRG_000007 Anglo Fatal Risk Guideline: Working at Heights

AA_AFRG_000008 Anglo Fatal Risk Guideline: Lifting Operations

AA_AFRG_000009 Anglo Fatal Risk Guideline: Underground Ground Control

AA_AFRG_000010 Anglo Fatal Risk Guideline: Underground Equipment

DOCUMENT CONTROL FORM

NAME: Fatal Risk Control Standard

DOCUMENT No: STD/SHE/SHE/16

This Standard shall be reviewed and revised as needed to ensure that it is current and applicable and reissued at least every three years.

VERSION	DATE	APPROVED BY:
v01	05/11/2013	Group SHE Manager – F. Jansen

CHANGES IN THIS REVISION:

v01 - New document.