



Major Hazard Management

Why is this Group Standard important?	The safety and wellbeing of our people is a key priority, and it is our objective to provide workplaces which are free from work-related injuries, incidents and illnesses and fatalities. This standard sets out the critical controls for managing the <i>major hazards</i> associated with our operations.	
Audience	Anyone who is working at an AngloGold Ashanti work site, including directors, employees, contractors and consultants.	
Legend	<p><i>Glossary terms</i> are in italics.</p> <p>Hyperlink to another document or to an intranet site or website.</p> <p><i>Reference</i> to another AGA document without a hyperlink.</p>	
Glossary	<i>Top event</i>	The moment where control is lost over the energy source in the situation and the possibility of loss / harm is imminent. <i>Top events</i> , also referred to as priority unwanted events, normally have major (single fatality) or extreme (multiple fatality) consequences.
	<i>Critical controls</i>	<p>Controls that, if compromised, may lead to the <i>top event</i> occurring or significantly increase the potential consequences of the event and will include:</p> <ul style="list-style-type: none"> Those controls that if compromised to any extent may render all other controls in the same pathway or multiple pathways ineffective, which may lead to the <i>top event</i> occurring. Those controls which independently are likely to prevent the <i>top event</i> occurring, even on failure of other controls in the same or multiple pathways.
	<i>Major hazard</i>	A hazard that has a consequence classification of major (fatalities) or extreme (multiple fatalities).
	<i>Working at height</i>	Task involves working at a height greater than or equal to 2 metres. This also includes working within 2m of a fall risk greater than or equal to 2m.

You must comply with AGA Group-wide Standards to the extent they apply

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Electrical Installations

We implement critical controls for electrical installation to prevent events such as electric shock by direct or indirect contact energised conductors or cables, inadvertent start-up of electrical energy, arc flash exposure and/or inadvertent contact with overhead power lines

- *Critical control 1:* All electrical work may only be carried out by trained, competent and authorized electrical personnel.
- *Critical control 2:* Certify and approve all electrical personal protective equipment (PPE) and test instrumentation.
- *Critical control 3:* Require a Permit to Work for all medium voltage and higher voltage work, including the excavation or reopening of cables or working in the immediate vicinity of power lines.
- *Critical control 4:* Develop a site electrical energy isolation procedure (isolate, test for dead, lock-out, tag-out) and implement before any electrical work commences.
- *Critical control 5:* Carry out a test for zero potential and “test for dead” at the specific piece of equipment/place of work itself prior to any work commencing to eliminate the risk of back feeds or stored energy.
- *Critical control 6:* Keep all sub-stations and motor control centres (MCCs) locked at all times and restrict access to authorized persons only.
- *Critical control 7:* Clearly mark the back and front of all electrical panels and switchgear to indicate where they are fed from and where they feed to and whether it is fed from any ring feed source.
- *Critical control 8:* Do not use damaged or non-standard equipment until it has been repaired by competent electrical staff and report any defect as soon as it is observed.

Energy Isolation

We isolate energy sources to prevent the uncontrolled release of energy, including uncontrolled explosions, ruptures, release of pressure, entanglement in rotating equipment, and/or the release of potential or stored energy.

- *Critical control 1:* All energy isolation related work may only be carried out by trained, competent and authorized personnel wearing authorized PPE who are also instructed in the use of the energy control/release procedures.
- *Critical control 2:* Identify, isolate, secure, discharge, test and tag all sources of residual or stored hazardous energy in line with an established procedure before commencing work on any equipment where hazardous energy may be present.
- *Critical control 3:* Document a site energy isolation lockout-tagout procedure, including the recommissioning/re-energizing processes post completion of work.
- *Critical control 4:* Report damage to or abnormal conditions relating to equipment with stored energy as soon as it is observed and do not use the equipment until a competent person has advised that it is safe.

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Equipment Safeguarding

We implement safeguarding on equipment to prevent workers from being inadvertently exposed to moving machinery, extreme temperatures, pressure or hazardous chemicals.

- *Critical control 1:* Fit guards and/or safety switches wherever there is potential for a worker to inadvertently encounter moving machinery, extreme temperatures, pressure or hazardous chemicals.
- *Critical control 2:* Install barriers and alarm/trip protection systems to restrict access in areas where fitting guarding is not practicable.
- *Critical control 3:* Require all equipment that can be started remotely to have a pre-start alarm and delayed-start mechanism.
- *Critical control 4:* Assess the condition and effectiveness of safeguards, barriers and protective systems before starting any work and immediately report any damage or safeguard failures to line management.
- *Critical control 5:* Require a Permit to Work, direct supervision and positive communication between all participants to be maintained while undertaking any work on moving machinery, extreme temperatures, pressure or hazardous chemicals, where the removal of safeguards, barriers of entry or any protection system is required.

Fires and Explosions

We implement critical controls to prevent exposure to fire, explosion, or uncontrolled ignition of combustibles, especially in the underground environment.

- *Critical control 1:* Train all workers in the site emergency management plan.
- *Critical control 2:* Ensure fire-fighting teams are trained and equipped to meet jurisdictional statutory requirements.
- *Critical control 3:* Verify that fire detection and suppression systems, refuge bays/chambers are in place, operational and maintained to meet jurisdictional statutory requirements.
- *Critical control 4:* - House Keeping – Remove combustible material from work area or equipment
- *Critical control 5:* Document and implement a procedure for hot work (as defined in the Major Hazard Standard Implementation Guideline) and require a Permit to Work to carry out hot work.
- *Critical control 6:* Implement an automatic fire suppression system and electrical overload protection where required.
- *Critical control 7:* “Ensure that Self-Contained Self Rescuers (SCSR’s), cap lamps and gas measuring instruments are used in cases of suspected irrespirable atmospheric conditions.”

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Ground Control

We implement critical controls to prevent uncontrolled fall of ground or slope failure, including rockfall, seismic ejection and slope collapse.

- *Critical control 1:* Train and test all workers on site in ground control hazard awareness, emphasising that everyone has responsibility to continuously inspect their work area for ground control hazards.
- *Critical control 2:* Provide surface support in all work areas of an underground operation.
- *Critical control 3:* Plan, schedule and construct all excavations according to the geotechnical design.
- *Critical control 4:* Prohibit all entry into an area of unsupported or unsecured ground.
- *Critical control 5:* Do not allow a person to enter an area unless they are authorized to enter the area and aware of ground control hazards.
- *Critical control 6:* Continuously inspect work areas for ground control hazards.

Hazardous Material

We implement critical controls to prevent uncontrolled exposure or uncontrolled release of hazardous materials.

- *Critical control 1:* All persons working on hazardous materials/facilities must be trained, competent and authorized.
- *Critical control 2:* Require a Permit to Work and complete a job safety assessment when working with hazardous materials or facilities.
- *Critical control 3:* Use material-specific personal protection equipment and develop material-specific procedures.
- *Critical control 4:* Monitor the integrity of hazardous material facilities at the documented risk-based frequency as per the asset integrity process.
- *Critical control 5:* Provide hazardous material emergency response training to all potentially affected workers and identified responders.
- *Critical control 6:* Restrict access to hazardous materials using signage, security, and access control.

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Lifting Operations

We implement critical controls to manage the risks associated with lifting operations, including loss of suspended loads, loss of control of mobile lifting equipment or inadvertent contact between the load and fixed objects, equipment, and personnel.

- *Critical control 1:* All lifting operations may only be carried out by workers who are trained, competent and authorized with respect to the specific job and/or equipment on which they are working.
- *Critical control 2:* Have a competent person develop a lift plan for all non-routine and complex lifts to determine the appropriate lift method and equipment to be used.
- *Critical control 3:* Ensure lifting devices and equipment are currently certified for use, maintained according to Original Equipment Manufacturer (OEM) standards and that a competent person completes a visual inspection of the device and equipment prior to each lift.
- *Critical control 4:* Make sure that all the required safety devices installed on lifting equipment are in place and functional.
- *Critical control 5:* Establish and maintain clear lines of communication during the lift.
- *Critical control 6:* Ensure people are not positioned under a suspended load or between a suspended load and fixed objects and the lifting area has been clearly marked out to prohibit access prior to each lift

Mobile Equipment

We implement critical controls to prevent interaction between mobile equipment and workers, other equipment, or the environment and to avoid losing control of mobile equipment.

- *Critical control 1:* All mobile equipment activities may only be carried out by trained, competent and authorized workers.
- *Critical control 2:* Complete a pre-operational safety check on all mobile equipment.
- *Critical control 3:* Ensure access controls (including barricading, signage and segregation) are in place for all active mining areas.
- *Critical control 4:* Ensure pedestrians are separated from all mobile equipment through safe operating procedures and positive communications.
- *Critical control 5:* Park mobile equipment so that it is fundamentally stable.
- *Critical control 6:* Install berms or windrows wherever there is a potential for vehicles to fall over edges.
- *Critical control 7:* Require seat belts to be worn while mobile equipment is in operation.

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Underground Vertical Transport

We implement critical controls to manage the risks associated with underground vertical transport, including out of control conveyance due to wind conditions or inundation or the conveyance striking objects while in motion.

- *Critical control 1:* Operating winding plant and shaft systems may only be carried out by trained, competent and authorized workers.
- *Critical control 2:* Operate and maintain all vertical transport infrastructure and equipment strictly in line with AGA Technical Standards and jurisdictional statutory requirements.
- *Critical control 3:* All shaft compartment entrances shall have lockable gates and suitably designed station stopping devices or gates to prevent any mobile equipment from inadvertently entering a shaft compartment.
- *Critical control 4:* All employees working in or near any open entrance to a shaft shall wear an appropriate hard hat and approved safety harness secured to a designated anchor point.
- *Critical control 5:* All winders shall be equipped with electronic slack/tight rope condition monitoring systems.
- *Critical control 6:* The head of all shaft winding compartments shall be equipped with appropriately designed crash beams, Jack catches or Cage / Skip arresting devices and spectacle plates.
- *Critical control 7:* All blind shaft bottoms shall be equipped with water level monitoring and alarms sounding on the winder driver desk to prevent conveyances being submerged in water.
- *Critical control 8:* Shaft communication systems (shaft phone or ECAM type systems) shall be used during shaft repairs or examination and be fitted with loss of signal alarms to indicate when communications signal has been lost.
- *Critical control 9:* All winding plant shall be equipped with emergency back-up power or brake release systems for moving personnel to the nearest level for safety in case of a loss of power to the winder.

Working at Height

We implement critical controls to prevent injuries as a result of working at height, including falls from height, falls into unprotected openings/ excavations, exposure to objects that can fall and prolonged suspension following a fall.

- *Critical control 1:* Working at height may only be carried out by workers who are trained, competent and authorized.
- *Critical control 2:* Require a Permit to Work and complete a job safety assessment prior to working at height.
- *Critical control 3:* Use approved harness, support and fall protection equipment when working at height and verify that the expiration date has not passed.

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- *Critical control 4*: Require scaffolding and temporary structures to be approved by a competent engineer before use.
- *Critical control 5*: Certify and document dedicated anchor points and inspect in accordance with the site risk assessment. Evaluate every anchor point (dedicated and non-dedicated) during a job risk assessment.
- *Critical control 6*: Document and communicate an emergency recovery plan to the emergency rescue team before *working at height* commences.
- *Critical control 7*: Use signage and barricades to prevent unauthorised/inadvertent access.

Control assessment and monitoring

- Complete a self-assessment and bow-tie risk analysis against each *major hazard* annually, by 31 December.
- Use the iSIMS software package to monitor *critical controls*.
- Use the implementation guideline as reference on how this standard should be implemented.

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