SHAFTS AND WINDERS-Final

DEFINITIONS

“allowable speed” means the maximum speed that the winder is designed to travel at or any lesser speed determined by the competent person (Engineer)

“approved rope testing station” means a testing station approved by the Chief Inspector of Mines for the destructive testing of ropes used on a winder;

“conveyance” means any equipment used to raise or lower persons, material, mineral or explosives in a shaft by means of a winder;

“failsafe” in relation to mechanisms, appliances, devices and controls, means so designed as to activate and effectively perform its intended function without human intervention.

“fixed rope winder” means a single drum or multi drum winder in which the end of the rope is fixed to the drum, excluding any lift, lifting machine, endless rope haulage and scraper winch installation (as defined in chapter 8);

“Friction winder” means a winder that drives a rope (or ropes) by means of friction;
“incline shaft” means any tunnel in which winding takes place that has an inclination to the horizontal of more than 5 degrees but less than 15 degrees and where the speed of traction exceeds 2 metres per second;

“maintenance” means preventive tasks (planned) and corrective tasks (unplanned) carried out on winder systems and shaft systems to maintain these in good working order and prevent functional failure;

“Open bells” means a signalling system that when operated does not lock the brakes of the winder as per the locked-bell system.

“recoverable recordable system” means any recordable system that will retain the data captured therein indefinitely and which -
   a) captures the time and date of every entry, name and signature of every person making an entry;
   b) allows for the retrieving of all data captured;
   c) Incorporates measures to prevent unauthorised changes to any captured data;
   d) is auditable; and
   e) in the case of an electronic system, is backed up weekly.

“shaft” means a tunnel in which winding takes place that has an inclination to the horizontal of between 15 and 90 degrees;
“shaft station area” means the area surrounding the shaft at every station level;

“shaft system” means the rope way, headgear, shaft, station level, shaft station area, shaft bottom and their associated infrastructure;

“small hoist” means a winding system that is driven by an engine or motor developing not more than 250 kilowatt.

“station level” means the bank and any level in a shaft, at which conveyances are stopped for the loading or unloading of persons, material, mineral or explosives;

“trial run” means a full cycle of travel in a compartment of the shaft by an empty conveyance;

“winder” means any hoist or other appliance used for the transport of persons, material, mineral or explosives by means of a conveyance in a shaft where the control system of this driving machinery is operated from the motor or engine room, but excluding any lift, chairlift, lifting equipment, endless rope haulage and scraper winch installation as defined in chapter 8

“winding system” means a system comprising of the winder, winding ropes, tail ropes, sheave wheels, conveyances and any attachments to any of these.
REGULATIONS

1. The employer must take reasonably practicable measures to prevent persons from being injured in a shaft system or winding system as a result of--

1.1 inadvertent contact with any moving parts of a shaft system or winding system;

1.2 all winding not being stopped while there is an incident in any shaft compartment that could result in any significant risk to any person should winding continue;

1.3 being in a conveyance and lowered into an accumulation of water;

1.4 being struck by a conveyance;

1.5 a conveyance being over wound into either extremities of a shaft;

1.6 uncontrolled or free travel of a crosshead in a sinking shaft;

1.7 winder brake failure;

1.8 a conveyance fouling any equipment in the barrel of the shaft;

1.9 a runaway conveyance or counterweight;

1.10 exposure to blasting or blasting fumes in a shaft system;

1.11 being tipped from, or mineral being loaded onto persons in, a conveyance;

1.12 a winder over speeding;

1.13 a conveyance striking fixed objects;

1.14 inadvertent disconnection between the end of a winding rope and any load attached to a conveyance;

1.15 interruption of the free travel of the conveyance;

1.16 overloading of a conveyance;

1.17 unauthorised conveyance movement;
1.18 uncontrolled *conveyance* movement;
1.19 winding rope failure;
1.20 boarding or alighting from a swaying *conveyance*;
1.21 being simultaneously conveyed with *mineral, material, explosives* or rolling stock;
1.22 coming into contact with any fixed objects of the *shaft system*;
1.23 exposure to excessive deceleration/acceleration or inertia forces in or on a *conveyance*;
1.24 unauthorised entry or access to a *winding system* or *shaft system*;
1.25 transportation of *mineral, material* or *explosives*;
1.26 persons being trapped in a *shaft* or *headgear* or on a *station level*;
1.27 unauthorised entry or exit from or to a *conveyance*;
1.28 incompetent persons designing a *shaft system* or *winding system*;
1.29 falling off or out of a *conveyance* or into a *shaft*;
1.30 being struck by any object falling down a *shaft*;
1.31 inadequate *maintenance* of a *winding system* or *shaft system*;
1.32 incompetent persons maintaining a *shaft system* or *winding system*;
1.33 a *winder* not being maintained to the certificate of registration specifications;
1.34 *self propelled mobile machines* having access to the *shaft system*;
1.35 incompetent persons operating or being in charge of a *shaft system* or a *winding system*;
1.36 being struck by an unstable load or the unstable load striking equipment;
1.37 non adherence to mine procedures;
1.38 some or all of the permitted *winder* operational parameters being exceeded;
1.39 appropriate actions not being taken after discovering substandard conduct or conditions in a *winding system*;
1.40 any safety device being rendered ineffective or inoperable;
1.41 failure of any component or safety device of a *winding system*;
1.42 unauthorised use of any signalling system;
1.43 unauthorised operation of a *winding system*;
1.44 an interruption of the power supply to the *winding system*;
1.45 unplanned stoppage of the conveyance between stations; and
1.46 the overwinding of persons above the top most landing/station

2. The *employer* must take *reasonably practicable* measures to prevent injured or ill persons condition from deteriorating due to medical complications as a result of a delay because of no formal signalling or communication system being available to arrange immediate transportation of such injured or ill persons from a *station level* to surface.

**SHAFT AND WINDING SYSTEMS UNDER COMPETENT PERSONS**

3. The *employer* must take *reasonably practicable* measures to ensure that-
3.1 all *winding systems* and *shaft systems* are selected, designed, and modified, by a *competent person*;
3.2 all *winding systems* and *shaft systems* are operated and maintained by a *competent person* or under the supervision of such a *competent person*;
3.3 all *winding systems* are constructed and relocated by a *competent person*; and
3.4 all *shaft systems* are constructed by a *competent person* or under the supervision of such *competent person*. 
NOTIFICATIONS

4 The employer must take reasonably practicable measures to ensure that-
4.1 the Principal Inspector of Mines is notified on forms MD1 and MD 208 of the intention to install, modify or relocate any winder not less than thirty days before the commencement of such installation, modification or relocation.

4.2 the Principal Inspector of Mines is notified in writing within 30 days when any winder -
4.2.1 will no longer be used for the regular conveyance of persons, material, mineral or explosives but will be maintained in an operational condition; or
4.2.2. is temporarily or permanently taken out of service.

4.3 The Principal Inspector of Mines must issue a confirmation of receipt of any notification contemplated in 4.1 and 4.2 within 30 days of receipt of such notification as per DME352.

4.4 The employer must keep readily available at the mine a copy of any notification contemplated in regulation 4.2, any confirmation of receipt contemplated in 4.3 or a permit authorising the use of a winder issued prior to enactment of these regulations.

DESIGN

5. The employer must take reasonably practicable measures to ensure that
all *shaft system* and *winding system* structures and equipment are designed according to SANS 10208-2007: Design of Structures for the Mining Industry

- Part 1- Headgear Structures
- Part 2- Sinking Stages
- Part 3- Conveyances
- Part 4- Shaft System Structures, as applicable.

**WINDER CONTROL**

6. The *employer* must take *reasonably practicable* measures to ensure that any *winder* is capable of being controlled so that the acceleration and deceleration are limited to a maximum of 3.5 m/s\(^2\) for persons and 4.5 m/s\(^2\) for *material, mineral* or *explosives* in a vertical *shaft* and at such acceleration and deceleration rates that the natural force of gravity does not permit the paying out of excess rope in an *incline shaft* that could create a dangerous condition.

**BRAKES**

7. The *employer* must take *reasonably practicable* measures to ensure that:

7.1 under normal operating conditions the braking system of a *winder* has adequate multiple independent systems to meet the safe retardation rates specified in regulation 6 above.

**BRAKES HOLDING POWER: STATIC CONDITION**

7.2 the braking system of a *winder* is designed and maintained so that for each drum it can at all times produce twice the braking torque
required to hold the total permitted suspended load for that drum in a maximum out of balance condition; and

**BRAKE HOLDING POWER: DYNAMIC CONDITION**

7.3 The braking system of a *winder* is designed and maintained so that under dynamic conditions the system will revert to a *failsafe* condition and comply to the minimum requirements as set out in regulation 6 above.

**EMERGENCY BRAKE RELIEF**

7.4 The emergency brake system is so interlocked that no release of the brakes can take place in a power outage unless the safety circuit is functional and the *winder* can be automatically stopped.

**DRUMS**

8. The *employer* must take *reasonably practicable* measures to ensure that a device or a combination of devices is/are installed and maintained to prevent the rope from being dislodged from the *winder* drum or from bad coiling on the drum.

**OPERATING LEVERS AND DIRECTION OF WINDING**

9. The *employer* must take measures to ensure that:

9.1 the forward movement of the control lever of a *winder* results in the overlay *conveyance* descending;

9.2 the brake lever of a *winder* must be pulled towards the driver to apply the brakes; and

9.3 there is always rope wound overlay on a *fixed rope winder* and that, on a double drum *winder*, when facing the *shaft* the rope wound overlay is on the right hand side drum.
CLUTCHING OPERATIONS

10. The employer must take reasonably practicable measures to ensure that:

10.1 a winder has a mechanism that will prevent inadvertent clutch withdrawal and a mechanism to indicate the clutch status at all times; and

10.2 the brake or brakes of a double drum winder must be fully applied before clutching commences and the clutch must be fully engaged and locked before the brakes can be released.

ERGONOMICS

11. The employer must take reasonably practicable measures to ensure that the ergonomic and operational environments for winding engine drivers are such that the winding engine drivers can perform their work healthily and safely.

DEPTH AND DIRECTION INDICATOR

12. The employer must take reasonably practicable measures to ensure that a winder is equipped with a device that will indicate the position in the shaft and direction of travel of the conveyance to the winding engine driver at all times.

SAFETY DEVICES

END OF WIND WARNING DEVICE

13. The employer must take reasonably practicable measures to ensure that a winder is equipped with a device that timeously warns the winding engine driver of a conveyance approaching the bank or the lowest landing for persons so that the winding engine driver can bring the conveyance to rest at the bank or such landing at a safe retardation rate.
BRAKE “OFF” DELAY DEVICE
14. The employer must take reasonably practicable measures to ensure that, when transporting persons, except when blasting is to take place in a sinking shaft, the brakes of a winder are not released less than 10 seconds after receiving the last signal to move persons and that the winder, for this purpose, is equipped with a device that will-
14.1 allow the winding engine driver to release the brakes not less than 10 seconds after receiving the last signal to move persons; or
14.2 inform the winding engine driver of the expiry of not less than 10 seconds after receiving the last signal to move persons.

ULTIMATE OVERWIND DEVICES
15. The employer must take reasonably practicable measures to ensure that a winder is fitted with one or more overwind prevention devices that will automatically trip the winder at a pre determined point and apply the brakes to stop the conveyance from striking any fixed object at the end of wind.

OVER SPEED/DISTANCE CONTROLLING DEVICE
16. The employer must take reasonably practicable measures to ensure that:
16.1 a winder is equipped with one or more devices that will-
16.1.1 warn the winding engine driver when the speed of the conveyance could subject persons inside the conveyance to excessive acceleration or deceleration rates and that will cause the brakes to be applied should the winding engine driver not react to the warning that is given at a 10% overspeed; and
16.1.2 prevent the maximum speed of the conveyance exceeding the allowable speed by 15%;
16.2 the devices contemplated in 16.1 are reset accordingly when the allowable speed of a winder is adjusted due to site specific conditions.

**RECORDING DEVICE**

17. The employer must take reasonably practicable measures to ensure that a winder with a permitted speed exceeding 5 m/s is equipped with a recording device, e.g. tachograph, that records at least time, speed, acceleration, and deceleration, and that the information recorded is kept readily available at the mine for a period of 30 days.

**BELL RECORDING DEVICE**

18. The employer must take reasonably practicable measures to ensure that a winder used for the conveyance of persons is equipped with a device that will continuously record the signals exchanged between the winding engine driver and banksman and the winding engine driver and onsetter, and that the information recorded is kept readily available at the mine for a period of 30 days.

**ATTACHMENTS**

19. The employer must take reasonably practicable measures to ensure that:
19.1 where site specific conditions require attachments between the rope and the conveyance to be manufactured from material requiring special treatment, those attachments are manufactured from such specially treated material and thereafter treated as specified by the manufacturer;
19.2 any attachment between the winding rope and the conveyance is designed, manufactured and installed such that no failure or accidental disconnection of the attachment can take place; and
19.3 the type of attachment and its period of use between the following are recorded in a recoverable recordable system:
19.3.1 any winding rope and the conveyance or counterpoise;
19.3.2 the conveyance and any trailer or other attached conveyance; and
19.3.3 any balance rope or tail rope and the conveyance or counterpoise.

WINDING ROPES

SLIPPAGE OF WINDING ROPE

20. The employer must take reasonably practicable measures to ensure that:

**Fixed Rope Winder**

20.1 at the hawsehole of a fixed rope winder adequate protection of the rope against damage and that a minimum of three rope turns provided on the drum, when the conveyance is at the lowest point of hoisting;
20.2 termination of the rope at the drum is carried out in such a manner as to prevent failure of the termination under full load conditions without the assistance of the friction provided by the compulsory three turns of rope; and

**Friction Winder**

20.3 the design and maintenance of the contact between the rope and its driving tread of a friction winder will prevent excessive slippage under all operating conditions so as not to cause damage to the ropes or friction material.
21. The employer must take reasonably practicable measures to ensure that:

21.1 all “winder” ropes are manufactured by a manufacturer accredited in terms of ISO 9001: “Quality system- Model for quality assurance in design, development, production, installation and servicing.”

21.2 all “winder” ropes have a breaking strength at installation such, that the factors of safety are not less those indicated in the “FACTORS OF SAFETY FOR WINDER ROPES USED IN SHAFTS” attached as annexure “A”

21.3 notification of all “winder” ropes newly installed or changed are sent to the DMR Regional Office on form MD 208 within 14 days of such installation or change;

21.4 all winder ropes are selected having regard to any operating parameters and site specific conditions which may negatively impact on the life of the rope;

21.5 where multiple ropes are used on a winder, the ropes are approximately the same nominal diameter and strength and a means is provided to equalise the load between the ropes;

21.6 a winding rope which has been joined or reinforced is only used if the safe use thereof has been assessed for site-specific conditions and authorised by a competent person;

21.7 any previously used winding rope is not re-used unless:

21.7.1 the breaking strength of a specimen cut from the end of such rope has been determined to be compliant with these regulations by a destructive test at an approved rope testing station; and

21.7.2 a competent person is in possession of the documented history of the working life of the rope;
21.8. at least one, but such number of spare winder ropes as determined by site-specific conditions, is readily available at the mine.

21.9 all winding ropes are assessed in accordance with SANS 10293:2004 “Condition assessment of steel wire ropes on mine winders” and that no rope is used which has reached the discard criteria specified in that standard;

21.10. for any newly installed winding rope or newly installed attachment to a winding rope, the maximum permitted mass is loaded and the conveyance is test run twice through the effective length of wind in the presence of a competent person to ensure that all appurtenances are functional.

21.11 the results of the test runs have been recorded in the winding engine drivers and winder ropes recoverable recordable systems and that no persons, material, mineral or explosives are conveyed-

21.11.1 if the results of the test runs indicate that any of the appurtenances are not functioning properly; or

21.11.2 until the results of the test runs have been recorded in the winding engine drivers and winder ropes recoverable recordable systems;

21.12 the rope on a fixed rope winder, excluding a platform winder, is cut to the correct length for testing and tested by an approved rope testing station to determine the breaking strength and general condition of the rope. Pieces must be cut and tested at least every 3 months where a compensator is fixed to a conveyance and every 6 months for all other configurations of winders. The pieces must be sent for testing within two weeks from being cut.

**RECOVERABLE RECORDABLE SYSTEM**
22. The employer must take *reasonably practicable* measures to ensure that a *recoverable recordable system* is established and maintained at the *mine* for the *winding system* and *shaft system* and in which the following information is captured:

22.1 details of all *maintenance*, repairs, testing, inspections and examinations of the *winding system* and *shaft system* and of the findings, which must be captured by the *competent person* who undertook the *maintenance*, repairs, inspections or examinations within 24 hours from completion of such *maintenance*, repairs, inspections or examinations;

22.2 all rope manufacturing and modification detail, as well as dates of installation, modifications and removal for each winding rope, which must be captured by the *competent person* within 24 hours after installation, and which information must include at least the following:

22.2.1 Name of manufacturer-
22.2.2 Date of manufacture;
22.2.3 Coil number;
22.2.4 Length in metres;
22.2.5 Mass per metre in kilograms;
22.2.6 Diameter in millimetres;
22.2.7 Width and thickness in millimeters;
22.2.8 Construction of rope-
  22.2.8.1 type and length of lay;
  22.2.8.2 number of strands;
  22.2.8.3 class of heart;
  22.2.8.4 type of lubricant;
22.2.9 Construction of strands-
  22.2.9.1 number of wires;
  22.2.9.2 diameter of wires in millimetres;
  22.2.9.3 class of core;
  22.2.9.4 class of steel in wires;
  22.2.9.5 tensile strength of steel in megapascals;
  22.2.9.6 Breaking force in kilonewtons;
22.2.9.7 Rope test certificate number and place of test;  
22.2.10 Whether used for winding or balance purposes-  
22.2.10.1 Name and type of shaft;  
22.2.10.2 Name of compartment;  
22.2.10.3 Winding plant notification number (Reg 4.3);  

22.3 all dates of installation, modification and removal of the winding rope attachments, which must be captured by the competent person within 24 hours after installation, modification or removal, as the case may be;  
22.4 the current condition of the winder and signalling arrangements, which must be captured by the competent person (winding engine driver) before commencing his or her shift or before taking over from another winding engine driver; and  
22.5 any unsafe conditions or events that occur during the full period of control of a winder, which must be captured by the competent person (winding engine driver) upon occurrence of such event.  

23. The employer must take reasonably practicable measures to ensure that a competent person-  
23.1 scrutinises all entries made in the recoverable recordable system within 7 days of entry;  
23.2 determines any required measures to be taken;  
23.3 ensures that such measures are implemented; and  
23.4 records all the activities required by this regulation 40 in the recoverable recordable system.  

INSTRUCTIONS TO WINDING ENGINE DRIVER.  
24. The employer must take reasonably practicable measures to ensure that the winding engine driver-
24.1 is notified on the *recoverable recordable system* of any instruction related to the operation or *maintenance* of, or repairs to, the *winder system* or the *shaft system*;
24.2 acknowledges on the *recoverable recordable system* any instruction contemplated in 24.1 prior to the carrying out of the instruction; and
24.3 is immediately notified on the *recoverable recordable system* upon the completion of any *maintenance* of, or repairs to, the *winder system* or the *shaft system* and acknowledges receipt of such notification on the *recoverable recordable system* before commencing or continuing winding.

**CHANGE OF SHIFT**
25. The *employer* must take *reasonably practicable* measures to ensure that on any change of shift of a winding engine driver-
25.1 the outgoing winding engine driver locks the brakes of the *winder* and records in the *recoverable recordable system* the last signal received and the contents of the *conveyance*; and
25.2 the oncoming winding engine driver is fully conversant as to the condition of the *winder* and the nature of the load that is being transported.

**ARTISANS**
26. The *employer* must take *reasonably practicable* measures to ensure that every *competent person*, at the start of his or her shift, acknowledges on the *recoverable recordable system* knowledge of all entries made the previous shift in terms of regulations 22.1 and takes all required remedial action falling under his or her area of expertise.
BANKSMAN AND ONSETTER

27. The employer must take *reasonably practicable* measures to ensure that:

27.1 the loading and unloading of persons, *material, mineral* and *explosives* in or on a *conveyance* and the exchange of the signals to perform these tasks are only done under the control of a competent person; and

27.2 on any change of shift a competent person records in the *recoverable recordable system*:

27.2.1 the condition of the visual inspection and record and report any latent defects on *conveyances*, bank and stations including all associated equipment used therewith; and

27.2.2 any unsafe conditions or events likely to endanger the health or safety of persons that have or may occur during the full period of control of that person during their shift must be reported and repaired before use of such equipment.

VERTICAL SHAFTS

OVER RUN CLEARANCE

28. The employer must take *reasonably practicable* measures to ensure that:

28.1 *fixed rope winders* used for the transport of persons, have sufficient distance, from the highest and lowest “*station level*” to the first fixed obstacle, to prevent the “*conveyance*” striking such structure at the end of wind, under all normal designed operating conditions. A retarding device provided for *friction winders* may be installed in this space. This requirement is not applicable to the bottom of a “*shaft*” in the course of being sunk;
28.2 overwind clearances are established as a function of the speed and the rate of retardation of the winders;

28.3 adequate clearance is provided when the conveyance has struck the crash plate and is supported by the spectacle plate, safety keps or jack catches and the detaching hook; and

28.4 access is provided for the safe removal of persons in the conveyance and the removal of the conveyance from an over wound position.

CONVEYANCES

29. The employer must take reasonably practicable measures to ensure that every sinking stage and conveyance is designed in accordance with SANS 10208 “Design of structures for the mining industry Part 2- Sinking Stages and Part 3- Conveyances, respectively, and that:

29.1 passengers are protected should any object fall on the conveyance;

29.2 the ergonomic environment for passengers and the ventilation in the conveyance are such that the passengers will be transported healthily and safely; and

29.3 when any conveyance is attached to the main conveyance-

29.3.1 the total weight remains below the factors of safety of the rope; and

29.3.2 the factor of safety of the attachment between the conveyances is not less than 10.

ULTIMATE OVERWIND

30. The employer must take reasonably practicable measures to ensure that all winders must be fitted with at least one physical activated overwind device to automatically cut power supply and apply the brakes of the
winder at a predetermined point that will stop the conveyance from striking any fixed structure at the end of wind

OVER SPEED/DISTANCE CONTROLLER
31.1 Winders used for the transport of persons must be fitted with a speed/distance device such that the speed of the conveyance does not subject persons inside the conveyance to excessive acceleration rates that exceed a maximum of 3.5 m/s$^2$;
31.2 Winders are fitted with at least one over speed prevention device that sounds an alarm at 10 % and trips at 15% when the maximum speed exceeds the allowable permitted speed; and
31.3 When the designed allowable speed of a winder is reduced due to site specific conditions, the over speed prevention device is set to suit the site specific conditions.

SLACK/TIGHT ROPE MONITORING DEVICE
32. The employer must take reasonably practicable measures to ensure that:
32.1 a winder in a vertical shaft, except a stage winder, is equipped with one or more devices that will continuously monitor whether there is a slack or tight rope condition throughout the movement of the conveyance in the shaft and will automatically stop all winding operations in the shaft on the detection of such slack or tight rope condition;
32.2 which device is installed to automatically stop all the winding operating in that shaft on the detection that the free passage of any conveyance is prevented;
32.3 all slack and tight rope incidents are recorded in the recoverable recordable system; and
32.4 conveyances only resume winding on identifying the reason for the stoppage and the driver is instructed by the competent person to resume winding.

ARRESTING DEVICES
33. The employer must take reasonably practicable measures to ensure that on a fixed rope winder the headgear is equipped with one or more arresting devices above the bank to support any over wound or detached conveyance from falling back into the shaft.

DETACHING DEVICES
34. The employer must take reasonably practicable measures to ensure that a fixed rope winder operating in a vertical shaft or winze is equipped with one or more detaching devices that are of such a design that a rope detachment can only take place when both scissor plates are struck simultaneously, to detach the rope from an over wound conveyance.

RETARDING DEVICE
35. The employer must take reasonably practicable measures to ensure that a friction winder is equipped with-
35.1 one or more devices installed in the overrun spaces at both extremes of the wind to minimize the forces on the conveyance before coming into contact with any fixed object; and
35.2 one or more devices to arrest the descending conveyance at the bottom of the shaft.
INCLINE SHAFTS

PROTECTION OF PERSONS IN AN INCLINE SHAFT

36. The employer must take reasonably practicable measures to ensure that:

36.1 any person travelling in an incline shaft, or working at the bottom of such incline shaft, is adequately protected from a conveyance that may be derailed or detached from the winding rope;

36.2 any person operating on a station or landing is adequately protected from the conveyance movement in and out of the incline shaft;

36.3 if the speed of a conveyance operating in an incline shaft reaches 15% higher than the allowable speed, a failsafe device will activate and will safely arrest the conveyance;

36.4 where persons are conveyed in a conveyance in an incline shaft, such conveyance is equipped with an onboard self activating fail safe braking device. Such device shall automatically activate when the speed of the conveyance reaches 15% in excess of the permitted speed and shall safely retard the conveyance;

36.5 material cars used on incline shaft are designed and provided with adequate precautions to prevent accidental detachment from each other and the winding rope; and

36.6 derailment devices are installed that are able to derail and/or stop the conveyance/ hopper in the case of a run away.

WINDING ENGINE DRIVER DUTIES

37. The employer must take reasonably practicable measures to ensure that a competent person (winding engine driver)
37.1 directly controls the operation of any winder;
37.2 only sets a winder in motion when it is safe to do so or after receiving a distinct signal or instruction by a competent person to do so;
37.3 only sets the winder in motion after satisfying himself or herself that conditions have not changed since receiving the signal to commence winding and actual commencement of winding;
37.4 does not operate the winder at speeds exceeding the limits determined by the competent person;
37.5 does not accelerate or retard the winder beyond the acceleration and retardation limits determined by the competent person;
37.6 applies every device and means at his or her disposal to prevent the conveyance over-running its destination;
37.7 applies every device and means at his or her disposal to prevent the conveyance moving in the opposite direction to the one signalled;
37.8 does not, when raising or lowering persons, move the winder until at least 10 seconds have elapsed after receiving the signal to do so;
37.9 reacts to emergency signals when alerted of an emergency by a signal on the call bell;
37.10 only performs clutching operations after assuring themselves, every time immediately before performing any clutching operations, that the winder motor has sufficient power to hold the load suspended from the drum to be unclutched, by testing the brake of the drum to be unclutched;
37.11 does not attempt to move an unclutched drum;
37.12 does not perform clutching operations whilst persons are in a conveyance; except with persons on a stage during sinking operations when blasting;
37.13 does not give the signal that clutching has been completed until he has assured himself that the clutches are fully engaged and locked in position;
37.14 transports occupants in the conveyance in a safe and comfortable manner;
37.15 is not interfered with by any person while operating a winder, except -
37.15.1 that a competent person\(^1\) may be required, while operating a winder, to let any other competent person\(^1\) familiarise themselves with the winder or to train a leaner competent person\(^1\) or competent person\(^2\);
37.15.2 when being assessed for competency purposes;
37.15.3 when being instructed in the operation of the winder; and
37.16. conducts a trial run before persons are conveyed in any:
37.16.1 compartment of the shaft system or winding system, if the integrity of that shaft system or winding system has been compromised; or
37.16.2 shaft compartment or part of a compartment in which no winding has taken place for more than one hour.

**LEARNER WINDING ENGINE DRIVER**
38. The employer must take reasonably practicable measures to ensure that a learner winding engine driver only operates a winder while under the direct supervision of a winding engine driver and then does so in accordance with the official training procedure issued by the Mining Qualifications Authority.

**BANKSMEN AND ONSETTERS DUTIES.**
39. The employer must take reasonably practicable measures to ensure that a competent person (Onsetter or Banksman):
39.1 is stationed at the bank (shaft top), is in charge of the means of conveyance and gives the necessary signals for such conveyance whenever any person, material or explosive is conveyed underground;
39.2 is stationed underground or in the conveyance in which persons are being raised or lowered, is in charge of the means of conveyance and gives the necessary signals for such conveyance whenever any person, material or explosive is conveyed underground;
39.3 controls the access of a conveyance by persons and permit such access only after having received the required signal from the competent person (winding engine driver);
39.4 does not give any signal, other than contemplated in regulation 36.3, until all persons are in the conveyance and all safety barriers provided are secured. Such barriers may be left open by the onsetter if he intends to travel in that conveyance and must be closed by him as he accesses the conveyance;
39.5 controls the exit from a conveyance by persons and permits such exit only after having received the required signal from the winding engine driver and after having ensured that the conveyance is positioned correctly and does not give any further signals, except emergency signals, until all persons wishing to exit the conveyance have done so and are clear of the conveyance;
39.6 only conveys persons in or on any conveyance when a roof or cover is provided and is in place prior to any movement of the conveyance;
39.7 makes use of safety barriers to prevent un-authorised access to a shaft system;
39.8 is aware of the list of material contemplated in regulation 42, with which person are allowed to travel.
39.9 is aware of which persons and the conditions under which those persons are allowed to travel, when *mineral* is being hoisted in the counter *conveyance* of a double drum *winder*;  
39.10 is aware of which persons have been authorised by the employer to travel with *explosives*;  
39.11 allows no person to travel on or in a *conveyance* or its *attachments* from an exposed position unless authorised to do so by a *competent person*;  
39.12 does not allow more persons, than the maximum permitted number of persons determined by the employer, to be loaded into or travel in any *conveyance* or deck;  
39.13 only uses the locked bell signalling system as contemplated in regulation 60.1 to send signals, except as otherwise provided in regulation 39.5;  
39.14 does not exchange any signal allowing movement of the *conveyance* unless it is safe to do so;  
39.15 does not exchange any signal to clutch whilst persons are in the *conveyance*, except in a *shaft* being sunk;  
39.16 whilst clutching, restricts the number of persons on the stage to only those persons who are required to guide the stage; and  
39.17 does not allow any person to enter or have access to the *conveyance* until the winding engine driver has given the signal that the clutching operation has been completed.

**WINDER EXAMINATIONS AND TESTING**  
40.1 The *employer* must take *reasonably practicable* measures to ensure that a *maintenance* plan is prepared and implemented for every *winding*
Shaft and Winders

system, shaft system and signalling system, which plan must cover at least the intervals at which every component making up each system must be inspected, e.g. daily, weekly, monthly, etc, which intervals must be determined as recommended by the equipment manufacturer or supplier in the case of equipment, or by a competent person in all other cases;

40.2 Notwithstanding regulation 40.1 the maintenance plan must include-
40.2.1 daily inspections by a competent person all conveyances, winder ropes, attachments and connections, arresting devices, pulley wheels, sheaves, brakes, depth indicators, safety devices and all external parts of the winding system;
40.2.2 weekly inspections by a competent person of the shaft, signalling arrangements and safety devices used in connection therewith, over speed and over wind prevention devices.
40.2.3 monthly examinations by a competent person of the winder ropes and all rope connections.
40.2.4 six monthly examination by a competent person of the dynamic brake system operation.
40.2.5 annual examination by a competent person of the internal mechanical and electrical parts, where practicable.
40.2.6 an examination once every five years by a competent person of the shaft system.

40.3 Notwithstanding regulation 40.1, the employer must take reasonably practicable measures to ensure that where any of the findings contemplated in regulation 40.1 or 40.2 require immediate remedial action, the competent person immediately notifies the competent person for a decision on what action to be taken and that such action is then implemented.
LOADING OF WINDING PLANT CONVEYANCES

41. The employer must take reasonably practicable measures to ensure that, when a winder is used for the hoisting of persons simultaneously with material, mineral or explosives, only the following persons are allowed to travel with such material, mineral or explosives and then only if the employer has determined that such travelling is necessary for carrying out their duties-

41.1 competent persons and assistants;
41.2 persons engaged in sinking operations
41.3 persons doing maintenance to the shaft system
41.4 persons conducting piloting operations of material; and
41.5 persons in a sinking shaft may descend against mineral being hoisted.

LIST OF PERMITTED MATERIAL

42. The employer must take reasonably practicable measures to ensure that-

42.1 a competent persons draws up a list of those materials which are unlikely to endanger persons travelling with such material in the same conveyance;
42.2 no other materials than those contemplated in regulation 42.1 are transported in the conveyance with any person; and
42.3 all persons travelling in a conveyance are made aware of the list contemplated in regulation 42.1.

LOADING OF EXPLOSIVES
43. The *employer* must take *reasonably practicable* measures to ensure that the loading of *explosives* into or from a *conveyance* in a *shaft* is supervised by a *competent person*.

**Conveyance or attached load to be steadied**
44. The *employer* must take *reasonably practicable* measures to ensure, where a *conveyance* or its load is unguided in a *shaft*, that the unguided *conveyance* or load is steadied before being moved.

**Overfilling Of Conveyance**
45. The *employer* must take *reasonably practicable* measures to ensure that any *conveyance* used to transport *mineral* is not filled to such an extent that any mineral could fall out of the *conveyance*.

**Fastening Projecting Material**
46. The *employer* must take *reasonably practicable* measures to ensure that protruding *material* is secured and placed in such a way in a *conveyance* so as not to obstruct the operation of the arresting device or the combination of arresting devices.

**SHAFT MAINTENANCE PRECAUTIONS**
47. The *employer* must take *reasonably practicable* measures to ensure that a procedure is prepared and implemented to ensure that:
47.1 any additionally added protection cover or device to protect persons on the *conveyance* while doing any work in a *shaft* does not compromise the function of the safety devices in the headgear;
47.2 only persons authorised by the employer to do so perform work or travel outside a *conveyance* in a *shaft* and then only when *reasonably practicable* measures have been taken by the employer to safeguard such persons;

47.3 no other winding takes place in a *shaft system* while *maintenance* is being done to that *shaft system*, unless it is safe to do so;

47.4 a *winder* being inspected, maintained or repaired is not used unless it is safe to do so; and

47.5 the structural integrity of every *shaft* is determined by a competent person at appropriate intervals as determined by the employer.

**EMERGENCY PREPAREDNESS**

48 The *employer* must take *reasonably practicable* measures to ensure that a procedure is prepared and implemented to ensure that-

48.1 every *winder* used for transporting persons has:

48.1.1 a power supply from two different sources or networks, which can include an emergency supply alternator or generator, for power supply in the event of an interruption to the normal power supply; or

48.1.2 other measures to evacuate persons trapped in a *conveyance* from the *shaft* in an emergency, provided that where such other measures include gravity winding, such gravity winding must:

48.1.2.1 have an alternative brake control system which has a manual operating lever within reach from the normal driving position and which alternative brake control system must be kept locked at all times, except when in use;

48.1.2.2 have an oil dump valve which automatically operates before the *conveyance* passes the man-overwind position;
48.1.2.3 have an operational over speed device which applies the brakes if the winder speed exceeds 2 metres per second; and
48.1.2.4 be dynamically tested at intervals not exceeding 200 days.

**ACCIDENT TO SHAFT OR WINDING SYSTEM**

49. The employer must take *reasonably practicable* measures to ensure that a procedure is prepared and implemented to ensure that-
49.1 when any dangerous occurrence contemplated in regulation 23.4.(h) has occurred, winding is immediately stopped;
49.2 the cause of the dangerous occurrence is investigated; and
49.3 winding only resumes once any required remedial action has been implemented.

**NOTICES AT STATION LEVEL**

50. The employer must take *reasonably practicable* measures to ensure that no unauthorised person travels in a *conveyance* and that the maximum number of persons allowed to travel is not exceeded. Such measures could include putting up notices at all *station levels* prohibiting unauthorised travel and the maximum number of persons allowed travelling.

**SHAFT IN THE COURSE OF BEING SUNK**

51. The employer must take *reasonably practicable* measures to ensure that in all *shafts* in the course of being sunk the descending *conveyance* is not lowered directly on to persons in the bottom of the *shaft* and that in a vertical sinking *shaft*-
51.1 a device is installed that will either warn the winding engine driver when the *conveyance* is separated from the crosshead anywhere below the
bank or prevent the \textit{conveyance} from being separated from the crosshead anywhere below the bank;
51.2 the unguided distance in a \textit{shaft} being sunk is kept to not more than 60 meters or such other safe distance as determined by the mines risk assessment;
51.3 a protective cover is provided while the \textit{shaft} is being sunk and is positioned so that it protects persons working on the top deck of the stage from falling objects;
51.4 the stage used in the course of a \textit{shaft} being sunk is designed and positioned so that it protects persons working in the bottom of the \textit{shaft} from falling objects; and
51.5 the speed of the \textit{conveyance} when entering the stage or protective cover is controlled by the winding engine driver to prevent fouling or contact with the stage or protective cover.
52 The employer must take reasonable practicable measures to ensure that a \textit{shaft} in the course of being sunk complies with the following provisions:
52.1 where a mobile, jib, tower or Scott Derrick crane is installed for the purpose of raising or lowering persons, \textit{material, explosives} or \textit{mineral} in a sinking \textit{shaft}, such mobile, jib, tower or Scott Derrick crane shall be positioned and installed on a solid competent foundation for which the installation and design must be authorised by an appropriate \textit{competent person}; and
52.2 A signalling device as specified in regulation 60.1;
52.3 Brakes that are capable of holding double the maximum designed suspended load;
52.4 Load limiting device or devices set at 15\% overload to safely trip and hold the suspended load without slipping;
52.5 Sinking using mobile, jib, tower or Scott Derrick cranes will not proceed past a depth of 60 meters below the collar of the *shaft*;

52.6 The cover over a vertical *shaft* in the course of being sunk shall not be more than 30 meters from the *shaft* bottom;

53. The employer must ensure that at the bank means are provided to prevent any objects from falling down the *shaft*;

54. The employer must take reasonable practicable measures to ensure that:

54.1 a *shaft* in the course of being sunk is provided with a cover over the *shaft* that covers a minimum of 50% of the area and designed to protect persons in the *shaft* bottom;

54.2 *Open bells* only operate below the stage;

54.3 where the winding depth exceeds 60 m, all *conveyances* are guided and where a crosshead is provided shall be equipped with an effective canopy;

54.4 a holding device or devices that will prevent accidental release of the *conveyance* from the crosshead, and a device warning of any accidental disconnection;

54.5 disconnection of the crosshead between the bank and the stage must trip all the *winders* operating in that *shaft*;

54.6 in a *shaft* being sunk the signalling systems contemplated in regulations 52.1 and 60. are installed, provided that the systems are capable of interchanging signals also between the *competent person* and persons at the bottom of the sinking *shaft*.

55. The employer must take reasonable practicable measures to ensure that where winding is carried out in a sinking operation in a vertical *shaft* the
headgear shall be provided with an effective mechanism to support any conveyance if detached from the winding rope as a result of an overwind.

56. The employer must take reasonable practicable measures to ensure that the speed of a kibble winder will not exceed 1 m/s when the kibble is moving through the stage. The kibble winder conveyance will not be lowered onto shaft bottom unless requested to do so by the person in the shaft bottom.

57. The employer shall take reasonably practicable measures to ensure that the stage winder be provided with an interlock that shall prevent the movement of all other winders are stopped in the shaft in which the stage is raised.

**REQUIREMENTS FOR BANKS AND SHAFT STATION**

58. The employer must take reasonably practicable measures to ensure that-

58.1 any shaft station area is clearly identified and demarcated as such; and

58.2 an effective lockable station stopping device or a combination of devices that are capable of preventing inadvertent access of vehicles to the shaft, are-

58.2.1 installed as close as practicable to all entrances for vehicles to the shaft;

58.2.2 kept in a functional condition;

58.2.3 operated under the direct supervision of a competent person; and

58.2.4 only operated when the conveyance is in the correct landing position.
59. The *employer* must take *reasonably practicable* measures to ensure that-

59.1 the source of energy of any *self-propelled mobile machine* parked or left unsupervised in the *shaft station area* is disabled; and

59.2 any *self-propelled mobile machine* only enters the *shaft station area* if supervised by a competent person\(^1\) and when operated by a *competent person*\(^2\).

**WINDING SYSTEM SIGNALLING ARRANGEMENTS**

60. Subject to regulations 53.7.2 above, the *employer* must take *reasonably practicable* measures to ensure that in every vertical and *incline shaft* the following three signalling systems are installed for the exchanging of distinct and definite signals:

60.1 a locked bell signalling system:

60.1.1 used to interchange signals between the *competent person* and the bank and between the *competent person* and every *station level* below or above the bank from which winding is normally carried on;

60.1.2 which does not enable the *competent person*\(^1\) to signal on this system to anyone but the *competent person*\(^2\);

60.1.3 which is secured to prevent any unauthorised access or use;

60.1.4 which is fitted with a bell brake interlock that can be initiated by the *competent person*\(^1\) on the locked bell signalling system to automatically prevent the *winder* brakes from being released until the *competent person*\(^2\) in charge of the loading and unloading operations has rung the necessary signals to unlock the locked bell signalling system;
60.2 an audio signalling system to exchange signals between the *competent person* and persons working from the *conveyance* anywhere in the *shaft* or headgear; and

60.3 a bell signalling system installed at all *station levels* for the transmitting of distinct and definite signals to the *competent person* and-

60.3.1 which is only to be used in the case of an emergency;

60.3.2 where there is only one such emergency signalling system in a *shaft* where more than one winder is used, a means must be provided for all *competent persons* to be notified when the emergency signal has been given; and

60.3.3 the signalling tone of which must be clearly distinguishable from the tone of the locked bell signalling system contemplated in 60.1.

**CODE OF SIGNALS AND USE**

61. The *employer* must take *reasonably practicable* measures to ensure that-

61.1 all persons involved with the operation of a *conveyance* in a *shaft* are familiar with the government code of signals (Annexure “B”) and any special signals applicable to that *shaft*. Such measures could include displaying the government code of signals and any special signals at the *winder*, bank and all *station levels*;

61.2 the signals contemplated in 61.1 are used and adhered to;

61.3 signals given or received on any signalling system are distinct and have clear audible tones;

61.4 special signals applicable to the *shaft* are only used if they cannot be confused with the government code of signals (Annexure B);
61.5 no person gains access to, exits from or travels in a *conveyance* unless the appropriate signals have been exchanged; and
61.6 a bell called the tell-tale bell with a unique sound is installed on the bank to inform the banksman of the signals given by the onsetter.

**SMALL HOISTS**

62. The *employer* must take *reasonably practicable* measures to ensure that a *small hoist* is not used –
62.1 for the raising or lowering of persons other than persons engaged in repairing or examining a *shaft*; or
62.2 in any portion of a *shaft* in a manner likely to interfere with other *conveyances* operated in that *shaft* that are served by another *winding plant*.

63. The *employer* must take *reasonably practicable* measures to ensure that a *competent person* operates any *small hoist* when raising or lowering persons engaged in repairing or examining a *shaft*.

64. The following regulations do not apply to *small hoists*: 21.1 to 21.3, 21.5, 21.7 to 21.10, 21.12, 25, 31.1 to 31.3, 32, 34, 35, 42, 60.1, to 60.3.3 and 61
## ANNEXURE “A”

### 2.1. Factors Of Safety For Selecting Winder Ropes Used In Shafts

### FACTORS OF SAFETY FOR SELECTING WINDER ROPES USED IN SHAFTS

<table>
<thead>
<tr>
<th>Ropes Related To Friction Winders in vertical shafts</th>
<th>Normal Conditions (not less than)</th>
<th>Reduced (Factors Of Safety) (SANS 10294 conditions apply)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Rope with a “Balance Rope”</td>
<td>“Capacity Factor Of Safety”</td>
<td>“Static Factor Of Safety”</td>
</tr>
<tr>
<td>Number of ropes</td>
<td>Number of ropes or falls</td>
<td></td>
</tr>
<tr>
<td>1, 2, 3, 4 or more</td>
<td>1, 2, 3, 4 or more</td>
<td></td>
</tr>
<tr>
<td>8.1 or (8.1 - (0.00135 x L)) but not less than 6.75</td>
<td>8.1 or (8.1 - (0.00135 x L)) but not less than 6.19</td>
<td>8.1 or (8.1 - (0.00135 x L)) but not less than 5.62</td>
</tr>
<tr>
<td>Balance rope</td>
<td>5, 5, 5, 5</td>
<td>n/a, n/a</td>
</tr>
</tbody>
</table>

### Ropes Related To Fixed Rope Winders In Vertical Shafts

| For Single or Multiple Ropes                   | 8, 8, 8, 8                      | 4.5, 4.5 x 0.95, 4.5 x 0.95, 4.5 x 0.95                |
| For Multiple Ropes Including Rope Tension Compensator | n/a, 8*, 8*, 8*                  | n/a, 4.5 x 0.95*, 4.5 x 0.95*, 4.5 x 0.95*            |

* Select Whichever Is The Greatest

### Guide Rope

<table>
<thead>
<tr>
<th>Single Rope (Single Drum)</th>
<th>10 x sine of Incline Angle</th>
<th>4.5, 4.5, 4.5, 4.5</th>
</tr>
</thead>
</table>

### Stage Rope

| n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |

### Attached Load

“Attached Load” – means everything suspended from or attached to the winding rope and includes the portion of any “Balance Rope” and one half of any tail carriage and one half of any sheave which contributes to the load at the termination of the winding rope. For multi-rope BMR winding plant divide the load equally by the number of ropes.

### Attachments

“Attachments” - means everything suspended from or attached to the conveyance other than the winding rope and includes any balance rope.

“Balance Rope” – means tail rope, balance rope or balance chain.
"Effective Length Of Rope" (L) - means the length of the winding rope between the centre of sheave or drum in the headgear and the lowest working point of the conveyance.

"Initial Breaking Strength" - means the breaking strength of the rope determined by the destructive testing of a sample immediately after the manufacture of the rope.

"Nominal Rope Diameter" - means the rope diameter specified by the manufacturer.

"Suspended Load" - means the sum of the Attached Load and the mass of the effective length of rope.

"Winding Cycle" - means a full trip starting with a conveyance at the bank level and ending with same conveyance returning to the same bank level.

"Static Factor of Safety" (SF) – means the initial rope strength divided by the maximum suspended load the rope has to carry.

"Capacity Factor of Safety" (CF)- means the initial rope strength divided by the maximum attached load that the rope has to support at its front end.

"Payload" – means the greater of the mass of persons, mineral, material or any combination thereof, to be transported in a conveyance.

“Load” - means the weight in Newtons of any mass carried by a rope, calculated by multiplying such mass in kilograms by a factor of 9.81 and assuming the mass of any person to be 75 kg.

---

# ANNEXURE “B”

Government Code of Signals

<table>
<thead>
<tr>
<th>Knocks or rings</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1..............</td>
<td>From onsetter or banksman: Raise when engine at rest.</td>
</tr>
<tr>
<td>1..............</td>
<td>From onsetter or banksman to driver: Stop when engine in motion.</td>
</tr>
<tr>
<td>2..............</td>
<td>From onsetter or banksman to driver: Lower.</td>
</tr>
<tr>
<td>3..............</td>
<td>From onsetter or banksman to driver: Persons about to travel.</td>
</tr>
<tr>
<td>3..............</td>
<td>Reply from driver to onsetter or banksman: persons may continue to travel or may enter the cage or other conveyance for the purpose of travelling.</td>
</tr>
<tr>
<td></td>
<td>Description</td>
</tr>
<tr>
<td>---</td>
<td>-------------</td>
</tr>
<tr>
<td>3 pause 2</td>
<td>From driver to onsetter or banksman when cage or other conveyance containing persons is brought to rest at a station: persons may leave the cage or other conveyance.</td>
</tr>
<tr>
<td>2 pause 2</td>
<td>From driver (clear signal requested) to onsetter or banksman: driver wishes to start the winding engine at his discretion.</td>
</tr>
<tr>
<td>2 pause 2</td>
<td>From onsetter and banksman to driver (clear signal): driver may start the winding engine at his discretion.</td>
</tr>
<tr>
<td>2 pause 2 pause 2</td>
<td>From driver to onsetter or banksman: persons must leave the conveyance.</td>
</tr>
<tr>
<td>2 pause 2 pause 2</td>
<td>Reply from onsetter or banksman to driver: no persons in the conveyance.</td>
</tr>
<tr>
<td>2 pause 2 pause 2 pause 2</td>
<td>From driver, onsetter or banksman: Cancel or repeat signal.</td>
</tr>
<tr>
<td>3 pause 3 pause 3</td>
<td>From onsetter or banksman to driver: Person giving signal about to travel in the conveyance.</td>
</tr>
<tr>
<td>3 pause 3 pause 3</td>
<td>Reply from driver to onsetter or banksman: acknowledgement that person signaling is about to travel.</td>
</tr>
<tr>
<td>4 pause 1</td>
<td>From onsetter or banksman to driver: Raise slowly.</td>
</tr>
<tr>
<td>4 pause 2</td>
<td>From onsetter or banksman to driver: Lower slowly.</td>
</tr>
<tr>
<td>4 pause 4</td>
<td>From onsetter or banksman to driver: marking signal for predetermined stopping level.</td>
</tr>
<tr>
<td>4 pause 4</td>
<td>Reply from driver to onsetter or banksman: acknowledgement of marking signal.</td>
</tr>
<tr>
<td>4 pause 4 pause 4</td>
<td>From onsetter or banksman to driver: clutching signal.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>4 pause 4 pause 4</td>
<td><strong>Reply from driver to onsetter or banksman:</strong> clutching operations completed.</td>
</tr>
<tr>
<td>5 pause 5 pause 5</td>
<td><strong>From onsetter or banksman to driver:</strong> explosives about to be placed in the deck of the <em>conveyance</em>.</td>
</tr>
<tr>
<td>5 pause 5 pause 5</td>
<td><strong>Reply from driver to onsetter or banksman:</strong> acknowledgement of signal that explosives to be placed in the deck of the <em>conveyance</em>.</td>
</tr>
<tr>
<td>5 pause 5 pause 5</td>
<td><strong>From driver to onsetter or banksman when <em>conveyance</em> containing explosives is brought to rest at a station: explosives may be removed from the deck of the <em>conveyance</em>.</strong></td>
</tr>
<tr>
<td>5 pause 5 pause 5</td>
<td><strong>From onsetter or banksman to driver:</strong> no explosives in the deck of the <em>conveyance</em>.</td>
</tr>
<tr>
<td>5 pause 5 pause 5</td>
<td><strong>Reply from driver to onsetter or banksman:</strong> acknowledgement of signal that there are no explosives in the deck of the <em>conveyance</em>.</td>
</tr>
<tr>
<td>6 pause 6 pause 6 pause 6 pause 6</td>
<td><strong>From onsetter or banksman to driver:</strong> <em>conveyance</em> may not travel to <em>station levels</em> below signalled <em>station level</em>.</td>
</tr>
<tr>
<td>6 pause 6 pause 6 pause 6 pause 6 pause 6 pause 6 pause 6</td>
<td><strong>Reply from driver to onsetter or banksman:</strong> acknowledgement of signal that <em>conveyance</em> may not travel to <em>station levels</em> below signalled <em>station level</em>.</td>
</tr>
<tr>
<td>6 pause 6 pause 6</td>
<td><strong>From onsetter or banksman to driver:</strong> <em>station levels</em> prohibited from travelling to reopened.</td>
</tr>
<tr>
<td>6 pause 6 pause 6</td>
<td><strong>Reply from driver to onsetter or banksman:</strong> acknowledgement of signal that <em>station levels</em> prohibited from travelling to reopened.</td>
</tr>
<tr>
<td>6 pause 6 pause 6 pause 6</td>
<td><strong>From onsetter or banksman to driver:</strong> <em>shaft</em> examination and repairs are about to take place.</td>
</tr>
<tr>
<td>6 pause 6 pause 6 pause 6</td>
<td><strong>Reply from driver to onsetter or banksman:</strong> acknowledgement of signal that <em>shaft</em> examination and repairs are about to take place.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>----------------------------------------------------------------</td>
</tr>
<tr>
<td>7</td>
<td>From onsetter or banksman to driver: persons about to have access to the conveyance for a purpose other than traveling.</td>
</tr>
<tr>
<td>7</td>
<td>Reply from driver to onsetter or banksman: acknowledgement of signal that persons about to have access to the conveyance for a purpose other than traveling.</td>
</tr>
<tr>
<td>1</td>
<td>From driver, when operating under the signal 7, to onsetter or banksman: persons may have access to the conveyance for a purpose other than traveling.</td>
</tr>
<tr>
<td>7 pause 7</td>
<td>From onsetter or banksman to driver: conveyance is clear of all persons who had access to it for a purpose other than traveling.</td>
</tr>
<tr>
<td>7 pause 7</td>
<td>Reply from driver to onsetter or banksman: acknowledgement of signal that conveyance is clear of all persons who had access to it for a purpose other than traveling.</td>
</tr>
<tr>
<td>15</td>
<td>From onsetter or banksman to driver: bells about to be tested.</td>
</tr>
<tr>
<td>15</td>
<td>Reply from driver to onsetter or banksman: acknowledgement of signal that bells about to be tested.</td>
</tr>
<tr>
<td>15 pause 2 pause 2</td>
<td>From onsetter or banksman to driver: bells testing completed.</td>
</tr>
<tr>
<td>15 pause 2 pause 2</td>
<td>From driver to onsetter or banksman: acknowledgement of signal that bells testing completed.</td>
</tr>
<tr>
<td>10 +station level signal</td>
<td>From onsetter or banksman to driver: Accident to person and station level at which the conveyance is required.</td>
</tr>
<tr>
<td>1 long ring</td>
<td>From onsetter or banksman to driver: Accident effecting shaft and winding operations to be stopped immediately in all compartments of the shaft. Note: In any purely mechanical signalling system 'continued ringing' shall replace 'one long ring' for the 'accident to shaft' signal.</td>
</tr>
</tbody>
</table>
When raising or lowering material, other than explosives, or mineral in trucks

<table>
<thead>
<tr>
<th>Knocks or rings-</th>
<th>From onsetter or banksman to driver: raising or lowering about to commence.</th>
</tr>
</thead>
<tbody>
<tr>
<td>8....................</td>
<td>Reply by driver to onsetter or banksman: acknowledgement of signal that raising or lowering about to commence.</td>
</tr>
<tr>
<td>1....................</td>
<td>From driver to onsetter or banksman: persons may have access to conveyance for the purpose of loading or unloading.</td>
</tr>
<tr>
<td>8 pause 8.......</td>
<td>From onsetter or banksman to driver: raising or lowering completed.</td>
</tr>
<tr>
<td>8 pause 8.......</td>
<td>Reply from driver to onsetter or banksman: acknowledgement of signal that raising or lowering completed.</td>
</tr>
</tbody>
</table>

**Emergency signals**

<table>
<thead>
<tr>
<th>Signal 1 long ring</th>
<th>Accident to shaft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal 10 followed by station signal</td>
<td>Accident to person</td>
</tr>
</tbody>
</table>