

PART VIII

WINDING AND TRIMMING

A. GENERAL

Interpretation in this Part

130. Whenever any provision in this Part requires the doing of anything in relation to the Driver's Log Book that requirement shall be construed as not applicable in respect of the driving of a small hoist.

Restriction of use of windlasses

131. No windlass shall be used for the raising or lowering of persons in a shaft or winze the depth of which exceeds thirty metres.

Driver's Log Book

132. (1) Subject to this section, the manager of every mine shall keep or cause to be kept at each winding engine, other than the winding engine of a small hoist, a book to be termed the Driver's Log Book in which shall be recorded in ink—

- (a) signed reports of the condition of the winding engine, including brakes, clutches, reversing gears, depth indicators, signalling devices and all protective devices, such reports to be recorded by the winding engine driver for each period of charge;
 - (b) any special instruction involving the safety of persons given to the winding engine driver and the time at which such instruction was given, such entry to be signed by the person giving the instruction;
 - (c) any other matter required by these regulations to be recorded therein.
- (2) Where a winding engine driver is unable to read and write and a provision contained in this Part requires an entry in the Driver's Log Book to be made, or signed, by the winding engine driver, the following provisions shall apply and compliance therewith shall be regarded as compliance with the provision concerned—

- (a) in the case of an instruction or warning given to the winding engine driver, the instruction or warning shall be given verbally to him by the responsible official in

charge and the driver shall indicate his understanding thereof by making his mark against the entry of the instruction in the Driver's Log Book;

- (b) in the case of a report required to be given by the winding engine driver on the condition of any part of the winding engine, the driver shall—

- (i) make his mark against the appropriate item on a suitable checklist to be provided in the Driver's Log Book; and

- (ii) orally report any defect or weakness to the responsible official in charge, which report shall forthwith be recorded in ink in the Driver's Log Book by such official and endorsed by the driver by him making his mark against the entry.

Entry to winding compartment prohibited

133. (1) Subject to subsection (2) no person shall enter or in any way encroach into the winding compartment of any shaft, winze or headgear except for the purpose of entering or leaving a conveyance or for the purpose of conducting an examination, effecting repairs or doing other necessary work in such compartment.

- (2) Subsection (1) shall not apply to persons working at the bottom of a shaft or winze in the course of sinking.

Winding prohibited during repair operations and vice versa

134. (1) No winding operation shall be carried on in the winding compartment of a shaft, winze or headgear while persons are engaged in effecting repairs, conducting an examination or doing any other work in such compartment unless—

- (a) winding operations in such compartment are necessary for the purpose of effecting the repairs, conducting the examination or doing the other work; and
- (b) the persons engaged in effecting the repairs, conducting the examination or doing the other work in the shaft, winze or headgear are adequately protected from any conveyance as well as from falling objects.

(2) No person shall effect repairs, conduct examination or do any other work in the winding compartment of a shaft, winze or headgear while winding operations are being carried on in such compartment unless—

- (a) winding operations in such compartment are necessary for such person to effect repairs, conduct the examination or do the other work; and
- (b) he is adequately protected from any conveyance as well as from falling objects.

(3) The person in immediate charge of any work in the winding compartment of a shaft, winze or headgear in which winding is being done by mechanical power shall, before any work is commenced specifically warn the driver of the winding engine operating the conveyance in such winding compartment that such work is about to be undertaken and, except in special circumstances where it is impracticable for him to do so, shall forthwith record in ink such warning and the time in the Driver's Log Book:

Provided that this subsection shall not apply to work at the bottom of a shaft in the course of sinking or to the loading or unloading of a conveyance.

(4) The person in immediate charge of any work in respect of which an entry has been made in the Driver's Log Book in terms of subsection (3) shall on completion of such work report the completion thereof to the winding engine driver, and except in special circumstances where it is impracticable for him to do so, shall forthwith record in ink such report and the time in the Driver's Log Book.

(5) Any entry made in the Driver's Log Book in terms of subsections (3) and (4) shall not be valid until countersigned by the driver.

(6) After alterations or repairs to the winding compartment of a shaft or winze or to its winding plant, no person shall travel or be permitted to travel in a conveyance therein until such time as the conveyance has been caused to make a complete trip up and down the working portion of the shaft or winze and found to be in order.

Special precautions during sinking operations

135. (1) No person shall work or be permitted to work at the bottom of a vertical or steeply inclined shaft or winze in the course of sinking unless protected by an adequate covering extending over the whole area of such shaft or winze, only sufficient opening being left therein for the passage of the conveyance.

(2) The covering required by subsection (1) shall be situated—

(a) in the case of a vertical shaft or winze, not more than twenty-five metres from the bottom thereof.

(b) in the case of a steeply inclined shaft or winze, not more than thirty metres from the bottom thereof.

(3) A set of doors to cover the sinking compartment shall be maintained at the collar or other points of service of every vertical or steeply inclined shaft or winze in the course of sinking.

(4) The doors required by subsection (3) shall be closed while persons, material or rock are being loaded into or unloaded from a conveyance above the point of service.

Hoisting during sinking operations

136. In a vertical shaft or winze in the course of sinking—

(a) the winding engine driver shall pick up the crosshead without undue shock; and

(b) the conveyance shall not be filled with loose rock or ground above the level of the brim; and

(c) except at blasting time, every conveyance, when being hoisted from the bottom of the shaft or winze, shall be stopped approximately two metres from the said bottom, steadied and any stones or mud shall be removed from the sides and bottom of the conveyance, and the conveyance shall not be further hoisted by the winding engine driver until a signal to do so has been received;

(d) the crosshead mentioned in paragraph (a) shall be so designed and maintained as to prevent hold-up or jamming in the hoisting compartment so as to endanger persons during sinking operations;

- (e) all crossheads shall be of sound construction and so designed to prevent swinging of the bucket or kibble;
- (f) after completion of sinking and equipping operations the use of an unattached crosshead shall be dispensed with and the protective coverage as required in terms of section 145 shall be provided.

Lowering during sinking operations

137. In a shaft or winze in the course of sinking the conveyance shall not be lowered directly to the bottom of such shaft or winze but shall be stopped at least four metres from the bottom until a signal to lower it further has been given by one of the men thereat:

Provided that this section shall not apply to shafts and winzes less than fifteen metres in depth.

Securing of material being conveyed

138. Material being raised or lowered in a shaft or winze shall, if it projects beyond the top of the conveyance, be fastened to the winding rope or to some suitable device attached to the conveyance so as to ensure safe passage in the shaft or winze.

Disturbance of winding engine driver prohibited

139. No person, other than a person in authority and then only in an emergency shall in any way distract the attention of the person operating a winding engine whilst it is in motion.

Unauthorized entry to winding engine room prohibited

140. No unauthorized person shall enter a winding engine room and notices to this effect shall be posted at the entrance to every winding engine room.

Maximum hours of work for winding engine drivers

141. No person in charge of a winding engine shall be caused or permitted to work more than ten hours in any one period of twenty-four hours except in cases of emergency:

Provided that, during the normal changeover of his working shift, such person may work, within one twenty-four hour period, two shifts of not more than eight hours duration each, which shall be separated by a period of not less than eight hours between the end of the first shift and the start of the second shift.

Travelling with mineral, material or explosives

142. (1) No person shall travel or be permitted to travel in a conveyance together with mineral or material when such mineral or material is of such shape, size or mass or is stored in such a manner that the safety of persons is likely to be endangered.

(2) No person, other than an authorized person or the cage tender and his crew, shall travel in a conveyance together with explosives.

Guides for conveyance in vertical shafts or winzes

143. (1) All vertical shafts or winzes exceeding thirty metres in depth which are used for winding purposes shall be provided with guides for skips, cages or other conveyance unless exempted by an inspector.

(2) In the case of vertical shafts or winzes in the course of sinking, the guides required by subsection (1) shall extend down to twenty-five metres or less from the shaft bottom and, when winding is being done to the shaft bottom, the crosshead shall travel to as near the end of the guides as is practicable.

Signals to be exchanged before entry to or exit from conveyance

144. No person shall enter or leave or be permitted to enter or leave a conveyance or continue to travel in such conveyance unless and until the appropriate signals required by section 150 have been exchanged.

Protective and warning devices for persons travelling in conveyance

145. When mechanically-powered means are used for lowering or raising persons by a conveyance—

- (a) in a shaft or winze exceeding thirty metres in depth and having an inclination of more than seventy degrees from the horizontal, sufficient overhead cover shall be provided on every such conveyance for the prevention of injury to persons travelling therein;
- (b) in an inclined shaft or winze, warning devices shall be installed to give adequate warning to persons travelling in or on the conveyance when such conveyance is approaching any collar set, station, brow, chute or other projection.

- (c) no person shall travel or be permitted to travel in any shaft or winze on the roof, top, rim or in any position outside the conveyance:

Provided that persons engaged in examining or repairing the shaft or winze may travel on the roof or bridle of such conveyance, if it is necessary, to the efficient conduct of such examination, repairs or work and if such persons when engaged in a vertical shaft or winze are adequately protected from objects falling from above.

- (d) an inspector may grant exemption in writing from the provisions of paragraph (c) provided that in granting such exemption no person travelling outside any conveyance is subjected to any danger.

Winding plant operators

146. (1) No person, other than a duly authorized person, shall operate any winding plant.

(2) No person, whose sight or hearing is deficient or who is subject to any other infirmity, mental or bodily or is under medication or treatment which is likely to interfere with the effective discharge of his duties shall drive or be caused or permitted to drive any winding engine or mechanical hoist.

(3) To comply with subsection (2) all authorized persons shall undergo a medical examination by a registered medical practitioner at intervals not exceeding twelve months and the result of each such examination shall be available to an inspector at all times.

(4) All authorized persons shall be in possession of a "Hoist Drivers Certificate" issued by his mine manager and this certificate shall record the name of the mine, the type and power of the hoist or hoists which he is authorized to operate.

Duties of winding engine driver

147. (1) The driver of a winding engine—
(a) immediately on taking charge of a winding engine, shall examine the Driver's Log Book and acknowledge.

by his signature or initials each uncanceled entry made in terms of paragraph (1) of this subsection or of subsection (3) of section 134; and

- (b) shall not start his engine before he has received a distinct and proper signal to do so unless instructed to do so by the manager or other official responsible for such shaft or unless he has received the "clear" signal; and

- (c) shall not act on any signal if he has been unable to do so within one minute after receiving it but shall call for or await a fresh signal:

Provided that, in the case of the "clear" signal, the driver may, at his discretion, move away the conveyance but, if a period of more than five minutes has elapsed since receiving the "clear" signal, he shall move away the conveyance very slowly; and

- (d) shall avoid undue shocks in starting, running and stopping the said engine; and

(e) shall apply correctly every device and means at his disposal to prevent the conveyance overrunning, to an extent which may endanger the safety of persons or cause damage to the winding equipment—

- (i) the signalled destination; or
(ii) where no destination has been signalled and—
A. persons are being conveyed, the highest or lowest landing place; or

B. persons are not being conveyed, the highest or lowest stopping place; and

- (f) after receiving a signal to raise or lower persons, shall not start his engine until after the expiration of ten seconds after receiving the signal:

Provided that this paragraph shall not apply when blasting is about to take place in a shaft or winze in the course of being sunk and the engine driver has received the special "blasting" signal referred to in subsection (6) of section 150; and

- (g) shall not unclutch a drum of his engine until he has assured himself immediately before hand by testing

the brake of the drum against the normal starting power or normal starting current of the engine applied in the direction to hold the load suspended from the said drum, no such unclutching operation or test shall be performed while persons are in any conveyance operated by the engine; and

(h) shall, when the drum is unclutched, use the brake only for the purpose of maintaining such drum stationary and shall on no account lower from unclutched drum; and

(i) shall observe only authorized signals and operate his engine in accordance therewith; and

(j) shall, whenever any conveyance is not in use, leave such conveyance at some point in the shaft or winze other than at the bank or at a station; and

(k) shall, at the first available opportunity after taking over the engine, test the brakes and such overwind prevention devices of the winding engine as can be reset by the driver; and

(l) if, during the test required by paragraph (k), there is discovered any defect by which the safety of any person may be endangered, shall record in ink such defect in the Driver's Log Book immediately and shall report it to the responsible official in charge, and, until such weakness or defect be remedied, shall not use the winding plant; and

(m) having taken charge of a winding engine, shall, throughout his period of duty, remain available to act in accordance with all authorized signals received; and

(n) after receiving the "shaft locked" signal, shall not move his engine until he has received the "shaft unlocked" signal.

(2) For the purposes of paragraph (k) of subsection (1), the brakes shall be considered satisfactory only if the test shows they are capable of holding the drums stationary against the normal starting power or normal starting current of the engine applied in the direction of the out of balance load.

Persons not to be lowered by hoist driven by friction, flat belt or chain

148. No winding plant driven by friction, flat belt or chain shall be used for the raising or lowering of persons. This restriction shall not be construed to prohibit the use of a friction hoist commonly referred to as a "Koepe" winder which may be used for the raising and lowering of persons.

Provisions concerning motive power of winding plants

149. (1) Every winding plant worked by—

(a) steam or compressed air shall be equipped with a proper pressure gauge to indicate to the winding engine driver the amount of pressure available for working it;

(b) electricity shall be equipped with an efficient device to indicate to the winding engine driver any disruption of the power supply.

(2) In no case shall the steam, compressed air or other motive power of a winding plant be cut off unless and until the person in charge of the generating plant on the surface has given due notice thereof to the winding engine driver.

B. RAISING AND LOWERING OF PERSONS ET CETERA

Hoisting signals

150. (1) In shafts or winzes exceeding thirty-five metres in depth hoisting signals shall be given by means of bell rings or other means approved by an inspector.

(2) Subject to subsection (3), where such signals are given by means of bell rings or knocks, the following code shall be used and strictly observed—

<i>Knocks or rings</i>	<i>Meaning</i>
1	Raise when engine at rest
1	Stop when engine in motion
1	(From driver) Repeat signal last given
2	Lower

2 pause 1	"Clear" signal-engine-driver may move at his discretion
2 pause 2	Lower conveyance slowly
3	Persons about to travel
3	(In reply from driver) Persons may travel or may enter conveyance for purpose of travelling
3	(From driver when conveyance is brought to rest) Persons may enter or leave conveyance
3 pause 3	Raise conveyance slowly
3 pause 3 pause 3	Person giving signal about to travel
3 pause 3 pause 3	(In reply from driver) Acknowledgement that person giving signal about to travel
2 pause 2 pause 2	(From driver) Persons must leave conveyance
2 pause 2 pause 2	(In reply to driver) No persons in conveyance
4	(From driver) Engine temporarily unavailable
4 pause 4	(To driver) "Mark" signal
4 pause 4	(In reply from driver) Acknowledgement of "Mark" signal
4 pause 4 pause 4	(To driver) "Clutching" signal
4 pause 4 pause 4	(In reply from driver) Clutching operations completed
5 pause 5	(To driver) Explosives about to be placed in conveyance
5 pause 5	(In reply from driver) Explosives may be placed in conveyance
5 pause 5 pause 5	All explosives removed from conveyance

6 pause 6	(To driver) Winding compartments served by engine locked
6 pause 6	(In reply from driver) Acknowledgement of "compartment locked" signal
6 pause 6 pause followed by station signal	(To driver) Shaft locked below station designated
6 pause 6 pause followed by station signal	(In reply from driver) Acknowledgement that shaft locked below station designated
6 pause 6 pause 6	(To driver) Compartments served by engine re-opened
6 pause 6 pause 6	(In reply from driver) Acknowledgement that compartments served by engine re-opened
7 followed by station signal	Accident to persons, station where conveyance required
10	Telephone communication required
13	Electrician testing bells
13	(In reply) Bell test satisfactory
1 long ring	Accident in shift, winding operations to be suspended immediately in all compartments of the shaft until a responsible person instructs the driver as to further procedure.

(3) The manager of a mine may authorize such additional signals as local conditions may demand.

(4) Copies of the code of signals, including any additional signals authorized by the manager, in use on a mine shall be suitably displayed in the winding engine driver's platform or in a suitable place in the winding engine room and at the bank and at all shaft stations for the time being in use.

Provided that, in the case of a winding compartment where some only of the above-mentioned signals are in use, it shall be necessary to display only that portion of the code which is in use in that compartment.

(5) Copies of the code of signals required by subsection (4) shall be maintained in proper repair and shall be so placed that they can conveniently be read by persons operating the signalling system.

(6) Where blasting operations are being carried out in a shaft or winze in the course of sinking—

(a) the person in charge of the blasting operations shall notify the engine driver when blasting is about to take place by means of a special "blasting" signal, namely, five knocks or rings; and

(b) except in the case of remote firing by electricity, the engine driver shall reply to that special "blasting" signal by raising and lowering the conveyance approximately one metre; and

(c) on receiving the signal to raise persons, the engine driver shall raise the conveyance without delay.

(7) No person shall fail to observe the code of signal set out in subsection (2) or any additional signals authorized by the manager in terms of subsection (3) or the special signals specified in subsection (6).

Provisions for signals during examination of shaft or winze

151. Every shaft or winze where persons travel on or in the conveyance while carrying out examinations thereof shall be provided with some efficient means, in respect of each conveyance used in connexion with such examinations, whereby such persons can signal effectively from any depth in the shaft or winze to the winding engine driver.

Cages to have doors

152. (1) Subject to subsection (2), in all cases where cages are used for lowering or raising of persons, suitably constructed doors shall be provided for use and used when persons are travelling to prevent them from inadvertently falling out of cages.

(2) Only when repairs, maintenance and installation work in the shaft is being carried out may use of the doors required by subsection (1) be dispensed with.

Notice of maximum number of persons to be conveyed

153. Notice of the maximum number of persons permitted to ride at any one time in a cage, skip or other means of conveyance shall be posted up and kept so posted in legible character at the top of the shaft or winze and at each station in use.

Facilities for maintenance of headgear

154. In every headgear there shall be provided such permanent ladders and platforms as may be necessary for the proper maintenance of all equipment installed thereat.

Provisions for winding plant

155. (1) Every winding engine shall be such that—

(a) when running at various speeds with light and heavy loads, it can readily be slowed and stopped and after stopping can immediately be started again in either direction by the driver;

(b) each winding drum, when unclutched from the engine, can be maintained in a position of rest by means of its own brake or brakes with no slipping when loaded to double the maximum permitted mass of persons or to the maximum permitted mass of mineral, whichever is the greater;

(c) where no part of the rope is rigidly fixed to the drum or sheave, there shall be no dangerous slipping of the rope on the drum or sheave, under any possible working conditions.

(2) In calculating the mass of persons for the purposes of paragraph (b) of subsection (1), seventy kilograms shall be allowed for each person.

Further provisions for winding plant

156. (1) Subject to subsections (2) and (3), every winding plant shall—

(a) in the case of—

(i) a single drum or single sheave winder, have an overlay rope; and

(ii) a double drum or double sheave winder, have an overlay rope on the drum or sheave on the right-hand side as seen from the driver's control position;

which overlay rope shall be termed the "reference rope"; and

- (b) on the drum or sheaves thereof, have such grooves, flanges or horns and, if the drum is conical, such other appliances in addition thereto as may be sufficient to prevent the rope from slipping off; and
- (c) have, in the case of a dial depth indicator, a pointer which moves in a clockwise direction, when the reference rope is lowered and, in the case of a post or spiral depth indicator, a pointer which moves up or down as the reference rope moves up or down:

Provided that, in the case of balanced winding where two depth indicators are fitted to one winding engine, the direction of movement of each depth indicator shall be determined by considering the rope carrying the conveyance as being the reference rope; and

- (d) have all bolts and fittings which, in the event of their becoming loosened might be a source of danger rendered secure by means of suitable locking devices; and
- (e) be provided with a locking device which shall prevent inadvertent withdrawal of the clutch; and
- (f) be fitted with an interlocking device making it impossible to—
 - (i) unclutch any drum unless the brakes of such drum are fully applied; and
 - (ii) release the brakes of such drum until the clutch is full engaged and securely locked; and
- (g) be provided with protective devices to shut off the power and apply the brakes automatically in the event of an overwind of a conveyance or in the event of the speed of a conveyance exceeding the maximum authorized speed of fifteen *per centum*:

Provided that—

- (i) in the case of a winding engine operating a conveyance in a shaft or winze in the course of

sinking such overwind devices need be provided only to guard against overwind of a conveyance above the highest stopping place;

- (ii) in the case of a winding engine used for regular man winding, such devices shall be so set that any passenger conveyance will be brought to rest within a distance of three metres above the highest stopping place used for passenger landing and three metres below the lowest stopping place used for passenger landing; and
- (h) when fitted with a multi-toothed type clutch or clutches which are not visible to the driver from his position at the controls, be so provided with mirrors or other suitable means that the driver can see, without moving from his position at the controls, whether or not a clutch is in correct position for engagement;
- (i) have an efficient brake for each drum or sheave which shall be kept in proper working order; and
- (j) when the winding engine is driven by electric power, be fitted in addition with an emergency brake system which shall be so arranged that the brakes will be applied automatically in the event of a failure of the electric power supply, save however, that the brake shoes may be common to both breaking systems; and
- (k) where necessary, be provided with guards over the drums and brake paths to protect the driver and any control gear from flying rope dressing; and
- (l) except in the case of a fricting-drive or sheave-type winding engine, have not less than three turns of rope round the drum when the conveyance is at the lowest point in the shaft from which winding is effected and have the end of the rope securely fastened to the shaft, hub, boss or an arm of the drum; and
- (m) have an indicating device which will clearly and accurately show the winding engine driver the position of the conveyance in the shaft:

Provided that, in the case of a sheave-type winder, disconnection of the indicator driver for the purpose of adjusting the indicator position shall automatically apply the brakes; and

(n) when it is used for regular man winding and the speed of the winding rope may exceed three hundred metres per minute, be provided with a device which will prevent the brakes from being applied at high rope speed with such pressure as to produce dangerous rate of deceleration; and

(o) have all instruments, signal light, switches and push buttons required by the driver for control of the winding engine clearly labelled with their functions where such function is not obvious; and

(p) have all push buttons, controls, adjusting devices and levers, including clutch operating levers, used by the driver for the control of the winding engine within the reach of the driver without moving from his driving position; and

(q) have a control lever which follows the reference rope in direction of movement; and

(r) have a positive brake lever which, if it is a hand-operated lever, must be pulled towards the driver in order to apply the brakes; and

(s) except in the case of a winding plant having an authorized maximum rope speed of less than three hundred metres per minute be fitted with a rope speed indicator which shall be so situated that the winding speed can at all times be read easily by the winding engine driver from his driving position; and

(t) be provided with a proper pressure gauge or, in the case of electrical power, with metres to indicate to the driver at all times the amount of motive power available for it.

(2) Paragraphs (c), (g), (j), (m), (q) and (t) of subsection (1) shall not apply in respect of small hoists:

Provided that a small hoist shall be provided with reliable means, either by conspicuous marks on the rope or by some other suitable method, showing clearly and accurately to the hoist driver at his operating position the position of the cage, skip or other conveyance in relation to all established landing and stopping places approaching which a reduction in winding speed is necessary.

(3) The Chief Government Mining Engineer may grant exemption in writing from any of the provisions of subsection (1) in respect of any winding plant in operation immediately before the date of commencement of these regulations.

Provision for overwinding

157. (1) Except where the winding plant is being used for sinking or equipping, in any vertical shaft or winze in which the raising and lowering of persons is regularly carried out and the authorized maximum rope is more than one hundred and fifty metres per minute—

(a) where the end of the winding rope is fastened to the drum of the winding engine—

(i) for each winding engine there shall be provided catch plates and safety detaching hooks to detach from the winding rope and to support any conveyance overwound in the headgear; and

(ii) the headgear shall be carried sufficiently high to allow an unobstructed space of at least seven comma five metres in which the conveyance can travel above or beyond the highest landing place for persons before it comes into contact with any fixed obstacle;

(iii) the shaft shall be carried sufficiently deep to allow an overrun space of at least seven comma five metres in which the conveyance can travel below or beyond the lowest land place before it comes into contact with any fixed obstacle:

Provided that such overrun space need not be provided in a shaft in the course of being sunk or in a shaft not exceeding three hundred metres in depth or length below bank where the winding system does not include the use of a balance rope or tail rope;

(b) where the winding rope is not fastened to the drum or sheave of the winding engine—

(i) the overrun space in the headgear above the highest established stopping place shall be provided with rigid or other appliances so arranged that an

overwound conveyance is retarded in order to minimize the risk of the conveyance colliding with the rope sheave or any fixed obstacle in the headgear; and

- (ii) the overrun space at the bottom of the shaft below the lowest established stopping place shall be provided with rigid guides or other appliances so arranged that an overwound conveyance is retarded and arrested before it can collide with any fixed obstacle; and
- (iii) there shall be fitted spring keps or jack-catches above the bank to arrest any conveyance which becomes accidentally disconnected from the rope as a result of an overwind.

(2) In respect of any winding plant in operation before the date of commencement of these regulations or in respect of any winding plant where the provisions of subsection (1) are inappropriate in relation to safety, the Chief Government Mining Engineer may grant exemption from any of the provisions of subsection (1).

Winding ropes

158. (1) Every rope used or the suspension of a conveyance shall be made of steel wire when the depth of wind exceeds thirty metres.

(2) Every steel wire rope used for the suspension of a conveyance shall be such that the diameter of the wires used in the construction of the rope is suited to the diameter of the sheaves and the drums fitted.

(3) In no case shall a winding rope be used which has a splice or join of any kind except at its attachments.

(4) The connexion between a winding rope and a conveyance shall be of such a nature that no accidental disconnection can take place, the rope attachments shall be properly made and no pen hooks shall be used therefore.

(5) No winding rope shall be turned end for end during its period of use.

(6) No friction hoisting rope shall be used unless it is of an improved construction.

Initial testing and care of winding ropes: Rope Record Book

159. (1) Whenever a winding rope or balance rope for use in a shaft or winze is not accompanied by a certificate from the manufacturer showing the breaking force as obtained by actual test on a whole sample of the rope, such rope shall not be used until a specimen cut from the rope has been tested by a reliable authority and the result of such test has been furnished to the manager.

(2) A winding rope or balance rope newly put on, whether new or previously used, and the attachments connecting any such rope to any conveyance shall be carefully examined by a competent person appointed for the purpose by the manager and shall not be used until the conveyance loaded with maximum permitted mass has been run at least two trips down and up between the highest and lowest stopping places ordinarily in use and found to be in order.

(3) The result of the examination and test required by subsection (2) shall be recorded in a Rope Record Book provided for the purpose by the manager and the record shall be signed by the person who conducted the examination and test.

(4) New ropes and ropes not in use shall be stored under cover in a dry place and the reels shall be jacked up clear of the ground or floor and shall be turned through half a turn at intervals of not more than three months so as to prevent migration of the rope lubrication to the bottom of the reel.

(5) The Rope Record Book shall, in addition to the results of the examination test required by subsection (2), contain the name of every person appointed in terms of section 172 and the following particulars regarding the rope—

- (a) the manufacturer of the rope;
- (b) the date of manufacture;
- (c) the date of purchase;
- (d) the date on which the rope was installed;
- (e) a full description, the make and construction of the rope;
- (f) the length of the rope in metres;
- (g) the diameter of rope in millimetres or width and thickness of rope in millimetres;

- (h) the mass of the rope per metre in kilograms;
- (i) the breaking force of the rope in kilonewtons as per manufacturer's certificate where the rope was accompanied by such certificate;
- (j) the ordinary working load;
- (k) the date of cutting and recapping and, additionally or alternatively the date of the non-destructive test;
- (l) the breaking force at each test and date of each such test;
- (m) the summary of condition of the rope at the time of cutting and the recapping;
- (n) the details and results of non-destructive test;
- (o) the date the rope was taken off;
- (p) where applicable, the date of annealing or renewing attachments.

Periodic testing and examination of ropes

160. (1) For every winding plant used in a shaft or winze in which winding is carried out, unless the winding plant is such that it does not allow for the shortening of the winding rope, a portion of the rope shall be cut off from the end attached to the conveyance, the balance mass or the counterpoise, as the case may be, at intervals not exceeding six months and the rope recapped.

(2) The portion cut off for the purposes of subsection (1) shall be of a length of at least four metres or such shorter length as the Chief Government Mining Engineer may permit in writing.

(3) From the portion of rope cut off, a specimen shall be sent by the manager, without delay, for a test to an approved testing station where its actual breaking force and general condition shall be determined at the expense of the owner.

(4) If the specimen of the rope received at the testing station is in a condition not admitting of a satisfactory test for the purpose of subsection (3), a fresh specimen shall be sent by the manager.

(5) On completion of the test required by subsection (3) the testing station shall send the manager a certificate showing the results of such test and shall send a copy of the certificate to the Chief Government Mining Engineer.

(6) Where a winding plant is such that it does not allow for the shortening of the winding rope, the winding rope shall be examined at intervals not exceeding six months by non-destructive means with approved equipment.

Particulars to be given when new rope fitted

161. Whenever a new winding rope, balance rope or tail rope is put on a winding plant, the following particulars of such winding rope, balance rope or tail rope shall be forwarded in writing to the Chief Government Mining Engineer and to an approved testing-station—

- (a) the name of the mine concerned;
- (b) the name of the shaft and compartment in which the rope is used;
- (c) a description of the shaft referred to in paragraph (b);
- (d) the coil number of the rope;
- (e) the date on which the rope was installed;
- (f) the date of manufacture of the rope;
- (g) the date on which the rope was installed;
- (h) the length of the rope in metres;
- (i) the diameter of the rope in millimetres;
- (j) the mass of the rope per metre in kilograms;
- (k) the construction of the rope and the number of wires in each strand and the number of strands;
- (l) the diameter of all wires used in the rope, in millimetres;
- (m) the lay of the rope;
- (n) the class of the heart or core of the rope;
- (o) the quality of steel used for the wire in the rope and the tensile strength in megapascals;
- (p) the breaking force of the rope in kilonewtons;
- (q) the coil number of the rope being replaced.

Special provisions for interpretation of section 163 to 168

162. (1) For the purposes of sections 163 to 168—

“Attachments” includes any balance or tail rope and everything suspended from or attached to the conveyance other than the winding rope;

“effective combined mass” means—

- (a) where winding is conducted in a vertical plane, the static force resulting from the mass of any load;
- (b) where winding is conducted in an inclined plane, one comma nought five times the incline component of the static force resulting from the mass of any load.
- (2) In determining, in accordance with the provisions of sections 163 to 168 the minimum allowable breaking force of any rope used in connexion with winding, the force in newtons exerted by any mass carried by the rope shall be obtained by multiplying that mass in kilograms by a factor of nine comma eight.

- (3) In calculating the mass of persons for the purposes of sections 163 to 168 seventy kilograms shall be allowed for each person.

Total mass to be attached to winding rope

- 163. The total mass attached to the winding rope when persons or material are conveyed shall not exceed nought comma nine times the mass attached to the winding rope when mineral is conveyed.

Use of more than one rope

- 164. Where a conveyance is suspended by two or more winding ropes—
 - (a) the ropes shall be of approximately equal size and strength; and
 - (b) adequate arrangements shall be made to equalize the tension in the ropes; and
 - (c) in calculating the breaking force of the ropes, each rope shall be assumed to carry an equal share of the load.

Periodically tested winding ropes: minimum breaking force

- 165. Where the winding system is such that it allows of the periodic testing of the winding rope or ropes as required by section 160 and a balance rope or tail rope is not used, a winding rope shall not be used for the raising or lowering of persons or materials, if the breaking force at any point in the rope is less than whichever is the greatest of—

- (a) ten times the force exerted by the effective combined mass of the conveyance and its attachments and the maximum number of persons or load of materials; or
- (b) nine times the force exerted by the effective combined mass of the conveyance and its attachments and the maximum permitted load of mineral; or
- (c) five times the force exerted by the effective combined mass of the length winding rope between the headgear sheave and the lowest working point of the conveyance and its attachments and the maximum permitted number of persons or load of materials; or
- (d) four comma five times the force exerted by the effective combined mass of the length of winding rope between the headgear sheave and the lowest working point of the conveyance and its attachments and the maximum permitted load of mineral.

Winding ropes not periodically tested: minimum breaking force

- 166. (1) Where the winding system is such that it does not allow of the periodic testing of the winding rope or ropes as required by section 160 and a balance rope or tail rope is used, a winding rope shall not be used for the raising or lowering of persons or material if the breaking force at any point in the rope, when new, is less than a multiplying factor of eight, less nought comma nought nought one five of the length in metres between the headgear sheave and the lowest working point of the conveyance, multiplied by the effective combined mass of conveyance and its attachments and the maximum mass permitted of persons or of material, whichever is the greater, plus the whole mass of the balance rope or tail rope plus nought comma five of the total suspended mass of the tail carriage if used:

Provided that in no case shall the multiplying factor be less than six.

- (2) Where the mass of the conveyance and balance rope or tail rope is suspended from more than one winding rope in such manner that, as far as is practicable, the load is shared equally between the winding ropes, then the winding ropes shall not be

used for the raising or lowering of persons if the combined breaking force of the winding ropes, when new is less than the minimum breaking force calculated according to subsection (1).

Application of sections 165 and 166 to plant not used for conveyance of persons or material

167. Where a winding plant which is not used for the raising or lowering of persons or material operates in a shaft or winze where persons are regularly conveyed, no winding rope shall be used on such winding plant if the breaking force at any point in the rope is less than the minimum permitted for a similar winding system by sections 165 and 166, as the case may be.

Balance ropes and tail ropes: minimum breaking force

168. No balance rope or tail rope shall be used in any winding system in a shaft or winze where persons are regularly conveyed if the breaking force at any point in such rope is less than—

- (a) six times the effective force exerted by the combined mass of the rope and nought comma five times the mass of the tail carriage, if any; or
- (b) nought comma nine times the initial breaking force of the rope, whichever is the greater.

Circumstances in which ropes shall not be used

169. (1) No winding rope, balance rope or tail rope shall be used—

- (a) when its breaking force determined by a test carried out in terms of section 160 is less than nought comma nine times its breaking force when new; or
- (b) when marked external corrosion appears; or
- (c) when the extent of internal corrosion indicates that the rope is no longer in a safe condition; or
- (d) when a detailed examination of cleaned portions of the rope indicates that the rope is no longer in a safe condition.

(2) No winding rope shall be used for a period exceeding two years except with the written permission of the Chief Government Mining Engineer.

Guide ropes: minimum breaking force, examination and testing

170. (1) A guide shall not be used in a shaft or winze where persons are regularly conveyed if the breaking force at any point in the rope is less than six times the force exerted by the effective combined mass of the rope and its tensioning mass.

(2) Subsection (1) shall not apply to any guide rope which is also used as winding rope to raise or lower a stage, in which case the breaking force at any point in the rope shall not be less than five times the force exerted by the effective combined mass of the length of winding rope between the headgear sheave and the lowest working point of the stage and its share of the combined mass of the stage and attachments, the maximum permitted mass of persons and material.

(3) A guide rope shall be of approved construction with a minimum diameter of sixteen millimetres. Discarded winding rope shall not be used as guide rope.

(4) All guide ropes shall be examined once a week and the results of such examination shall be recorded in ink in a Rope Record Book provided for the purpose by the manager and the record shall be signed by the person who conducted the examination.

(5) All guide ropes shall be recapped at intervals not exceeding once a year so as to shift the positions liable to maximum wear. At intervals not exceeding two years a portion of each guide rope of at least three metres in length shall be cut off immediately above its bottom attachment. Such cut off specimen shall be sent by the manager, without delay, for a test to an approved testing station where its actual breaking force and general condition shall be determined at the expense of the owner.

(6) If the specimen of the rope received at the testing station is in a condition not admitting of a satisfactory test for the purpose of subsection (5), a fresh specimen shall be sent by the manager.

(7) On completion of the test required by subsection (5) the testing station shall send the manager a certificate showing the results of such test and shall send a copy of the certificate to the chief Government Mining Engineer.

(8) Except in sinking shafts or winzes tensioning of guide ropes shall be carried out by means of fixed weights freely suspended from the lowest point of each guide rope or by some other suitable tensioning device authorized by the Chief Government Mining Engineer. The minimum tension on each guide rope shall be ten kilograms per metre length.

(9) Where—

- (a) guide ropes are limited to two in each hoisting compartment there shall be a difference of twenty *per centum* in the mass of each fixed weight;
- (b) more than two guide ropes are used in each hoisting compartment the tensioning weights suspended from each guide rope shall vary from a minimum of ten *per centum* above to ten *per centum* below the average mass of each weight.

(10) Where guide ropes are installed in a shaft where hoisting takes place in more than one compartment an inspector may require rubbing ropes to be installed to such specifications as he may direct should he consider there to be a danger of collision between conveyance in each compartment.

Provided that the Chief Government Mining Engineer may grant exemption in writing from any of the provisions of this section under such conditions and for such periods as he may deem fit.

Suspension gear and attachments

171. (1) This section shall apply to every winding plant in a shaft or winze in which persons are regularly conveyed.

(2) The suspension gear and attachments between the rope and the conveyance and between the conveyance and the balance rope shall—

- (a) be of good quality, sound manufacture and free from patent defect; and
- (b) have a designed static factor of safety of not less than ten in respect of the load suspended from the rope; and
- (c) be such that no accidental disconnection can take place; and

(d) in cases where more than one rope is used, shall be designed to provide, as far as is practicable, for the equal sharing of the load between the ropes from which a conveyance is suspended.

(3) At intervals of not more than twelve months the suspension gear and attachments referred to in subsection (2) shall be dismantled, cleaned and examined carefully for any weakness or defect by the competent person appointed in terms of section 172 and, where it is necessary to do so in order to relieve stress and to restore the designed physical properties of the material, shall be annealed or subjected to other suitable heat treatment or discarded and replaced.

(4) A record of all examinations and tests carried out in terms of this section and details of any heat treatment or replacement of the suspension gear or attachments, shall be entered in ink in the Rope Record Book.

Maintenance and examination of winding plant

172. (1) Each winding plant used in a shaft or winze where regular winding is carried out shall be properly maintained in a proper working order and the manager shall appoint in writing some competent person or persons whose duty it shall be to examine carefully and, except as otherwise provided in paragraph (d), to record his findings in ink in a book, to be termed the Machinery Record Book, provided for the purpose by the manager—

- (a) at least once in each working day, the winding rope attachments to the drums and the conveyances, the brakes and depth indicators, the conveyances, and safety devices and all external parts of the winding equipment upon the proper working of which the safety of persons depends; and
- (b) at least once in each week at intervals not exceeding ten days, the guides or rails and the winding compartments generally; and
- (c) at least once in each week at intervals not exceeding ten days, the external parts of the winding engine and the condition and operation of all controls and all safety devices and circuits, the hoisting ropes, balance

ropes, tail ropes, guide ropes, stage ropes and the signalling arrangements, head frame fittings, sheave wheels and all ancillary equipment for loading and unloading of conveyances;

- (d) at least once in each calendar month at intervals not exceeding forty-five days in respect of the structure of the hoisting ropes, balance ropes, tail ropes, rubbing ropes, guide ropes and stage ropes with a view to ascertaining the amount of deterioration thereof; for the purpose of this examination, the rope shall be thoroughly cleaned at places selected by the person carrying out the examination who shall note and record in ink in the Rope Record Book any reduction in the diameter or circumference of the rope; the superficial condition of the wires as to wear, corrosion, fractures and brittleness and all other data for ascertaining the amount, extent and distribution of the deterioration of the rope.

- (2) Notwithstanding subsection (1), where the winding system is to be shut down for a prolonged period, the examinations and tests required by that subsection may be waived, in which event the plant may not be put back into service until one each of such examinations and tests as would otherwise have been required within the period of shutdown has been carried out.

- (3) If, during any examination required by this section, there is discovered any defect by which the safety of persons may be endangered, such defect shall be recorded in ink in the Driver's Log Book immediately and reported to the responsible person in charge and, until such weakness or defect has been remedied, the winding plant shall not be used.

Books open to inspection

173. The Machinery and Rope Record Books and the Driver's Log Book shall at all times be open to inspection by an inspector.

C. TRAMMING

Riding on trucks, et cetera

174. No person shall do, or cause or permit any other to do any one or more of the following in or about a mine—

- (a) ride in or on a vehicle or drive a vehicle in such a position as to endanger himself or any other person;
- (b) ride in or on a vehicle or loaded truck unless authorized in writing to do so by the manager or an official;
- (c) get on to or off a vehicle while it is in motion, except during shunting operations on the surface in which he is directly employed;
- (d) ride on a haulage rope;
- (e) drive or operate a vehicle unless he is competent to do so and has been authorized in writing by the manager or an official in terms of section 176;
- (f) wilfully damage or interfere with or order any other person to damage or interfere with any vehicle or part thereof;
- (g) neglect to inspect or maintain any vehicle which he is required to inspect or maintain in terms of these regulations.

Safety devices for trucks or cars

175. (1) On every inclined track excluding tracks in shafts where trucks or cars are attached to a rope or chain adequate safety devices shall be provided and maintained in good order to prevent danger from such trucks or cars in the event of a runaway.

- (2) On any inclined plane or portion of an inclined plane exceeding a gradient of 1 in 50 where vehicles are used there shall be provided and used on the vehicle or on the inclined plane an adequate number of effective devices to prevent such vehicle endangering the safety of persons should the vehicle run out of control.

- (3) As far as practicable every device provided in terms of subsection (2) shall be of a type to operate automatically.

- (4) Where a device provided in terms of subsection (2) is hand operated, any person operating it shall be properly instructed in its operation and shall be afforded adequate protection from any moving truck or car.

- (5) Daily inspections of all safety devices shall be undertaken by a person appointed by the manager or an official.

Appointment of drivers of locomotives and self-propelled vehicles

176. (1) No person shall drive or be permitted to drive any locomotive or any other self-propelled vehicle unless he has been authorized in writing to do so by the manager or an official.

(2) The manager or official shall satisfy himself that all persons authorized in terms of subsection (1)—

- (a) are competent to carry out the duties assigned to them;
- (b) have adequate sight and hearing to drive such locomotives or self-propelled vehicles and do not suffer from any infirmity, mental or physical or are under medication or treatment which is likely to interfere with the efficient discharge of their duties.

(3) All persons authorized to drive any locomotive or any other self-propelled vehicle in terms of subsection (1) shall undergo a medical examination by a registered medical practitioner at intervals not exceeding twelve months and the result of each such examination shall be available to an inspector. The medical examination shall be conducted to comply with paragraph (b) of subsection (2).

Moving vehicles down inclines by hand and devices for holding vehicles

177. (1) No person when moving a vehicle by hand down a gradient exceeding 1:12, shall precede the vehicle.

(2) No person shall move any vehicle by hand down an incline in circumstances in which he cannot by his own strength control the vehicle from behind unless there is provided such a contrivance as to enable him to control it from behind.

(3) A sufficient supply of a suitable sprags, lockers or drags shall be provided, maintained and used for the purpose of holding vehicles—

- (a) at the top of every incline on which vehicles are moved by gravity operated rope haulage apparatus; and
- (b) at every place at which vehicles are coupled or uncoupled from the haulage apparatus.

Clearances and refuge holes in haulageways

178. (1) In any haulage in which mechanical rope haulage or locomotive haulage operates and in which persons travel on foot, a continuous unobstructed travellingway shall be maintained with a clearance of at least five hundred millimetres between the side of every moving vehicle and the sidewall or, where the travellingway lies between a double line of tracks, between the sides of any two vehicles passing each other on the respective tracks.

(2) Where the clearance prescribed in subsection (1) is reduced or in any haulage in which self-propelled vehicles which do not run on a track or rails operate and along which any person may have to pass when the vehicle is in motion, suitable refuge holes of adequate size shall be provided at intervals not exceeding thirty metres.

(3) The clearance and refuge holes required by this section shall be kept clean and free from any obstruction.

Vehicles attached to ropes

179. (1) On any haulage where vehicles which run on rails are attached to a rope operated by a winch or haulage engine there shall be provided, used and maintained in good working order effective signalling arrangements whereby distinct signals can be given to the driver from all places where vehicles are attached to or detached from the rope and from any other places along the haulage where the giving of signals is necessary for the safe and efficient conduct of tramming operations.

(2) No vehicle shall be placed or moved into a position from which it may run out of control unless it is securely attached to the winch rope or haulage rope or is held in position by a stop block or other adequate device for the prevention of a runaway.

(3) The Manager or an official shall satisfy himself by daily written reports by the operator in charge of the haulage that the signalling arrangements and other safety devices referred to in this section are in good working order.

Shaft protection

180. (1) Where a haulage track leads to a shaft or winze on surface or underground, there shall be provided and installed a suitable arresting device, sufficiently strong to withstand any impact by collision with a truck, car, vehicle or train.

- (2) Every person opening the arresting device shall close it immediately after the car, vehicle, train or truck has cleared the arresting device.
- (3) An inspector may order a derailling switch to be installed.

Lights and warning devices for locomotives and trains

181. (1) Every moving train of vehicles operated by a locomotive or any other power-driven vehicle, and every moving locomotive or other power-driven vehicle unattached to trucks or other conveyances, shall be provided with a white headlight shining in the direction of travel, a whistle, bell, horn or other audible warning device, and a red light:

Provided that, where the train of vehicles or unattached vehicle is operated underground, the red light may be replaced by an effective red reflector or red reflective strip.

- (2) The headlight referred to in subsection (1) shall—
 - (a) be capable of illuminating the way ahead for a distance of at least thirty metres; and
 - (b) be affixed to the front of the front vehicle in the train of vehicles, whether or not it is the vehicle operating the train, or to the front of the unattached vehicle, as the case may be.
- (3) The red light, red reflector or red reflective strip referred to in subsection (1) shall be affixed to the rear of the last vehicle in the train of vehicles, whether or not it is the vehicle operating the train, or to the rear of the unattached vehicle, as the case may be, in such a manner as to be clearly visible.
- (4) The lights, red reflector or red reflective strip referred to in subsection (1) shall be used—
 - (a) whenever the train of vehicles or unattached vehicle concerned is operating underground; and
 - (b) on surface between the hours of sunset and sunrise.

- (5) The manager of a mine shall ensure that adequate safety precautions are taken to warn persons who may have to work or travel by foot in any haulageway which is used by any mobile operated vehicle, locomotive or train.

Duties of driver of vehicle

182. It shall be the duty of the driver in charge of any self-propelled vehicle to ensure that—

- (a) the brakes are in good working order and that the vehicle is not moved if the brakes are not in good working order; and
- (b) the warning signals and lights are in good working order and affixed and, if they are not in good working order or are not affixed, that such vehicle is not moved except to the nearest place where repairs can be effected; and
- (c) all attachment devices are in good working order and effective.

Vehicles not to be left unattended

183. The driver of any self-propelled vehicle shall not leave the vehicle unattended, other than at the place where it is normally kept when not in use, unless he has taken reasonable precautions to ensure it cannot inadvertently be set in motion.

Scheme for testing of vehicles to be instituted

184. (1) The manager of a mine shall ensure that there is in force at the mine a scheme for the systematic inspection, examination and testing of all self-propelled vehicles in use which is sufficient to ensure that the external parts of the engine or motor, the condition and operation of all controls, safety devices and signal arrangements are in all respects in proper working order.

(2) The results of an inspection, examination or test carried out in terms of subsection (1) shall be recorded in ink in a book provided by the manager for the purpose.

(3) The book referred to in subsection (2) shall at all times be open to inspection by an inspector.