

SLINGWORK IN A VERTICAL SHAFT

SLING MATERIAL INTO AND REMOVE SLUNG MATERIAL FROM A SHAFT



Explain specific requirements pertaining to the slinging of material into a shaft

10

- 1.1** The consequences of not adhering to logbook entries are explained in terms of legal and site specific requirements.
- 1.2** The type and condition of slinging equipment to be used are explained in terms of legal, site-specific and operational requirements.
- 1.3** The safety precautions to be taken when connecting material to the conveyance and the securing methods are explained in terms of legal, site-specific and operational requirements.
- 1.4** The positioning of persons in relation to the equipment is explained in terms of safety, site-specific and operational requirements.
- 1.5** The effects on safety when the required signals used when slinging material are not adhered to are explained in terms of legal, site-specific and operational requirements.
- 1.6** The restrictions regarding the conveying of persons, mineral and explosives are explained in accordance with legal, site-specific and operational requirements.
- 1.7** The consequences of non-adherence to safety requirements while preparing to sling material are explained in terms of legal, site-specific and operational requirements.

Prepare to and sling material into the shaft

15

- 2.1** Required functional personal protective equipment is used in accordance with its design, legal, site-specific and operational requirements.
- 2.2** Tools and equipment required for slinging are inspected and used in accordance with manufacturer's specifications and operational requirements.
- 2.3** The workplace and material to be slung is examined and hazardous conditions are dealt with in accordance with the relevant procedure.
- 2.4** The material to be slung is positioned, connected and secured in accordance with legal, site-specific and operational requirements.
- 2.5** The conveyance is clutched for the designated position in accordance with site-specific and operational requirements.
- 2.6** The reactions on signals received are in accordance with legal, site-specific and operational requirements.
- 2.7** Interpersonal interaction is conducted in a positive consistent manner with specified requirements that promotes effective teamwork.

- 2.8 Reports are completed accurately in the required format and submitted to the designated personnel on time, in accordance with site-specific and operational requirements.

Explain the specific requirements pertaining to the removal of slung material from a shaft

21

- 3.1 The effects on safety if safety precautions to be taken when slung material is removed from the shaft are not adhered to are explained in terms of legal, site-specific and operational requirements.
- 3.2 The effects on safety when the required signals used when the slung material is removed are not adhered to are explained in terms of legal, site-specific and operational requirements.
- 3.3 The restrictions regarding the conveying of persons, mineral and explosives when removing slung material are explained in accordance with legal, site-specific and operational requirements.

Logbook entries include but not limited to the following:

- Type of material to be transported
- Quantity of material to be transported
- Destination
- Specific travelling speed

Logbooks includes but not limited to the following:

- Shaft report book.
- Driver logbook.

Requirements pertaining to the slinging of material

No person shall travel in a conveyance operated by a winding engine if such conveyance is loaded or partially loaded with mineral, and no person shall travel in a conveyance operated by a winding engine that is being used simultaneously for the winding of mineral:

Provided that, if authorised by the manager or mine overseer, persons engaged in sinking operations in a vertical shaft may descend such shaft in a conveyance operated by a winding engine that is being used simultaneously for the raising of mineral.

No person shall travel with material or explosives in a conveyance operated by a winding engine; and in a conveyance operated by a winding engine that is being used simultaneously for the winding of material or explosives

The manager, engineer or mine overseer may grant permission in writing for persons to travel with material if such material is not likely to endanger persons travelling in the conveyance; and the manager shall cause a list to be kept of the material which is regularly conveyed in the shaft for which permission has been granted.

Ensure that all persons authorised to give signals for the raising and lowering of persons are conversant with the material mentioned in the list and make a copy of the list readily available to all persons concerned.

The manager, engineer or mine overseer may authorise the following persons to travel in a shaft with material or explosives prohibited if such travelling is necessary for the efficient carrying out of their duties; such as, but not limited to the following: -

- Onsetter and their gangs,
- Persons engaged in sinking operations,
- Persons conducting an examination, effecting repairs or doing other work in the shaft, and
- Persons are required to ensure the safe passage through the shaft of material, which cannot be conveyed inside a conveyance.

Any warning for a special instruction given and the time such warning was given involving the safety of persons to the winding engine driver, such entry shall be signed by the person giving the instruction and shall be countersigned by the winding engine driver.

Practical procedures

Adhered to the following notices and documents displayed on the bank: -

Site specific requirements for the shaft will apply to prevent hazardous conditions which may endanger persons and property damage.

A notice approved by the manager will be posted for the type and quantities of material to be slung.

The correct slings without any visual defects must be selected as per site specific requirement.

The person in immediate charge must inform the onsetter of the procedures to be followed, the exact number and amount of material per trip to be slung.

The banksman will instruct the onsetter to travel to the required destination in preparation to receive the slung material.

All required tools and equipment must be lowered to the onsetter destination before slinging material.

Other winding operations in the shaft must be stopped in accordance with the site specific requirements, when slinging material into or removing slung material from a shaft conveyance.

The person in immediate charge must: -

- Make pre-arrangements with the driver and enter the arrangements in the driver's logbook.
- Sign the entry made in the driver logbook and the driver must countersign.
- Check that the material complies with the approved material list for the shaft,
- Check that no tools, equipment or other materials are either in or on the material to be slung. *(These objects may accidentally fall down the shaft when the material is raised into the shaft).*
- Check that all gates and conveyance doors are closed.
- Instruct the assistants to open the shaft steel work on the bank to the shaft entrance. *(Gantries)*
- Store equipment not required for the slinging operation,
- Position the safety devices on the bank.
- Select the correct slings accordance with the site specific requirements.
- Examine the condition of all equipment to be used. *(Safe and fit for purpose).*
- Examine all safety harnesses for visible defects.
- Transmit signals to the driver to position the conveyance to be able to reach the cage slings underneath the conveyance.
- Transmit a signal to stop the driver on the required position.
- Interchange the mark signal when required with the driver.
- Transmit the clutching signal, underground destination signal, and a clear signal to the driver when required.

Clutching will only be required when both conveyances are use simultaneously to sling material.

The driver will clutch according to the site specific requirements for slinging operations.

The person in immediate charge must: -

- Receive the clutching completed signal from the driver.
- Interchange signals "persons about to have access to the conveyance for a purpose other than travelling" with the driver.
- Check that the robot indication is green.
- Instruct the assistants to secure their lifelines in accordance with site specific requirements.
- Instruct the assistants to use the correct tools to pull out the conveyance slings from underneath the conveyance.
- Transmit a signal to the driver to lower slowly and instruct the assistants to pull the slings towards the bank.
- Transmit a signal to stop the conveyance as required above the bank landing.
- Interchange the signal "conveyance is clear of all persons who have had access to it for a purpose other than travelling" with the driver.

- Interchange a signal with the driver; “raising or lowering of mineral in trucks or of material about to commence”
- Receive a signal from the driver “persons may have access to conveyance for the purpose of loading or unloading”
- Check that the robot indication is green.
- Instruct the assistants to open the required safety devices on the bank area and move the slung material into position.
- Instruct the assistants to connect and secure the cage slings in accordance with site specific requirements to the slung-material.
- Examine the connections made between the material slings and conveyance slings.
- Instruct the assistants to secure the “*winch rope*” to the bottom end of the slung material.
- Instruct the assistants to move clear of the slung material and to position themselves correctly to assist when required.
- Instruct the winch operator to take-up the slack in the “*winch rope*” connected to the slung material.
- Transmit a signal to the driver to raise slowly, and the winch operator to control to slung material.

The person in immediate charge must: -

Transmit a signal to stop the driver when the slung material is in the shaft.

Receive a signal from the driver “persons may have access to conveyance for the purpose of loading or unloading”

Check that the robot indication is green.

Instruct the assistants to steady the slung material underneath the conveyance.

Instruct the assistants to disconnect the air “*winch rope*” from the bottom end of the slung material.

Instruct the assistants to close the shaft gate, and remove equipment and tools from the bank area.

Instruct the assistants to close the shaft steel work on the bank to the shaft entrance. (*Gantries*)

Instruct the assistants to secure all safety devices in the safe position to the shaft entrance.

Transmit a signal to the driver to lower the conveyance slowly to the bank position.

Check that the slung material is positioned correctly underneath the conveyance.

While lowering, check to ensure a safe passage through the shaft of the material underneath the conveyance.

Transmit a signal to stop the conveyance at the bank.

Receive a signal from the driver “persons may have access to conveyance for the purpose of loading or unloading”

Interchange the onsetter destination signals with the driver.

Transmit the signal to the driver to lower the conveyance. (*Lower at the pre-determined speed entered in the driver logbook*).

Remain at the lock bell to check that the slung material is not obstructed when lowered down the shaft and remove the lock bell key from the bell box.

The driver will lower the conveyance to the signalled destination.

Logbook entries [include but is not limited to the following]:

- Type of material to be transported
- Quantity of material to be transported
- Destination
- Specific traveling speed
- Time
- Date
- What’s going to be done
- Signature and driver countersign

Checks that the Onsetter and banksman need to do before slinging a bogey

- Phone the Banksman and tell him you are going to sling
- Check the station for loose material
- Check the slings on the bogey
- Check the swivel pin on the bogey
- Check the 16mm safety pin chain below the bogey
- Check the locking pins on top of the bogey
- Check the loose material inside the pipes
- Check the air winch

Check the safety belts and Sala block
Chained Together
Rail worthy
Material are not mixed

Check son Slings

Rust
Kinks
Broken wires
Expiry date

Colour code

Checks on a Winch

Bolts and nuts
Bolts & Nuts
Brakes
Oil (Gearbox)
Winch Rope
Start/stop buttons
Make sure that the rigger has cleared the bogey
Make sure all other winding has stopped



Material is lowered and disconnected from the conveyance in accordance with legal, site-specific and operational requirements.

The person in immediate charge must: -

- Transmit a signal to the driver with the conveyance in position to connect the air winch rope to the bottom end of the slung material.
- Interchange the material signal with the driver.
- Receive a signal from the driver for “persons to have access to the conveyance for the purpose of loading or un-loading material”.
- Check that the robot indication is green.
- Request the assistants to secure their lifelines to the steelwork on the shaft station.
- Instruct the assistants to open the shaft gate and secure the top deck platforms in the open position.
- Instruct the assistants to prepare the shaft station area to lower the slung material.
- Instruct the assistants to secure the required equipment to the bottom end of the slung material.
- Instruct the assistants to move clear of the station area for the slung material about to be lowered.

- Transmit a signal to lower the conveyance slowly with the slung material.
- Transmit the signal to stop the driver when sufficient slack is obtained on the conveyance slings connected to the slung material.
- Receive a signal from the driver for “persons to have access to disconnect the sling equipment”.
- Check that the robot indication is green.
- Instruct the assistants to detach the slung material from the conveyance slings.
- Follow site specific procedures to secure the conveyance slings underneath the conveyance.
- Instruct the assistants to close and secure the shaft gates and top deck platforms.
- Instruct the assistants to detach their lifelines from the shaft steelwork.
- Instruct the assistants to remove and store all tools and equipment.
- Instruct the assistants to move the slung material to the designated area clear of the shaft entrance.
- Instruct the assistants to stand clear from the shaft entrance.
- Transmit the clear signal on the lock bell system.
- Remain at the lock bell until the conveyance is clear of the station landing.
- Remove the lock bell key from the lock bell box.

PROCEDURES TO SLING LONG MATERIAL IN A VERTICAL SHAFT, LOWERING LONG MATERIAL IN A VERTICAL SHAFT (SLINGING).

The driver will be notified by the banksman that long material will be lowered below the conveyance. This is done either by a special signal or the banksman must make an entry in the driver’s logbook.

Assume that long material has to be lowered below the conveyance in a Vertical shaft.

The following procedure will be followed:

The driver will:

- Reply to the special signal from the banksman.
- Receive the clear signal from the onsetter.
- Receive the signal 4 pause 1 from the banksman.
- Raise the top conveyance about 1.5 meters above the bank level mark.
- Stop on the signal 1 received from the banksman.
- Receive the mark signal 4 pause 4 from the banksman.
- Mark the depth indicator and the drum.
- Reply to the mark signal 4 pause 4 from the banksman.
- Receive the clutching signal, mark signal and the clear signal from the banksman.
- Test both brakes separately and if satisfied, unclutched the top conveyance.
- Position the bottom deck of the bottom conveyance 1.5 meters above the station mark.
- Clutch in and test both brakes separately.
- Signal the clutching completed signal to the banksman.

The driver clutch in such a manner to enable the banksman and the onsetter to attach and detach the long material from the conveyance simultaneously.

The driver will:

- Reply to the signal 8 from the banksman. (For continuous lowering of material it is not necessary to interchange the signal **8** before every trip, but only on commencement of material)
- Pause a few seconds and signal the signal 1 to the banksman. (The driver must signal this signal spontaneously)

The banksman attach the long material to the slings below the conveyance.

[Remember to use the signal 7]

The driver will:

- Receive the signal **4** pause**1** from the banksman.
- Operate a special switch, backing out switch, or move the man / rock lever to the rock position.
- Raise the conveyance slowly.
- Stop on the signal 1 received from the banksman.

- Reply to the signal 1 from the banksman.

The banksman and his helpers will steady the long material below the conveyance.

The driver will:

- Receive the signal 4 pause 2 from the banksman.
- Lower the conveyance slowly.
- Stop on the signal 1 received from the banksman.
- Release the special switch, backing out switch or move the man / rock lever to the man position.
- Reply to the station signal from the banksman.
- Receive the signal 2 from the banksman to lower the conveyance.
- Lower the conveyance to the onsetter.
- Stop on the signal 1 received from the onsetter.
- Reply to the signal 8 from the onsetter.

The person who receives the first loaded conveyance of material must also interchange the signal 8 to the driver. It is only applicable on the first trip.

The driver will:

- Pause a few seconds and signal 1 to the onsetter.

The onsetter and his helpers will hook the bottom of the long material and pull the material towards the station.

The driver will:

- Receive the signal 4 pause 2 from the onsetter.
- Lower the conveyance slowly.

While the conveyance is being lowered slowly, the onsetters helpers will use a winch or man handle the long material out of the shaft and lower them onto the station.

The driver will:

- Stop on the signal 1 received from the onsetter.
- Reply to the signal 1 from the onsetter.
- Reply to the signal 1 from the banksman.

It is now possible for the banksman to attach, and the onsetter to detach the long material simultaneously from the conveyances.

The driver will:

- Receive the clear signal from the onsetter.
- Receive the signal 4 pause 1 from the banksman.

On completion of lowering long material to the onsetter, the banksman and the onsetter must interchange the signal 8 pause 8 with the driver. The driver will acknowledge the signal 8 pause 8 to the banksman and the onsetter.

The onsetter must lower a bogey, loaded with rails from 67 level to 73 level, the onsetter is on 70 level.

In short the procedure is as follows:

1. Clutch correctly.
2. Onsetter goes to 67 level.
3. Onsetter sling bogey to banksman.
4. Onsetter goes to 73 level.
5. Banksman sling bogey to onsetter at 73 level.

STAGE 1

- a. The onsetter make sure that all persons are clear from the cage and compartments, then he will clutch correctly if necessary, 4 pause 4 pause 4, station signal 73 and a clear signal 2 pause 2.

- b. Driver will bring the cage to the onsetter at 70 level, and signal 4 pause 4 pause 4.
- c. Onsetter will prepare the cage if it is necessary, with the signal 7
- d. Driver will reply the signal 7 to the onsetter, on completion of preparing the conveyance the onsetter will signal 7 pause 7 to the driver. The driver will acknowledge signal 7 pause 7 to the onsetter.

STAGE 2

- a. Onsetter will signal 3 to the driver.
- b. Driver will signal 3 to the onsetter,
- c. Onsetter will open the shaft gates and cage doors, load his helpers in the cage, close the cage doors and shaft gates.
- d. Onsetter signals 3 pause 3 pause 3 to the driver.
- e. Driver signals 3 pause 3 pause 3 to the onsetter.

- f. Onsetter signals station signal 67 to the driver.
- g. Driver acknowledges station signal 67 in full to the onsetter.
- h. Onsetter opens the shaft gates and cage doors just big enough to let him through, signals 1 to the driver. Close the shaft gates, and the onsetter gets into the cage, and close the cage doors.
- i. Driver pauses at least 10 second, and raises the cage to 67 level. On arrival at 67 level the driver stops on the correct station mark and signal 3 to the onsetter.
- j. Onsetter and his helpers will leave the cage.

STAGE 3

- a. Onsetter will do some checks before he commences with this task.
 He will check the following:
Cage slings: Onsetter checks the sling that is below the cage. It is only a visual inspection. He checks the sling for any broken wires or strands, any kinks, shackles, rust and any other irregularities.
Slings: Colour code, expiry date, visual inspection on the sling.

Bogey: The material in the bogey, if it is fasten properly, the wheels and the connecting pin between the wheels and the upper area, the sling that hold the two ends together, the tail sling on the bogey, the shackles on the slings, the winch rope that is going to be used.
- b. Now the onsetter can start his procedure. Onsetter signals a special signal to the winding engine driver, or phone him to make an entry in his logbook.
- c. Onsetter signals 8 to the driver.
- d. Driver signals 8 to the onsetter, change the man switch to the material position and signals a 1 to the onsetter.
- e. Onsetter position the cage with a 4 pause 1 or an approved decking signal, stop the driver with the signal 1, when the cage is at the correct position, about 1,5m above the station.
- f. Onsetter connect the winch rope to the rear end of the bogey (tail rope) and remove the safety devices on the station, Move the bogey slowly towards the shaft.
- g. Onsetter and helpers fasten their safety belts, open the shaft gates and connect the cage slings to the bogey. Onsetter will check the condition of the slings below the cage.
- h. Onsetter will signal the winch driver when to slack and when to tighten the tail rope.
- i. Onsetter signals 4 pause 1 to the driver, to raise the bogey into the shaft. When the bogey is in the shaft, the onsetter will stop the driver with the signal 1.
- k. Driver will stop the winder and signal 1 to the onsetter.
- l. Onsetter will steady the material, remove the winch rope from the tail-end of the bogey, clear all his helpers from the shaft, close the shaft gates, release the safety belts and replace the safety devices on the station.
- m. Onsetter signals bank signal to the driver.
- n. Driver acknowledges bank signal in full to the onsetter.
- o. Onsetter signals 1 to raise the conveyance.
- p. Driver raise the cage to the bank.
- q. On arrival at the bank, the banksman will stop the driver with the signal 1. Banksman will signal 8 to the driver.
- r. Driver will signal 8 to the banksman, select the switch from men to material and signal 1 to the banksman.
- s. Banksman will check that his helpers secure themselves with the safety belts, pre-arrange with the winch operator, remove the safety devices on the bank and open the shaft gates.
- t. Banksman signals 4 pause 2 to the driver.

- u. Driver lowers the bogey slowly on to the bank.
- v. Banksman stops the driver with the signal 1 when the bogey is on the bank and clear from the shaft.
- w. The driver signals a 1 to the banksman.
- x. Banksman disconnect the bogey from the cage slings, close the shaft gates, move the bogey away from the shaft and replace the bank safety devices.
- y. Banksman signal 8 pause 8 to the driver.
- z. Driver acknowledges 8 pause 8 to the banksman.
- aa. Banksman signals 2 pause 2 to the driver.

STAGE 4

- a) Onsetter will give the driver a call-over.
- b) On arrival the onsetter stop the driver with a signal 1.
- c) Driver stops the cage.
- d) Onsetter signals 8 pause 8 to the driver.
- e) Driver acknowledges 8 pause 8 to the Onsetter.
- f) Onsetter signals 3 to the driver.
- g) Driver signals 3 to the onsetter.
- h) Onsetter opens the shaft gates and cage doors, load his helpers in the cage, check that they are in safely, close the cage doors and shaft gates.
- i) Onsetter signals 3 pause 3 pause 3 to the driver.
- j) Driver acknowledges 3 pause 3 pause 3 to the onsetter.
- k) Onsetter signals station signal 7 pause 3 to the driver.
- l) Driver acknowledges destination signal in full.
- m) Onsetter opens the shaft gates and cage doors just wide enough to let him through.
- n) Onsetter signals 2 to the driver, get into the cage, close the shaft gates and cage doors.
- o) Driver pauses at least 10 seconds and lowers the cage to 73 level.
- p) On arrival at 73 level the driver will stop on the correct station mark and signals a 3 to the onsetter.
- q) Onsetter opens the cage doors and shaft gates, and exit the cage with his helpers.
- r) Onsetter close the shaft gates and check that all persons are clear of the cage.
- s) Onsetter signals 2 pause 2 to the driver.

STAGE 5

- a) Banksman will do some checks before he commences with this task.
He will check the following:
Cage slings: Banksman checks the sling that is below the cage. It is only a visual inspection. He checks the sling for any broken wires or strands, any kinks, shackles, rust and any other irregularities.
Slings: Colour code, expiry date, visual inspection on the sling.
Bogey: The material in the bogey, if it is fasten properly, the wheels and the connecting pin between the wheels and the upper area, the sling that hold the two ends together, the tail sling on the bogey, the shackles on the slings, the winch rope that is going to be used.
- b) Now the banksman can commence with his procedure. Banksman signals a special signal to the driver or make an entry in his logbook. The driver will reply to the special signal, and or countersign the logbook.
- c) Banksman signals 8 to the driver.
- d) Driver signals 8 to the banksman, change the man switch to the material position and signals a 1 to the banksman.
- e) Banksman position the cage with a 4 pause 1 or an approved decking signal, stop the driver with the signal 1, when the cage is at the correct position, about 1,5m above the bank.
- f) Banksman remove the safety devices on the station; hook the winch rope to the rear end of the bogey where the tail rope is. Move the bogey slowly towards the shaft.
- g) Banksman and helpers fasten their safety belts, open the shaft gates and connect the bogey to the cage slings. Banksman will check the condition of the slings below the cage.
- h) Banksman will signal the winch driver when to slack and when to tighten the tail rope.
- i) Banksman signals 4 pause 1 to the driver, to raise the bogey into the shaft. When the whole bogey is in the shaft, the banksman will stop the driver with the signal 1.
- j) Driver will stop the winder and signal 1 to the banksman.
- k) Banksman will steady the material, remove the winch rope from the tail-end of the bogey, clear all his helpers from the shaft, close the shaft gates, release the safety belts and replace the safety devices on the station.
- l) Banksman signals station signal to the driver.

- m) Driver acknowledges station signal in full to the banksman.
- n) Banksman signals 2 to lower. Driver lowers the cage to the onsetter.
- o) On arrival at the onsetter, the onsetter will stop the driver with the signal 1. Onsetter will signal 8 to the driver.
- p) Driver will signal 8 to the Onsetter, select the switch from men to material and signal 1 to the Onsetter.
- q) Onsetter will check that his helpers secure themselves with the safety belts, pre-arrange with the winch operator, remove the safety devices on the bank and open the shaft gates and connect the winch rope to the tail-end of the bogey.
- r) Onsetter signals 4 pause 2 to the driver.
- s) Driver lowers the bogey slowly on to the station.
- t) Onsetter stops the driver with the signal 1 when the bogey is on the station and clear from the shaft.
- u) Driver signals 1 to the Onsetter.
- v) Onsetter disconnect bogey from the cage slings, replace cage slings and close the shaft gates, move the bogey away from the shaft and replace the station safety devices.
- w) Onsetter signal 8 pause 8 to the driver.
- x) Driver acknowledges 8 pause 8 to the Onsetter.
- y) Onsetter signals 2 pause 2 to the driver.

The correct procedure and signals to sling material into a shaft and the Safety precautions

Precautions

- Correct body position.
- Use safety equipment.
- Clean work area.
- Securing of rolling stock.
- Action taken to prevent slung material entering other compartments.

Lowering long material or equipment in a shaft. (Slinging)

There are two methods of lowering long material or equipment in a Vertical shaft.

One method is to place the long material in the cage with one end resting on the bottom deck, and the other end of the material protruding through the top of the cage and tied together to the winder rope.

The other method is to sling long material underneath the cage.

1. General rules for sling work.

- The banksman and his helpers are responsible to attach the required slings to the bottom of the cage.
- The banksman will use a platform to cover the shaft compartment, when his helpers attach the slings to the cage, and are secured by safety belts. After fixing the slings, remove the platform and safety belts.
- No other hoisting is permitted when the helpers attach the slings to the cage.
- Before sling work commence, the WED will be warned specially by the banksman, by means of a special signal or an entry in the WED logbook.
- The onsetter and his helpers are not allowed to travel with a cage loaded with long material or equipment in, or underneath the cage.
- The onsetter and his helpers will travel to the destination prior to sling work, and when he has to travel between levels during sling work, he will use the service winder, or the sling cage when it is clear of material.
- Pipes and rails, slung underneath the cage must be securely lashed together.
- Flexible plastic pipes will not be slung underneath the cage, but will be transported inside the cage.
- The total weight of material lowered (slung) will be according to the Inspector of Mines permission for that shaft.
- Check your shaft procedure for the quantities and weight of material that may be slung per trip.

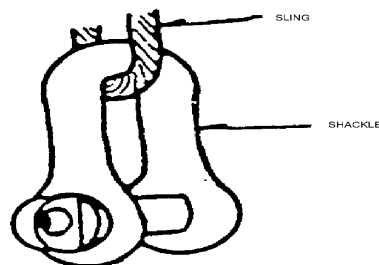
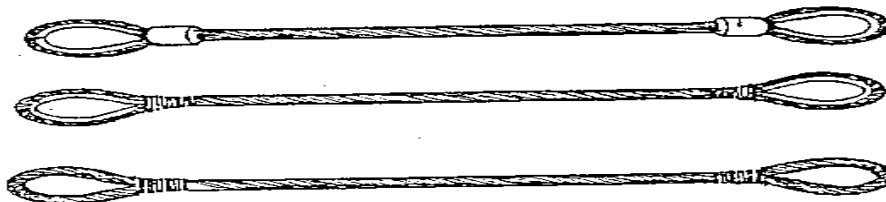
3. SLINGS

- All slings will be made from flexible galvanised wire rope 6 x 24 ordinary lay, 80/90 tons breaking strain and 10,47 tons breaking load.
- Only 16 mm and 38 mm shackles must be used.
- Slings are classified with an international colour code system.
- Each sling is marked with a different colour, indicating the different thickness of each sling.
- With the colour code system, it is easier to select the right sling for the right material.
- Each sling must have an expiry date.
- This date is marked on the thimble; a ring or a round metal tag that is fastens to the sling.
- The date that appears on the sling is the expiry date.
- This date is normally 6 months valid.
- The sling cannot be used after that date.

4. CARE AND MAINTENANCE OF SLINGS AND EQUIPMENT.

- The banksman and the onsetter will visually examine slings and shackles before use, and all slings and equipment will properly be stored in a special storing place on the bank, immediately after use.
 - Slings are normally stored in a vertical hanging position.
 - The banksman will remove all slings from underneath the cage when slinging operations are completed.
 - Whenever slings are transported inside a cage, they will be placed in bags or suitable containers to prevent them from moving out of the cage and fouling shaft equipment.
 - The rigger is responsible for the maintenance and examination of slings, shackles and other equipment.
1. Examine slings weekly and replace them every six months when the rings are annealed.
 2. Replace shackles every six months.
 3. Examine rings weekly and have them annealed every six months.
 4. Record all examinations and replacements in a book, kept in the Section Engineer's office.

Typical slings



5. SLING COLOUR CODE SYSTEM.

Different diameter slings have different breaking strengths, and to make sure that the correct slings are used when slinging the different types of material, check the colour code of slings posted up in the banksman's cabin.

SLINGS: SAFETY STANDARDS (Color code)

DESCRIPTION	WEIGHT (Kg)
8 Ton battery locomotive without battery	5 000
Hunslet diesel locomotive with Deutz engine	4 200
Hunslet diesel locomotive with Gardner engine	4 500
H and R diesel locomotive	3 500
5 Ton battery locomotive without battery	3 700
Mini substation	3 500
8 Ton locomotive battery (loaded on tray)	2 600
5 Ton locomotive battery (loaded on tray)	1 500

RADIUS OF SLING	COLOUR CODE
8 mm	Orange
9,5 mm	Green
13 mm	White
14 mm	Grey
16 mm	Blue
18 mm	Aluminium
20 mm	Black
22 mm	Red
24 mm	Yellow
26 mm	Brown

PROCEDURES TO SLING LONG MATERIAL IN A VERTICAL SHAFT

5. LOWERING LONG MATERIAL IN A VERTICAL SHAFT (SLINGING)

The driver will be notified by the banksman that long material will be lowered below the conveyance. This is done either by a special signal or the banksman must make an entry in the driver's logbook.

Assuming that long material is to be lowered below the conveyance in a Vertical shaft. The following procedure will be followed.

The driver will:

- Reply to the special signal from the banksman.
- Receive the clear signal from the onsetter.
- Receive the signal 4 pause 1 from the banksman.
- Raise the top conveyance about 1.5 meters above the bank level mark.
- Stop on the signal 1 received from the banksman.
- Receive the mark signal 4 pause 4 from the banksman.
- Mark the depth indicator and the drum.
- Reply to the mark signal 4 pause 4 from the banksman.
- Receive the clutching signal, mark signal and the clear signal from the banksman.
- Test both brakes separately and if satisfied, unclutched the top conveyance.
- Position the bottom deck of the bottom conveyance 1.5 meters above the station mark.
- Clutch in and test both brakes separately.
- Signal the clutching completed signal to the banksman.

The driver clutch in such a manner to enable the banksman and the onsetter to attach and detach the long material from the conveyance simultaneously.

The driver will:

- Reply to the signal 8 from the banksman. (For continuous lowering of material it is not necessary to interchange the signal **8** before every trip, but only on commencement of material)
- Pause a few seconds and signal the signal 1 to the banksman. (The driver must signal this signal spontaneously)

The banksman attaches the long material to the slings below the conveyance. [Remember to use the signal 7]

The driver will:

- Receive the signal **4** pause 1 from the banksman.
- Operate a special switch, backing out switch, or move the man / rock lever to the rock position.
- Raise the conveyance slowly.
- Stop on the signal 1 received from the banksman.
- Reply to the signal 1 from the banksman.

The banksman and his helpers will steady the long material below the conveyance.

The driver will:

- Receive the signal 4 pause 2 from the banksman.
- Lower the conveyance slowly.
- Stop on the signal 1 received from the banksman.
- Release the special switch, backing out switch or move the man / rock lever to the man position.
- Reply to the station signal from the banksman.
- Receive the signal 2 from the banksman to lower the conveyance.
- Apply sufficient current to raise the bottom conveyance, control the speed and watch the depth indicators and coiling.
- Lower the conveyance to the onsetter.
- Reduce the winder speed to approach the signalled destination.
- Stop on the signal 1 received from the onsetter.
- Reply to the signal 8 from the onsetter.

The person who receives the first loaded conveyance of material must also interchange the signal 8 to the driver. It is only applicable on the first trip.

The driver will:

- Pause a few seconds and signal 1 to the onsetter.

The onsetter and his helpers will hook the bottom of the long material and pull the material towards the station.

The driver will:

- Receive the signal 4 pause 2 from the onsetter.
- Lower the conveyance slowly.

While the conveyance is being lowered slowly, the onsetters helpers will use a winch or man handle the long material out of the shaft and lower them onto the station.

The driver will:

- Stop on the signal 1 received from the onsetter.
- Reply to the signal 1 from the onsetter.
- Reply to the signal 1 from the banksman.

It is now possible for the banksman to attach, and the onsetter to detach the long material simultaneously from the conveyances.

The driver will:

- Receive the clear signal from the onsetter.
- Receive the signal 4 pause 1 from the banksman.

On completion of lowering long material to the onsetter, the banksman and the onsetter must interchange the signal 8 pause 8 with the driver. The driver will acknowledge the signal 8 pause 8 to the banksman and the onsetter.

SHAFT EXAMINATION VERTICAL SHAFT

Examination platform

16.14 Where the roof or cover of a cage, skip or any other means of conveyance is used as a platform for persons engaged in examining, repairing or doing other work in a vertical or steeply inclined shaft or wins, the persons so engaged shall be protected by a hood or cover immediately above them. Such hood or cover shall be removed as soon as work is completed.

Provision for crossing shaft

16.51 At any place in a shaft where it is necessary for workmen to pass from one side to the other, provision shall be made for them to do so without entering or crossing a compartment in which winding is taking place; such passage shall be securely fenced off from moving parts of machinery and from any conveyance.

Entering winding compartments

16.52 No person shall enter or cross a compartment of a shaft or of a headgear in which winding is taking place, except for the purpose of entering, leaving or having access to a cage, skip or other conveyance or for the purpose of conducting an examination, effecting repairs or doing other necessary work in such compartment.

Winding during repairs

16.53 No winding operations shall be carried on in a shaft or a headgear while persons are engaged in effecting repairs, conducting an examination or doing other work in such shaft or headgear, except -

16.53.1 where such winding operations are necessary for the purpose of effecting the repairs, conducting the examination or doing the other work, or

16.53.2 where the persons engaged in effecting the repairs, conducting the examination or doing the other work are adequately protected from the conveyances and other winding equipment used in such winding operations as well as from falling stones and falling material.

Repairs in shaft

15.54 No person shall effect repairs, conduct an examination or to do other work in a shaft or a headgear while winding operations are being carried on in such shaft or headgear, except -

16.54.1 Where such person is adequately protected from the conveyances and other winding equipment as well as from falling stones and falling material or

16.54.2 Where the winding operations are necessary for such person to effect the repairs, conduct the examination or to do the other work.

Driver to be specially warned

16.55 The person in immediate charge of any repairs or examination in a winding compartment of a shaft or winze or a headgear or in immediate charge of any work in connection with maintenance or installation of equipment in a winding compartment of a shaft or winze or a headgear shall warn the driver of the winding engine operating the conveyance in such compartment that such repairs, examination or work are about to be undertaken and where practicable shall enter forthwith, in the presence of the driver on duty at the time, such warning in the driver's logbook provided in terms of regulation 16.81. Such entry shall be countersigned by the driver and by any driver relieving him. Where it is not practicable for the person in charge of such repairs, examination or work to enter such warning, the entry shall be made by the driver on duty. Except where the provisions of regulations 16.53.2 and 16.54.1 are complied with, the driver of every other winding engine operating conveyances in the shaft or winze or headgear shall be warned in a similar manner. The entry shall be cancelled by the person in immediate charge of such repairs, examination or work on completion thereof.

TRAIL RUN OF WINDING PLANT

16.72 When winding in any compartment or compartments of a shaft, winze or headgear has been stopped for repairs or blasting operations or when it has been stopped for any other purpose for a period exceeding one hour in duration or when a conveyance has been changed, the winding engine serving such compartment or compartments shall not be used for the raising or lowering of persons until the cage, skip or other means of conveyance has been run at least one complete trip up and down such compartment or compartments: Provided that this regulation shall not apply to the use of the winding engine for the raising or lowering of persons conducting an examination or effecting repairs: and provided further that where such stoppage is confined to a portion of any compartment or compartments, the requirements of this regulation shall apply only to such portions.

What is clutching?

- To make the rope longer or shorter.
- The winding engine driver will test brakes, unclutched 1 drum, the other drum will stay stationary.
- Move the unclutched drum to destination.
- The winding engine driver will re-clutch the drum, test brakes again.
- When clutching down ,clutch first, the move onsetter
- All ways when clutching down do trail run.
- When clutching up, first move onsetter, then clutch
- No trail run when clutching up.

1. Pre-arrangements

The person in charge of the examination must make pre-arrangements, with the driver and make an entry in the driver's logbook according to regulation 16.55.

Pre-arrangements are dealing with the discussion of the work to done and emergencies that could occur during examination, and the action on the emergencies.

2. Rig-up procedure.

The banksman is always responsible for the safety of persons, those who are under his direct supervision or not, the banksman is responsible for those persons who are effecting the rig-up procedure.

The banksman must check that equipment and material has been placed and secured properly and safely on the conveyance.

Banksman must check that all persons are equipped with personal protective equipment, and wear it properly. [Safety belts]

The banksman must send them down to commence the procedure.

Procedure for shaft examination.

Safety precautions

- At any mine or works no person shall work, or cause or permit any other person to work, in any position from which falling or slipping of such person may result in injury unless such person is, secured by a lifeline or otherwise suitably safeguarded.
- No person shall work or be present at or near or cause or permit any other person to work or be present at or near any place where there may be danger of falling mineral or material unless s/he or such other person wears a hard hat in good condition and of a type approved by the *Chief Inspector*.
- Every entrance to every vertical or steeply inclined shaft, winze, sump, rock-pass or other dangerous excavation shall be kept properly closed by a fence, barrier, door or gate, or shall be kept adequately covered, so as to prevent persons having unintentional access to, or accidentally slipping or falling into, such excavation.
- No timber, rock, tools or other articles shall be placed or allowed to remain where they accidentally can fall or be caused to fall down any vertical or steeply inclined excavation and thereby endanger the safety of persons.
- No person shall work or travel in any unilluminated part of a mine or works unless s/he carries a light.
- Every conveyance used for examining, repairing or doing other work in a vertical or steeply inclined shaft or winze shall be provided with a substantial roof or cover and shall be sufficiently enclosed to protect any person from accidentally falling out.
- Where the roof or cover of a cage, skip or any other means of conveyance is used as a platform for persons engaged in examining, repairing or doing other work in a vertical or steeply inclined shaft or wins, the persons so engaged shall be protected by a hood or cover immediately above them. Such hood or cover shall be removed as soon as work is completed.
- Every shaft where persons travel on or in the conveyance while carrying out any examination, repair or other work shall be provided with some efficient means, approved by the *Principal Inspector of Mines*, whereby persons doing such examination or work can signal effectively from any depth in the shaft to the winding engine driver.
- No winding operations shall be carried on in a shaft or a headgear while persons are engaged in effecting repairs, conducting an examination or doing other work in such shaft or headgear, except: - where such winding operations are necessary for the purpose of effecting the repairs, conducting the examination or doing the other work, or :- where the persons engaged in effecting the repairs, conducting the examination or doing the other work are adequately protected from the conveyances and other winding equipment used in such winding operations as well as from falling stones and falling material.
- No person shall effect repairs, conduct an examination or to do other work in a shaft or a headgear while winding operations are being carried on in such shaft or headgear, except; where such person is adequately protected from the conveyances and other winding equipment as well as from falling stones and falling material or, where the winding operations are necessary for such person to effect the repairs, conduct the examination or to do the other work.
- The person in immediate charge of any repairs or examination in a winding compartment of a shaft or winze or a headgear or in immediate charge of any work in connection with maintenance or installation of equipment in a winding compartment of a shaft or winze or a headgear shall warn the driver of the winding engine operating the conveyance in such compartment that such repairs, examination or work

are about to be undertaken and where practicable shall enter forthwith, in the presence of the driver on duty at the time, such warning in the driver's logbook.

- Such entry shall be countersigned by the driver and by any driver relieving him/her. Where it is not practicable for the person in charge of such repairs, examination or work to enter such warning, the entry shall be made by the driver on duty. Except where winding operations are not stopped which will endanger persons examining, repairing or doing other work in such shaft. The driver of every other winding engine operating conveyances in the shaft or winze or headgear shall be warned in a similar manner.
- The entry shall be cancelled by the person in immediate charge of such repairs, examination or work on completion thereof.
- No person, other than the banksman or onsetter on duty, shall give or shall be caused or permitted to give any signals for the raising or lowering of persons provided that – when the banksman or onsetter is not available, a competent person to whom the manager has given written permission to do so may give signals for the conveyance of him/herself and any person travelling with him/her.

The person in immediate charge shall take all reasonable measures to safeguard against accident to all persons at the place where s/he is in charge, whether such persons are under his/her direct supervision or not.

What will protect persons when examining, repairing or doing other work in a vertical or steeply inclined shaft or winze?

Roof or cover of a cage, skip or any other means of conveyance is used as a platform for persons engaged in examining, repairing or doing other work in a vertical or steeply inclined shaft or wins, the persons so engaged shall be protected by a hood or cover immediately above them. Such hood or cover shall be removed as soon as work is completed.

May winding operations be carried out in a shaft or a headgear while persons are engaged in effecting repairs, conducting an examination or doing other work in such shaft or headgear?

No winding operations shall be carried on in a shaft or a headgear while persons are engaged in effecting repairs, conducting an examination or doing other work in such shaft or headgear, except - where such winding operations are necessary for the purpose of effecting the repairs, conducting the examination or doing the other work, or where the persons engaged in effecting the repairs, conducting the examination or doing the other work are adequately protected from the conveyances and other winding equipment used in such winding operations as well as from falling stones and falling material.

The person in immediate charge shall not allow any unauthorised persons to give signals on the signalling arrangements used in connection with winding operations.

The person in immediate charge shall not give the "clear signal" 2 pause 2 or any signal to raise or lower the conveyance unless all persons at the bank, station, landing platform, loading box or other place where he is in charge, are in a position in which they will not be endangered by the movement of such conveyance or any other conveyance operated by the same winding engine.

Preparation for shaft examination and repairs

The person in immediate charge will be responsible for the safety of all persons during shaft examination and repairs that must check that no person could be injured when a signal is transmitted to move the conveyance.

The person in immediate charge will be responsible to make pre-arrangements with the driver and enter all this information and time in the driver logbook.

The person in immediate charge must sign and the driver must counter sign the entry.

Pre-arrangements must include but not limited to; procedures to follow for failure of the signalling system as well as that for accident to person signal is received during shaft examination.

In preparation for shaft examination the banksman will check that all gates and doors are closed and gantries secured, all safety devices are positioned on the bank, the bank area is clear of all tools, equipment, material and persons.

The person in immediate charge must: -

- Instruct the onsetter to interchange signals with the driver to travel to the required position.
- Instruct the onsetter to transmit a clear signal on the underground lock bell system to the driver.

The driver will position the required conveyance at the bank. (In accordance with the pre-arrangements)

The person in immediate charge must: -

- Transmit signals to position the conveyance correctly at the bank.
- Interchange the mark signal 4 pause 4 with the driver.
- Instruct all persons to stand clear of the shaft entrance.
- When required transmit the clutching signal, destination signal for the lowest examination point in the shaft and clear signal to the driver.

The driver has to clutch correctly for the bank and the lowest examination point.

The person in immediate charge must: -

- Receive the clutching completed signal from the driver.
- Interchange the signal 7 with the driver.
- Check that the robot indication is green.
- Instruct all persons to secure their life-lines to the shaft structure.
- Secure handrails when required, protective hood or cover and place the examination equipment correctly in/on the examination platform.

When the top of the skip is used as a working deck a platform must be fitted inside the skip and a hood or cover to protect persons from falling objects.

Test the shaft examination signalling system for functionality and request the shaft electrician to test the battery.

On completion of rigging-up for shaft examination and repairs: -

The person in immediate charge must: -

- Instruct all persons who have had access to the conveyance to stand clear of the shaft.
- Instruct the assistants to close the shaft gate.
- Interchange the 7 pause 7 signals with the driver.
- Interchange the 6 pause 6 pause 6 pause 6 signals with the driver. (*Shaft examination and repairs*).

What is a trail run?

One complete trip, with both conveyances, down and up the shaft.

When must the driver do a trail run?

- When he did not wind in an area of the shaft for longer than one hour.
- After shaft examination and repairs.
- After hoist examination.
- After the changing of conveyances.
- After replacing or cutting ropes.
- After blasting near the shaft area.

What is Pre-arrangements?

The person in charge of the examination must make pre-arrangements, with the driver and make an entry in the driver's logbook according to regulation Pre-arrangements are dealing with the discussion of the work to done and emergencies that could occur during examination, and the action on the emergencies.

Explain the Rig-up procedure.

The banksman is always responsible for the safety of persons, those who are under his direct supervision or not, the banksman is responsible for those persons who are effecting the rig-up procedure. The banksman must check that equipment and material has been placed and secured properly and safely on the conveyance. Banksman must check that all persons are equipped with personal protective equipment, and wear it properly. [Safety belts]The banksman must send them down to commence the procedure.

Name the equipment required for shaft examination?

- Canopy of roof
- Barricade around cage or hand rails
- Bright lights
- 2 Signalling systems
- Hard hats
- Fire extinguishers, water bucket and sand
- Safety belts
- Shaft examination tools

Explain how you will examine an incline shaft?

- Examinations are done by walking down the shaft
- The Manager must appoint in writing, a competent person or persons to examine the shaft once a week.
- Run both conveyances out on the drop sets.
- Sign the Driver's log book – the Driver and the Relieving Driver must countersign.
- The shaft is locked and examination can commence
- The Timberman and his workers examine:
 - Hanging and sidewalls
 - Rails, fishplates and bolts
 - Marshall alarm wire, see that bobbins are dry and unbroken
 - Rollers
 - Clearance for skips
 - Ladder way (breaks and handrails)
 - Air, water and pump column
 - At stations the brows, gates and drop sets
 - Loading boxes
- On completion the shaft is opened and the conveyance does one complete trip
- The Driver's logbook is signed off and all details of the examination are entered in the shaft logbook

Procedure for shaft examination. [VERTICAL SHAFT]

- The person in charge of shaft examination will make an entry in the driver's logbook. Special instruction consists of the time, description, signature of driver and the signature of person in charge of examination.

- The banksman must clutch correctly, 4-4-4 S/S for the bank and the lowest examination point in the shaft.
- If necessary, the onsetter must do an all level to raise all the stranglers.
- Banksman signals a 4 pause 2 to the driver to lower the conveyance to position the roof of the conveyance level at the bank.
- Banksman stop the driver with the signal 1. Banksman signals the signal 7 to the driver. The driver acknowledges the signal 7 in full to the banksman.
- The banksman, timber man and his helpers will prepare the conveyance. They will fit the cover, handrails, tools, the E-cam and the I-coil of the E-cam. They will also test the E-cam with the driver, the signal and speak unit.
- Banksman signals 7 pause 7 to the driver.
- Driver signals the signal 7 pause 7 to the banksman.
- Banksman signals 6 pause 6 pause 6 pause 6 to the driver.
- Driver signals 6 pause 6 pause 6 pause 6 to the banksman.
- Banksman signals 3 to the driver.
- Driver signals 3 to the banksman.
- Banksman load the persons involved in the examination, check that they fasten their safety belts. Check that the cover is properly in position before he gives signals to lower.
- Banksman signals 4 pause 2 to the driver to lower the conveyance. Driver lowers the conveyance slowly.
- The timber man stops the driver with a signal 1, when the conveyance is about one turn below the bank. When the driver does not receive the signal 1, he will stop with in one turn below the bank. The timber man must test the E-cam again by means of the signal 15.
- Driver acknowledges the signal 15 to the timber man.
- Timber man signals 15 pause 2 pause 2 on completion of the E-cam test to the driver.
- Timber man signals 4 pause 2 to the driver to lower the conveyance.
- Shaft examination will proceed to the first passenger landing.

Checks in the shaft:

Electrical cables, Contact wire and insulators, Pipe columns, brackets and bearers. Guides, joints, wedges, brackets and bolts. Dividers. Bunton's. Shaft screens and bratticing, Clearances between landings and conveyances. Water rings, Side-walls. Water seeping into the shaft. Bratticing between shaft, spillage compartments. Brow boxes .Penthouses.

Checks on the station landings (rail mats) and shaft gates.

- Station screens, bratticing and barricades, Safety devices on station, Communication systems, Lock, Call-bell. Station and tip cross cut lights. Notice boards. Shaft tips. Ore pass control boxes. Dust extractor fans, bags and enclosure.
- On completion of shaft examination the timber man will go to the bank. Stop the driver with a signal 1. Driver signals a signal 3 on the lock-bell system. Timber man and his helpers may leave the conveyance.
- Banksman signals 7 to the driver. Driver signals 7 to the banksman. The banksman, timber man and his helpers will remove all the tools and the cover from the conveyance.
- Banksman signals 7 pause 7 to the driver. Driver acknowledges the signal 7 pause 7 to the banksman.
- There is no cancelling signal for shaft examination, but only an action nil, to clear the driver's logbook.