



Kopanang Mine Cage Levelok Safety Enhancements

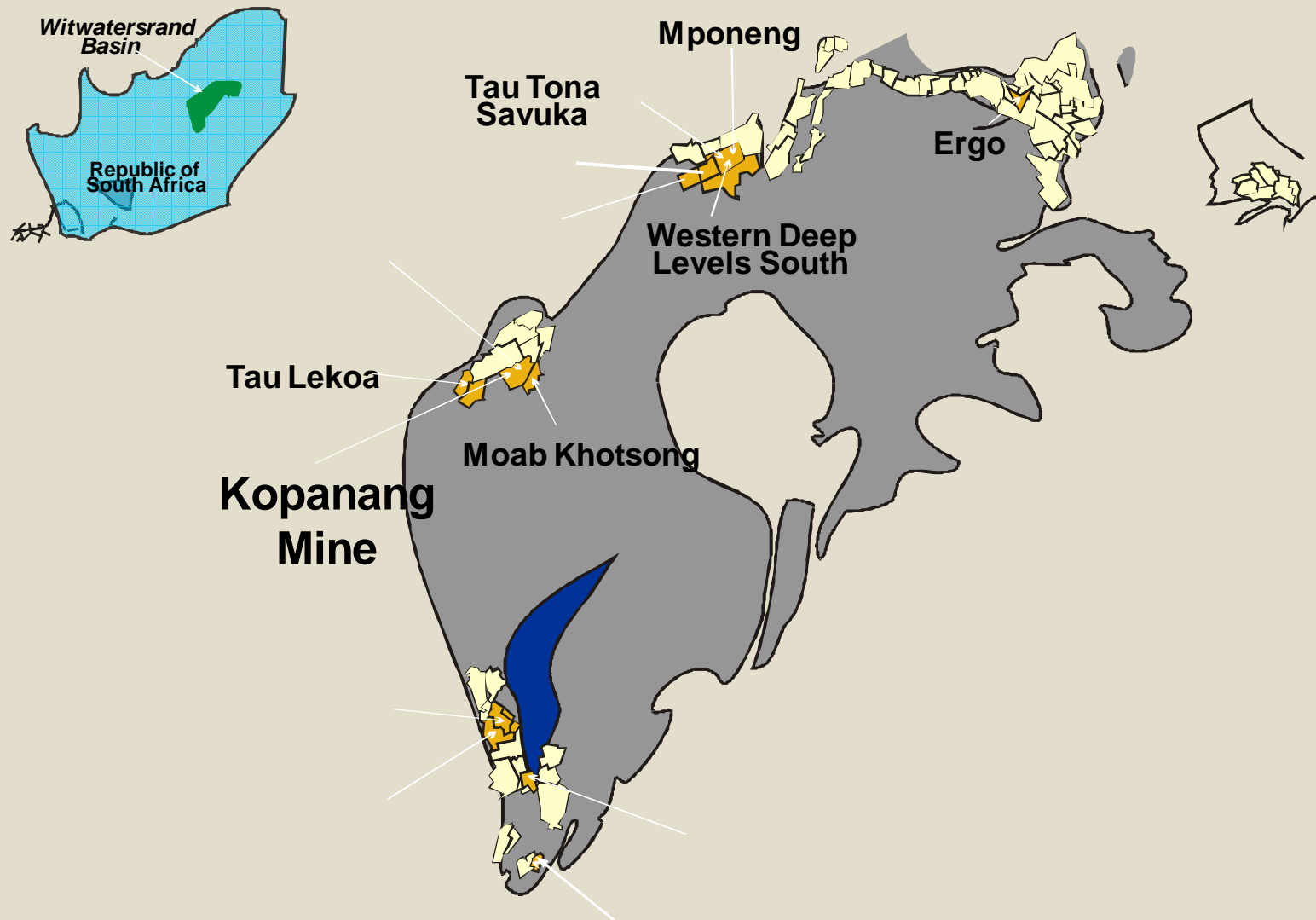
Deon Wilken

24 July 2008

It is OK!



Location



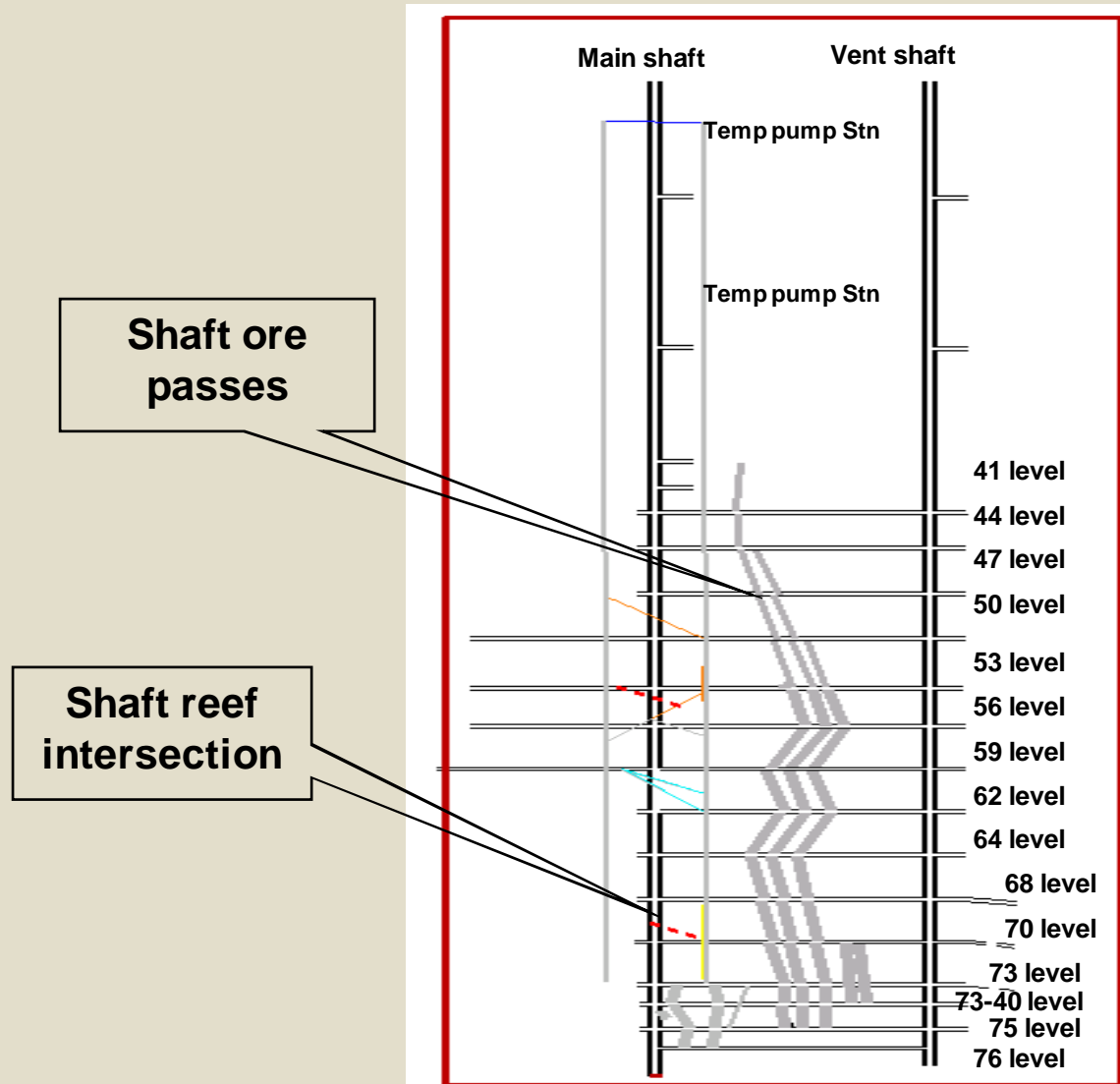


Kopanang Mine - Facts

- Kopanang means “Place where people come together” [Sesotho]
- Kopanang mine originally formed part of Vaal Reefs Exploration and Mining Company and was known as Vaal Reefs No 9 shaft, situated in the South Vaal lease area.
- Shaft sinking at No 9 shaft began in 1978 before reaching a final depth of 2,240 m.
- The shaft has 15 levels of which 10 are production levels.
- The first gold from the shaft was produced in 1984.
- Today, the shaft hoists approximately 226,000 tons of material, including waste, per month.
- Mining takes place at an average depth of 1,770 m below surface.
- Kopanang mine has a work force of about 6321 people



Mining Layout





Need for cage clamping

- Depth of the single lift shaft
- Excessive rope stretch when loading 144 people in 3 deck cage
- Damage to cage when loading heavy material cars underground
- Danger when off loading material cars underground



Systems available

- Kepps
- Levelok

Safety features on Levelok



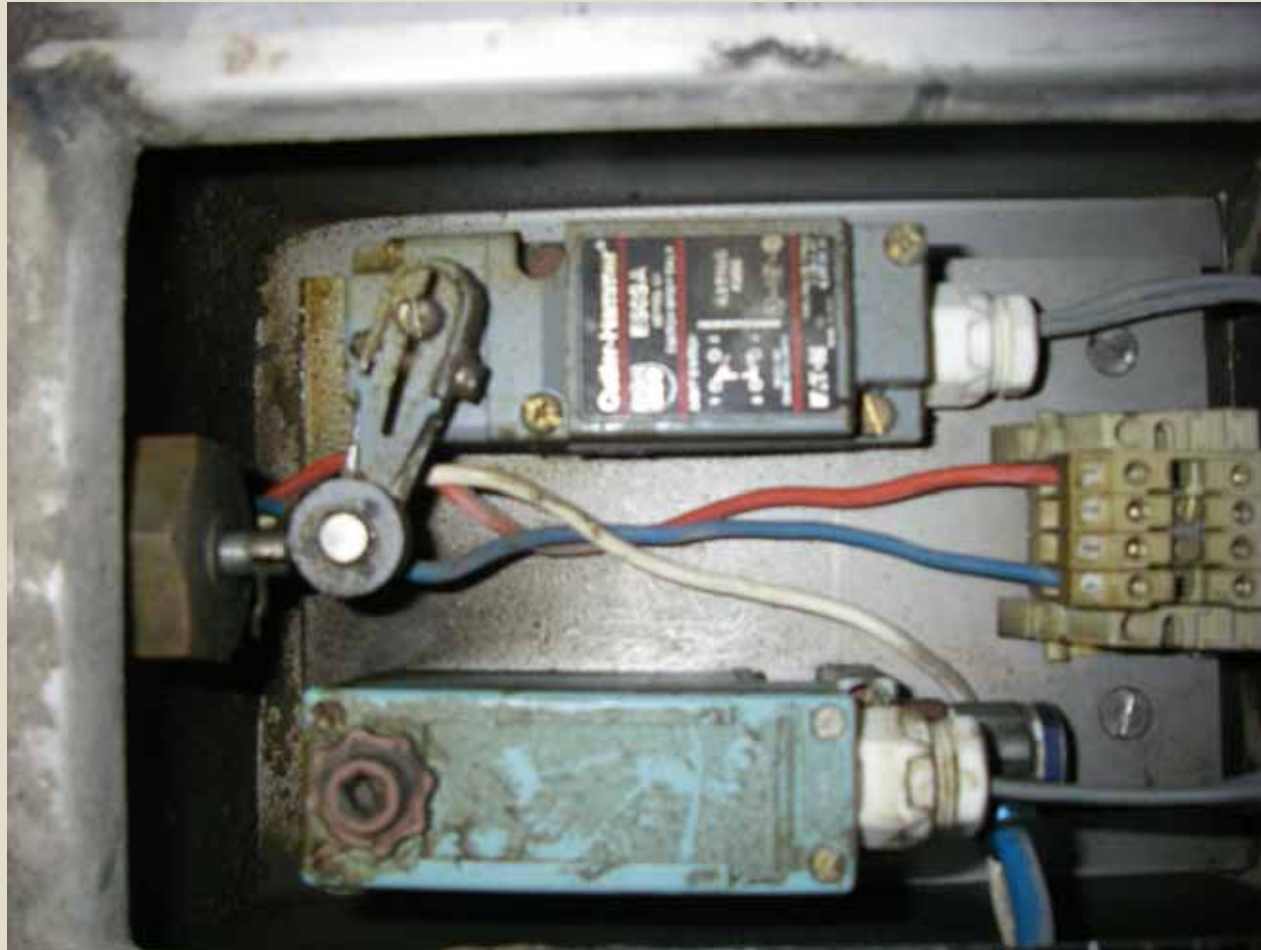
- Park box limit switch
- Park box pressure switch
- Fly hose sleeve
- Fly hose non return valve
- Clamp lock valve

Fly hose on Park box



It is OK!

Park box limit switch



It is OK!

Fly hose





Incidents

- Unauthorised uncoupling of the fly hose
- Stalling of intensifier pump before achieving operating pressure



Methods of risk amelioration

- Lock fly hose with onsetter key
- Release Levelok from Winder via slack rope system after winder receive all clear signal
- Release Levelok from Lock bell box via infra red beam
- Release Levelok via tag reader on cage

Mechanical release valve





Tag reader

- Number of working levels
- Less maintenance



Modifications of existing system

- Install tag reader on each deck of conveyance
- Install solenoid valve on power pack
- Make use of Grinaker slack rope system to send data to winder
- Incorporate levelok into winder brake safety system
- Incorporate on winder Scada system



Added safety advantages

- Indication for onsetter when the pump reaches operating pressure
- The release of the clamp is controlled by the onsetter
- The WED can see the condition of the clamps on the Scada
- An alert system for artisans by means of low oil level indicator light

Card reader

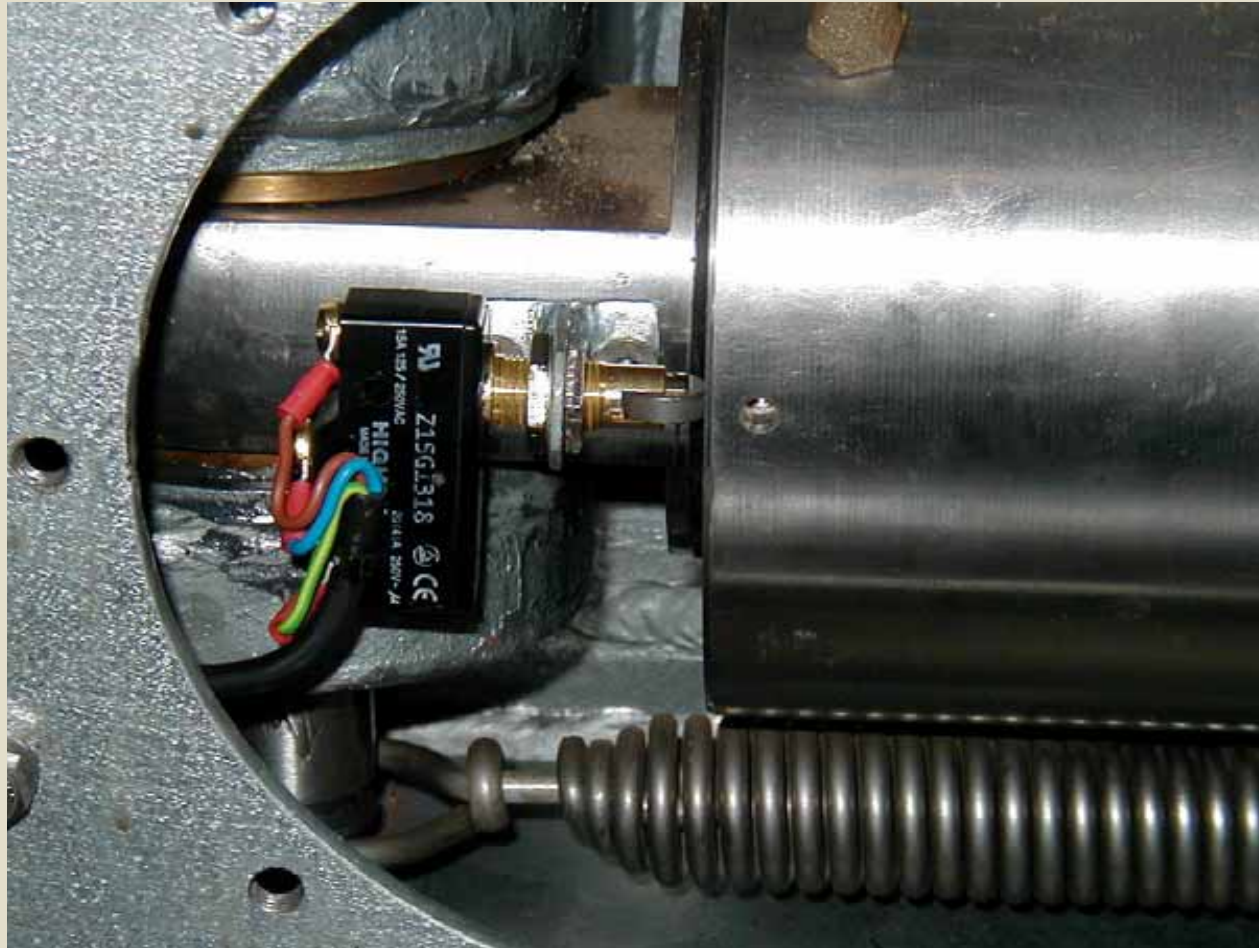


Solenoid dump valve on pump



It is OK!

Limit switch in clamp



Location



Manuel release of clamp



It is OK!

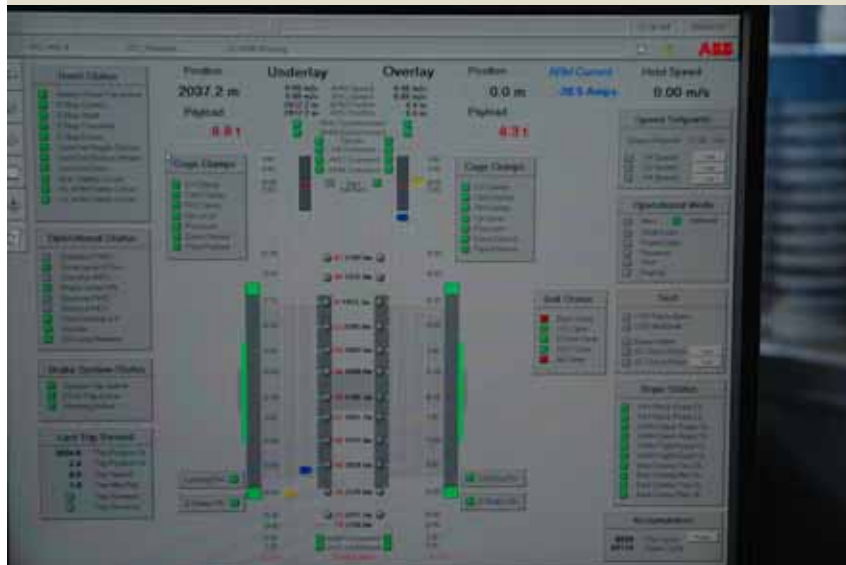


Man Winder



It is OK!

Scada System



It is OK!



It is OK!