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IIT(BHU) ,VARANASI STUDENT'S NOTES

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Alimak raise climbers

Raise climbers,commonly known as Alimak raise climbers after the company that first introduced them in 1957, are used to drive vertical or inclined raises in underground development and mining operations. Raises up to 1000 metres are possible with this method, but practically, raises less than 300 m are more common. The method of excavation has been used successfully on many project applications, including ore and waste pass raises, ventilation shafts and airways, main shaft excavating, communication shafts and materials handling shafts. Air motors driven climbers are normally used to drive short raises. Electric powered raise climbers are used for longer raises.

Compared to open raise construction, there is no restriction on raise angles. Compared to raiseboring, there is not as high a power requirement and no need to pour reinforced concrete foundations. Alimak raising provides the safest of all entry methods involving the least risk to the miner and can excavate safely through all types of ground conditions supporting the face after each blast is taken ensuring the integrity of the excavation during all stages of development. The method enables raise development approaches that cannot be carried out using raiseborers and has the added advantage of in raise access to allow for the installation of ground support and grouting of water inflows as the raise is excavated, unlike raise boring where boring through highly stressed or bad ground conditions only ends up in ultimate failure or costly and time consuming remediation

Worldwide more than 2,300 Alimak raise climbers have been distributed since 1957, being used to drive more shafts and raises than any other system.

Even multiple raises with directional changes in the raise of up to 90° can be carried out easily making this method the ideal choice for ore passes, crusher chambers, split level ventilation raises or any difficult excavation profile.

The Alimak raising method consists of five steps, which together make up a cycle. The five steps are all dependent on the Raise Climber, which serves both as a working platform and a means of transport up to the work site. The five steps are:

1. DRILLING - Drilling is done from a platform on the Raise Climber. The platform is adapted to fit the size and shape of the raise required.
2. LOADING -Loading is also done from the platform. Explosive charges are placed in the holes by hand.
3. BLASTING -Before blasting, the Raise Climber is moved down to the nest for protection against falling rocks. Then the blast can be triggered from a well protected spot close by.
4. VENTILATION -Noxious gases and dust created by the blast are cleared by spraying a mixture of water and air from the top of the guide rail.
5. SCALING -When the air is free of dust and gases, the crew can ascend to the face to begin scaling and installation of a new guide rail section. This is also done from the platform, under the protection of the safety canopy

Safety devices

Raise climbers have a very good safety record. The drive gear of air dribven raise climbers is equipmmed with an air operated brake whch is activated when ar for the motors is shut off. There is a safety device that{footnote}Raise Climbers, Hans Svensson, Underground Mining Methods Handbook, W.A. Hulstrulid, Ed. 1982 {/footnote}

The raise climber climbs along a pin rack welded to a guide rail whic is also used to supply air and water for the drills. The rail is extended i 1 or 2 metre sections as the raise is extended. The rail is fastended to the wall of the raise with rockbolts.