

Editorial

Tunnelling is a fascinating and challenging experience. It is fascinating because tunnels may be considered as an engineering marvel which thrills an individual as he passes through it. This experience can be compared with the experience of seeing an airplane flying above; no matter how many times one has traveled in an airplane.

With the advent of new investigating and exploring equipments and techniques including the geophysical techniques, it has become possible to know the rock mass to be tunnelled through in advance. But, still there are surprises and problems and therefore tunnelling is considered as a challenging activity. We need to overcome these problems by adopting the approach of thorough investigations and explorations at feasibility and DPR stages and really before taking up the excavation work.

There are state-of-the-art computer software available for tunnel design and machineries to excavate and support the tunnel. Once we know the rock mass accurately in advance, to some extent, we can plan and select the right tunnelling technique, machines, etc. It is high time now when we should realize that tunnel and underground construction activities shall be tackled more scientifically.

A mountain once roused does not sleep again. The rock engineers most of the time handle the rock carelessly and realize their mistake when it starts creating problems which are difficult to tackle apart from leading to time and cost over-runs. The problems are more aggravated in case of highly fragile and weak rocks as in lesser Himalayas. Hence, it is important to know about the anticipated behaviour of rock mass in advance and then tackle it carefully in a non-violent manner.

According to Harvey W. Parker, Past President, International Tunnelling Association (ITA), tunnel and underground space shall be regarded as an investment and not as an

expenditure. Hence primary objective should be to construct safe tunnel, keeping in view the life of the structure. We will have to be more quality and safety conscious.

Another issue which needs to be highlighted here is monitoring and maintenance of tunnels. In other countries there are rules for the maintenance. Is it not required in all other countries which are not having such guidelines?

Recently, European Construction Technology Platform has made clear statement that 'underground construction will be safe and with no impact on the environment'. It has set up year-wise targets for technology break-through. *Couple of important targets set by the year 2030 are; (i) similar cost for underground and above ground structure and (ii) no workers inside tunnel during construction (totally automated remotely controlled tunnel construction work). At first glance, the set goals seem to be rather unrealistic. Nevertheless, the future developments may surprise us.*

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