

## 4. MINERAL SERVICES

### **R&D Services**

Some of the important aspects of these R&D programmes in the non-coal sector are summarised below for ready reference (significant contributions have been made in optimum exploitation of coal from existing and new mines).

1. Optimisation of stoping parameters and stop design
2. Numerical modeling of rock excavations
3. Ground monitoring and control
4. Support of underground excavation and tunnels
5. Back filling
6. Blasting
7. Method of working
8. Ventilation
9. Conservation of minerals

CMRS since its inception in 1956 is involved in research in the field of:

- coal mine galleries,
- stope backs and drivages,
- hydroelectric tunnels, and
- other underground excavations such as power houses and caverns for different rock conditions (including highly disturbed rocks in Himalayas and rock pressures including squeezing conditions).
- Presently a new area of R&D for large scale underground storage has also been taken up, under the broad area of "Underground Space Technology".

### **Mechanisation Problems**

The problems associated with mechanisation schemes in coal and non-metaliferrous mines can be classified as follows:

#### (1) Technical Problems

##### (a) Geo-Know-How

Problems due to lack of prior knowledge of geomining conditions and geology of the area where mechanisation scheme had to be planned.

##### (b) Tech-Know-How

1. Inappropriate selection of machines
2. Lack of standardisation techniques