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Guest Editorial

It is a great honour for me and at the same time a pleasure to write this editorial on behalf of the JRMTT team as the newly elected President of the Indian Society for Rock Mechanics and Tunnelling Technology (ISRMTT). I recall that the Journal started in 1993 and as an overseas citizen of India (OCI) I became a member of ISRMTT in 1992. Since that time, I have had the opportunity to contribute to JRMTT and describe some of the updates and new technology being used in Norway and abroad for construction of tunnels. The contributions pertain to design of nuclear waste repositories and bypassing landslides through tunnels using the principles of Norwegian Tunnelling Technology including cost-benefit analysis. The Indian Journal of Rock Mechanics and Tunnelling Technology (JRMTT) is an excellent means of contributing and conveying updates in Tunnelling Technology.

I have fond memories of the fruitful discussions I had at that time with Late Prof. Bhawani Singh, Dr. V.M. Sharma, Dr. J.L Jethwa, Dr. V.K. Mehrotra and a host of others including Prof. T. Ramamurthy who is still active in geotechnical engineering. Such interactions have helped me enhance my knowledge in Rock Engineering. It was not only these late stalwarts with whom I had excellent discussions in our field of common interest, but many young and upcoming experts who are now Seniors and making excellent contributions to both the JRMTT Journal and ISRMTT. These include, Dr. R.K. Goel, Dr. Rajbal Singh, Dr. A.K. Dhawan, Mr. Anil Swarup and others who were glad to share their experiences and knowledge with me during the days when I was doing PhD (1993-1997) at the Norwegian Geotechnical Institute (NGI) in Oslo, Norway.

I have been fortunate to be at NGI since that time and had the opportunity to be a part of the NGI team that introduced the principles of the Norwegian Method of Tunnelling (NMT) to India in 1993. The introduction of NMT commenced at the Nathpa-Jhakri Hydroelectric project site in Himachal Pradesh. In this project, the practical application of some of the principles of NMT were attempted through training workshops that were organised by the Central Soil and Materials Research Station (CSMRS), Ministry of Water Resources in Delhi. During these practical workshops at Nathpa-Jhakri, it was realised that not only the Indian tunnelling community benefitted but also the Norwegian team which learned a lot by working in a significantly different engineering geological environment (lower and middle Himalayas) than that prevalent in Scandinavia. Both, Dr. Nick Barton and Mr. Eystein Grimstad provided insights into how the Q-system can be applied and modified to suit the Himalayan rock conditions. The highly anisotropic nature of the rocks prevalent at the hydroelectric project strongly warranted the application of advanced numerical tools such as UDEC-BB and 3 DEC to compliment the empirical approach utilising the Q-system of rock mass classification. This added confidence to the application of NMT to Himalayan rocks. One aspect which really surprised the Norwegian Team was the fact that the amount of geotechnical investigations performed on such challenging projects in weak Himalayan rocks contributed to less than 1% of the total cost of the project. Norway had realised quite early (around the late 1970s) that one must utilize atleast 3% of the estimated total cost of a project on pre-investigations. Unfortunately, this number has still not been achieved in Indian projects. This is probably one of the major reasons why most underground projects get delayed from time to time.

It was heartening to see the successful application of Reinforced Ribs of Shotcrete (RRS) as one of the components of NMT implemented by RVNL at their Rishikesh-Karnaprayag rail tunnel project. The credit goes to Er. Sumit Jain, Project Manager at RVNL for successfully designing, implementing and instrumenting RRS in the tunnel. RRS has both saved time and costs compared to implementation of steel ribs in a tunnel.

As we look forward, we really need to implement state of the art modern techniques and practices for building safe and cost-efficient tunnels in India. Currently, more than 100 km of tunnels are being constructed each year in the country and this number is bound to increase as the transport infrastructure improves warranting more and more tunnels and underground structures. Collectively, we all hope to contribute to this Journal by sharing case studies and research & development on updated and advanced tunnelling techniques which can contribute to making India a world-class tunnelling nation.

With best wishes and regards,

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President, ISRMTT