



Tunnelling Association of India

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Malcha Marg, Chanakyapuri, New Delhi 110 021

Press Release

1. Workshop on Sprayed Concrete in Underground Structures – Issues and Challenges, 27-28 February 2014 at New Delhi.



From L-R: Mr. V.K. Kanjlia, Mr. Soren Den Eskesen, Mr. A.B. Pandya, Mr. Aaro Cantill, Mr. Hitesh Khanna, Mr. A.C. Gupta during the inaugural session of the workshop

Sprayed concrete technology has revolutionized tunnel construction and mining operations since the middle of the 20th century. The development of material science and performance together with advances in spraying equipment technology have made sprayed concrete the building material of choice for today's underground construction projects. Due to its nature as a spray-applied material, sprayed concrete offers excellent surface sealing and ground strengthening as it perfectly fits the excavation contour, hardening and gaining strength in a remarkably short time frame. The development of modern wet-mix sprayed concrete in particular has contributed considerably to this effort. Furthermore, the proven quality of sprayed concrete has led to it being used more and more as a permanent support solution, replacing the traditional cast in-situ inner concrete lining. To focus on the technical and practical aspects of Sprayed Concrete for Underground Structures, organized this two days workshop on 27-28 February 2014 at New Delhi by Tunnelling Association of India (TAI), Indian Committee on Large Dams (INCOLD) and central Board of Irrigation and Power (CBIP). The workshop was sponsored by M/s Normet, BASF and Bakaert Industries Ltd.

This workshop was organized to upgrade the knowledge of participants to all technical and practical aspects of sprayed concrete and followed state of art technology by presentation from internationally renowned experts on Sprayed concrete in tunnelling.

The workshop was inaugurated by Mr. A.B. Pandya, Chairman, Central Water Commission. The other dignitaries who addressed the participants during the inaugural session were *Mr. Søren Degn Eskesen, President, International Tunnelling and Underground Space Association (ITA)*, *Mr. Hitesh Khanna, Director – Works, IRCON international Ltd.*, *Mr. Aaro Cantill, CEO Normet Group*, *Mr. V.K. Kanjlia, Secretary General, TAI & Secretary, CBIP* and *Mr. A.C. Gupta, Treasurer, TAI and Director – Water Resources, CBIP*. During the course of two days deliberations many national and international resource speakers shared their experiences on the different aspects of Sprayed Concrete technology as per the details given below which ultimately benefited to 125 participants from different agencies, like Metros, Central Public Sector Organizations hydropower corporations, BRO, NHAI, Northern railways, contractors, and other agencies who are involved with the construction of tunnel and underground works in different parts of the country.

Technical Session1: Overview Application and Use of sprayed concrete for Ground Support and Repair/Strengthening of Underground Structures

- [ITA Global Development of the Underground Space](#)" – Mr. Søren Degn Eskesen, *ITA President*
- Modern High Performance Sprayed Concrete - Best Practice "A Holistic Approach"– Mr. Tom Melbye, *President, NormetGroup*
- Sprayed Concrete Today and Tomorrow – Mr. Wolfgang Aldrian, *BASF*

Technical Session 2: Mix design and Components

- Fibre sprayed concrete relevant test of characterization relevant material, properties/performance class for temporary support and final lining – Mr. Benoit de Rivaz, *NV Bekaert*
- [Why shotcrete is the appropriate material for tunnel support](#)– Dr. Florian Krenn, *Managing Director, Geoconsult India*
- Construction of Underground Structures- Use of Synthetic Fibre Reinforced Shotcrete – Mr. M.M. Madan, *Director – Hydro, GVK*
- Structural and other types of Reinforcements e.g. SFRS – Mr. Navneet Narayan, *Technical Manager, Bekaert Industries Limited*

Technical Session 3: Certification and Control

- Why Certify Nozzle Operators? Manual/Robotic application, presentation of existing certifying bodies – Mr. Odd-Bjorn Kleven - *Global VP Admixtures, Normet. & EFNARC Examiner for Nozzleman certification.*
- Specific tests for Sprayed Concrete on fresh and hardened concrete - Mr. Lars Hage, *Global Technical Manager – Shotcrete, BASF*
- Why specifications for shotcrete need to be observed and executed properly - Dr. Florian Krenn, *Managing Director, Geoconsult India*

Technical Session 4: Case histories (including Design, Scheduling and Costs Aspects) and future developments

- Sprayed Concrete In India- Best Demonstrated practice . – Mr. Milon Mukhopadhyay, *Managing Director, Normet India*
- Future development of Sprayed Concrete – Single Shell lining system.- Mr. Odd-Bjorn Kleven .



Group photograph during the inaugural session



View of audience