

## **Mountain Train**

Inside the Jawahar tunnel, the only road link between Jammu region and Kashmir Valley in the Pir Panjal mountains, cars and trucks went by in a neat file. Some 400 metres below them, engineers stood by for that final blast. A deafening sound and the two regions of Jammu and Kashmir came closer once again, with a 11 km long tunnel that will be part of the railway line between Banihal in Jammu and Qazigund in Kashmir.

The Banihal-Qazigund line is part of the larger project of linking Kashmir Valley with the country's rail network. Though it won't be before 2017 that the first train from Baramulla travels downhill to the plains of Jammu, the Bahihal-Qazigund line is a key step towards that larger dream - the 345 km long Jammu-Udhampur-Srinagar-Baramulla railway line.

More than 200 engineers and nearly 2000 workers of Hindustan Construction Company (HCC) apart from several other private contractors, are working round the clock - laying concrete and tracks inside the new tunnel and leveling the ground at Banihal railway station - as the Railways has fixed December 2012 as the deadline to run the train between Qazigund the Bahihal. Once the tunnel is ready, a passenger train can cross it in a mere six minutes, a symbolic straddling of two regions. There is much more to be done: another 4km long tunnel has to be drilled between Chamalwas and Banihal, tracks have to be laid along the rest of the section and quarters are to be built for General Railway Police (GRP).

In August 2005, HCC won the bid to construct the Pir Panjal railway tunnel from both the north (Qazigund) and south (Banihal) sections.

“We will complete concreting work inside the Qazigund-Bahihal tunnel, including the construction of a 3m wide road along the railway track, in the next couple of months,” says HCC's project manager Sharanappa Jalal, adding that thereafter, the track laying, electrification and other projects would be taken up by other agencies.

### ***Story of a tunnel***

The 11km tunnel, India's longest and the second-longest transport tunnel in Asia after the 20km long Wushaoling tunnel in Gansu, China, was constructed at a cost of ₹1100 crore (11 billion). Besides cutting down the travel time between Qazigund and Banihal from 35 km to 11 km, the tunnel has many other firsts.

It has the highest 'over-burden' of 1140 metres (the mountain strata above the tunnel) and deepest drill holes for geotechnical investigations, measuring 640 metres. It boasts of the first large-scale use of New Austrian Tunnelling Method (NATM) in India. When ready, it will be the first railway tunnel to have automatic ventilation and tunnel

lighting. Besides, a 3m wide road will run along the entire railway track for use in case of emergency.

Since 2005, as engineers worked on the project, the Pir Panjal mountains and the surrounding areas presented their own set of challenges. They had to often work in areas with no habitation, road or tracking path. Besides, there were changes in geological conditions - engineers would anticipate a certain class of rock only to be encountered by another - unexpected bursting of rocks during excavation, even the presence of villages over the alignment of the tunnel.

Jalal of HCC says that while the first 650 metres of the tunnel were through soft ground, road headers equipped with cutting heads were mounted at the end of a boom to tunnel through rocks. For the toughest rocks, they had to use the drill and blast method.

Inder Kumar, an engineer working on the project, says, "We came across many surprises. After excavating hardly 250 meters, we discovered a thickly populated village, Cheril, only 20 metres above the tunnel. We could even hear sounds from the village inside the tunnel, so we brought in special excavators to avoid vibrations during excavation. We also avoided blasting inside the tunnel until we crossed the village."

As they proceeded further, there were more problems. "Water seeped in from all sides at the rate of 180 litres a second - more than double the maximum seepage of 70 litres a second projected in hydrological and geotechnical studies provided by IRCON. We had to use boats to carry out protective works and drain out water," says Kumar.

### ***The larger line***

With the tunnel between Qazigund and Banihal ready, the first train between Kashmir valley and Jammu region will roll out by December 2012. But it will continue to be a standalone railway as it will take many more years - at least till 2017 - before it gets connected with the country's railway network.

Senior engineers of the Indian Railways, who are supervising work that has been subcontracted to various agencies - IRCON, Konkan Railways, HCC and others - describe it as the biggest project undertaken by the Railways since independence.

The Jammu-Udhampur line, funded and executed by the Railways, was commissioned in April 2005. To expedite work on the remaining line from Udhampur to Baramulla, the Centre declared it a national project and divided it into three stretches: Udhampur to Katra, Katra to Qazigund and Qazigund to Baramulla.

Of these, trains are already running on the 119 km long Qazigund-Baramulla stretch and 53 km long Jammu-Udhampur sections. Efforts are on to complete the Udhampur-Katra stretch and the Qazigund-Banihal section by December 2012, says Railway Board member A P Mishra.

That leaves the 111.5 km long Katra-Banihal section. As it passes through deep gorges, this is seen as the toughest stretch of the project with 31 tunnel and 62 bridges. This line will witness another engineering marvel: a bridge over the Chenab river at a height of

359 metres, the highest railway structure of its kind in the world, 35 metres higher than the tip of the Eiffel Tower in Paris and five times the height of Qutab Minar in Delhi. Once ready by 2017, this will prove to be a decisive link in Kashmir's rail dream.

### ***Track II***

The proposed railway line has led to socio-economic changes in areas around it. Villages got connected as engineers constructed approach roads to reach sites of the proposed railway track. Till a few months ago, people in Kanthan and Kouri, two villages in Reasi district in Jammu, had to walk up to Mahore to catch a bus. But now, a 15 km gleaming road comes all the way to Kanthan and Kouri and so does the bus.

Similarly, people in Bakal, a village in Reasi district, are said to marry among themselves since they are cut off from nearby villages in the absence of a road link. As Konkan Railway engineers constructed a 15 km long approach road and a 500 metre long tunnel to carry men, materials and machinery to a proposed railway alignment site, the village automatically got a road link.

Banihal, once a hotbed of militancy and where jobs are scarce, also witnessed a spurt in construction after work on the railway line began in 2003.

"After our arrival here, people got jobs and accordingly, their economic condition improved," says Naseer Massoodi, HCC's manager administration, who hails from Baramulla, "When we came to Banihal, there were hardly any good schools. Today, the town has nearly half-a-dozen good private English-medium schools," he says.

*Source: Indian Express, 13.11.2011*

### **Work on India's Longest Road Tunnel Starts**

Work on India's longest road tunnel started with engineers blasting a portion of a hill to clear way for construction of the 9km long Chenani- Nashri Tunnel in Jammu and Kashmir's Udhampur district.

Australian company Leighton Welspun, renowned for tunnelling technology, began the project by triggering the blast this afternoon.

"We have started the work today on this prestigious project. The twin tunnels which will come on Jammu-Srinagar national highway NH 1A is one of the longest road tunnels in Asia and also in India," Managing Director of Leighton Welspun, Russell Waug told reporters at the Chenani project site.

The twin tunnels will come up in a period of next five years at a cost of Rs 2,600 crore (Rs. 26 billion), he said, adding that it will also reduce the length of the highway as well as the travel time between Srinagar and Jammu.

The two-lane main tunnel will have a diameter of 13.3 m, while a parallel escape route shall have a diameter of 5 m. Engineers will use the NATM technique of sequential excavation and support for executing the project, he said.

The completion of the first section of the tunnel comprising of all the portal sections represents the key milestones for the project, he said.

A team of over 800 staff and 200 strong work force, armed with sophisticated drilling machines, will daily bore around 5 m of the main tunnel and 8 m of the escape route, he said.

In reply to a question about the challenges of the project, Waug said that Jammu and Kashmir has young Himalayas which keeps shifting thereby posing great challenges for tunnel construction.

He said that the tunnel would have a life span of more than 100 years and is expected to be completed before the expected deadline.

The construction team will continue to tunnel through the mountain to construct an all weather road connecting Chenani with Nashri, slashing 30-km of the journey and reducing the time travel by one hour.

"We are pleased to see this nationally important project underway. It is not only a landmark project in the history of India's transportation network but will bring increase safety and employment to local community," the MD said.

"Our focus is to complete the project on schedule and to be an integral part of the Jammu's progress and development," he said.

*Source: PTI, Economic Times, 2.9.11*

## **There's Need and also Greed**

According to Gautama Buddha tanha or desire and craving is the cause of human suffering. Once we are free of desire for worldly objects, we are free from suffering and we attain the state of nirvana. Hence it is greed, not need, that we have to do away with. The more we have, the more we want. Greed is a never-ending cycle.

How to make the distinction between need and greed? Economists explain the distinction between the two in terms of 'needs' and 'preferences' or 'desire satisfaction'. The distinction between 'preference' and 'need' is that the former is intentional and the latter is extensional. The need, for example, is to quench or thirst; the preference is whether we use bottled water or drink straight from the tap.

The need of a person is something which depends on his factual material, mental, physical and social condition. It also depends upon the available objects which are perceived as possessing the capacities to contribute to his survival and well-being. Whether a person prefers one object to another depends upon the nature of the person's beliefs about the objects.

While the concept of need is a threshold concept, the concept of preference is not. Need is a threshold concept because having more or less than one's needs would harm one's

survival. Need is that without which the individual cannot survive. For example, a person needs a certain amount of water, food or shelter to lead his life and maintain social relations.

Moreover, while the objects required for 'preference' or 'desire satisfaction' may have several alternative substitutes, needs are objective and specific and do not admit any substitute. For example, it is admitted by everyone that there is no substitute for good health, good friends and good environment. They are specific to the needs for the well-being of all individuals.

Desires and preferences can be artificial or superfluous. For example, the desires for accessories are artificial. They are market-governed and even market-determined. Desires can be natural or non-natural. It would be instructive here to listen to a conversation between Alexander and an Indian thinker, Dandamis.

Alexander was greatly struck by the austerity of life and majesty of the Indian thinker. The Indian told Alexander that natural desires are quenched easily: thirst by water, hunger by food. But the craving for possession is an artificial one; it goes on unceasingly and is never fully satisfied.

The sage explained the criterion for making a distinction between a natural or real and a non-natural or contrived desire. A natural desire is fulfilled the moment you get what you sought. For example "If you drink the water you thirst for, your desire ceases. Similarly, if you are feeling hungry, you receive the food you seek, your hunger comes to an end. If, then, man's appetite for gold were on the same natural level, no doubt his cupidity would cease as soon as he obtained what he wished for. But this is not the case. On the contrary, it always comes back, a passion is never satiated, and the craving remains because it does not proceed from an inclination implanted by nature."

The criterion of distinction between need and greed is: Natural desires are our needs therefore they are those which come to an end or are satiated when one fulfils them. Artificial desires are greed, as they are those which can never be satiated.

*-Ashok Vohra*

*Source: Times of India, 27.11.2011*

### **Third Indian Rock Conference – Indorock 2011**

Indian Society for Rock Mechanics and Tunnelling Technology (ISRMTT) Roorkee Chapter in Association with Department of Civil Engineering, Indian Institute of Technology (IIT) Roorkee and CSIR-Central Institute of Mining and Fuel Research (CIMFR) Regional Centre, Roorkee organized a three days Third Indian Rock Conference - Indorock 2011 at Roorkee during 13-15 October 2011.

On October 13, 2011 the conference was inaugurated by Dr. Amalendu Sinha, Director, CIMFR Dhanbad, India and address the gathering of over 200 engineers, designers, academicians and researchers from India and abroad. ISRMTT awards on life-time achievement, outstanding contribution and on papers published in conferences

organized by ISRMTT and JRMTT from 2006 to 2010 were also given during the Inaugural Function of Indorock-2011.

Prof. Bhawani Singh, Dr. V.M. Sharma and Dr. D.G. Kulkarni received the Life-Time Achievement award in Rock Mechanics. The awards for outstanding contribution in Rock Mechanics were given to Dr. Rajbal Singh, CSMRS; Dr. R.K. Goel, CIMFR; Dr. Gopal Dhawan, NHPC; Dr. D.V. Thareja, CWC and Mr. Ranjodh Singh, SJVNL for the year 2006, 2007, 2008, 2009 and 2010 respectively. Dr Subhash Mitra, IRI Roorkee was given Excellence Performance award for his significant contribution in JRMTT.

The Indorock 2011 was attended by about 150 delegates from India and abroad representing Government Institutions and Private Companies. Apart from the Conference lecture from Dr. Nick Barton, five keynote papers by eminent persons like, Dr. D.G. Kulkarni, Prof. K.S. Rao, Prof. T.G. Sitharam, Dr. J.L. Jethwa, Dr. V.M. Sharma and 44 papers by field engineers and academicians were presented on October 13 and 14, 2011. On third day, i.e. on October 15, 2011 a Technical tour was organized for the interested participants to Tehri Dam project.

The conference was sponsored by Department of Science & Technology, New Delhi, Ministry of Water Resources, Govt of India, New Delhi, IL&FS Transportation Networks Ltd., Mumbai, Leighton Contractor (India) Pvt Ltd, Gurgaon, Satluj Jal Vidyut Nigam Ltd, Shimla, THDC India Ltd, Hydraulic & Engineering Instruments (HEICO), New Delhi, MACCAFERRI, New Delhi, Jaiprakash Associates, Noida, Uttam Blastech Pvt Ltd, Hyderabad, Giertsen Tunnel AS Norway, Ultra Enviro Systems (P) Ltd, New Delhi, AEC Pvt Ltd, New Delhi.

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