Biannual Newsletter

INDIAN SOCIETY OF ENGINEERING GEOLOGY

ISEG News

Bridging communication gap...

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From the Editor's Desk...

With the booming infra-structure work in the country, tremendous activities are going on in the field of development of highways, railway lines and power projects. Some of these schemes include more challenging projects located in difficult terrain conditions. These activities no doubt demand greater participation of Engineering Geologists and Geo-technical professionals. Accordingly, emphasis is required to understand complex geological set up for fixing up the alignment or locating different components of these infrastructure works. Old saying is that "Well begun is half done" and this applies very aptly in case of proper site selections in a suitable geological environment. Otherwise lot of difficulties have to be faced as they are being experienced at some of the on-going projects. It is well understood that while selection of highways or railway line alignments, there are some other engineering aspects which carry more weightage in finalizing the corridors of these communication network. But, it is equally important to give due considerations to the local geological set up such as weak lithological horizons or major geo tectonic features like thrust, fault etc. especially in mountainous regions. In some of the tunnels being built for the railway lines in the Himalayan region it is understood that lot of difficulties are faced even in establishing the tunnel portals as these locations happened to be in the vicinity or right within the thrust zones. Only a careful consideration to these tectonic features while selecting the alignment of such communication network would have minimized the geological uncertainties during construction of these structures.

Metro lines for urban areas these days are being planned in this country after the great success in Delhi. Even cities like Bangalore, Hyderabad etc. can take advantage of better bed rock conditions available in these places while planning corridors of metros to the maximum extent possible for underground networks.

Ground water and its assessment has a great significance during construction of these infra structure components specially in case of tunnels or cut slopes involving greater heights. Many of the tunnels during construction especially in the Himalayas have met with huge and continuous flow of water charged with silty/debris material disrupting the works for considerable period thereby upsetting the overall schedule of the projects. Probably such incidences can be avoided if the locations of these potentially hazardous zones are not only identified well in advance with suitable techniques but appropriate remedial measures are also considered in advance. In a nut shell, better exploratory techniques are the need of the hour.

(U.V. Hegde)

Secretary's message...

For ISEG too, the Year 2007 ends at a happy note. After hectic parleys, a three-day Seminar has been finalised and, for a change, Hyderabad being the venue, we move from North to South. You may, therefore, look forward to some geotechnical fireworks in Dec 2008. The details of the event are being ironed out and would be circulated shortly.

During one year of its existence, besides geotechnical developments, the ISEG website (www.isegindia.org) has provided all the information that we used to carry in our biannual Newsletter. The purpose of the newsletter, that was launched in March 2004 with the objective to have better communication with the members and to provide a forum for exchange of ideas, has been more than fulfilled by the website. Although it is felt that there is duplication of material on these two forums, the importance of the newsletter can not be negated as it serves our members to whom the Internet is not accessible for various reasons.

Under the given conditions, the ISEG Council has decided to tone down the newsletter as a simple and brief communication. The said change has been implemented with this Issue.

I am happy to announce that the Society has agreed in principal to publish a book titled "Earthquake Induced Landslides – A Major Geohazard in Himalaya" under the "USERS" (Utilisation of Scientific Expertise of Retired Scientists) scheme of the Department of Science & Technology, Government of India. Authored by Shri S.K.Gupta, Former Director, Geological Survey of India, it would be a two-year project and the publication may be expected in the Year 2009.

I take this opportunity to thank National Hydroelectric Power Corporation Ltd., JAYPEE Group and Energy Infratech Private Limited (formerly Erudite Engieers Pvt. Ltd.) for their association with the Society and for choosing the ISEG website for their advertisements. We expect that our other valued patrons would also find it worthwhile to advertise on the Society's website.

Wishing you all a Merry Christmas and a Very Happy New Year,

(Y. Deva)

The Society announces its Seminar on CHALLENGES IN ENGINEERING GEOLOGY

Hyderabad, India, December 2008

Themes: River Valley Storage and Diversion Structures; Underground Excavations;Engineering Geological Mapping; Construction Material; Communication Projects; Geohazards; Explorations, Instrumentation and Lab Techniques; Peripheral Issues (Reservoir Competency, Geotechniques in Extreme Climatic Conditions, Geo-environment, Watershed Management, Engineering Design, Computer Aided Approaches, etc.).

Two-Day Technical Sessions followed by an **Excursion** to TBM bored 42 km long tunnel at Srisailam.

Exciting Venue: Hyderabad, Andhra Pradesh. Hussain Sagar, a man-made lake created during the time of Ibrahim Qutb Shah in 1562, in the middle. Rich history, multilingual culture and architecture. City of Nizams, pearls and lakes. Nicknamed 'Cyberabad' for being a thriving Information Technology hub. Home to some of the major Indian landmarks like the Charminar, Salarjung Museum, Falaknuma Palace and Golconda Fort, and the second largest film industry in the country. Local cuisine a blend of Mughal, Persian and Telugu variety, with the famous Hyderabadi Biryani and Irani Chai being the iconic dishes of the region.

Key Dates: Receipt of Abstracts, 30 April 2008; Receipt of Full Papers, 31 Aug 2008.

Release of Circular: End Dec 2007

ISEG Special Publication
"Earthquake Induced Landslides – A Major Geohazard in Himalaya"

The Society has agreed in principal to publish a book titled "Earthquake Induced Landslides – A Major Geohazard in Himalaya" under the "USERS" (Utilisation of Scientific Expertise of Retired Scientists) scheme of the Department of Science & Technology, Government of India. Authored by Shri S.K.Gupta, Former Director, Geological Survey of India, it would be a two-year project and the publication may be expected in the Year 2009. Tentative resume of the publication is as follows :

Introduction : Beginning with a brief narration on the hazard potential of earthquake induced landslides, this Chapter will include selected examples of these phenomena from mountainous terrains falling in different seismic belts of the world including Himalaya, and will provide a glimpse of the contents of the book.

The Himalayan Terrain : Will include physiographic and meteorologic, vegetation and demographic details, having direct bearing on this geohazard.

Geotectonic Setting & Seismicity : Discusses geologic and tectonic features of the terrain and their seismoginic potential; describes seismicity.

Earthquake Induced Landslides–an Overview : Gives a brief historical account and an overview of earthquake induced landslides from different parts of the world and also some back-worked studies; emphasizes upon the occurrence of these phenomena in Himalayan terrain.

Some Case Histories : Describes in detail landslides induced in great Indian earthquakes such as 1897, 1905 and 1950 events, and in two recent damaging ones – the 1991 Uttarkashi and 1999 Chamoli shocks.

Earthquake Induced Landslide Hazard - Quantification : Discussion on various relations between earthquake parameters and generation of landslides, and based on them estimation of aerial and volumetric extents of landslides generated in damaging earthquakes and their hazard potential in terms of slope erosion and debris/silt contribution.

Zones With Earthquake Landslide Hazard Potential : Based on available historical details and well documented data from field-studied earthquakes, demarcation of zones with earthquake induced landslides potential along with discussions on landslide controlling and contributory factors; also defining geological units in terms of this hazard grades.

Landslide Hazard Zonation vis-à-vis incidence Of Eathquake induced Landslides : This chapter will include correlation between distribution of earthquake triggered landslides with the existing, rationally constrained and slide (hazard) zones in which the definition of seismicity as an instability contributing factor is not taken into consideration.

Concluding Remarks : Includes discussions on the contents of various chapters and sub-chapters of the main text, and emphasizes on their significance in hazard-free planning, sustained development and safer living.

A CHALLENGING RAIL LINK — JAMMU – UDHAMPUR – SRINAGAR – BARAMULLA RAILWAY LINE (JUSBRL)

The construction of Jammu – Udhampur – Srinagar – Baramulla (JUSBRL) rail link project has been taken up as a National project with a total length of about 341 Km. The project traverse across geologically three major tectonic zones viz. the outer Himalayas, the lesser Himalayan structural zone and the Kashmir Tethyan belt. The Main Boundary fault/Reasi Thrust, Murree and Panjal Thrusts are the three major tectonic planes of regional importance which are present in the proposed railway alignment area between Udhampur-Katra-Reasi towns.. Besides these major thrusts, there are other local faults which cut across the alignment or nearly parallel to the alignment such as Sangalkundi and Saldhar faults/thrusts.

The 53 Km long Jammu-Udhampur railway line has been completed and commissioned for traffic. Besides huge cutting and filling, the alignment involved the construction of 21 tunnels and 5 major bridges. Of the 21 tunnels, one tunnel in post Siwalik boulder conglomerate, three in Upper Siwalik, four and half in Middle Siwalik, eleven and half in Lower Siwalik and one in Murree rocks, have been excavated for an aggregate length of 8.115 Km

Because of complex geological conditions involving varied lithology and tectonic features, construction of railway line comprising several tunnels, high cut slope establishing the tunnel portals are the real challenging job. However this write gives broad idea about the geology and difficulties being met in the tunneling done so far in this rail line.

B.D. Malbarna
Director (retd), GSI

(For detail article visit **www.isegindia.org**)

HIMALAYAN SILT EATS AWAY TURBINE PARTS

Premature and frequent failures of the underwater parts of the turbines at some of the hydropower projects in the northwest Indian Himalaya have resulted from silt erosion and call for remedial measures as short and long term solutions. The features of some of the schemes located in Himalaya very well illustrate the problem. It is found that the problem of erosion to the underwater parts due to silt exists in the run of the river schemes with high silt content. On the other hand, the projects with storage reservoir or low silt content in the river do not encounter the problem of silt erosion to the underwater component. It has also been found that the damage was more in the case of Francis turbines than in the Peltan and Kaplan turbines. Further, silt erosion was lesser with larger turbine diameter and more when the runner speed and rated head were higher. As short term measure, the operational management in the silt-affected projects is being done through regular maintenance of under water parts and stocking adequate spares. Refurbishment and repairs of damaged parts of the units need to be carried out in a scheduled manner after every monsoon period. In-situ repair of the repair of runner and guide vane need regular attention. The silt erosion can also be reduced to an extent using various coatings the under water parts.

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(For detail article visit **www.isegindia.org**)

COAL BED METHANE (CBM) FROM RANIGANJ COAL

Raniganj in Western Bengal was the scene, in 1774, of the first coal mining in India. Production was not significant until about 50 years later, partly because the coal initially obtained at Raniganj compared unfavorably in terms of combustion performance with imported coal from Britain. The deposit was appropriated by the Bengal Coal Company in 1843 and a geological survey a few years later revealed that the deposit was much more extensive than had originally been realized. The coal is high in rank and across the extensive acreage of the deposit varies in suitability for coking but in general the coal from Raniganj is classified as non-coking or at most semi-coking, having fairly poor coalescence properties on heating. It is low in sulphur but moderately high in ash, typically 20% but sometimes as high as 45%, which is why in the early assessment of the coal in the 18th Century it did not compare well with imported coal as already noted. There are over a hundred mines at the Raniganj deposit eighteen of which are open cast. At present the Raniganj deposit is seen as a promising source of coal bed methane (CBM). There has been major interest internationally recently in CBM as a supplement to natural gas, and about 8% of the methane supplied to homes and industries in the US is in fact CBM. The Rocky Mountain states are the chief source of it India, which relies on imports of liquefied natural gas, is intending to reduce such reliance by means of CBM and the deposit at Raniganj is seen as a promising source of it. CBM once produced in India will be used for power generation and also, in the form of compressed natural gas (CNG), for vehicles.

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(For detail article visit **www.isegindia.org**)

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Ist International Conference on Education and Training in Geo-engineering Sciences
2-4 June 2008, Constantza,Romania

10th International Symposium on Landslides and Engineered Slopes
Jun 30 - Jul 4 2008, Xi'an, China
www.landslide.iwhr.com/

Fifth IAEG Asian Regional Conference on Engineering Geology for Major Infrastructure Development and Natural Hazards Mitigation
Jun 30 -Jul 4 2008 Kathmandu, Nepal
www.ngs.org.np/iaeg.htm

Euroengeo 2008, The City and its Underground Environment
15 -20 Sept, 2008, Madrid, Spain
www.euroengeo.com

World Tunnel Congress
22-27 September2008, NewDelhi,India
www.cbip.org

Geothermal Characteristics of the Ground
Newcastle-upon-Tyne,May 2009
www.geotechnique-ice.com

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