



**The Society for Rock Mechanics & Engineering Geology,
Singapore (SRMEG)**

Technical Seminar on Underground Storage Cavern Development

Thursday 28 June, 2007 @3.00 – 5.00 pm
CEE seminar room A, CEE, NTU (BLK N1: B1b-06, see the attached location map)

Topic 1: Geotechnical risks and solutions during the construction of underground storage cavern - Case studies in Korea

By Ho Yeong Kim, PhD.,

Vice President, Civil Overseas Division, SK Engineering & Construction

Abstract

Underground cavern works are quite different from conventional structural works mainly due to inherent uncertainties and risks of underground works. Most serious geotechnical risks in construction of underground storage cavern are the cases where large scale fault or excessive in-situ stress are occurring. Most of these risks can be identified during geotechnical investigation and design stage, and proper measures are provided. However, unexpected geotechnical risks are still occurring during real construction stage. Underground cavern for hydrocarbon storage has very big sized section; therefore special efforts are required to ensure structural stability against faults and excessive in-situ stress problems. Based on past Korean experiences from 3 projects, several cases of geotechnical problems such as a large scale fault problem during construction of sub-sea storage cavern, hidden fault unidentified during design and investigation stage, locally severe excessive in-situ stress problem are introduced with solution for such problems.

Topic 2: Lessons learned from underground cavern experiences in rock mechanics view and related R&D works for underground cavern development

By Hee-Suk Lee, Ph.D

Senior Manager, SK Engineering & Construction, Korea

Abstract

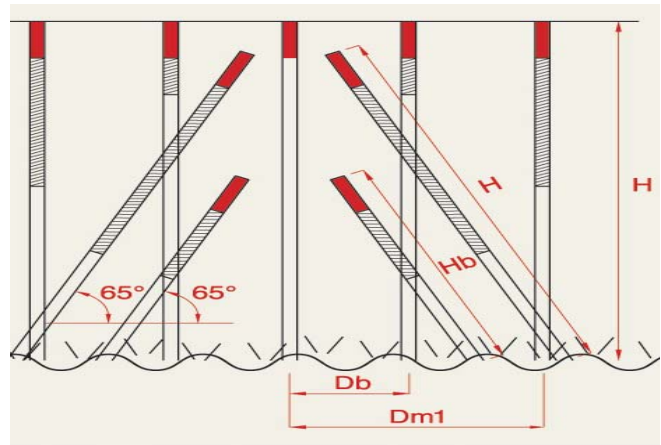
Technology for design and construction of underground storage cavern is one of the highlighted field of rock mechanics and engineering geology. Various technical issues can arise such as efficient excavation of large rock cavern, reliable geotechnical monitoring and hydrogeological testing & management during construction/operation etc. SKEC has been carrying out over 10 projects related with underground cavern design and construction for 25 years. Many research and development activities have been carried out during the project implementation for efficient and reliable development of storage caverns. The presentation will review the several rock mechanical aspects of storage cavern works based on lessons learned from underground cavern experiences, and related R&D works such as SUPEX-cut for cavern drill and blast, SK Measuring & monitoring system for construction and operation stage and several applied rock mechanics testing & techniques etc. Recently developed underground LNG storage concept and pilot cavern works are also introduced. Several important aspects of cavern design & construction will be discussed

Light refreshment will be provided after the seminar.

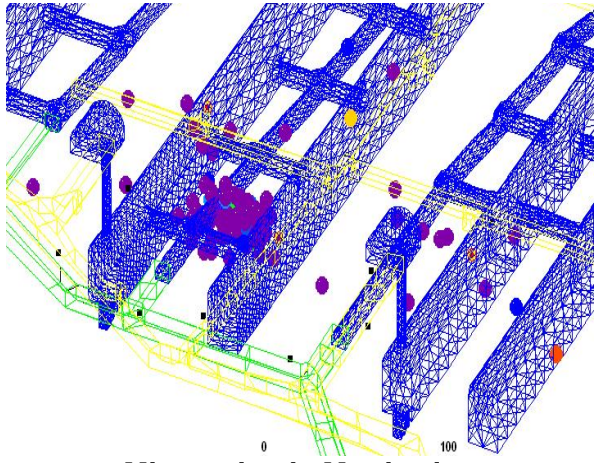
Please kindly confirm your attendance by email to An Xinmei at: ANXI0001@ntu.edu.sg by Wed. 27 June 07.



Rock fall treatment in storage cavern



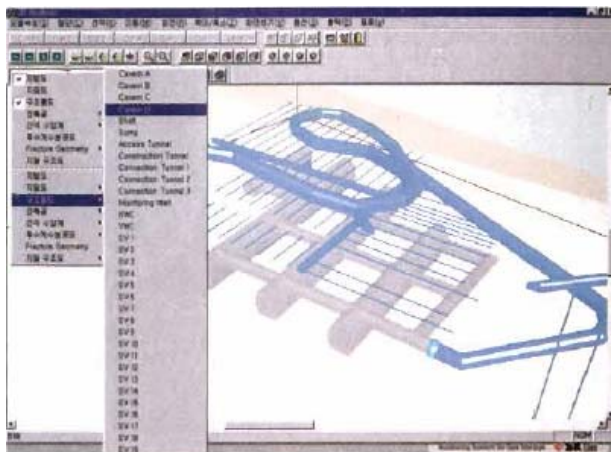
SUPEX-Cut



Microseismic Monitoring



Final cavern shape with changed design due to excess in-situ stresses



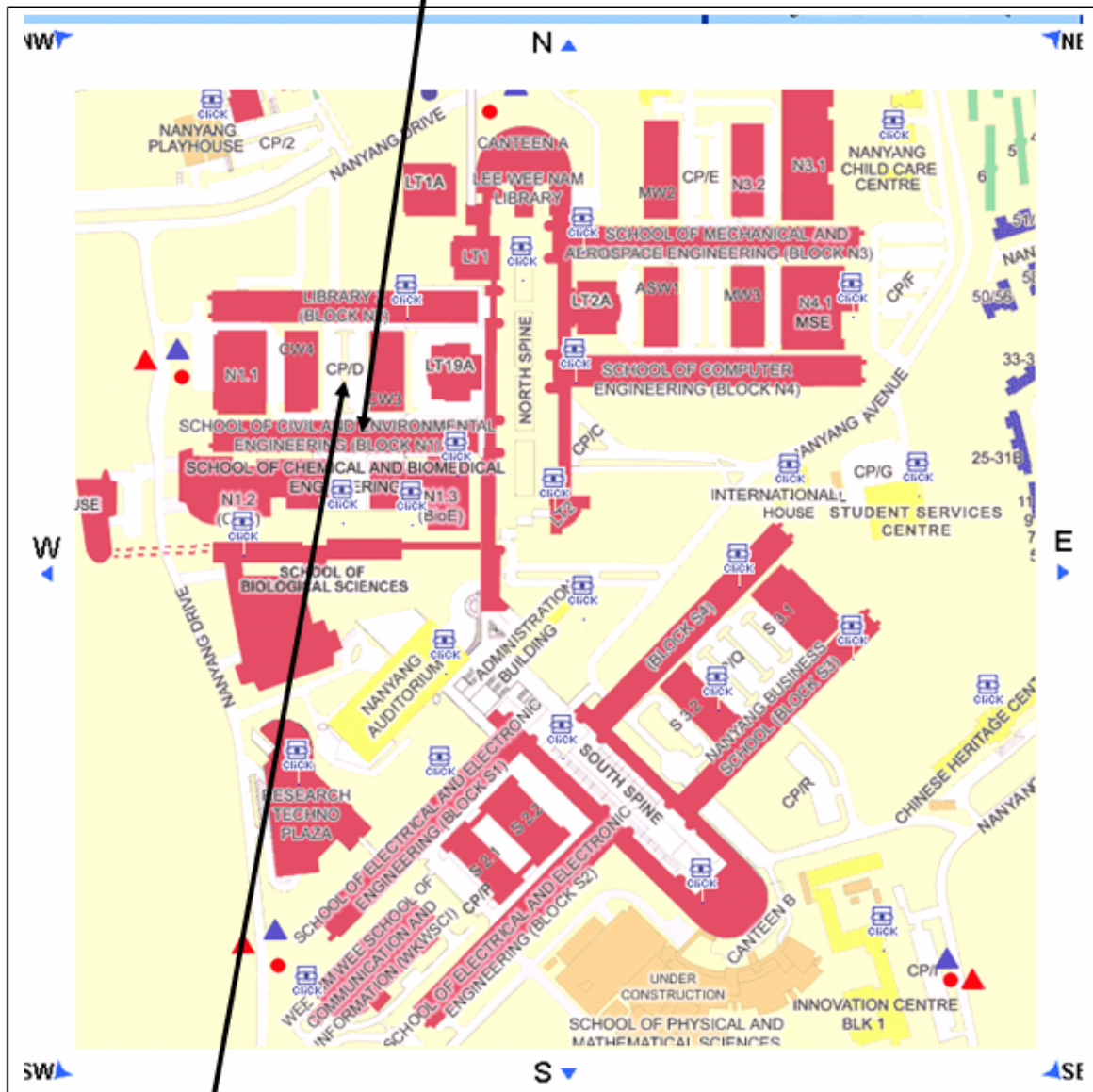
MOGAS (Monitoring Data Analysis system for Underground Storage Cavern)



Underground LNG storage cavern

Location Map, NTU

Seminar Venue: BLK N1 (School of Civil and Environmental Engineering), CEE Seminar Room A (Section B of Level B1)



You can park your car at Car Park D (free parking)