

Aspiring to Organise World Tunnel Congress 2020

TUNNELLING & UNDERGROUND SPACE TECHNICAL DIVISION

reported by



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The Institution of Engineers, Malaysia (IEM), through its two wholly-owned subsidiaries, IEM Training Centre Sdn. Bhd. (IEMTC) and IEM Academy Sdn. Bhd., organised a two-day conference titled "The Southeast Asian Conference and Exhibition in Tunnelling & Underground Space 2017" (SEACETUS 2017) on 18-19 April, 2017, at Dorsett Grand Subang in Subang Jaya, Selangor, Malaysia.

SUCCESS OF TUNNELLING CONFERENCES BY IEM

With the completion of the SMART tunnel, IEM's Tunnelling & Underground Space Technical Division (TUSTD) held the first International Conference and Exhibition on Tunnelling & Underground Space (ICETUS) in 2006, to record the significant progress and development in the industry here.

The second and third ICETUS conferences in 2011 and 2015, coincided respectively with the substantial completion of the Pahang-Selangor Water Transfer Tunnel, and the tunnel section of the massive development of Klang Valley Mass Rapid Transit SBK Line 1.

Last year, at the WTC2016 in San Francisco, IEM announced its intention to bid for ITA-AITES World Tunnel Congress 2020. A bidding committee was formed, comprising TUSTD committee members led by Ir. Dr Ooi Teik Aun. In record time, by September 2016, the Southeast Asian Conference and Exhibition in Tunnelling & Underground Space (SEACETUS 2017) as well as a two-day post conference Training Course on Principles for Tunnel Design, were conceived and launched in support of the WTC 2020 bidding. The bid document was then submitted to ITA Executive Council and accepted in January 2017.

Table 1: Measuring Success

	ICETUS 2006	ICETUS 2011	ICETUS 2015	SEACETUS 2017
Conference Sponsors	5	5	5	7
Conference Exhibitors	24	24	13	22
Advertisers	-	36	15	31
Conference Participants	332	>200	207	>370
Conference Papers	42	43	40	47

The success of an event cannot be measured solely by the amount of financial surplus from the organising of the conferences. A comparison of tunnelling conferences conducted by IEM in the last 10 years, shows progress achieved in five main areas (measured in numbers): Conference sponsors, exhibitors, advertisers, participants and conference papers (see Table 1). SEACETUS 2017 was once again a tremendous success, according to feedback from the conference participants.

UNDERGROUND TUNNELLING DEVELOPMENTS IN MALAYSIA

From the very beginning, tunnels have been associated with KTM railways (e.g. Butterworth-Singapore Line, Gemas-Tumpat Line), construction of dams (e.g. Kelinci Dam water transfer tunnel, diversion tunnel of the Sungai Selangor Dam, pressure tunnels and powerhouse for the Pergau Dam, etc.) and highways such as Genting Sempah twin



SEACETUS 2017 Conference participants

tunnels at Karak Highway and Penchala Link twin tunnels as well as the subway Light Rail Transit (LRT) system.

Tunnelling activities gained momentum in the 21st century with the construction of the Storm Water Management and Road Transport System (SMART) dual-purpose tunnel, Pahang-Selangor interstate water transfer tunnel, double tracking electrified railway tunnel (Bukit Berapit and Larut tunnels) and more recently, the on-going Mass Rapid Transit (MRT) project and the planned High Speed Rail (HSR) and the East Coast Railway Link (ECRL) tunnels.

Hundreds of tunnels, with a total length of at least 300 km, have been constructed in Malaysia since the 1900s. The milestones marked and the cumulative length of all constructed tunnels are shown here (see the following figures).

Ir. Dr Ooi and Ir. Khoo (2017) documented tunnelling activities in Malaysia for the past decade (2005-2015) and predicted the exponential development of tunnelling in the future.

In 2003, tunnelling became more important when there was an acute need to address major flooding issues in Kuala Lumpur. Because the city space was almost fully developed, the flood mitigation infrastructure had to be taken underground via tunnelling through its extreme karst geology.

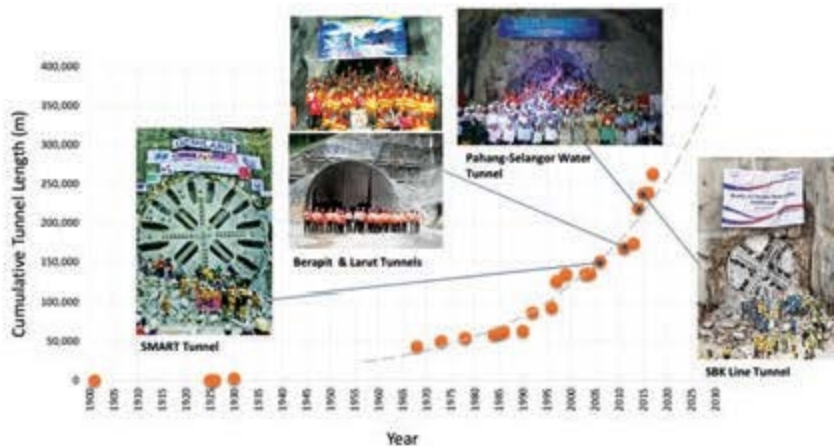
From the initial incepted flood mitigation tunnel, an ingenious dual-purpose construction was conceived at the design stage and a motorway tunnel was integrated into the system to reduce traffic congestion at the main Southern Gateway leading to the city centre. The SMART Tunnel, regularly featured on National Geographic and Discovery TV channels, won international accolades such as the British Construction Industry International Award (2008) and the United Nation's Habitat Scroll of Honour Award (2011), in recognition of work in the field of human settlements development in urban centres around the world. In April 2015, it was again described by the United Nations as one of the most innovative projects in the world for an urban issue. CNN also listed the SMART tunnel as one of the world's top 10 greatest tunnels.

The spin-off effects of the SMART tunnel on Malaysia and the tunnelling community worldwide, are too great to be ignored. Locally, the project inspired the innovation of the Variable Density Tunnel Boring Machine (VD TBM) when Malaysia decided to embark on its metro system, with unprecedented tunnelling challenges in the cavernous karstic limestone for the 9.5km stretch of a twin bored tunnel with 7 underground stations for the 51 km Klang Valley MRT Line 1. The VD TBM broke all conservative rules and we achieved what was considered "impossible" in the past.

At the same time, local tunnelling experts became highly regarded for having honed the right skills and gaining the expertise to take tunnelling to the next level in innovation technology (Ooi, 2017). The establishment of the world's first tunnelling school, Tunnelling Training Academy (TTA), in 2011 and the recent initiative to set up the local TBM refurbishment plant, an extension of the TTA to train



Milestones of the First Tunnels constructed, according to years



Milestones of the First Tunnels constructed, according to category

loads in high technology and niche tunnel engineering, are steps forward for Malaysia's sustainable tunnelling industry.

Already, TTA has produced 500 "graduates" and contributed towards improving the tunnelling know-how of our workforce. The consistent Joint Training Courses of IEM-ITACET during ICETUS 2006/2011/2016 and SEACETUS 2017 have also helped to increase the number of tunnelling professionals in the country.

MALAYSIA BIDDING FOR WTC 2020

The golden era of tunnelling has put Malaysia on the world map as an active member nation of International Tunnelling & Underground Space Association, ITA-AITES. Indeed, our achievements in tunnel and tunnelling technology in the past 15 years have been most impressive. This shows that Malaysian professionals have not only learnt from the training but more importantly, have also developed their own expertise to come up with ingenious underground solutions to their problems.

It is no surprise that IEM has submitted a bid to host the ITA-AITES World Tunnel Congress 2020 (WTC 2020) in Malaysia with the theme, "Innovation and Sustainable Underground Serving Global Connectivity". The other two bidders are Australia and India: both held WTC 2002 and WTC 2008 respectively.

Bidding for this prestigious event is held three years in advance. The event is held in high esteem by leaders in Tunnelling & Underground Space Engineering. A dedicated team, led by IEM President Ir. Tan Yean Chin, together with Ir. Dr Ooi Teik Aun, will be at WTC 2017 in Bergen, Norway, on 9-15 June, 2017, where the voting will take place. The support of ITA member nations in Southeast Asia and other parts of the world, is being actively solicited to vote for Malaysia and we are all hoping the Malaysian dream will come true in Bergen, Norway! ■