

Risk Management in Underground Space Projects

TUNNELLING AND UNDERGROUND SPACE ENGINEERING TECHNICAL DIVISION

reported by



Ir. Dr Ooi Teik Aun

The World Tunnel Congress (WTC2020) organising committee and the Tunnelling & Underground Space Technical Division (TUSTD) of IEM held an evening lecture on Risk Management in Underground Space Projects on 11 April, 2018, at Chin Fung Kee Auditorium, Wisma IEM.

The speaker was Dr Maged F. Hanna of SELEM (Smart Engineering Leadership & Excellence in Management) Consultant & Training Specialist in Risks. He was also a former ITA Executive Council Member representing WTC2018 in April 2018 in Dubai.

Chairing the talk was Ir. Ong Sang Woh, Secretary cum Treasurer of TUSTD. Despite the short notice, the event was attended by about 20 participants from different sectors of the tunnelling industry.

Dr Maged addressed the importance of utilisation of underground space and demonstrated with different case studies for land use and location reasons, isolation considerations, environmental protection, topographic reasons and social benefits.

Managing tunnels as portfolio projects in tunnel construction involves complex projects that encompass various types of risks. To achieve project goals, one needs to adopt appropriate

risk management strategies from project inception to project completion.

In Tunnels Portfolio, one must always consider the stakeholder investment and how one can maximise the city's investment and the ROI, identify risks in underground space projects so as not to impact the stakeholder investment and mitigate the risks. This requirement forces engineers to start thinking innovatively and to apply design thinking in underground space projects in order to deliver solutions and to maximise the utilisation of space.

Implementing project management for tunnel projects is important to ensure customer satisfaction and end user happiness. This magnifies the importance of building sustainable tunnels which will impact the economy, environment and social impact of the city investment. Using new technology such as BIM (Building Information Modelling) will simulate and ensure design credibility as well as reduce failures. Using 3D printing, robotics technology etc. will ensure better quality, lean construction and reduced wastage.

Dr Maged also talked about risk management processes from planning and developing methodology, choosing the right tools and techniques to be used, identifying risk and performing

qualitative & quantitative assessment, planning the risk response and implementing and controlling the risk through Tunnels Portfolio, highlighting different frameworks for risk ISO 31000 and PMI Risk Management Framework.

He said when risk is triggered in Tunnel Portfolio, it will impact all other factors in the project such as scope, quality, schedule, cost, resources and customer satisfaction. So risk management is not a small issue that can be ignored or just added as a lump sum percentage of the total project budget.

Dr Maged further emphasised the importance of addressing the individual and overall project risk factors, looking into variability risk, ambiguity risk and project resilience and addressing internal and external enterprise environmental factors which will affect the portfolio success. Therefore, Risk Management should be integrated with portfolio management with more elaboration in the techniques of identifying risk, develop probability and impact matrix and quantifying contingency reserve and implementing different strategies in response to risk sharing, transfer, avoid, exploit, mitigate and enhance.

Building a Risk Register and knowledge base for the portfolio is important as it increases the organisational process assets and



Figure 1: Dr Maged F. Hanna and the Committee Members



Figure 2: Dr Ooi Teik Aun presenting a memento to Dr Maged F. Hanna

enhances business value. Empirical studies on over 107 tunnels show that claims come from these different factors: 10% from fire, 50% from natural events, 25% from construction methods, 10% from design defaults and 5% was unassigned). Finally, Risk Management Study, if performed by experts, will bring in more opportunities and fewer undesirable incidents in undergrounds space projects.

After the talk, WTC 2020 Organising Chairman Ir. Dr Ooi Teik Aun presented a token of appreciation to Dr Maged. ■

IEM DIARY OF EVENTS

Title: Pre-AGM Talk CESIG

21 July 2018

Organised by: Consulting Engineering Special Interest Group

Time : 9.00 a.m. - 11.00 p.m.

CPD/PDP : Applying

Kindly note that the scheduled events are subject to change. Please visit the IEM website at www.myiem.org.my for more information on the upcoming events.