Challenges around large infrastructure projects and the lessons learned

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Risk management from an insurer’s perspective

Transportation Case study 1

**Shanghai Metro, China 2003**
- Expansion of the Shanghai Metro Line 4 crossing beneath the Huangpu River
- Two parallel tunnel tubes constructed by earth pressure balance TBM

**What happened?**
- Failure occurred during construction of a cross passage
- Massive ingress of water and material at a depth of 35m
- Several meters ground subsidence
- Cause – failure of ground freezing unit, failure to implement risk management

**Consequences**
- Collapse of a high rise office buildings
- Flood protection dyke on the river badly damaged
Risk management from an insurer’s perspective
Transportation Case study 2

Mass Rapid Transit, Singapore 2004

- An open cut tunnel excavated for MRT’s Circle Line
- Excavated trench of 15m wide and 33m deep supported by 0.8-1m thick diaphragm wall
- Steel struts: 4-5m horizontal and 3m vertical spacing as ELS system

What happened?

- 9th level of struts were being installed when collapse happened
- Unusual cracking noises were heard early in the morning till the collapse
- Collapse plan area was 100m by 130m, settlement up to 15m
- Causes – under design of strut-waler connection in the strutting system, no proper design reviews, poor construction, failure to implement risk management

Consequences

- Part of Nicoll Highway, Singapore’s major east-west harbour front road destroyed
- 4 workers killed, several injured
- 15,000 people and 700 business affected
Risk management from an insurer’s perspective

Lessons learnt

What can we learn?

1. A need for robust design, risk management, design review and independent checking

2. Purposeful back analysis, effective instrumentation, monitoring and interpretation regime

3. An effective system of management of uncertainties and quality during construction, corporate competencies and safety management

4. The safety of temporary works is as important as permanent works and should be designed according to established codes and checked
Sri Lanka through the eyes of a Risk Manager

- Flood risk
- Earthquake exposure
- Design codes and standards to be adopted
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- Diversified business model
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Only by understanding each client’s individual requirements, we can help manage and reduce risk
Thank you!
We welcome your questions.