

Title: Challenges and Innovations in Designing Lightweight Armours for Protected Vehicles and Critical Structures against Blasts and Impacts

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Room NA 1.418, GTP building (ground Floor), Centre for Intelligent Systems Research, Deakin University, Waurn Ponds, Geelong, Australia

RSVP – <http://www.deakin.edu.au/research/cisr/workshops/ieee-smc-vic.php>

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Challenges and Innovations in Designing Lightweight Armours for Protected Vehicles and Critical Structures against Blasts and Impacts

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Abstract:

Force structure planning by the Australian Defence Force is driving an evolution in the design and development of protected military vehicles. Future vehicle acquisition plans include vehicles that are smaller and lighter and this is influencing the types of vehicles being developed by defence companies. Engineers are faced with the challenge of minimising the weight of the vehicle while still meeting structural performance, protection levels and endurance requirements. Meeting these challenges has pushed engineers to embrace lightweight materials, explore new design concepts and take advantage of state of the art engineering tools. The underlying question is: How to mitigate the extreme blast and ballistic loads acting on critical structures to minimise damage and casualties? Much of Dr's Ngo research effort over the last 15 years has been expended to look for answers to these challenges. His presentation will highlight the innovations in designing lightweight armours for critical structures including protected vehicles for extreme blasts and impacts.

Biography

Dr Ngo is one of Australia's leading researchers in an area of critical infrastructure protection, and as a world expert in blast and extreme loadings. He is a co-founder and Director of the internationally recognised research group in this area - the Advanced Protective Technology of Engineering Structures (APTES) Group at the University of Melbourne. Dr Ngo has attracted significant amounts of research funding (totalling more than \$10M) from the ARC, CRCs, Department of the Prime Minister and Cabinet, CSIRO, DMTC and Industry. Between 2005-2009, he was the Research Manager of the ARC Research Network for a Secure Australia (RNSA), the Australia's most comprehensive network in the multi-disciplinary areas related to critical infrastructure protection from natural or human-caused disasters (including terrorist acts).

Dr Ngo has won a number of prestigious scientific awards, including the Safeguarding Australia Award (2011) for the best contribution to national security technology research and the prestigious Eureka Science Prize (2013) for Outstanding Science in Safeguarding Australia. He has been working as an expert on many government projects related to national critical infrastructure security (airports, bridges, tunnels, ports, gas and power plants, water pipelines etc.) and the protection of Australian diplomatic posts overseas. Dr Ngo is one of the pioneers in Australia carrying out research in the lightweight composite materials systems for blast and ballistic protection. Dr Ngo has been leading the research and development of advanced protective materials and systems for a number of companies in the defence, civil and security industries.