

EDITORIAL



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This year marks Singapore's fiftieth year of independence and coincidentally, DSTA's fifteenth anniversary and the tenth issue of DSTA Horizons. Hence, it is only fitting that the 12 articles chosen for this issue reflect the diverse competencies, innovations and expertise of DSTA which have contributed towards building a modern armed forces that is highly capable and resource efficient.

'Transforming Range Practices with the Multi-Mission Range Complex' traces the innovative development of the Multi-Mission Range Complex (MMRC), an indoor live-firing training facility that represents the next step forward in marksmanship training. Bearing unique features such as the single-rail targetry system, the MMRC is a prime example of how creative solutions can overcome resource and space constraints. Innovative ideas are also crucial as rapid advancements in technology have changed the battlefield landscape and how the Singapore Armed Forces (SAF) operates in the field. **'Innovative Approaches for the Advanced Combat Man System'** chronicles the enhancements of the Advanced Combat Man System (ACMS) into its newer and lightweight variant – the ACMS iLITE. The lessons learnt during its development serve to highlight possible concepts and technologies to enhance the SAF's combat capabilities. Focusing on key areas of combat engineering tasks on the battlefield today, **'Technological Advancements and Innovations in Combat Engineering Equipment'** explores the evolution

of combat engineering equipment and how it has shaped the operational capabilities of the SAF. The article also looks at future technological trends that will possibly shape the development of future combat engineering equipment.

DSTA utilises its pool of knowledge to deliver new and exciting capabilities to the SAF. **'Delivering New Mine Countermeasure Capabilities to the RSN'** offers insights into the modernisation programme of the Navy's Mine Countermeasure Vessels which improves their mine hunting capabilities. It discusses the technical challenges of the programme and the project management team's systems engineering based approach that resulted in a significant improvement in mission effectiveness.

Deriving technical lessons and insights from practical experiences is also a valuable component of DSTA's work. Capturing the key features and design considerations behind DSTA's next-generation digital workplace is **'eWorkplace: Evolving DSTA's Knowledge Management Journey'**. It details the transformation of DSTA's eWorkplace Intranet platform that greatly enhances collaboration, learning and productivity within the organisation. **'Model-driven Architecture Approach for Enterprise Systems'** illustrates the features of a Model-driven Architecture approach and how it can improve the efficiency of enterprise application development. It also shares the architecting

efforts and benefits of adopting such an approach as part of the IT Application Lifecycle Management framework. **‘Data Analytics for Optimising Cyber and Data Centre Operations’** examines how DSTA is utilising data analytics to overcome the increasingly challenging task of managing cyber defence and data centre operations through anomaly detection, discovery of hidden patterns and insights and the optimisation of resources. It also explores other challenges that have to be addressed in order to maximise the potential application of data analytics.

New ideas and perspectives are often triggered in the face of technical challenges. **‘Challenges and Design Considerations for Radar Operation in Local Littoral’** describes the challenges posed by Singapore’s unique littoral environment to radar design. Its authors also share some of their best practices in the operationalisation of radars and discuss potential developments in the domain.

‘Ka Band Satellite Communications Design Analysis and Optimisation’ examines the feasibility and application of a Ka band network in satellite communications by taking a systems approach and carrying out detailed trade-off analysis of key operational parameters. **‘Performance Challenges for High Resolution Imaging Sensors for Surveillance in Tropical Environment’** delves into the science behind environmental factors such as weather

and haze that can adversely affect a sensor’s performance and looks at how the right kind of electro-optics can be exploited to enhance surveillance performance.

Drawing from its experiences in the areas of safety and security, DSTA has been contributing its expertise in fireworks safety management for the National Day Parade (NDP). **‘Safety Management of National Day Parade Fireworks Display’** outlines how safety is addressed through the fireworks life cycle and also shares the innovative solutions used in the real-time management of fireworks to deliver a safe fireworks display for the NDP. Finally, **‘Protection and Resiliency for Singapore’s Critical Infrastructures’** leverages DSTA’s know-how in designing critical infrastructures for the Ministry of Defence and the SAF to illustrate how protection and resiliency can be balanced to improve the survivability of critical infrastructures in Singapore.

We hope that the articles will be an insightful and enriching read for our readers. We are also appreciative of the authors and reviewers for all their efforts and commitment. This tenth issue of DSTA Horizons represents a significant milestone in our efforts to enrich the learning and sharing culture within the defence technology community. It is hence our wish that DSTA Horizons will continue to play this important role for many more issues to come. Thank you.