

THE VALUE OF SIMULATED TRAINING ENVIRONMENTS IN TDL OPERATIONS

Technical Article

Introduction

As the Covid-19 pandemic continues to disrupt governments, industries and economies worldwide, we have all found it necessary to adapt rapidly to the evolving landscape by identifying and implementing innovative solutions to maintain and deliver organisational efficiency.

These processes have made way for the unprecedented rise of virtual and simulation-based methods of communication and training output, which the Tactical Data Link (TDL) industry has been at the forefront of developing by putting into practice dynamic procedures which have been carefully designed over many years.

It's well known that simulation-based training has long been advocated and driven by military usage and requirement, driven through the need to keep ahead of adversarial technological advancements and operating in highly complex, often hostile, joint environments. Simulation technology presents a huge opportunity for the TDL industry; as simulated TDL experiences and technology become more sophisticated, so too does the ability to imitate real-world scenarios; the line between the two is often impossible to decipher, with immersive technology improving at an exceptional rate. This article shines a spotlight on TDL Training, exploring how simulation environments are invaluable in improving benefit via its application in military exercises, through enhancing the skillset of military personnel, reducing risk and minimising cost.

Simulation is Mission-Critical

Reliance on a simulation-based learning experience, within a digital environment, can be traced back to World War 2. The process origins were embedded within the use of computer techniques and modelling, designed to enable the development of nuclear detonation. The subsequent transformation into education and the relevance of training provides clear adaptability and a multitude of benefits. Simulation-aided learning allows training to repeatedly replicate real-world operational scenarios, which can be developed and enhanced subject to training needs. In addition to receiving theoretical training, students can conduct hands-on practical experience through various TDL simulation tools. Simulation-based learning allows the application of a comprehensive range of different user levels meaning that students, operators and stakeholders can tap into training at all stages, which would not be readily available in live operating environments. This enhances the efficiency of overall exchanges for command and coordination activities.

A Safe Environment to Build Confidence

Simulation tools allow the development of both simple and complex scenarios which provide a safe, yet realistic environment for tactical techniques and procedures to be learnt and applied. More importantly, the screen assessors and examiners can gain valuable analysis and insight into trainees' methodologies, allowing constant revision and adaptation of deliverables to fit developing requirements. Progress can be tracked while realistic simulation, linked into real-time application, provides trainees and fully trained operators the ability to maintain currency and trial new processes and procedures in a regulated and controlled environment. Training and education facilitate the development and maintenance of the targeted skill sets while simulation provides individuals with a safe, constructive, and risk-controlled environment in which to apply these skills.

Bringing Costs Down

Whilst Covid-19 has made a huge impact on current levels of commercial aviation and transport activity, the output required to maintain military training and operational reach has not reduced.

The costs of utilising live platforms for joint training and development, along with the associated environmental impacts, remain high. Operational commitments, limited platform availability and environmental factors, including meteorological conditions, often impact the value of live training and trials. With their ASTRA and Future Force initiatives, the Royal Air Force expects simulation vs live activity to alter radically in the next decade; the programme to replace live sorties with simulators across a multitude of platforms is well underway. As this article goes to press the Integrated Review and associated Spending Review will only serve to further reduce available funding in the short term. We are all familiar with the mantra 'do more with less', this most certainly applies to TDL operations in terms of the availability of physical military assets for training purposes.

The significant cost associated with providing military assets for the sole use of training provides a real challenge for the TDL industry; the use of simulation tools is vital to achieve the training and interoperability validation trials determined by defence.

SyntheSys' Approach to Simulation-Aided and Virtual Learning

Our style of training is unique in today's market. We provide a blend of operational, theoretical and practical exercises to ensure that each of our training courses caters to accommodate varied learning styles. Our training utilises an unrivalled suite of tools to aid learning, combining simulation and real-world software to complement and enhance the learning experience. We also use a variety of different assessment methods, including a powerful interactive learning tool, to assist development of students.

How Simulation Makes the Difference

As an example of the combined capability, we can design a Link 16 network on TNDS and then run that network using the DLTS. Scenarios and complex message flow can be demonstrate using TACTX, while disparate simulated networks can be connected using JRE.

Our Training Tools

We currently use the following TDL tools and learning aids during our TDL Training courses:

- CS Group (formerly Diginext) Multi-Link Simulation System (TACTX)

TACTX 2 suite is the worldwide standard multi-link simulation and test tool, to support the development and integration of air, sea and land tactical systems. The tool evaluates the compliance of an embedded TDL implementation with standards, to verify and qualify the combat platform interoperability with NATO Forces and/or Domestic Armed Forces.

- Daronmont Link Training Suite (DLTS) for Link 11, Link 16 and Multi-Link Simulation

DLTS uses linked computers to create a virtual network, in which each student becomes a node of that network. The student can practice setting up the system, operating and fault finding, plus creating messages which are then sent on the network to the other nodes.

- Tactical Network Design Station (TNDS)

TNDS is a fully integrated, Microsoft Windows based facility for the planning, generation, distribution and configuration management of TDL Network Designs, supporting both the initialisation of Joint Tactical Information Distribution System/Multifunctional Information Distribution System (JTIDS/MIDS) assets and the exchange of international Network Designs. TNDS converts operator specified Communications Requirements into an allocated Network Design.

Network Designs may also be exchanged between nations and with NATO, regardless of whether TNDS or other design tools are being used, allowing platforms to participate in multi-national Network Designs.

- Joint Range Extension (JRE)

JRE is a combat-proven data link gateway that provides multipoint, interoperable, long-haul communications data exchange.

DLTS 16
Student
Console
Setup



TACTX generated
Multi-TDL Scenario
operating within the
Baltic Sea

TDL Online Training

At a time when virtual training is more important than ever, we offer a range of TDL training through an online delivery model. The word 'simulation' implies the imitation of a real-life process, to provide a lifelike experience in a controlled environment. A well-constructed simulation allows trainees to answer the question, "If I do this, what happens?" It provides students with an opportunity to test out different scenarios to see what works and to understand how they arrived at the right and wrong answers. This trial-and-error approach gives them the knowledge and confidence they need to apply their new skills in the real world. With the help of a simulated environment, training can be analysed while errors are identified, thus enabling students to learn from their mistakes.

If you would like to know more about how we can develop and provide specialised training to meet your individual needs, please contact: training@synthesys.co.uk

About SyntheSys

SyntheSys provides defence systems, training, systems and software engineering and technical management services over a spectrum of different industry sectors. Along with distinct support and consultancy services, our innovative product range makes us first choice provider for both large and small organisations. Established in 1988, the company focus is on fusing technical expertise with intuitive software applications to solve common industry challenges.