

DRDC Toronto Relies on MÄK Tools for Hercules Transport Aircraft Training

Defence Research and Development Canada (DRDC) — Toronto is the centre of excellence for human effectiveness science and technology within Canada's Department of National Defence. Using a systems-based approach, DRDC Toronto covers all aspects of human performance and effectiveness, including individual and team performance, human-technology interaction, and social and psychological factors that affect the resolution of conflict.



selected the MÄK Stealth for 3D visualization of threats and the MÄK Data Logger for capturing and replaying simulations.

“The MÄK products were selected at the initial stages due to their networkability and the ease of integration of these tools with other systems via HLA,” said Tony Ghoman, Group Leader of HSIE (Human Systems Integration Effectiveness) at DRDC Toronto. “They allow us to create distributed, real-time simulations, and they connect with other HLA-compatible systems so we can optimize our simulation flexibility.”

DRDC Toronto has been working with the Canadian Forces Aerospace Warfare Centre to provide training solutions for CC-130 Hercules Aircraft personnel. Their training solution is the Hercules Observer Trainer (HOT) — a simulator that allows flight crews to train in a realistic environment to learn how to identify and react to threats in a virtual environment.

The Hercules Observer Trainer was designed for individual and team training on threat recognition and reaction and is intended to improve aircrew ability to detect, report, and react to surface-to-air threats. The threats include small arms, anti-aircraft artillery, man-portable air defense systems, and radar-guided surface to air missiles. DRDC Toronto needed the ability to create complex simulations capable of linking multiple event scenarios, simulating real-world hostile conditions, and allowing aircraft personnel and staff to visualize operational conditions.

After evaluating available tools, DRDC selected products from VT MÄK for a distributed simulation software solution that would allow them to link, simulate, and visualize the synthetic world they needed to train transport pilots, loadmasters, and flight crews. For linking their simulators they chose VR-Link® and the MÄK RTI®, and VR-Forces provides the simulation. For visualization, DRDC Toronto

Linking Distributed Simulations

DRDC Toronto relies on VR-Link and the MÄK RTI to network their distributed simulations via HLA.

“We built VR-Link to save our users development dollars,” said Jim Kogler, MÄK VR-Link Product Manager. “It provides a single documented API that abstracts away the details of the various networking standards. Plus VR-Link simulations can be fully compliant with both HLA 1.3 and IEEE 1516 while maintaining DIS compatibility.”

Simulating Surface-to-Air Threats

Training conditions are simulated using VR-Forces, MÄK's simulation toolkit. VR-Forces is a powerful and flexible environment for generating and executing scenarios. In the Hercules Observer Trainer, VR-Forces is used as a threat generator. The product's intuitive GUI allows non-programmers to build scenarios by placing icons on a map, or by directly manipulating models in a 3D environment. VR-Forces goes beyond its out-of-the-box functionality, and one of its key strengths lies in its flexibility. Because it was designed as a simulation toolkit with a C++ API, users can customize nearly every aspect of the application.

CUSTOMER PROFILE



“VR-Forces is easy-to-use and allows just about anyone with a few hours of training to develop new scenarios,” explained Ghoman. “The API allows us to create additional data capturing capabilities that are required for better training results.”

Visualizing Threats and Conducting After-Action Reviews

DRDC Toronto relies on the MÄK Stealth for 3D visualization of threats. MÄK's 3D information station, the MÄK Stealth provides extensive data about the Hercules Observer Trainer's networked virtual world, and presents it in a clear and accessible way to enhance training for military personnel. Instructors conduct after-action reviews using the MÄK Data Logger, an easy-to-use system for capturing and replaying simulation data. Using the intuitive GUI, they record HLA messages to a file and replay them to review and critique simulation exercises. The Data Logger provides standard DVR-like features, and simulation data can be automatically exported to an SQL database for data mining and analysis.

“It's fairly easy to use VR-Forces for scenario development, and it is fairly easy to use Data Logger as well,” said Ghoman. “The MÄK tools are easy to use and networkable, allowing us to seamlessly connect other HLA-compatible systems to provide a valuable learning experience for aircraft personnel.”

Fulfilling System Requirements

MÄK's products are designed for interoperability, and all of the tools are built on MÄK's VR-Link networking toolkit. They work out-of-the-box with the RPR FOM, but are also FOM-Agile-able to support custom FOMs through VR-Link's FOM Mapping architecture. Interoperability, usability, and flexibility allows DRDC Toronto to build the HOT virtual world and benefit from a simulation that is:

- Networkable via industry standard protocols
- Resilient to enable easy development of new scenarios
- Extensible to support additional threat targets
- Flexible to enable continuous improvement of training results via playback and analysis of operations
- Capable of data logging for subject analysis and playback and views from multiple eye points to improve training results

“MÄK offers a more complete set of tools than other tools we evaluated, and they are easier to maintain and get maintenance renewal,” said Ghoman. “And MÄK technical support provides us with added value. DRDC Toronto is pleased to collaborate with MÄK to enhance training opportunities for the Canadian Forces.”

DRDC Toronto deployed a Hercules Observer Trainer prototype to train flight personnel and the Canadian Forces are now considering HOT for inclusion in their standard CC-130 Hercules Aircraft training course.

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