

# Science & Technology Enables Air Force M&S

The defence technology investment strategy identifies Simulation & Modeling for Acquisition, Requirements, Rehearsal, and Training (SMARRT) as a key R&D activity for enabling the development of future force concepts and identifying future capabilities. Modeling & Simulation (M&S) is an essential component of Concept Development & Experimentation (CD&E). Cutting edge R&D will assist the Canadian Forces in exploiting advanced acquisition concepts such as systems-of-systems methodologies and simulation-based acquisition. In training, simulations can enhance readiness by providing operators with the knowledge, skills and confidence they need to perform their tasks.

The Air Force transformation strategy includes the creation of the Canadian Air Force Aerospace Warfare Centre (CFAWC) to conduct CD&E and to coordinate modeling and simulation. Proactive interaction between Defence R&D Canada (DRDC) and CFAWC are ongoing to better tailor R&D efforts to Air Force requirements and to construct an R&D road map for the development of a common Virtual Air Mission environment.

The Air Force lead project for establishing the infrastructure backbone for simulations and synthetic environments in the CF is the Canadian Advanced Synthetic Environment (CASE) that is just coming to the end of its definition phase. The CASE Project Office plans to first address two areas: distributed mission operations and technical training. To do this, the Project Office plans to implement a network transport layer, a modeling and simulation framework, a management system and a collection of models and simulations that serve the users. The Air R&D program has identified CASE as a key component of Air Force and CF transformation, and will be assisting in the development of this capability through collaboration with the project office and established R&D projects.



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The Canadian Air Force will be relying on greater use of simulators in the future and is embracing the concepts of Distributed Mission Training within synthetic environments to achieve their training objectives, including interoperability with allies.

To help the Air Force achieve these goals, DRDC initiated the Advanced Distributed Mission Training Technology Demonstration Project in the 1990s. The objective of this project was to provide the CF with enhanced training capabilities by developing and applying advanced simulation technologies for coalition air operations. The results reduce significant shortfalls in Air Force advanced M&S-based combat training capabilities by developing and demonstrating a cost-effective, distributed simulation system which can support both research and operational requirements in advancing key technologies related to air combat simulation. The project provided a CF-18 simulator, fully interoperable with the US, to address inter-simulator networking issues, visual display fidelity, the use of constructive agents for friendly and opposing forces and the right mix of sim-

ulator and in-flight training. Collaboration with the US was enabled by a Technology Research and Development Program Project Arrangement.

To further this research, a tri-lateral agreement was established in 2003. The purpose of this agreement is to conduct Coalition Mission Training Research (CMTR) with the US and the UK. CMTR uses networked, synthetic environments for coalition air operations as its initial operational context. The prime objectives of these projects are to advance the development of flight simulator technologies and to investigate the use of flight simulators for training team, collective, joint and coalition tasks. The Advanced Distributed Combat Training System project and the Canadian Advanced Synthetic Environment project are the two immediate beneficiaries of the work. Although it focuses on air activity, the lessons learned are applicable to army and navy as well.

The Air program's Maritime Air Littoral Operations (MALO) Technology Demonstration is another major simulation project. Its objective is to develop, demonstrate and evaluate a synthetic environment of the maritime littoral region where maritime air platforms operate as part of a task force. The project will provide the Canadian Forces Maritime Warfare Centre with the modeling and simulation technologies required for development, evaluation and verification of doctrine and tactics of maritime littoral operations. MALO will also assist the maritime air communities evaluate tactics and doctrine developed for the new maritime helicopter using the Transitional Synthetic Environment Air Force project.

Overall, the Air Force is realizing that modeling & simulation can and should be used from concept development and experimentation right through to mission rehearsal. They have learned that the use of this key transformational tool will help to procure or to better deploy existing and future capabilities, faster and cheaper. To assist the Air Force exploit this capability, DRDC will continue to use its extensive expertise in modeling & simulation, and synthetic environments to provide goal-oriented results. ■

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