SIMULATION IN THE CANADIAN FORCES

By

Commodore Gordon L. Edwards
Director General Military Plans and
Operations, National Defence Headquarters,
Ottawa, Ontario

ABSTRACT

The Canadian Armed Forces stress the use of simulation to both increase effectiveness and realism, and reduce costs associated with military training. An integrated approach to the use of simulation across all three Services ensures that the maximum benefit is derived from new technology.

INTRODUCTION

One year ago, General Ramsey Withers, Chief of the Defence Staff directed that simulation be accorded a much higher priority in the training of the Canadian Armed Forces. A Simulation Permanent Working Group was formed to serve as a focal point for simulation throughout the Canadian Forces.

The present policy in effect across all three Services directs that simulation be incorporated into the training system whenever savings in resources or energy accrue while improving or maintaining operational proficiency. It further directs that in all new projects, simulation opportunities be addressed. New projects will also address the energy factor and stress conservation in all non-renewable resources.

Since the Second World War the Canadian Navy has, by and large, sailed in ships designed and built in Canada and the majority of Canada's military research and development has been directed towards the maritime requirement. Notwithstanding, the Navy training philosophy has followed that of the Royal Navy and many training devices have been purchased from United Kingdom sources. The new patrol frigate program has given new impetus to the development of naval simulators that will replace our outdated trainers and match the needs of the updated DDH 280, and the new patrol frigates.

Due to the close association among North American aviation industries and joint North American Air Defence agreements our Air Force has adopted similar aircraft and consequently has similar requirements for simulators and training devices as the USAF. The recent additions to the CP 140 Long Range Patrol Aircraft and the decision to purchase the F18 with their new technologies have generated the need to push the state-of-the-art to develop associated modern training equipments and methods.

In the Army most equipment is purchased outside of Canada, generally in the US, while training and organizations have tended to follow the British Army. While individual training standards have been maintained, attitudes towards the use of sophisticated simulation have been rather conservative until fairly recently, when, with the acquisition of the Leopard Tank, trainers became more aware of the potential offered by simulation. This, plus the high ammunition costs along with large personnel turnovers have given those responsible for training the desire to seek out new and innovative approaches for maintaining the high standard for which the Canadian soldier is renowned.

While we have a small Armed Forces, our current inventory of simulators is worth about $200 million and if tentative plans are approved the value of that inventory will exceed one billion dollars by the end of this decade. To give you an idea of what we have and our plans for the near future let me run through some examples.

COMPUTER ASSISTED LEARNING (CAL)

In co-operation with the National Research Council of Canada the Canadian Forces is engaged in a five-year R&D project to experiment with Computer Assisted Learning with a view to large-scale implementation in our training system. NRC has, in conjunction with this, developed a high level, second generation courseware Authoring Language known as NATAL, National Author Language. This common instructional language is easily adaptable, transportable, flexible, bilingual and is machine independent. Most important it is easy to use and trials have confirmed that instructors without previous ADP experience can program courseware within two weeks. The CAL project will investigate a number of potential uses, for example; substantial savings may be expected in the number of

operational equipments required for training purposes.

NAVY

Navy Bridge Trainer

Installed at Esquimalt (near Victoria, B.C.) in 1980, this British designed (SOLARTRON) simulator effectively teaches junior officers in ship handling techniques, use of radar, voice procedure and bridgemanship leading to watch keeping certification. It has a digital coastline radar simulation and most significantly teaches the handling of ships in close company and collision avoidance under various weather and sea states as well as navigation under zero visibility conditions. Needless to say we dare not afford to let junior officers thrash around congested and hazardous waters trying their hand at ramming, colliding and running aground, normally the prerogative of senior officers. A positive benefit of this trainer is the greatly reduced time it takes to reach watch keeping certificate standards. In addition, we believe that it will prove to be effective in improving confidence and morale of junior Naval officers.

The Action Speed Tactical Trainer

Just installed this summer at our Maritime Warfare School in Halifax, this trainer, designed and manufactured by Ferranti Digital Systems UK, employs state-of-the-art simulation and displays to provide tactical scenarios for exercising surface, sub-surface and aircraft under various Naval combat conditions. Its purpose is to practise maritime officers in tactical decision-making. Capabilities include the full complement of modern sensors and weapons systems with the capability to accommodate future developments. This trainer permits the training of officers to cope with the multi-threat environment as well as the development and evaluation of new tactics. It also provides a depth of experience that could not be achieved in other than a synthetic environment. In addition to these recent acquisitions we have in service on both coasts a wide range of sonar, EW, radar, blind pilotage and operations trainers, most of which are out of date.

We are about to start a complete modernization program of all Navy combat procedures training facilities. Already identified are an advanced Command Team Trainer, a basic Command Team Refresher Trainer, two Tactical Data System Trainers, two Sonar Trainers, and an EW Trainer. Yet to be defined are a series of trainers in support of the new Canadian patrol frigate. In addition, there is a program to refurbish the entire spectrum of training aids and devices currently in the Navy inventory.

ARMY

Observed Fire Simulators

We recently installed six Invertron, UK designed artillery Observed Fire Simulators. It is a second generation simulator that has proven to be extremely effective in training indirect fire observers. Users are very positive about its value and during the first year of use at the Artillery School in Gagetown, New Brunswick, ammunition savings of $1.3M were made.

Leopard Tank Training Devices

With the acquisition of the Leopard Tank, trainers began to realize the importance of cost effective modern training devices. Currently we have:

1. Drivers Instructional Cab (German);
2. Turret Classroom Instructional Models; and
3. TALAFIT (Tank, Laying, Aiming and Firing Trainer) (Belgium).

We are in the process of improving the armoured training system to include gunnery crew simulators, tactical simulators and driver simulators. One concept is the TICS (Turret Interaction Crew Simulator). This is similar to the UCOFT (Unit Conduct of Fire Trainer for the US Battle Tank M1).

Staff Training Tactical Simulator

Although no acquisition project is currently underway for an Army Staff Tactical Training Simulator, we have completed development of a system that economically solves the displayed map, line of sight and movement problems on an automated battle board. We are now in a position where we can build on this capability to provide automated command and staff training from unit to corps level.

AIR FORCE

Long Range Patrol Aircraft - CP 140 Aurora

By combining the better features of the USN P3 and S3 trainers along with our own ideas utilizing the state-of-the-art, we have produced a package that has proven to entirely satisfy our training requirements. Trainers include:

1. The Flight Deck Simulator, designed and manufactured by CAE Industries;
2. The Operational Mission Simulator; and
3. The Integrated Avionics Trainer, and six other part task trainers

which represent major sub systems for maintenance training purposes.

These trainers/simulators have been in service for one year and both trainers and trainees are extremely enthusiastic.

CC130 Hercules

extend a warm invitation to you to visit any of our training bases and see any of these, or other training devices in operation. We of course would welcome any joint development suggestions and perhaps at some time should consider some sort of body where matters related to training development/simulation, etc, can be mutually shared.

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to-date CC130 Operational Flight Trainer which will include a state-of-the-art digital computer generated visual system. As well, we are in the process of

Commodore Gordon L. Edwards, a Naval Officer, is currently serving at National Defence Headquarters as the Director

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