Royal Danish Warfare School

During the last 4 decades simulation has been an integrated tool for basic warfare education and training for operational personnel in the Royal Danish Navy. Cdr s.g. Stig Meyer explains.

In the early 1970's, the initial development of the Naval Tactical trainer started as a very simple simulation tool for the education of tactical personnel. From the beginning the overall concept was "train as you fight" and all the way up to today's modern and very advanced simulation tools, the Warfare School have been loyal to that initial concept.

At the start, the Tactical Trainer complex at the Warfare School was divided into numerous cubicles, each simulating a typical operations room as on-board a Danish warship. Today there are 12 cubicles, giving the opportunity to engage 12 operations room teams simultaneously. During 40 years of development, the simulation facility has been boosted significantly from a simple tactical simulation tool to a very complex facility consisting of numerous simulators, all interacting to facilitate the new demands for effective education within the different warfare branches on a modern warship.

Today the Warfare School utilizes simulation in about 95% of all education, indicating the importance of being able to secure the ever on-going development in order to meet present and future education demands from the Navy. Just to indicate how complex the simulation branch is today, the following list presents the major simulators:

- Main Tactical simulator
- Radar Video simulator
- Data Link simulators
- Sonar simulators
- Weapon simulators
- Electronic Warfare simulator
- Tactical Voice Communication simulator
- Officer of the Watch simulator
- Search and Rescue simulator
- General Communication simulator (Radio Operators)
- GMDSS simulator
- Crypto Equipment simulator

The majority of the above listed simulators are fully integrated in the Tactical Trainer and most of them utilize live front-end equipment that is stimulated by the different specific simulators.

Above
A Tactical Trainer cubicle represents a typical operations room on-board a Danish warship.
Image credit: Danish Navy.

Concept of Development – Today

The original concept; "train as you fight" still has the highest priority; however, today "interoperability" between all the various equipment is essential. Every time a demand for a new simulator is identified, it is paramount that the simulator can interact with other relevant simulation equipment. Even if there is no present need for interoperability, a future demand could easily change that need during a long equipment lifecycle.

Another major focus area is "fidelity", that is, creating the needed quality of the simulation to make sure that the educa-

tional level is reached for the student. Fidelity does matter and it also has to be differentiated all the way down to creating an underwater acoustic environment realistic enough to facilitate the education of a Sonar operator on a specific sonar system. This is the exact reason why live equipment is used where possible in the simulation environment. As an example, the Warfare School has the largest number of C4I consoles installed, 62 all together divided among the 12 individual cubicles.

One thing is to create interoperability between stationary simulation equipment at the Tactical Trainer, another matter which is possibly more important in the future, is to create the necessary interoperability between simulators physically separated by long distances. That could be interoperability between the Royal Danish Air Force F-16 flight simulator and the Tactical Trainer at the Warfare School or even interoperability between a Danish frigate and a foreign simulation network. In order to be compliant with today's standards for distributed simulation, the Warfare School does support both HLA as well as DIS and interoperability tests have proved success. It has been tested that the German- and Danish Warfare Schools can hook up their main tactical trainers, thereby creating the future possibility to interact in war games across national borders.

Above
The school utilizes simulation throughout, including a radio training classroom.
Image credit: Danish Navy.

As a major participant in NATO's Coalition Warrior Interoperability Exercise (CWIX), the Danish Warfare School

Specialist Schools

The Danish Naval Warfare School is one of five schools organised under the Naval Specialist Training Staff. The other specialist schools within this structure deal with naval weapons, damage control, diving and technical training and education. The specialist schools are geographically dispersed in Denmark and placed where they can exercise their special training curriculum in the best possible environment.

Together the five schools make up a comprehensive training facility, covering all the needed specialist training needs required to run a modern navy. All ranks serving in the ships will pass through one or more of the specialist schools during their preparation for sea duty and later on when they need updated training or introduction to new equipment or doctrine.

Together with the Naval Academy and the Naval NCO and Training School the Naval Specialist Training Staff makes out the complete training and educational structure in the Danish Navy.

is creating the maritime scenario by utilizing a portable version of the main tactical trainer, stimulating all the various systems from many different nations in the maritime environment. It is quite a challenge to be able to provide a comprehensive simulation to that many different live systems ranging from complex C4I equipment to very specialized subsystems able to detecting abnormal behaviour at sea. By doing so, the Danish Warfare School is gaining much valuable experience making our simulation tools even better suited for future tasks and challenges. By working with so many different live systems within the Land, Air and Maritime arenas, it is rather surprisingly that only a very few live systems are actually prepared for distributed simulation via common NATO standards. By comparison, it seems like the Royal Danish Navy is well prepared for the future.

Concept of Development – Tomorrow

In the last few years, the Royal Danish Navy has undergone a major transition from a Navy consisting of many small units designed specifically for coastal operations to a new Navy with only frigate size warships designed for global operations. This change in operational concept paired with the fact that it is very difficult to conduct a comprehensive national exercise with only a few units, calls for an even higher level of simulation. At the same time modern warships are equipped with many complex systems, which have a number of limitations imposed on them for use in peacetime, both due to restrictions in use (radars and Link systems) or the cost (weapons). Creating a simulated environment with the necessary fidelity, it is possible to reduce all those limitations.

By utilizing the experience from the Naval Warfare School with regards to integration of sub-systems into the Main Tactical Trainer using the Navy's new C4I system, the Royal Danish Navy intends to fit an identical Tactical Trainer on-board the new large warships. The project is very well underway and will give the warships the possibility to connect directly to the simulation complex at the Warfare School only requiring a broad band connection. The C4I system in the operations room on-board the ships will be fully flexible to operate in live and simulated mode simultaneously, providing the possibility to conduct smaller war-games at the same time the ship conducts (less demanding) live operations. The system will also be fitted with a HLA/DIS gateway, thus giving the possibility to interact with any other relevant simulation, supporting common NATO simulation standards for distributed simulation.

The Royal Danish Navy has been using simulation as a very important tool in basic education and training for many years. In the years to come, simulation will have an even higher priority due to many different factors affecting the possibility to conduct conventional exercises at sea. As one of the major role players in simulation, the Royal Danish Warfare School is well prepared for the future together with the rest of the Navy. Projects regarding the formal scheduling of simulated exercises into the standard traditional exercise programme are ongoing, and with the new technology available, it is very close to being reality. ms&t

About the Author

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