

CV90/35 Infantry Fighting Vehicle Simulator for the Danish Army

With the procurement of the new infantry fighting vehicle CV90/35 from BAE Hägglunds the necessity for a training solution appeared on the agenda of the Danish Army. eSim Games took the responsibility to provide the software for gunnery and crew procedure training within the well-known tactical environment of *Steel Beasts Professional*.



The CV90/35-DK

The simulation software follows a holistic training approach, merging crew task training with AI-supplemented tactical instruction for constructive purposes in a real-time environment. This allows embedding every training scenario into a wider tactical context, as well as collective training up to battalion level.

Software development was contracted in autumn 2007, with frequent prototype updates once that the first vehicle was actually delivered to the Combat School in southwest Denmark in summer 2008. Less than one year later the software passed acceptance test, and was commenced to support the training of CV90 vehicle crews.



CV90/35 interior view

The CV90/35's fire control system revolves around the capabilities of the 35mm Kinetic Energy Timed Fuze (KETF) ammunition. The projectile features a very small charge to burst the projectile shell, relying on projectile spin to disperse the tungsten pellets to saturate the target area forward of the bursting point with fragments to neutralize a wide variety of targets.

As the performance of the projectile depends to a large degree on the precise positioning of the detonation point for optimal pellet dispersion the fire control system includes the usual meteorological data, two-axis stabilization, cant compensation, laser range finder, lead prediction, and the measurement of each projectile's muzzle velocity with inductive timer fuze programming as the projectile leaves the barrel.

All of these elements that have an impact on gunnery and crew procedure training are replicated or approximated with a sufficient degree of fidelity by *Steel Beasts Professional*, including weapons performance and a simulation of the vehicle's armor protection and component localization with subsequent simulation of the effects of component failures; this is partially required for crew training, but also for the constructive simulation element that is required for the tactical education at the Danish Officers' School. In addition, *Steel Beasts Professional* replicates the CV90/35's built-in crew information system with multi function displays to provide all crew stations including the leader of the dismount element with system state and sensor information that is crucial for the crew to develop situational awareness, especially prior to dismounting the vehicle.



KETF ammunition terminal effect

Crew training stations are equipped with control handle replicas as well as integrated battlefield management devices, and optional touchscreens to allow crew members to operate different instruments from a single device, if so desired by the customer.



CV90/35 Control Handle Replica

The After-Action Review module will capture both all tactical events as well as crucial steps in the gunnery engagement procedure like laser range

finder operation, weapons release, and terminal effect/impact localization in the 3D environment. In addition, tabular summaries are generated for each mission for further aggregated statistical analysis of training results, both for the individual crew member as well as the tactical performance of units, or comparative studies of the quality of training among units.

Customer satisfaction is demonstrated by unbroken use of *Steel Beasts Professional* in training at all levels from crew position to battalion commander in the Danish Army since 2003.

About eSim Games

eSim Games is an independent software developer from Mountain View, California. After debuting the consumer market with the armor simulation *Steel Beasts* in 2000, a strategic pivot was made to cater to the market for military training and simulation by introducing *Steel Beasts Professional*.

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Mr. Hinrichsen served in the German Bundeswehr as an armor officer, and has studied industrial engineering in Hamburg and Albstadt-Sigmaringen. During university he formed the eSim Games team with president of eSim Games, Mr. Alexander H. Delaney.