General

The modern battlefield is characterized with wide variety of threats, multi dimensional operations, advanced weapons, communication and C&C systems and strong linkage between political strategy, military tactical decisions, and military technical execution.

The armed forces commanders are required to be proficient with forces operations, familiar with advanced weapons capabilities, capable of compound yet fast decision making and understanding of complicated tactical situation.

To achieve the required proficiency and competency a massive and comprehensive training effort is a necessity including theoretical and practical training, live munitions usage, forces movements etc.

Training in “real world” scenarios is limited, due to various restrictions and limitations such as budget constraints, safety considerations and logistic arrangements.

In order to overcome these limitations, the use of advanced simulation technology is a necessity.

Military forces have become adept at using “virtual environments” to practically represent real world activities and to achieve efficient training of the forces.

We usually define the following simulation system levels:

- **The mission simulator** – for the training of the operation of systems and operation posts, and familiarity with the functionalities of the systems such as – weapon systems, Radar, EW, use of firearms, bridge simulators etc.

- **The tactical level** – for the training of officers, commanders in all levels, decision makers at sea and ashore and training of large level operations.

- **The strategic level** – for the training of the Joint staff, the armed forces arms – land, air and Naval, high ranked commanders and national leaders in commanding and managing of complex operations, responding to national level emergency scenarios and evaluation of units performance.
This document describes the advantages and major components of the **Wargame Trainer (WGT)**. Suitable for the training of the strategic and tactical level position holders – joint staff, arms commanders, field commanders, intelligence units and other security organizations managers.

### The training needs

The modern combat arena and the wide variety of potential threats pose a big challenge to armed forces commanders of all levels – Joint staff, arms commanders, field, air and Naval units commanders and intelligence units commanders, they need to assess the strategic situation, analyze the arena tactical picture, plan defensive and offensive operations, plan of logistics supply and consumption to ensure operations competency, deploy forces and conduct various operations from simple rescue missions up to the large scale defensive or offensive activities.

In addition, forming the country’s largest, trained and equipped organizations, the armed forces are required to act in national disaster situation – earthquakes, fires, terrorist attacks, etc. the dimensions and nature of such activities is almost impossible to anticipate and therefore preparation of forces for these mission requires adequate training.

The war-game trainer provides the necessary tools for training for the armed forces decision makers, enabling training in various scenarios using weapons and following doctrines and procedures while maintaining stringent confidentiality and safety considerations, all these while maintaining realistic geographic, environmental, and other conditions.

### The War-game Trainer (WGT)

The War-game Trainer (WGT) is a comprehensive simulation-based system that facilitates the conduct of realistic strategic and tactical training.

The primary purpose of the War-game Trainer is to train the armed forces decision makers, the Joint staff, arms commanders, field, air and Naval unit’s commanders and intelligence commanders in complex scenarios.
Training objectives

HarTech Technologies War-game Trainer supports wide range of exercise, suitable for training all command levels and units.

- Training of joint staff and other high level commanders in decision making in battle conditions.
- Training of mid range field commanders in tactical decision making and force management under constraints in a variety of operational scenarios.
- National level training – decision makers training of situation analysis in various scenarios, management of large forces, responding to evolving events.
- Developing of national level response to potential threats - Implications on doctrines, logistic assets and reserves, required means (force buildup), and order of forces.
- Evaluation and testing of new operational plans and doctrines.
- Enhancing of cooperation between national leaders, armed forces commanders, arms and units.
- Crisis management – training of large scale disasters management such as earthquakes, tsunami waves, passenger’s aircraft/ ships crash, large scale pollutions etc. focusing of situation assessment, reporting, operation of large units, and more.
- Developing and evaluating of War fighting doctrines against potential threats.
- Deployment of combined forces operations – land, air, Naval and special units.
- Teaching and training tactics and skills of military operations.
- "Fighting" doctrines and techniques against a modern enemy.
- "Fighting" in a terrain typical for the respective unit
- "Fighting" in realistic time sequences
- Intensive scenarios integrating forces applying well-known doctrines.

Multi dimensional scenario including 10,000 simulated entities – land forces, attacking and defending aircraft and Naval forces
War-game Trainer architecture

The War-game Trainer comprises a network of computers used as the trainee’s workstations, a main control station and debriefing rooms.

The trainee’s workstations can be configured to simulate all type of entities – Headquarters, land forces, aircraft, ships, soldiers etc.

The War-game Trainer is capable of creation scenarios consisting of all required simulated entities, including – aircraft, surface and subsurface craft, ground vehicles, human, animals, weapons of all kinds, sensors, communication systems, munitions.

Based on the training defined objectives, the War-game Trainer controller defines a scenario that includes the training area, atmospheric and environmental conditions, composition of friendly, neutral and enemy forces, inventory of sensors and weapon systems, initial positions, mission objectives, and various constraints.

The entities technical parameters are edited by the user using the **Technical Knowledgebase Editor TKE**, consisting of the technical data and parameters of craft, sensors, weapons, communication, munitions, damage etc.

All simulated entities are computer driven (**CGF – Computer Generated Forces**) and follows predefined behavior patterns determined by the user in HarTech “**Behavior Knowledgebase**” **BE**, aiming to describe the entities behavior - doctrines, conditions and actions.

During the exercise, the trainees, operating dedicated consoles simulating the respective systems consoles, receive information regarding detections, intelligence information, EW bearings, and observation systems identifications and according this have to assess the tactical picture, deploy relevant forces and assign subordinates operating doctrines.

The information is continuously processed by the simulation engine that updates exercise data, the updated information again distributed to the trainees consoles and so forth.

All information – exercise data and trainees activities are recorded, analyzed for performance evaluation and can be replayed for the exercise debrief.

HarTech technologies War-game Trainer comprise of the following:

- **The control room** – consisting of 3-4 control stations, capable of controlling several exercises simultaneously, using also for the preparations of the exercises using HarTech technologies **Scenario Editor SE** a dedicated tool for editing simulated scenarios.

  The SE enables the user to graphically place different forces on the scenario map and setting the scenario starting conditions including: Environment, communication, force deployment and command hierarchy.
• **Computer room** – hosting the main simulation server and the communication server.

• **Debriefing Room** – able to accommodate 40-50 trainees, used for briefing of the trainees prior exercise, refreshing of warfighting doctrines and operational procedures and for debriefing of exercises including the trainees performance evaluation.

• **Trainees cubicles** – HarTech technologies War-game Trainer can support large number of trainees cubicles, each represent a specific unit (HQ, battalion, brigade, aircraft etc.) Each cubicle consist of several operating consoles, for the operators and for the unit commander commander, each console represents the unit operational systems (sensors, weapons, C&C etc.).

An example to HarTech’s War-game Trainer is described in the following figure:
HarTech’s War-game Trainer advantages

- HarTech simulation engine, the SSG is Capable of preparation and execution of scenarios containing thousands of entities (30,000 and more) allowing simulating and representing every platform, depot and soldiering allowing for high fidelity simulation of all aspects of the encounter.
- The entities technical data and behavior patterns are user defined, thus fit the actual known parameters.
- Presentation and simulation of wide range of craft, sensors, weapons, communication and more.
- Evaluation of naval operation plans with “simulated” enemy (RED FORCES) using HarTech CGF.
- Execution of several exercises simultaneously.
- Preparation and Generating of scenarios is easy using the SE.
- Debrief and trainees performance analysis capability.
- Reasonable budget for implementation.