TKMS

RESILIENT OPERATIONAL TRAINING

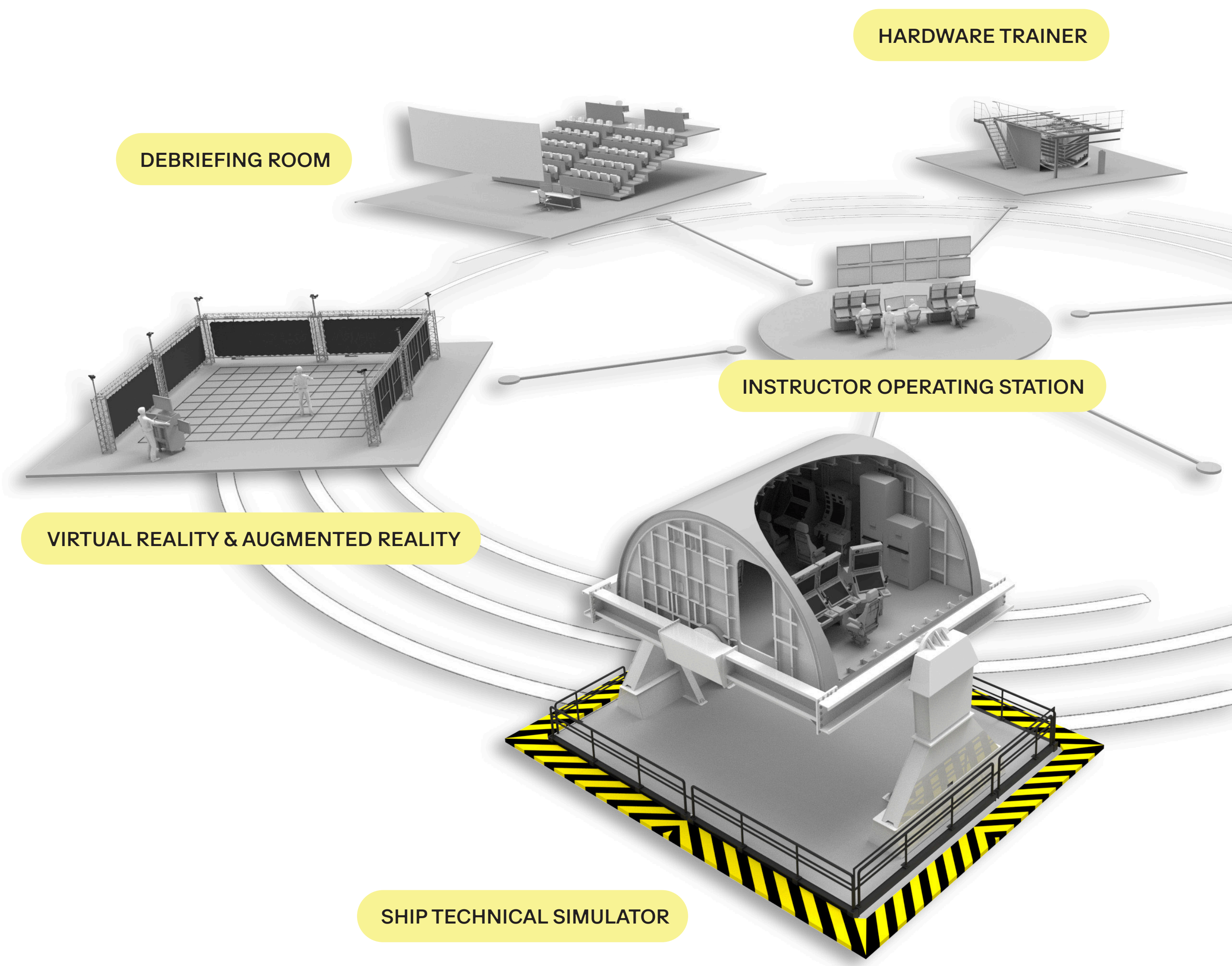
SUBMARINE TRAINER SYSTEM

Modular and interconnected

Your Maritime Powerhouse

SUBMARINE TRAINER SYSTEM

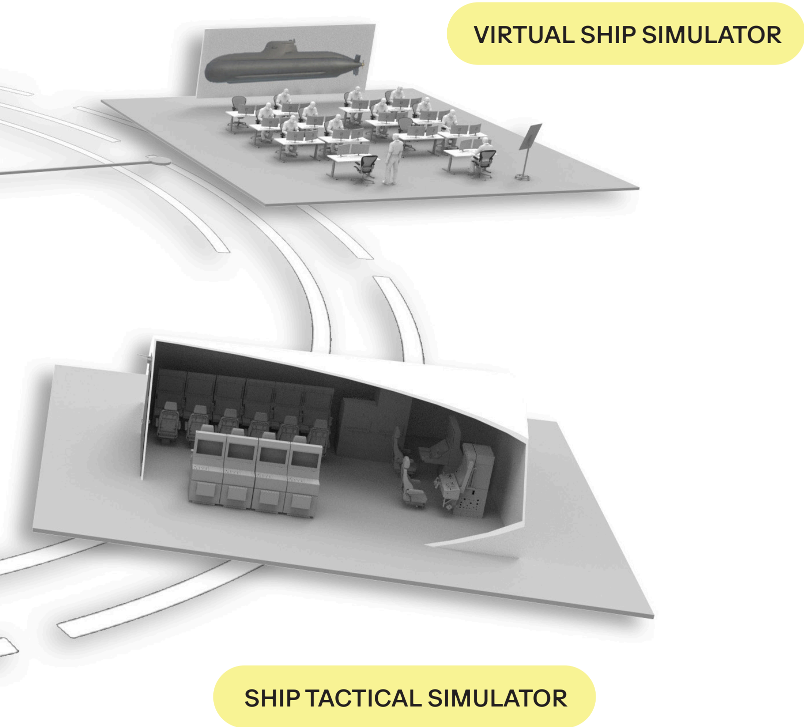
The trainer system for submarines was developed specifically for crew training and mission preparation. The following simulators and support systems are available:



Ship Tactical Simulator (STAS)
The Ship Tactical Simulator provides training in "external battle" for the Combat Information Center (CIC) crew, as well as related mission preparation training.

Ship Technical Simulator (STES)
The Ship Technical Simulator provides training in "internal battle/damage control" for the crew of the machinery control room and the helm on a motion platform.

Virtual Ship Simulator (VSS)
The Virtual Ship Simulator is a highly realistic digital replica of the original submarine. It is designed to train personell in procedures and onboard scenarios with customized avatars in a simulated environment. This allows training to be conducted largely independet of the actual platform.



Hardware trainer
The hardware trainer can be set up in a separate hall and may include either original equipment or realistic replicas (mockups). These devices can also be fitted with visual and/or audio feedback systems to indicate incorrect operation. The hardware trainer is designed to support safe handling, fault diagnosis and maintenance training.

Virtual reality / augmented reality
A training room can be enhanced with virtual reality (VR) and augmented reality (AR) applications, either as an integrated feature or added later. These technologies are especially in supporting skills-based training and greatly increase the level of immersion.

Instructor Operating Station (IOS)
The Instructor Operating Station is used for individual and team training. Areas of application:
- Exercise preparation
- Exercise execution
- Exercise control and monitoring
- Exercise follow-up for selected exercises and parts of exercises.

Debriefing system
The debriefing system is used to assess the exercises that have been completed. The auditorium cas also serve as a space for observing exercises in progress.

Full crew training
The Ship Technical Simulator provides practical training and coordination for handling "internal battle" situations (such as leaks, fires, and other forms of onboard damage) for the crew of the ship's machinery control room. When combined with the Ship Tactical Simulator and the Virtual Ship Simulator, it allows for more comprehensive team exercises as well as spezialised training in individual areas of responsibility related to "external battle".

IMPROVING OPERATIONAL READINESS

Enhancing the operational readiness and efficiency of vessels through comprehensive, land-based training

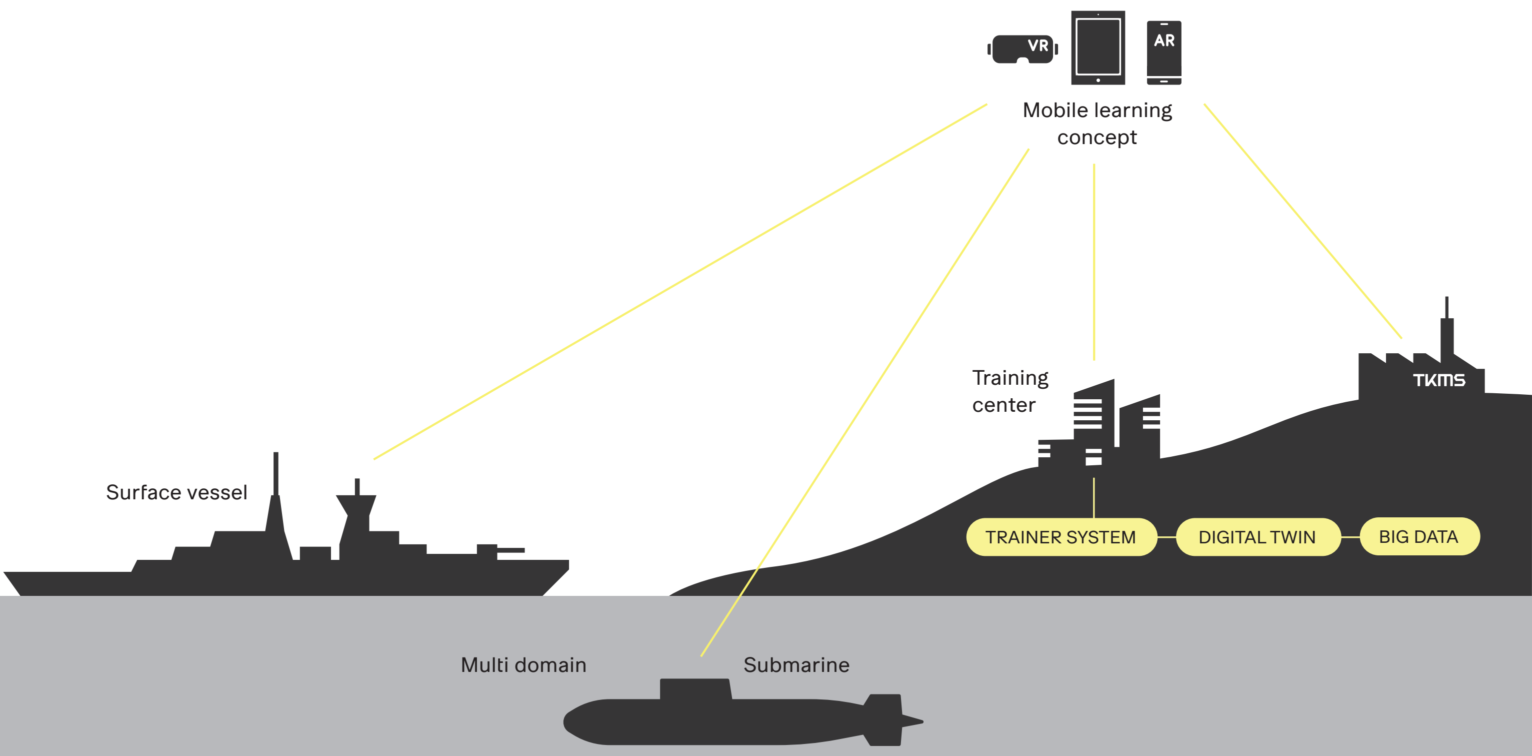
In today´s dynamic and multidimensional naval environment, achieving maximum operational readiness and thorough mission preparation is more critical than ever.

With limited unit availability and extended periods away from home ports, interconnected land-based training systems provide an optimal solution for maintaining and enhancing operational capability. These systems improve both effectiveness of units and readiness of crews.

Training systems can also be designed to operate independently of location and, if needed, remain mobile. This ensures training can continue on a decentralized basis during crises or wartime, offering resiliance against disruption or destruction.

The creation of external interfaces (e.g., with NATO partners or across different branches of the armed forces) allows for training in interconnected operations management. This joint and combined approach strenghtens mission preparation.

Although sophisticated, the training system is intuitive and replicates the look and feel of an actual submarine. Its "train as you fight" approach ensures that realistic training objectives are consistently achieved in a reliable manner.



Typical training situation –
virtual vessel connected to
submarine simulator

TRAIN AS YOU FIGHT

The training environment is customized for each vessel type and designed to be as realistic as possible. Original equipment, mock-ups, and simulators are arranged so that instructors and trainees can operate within configurations that accurately represent their vessel.

Detailed simulation models are stored to enable interaction between the vessel's core functions, platform technology, and higher-level operational management.

When combined with the virtual vessel, realistic and mission-focused crew training becomes possible - true “train as you fight” preparation.

External interfaces also allow for future expansion, enabling additional trainer systems to be connected to the network, regardless of location, when required.

Virtual Ship Training & Information System (ViSTIS®)

High-quality training in complex systems for operating and maintenance personell is essential for the effective deployment of both people and resources.

VISTIS, the Virtual Ship Training and Information System, is a registered trademark of TKMS. It introduces a new training concept that is lagerly independent of the actual vessel, conducted instead on a "virtual vessel".

Within this virtual simulation environment, crews can practice both routine operations and emergency or combat scenarios under realistic conditions. The system presents the user with a highly detailed 3D environment where they can interact with the vessel's systems, devices, and other crew members in real time.

Benefits of ViSTIS®:
Interactive learning and the specific combination of modern training tools deliver the following improvements:

- The highly realistic, interactive training environment greatly enhances participant motivation.
- It allows training from simple procedures to complex and critical maneuvers without risking people or equipment.
- It improves training quality and helps standardize procedures.
- Training duration can be significantly reduced, while knowledge retention and memory accuracy improve considerably.
- With network capability, the virtual vessel can be expanded into full crew training for entire teams.

INDIVIDUALIZED TRAINING CONCEPTS

The submarine Trainer System is built on the training concepts developed by our experienced crew and training team. It is specifically designed to meet the requirements and demands of modern submarine crews.

This training program distinguishes between individual and team training.

Individual training
We provide customers with immersive self-study training courses for every application, covering all levels – from individual devices to the entire submarine. Basic knowledge is taught through structured learning modules. Each course includes includes e-learning, training in the virtual submarine, and practical sessions in simulators (e.g., helm simulators). Courses are organized along a consistent path, progressing from basic knowledge to advanced, skills-oriented training.

Team training
The team training component was developed to train crews in essential onboard procedures, as well as command and reporting chains within the submarine. This approach ensures that operational coordination and teamwork are effectively practiced.

The training concept enables the entire crew to train simultaneously on board an interactive virtual submarine, while also connecting with networked simulators for integrated exercises.

Training options
The trainer system offers the following modes:

- **Standalone mode:** Each simulator can be operated independently by an instructor, who conducts and supervises the training. Every simulator has its own Instructor Operating Station (IOS) for controlling and monitoring the exercises.

- **Interconnected mode:** The Virtual Ship Simulator (VSS) can be linked with either the Ship Technical Simulator (STES) or the Ship Tactical Simulator (STAS) for integrated training. In this mode, the instructor can mange and lead the networked training session through the corresponding STES or STAS Instructor Operating Station (IOS).

- **Multi domain mode:** The Trainer system can be integrated into a secure network structure, enabling multiple training simulation systems to interconnect and operate together in real time, regardless of location (e.g., across different naval bases).

If you are interested, please do not hesitate to contact us – we are available to provide further information and engage in more deep dive.

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