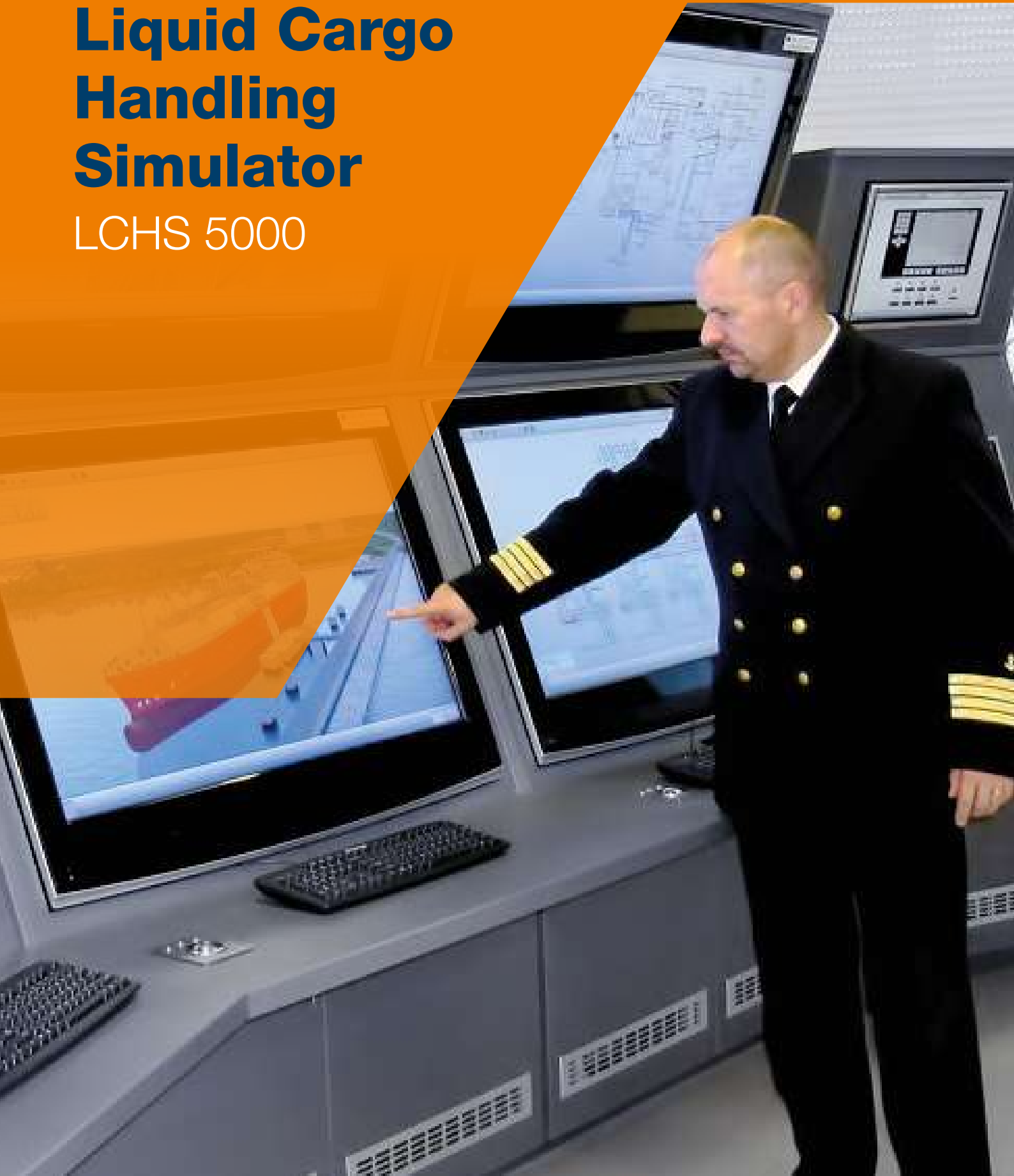
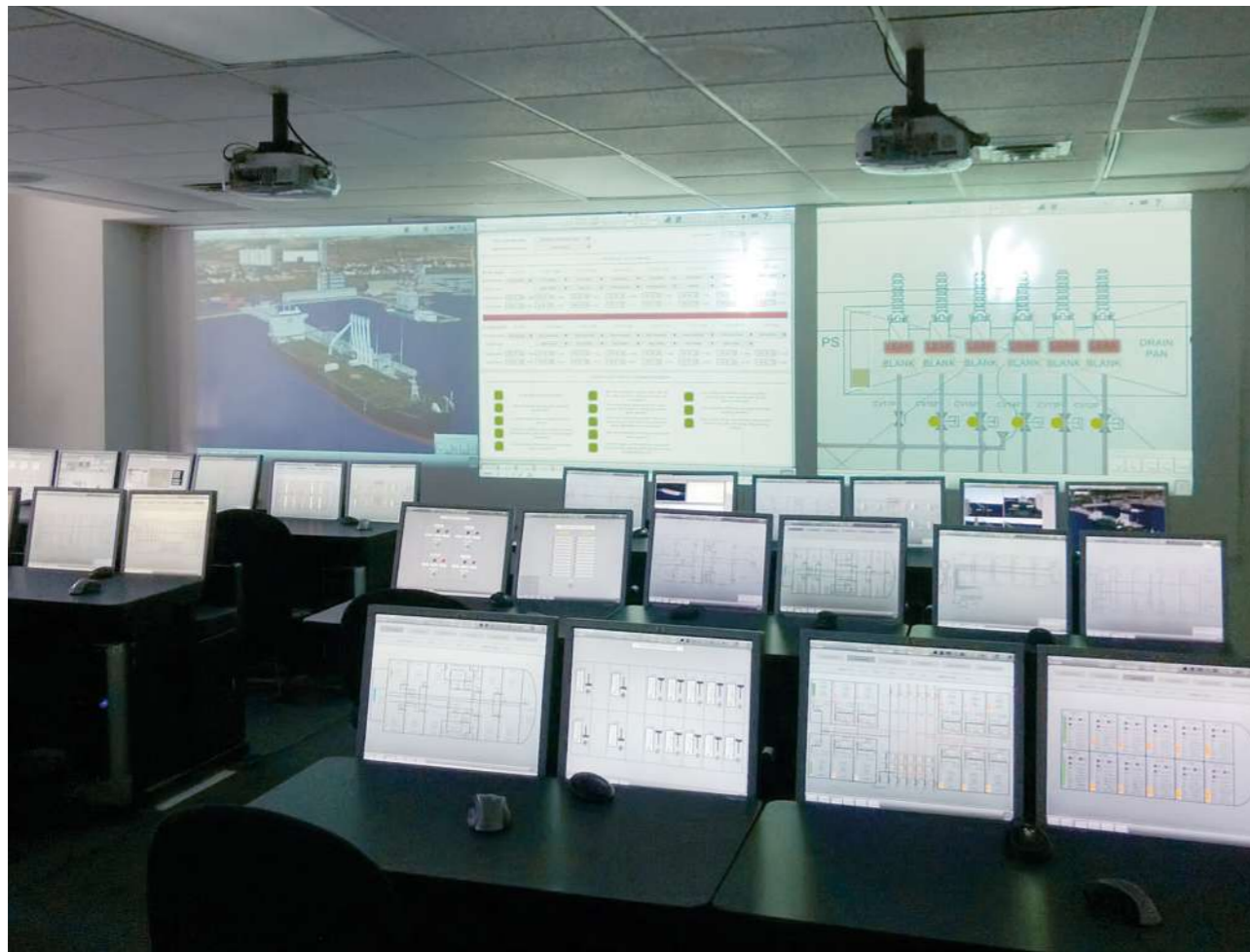


Liquid Cargo Handling Simulator

LCCHS 5000





The LCHS 5000 TechSim Liquid Cargo Handling simulator is designed to train, assess and certify crew members of liquid cargo tankers, gas carriers and terminals, as well as other staff responsible for the safe cargo handling and the operation of auxiliary equipment. The LCHS 5000 TechSim provides an exact, detailed copy of vessel/terminal systems and their components. This simulator is an ideal solution for training centres, academies, government authorities, shipping companies, coastal centres and crewing agencies. In addition, the simulator enables onboard training and demonstration of competency.

Training Objectives

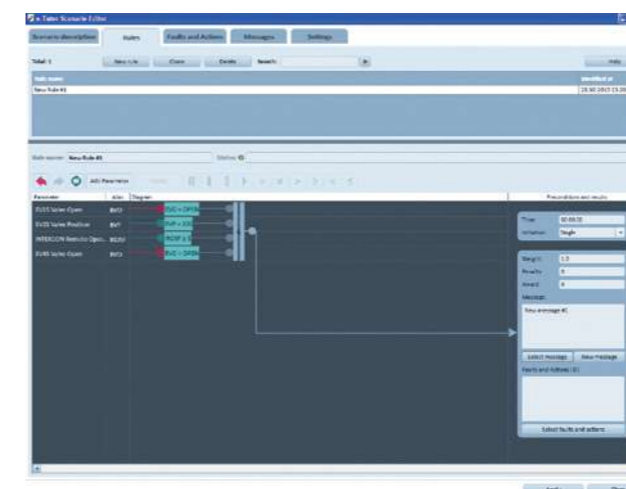
The LCHS 5000 TechSim Liquid Cargo Handling Simulator replicates a modern cargo control room, allowing a comprehensive study of tanker and terminal layouts, including its machinery and systems, according to international standards and requirements:

- General arrangement of the tanker and its systems;
- Maintenance of the tanker systems on management level;
- Control of vessel ballast system;
- Control of trim, stability and stress;
- Proficiency in tanker technological operations;
- Maintaining seaworthiness of the ship, planning and the safe loading, stowage, securing, care during the voyage and unloading of cargoes;
- Control of pump, valves and piping systems;
- Resource management training;
- Responding to emergencies;
- Taking precautions to prevent pollution of the environment;
- Tanker/terminal interaction: cargo transfer systems, shore storage, shore equipment and instrumentation.

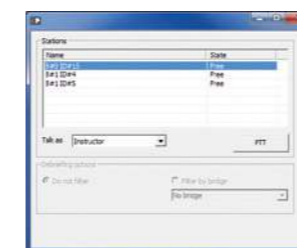
Compliance

The Liquid Cargo Handling Simulator meets the requirements of international standards:

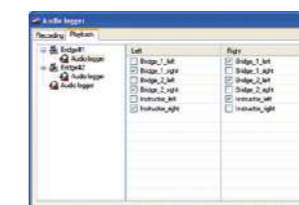
- Standard training for ship officers of all vessel types within the competency framework of STCW 2010 (with Manila amendments) Convention requirements;
- IMO model courses: IMO 2.06 “Oil Tanker Cargo and Ballast Handling Simulator”; IMO 1.01 “Basic Training for Oil and Chemical Tanker Cargo Operations”; IMO 1.02 “Advanced Training for Oil Tanker Cargo Operations”; IMO 1.03 “Advanced Training for Chemical Tanker Cargo Operations”; IMO 1.04 “Basic Training for Liquefied Gas Tanker Cargo Operations”; IMO 1.05 “Advanced Training for Liquefied Gas Tanker Cargo Operations”; IMO 1.06 “Specialized Training for Liquefied Gas Tankers”; IMO 1.35 “Liquefied Petroleum Gas (LPG) Tanker Cargo & Ballast Handling Simulator”; IMO 1.36 “Liquefied Natural Gas (LNG) Tanker Cargo & Ballast Handling Simulator”; IMO 1.37 “Chemical Tanker Cargo & Ballast Handling Simulator”;
- DNV GL-ST-0033 Maritime Simulator Systems standard;
- OCIMF marine terminal training and competence assessment guidelines for oil terminal and product terminals;
- MARPOL 73/78 requirements;
- SIGTTO requirements.



e-Tutor automated evaluation and assessment system



Intercom station



Audio logger

Simulator Components

Instructor Workstation

- Dual monitor workstation demonstrating and recording all trainee’s actions during an exercise;
- 3 operating modules:
 - Exercise Editor – creating and editing of exercises;
 - Online control – running a class and monitoring the exercises performance;
 - Debriefing – loading/viewing of recorded actions.
- Intercom and Audio/Video loggers;
- e-Tutor – automated tutorial, assessment and monitoring system.

Trainee Workstation

Interactive scalable drawings of the systems and subsystems:

- Cargo operations control console;
- Cargo Monitoring System;
- Integrated automation system;
- Closed circuit television (CCTV);
- 3D visualisation of the ship deck;
- Real control panels and touchscreens;
- Video Wall Mimic diagrams.



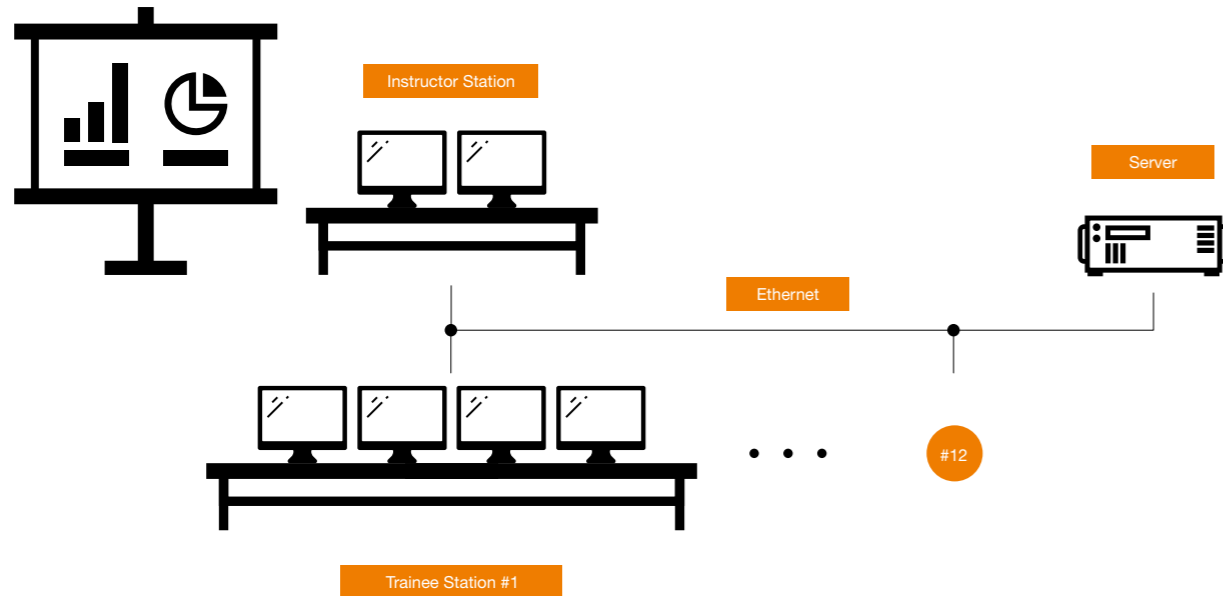
Intercom station

Configuration Options

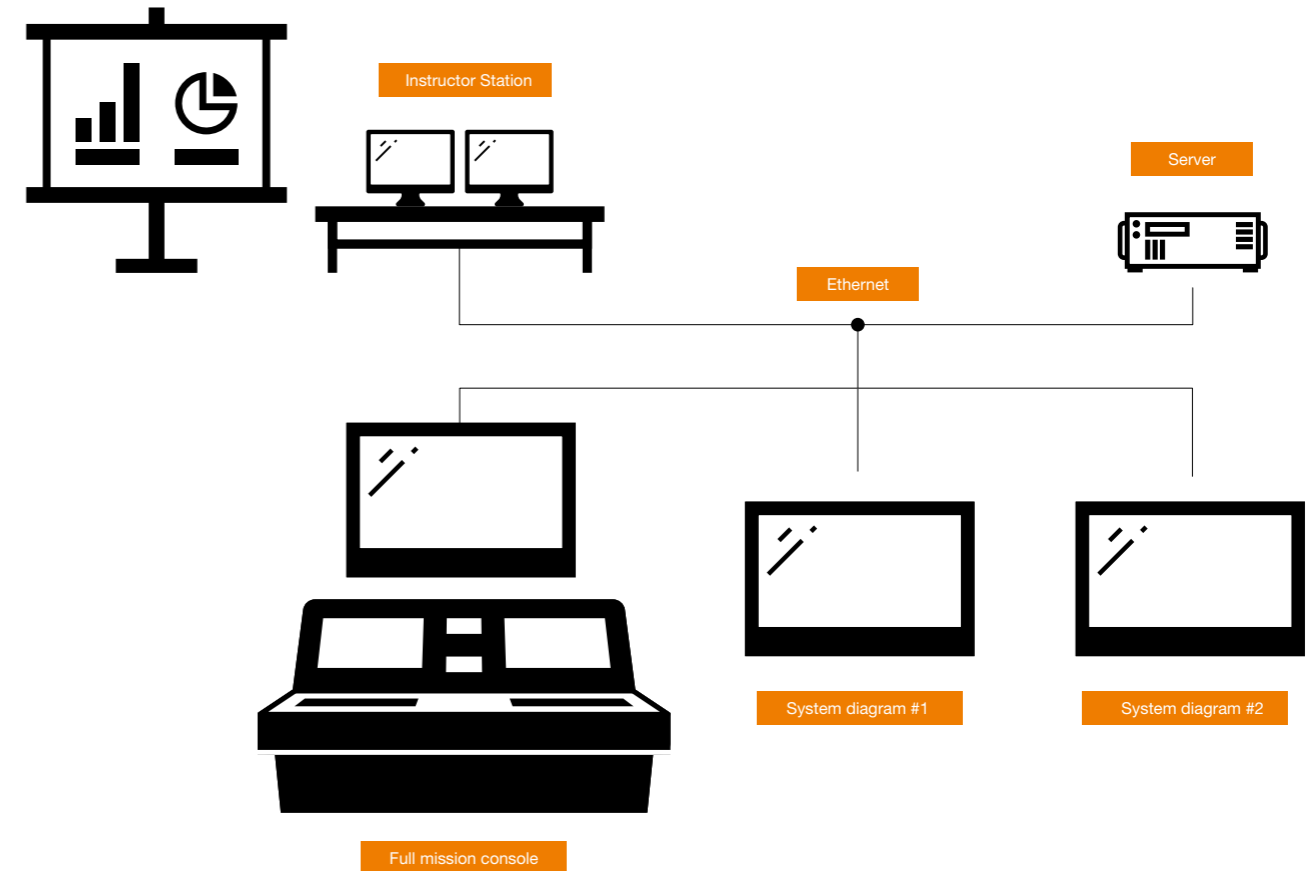
Standalone mode for self-study or shipboard operation



PC-based networked class for group and team training under instructor supervision



Full mission configuration for the ultimate realistic hands-on training and certification using a high fidelity ship like environment



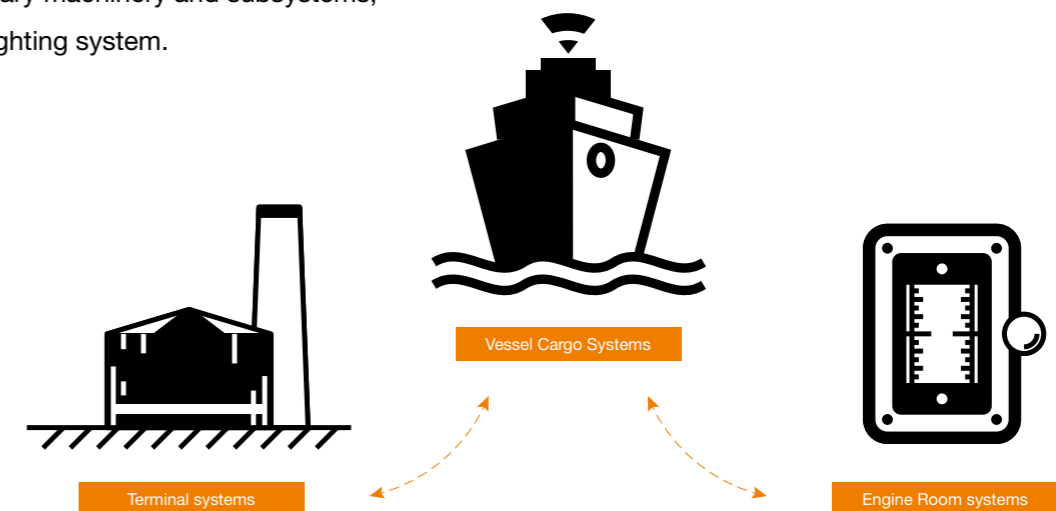
Complete resource management training through simulators integration

LCHS interconnectivity:

- Ship to ship transfer: cargo transfer systems;
- Vessel-terminal interaction: cargo transfer systems, shore storage, shore equipment and instrumentation.

Joint operation with engine room and navigational simulator:

- Power generation/consumption;
- Heat supply for cargo system;
- Auxiliary machinery and subsystems;
- Firefighting system.



Simulated Systems

(depending on the ship model)

- Cargo System
- Ballast System
- Tank Heating System
- Inert Gas & Dry Air System
- Submerged Cargo Pumping System
- Steam driven cargo pumps
- Tank Washing System
- Deckwash Fire System
- ODME System
- Gas Detection System
- Loading Control System
- Cargo Machinery Room
- Cofferdam Glycol Heating System
- Insulation Space Nitrogen Control System
- Emergency Shutdown System
- Level and Overfill Alarm System

- Custody Transfer System

Various Model Types

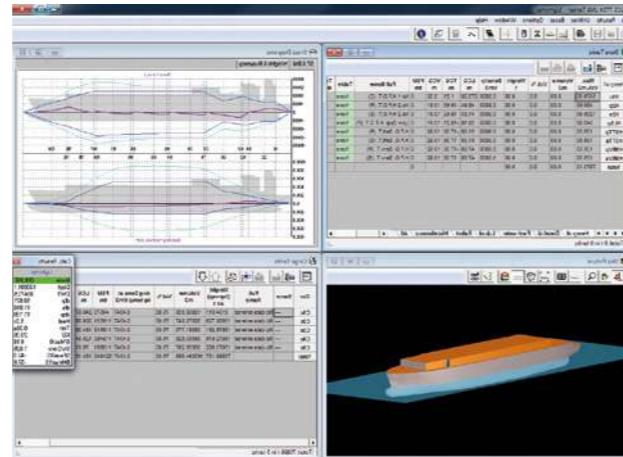
Ship model library includes the major gas and oil tankers used in the marine cargo handling industry worldwide. All simulator models are based on the real ship/terminal prototypes and replicate their systems to a very high level of fidelity.

Different Cargo Types

Different cargo types can be selected from the simulator databases. Operations are carried out for almost all types of cargo.

Loading Control System

Tanks, hull strength, ship stability and ship loading in the simulator are calculated by the included Load Calculator System. This program links all the necessary shipboard calculations with the ship loading, its stability and strength. Use of the software is required by STCW 2010 recommendation B 1/12, i 40 (2,3).



Mathematical Model

The math-model allows run-time to be accelerated in order to make training time more efficient, without any deterioration in realism.

Graphic User Interface

The interface is optimised for familiarisation with the operating principles of the entire system and to provide practical skills in equipment handling. The main tanker units are depicted as 3D objects, showing cross sections of individual assemblies. Computer animation is used to display current processes.

Developing New Models on Request

Specific oil, chemical and product carriers DNV class A simulators based on customer's prototype data can be developed on request within 3-4 months.

Model Library

We continuously extend our library with detailed realistic models based on real prototypes.



VLCC Tanker



LCC Tanker



Product Tanker



Chemical Tanker



LNG Tanker Membrane



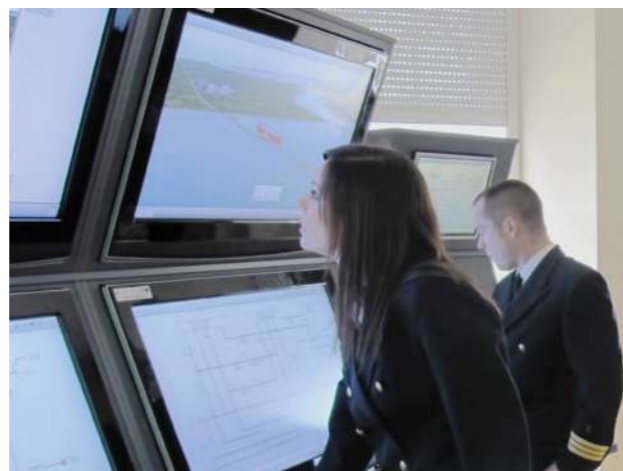
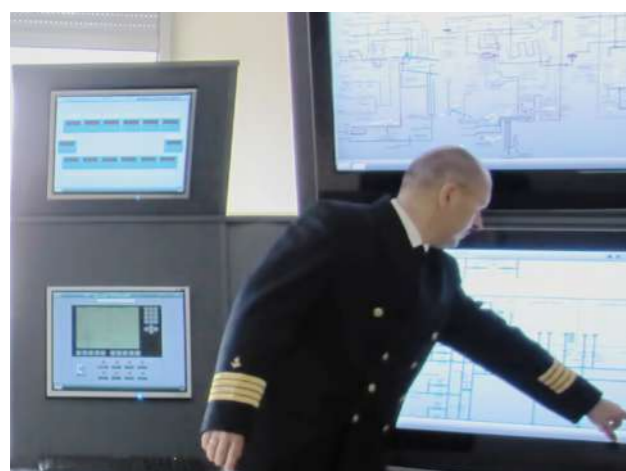
LNG Terminal



LNG Tanker Spherical



LPG Tanker





Wärtsilä is a global leader in smart technologies and complete lifecycle solutions for the marine and energy markets. By emphasising sustainable innovation, total efficiency and data analytics, Wärtsilä maximises the environmental and economic performance of the vessels and power plants of its customers.

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