WÄRTSILÄ

Engine Room Simulator

Engine Room Simulator

Training Objectives

- Engine room equipment familiarisation
- System layout and flow diagrams
- Control system and automation
- Alarm and safety system
- Watch-keeping and troubleshooting
- Emission control and fuel economy management
- Energy management
- Emergency operations
- Vessel resource management

Training for Engine Department Personnel

- Ratings forming part of engineering watch
- Engineer officers in charge of watch
- Senior engineering staff
- Navigating / marine engineering officers and technicians

Compliance

- STCW 2010 Convention and Code
- ISM Code, sections 6 and 8
- IMO Model Courses 2.07, 7.02, 7.04
- MARPOL and SOLAS
- DNVGL-ST-0033 Maritime Simulator Systems standard
- Has a statement of product quality according to the NK Standard for Certification of Maritime Education and Training Simulator Systems based on the latest STCW requirements and corresponding IMO model courses

Configuration

Solo

Stand-alone simulator

- Distance learning
- Self-education
- Equipment familiarisation
- Refresher training

Networked Class

Several interactive trainee workstations with instructor supervision

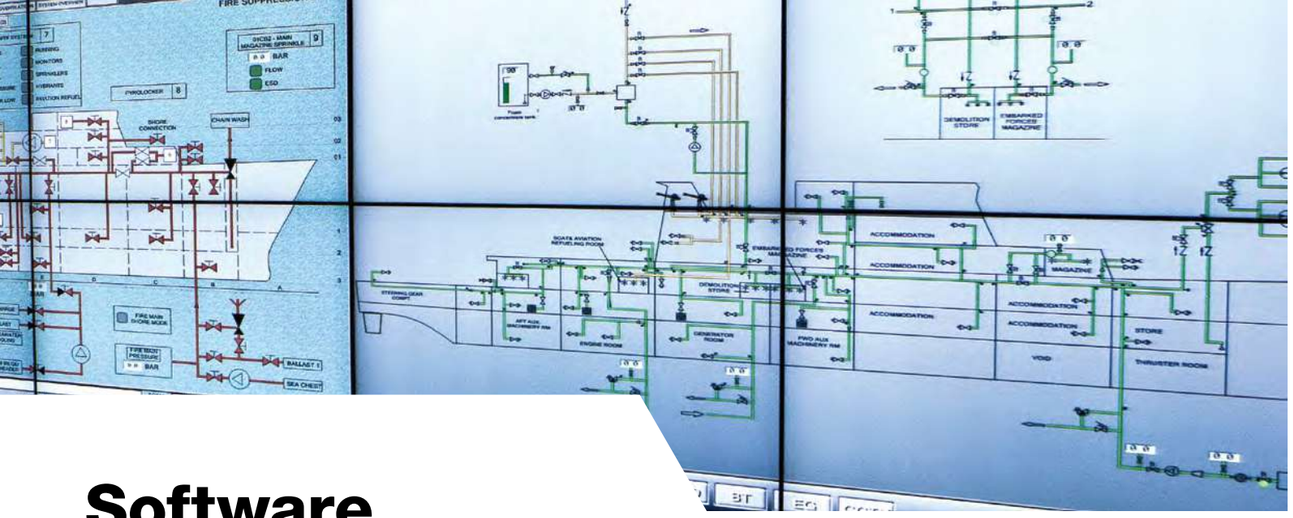
- Principles of operation and troubleshooting
- Diagnosis of engineering/ electrical systems

Full Mission

Replica of Engine Control Room, Main Switchboard and Machinery Compartments

- Advanced operation and troubleshooting
- Human Factors training
- Resource Management training
- Communication protocols
- Emergency operating procedures
- Machinery disaster management
- Final training and certification
- Assessment and examination

Custom Engine Room design for specified vessels
Vessel Management training via Total Ship Operation



Software

Trainee Workstation

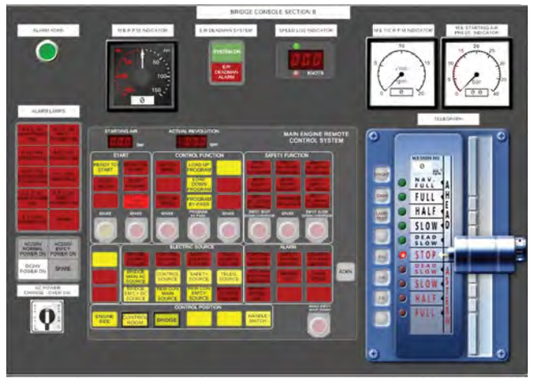
- Remote control and monitoring of Propulsion Plant from the Navigational Bridge
- Remote control and monitoring from the Machinery Control Room
- Local control and monitoring from Engine Room compartments
- Control, Monitoring and Alarm PC-based system
- Courseware and CBT for self-study with instructions in visual and audio format

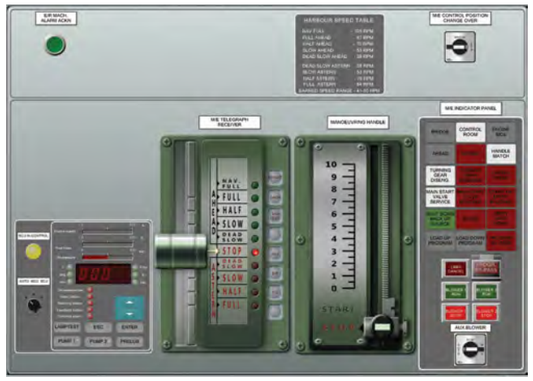
The Following Systems are Imitated

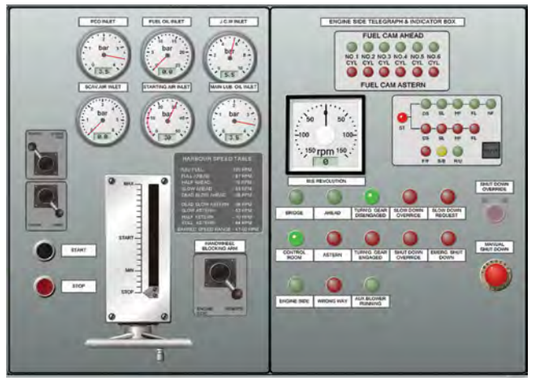
- Ship's diesel propulsion plant
- Ship's electric power plant
- Auxiliary systems and machinery
- Machinery sound imitation
- Alarm systems with Sound & Visual Alarm Unit

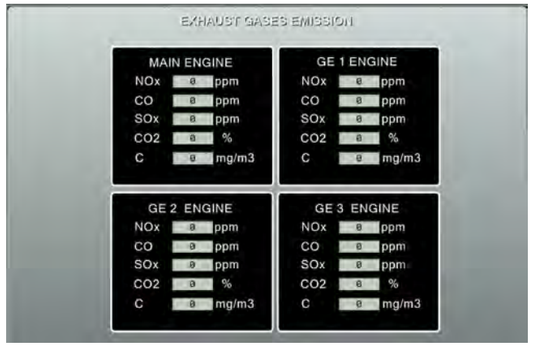
Trainee Console Structure

- Bridge Control Console
- Engine Control Room
- Main Switchboard
- Control and Monitoring System
- Boiler Monitoring and Control System
- Cylinder Indication diagrams
- Schematic diagrams of modelled systems
- Steering Gear Room
- Engine Rooms
- Firefighting Room
- Emergency Generator Room
- Cargo Control Room









Control from Bridge

Standard navigation bridge console panels for joint crew resource training exercises

- Propulsion Plant Remote Control Panel
- Steering Control Panel
- Fire Alarm Station

Control from Machinery Control Room

- MCR Control Desk panels
- Control, Monitoring and Alarm system through VDU
- Sections of Main Switchboard of Electric Plant

Local Control from Engine Room

- Main engine and Diesel Generator LOPs
- Purifier and Compressor control panels
- Electrical motor starters
- Incinerator control panel
- Steam Boiler LOP

...and more

Exhaust Gas Emission Monitoring and Control

- Exhaust gas emission monitoring
- Exhaust gas scrubber system
- Low-sulphur fuel oil selection

Software

3D Virtual Reality

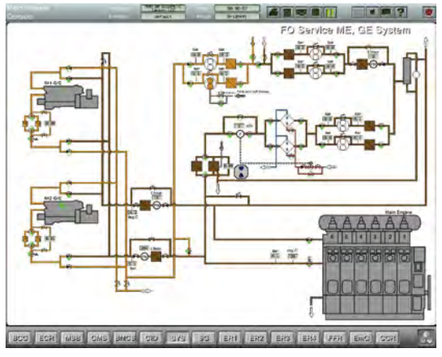
- 3D visualization of various ship compartments
- Access to local operation posts from 3D visualization
- Control and functionality adjustment from 3D visualization

Imitation of Local Operation Posts in Machinery Compartments

- Trainee selects a starting point and a point of destination
- The advanced walk through feature allows the student to walk anywhere in the environment giving a full immersive experience
- On arrival trainee can operate the selected local operation post
- The machinery space 3D visualization allows trainees to move to an individual piece of equipment and to operate it

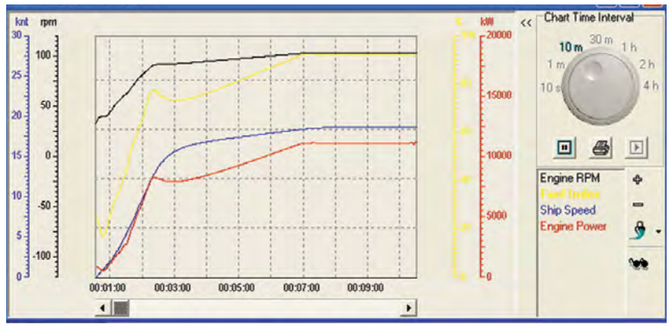
Interactive System Diagrams

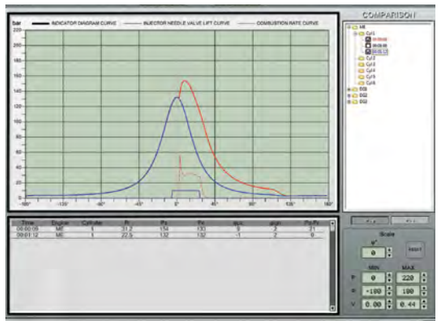
- Exact copy of the real vessels schematic drawings
- Ability to control the individual system pages directly on screen
- Zoom function for the extensive diagrams



Analytical Presentation

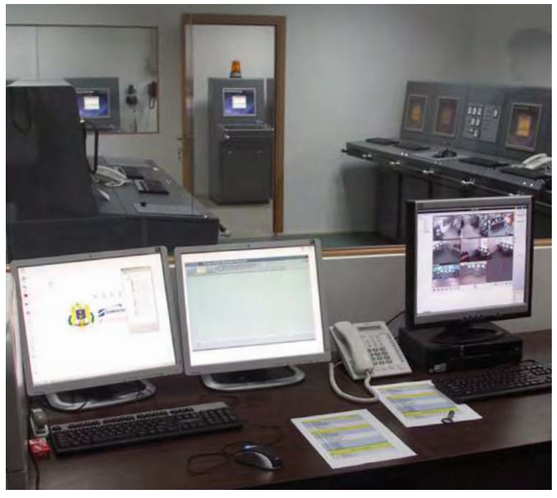
- Combustion process with adjustments
- Trend curves of all physical parameters
- Interactable objects eliminate the need to move away from the 3D environment, giving a better situational awareness





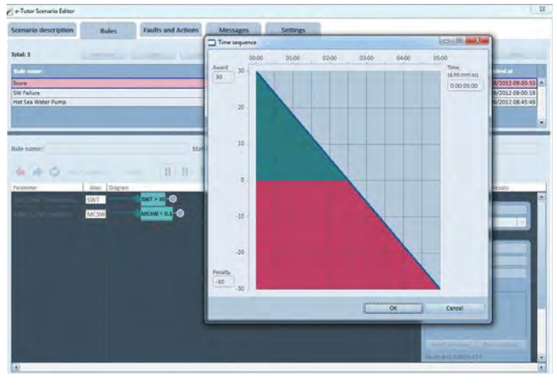
Instructor Workstation

- Exercise editor to create and edit exercises
- Briefing facility for trainee
- Monitoring and recording the trainee work in online mode
- Debriefing facility for display and analysis of recorded exercises



e-Tutor – Automated Evaluation and Assessment System

- Objective assessment of an exercise fulfillment by a trainee
- Evaluation of student performance against set criteria
- Embedded Electronic Registry and questionnaire system
- Trainee Performance Monitor tracks the overall status of multiple sessions
- Automated reports



Integration of Communication System and CCTV

- Sound-powered telephone with the simulated audio recording and debriefing system
- Software recording of up to 30 separated audio channels
- Synchronized playback of any of the chosen channels during debriefing
- Integrated CCTV recording and playback during debriefing
- Intercom and audio/video loggers

Hardware

Standard and Customized Dedicated Control Panels

Engine Room Simulator can be supplied with full-size control consoles comprising built-in monitoring and control panels, providing a fully immersive training environment

Center for Simulator Maritime Training (CSMART), Netherlands

Naval Academy, Romania

Korean Coast Guard

Virtual Hardware Panels

- Photorealistic touch screens replace the traditional hardware panels and instruments
- The ship modelled can be changed in one click, allowing several ship types to be simulated within the same full mission infrastructure

Center for Simulator Maritime Training (CSMART), Netherlands

Combination of Real Dedicated Panels with Virtual Panels

Virtual hardware option allows several ship models to be simulated using the same full mission simulator infrastructure.

Large flat touchscreen displays replicate the main switchboard and switchboard generator control

Institute of Technical Education, Singapore

MESTE, Royal New Zealand Navy

MESTE, Royal New Zealand Navy

Simulators Interconnectivity

- Joint training in a single environment
- New training opportunities in disaster control, resource management and human factors
- Crew resource management training: training in efficient cooperation between the engine room and bridge crews
- Joint operations with Liquid Cargo Handling Simulator: power generation/ consumption, heat supply for cargo system, auxiliary machinery and subsystems, firefighting system
- Understanding the complexity of all onboard equipment and interactions

Advanced equipment familiarisation and emergency situations training are necessary due to increased level of automation on board the ships, where modern engine monitoring and control devices are installed on the bridge (in accordance with the IMO ‘Watch 1’ standard).

LCHS

NTPRO

ERS

Ship Model Library

ERS 5000 Techsim Ship Models

ANZAC Frigate Ship

2 × Diesel Engine MTU 12V1163
TB83 GE LM2500
1 × Gas Turbine
Joint operation with NTPRO

Offshore Patrol Vessel

2 × MAN B&W Diesel 12RK280 (MAN 12V 28/33D)
2 x Double-reduction gear ZF W63000 NR2H
2 x CPP – Wartsila Hub-Type Propeller
Joint operation with NTPRO)

Azipod Diesel-Electric Cruise Ship

2 x ABB AZIPOD 17.6 MW, 160 RPM
3 x Bow Thruster 1.91 MW
Joint operation with NTPRO

Tanker LCC (AFRAMAX)

MAN B&W 6S60MC-C,
2 strokes, slow speed, turbocharged, reversible main diesel engine, FPP
Joint operation with NTPRO

Ship Model Library

ERS 5000 Techsim Ship Models

Dual Fuel Diesel-Electric LNG Carrier

2 × MAN L51/60DF
2 x Propulsion Frequency Converter
2 x Reduction Gears
2 × FPP
Joint operation with NTPRO

Steam Turbine LNG Carrier

1 x HP turbine of impulse type
1 x LP turbine including astern elements
Joint operation with NTPRO

Product Tanker

MAN B&W 6S50MC-C
MCR 8,600 kW at 127 RPM with electronic governor, FPP
Compatible with NTPRO and LCHS Product Tanker

Containership – Electronic Controlled Main Engine

1 x MAN B&W 11S90ME-C 9.2
1 × 6 blades Fixed Pitch Propeller
Ballast Water Treatment
HV ship model [6.6KV]
Joint operation with NTPRO

Eurodam

2 x Propulsion Motors type ABB AMZ1250M12LAEZ
Output Power 17600 kW
High Voltage Ship 11 kV
Joint operation with NTPRO

Royal Princess

2 x VEM Sachsenwerk GMBH Propulsion Motors,
Type: DTMSZ 3466-16YSOutput power 18000 kW;
Joint operation with NTPRO

Patrol Vessel PV3000

4 × MTU 20V 1163 TB93
2 x RENK type “ASL 2x150” Reduction Gears
Joint operation with NTPRO

Ro-Pax Ferry

2 × MAN B&W 8L32/40
2 × CPP
2 x Fin Stabilizers
Joint operation with NTPRO

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.

wartsila.com

08.2018 / Wärtsilä Voyage Solutions