UNITEST SINGLE CONSOLE ENGINE ROOM SIMULATOR

The UNITEST single console is an engine room simulator with a single desktop hardware console.

The desktop hardware console combines features and benefits of a hardware simulator (real levers, gauges, lamps and pushbuttons) with a very compact size. It can be used in normal PC-classrooms as a multiple installation in different configurations.

UNITEST offers the single console simulator in two (2) versions. In one version, the console is dedicated to medium speed engine room (MER3d, MER2 software) with two (2) main engines, reduction gear and controllable pitch propellers. The second version is dedicated to low-speed engine room (ERC software).
The UNITEST MER3D Engine Room Simulator

The UNITEST MER3D Engine Room Simulator is based on typical solutions presently used in medium sized engine rooms (2 four-stroke type main engines with reduction gear and controllable pitch propeller).

The main purpose of the simulator is the practical preparation of the trainee for engine room operation, in particular:
familiarization with the basic engine room installation (compressed air system, fresh and sea
water cooling system, lubricating and fuel oil system, gear and CPP hydraulic system);

- acknowledgment with main engines and auxiliary equipment starting procedure;
- propulsion system maneuvering (main engines – reduction gear – CPP);

**MER3D** has been developed to comply with:

- STCW Code: Section A-1/12 and Section B-1/12.
- ISM Code: Section 6 and Section 8.

The **MER3D** simulator is based on an engine room composed of two (2) medium speed diesel ME’s
and two (2) diesel engine generators.

The propulsion system includes two (2) ME’s, which driving the controllable pitch propeller (CPP)
through reduction gear. The propeller’s revolutions and pitch are controlled simultaneously.

The simulator introduces 3D model of the Engine Room, based on the real equipment. In order to
create the impression of working in real environment, it provides 3D sounds which can be listened
to on 2, 4 or more speakers.
MER3D simulator model includes the following systems:

- Fuel System
- Cooling & Fire System
- Lubricating System
- Compressed Air System
- Power Plant
- Emergency Generator
- Sanitary Water System
- Bilge System
- Steering Gear
- Sewage Treatment Plant
- Fresh Water Generator
- Air Conditioning Plant
- Water Mist System
- CO2 System
- Reverse osmosis system
- Hot water boiler
- Refrigerating Plant

The simulator introduces a 3D model of the Engine Room, based on real equipment.

The 3D model includes very realistic, animated, virtual controls like switches, gauges and lamps.

The Electric Power Plant is equipped with a modern Power Management
System which allows for automatic control of generators according to actual power demand.

The mimic diagram provides the possibility to zoom in the selected part of the engine room.

The control room allows for remote control of the engine room’s equipment from computers.

The control panels have to imitate the most important parts of the control room equipment.
The Zoom function allows for navigation in 3D environment and easy access to details.
The MER3D's main features:

- MER3D is a highly realistic simulator for engine room training which can also be used as a low cost introductory simulator.
- The mathematical model simulates a typical ship's engine room with two 2-stroke, medium speed engines, which driving the controllable pitch propeller through reduction gear.
- All vital auxiliary systems have been implemented.
- The user interface includes virtual controls and alarms and creates a very realistic environment.
- The 3D virtual reality with active valves, tank level indicators and selected digital gauges allow for comfortable engine room operation and monitoring.
- Multichannel digitized sound provides a very realistic engine room feel. The sound effects include: engine sound correlated with engine speed, sound of a diesel generator starting and running, open indicator valve sound, alarm and machine telegraph buzzers.
- Emergency procedure training including fire simulations.

The main educational tasks which can be accomplished using MER3D have been listed below:

- Learning the engine room's typical operating routines.
- Engine room operation training. The user will have the possibility to accomplish any operational tasks starting from different set-ups, both pre-prepared and saved by the user. Corrective action learning when faults occur. Different faults can be simulated and mixed in the run-time or loaded from disk.

Medium Speed Engine Room (MER2)

Medium Speed Engine Room (MER2) is a PC-based engine room simulator. All vital systems in a ship's engine room have been modelled and implemented. The multichannel digitised sound is fully comparable with the best simulators available today.
The MER2 simulator model includes the following systems:

- Two (2) main engines (4 stroke, medium speed, 16 cylinders, reduction gear, controllable pitch propeller).
- The fuel system (DO, including storage system and separator).
- The lubricating system (LO circulation and separator, LO storage).
- The cooling system (fresh water).
- The compressed air system.
- The power plant (2 diesel- and 1 emergency generator).
- The bilge system with oily water separator.
- The ballast system.
- The steering gear.
The cooling system

Gear panel

Control local

Control remote

Gravity tank low level

Main tank low level

Gear / Lub Oil Press.

Clutch / Servo Oil Press.

Aux Lub Oil Press.

Gear / Lub Oil Temp.

Gear / Lub Oil Pumps No 1

Clutch / Servo Oil Pumps No 1

Aux Lub Oil Pump

Reduction gear lubricating and control system panel
The **MER2** simulator’s main features:

- MER2 is a highly realistic simulator for engine room training which can also be used as a low cost introductory simulator.
- The mathematical model simulates a typical ship’s engine room with two 4-stroke, medium speed engines, reduction gear and controllable pitch propeller.
- All vital auxiliary systems have been implemented.
- The user interface includes virtual controls and alarms and creates a very realistic environment.
- The mimic diagrams with active valves, tank level indicators and selected digital gauges allow for comfortable engine room operation and monitoring.
- Multichannel digitised sound provides a very realistic engine room feel. The sound effects include: engine sound correlated with engine speed, sound of a diesel generator starting and running, open indicator valve sound, alarm and machine telegraph buzzers.
- MER2 can co-operate with another personal computer connected to a local area network. This second machine will be used as an instructor terminal enabling the online monitoring of student activities, fault simulation and the telegraph communication between a bridge and an engine room.

The main educational tasks which can be accomplished using MER2 have been listed below:

- Learning engine room typical operating routines.
- Engine room operation training. The user will have the possibility to accomplish any operational tasks starting from different setups, both pre-prepared and saved by the user.
- Corrective action learning when faults occur. Different faults can be simulated and mixed in the run-time or loaded from disk.