The Engine Room Simulator 4000, developed by Transas, is a maritime simulator meant for the education, training and assessment of engine department personnel, including officers in charge of watch, second and chief engineers.

ERS 4000 meets the requirements of the STCW’95 Convention and Code. The simulator’s scope of training objectives corresponds to the specifications of standard competence for engine department personnel as to Chapter III of STCW’95, IMO Model Courses 2.07; 2.08; 7.02; 7.04; and facilitates marine engineering training at the operational, management and support levels. It is certified by Det Norske Veritas as Class A Simulator.

**AREAS OF APPLICATION**

**Education**
- Basic physical and technical knowledge
- Engine room equipment familiarisation
- System layout and flow diagrams
- Control, Automation, Alarm and Safety systems
- Operational instructions
- Watch keeping procedures

**Training**
- Updating of seagoing engineering personnel
- Educating specialists from other related qualifications
- Refresher courses

**Assessment of Competence**
- Issue of qualification certificates
- Diploma revalidation and qualification
- Demonstration of professional competence

The wide application capabilities of the Transas ERS 4000 simulator make it the ideal solution for maritime colleges and academies, training centres, shipping companies, maritime authorities and crewing agencies.

**TYPES OF TRAINING**

The high level of physical and behavioral realism of the ERS 4000 creates a professional environment for the following types of marine engineering training:
- Familiarisation and education
- Standard operation and watch keeping
- Advanced operation and troubleshooting.

**CONFIGURATION**

**ERS 4000 Solo**
Single-PC Desktop System
- Designed for self-education, equipment familiarisation and knowledge refresher training
- Run on standalone PC
- Off-line Instructor functions include Exercise Editor and Debriefing

**ERS 4000 Network**
PC-based Simulator Class
- Designed for group and team training
- Instructor control and monitoring
- Up to 12 interactive Trainee workstations

**ERS 4000 Full-mission**
‘Real’ Engine Room Consoles supplied with the Trainee Workstation:
- Designed for professional hands-on simulator training, including advanced operation and troubleshooting tasks
- ‘Real’ simulated consoles with built-in monitoring and control panels
- Panels are available for Ship’s Diesel Propulsion Plant with Auxiliary systems and machinery and for Ship’s Electric Power Plant. Full interaction between simulator software and hardware
- Any combination of ERS 4000 Network and Full-mission workstations.

Network workplace configuration is flexible and could be adjusted according to the training requirements.
**Engine Room Simulator ERS 4000**

**Electric Power Plant**

The Ship’s Electric Power Plant incorporated in ERS 4000 includes the main switch board and control panels for diesel-generators, shaft-generator, turbo-generator, emergency-diesel-generator, shore supply, consumers, synchronising, automatic and manual control modes, alarm and safety systems.

The simulator imitates the actual dynamics of the transition processes, allowing the trainee to acquire the appropriate operation skills.

Simulated Systems Include

- Diesel Generators
- Shaft Generator
- Turbo Generators
- Shore Supply
- Emergency Generator
- Sections of Main Switch Board and Emergency Switch Board
- Consumers, feeders, earth monitoring, etc.

**Propulsion Plant**

The set of equipment simulated in ERS 4000 complies with the modern standard accepted for ships’ diesel and steam turbine plants. To fully meet the engineering training requirements of its customers, Transas has simulated three of the most widespread types of ship’s propulsion plant, including:

- Two-stroke slow-speed diesels: MAN B&W 6S60MC, MAN B&W 10K96MC, Wartsila-Sulzer 6RTA58 with a fixed pitch propeller
- Four-stroke medium-speed diesel of the SEMT Pielstick 16 PC2.2V-400 type with a controllable pitch propeller
- Four-stroke high-speed diesel of the Caterpillar 3508 TA type with reversible reduction gear and fixed pitch propeller
- Steam turbine cross-compound, double reduction geared (Kawasaki UA-400 as prototype)

**Auxiliary Systems**

The extensive range of Auxiliary systems and Machinery subsystems modeled in ERS 4000 meets the ever growing requirements set forth for marine engineering simulator training.

The set of Auxiliary Systems and mechanisms is compliant with MARPOL and SOLAS requirements.

Simulated Systems Include

- Steering Gear
- Ballast System
- Sewage Treatment System
- Incinerator
- Steam Plant
- Fire systems
- Bilge Systems
- Refrigeration Systems, etc.
'Virtual Reality' Engine Room

The 3D Engine Room is an innovative module included in the Transas ERS 4000 simulator. With this module, simulator users can solve the following training tasks:

- '3-D virtual reality' of the Engine Room area for familiarisation support
- Standard and Advanced operation, including troubleshooting
- System mimic diagrams and local control places
- Familiarisation with Engine Room sounds

Hardware Controls

To simulate the vessel interior with greater realism and thus further improve the efficiency of training, ERS 4000 can be supplied with full-size control consoles comprising built-in monitoring and control panels, as well as computers.

The hardware consoles included in ERS 4000 imitate:

- Integrated Engine Control Room control desk
- Main Switchboard and Emergency Switchboard of the Ship’s Electric Power Plant
- Engine Room local control places
- Monitoring and control panels ensuring the inspection of the majority of simulator systems and their control
- Alarm panels
- Sounds and noises of all the major engine room devices, as well as alarm sound signals
- Sound & Visual Alarm Unit. ERS 4000 transmits the complete set of alarm signals to this newly-implemented device

External equipment may be connected to create customized controls configuration through universal hardware interface.

All sets of 'real' consoles supplied with ERS 4000 are provided with built-in computers connected to a local network, which ensures the full interactivity between all the components of the simulator.
ERS 4000 is an excellent tool for carrying out professional education, training, and knowledge assessment of ship’s engineers, under the supervision of an Instructor. Advanced exercise monitoring and analysis functions of the simulator’s Instructor Station make ERS 4000 applicable for training tasks of practically any level of complexity.

Up to 12 interactive Trainee Stations can be controlled from a single Instructor Station.

**Exercise Editing**
- Generation of new exercises
- Editing of existing exercises
- Access to existing and creation of new training scenarios
- Transas is able to provide courseware packages according to SRCW’95 requirements

**On-line Class**
- Exercise monitoring, on-line control of a class network
- Introduction of equipment faults, changing preset exercise parameters in the on-line mode
- Recording of all the events at Trainee workstations
- Various ship models could be appointed for different trainees at the same time; the task could be appointed for individual, team and crew training

**Debriefing**
- Post-exercise analysis of trainee performance
- Replay of recorded exercises in real, fast and slow time or in the step-by-step mode

**Competence Assessment**
- A set of standard tests on maritime qualifications for competence assessment exercises
- Results database for training statistics

The ERS 4000 Instructor Station incorporates the following equipment:
- Dual-head computer
- LAN server
- Color printer
- Projector.

**INTEGRATION WITH NAVIGATIONAL SIMULATOR**

Using the open architecture and modular design structure of its simulator systems, Transas has allowed for the integration of the ERS 4000 and NT PRO 4000 shiphandling simulator into a single interactive training environment.

The combined training of engineering personnel and deck officers in a single exercise solves the following tasks:
- Training of efficient and well-coordinated cooperation between the engine room and bridge crews as it is onboard the real ship
- Understanding of the complexity of all onboard equipment and interactions
- Training of emergency situations
- Advanced equipment familiarisation necessary due to the increased level of automation on board ships, where modern engine monitoring and control devices are installed on the bridge (in accordance with the IMO ‘Watch 1’ standard)

Such integrated training is now increasingly demanded by:
- Maritime training centres and schools, where dual qualifications (watch officer/engineer) are available
- Shipping companies training their crews onboard and ashore
- Advanced shiphandling simulator courses designed for crews of vessels with an A1/A2 automation class
ERS 4000 AVAILABLE SHIP MODELS

ERS 4000 incorporates the library of ship models with the most widespread types of propulsion plant. The model library is constantly growing. Customised models can be developed on demand, given that a customer provides the necessary technical data on the vessel’s engine room equipment.

The following Ship Models are available now:

**Dry-Cargo Vessel/Container Ship**

- **Model Description**: Multipurpose dry-cargo vessel/container ship of 12,000 DWT, carrying general cargo, 20’ and 40’ containers.
- **Main engine**: Two-stroke low-speed reversible turbo charged diesel engine with fixed pitch propeller.

**RO-RO Vessel**

- **Model Description**: Ro-Ro vessel of 5,000 DWT, with a four-stroke medium-speed non-reversible turbo charged diesel engine and controllable pitch propeller.

**Container Ship**

- **Model Description**: Containership of 83,105 DWT with a two-stroke reversible low-speed turbo charged diesel engine with fixed pitch propeller.

**ERS 4000**

Engine Room Simulator ERS 4000

**General Cargo-2**

- **Model Description**: Multipurpose general cargo-containership of 12,000 DWT, having a two-stroke reversible low-speed turbo charged diesel, and direct transmission to a fixed pitch propeller.

**LNG Tanker**

- **Model Description**: LNG tanker of 76,000 DWT, with a steam turbine as the main engine, driving a fixed pitch propeller via a turning gearbox.

**Oil Tanker**

- **Model Description**: Oil tanker of 60,500 DWT, with a two-stroke low-speed reversible turbo charged diesel engine and fixed pitch propeller. The Auxiliary systems: Oily Water Treatment System & Incinerator added according to MARPOL requirements.

**Fishing Vessel**

- **Model Description**: Trawler with a four-stroke high-speed turbo charged diesel engine, reversible reduction gear and fixed pitch propeller.