

Suez Canal Simulation Complex

MANAN

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SUEZ CANAL

البعدى والمحاكاة



Maritime Training in Suez Canal

Marine training is one of the vital sectors in the Suez Canal Authority, where navigation on the Suez Canal is the first priority for the authority. So along with the rapid development of the shipping industry that requires continuous training to keep up with that fast progress

In 1996, the Suez Canal Authority established the Maritime Training and Simulation Center for the purpose of training the Suez Canal Authority guides on the safe passage of ships in various navigational cases.

The center relied on the most advanced training methods of the time and was one of the most specialized centers in the Middle East.



Maritime Training Sectors



Ship Handling Simulator



Tug Simulation



Oil Spill Management



ECDIS/ARPA Radar Classroom





CSD Dredging Simulation

Suez Canal Ship Handling Simulator

Full-mission, DNVapproved, Class-A Ship Handling Simulator. Possibility of making three separate and interacted maneuvers simultaneously Possibility of operating more than one type of propulsion in each bridge

Training in open sea, coastal and restricted waterways. High quality and realistic visualization of Suez Canal. Assistance in navigational risk assessment



Training Objectives

Theoretical Training

The theoretical training for pilots will be executed through special courses in the field of pilotage which are mainly applied in Maritime institutes; the course is comprised of some units, each of discrete training objectives which will provide a logical sequence in the acquisition of piloting and ship handling.

Practical Training

The practical training will be executed with the aid of the ship handling Simulator. We can set up almost any scenario. An example of this was the training of PORT SAID pilots, for all berths and docks, where we trained pilots the new east port (SCCT) and a new generation of container ships, were also able to familiarize themselves with maneuvering in the new terminal before it was completed.

The flexibility of being able to change the current, time, and weather conditions instantly, inter-connecting own-ship bridges for tug / ship interaction and to be able to repeatedly pause, replay to assess and analyses a maneuver.

Realistic ship model behavior (vessel, tug, any other floating object) responding realistically to environmental conditions (Wind, Waves, and Current) and hydrodynamic interaction. Other real-life phenomenon such as bank suction, squat and trim and depth / draft dependent modeled.

Promotion of Pilots

To be upgraded to the next level of tonnage, the pilot training

blends practice with theory supported by Simulation, ensuring a professional and participatory atmosphere. Often a feasibility study is performed before training. While the studies and training instructors operate the simulator (s) and (de) brief the participants.

Selection of Instructors

The instructors are carefully chosen for a project on experience and type of Simulation.

The MTSC instructors have all proven themselves at sea as Master Marines and also still works as a senior chief pilot at Suez Canal.



Simulator Layout

The simulation complex consists of four own ship bridges, four instructor stations, two exercise debriefing facilities, visual imaging system and simulation hardware and software.

Thefullmissionownshipbridgeisfurnished and equipped in a shiplike manner. The bridge is designed to be of operational/hands on type to allow for realistic training according to DNV requirements.

The Own ship equipment is similar to real shipboard equipment both in appearance and in operation. Instrument readouts are either analogue or digital according to current ship practice.







Instructor Stations

Both the Full Mission Navigational Bridge and Tug Bridges include one Main and Two Additional Instructor Stations, connected on the LAN and capable of communicating with the other simulator Instructor Stations.

Instructor stations can communicate and control all connected bridges. In addition, all exercises are recordable and available for playback after the exercise on either the Instructor or debriefing stations.

Each Instructor area is designed with sufficient space to accommodate at least tree instructors, and offering unencumbered access to communication devices.

NTPro-5000

At the heart of each of the Instructor Stations is the NT-PRO 5000 instructor control and monitoring software which resides on a single PC. This software provides the tools for exercise creation, conduct, monitoring, interaction, debrief, replay and review.

The instructor can adjust and view simultaneously several windows, with on-chart presentation of current exercise areas, and various alpha-numeric displays.

Exercise objects:

- Weather zones
- Fixed depth zones
- Passive targets as wrecks
- Land objects
- Helicopters passive targets
- Special objects (Liferafts, etc.)
- Ownships and their routes
- · Passive targets and their routes, lights, shapes and

special orders

- Rain clouds with their routes
- Tugs for mooring operation
- Mooring points (Buoys and Bollards)
- Text information
- Additional points, Zones and Lines



Our Services

Training of Suez Canal Pilots

Training SCA Pilots on special manoeuvers for transiting safely the Canal at different ship's tonnages and draughts up to 66 feet for the time being.

Training the Pilots to enable them controlling the vessel in different conditions especially bad visibility and different environmental conditions.



Training for Ship Masters

The simulation center holds special courses "SAFE HANDLING OF SHIPS IN SUEZ CANAL" for ships masters who transit the canal frequently to familiarize them with the channel characteristics and pilotage for good understanding and cooperation between pilots and masters for safe passage, these courses are provided by experienced instructor chief pilots from different sections specialized in handling huge and deep draught ship.

First Transit Trials

Designing and running trial manoeuvres for ships transiting the canal for the first time using the mathematical model of the ship.





Analysis of Accidents

Analyzing any accident in the Canal in order to find out the causes and the proper avoidance in future by the aid of ship parameters curves recorded during simulation session.



Research Studies

The simulation center participates in the studies of the development of navigational facilities of the Suez Canal, where the center has the capabilities of the design of sea lanes and ports. One of the models for the development processes is the participation of the center in the design and testing of the Suez Canal and the new and the training of the Authority's guides on navigation in the new Suez Canal





Conning Display

A Conning Control Display (CCD) is provided on each full mission ownship bridge. The CCD consists of a main conning data display, and a number of pertinent "call up" pages for information, controls and simulation features like Gyro and Magnetic compass, rudder and propulsion controls and indicators for the vessel model, Pilot Card, Autopilot Control, Echo sounder, Navigation lights, Log and Anchor control, Mooring operations and more



Navigation Lights

Log and Anchor Control

Mooring operations



Electronic Charts

The simulator includes Transas Navi-Sailor 4000 ECDIS system housed in a marine console and equipped with a dedicated ECDIS keyboard with integrated trackball, is provided on both the VOS and OIVOS bridges. In addition all PC based classroom simulator stations include this functionality.

Transas Navi-Sailor ECDIS is type approved by DNV in accordance with the IMO's performance standards for Electronic chart display information systems.

Navigational Aids Station

Simulated Navigational Aids are provided at the chart table on 15" LCD displays on each bridge. simulated Navigational Aid unit is fully integrated with the simulator, giving the same accuracy as in real life, and operational procedures as found on real equipment.

- · Simulated systems include:
- DGPS Navigator
- Furuno Radio Direction Finder
- Furuno Loran C
- McMurdo/Transas Minimum Keyboard display (MKD)
- Transas Shipboard Security Alert System (SSAS)





Navigational Adis Station



Radars

Suez Canal simulator allows training in modern radar and ARPA operation skill. The simulator includes the most advanced marine radar image generator which provides realistic relief reflection, target reflection, weather conditions (rain and sea clutter), and noise simulation.

The radar simulation presents the following capabilities:

- Imitates displays of the following radar types: Bridge Master E, Furuno FR2100, Nucleus 6000;
- Real ARPA/radar units can be incorporated using Transas Radar Imitator Board
- The instructor radar/ARPA allows the instructor to see the current radar situation in any point of the gaming area, and from any ship involved in the exercise;
- Ensures full ARPA functionality in the simulation mode with the capability to track up to 60 targets;
- Real ARPA keyboard can be connected
- Provides trial manoeuvre operation mode.







GMDSS

GMDSS Radio Communication simulators based on PCs, software and hardware facilities have been developed for training and examining ship specialists who receive a General Operator Certificate (GOC) or Restricted Operator Certificate (ROC).

The program implemented in the simulator is in full compliance with IMO Resolution A.703(17) and the latest requirements of the STCW Convention, and ensures correct and efficient operation of all the GMDSS equipment subsystems in the scope specified in IMO 'Model Course 1.25.









Radio DSC

NAVTEX

MF/HF



Debriefing

One of the most important elements of any simulation and training system is the exercise and debriefing facilities offered. Suez Canal simulator debriefing includes highly developed analysis and replay tools to allow Instructors to complete their training objectives with comprehensive, detailed and effective debriefing sessions.

Debriefing facility enables:

- On-chart monitoring and control of own ships and targets
- Replaying of recorded exercise data forward and backwards both in real time and faster than real time on the exercise chart.
- Display and examine data from the simulated exercise, using diagrams and tables
- · Set-up and control simultaneous and/or multiple debriefing sessions

Evaluation and Assessment

The Transas Evaluation and Assessment System (TEAS) allows objective assessment of an exercise fulfilled by a trainee on a navigational simulator. It is possible to compare individual exercise fulfilment scores with other exercise results. Results can be averaged with other runs or with the results of other trainees.

Exercise start time: Trainee: Exercise: Own ship: Final score:			12:00:00 Nick Olson, Captain SYDNEY TEAS.nti OS 1 (Bulk carrier 4 (Dis.104510t)) 65			
	TIVE	RULE CATEGORY RULE NAME	VIOLATION ADVICE	PENALTY WEIGHT	SCORE	
	-	-	-	%	%	
	12:00:01	Navigation Rule 1	You are in anchorage area Remember about Traffic Regulations	20 1.0	80	
	12:00:01	Traffic regulations Rule 2	You are proceeding at prohibited speed Slow down your speed to less then 5 knots	15 1.0	65	
			END			

Evaluation Report



Visual Presentation

Suez Canal simulator includes a full range of visual conditions, continuously varied from through a full daily cycle in all types of climatic conditions. These conditions are manually adjustable by the Instructor, or automatically generated based upon the time of day set for the exercise start, and the geographic location. All levels of visibility are offered from clear conditions to thick fog, or variable fog banks. Snow, rain, thunder and lightning, celestial objects correct for the date/time, sun shading, reflections and highly developed sea visualizations.

Suez Canal simulator includes a full, high detailed and up-to-date version of Suez Canal area covering over 190 KM including the new Suez Canal. The database includes Suez Canal visual scene, radar simulation, and environmental information Suez Canal like approches, anchroage areas, light houses, landmarks, bouys, and more.



Suez

Ismailia





Ferdan Bridge

Salam Bridge

East Portsaid Terminal

Ship Models

	Conto	ainer S	Ships	•			
Ref No.	Engine	Bow / Stern thrusters(kW)	Propeller	Speed (knt)	Displacement	Length x Bradth x Draft	Dead Weight
CONTAINER SHIP 11, FLOAD	Diesel, 1 x 25270	1 x 1750	1 FPP	22.50	51309	25.3 x 10.4 x 3.87	35000
CONTAINER SHIP 17, FLOAD	Diesel, 1 x 72240	2 x 1700	1 FPP	23.50	201700	366 x 51.20 x 15.60	155600
CONTAINER SHIP 3, FLOAD	Diesel, 1 x 54935	1 x 2000	1 FPP	24.90	83105	277.40 x 40 x 13.30	58070
CONTAINER SHIP 4	Diesel, 1 x 60950	1 x 2210	1 FPP	22.80	132540	347 x 42.80 x 14	104696
CONTAINER SHIP 22 (EMMA MAERSK)	Diesel, 1 x 71785	2 x 3500 / 2 x 3500	1 FPP	25.50	191000	393 x 56 x 13.70	
CONTAINER SHIP 25 (TripeE – Mckney Moller)	Diesel, 2 x 30632	2 x 2500	2 FPP	23	257771	399 x 59 x 16	_
CONTAINER SHIP 2, FLOAD	Diesel, 1 x 54847	1 x 2000	1 FPP	27.10	93130	279 x 40.40 x 14	_
FEEDER CONTAINER SHIP 1	Diesel, 1 x 12640	1 x 950 / 1 x 650	1 CPP	20.60	24080	169 x 27.20 x 9.49	
FEEDER CONTAINER SHIP 3	Diesel, 1 x 3263	1 x 300	1 CPP	16	5530	90 x 14.50 x 6.30	-
CONTAINER SHIP 15	Diesel, 1 x 68640	1 x 2000	1 FPP	26.50	107500	304 x 40 x 14.22	
CONTAINER SHIP 20, FLOAD	Diesel, 1 x 80080	2 x 2200/ 2 x 2200	1 FPP	26.40	211405	397.7 x 56.5 x 15.2	
CONTAINER SHIP 28	Diesel, 1 x 17316	1 x 1000/ 1 x 1000	1 FPP	20.10	32910	190 x 30 x 8.50	

HORIZON LINES

Tankers and VLCCs

Ref No.	Engine	Bow / Stern thrusters(kW)	Propeller	Speed (knt)	Displacement	Length x Bradth x Draft	Dead Weight
VLCC 1, FLOAD	Diesel, 1 x 15500		1 FPP	15	159584	261 x 48 x 16.90	
VLCC 2, BALLAST	Diesel, 1 x 23493		1 FPP	17.10	127691	332 x 58 x 11	279400
VLCC 4, FLOAD	Steam Turb., 1 x 26800	1 x 2000	1 FPP	19.40	108959	249.8 x 44.1 x 15.4	58070
VLCC 3, FLOAD	Diesel, 1 x 15730		1 FPP	14.40	122961	250 x 44 x 14.20	
VLCC 8, PLOAD	Diesel, 1 x 24493		1 FPP	15	309795	332.90 x 60 x 19.50	



Ref No.	Engine	Bow / Stern thrusters(kW)	Propeller	Speed (knt)	Displacement	Length x Bradth x Draft	Dead Weight
LNG 1, FLOAD	Steam Turb., 1 x 26800	1 x 2000	1 FPP	19.40	108959	297.5 x 45.8 x 10.80	68200
LNG 6, FULL LOAD	Diesel, 2 x 17490		2 FPP	19.50	171300	360 x 55 x 12	125600
LNG 15 (QMAX)	Diesel, 2 x 18940		1 FPP	21.20	171705	345.30 x 53.80 x 12	125600



Bulk Carriers

Ref No.	Engine	Bow / Stern thrusters(kW)	Propeller	Speed (knt)	Displacement	Length x Bradth x Draft	Dead Weight
BULK CARRIER 4	Diesel, 1 x 9856		1 FPP	14.80	104510	250 x 43 x 12	90100
BULK CARRIER 7 PANAMAX	Diesel, 1 x 9856		1 FPP	14.80	69580	230 x 32 x 12	50100
BULK CARRIER 5, FULL LOAD	Diesel, 1 x 25000		1 FPP	14.60	248000	327 x 55 x 16.30	179658
BULK CARRIER 5, PART LOAD	Diesel, 1 x 25000		1 FPP	14.60	142600	327 x 55 x 9.77	
BULK CARRIER 12, FLOAD	Diesel, 1 x 6620	1 x 1030	1 CPP	12.90	38624	225.5 x 23.76 x 7.93	30000
BULK CARRIER 17, FLOAD	Diesel, 1 x 14720		1 FPP	14.60	155000	289 x 45 x 14.20	
BULK CARRIER 1, FLOAD	Diesel, 1 x 8827		1 FPP	14	33089	182.9 x 22.6 x 10.7	
BULK CARRIER 15	Diesel, 1 x 15500		1 FPP	14.60	155000	289 x 45 x 14.20	



Ref No.	Engine	Bow / Stern thrusters(kW)	Propeller	Speed (knt)	Displacement	Length x Bradth x Draft	Dead Weight
CAR CARRIER 8	Diesel, 1 x 15130	1 x 1250	1 FPP	20.70	27784	200 x 32.20 x 8.50	12688
CAR CARRIER 7	Diesel, 1 x 23743	1 x 1600/ 1 x 1600	1 CPP	19.20	68229	240 x 36.20 x 10.90	



The simulator is configured to include two bridges for tugs of VSP, ASD and Conventional twin screw type including real ship like HW controls. Both tug bridges shall be configured with simulated towing winch equipped with its necessary control, monitor and alarm. Both tug controls shall be realistic controls similar to the actual tug operational systems.

The simulator provides capability to train personnel on how to tow ships, failure and damaged ships, rigs, etc... Also, Operating the tug boats in escorting direct and indirect modes, towing, floating of grounded vessels.

The simulator is also able to prepare and execute a detailed passage plan including berthing and using of anchors, mooring lines and up to eight (8) tugboats.





VSP Tug Bridge

ASD Tug Bridge

High Quality Mathematical Models

A large library of high-quality ship models designed to sail in narrow channels, developed in collaboration with the trainers and engineers of the simulation center.

The tug simulator is used to perform operations:

- Escorting ships
- Emergency handling of ships
- Towing and rescue operations
- Port entry and exit operations





Ref No.	Engine	Bow thrusters (kW)	Stern thrusters (kW)	Speed	Displace- ment	Pulling Power	Length x Bradth x Draft
ASD Tug 1 (bp53t)	Diesel, 2 x 1566		2 Azimuth FPP	11.20	366	53	25.30 x 10.40 x 3.87
ASD Tug 4 (bp70t)	Diesel, 2 x 1280	1 x 90	2 Azimuth CPP	12.70	450	40	26 x 8.90 x 4.30
Azimuth Tractor Tug 1 (bp77t)	Diesel, 2 x 2350		2 Azimuth FPP	12	885	77	33.50 x 12.80 x 6.10
Z-Drive Tug 2 (bp39t)	Diesel, 2 x 1156		2 Azimuth FPP	9.50	366	39	25 x 10.40 x 3.90
Voith Sheinder Tug 2 (bp 55t)	Diesel, 2 x 1965		VSP	13	797	55	39.30 x 13.90 x 5.80
Voith Sheinder Tug 3 (bp 70t)	Diesel, 2 x 2710		VSP	13		70	42 x 15.30 x 6.30
ASD Tug 8	Diesel, 2 x 2300	1 x 650	2 Azimuth CPP	13	1307	75	41 x 12.70 x 5.10
OSV 5	Diesel, 2 x 2797	1 x 1120; 1 x 880 drop- down / 1 x 1120	2 CPP	14	8637		87.70 x 20.10 x 6.40

Oil Spill Response Management

Suez Canal Simulation Complex contains the capability to handle oil spill response situations using PISCES II software solution. The system is capabile of simulating handling of pollution caused by oil leakage where all oil spill data and different weather conditions are entered, and then predict how leakage spread and the method of optimum control.

PISCES II is a response simulator intended for preparing and conducting command centre exercises and area drills in oil spill response. The PISCES II is oriented to the accomplishment of tasks required by the Oil Pollution Act 1990 (OPA 90) to provide improved training for spill response managers.



The PISCES II provides the exercise participants with an interactive information environment based on the mathematical modeling of an oil spill interacting with surroundings and combat facilities. The system also includes information-collecting facilities to enable the assessment of the participants' performance.

CSD Dredging Simulator

Suez Canal Simulation Complex contains a modern Cutter Suction Dredging (CSD) Simulator. The simulator is useful for CSD operators in order to advance their dredge process awareness, competences, experience and efficiency without the need to utilise expensive on board equipment.

Using simulator for CSD operators training saves money, fuel, emissions and training time. Newly recruited trainees can reach the same level as experienced operators. Experienced trainees bring their skills to a still higher level.

The daily training programme will depend on the type of project, the situation on board and your individual training needs. Potential subjects include:



- Desk controls
- Start-up and shut-down procedures manoeuvering procedures
- Dredging procedures
- Dredging in different soil types
- Operational optimisation for challenging situations production optimisation
- Safety procedures
- Use of dredging automation
- Maintenance of dredging installation.

ECDIS/ARPA Radar Classroom

Suez Canal Simulation Complex contains an ECDIS/ARPA Radar Simulator is based on Navi-Sailor ECDIS Multifunction Display MFD 4000 with inbuilt Navi-Planner voyage planning software, both fully compliant with the latest performance standards for shipborne navigation equipment. It incorporates Chart Delivery Server Emulator for charts delivery, charts updates and licence updates in automatic mode which is a critical issue during ECDIS/ARPA Radar training. Among other new options are fictitious area database, new training chart folios and weather forecast.

ECDIS/ARPA Radar Classroom provides the following functionality

- NTPRO 5000
- Multifunctional Display MFD 4000
- Navi-Planner 4000 software
- Radar overlay
- Dedicated generic area database
- Training chart folios
- Weather forecasts

The ECDIS classroom provides training for group up to 6 trainees in the following topics:

- IMO Model Course 1.27 "Operational Use of ECDIS".
- IMO Model Course 1.07 "Radar Navigation Operational level"
- IMO Model Course 1.08 "Radar, ARPA, Bridge Teamwork and Search and Rescue Search and Rescue"



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