STAR Center
Simulation, Training, Assessment & Research
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ISO 9001
Certificate No. 38806

Appendix 1: Facility Description

STAR Center Facility Description Index

STAR CENTER TRAINING FACILITY OVERVIEW

The STAR (Simulation, Training, Assessment & Research) Center located at Dania Beach, Florida has more than a dozen simulators and possesses the most advanced marine simulation capabilities in the United States. The simulators, programmed and run by operators and technicians from a control room, are interactive, allowing for real-time exercises. STAR Center is also ISO 9001 certified and committed to providing the worldwide maritime community with quality marine Simulation, Training, Assessment, and Research services. These descriptions are an overview of STAR Center's, simulator systems and training capabilities.

CLASSROOM AND OTHER FACILITIES

STAR Center has over 15,000 square feet of classroom space for use in coursework, briefing, debriefing, and the discussion of the theoretical considerations of the simulation problems. These classrooms are equipped with all the necessary audio/visual aids including feedback stations, and large-screen overhead projection systems required to conduct effective learning sessions. Instructor/control stations are provided for each of the Engine propulsion plant simulators and for the cargo system simulator for initiating and monitoring training exercises.

Online Classrooms

STAR Center can conduct five (5) simultaneous online classes utilizing the latest touchscreen technology. The instructor can share their screen with the students, use the interactive touchscreen display as a whiteboard, and switch camera views to utilize a document camera for a more detailed view of equipment as needed. The instructor will deliver online courses using screens of 50" or larger as depicted below.

STAR Center Classroom Summary

SRL #	Room Number	Room Name and Primary Function	Actual # Students
1	101	Engineering classroom	24
2	101A	Refrigeration Lab	N/A
3	102	Electronics Lab	N/A
4	103	Mechanical Lab	N/A
5	104	Electrical Classroom/TTT Classroom/Computer Lab (12 x student PCs)	12
6	105	Gas Turbine (Engine) Classroom/Computer Lab (12 x student PCs)	12
7	108	Engineering classroom	8
8	109	Engineering classroom	8
9	201	Cargo, Celestial, and Stability (12 x student PCs)	12
10	203	Deck Self-Study room/Computer Lab (8 x student PCs)	10
11	205	Self-Study	4
12	206	General Classroom	24
13	207	Medical Classroom/BT/Adv F/F	20
14	211A	Neptune Engine Simulation (8 x student PCs)	8
15	211B	Neptune Engine Simulation (8 x student PCs)	12
16	211F	Engine Simulator Classroom	11
17	211G	Neptune PrC Simulator (8 x student PCs)	8
18	212B	Distance Learning Classroom	N/A
19	217	Banquet Room	24
20	218	Self-study Engineering Classroom 8 x Student PCs)	8
21	301	Adv Stability, Cargo, LNG and navigation support (12 x student PCs)	12
22	302	Navigation & General classroom	24
23	303	Voyage Planning	12
24	305	ECDIS & GMDSS & Classroom (9 x student PCs)	12
25	306	Simulator Debrief Room	N/A
26	308	Deck Simulator Debrief Room	6
27	312	Deck Simulator Debrief Room	6
28	410B	Distance Learning Classroom	N/A
29	M405	DP Training/General Classroom (6 x student PCs)	12
30	MSC 110	Small Arms & MSC Classes/General Classes	24
31	MSC 111	Small Arms & MSC Classes/General Classes	24

SIMULATION SYSTEMS

Bridge Simulation Systems

The bridge simulation system suite is comprised of two (2) full-mission bridge simulators and three (3) ECDIS / ARPA RADAR navigation simulators:

(1) **360° Full Mission Bridge or Main Bridge,** with a 360º horizontal field of view, is a simulator designed by Kongsberg Digital Simulation Inc featuring the capability to simulate up to three Azipod® propulsion units as well as a traditional propulsion system. This DNV Class- A simulator includes two radar/ARPA units, three (3) ECDIS units, input for a pilot plug, and a *"BridgeLine" Integrated Navigation System*. It also features a GMDSS and Safety Console. The Full Mission Bridge is surrounded by a computer-generated image of the port projected onto a theater measuring 64' in diameter. The bridge features four channel stereo audio with mission specific sound fields which add to the realism of the bridge.

(2) **270° Full Mission Bridge**, with a 270º horizontal field of view, is a simulator designed by Kongsberg Digital Simulation Inc. It features the capability to simulate Azipod® equipped vessels in addition to traditional propulsion systems. It also features four (2) radar/ARPA units, two ECDIS units, and a *"BridgeLine" Integrated Navigation System.* Unlike the Full Mission (Main) Bridge, the large vertical field on this bridge is much better suited for maneuvering vessels in close proximity to piers and/or other vessels. The bridge features four channel stereo audio with mission specific sound fields which add to the realism of the bridge.

(3) The three (3) **ARPA/Radar Non-visual Bridges** which are primarily set up for radar and electronic navigation featuring the same ship maneuvering controls as the training bridges but without the visual presentation.

The two (2) visual bridge simulators are used for both training and research tasks, including work in areas such as shipboard resource management, shiphandling, basic rules of the road, emergency response, tug operations, vessel and harbor familiarization, and port design. The three (3) non-visual bridges are used for training in areas such as RADAR, ARPA, ECDIS, anti-collision and advanced navigation techniques. The bridge simulators are enhanced by a variety of *Ownship* models and harbor & waterway databases that create a realistic and diverse sailing environment. All the simulators are capable of interactive operation with each other or may be operated as individual trainers.

Engine Room Simulation Systems

The ship's propulsion system trainers consist of the main plant monitoring and control system of modern Diesel-powered ships, including electrical generation/distribution and other auxiliary systems. Sophisticated computer models insure the proper response to operator action as well as system degradation due to wear and tear and component failure. The full-mission propulsion system simulator can be fully interactive with the bridge simulators.

Steam plant operations are mastered on stand-alone workstation trainers that provide a computer model of a steam turbine system featuring dynamic system and subsystem schematics which the student or researcher can interact with to gain a strong background in the system's operation. The simulators and workstation trainers place students in realistic exercises operating the plant, trouble-shooting problems, and reacting to emergency conditions. The propulsion system simulators are described below.

(1) **Full Mission Engine Room Simulator**: The full mission engine room simulator (Kongsberg K-Sim Engine) provides high fidelity real-time simulation, enabling unique training and education possibilities. K-Sim Engine is based on real engine physics and specifications with enhanced mechanical and electrical systems enabling it to meet STCW requirements. K-Sim Engine is capable of running numerous different propulsion plants and engine types based on exact simulations certified by the engine manufacturers. STAR Center currently has the following four different engine models: MC-90-V MAN B&W 5L90MC (VLCC), RT-Flex Wärtsilä (Container ship), M11 MaK 8M32C-V (Container ship), DE-III (Cruise ship).

(2) **Desktop Simulator Workstations:** Designated simulator rooms consist of one instructor computer station and multiple student stations. The system uses the Kongsberg Neptune Simulator System with eight programmable, fully interactive propulsion models that can run on each desktop student station. Models include a M11 MaK, MC90, GT25, M22PC, RT-Flex, SP Duel Fuel, and DE III, and M11 CONTNR.

Cargo Simulation Systems

(1) Instructor Station

(2) Interactive Workstations, STAR Center's cargo software system is supplied by Kongsberg and is their Neptune Product Carrier program that has the ability for one (1) instructor and up to eight (8) students in multiple PC equipped classrooms. This model of a product tanker is a complex liquid cargo system, incorporating a ballasting subsystem, valves, level indicators, manifolds, piping subsystem, crude oil washing (COW) system and inert gas system (IGS). The Liquid Cargo Handling Trainer provides a high-technology tool for the thorough study of modern tankship operations and provides the student the ability to:

- Plan the operations using the Load Master computer
- Run test conditions on the Load Master computer
- Study single components of a liquid cargo handling system or associated subsystems
- Study individual subsystems and the control of same
- Study tank atmosphere and the control of same
- Study inert gas in relation to boiler load
- Perform full-cycle cargo operations including load and discharge, ballasting/deballasting, inerting tanks, cleaning tanks, etc.
- Monitor discharge cost and time expended
- Shows the results of incorrect operations without damage to actual equipment or loss of cargo
- Presents all relevant terminology and relates it to associated hardware
- Demonstrates both practical results and theoretical aspects of modern cargo operations

LNG Cargo Handling Simulator

(1) Instructor Station

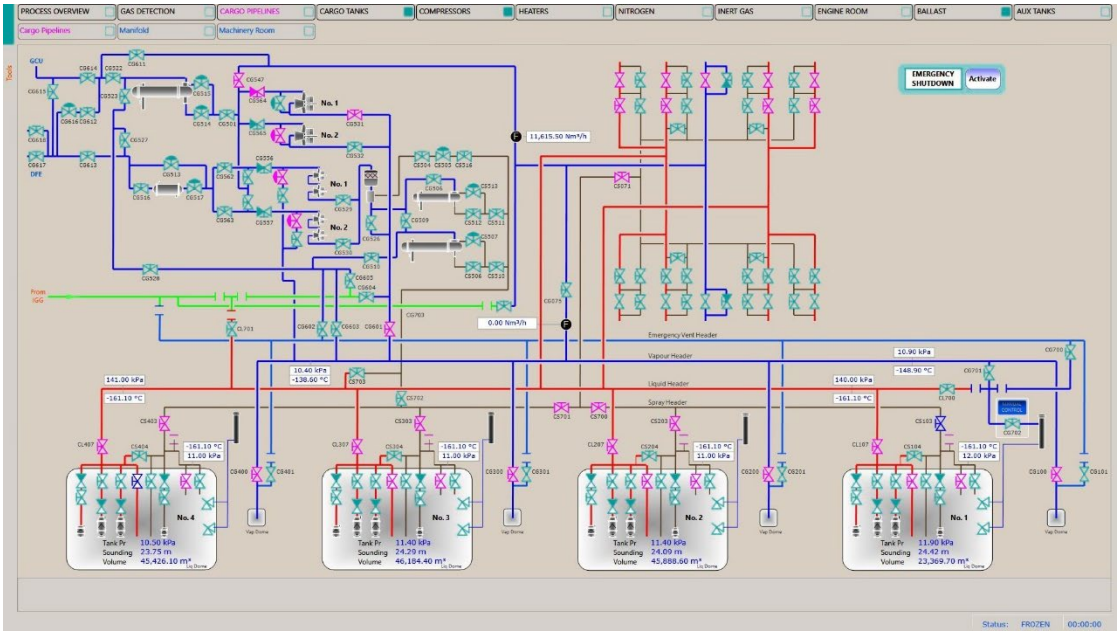
(4) Interactive Workstation which permits individual training with either the membrane or spherical containment models including ballast subsystems, valves, level indicators, manifolds, piping systems and associated machinery systems.

The complex dynamics of the membrane containment system are captured in the GTT G-Sim.

The Liquid Operations Simulator (or Liquid Gas Handling Simulator) developed by GTT Training Ltd., is a highly detailed simulation platform that allows operators to be trained in all aspects of handling Liquid Gas Cargoes on board ship and ashore.
The accuracy and realism of the simulator also allows it to be used for research and operation preplanning/procedure checking purposes.

Using high fidelity mathematical models, the system provides very realistic simulation of all the flow and control processes together with the appropriate equipment for the respective liquid gas system(s). Facilities within G-Sim allow the operator to select the system that is used based upon:

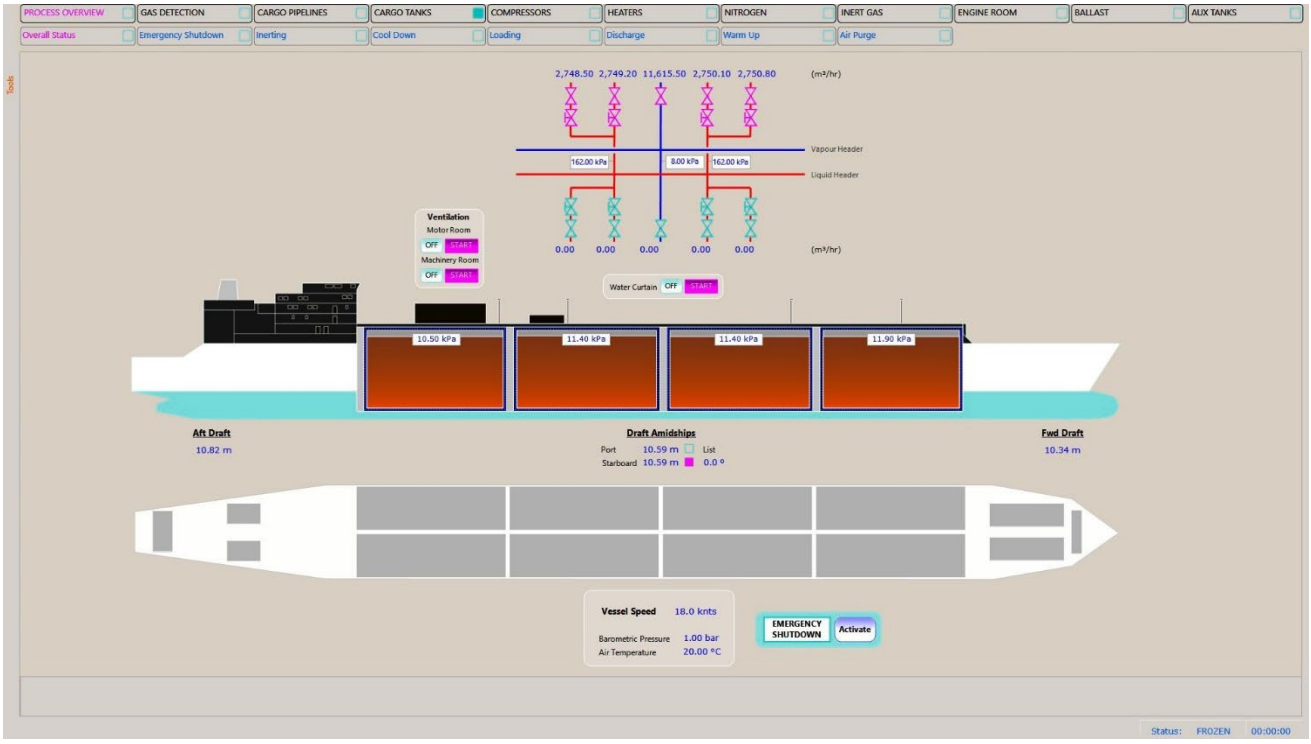
- Vessel size
- Cargo containment system
- Propulsion system
- LNG Cargo composition



Each model includes all the components of a vessel or system that need to be considered in the management of a vessel or shore installation and hence allow any operation that may be undertaken on the real system to be replicated. Consequently, the models allow the full scope of training to be conducted from basic system familiarization through to detailed problem solving and implementing emergency procedures involving LNG Carriers and vessels using LNG as a fuel.

Main features of the system are:

- Designed to run on any PC or tablet using a MS Windows based operating system
- User interface designed to replicate real systems incorporating all the appropriate controls and information, whilst being simple to use
- Ability to configure the training environment to suit the requirements of the organization, instructor or individual



The flexibility of the system allows it to be used very effectively for:

1. Training
    - All the models are designed specifically to support the training requirements for seafarers, as identified by the STCW convention, and industry bodies such as SIGTTO & SGMF
2. Performance Assessment
3. Research including:
    - Pre-running on unusual load patterns
    - Development and verification of operating procedures
    - System design

G-Sim, and all the model libraries, are approved by DNV in accordance with their Standard for Maritime Simulators Systems (DNVGL-ST-0033), meeting the requirements of Type A, B, C, D & Type S as appropriate.

IGF Code GTT Simulator:

The purpose of the 2PMS FGHS Model is to provide the training provider or instructor with the capability to be able to simulate and conduct training in all the various aspects that need to be considered with respect to the management of the LNG storage tanks and the various means of supplying gas to the various consumers that may be found on LNG fueled vessels that are equipped with two pressurized storage tanks and medium speed consumers.

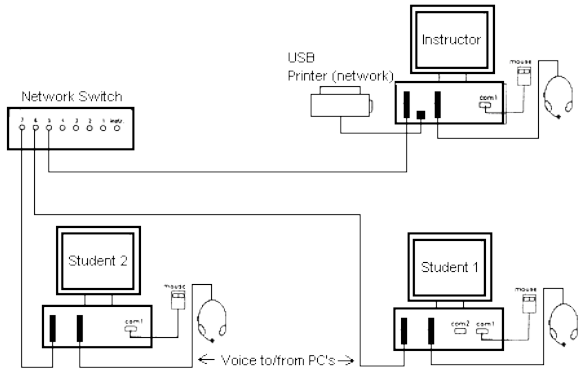
The 2PMS FGHS Model comprises the following:
• All the systems that are installed on board a vessel associated with the fuel storage and gas supply systems, enabling the simulation of any operation related to the management of the storage and supply facilities and equipment and bunkering operations that may need to be conducted on the type of vessel. The controls for the equipment and systems are designed to replicate the controls that would be found on board an actual vessel that is equipped with similar systems, whilst taking into account the different user interface
• Facilities to allow the simulation of the supply of the various gases (N2, Inert Gas) or liquids (Liquid Nitrogen or LNG) from the supplier into the vessel being simulated including the ability to change compositions of the supplied components

The system within the model comprises of the following components:
• Two (2) Type C (pressurized) LNG storage tank
• Two (2) fuel pumps (variable frequency drive type)
• Port & Stbd bunker stations with connections for both liquid and vapour to/from the supplier
• Gas supply to consumers via: o Two (2) sets of Vaporisers and Heaters together with a warm glycol heating system o Two (2) medium speed main engines o Three (3) medium speed auxiliary engines o Two (2) dual purpose boiler / Gas Combustion Unit (GCU) o Fuel gas demand control system
• Nitrogen supply system
• Emergency shutdown systems
• Fixed and portable gas detection systems

Once the storage tank has been prepared and bunkered with LNG, the fuel gas handling system can be used to supply gas to the consumers using the following means:
1) Via Fuel Pump A fuel pump is used to supply the LNG from one of the storage tanks at the required pressure. The LNG is vaporised and heated to the required temperature in a gas vaporiser (evaporator) before being supplied to each of the consumers. A fuel demand control system regulates the capacity of the pump to meet the consumer demand based on the pressure in the supply line to the consumers
2) Supply of boil off gas When the pressure in the tank is sufficiently high (>4.5 bar), it is possible to send the gas from the storage tank directly to the consumers via a gas heater. Alternatively, if the pressure is not sufficient to supply the engines it can be routed to be used in the dual-purpose boilers. (If required it is also possible to increase the pressure in the tank by running the fuel pump and recirculating the vapour produced in the vaporiser back into the tank)

GMDSS - Global Maritime Distress and Safety System Simulator

POSEIDON GMDSS SIMULATOR
BASIC CONFIGURATION



Up to six (6) student workstations can be connected to the instructor station. This drawing shows only the instructor station and two (2) student stations, which is the minimum and constitutes the basic configuration.

The Poseidon Pharos GMDSS Simulator at STAR Center encompasses the various means of marine communication referred to in the GMDSS regulations.

- Each headset has a microphone built into it, and the GMDSS software has a graphical (PTT) switch for operating the sound transmission, and others graphical interface methods for typical user controls such as channel selection on VHF radio.
- An advanced 'noise generator' is controlled by the instructor's software. This enables the generation of noise (white noise) and declining signal strength.

An exercise may use one single means of communication; involve a voyage plan, or it can be a complex search and rescue (SAR) operation requiring all or a combination of systems and ship types (GMDSS and/or pre GMDSS) to be used for exchanging information and traffic. For example, in SAR exercises one station can be the RCC (Rescue Coordination Center), another the vessel in distress, others function as vessels responding to the situation either by searching or relaying the communications, and other vessels at a distance may continue with normal traffic while still monitoring the distress situation.

The simulator has available the following equipment:

VHF Radio with DSC	AIS Sart
Portable VHF	Inmarsat C
Portable VHF with AIR	Radar and Maneuvering Unit
Navtex receiver	EPIRB and SART
MF/HF radio with DSC	Battery Panel
Radiotelex	

ECDIS - Electronic Chart Display and Information System Simulator

Simulator/Lab

The Wärtsilä Navi-Trainer combined with Navi-Sailor student stations make up the Electronic Chart Display Information System (ECDIS) Laboratory at STAR Center.

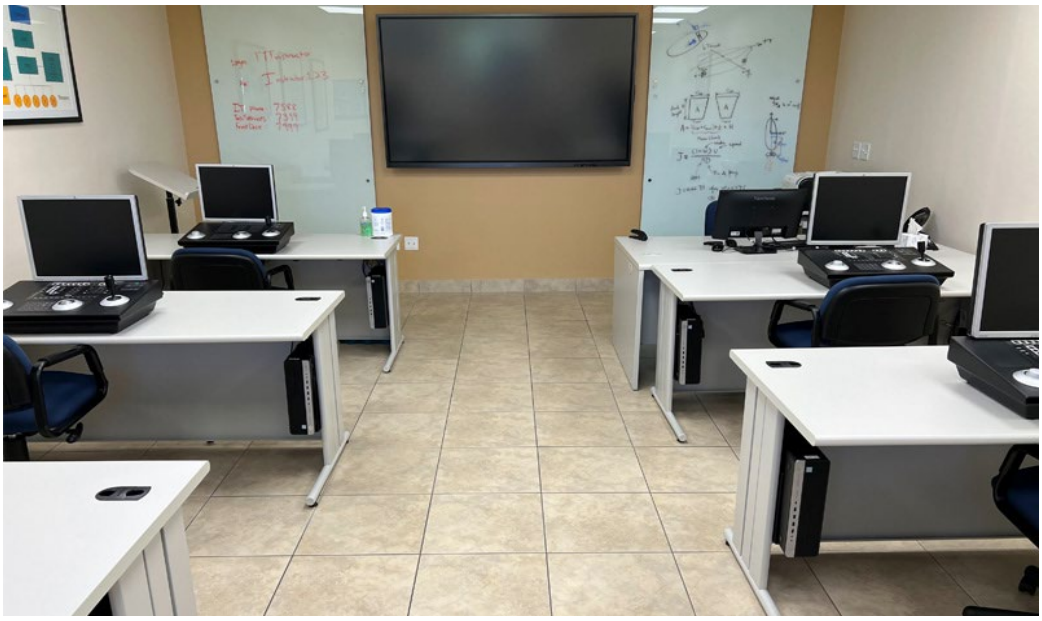
The classroom lab consists of nine student stations, one instructor station, and has various touchscreen display modes. Each electronic chart station is simulated or stimulated by a network connection from the instructor station using Watsila Navi-Trainer 5000 simulation software. The student stations use Watsila Navi-Sailor 4000 software, and utilize Official Electronic Navigational Charts (ENCs),.

The students working at their individual stations receive navigational data from the instructor station, i.e., position, depth of water, ARPA targets, AIS targets, etc. Exercises are designed to teach basic and advanced navigational functions and the setting of safety parameters, route planning, route monitoring, and chart maintenance. The classroom setting combines lectures, demonstrations, and classroom exercises to allow the student to obtain a solid learning base before gaining real-time experience on the radar bridge simulators.

DP - Dynamic Positioning Simulator

DP Simulator

Approved by Nautical Institute as Class C simulator for the DP training scheme. The DP Induction Operator Simulator/Lab is a Kongsberg
K-Pos DP-22 system. This configuration allows the students to practice realistic DP operations on their desktop panels and through the graphical user interface on the monitors. The instructor will guide the students to operate the DP control system, and the built-in simulator will offer realistic response to the operations initiated by each student. The lab contains six (6) DP stations.



DP - Dynamic Positioning Simulator (cont.)

DP Simulator

Approved by Nautical Institute as Class B simulator for the DP training scheme and Revalidation/Refresher and Competency Assessment course. The K-Pos DP-22 is a dual redundant dynamic positioning system designed for all required DP applications with the full range of functionality. Its modularity and use of common building blocks allows for high flexibility and various upgrades. The system consists of a dual redundant controller unit and two operator stations (K-Pos OS). The controller unit contains two control computers and dual network to provide a redundant interface to position-reference systems, sensors, tunnel and azimuth thrusters with variable, fixed, environmental, and operational thruster allocation settings. The operator stations each contain a computer running Windows operating system. The DP Simulator room is equipped with a 65” TV for a single channel visual view with the ability to pan 360° for monitoring surroundings and environment. There are LCD overhead monitors displaying conning information, Vessel Maneuver Switch (Manual to DP Control), PTZ controls for single channel visual view and various display panels such as steering and throttle controls, doppler and speed logs, GPS, echo sounder, and gyro and magnetic repeaters.

Dual Redundancy

Simulation of DP Equipment Class 2 operations with the corresponding redundancy, consequence analysis, PMS, Datum selection, sensor and reference system inputs, Coordinate selection and system tests.

DP Class B Control Room

The Instructor Station is located in a separate room from the dual DP operator station (Bridge). From the Instructor Station, the instructor can initiate events according to the training scenarios. This includes all failure modes required for NI accredited DP training.

OTHER CAPABILITIES

Modeling & Research

STAR Center's Modeling & Research department develops computer generated geographic databases, target objects and hydrodynamic ship models to be used for real-time simulation training and research for both of our full mission bridge simulators. This department also conducts all of STAR's research and maritime consultancy work.

Modeling

The geographic database replicates real world conditions including bathymetry, currents, topography, cultural structures, cultural lights and navigational aids in a particular port or waterway. Resources for building the 3D geography are found via nautical and electronic charts, CAD drawings, detailed photos, USCG light lists, and other publications necessary for accurate reproduction.

. The process starts with electronic chart and CAD drawings that are used to depict size and location of the area. Through a series of procedures, the terrain is generated with proper elevations. Buildings and other structures are then modeled and introduced into the terrain model. Navigation aids such as lights, buoys, and ranges are in turn inserted along the correct latitude and longitude for accurate traffic flow. Once the model is complete, it is loaded on the simulator for use in training or an operational research study.

Targets are treated differently, as they represent moving objects rather than stationary ones. Vessels such as cruise ships, tankers, container ships, tugs and barges are modeled three dimensionally to define the shape of the hull and superstructure. In addition, the vessels have built in light configurations that can be controlled from the simulator operator station so that the vessels display the correct navigation lights complying with the rules of the road. Bow and stern wakes are also displayed adding realism to the vessel model.

A local coordinate system is used to establish the origin at the exact center of the ship. This allows the image generation system to accurately display the dynamic position of the vessel as it is underway.

The vessel model is defined as a hydrodynamic math model, which controls the maneuvering characteristics of the ship. The hydrodynamic model is developed through a series of programs for output to the simulator. The model is loaded onto the simulator and validated through a set of verification and validation tests, which involves taking the simulator data and comparing it to the real world data used to build the vessel. The hydrodynamic model may be fine-tuned and the tests repeated until the vessel's performance matches that of the real world vessel from which it was modeled.

Research

The STAR Center has a demonstrated performance record in conducting simulation based Maritime Research Studies for Port Authorities, Shipping Companies, U.S. Army Corps of Engineers, Private Engineering Companies, and Maritime Law Firms. These studies involved evaluating proposed port improvements, examining port access, and analyzing ship accidents.

- **Port Improvements**
  STAR Center's capabilities can be effectively utilized to evaluate proposed channel improvements, pier configurations, and breakwater design. Proposed designs can be tested in a controlled environment in order to optimize the plan in terms of navigational safety and cost efficiency. It is not uncommon for a port to save millions of dollars in construction costs by having the foresight to optimize the design through simulation testing.

- **Port Access**
  Many studies have been conducted at STAR Center that evaluates access into existing ports. This type of evaluation can be very beneficial to the ship operator when considering taking an existing ship to a new berth or to a new port. This can be effective when examining the safety of a proposed ship design while considering the navigational challenges of the expected ports of call.

- **Accident Analysis**
  One of the most effective ways to analyze the events leading up to a maritime casualty is to recreate the events on a simulator. With this method, the casualty can be brought to life in an extremely realistic manner. The simulator can be used effectively to support or dismiss "what if" theories which have come up in the investigation.

STAR Center has been conducting these types of projects since 1993 at our facility in Dania Beach, Florida.

Engineering Workshop Facility / Machine Shop

The Engineering Workshop Facility is a 3,050 ft^2 workspace. It has been designed to support the required practical tasks for STAR Center's US Coast Guard approved, Officer In-Charge of an Engineering Watch (OICEW) courses and professional development courses.

The Engineering Workshop Facility currently contains the following major pieces of equipment organized by the discipline being studied. Other items not pictured or individually listed are hand tools, diesel engine components, and valves.

Pictured above: Overview of Diesels Lab and Machine Shop

Diesel Engine Technology:

- EMD 16-645-E2 Diesel Engine 1
- EMD Injector Test Stand 1
- Volvo D-12 Diesel Engine 1
- 6-71 Detroit Diesel Generator Sets 75KW 1
- 2 Cylinder Lifeboat Engine 1
- Wakefield Corp. Valve Grinder 1

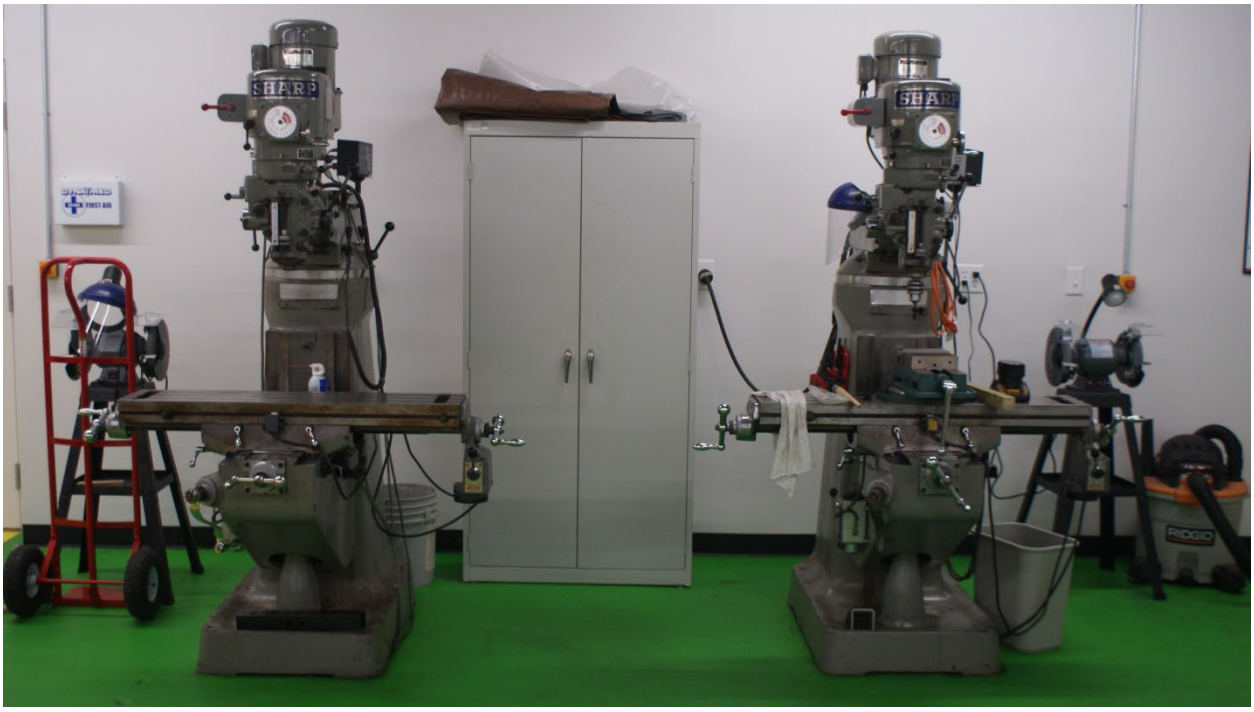
Pictured above: EMD 16-645 used for diesel engine maintenance labs

Machine Tool Technology:

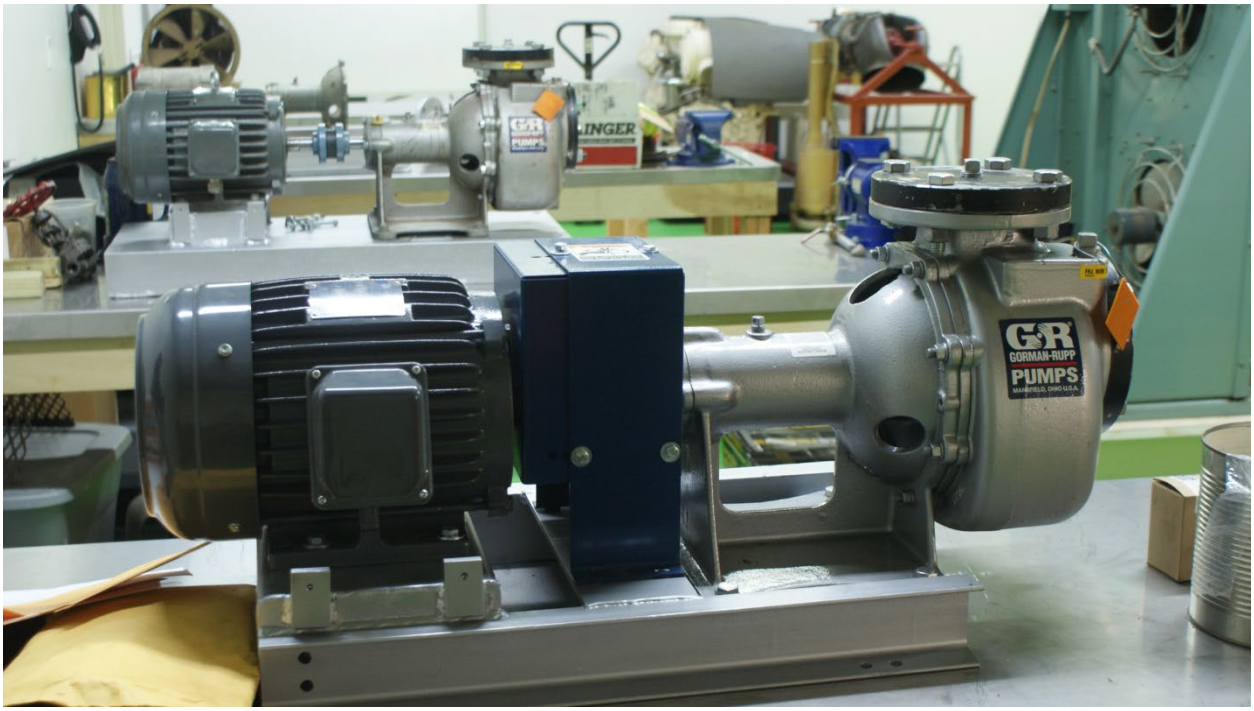
- GMC Lathes 1440 GMF 6
- Little Machine Shop Lathe 2
- Sharp Vertical Milling Machines 2
- Rockwell/Delta Drill Press 1
- Jet Bench Grinder 10” 1
- Central Machine Bench Grinder 8” 2
- Dayton Bench Grinder 8” 1
- Iron Tron Bench Grinder 6” 2
- Chicago Electric Chop Saw 18” 1
- Ryobi Band Saw Tabletop 9” 1
- Dewalt Chop Saw 18” 1

Pictured above: Lathes 1 – 6

Pictured above: Lathes 7 & 8



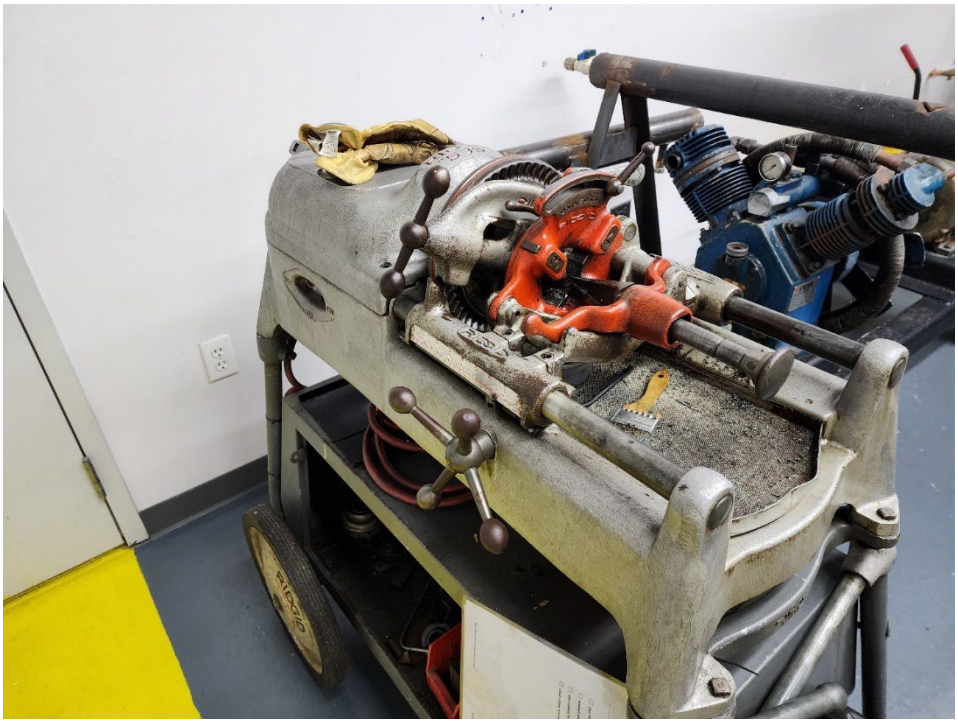
Pictured above: Milling machines used in the Machine Shop class



Pictured above: Centrifugal pumps used for maintenance and repair training

Maintenance and Repair:

- Electric Motors ½ to 30 Hp 7
- Quincy Air Compressors 3
- Sperre Air Compressor 1
- Framo® Hydraulic Pump 2
- Diaphragm Pump 2
- Centrifugal Pumps with 120V Motors 3
- Centrifugal Pump with 480V Motor 1
- Central Machine 20 Ton Hydraulic Press 1
- Central Machine 30” Shear, Brake, and Roll 1
- Little Mule Pallet Jack 1
- Pittsburg Portable Lift 1
- Central Pneumatic 60 Gal. Air Compressor 1
- Central Pneumatic Bead Blaster 1
- Baileigh Metal Band Saw Rolling 7” 1
- Ridgid 534 Electric Pipe Threader 1



Pictured above Rigid Pipe Threading Machine Used for Maintenance and Repair

Electrical Lab Facility

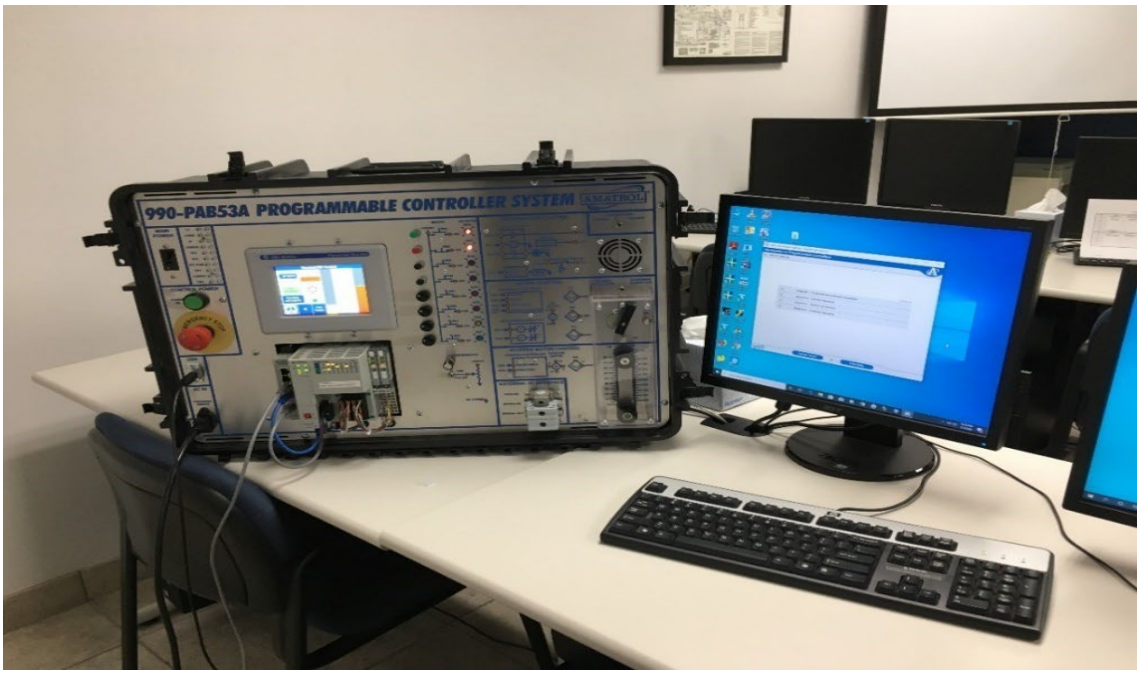
The Electrical Lab Facility consists of several modules purchased from AMATROL. Amatrol is the world's leader in skills-based, interactive technical learning. Amatrol's learning solutions include interactive multimedia as well as print-based student learning materials, virtual trainers, teacher's guides, industrial quality hands-on training equipment, and instructor training.

The students go through hands-on training which replicates workplace applications and conditions with realistic learning experiences. The equipment-based training systems use industrial quality components and include features such as fault insertion, dynamic loading, and static loading.

Amatrol's student learning materials are based on industry task analyses where student activities are structured around relevant, industry-based tasks.

Current Training Systems:

Programmable Controller System (PLC) – 990-PAB53A



The 990-PAB53A Programmable Controller System is a PLC training system that covers the following: Programmable Logic Controller theory, including familiarization with operation, troubleshooting, and programming of PLCs. The course includes practical demonstrations using the Allen-Bradley CompactLogix L16 PLC, mounted in a trainer for class exercises. Included features: Analog Inputs & Outputs, Digital input & Outputs, PLC Programming, PLC Troubleshooting, PLC Motor Control, and PLC Temperature Control.

AC/DC Electrical Learning System – T7017

The model T7017 AC/DC Electrical Learning System teaches fundamentals of AC and DC electrical systems used for power and control in industrial, commercial, agricultural, and residential applications. Students learn industry-relevant skills including how to operate, install, design, and troubleshoot basic AC and DC electrical circuits for various applications.

The model T7017 includes a bench top-mount workstation, AC power supply, DC power supply, electrical components set, lead set, hand-held multimeter, circuit tester, built-in instrumentation console, electrical circuit simulation software, student learning materials for both theory and lab, and teacher's assessment guide. This system uses industrial quality components to help students become better prepared for what they will encounter on the job.

Electric Motor Control Learning System – 85-MT5

The model 85-MT5 Electric Motor Control Learning System teaches electric relay control of AC electric motors found in industrial, commercial, and residential applications. Students learn industry-relevant skills including how to operate, install, design, and troubleshoot AC electric motor control circuits for various applications. The model 85-MT5 includes a bench top-mount workstation, AC induction motor, motor mounting frame, control component panels, multi-meter, lead set, student learning materials for both theory and lab, and teacher's guide. This system uses industrial quality components to help students become better prepared for what they will encounter on the job.

Electric Machines Learning System – 85-MT2

The model 85-MT2 Electric Machines Learning System teaches electric machines commonly found in industrial, commercial, and residential applications including: single phase AC motors, three-phase AC electric motors, DC electric motors, and DC generators.

Students will learn industry-relevant skills including how to operate, install, analyze performance, and select electric machines for various applications. The 85-MT2 includes a number of industrial machines, integrated base unit, photo-tachometer, lead set, prony brake, clamp-on ammeter, student learning materials for both theory and lab, and teacher's guide. This system uses industrial quality components to help students become better prepared for what they will encounter on the job and to withstand frequent student use.

DC Generators Learning System – 85-MT2-B

Amatrol's 85-MT2-B DC Generators Learning System adds to the 85-MT2 Electric Machines Learning System to teach DC generators commonly found in industrial, commercial, and residential applications. Students will learn industry-relevant skills including how to operate, install, analyze performance, and select DC generators for various applications.

The 85-MT2-B includes resistive load and inductive load units that connect to the DC generator supplied with the 85-MT2 System to provide operation under various types of loads. Student learning materials for both theory and lab and a teacher's guide are included.

Alternators/Synchronous Motors Learning System – 85-MT2-C

Amatrol's 85-MT2-C Alternators/Synchronous Motors Learning System adds to the 85-MT2 Electric Machines Learning System and 85-MT2-B DC Generators Learning system to teach alternators and synchronous motors commonly found in industrial applications. Alternators provide a mobile source of AC electrical power while synchronous motors reduce power costs by correcting the overall power factor in a plant. Students learn industry-relevant skills including how to operate, install, and analyze the performance alternators and synchronous motors.

The 85-MT2-C includes capacitive load, combination synchronous motor/alternator, and synchronizing lights/switch unit. The capacitive load unit combines with the loads supplied with the 85-MT2-B (resistive and inductive) to provide operation under various types of loads. Student learning materials for both theory and lab and a teacher's guide are included.

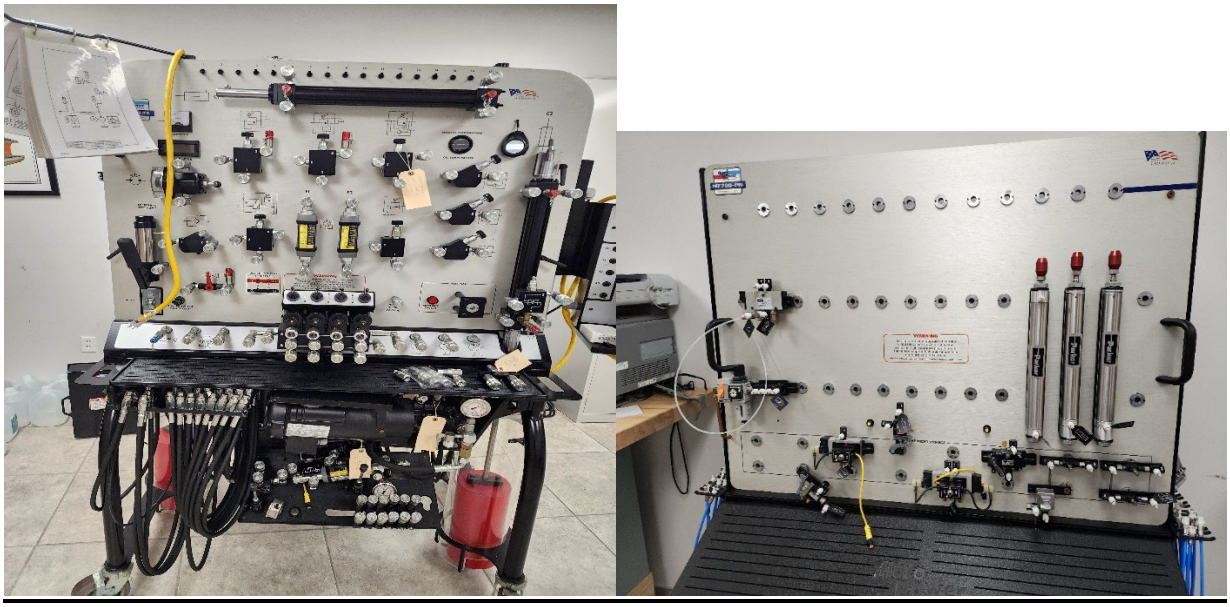
Controls and Instrumentation

The trainers used for controls and instrumentation are designed to support the classroom instruction by using practical trainers that increase knowledge and proficiency in the below skills:

- Control Systems
- Controller Action
- Pressure Measurement and Control
- Temperature Measurement and Control
- Level Measurement and Control
- Analytical Instrumentation
- Symbols and Diagrams
- Process Control Methods
- Instrument Calibration and Controller Tuning

Fluid Power Hydraulic Trainer

MF 102-H-TS hydraulic training system is masterfully crafted to help students connect the dots. Pascal's Law, Inertia, power, resistance, pressure differential, series, parallel. These theories are put to practical use with this hydraulic trainer for better student understanding. Combining the MF-102 hydraulic trainer and the MF 700 pneumatic trainer add to the understanding of critical systems.



Pictured above MF102 and MF 700 Fluid Power Hydraulic and Pneumatic trainers

Infinit Technologies Power Electronics Training System

Used to perform all the power electronics circuit experiments. It is very useful in power electronics laboratory for performing power experiments in technical colleges and universities. This trainer familiarizes student with characteristics of power electronics devices and the applications of power devices. The applications of power devices are in alarm circuit, lamp flasher, rectifiers, choppers, and inverters.

Power Electronics Training System Contains Following Blocks:
DC supply, AC supply, Triggering circuit, Pulse amplifier and Isolation transformer, Pulse transformer section, Single phase-controlled rectifier firing circuit, SCR assembly, Load section, Power component section

Infinit technologies IT-900 pictured above

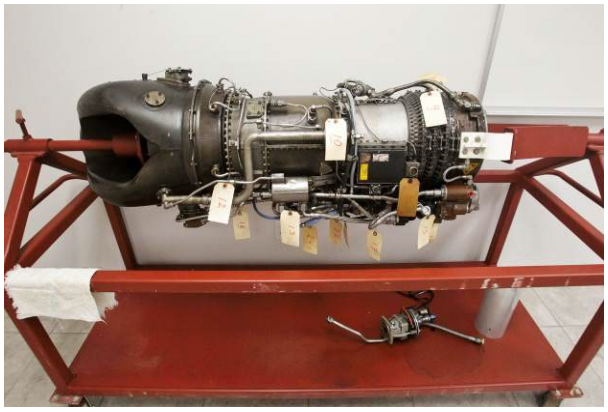
Infinit Technologies Process Control Training System

An educational training board featuring interface circuits for the sensors and the actuators for on/off, proportional, integral, and derivative control circuits (PID). This training systems studies and controls rotational sensors, temperature sensors, photo sensors, open loop, and closed loop systems.

Pictured above are the IT-5202 Temperature control trainer and the IT 4406 PID Trainer

Gas Turbine T-58 / Display Unit

STAR Center owns a T58 gas turbine located in the mechanical lab. The unit T58 is a compact turboshaft engine with a high power-to-weight ratio and uses the free turbine principle.



This engine is used for display and practical exercises in the E029 Gas Turbine's class to execute tasks on inspection skills and safety wiring. The engine features a 10-stage, axial-flow compressor with a through-flow annular combustion chamber and it consists of 2 basic components: the gas generator assembly and the power turbine assembly.

Centrifugal Separator / Westfalia Unit

The Westfalia unit is a self-shooting purifier used to separate diesel oil, heavy fuel oil, and lube oil. The main application is mainly onboard ships and in power stations. The unit has the following characteristics:

- a high separator efficiency;
- self-cleaning system;
- compact in design / light weight; and
- easy to maintain and install

The unit is capable of handling up to 1180 liters / hour and is equipped with a set of tools and regulating rings. The capacity is different depending on the type of product.

Fire Detection Trainer

The Fire Detection Trainer includes an addressable fire alarm control panel that is normally powered by 120 VAC and has battery back-up. There is (1) one smoke detector, (1) one heat detector, a pull station, siren, and strobe.

The trainer is used to teach students how to test systems batteries, the various sensors and verify that the alarms are functioning properly, and how to track down and remedy a trouble alarm.

Refrigeration Workshop Facility

The Refrigeration Workshop Facility is a 1,000 ft^2 workspace. It contains a Hampden H-IRT-1 Industrial Refrigeration Trainer which the students operate, and trouble shoot utilizing the built-in fault package on the unit.

There is also a Carrier 76CT trainer which is operated by the students who can recover refrigerant, dehydrate, evacuate, and recharge the unit utilizing various vacuum pumps, reclamation units and charging methods. The facility contains four (4) brazing stations complete with exhaust ventilation for hands-on brazing and soldering.

Current Training Systems:

Hampden H-IRT-1 Industrial Refrigeration Trainer
- Semi hermetic R-134a compressor
- Two water cooled condensers (tube / tube and shell/tube)
- Two evaporator coils (electric defrost/hot gas defrost)
- One chilled water evaporator

Carrier 76CT trainer
- Semi hermetic R-404 compressor
- Air cooled condenser
- Evaporator with choice of three expansion devises

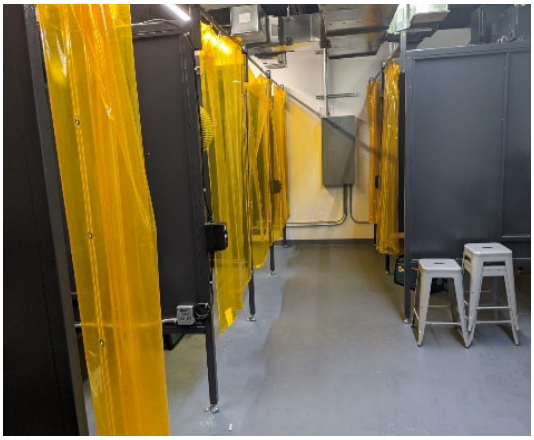
High Voltage Motor Control Center Training Aid

Siemens Series 81000™ Controller with Drawout Vacuum Contactors. This inert training aid provides a high voltage electrical motor control center with which to assess Marine High Voltage students on high voltage and Arc Flash safety as well as troubleshooting, testing and maintenance of a motor control center. The controller is housed in an enclosure using a trap key system along with signage and alarm system to simulate real life situations

Pictured above: Siemens Series 81000™ Controller, a High Voltage Training Aid

Welding

STAR Center has its own six (6) station welding laboratory with additional supporting tools and equipment as described below:



Each booth is equipped with fume extraction, Miller Multimatic 215 multi-process welding machines, and hand tools.

A metal cutting station is available with oxy-acetylene torch, arc gouging, and a plasma cutter.

AugmentedArc™ Simulator

The Miller AugmentedArc augmented reality welding system is used to provide high-fidelity, simulated welding training that significantly aids the student's learning. It provides realistic simulation of Stick, MIG, and TIG welding processes. Machine provides post weld feedback for the review and allows students to practice bead on plate, T-joint, butt joint, lap joint, pipe to plate, and butt pipe welds in multiple positions.

Pools

The STAR Center has two (2) pools on site. Each pool is a minimum of 15 feet wide by 30 feet long by 7 feet deep (at the deepest end). The Personal Survival Techniques Course can be conducted at any one of the pools.

STAR CENTER TECHNICAL DESCRIPTIONS & SIMULATION CAPABILITY

Full Mission Bridge Simulators

Realistic simulation of the total man/ship/environment is a vital component in molding desirable behavior, for both maritime training and in analyzing human operator behavior in research applications. The STAR Center's full mission bridge simulators provide realistic simulation by means of the following components:

- **Navigation Bridge**

  A full-scale fully equipped wheelhouse includes control and communications equipment and simulated real-world radar and ECDIS units, from which the mariner controls the simulation.

- **Control Station**

  A console from which the simulator operators or instructors can start, monitor, and terminate simulator exercises is available. From this console, they can also control other traffic vessels and aircrafts, adjust environmental conditions, and initiate ship system failures. All this data can be plotted or recorded for post-exercise playback. Full communications capability is provided so that the operator or instructor can provide realistic input from sources external to the simulator's wheelhouse. This includes a VHF radiotelephone for external communications with shoreside facilities and for verbal ship-to-ship interaction. Internal communications to/from points within the simulated ship (such as the fo'c'sle head, engine room, after steering station, etc.) can be provided by means of a multi-station ship's intercom system and hand-held UHF radios. There is also a sound-powered telephone located in the Control Station to simulate interaction between the bridge and the engine room.

- **Visual Scene**

  A large screen which is external to the wheelhouse shows a 3-dimensional representation of the depicted world as seen from the ship’s bridge in a full-color computer generated image (CGI). The screens can either be an arc segment or a complete surrounding circular screen. The scene changes dynamically and in real time in accordance with the simulated ship's movement through the database which is under the control of the student in the wheelhouse. This CGI world has landmasses, buildings and other cultural features, aids to navigation and other ships. The other ships may be pre-programmed in their movements or under the control and direction of the Control Station Operator. In a multi-bridge interactive mode, other ships may be CGI representations of one or more of the other simulators that have been linked together in the same exercise.

- **Briefing/Debriefing/Monitoring Subsystem**

  This subsystem provides a multitude of capabilities that allow trainees to learn from observing the performance of others and from reviewing their own performance through a variety of audio-visual and graphic presentations. It includes a "Bird's Eye View" of an exercise which permits observers to monitor the simulated vessel's route through a geographic area and interaction with other ships as it happens (in real-time) or in playback mode after the exercise is terminated. In the playback mode, the subsystem saves all the relevant data from the exercise for review and critique. Graphical time-line representations of parameters such as RPM, speed, course, heading, rudder angle, etc. can be presented and referenced to a specific point and time in the exercise. The playback can be advanced or replayed as often as necessary to review the activities of the trainees and their handling of the ship. The data is displayed by means of a large screen projection system easily viewed from all parts of the Briefing/Debriefing Classroom.

- **Track Plot & Data Log**

  Other features of this subsystem include providing digital track plots, showing the vessel's route with time markings and geographic reference points, buoy positions and corresponding tracks of other vessels. A log of the ship's important maneuvering data can be made for each run and printed out for use as a debriefing tool complementing the previously mentioned features.

- **Audio-Video Recording**

  Each simulator bridge is equipped with closed circuits, low-light video cameras and microphones so that the activities on the bridge can be recorded to provide a video and audio record of occurrences. Helm orders, critical communications and information passed between bridge team members can be analyzed during the debriefing sessions from this recording.

- **Visual Scene Monitors**

  The Briefing/Debriefing Classroom provides audio and video feed from the simulators, repeat displays of the ECDIS and RADARs and monitors that can display the forward arc of visibility from either bridge simulator. . These options allow the observing trainees to see what the trainees on the bridge see. If the instructor chooses to run a recorded exercise in playback mode, the visual scene will be presented exactly as it was viewed during the exercise.

Kongsberg 360° and 270° Bridge Systems

The following is a detailed description of the equipment and capability of the various Simulator systems as follows:

360° Full Mission Main Bridge Simulator

- ECDIS
  - Wärtsilä Navi-Sailor 4000 with type specific keyboard
  - Kongsberg K-ECDIS with type specific keyboard
    - Track mode available with K-ECDIS
- Radar/ARPA (Three types available)
  - Polaris K-Radar/ARPA
  - Sperry Bridge Master E
  - Furuno FAR-28x7
- Main Console
  - Dual Monitor Conning Display
    - Port Display
      - Conning information display
      - Azipod conning display page
    - Starboard Display
      - Multi-function display capable of showing the following panels: AIS, alarms, anchor control, azimuth conning, clinometer, combinatory control, conning, DGPS navigator 1 & 2, distress alert, Doppler log, echo sounder, emergency actions, engine alarms/clutch indicator, engine indicators, engine telegraph, fire doors, generator control, gyro control, gyro repeater, gyro/steering gear control, Inmarsat-B, log/distance/time, magnetic compass, magnetic compass repeater, MF/HF, MF/HF DSC, Morse light, navigation lights, navtex receiver, overhead maneuvering indicators, overhead propulsion indicators, sound signals, VHF, VHF DSC, and watch responsibility/engine control.
      - Ship monitoring systems
  - Propulsion
    - Throttle
    - Podded propulsion controls for up to three pods
  - Communication
    - VHF radio
    - Kongsberg VHF Radio
    - Handheld UHF radios

- Two (2) multiflex touchscreen panels
  - A touch screen panel capable of showing the following panels: AIS, anchor control, azimuth conning, clinometer, combinator control, conning, DGPS navigator 1 & 2, distress alert, Doppler log, echo sounder, emergency actions, engine alarms/clutch indicator, engine indicators, engine telegraph, fire doors, fire indicator, generator control, gyro control, gyro repeater, gyro/steering gear control, log/distance/time, magnetic compass, magnetic compass repeater, MF/HF DSC, Morse light, navigation lights, navtex receiver, overhead maneuvering indicators, overhead propulsion indicators, sound signals, VHF DSC, watch responsibility/engine control, VHF 2 & 3, thruster control, visual view control, alarms, steering system, searchlight and intercom.
  - Bow/Stern thruster
  - Gyro/Steering gear control
  - Sound signals
    - Whistle
    - Bell
    - Gong
  - Visual view control
    - Port/Starboard view
    - Spotlight with joystick control
    - Binocular view with joystick control

- Overhead panels
  - Port Overhead LCD - Ship monitoring systems
  - Center Overhead LCD - Binocular view
  - Starboard Overhead LCD - Propulsion indicators
- Safety Console
  - Multi-function display capable of showing the following panels: AIS, alarms, anchor control, azimuth conning, clinometer, combinatory control, conning, DGPS navigator 1 & 2, distress alert, Doppler log, echo sounder, emergency actions, engine alarms/clutch indicator, engine indicators, engine telegraph, fire doors, generator control, gyro control, gyro repeater, gyro/steering gear control, Inmarsat-B, log/distance/time, magnetic compass, magnetic compass repeater, MF/HF, MF/HF DSC, Morse light, navigation lights, navtex receiver, overhead maneuvering indicators, overhead

propulsion indicators, sound signals, VHF, VHF DSC, and watch responsibility/engine control.

- Multiflex touchscreen panel
  - A touch screen panel capable of showing the following panels: AIS, anchor control, azimuth conning, clinometer, combinator control, conning, DGPS navigator 1 & 2, distress alert, Doppler log, echo sounder, emergency actions, engine alarms/clutch indicator, engine indicators, engine telegraph, fire doors, fire indicator, generator control, gyro control, gyro repeater, gyro/steering gear control, log/distance/time, magnetic compass, magnetic compass repeater, MF/HF DSC, Morse light, navigation lights, navtex receiver, overhead maneuvering indicators, overhead propulsion indicators, sound signals, VHF DSC, watch responsibility/engine control, VHF 2 & 3, thruster control, visual view control, alarms, steering system, and intercom.

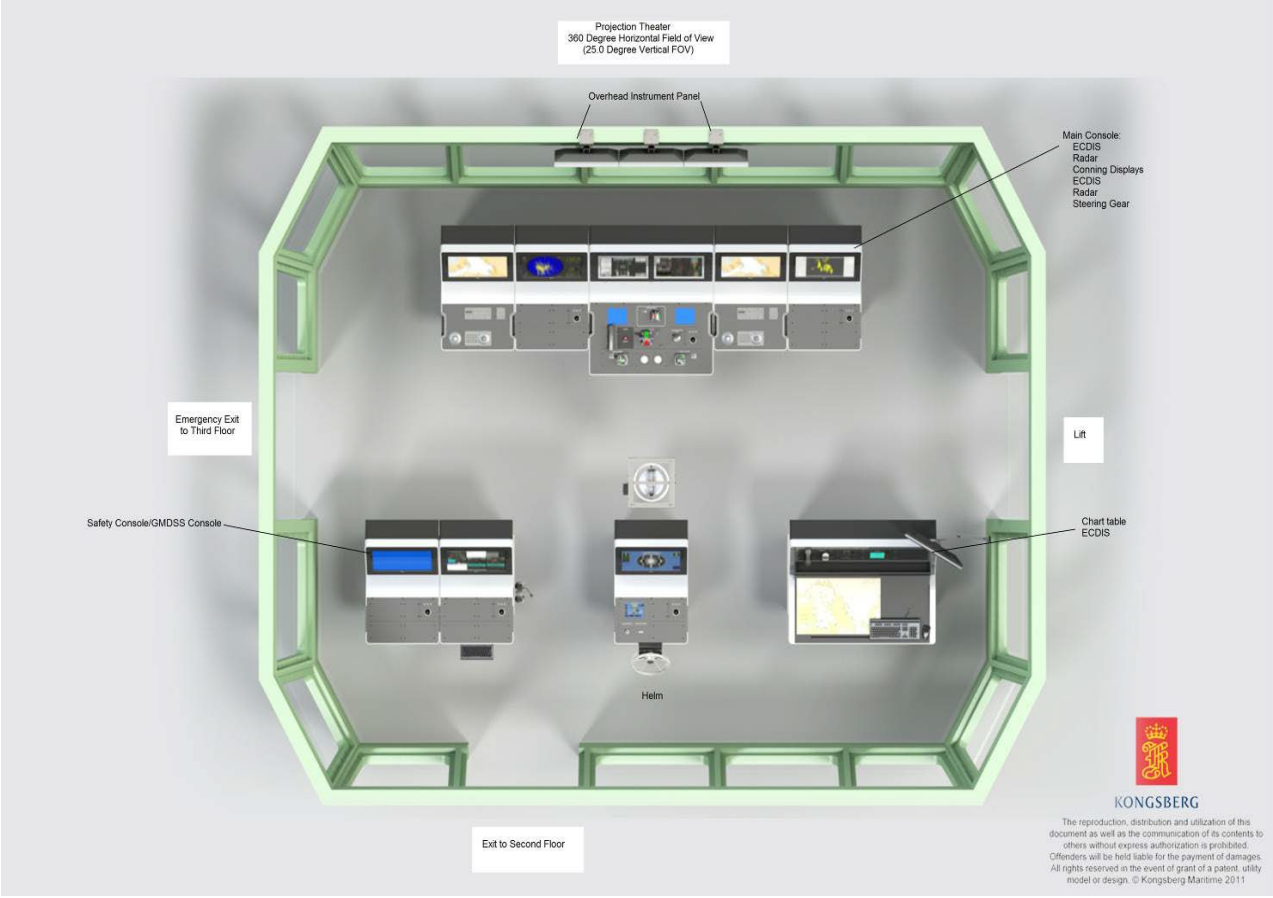
- GMDSS Console
  - Inmarsat B Telex
  - NBDP
  - MF/HF DSC
  - MF/HF
  - VHF DSC
  - Inmarsat C
  - Navtex
  - VHF
  - Distress panel
- Helm Console
  - Panorama
    - Conning display
    - Gyrocompass
    - Magnetic repeater
  - Multiflex panel
    - Steering system
- Chart table
  - Three (3) multiflex touchscreen panels
    - A touch screen panel capable of showing the following panels: AIS, anchor control, azimuth conning, clinometer, combinator control, conning,

DGPS navigator 1 & 2, distress alert, Doppler log, echo sounder, emergency actions, engine alarms/clutch indicator, engine indicators, engine telegraph, fire doors, fire indicator, generator control, gyro control, gyro repeater, gyro/steering gear control, log/distance/time, magnetic compass, magnetic compass repeater, MF/HF DSC, Morse light, navigation lights, navtex receiver, overhead maneuvering indicators, overhead propulsion indicators, sound signals, VHF DSC, watch responsibility/engine control, VHF 2 & 3, thruster control, visual view control, alarms, steering system, searchlight and intercom.

- Communication
  - Multi-channel VHF RT radio
  - Handheld radios
- ECDIS
  - Wärtsilä Navi-Sailor 4000 ECDIS repeater

- Gyrocompass repeater
  - Pelorus with bearing circle
- Engine Room communication
  - Sound powered telephone

360° Full Mission Main Bridge Simulator



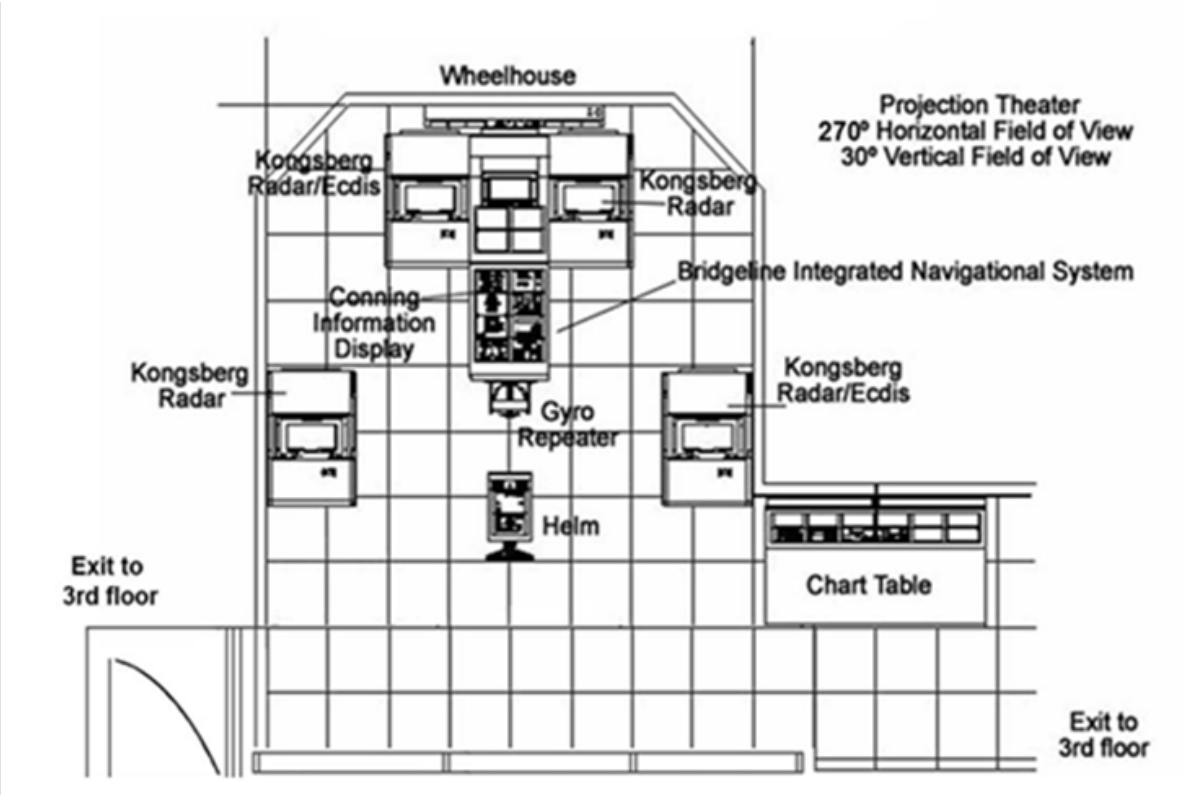
270° Full Mission Simulator

- ECDIS
  - Wärtsilä Navi-Sailor 4000 with type specific keyboard
  - Kongsberg K-ECDIS with type specific keyboard
    - Track mode available with K-ECDIS
- Radar/ARPA
  - Polaris Radar/ARPA display
  - Sperry Bridge Master E
  - Furuno Far-28x7
- Main Console
  - Conning display
    - Normal propulsion
    - Azipods
  - Echo Sounder
  - Gyro/Steering gear control
  - DGPS Navigation
  - Hydraulic Winch control
  - Communication equipment
    - Multi-channel VHF RT radio
  - Propulsion Console
    - Engine/Throttle Control for up to two throttles
    - Azipod control for up to two (2) azipods
  - Steering System
    - NFU
    - Autopilot
    - Track Control
    - Manual
  - Bow/Stern thruster
  - Multiflex touch screen panel
    - Sound signals
      - Whistle
      - Bell
      - Gong
    - View/Spotlight
      - Port/Starboard view
      - Spotlight
    - Steering System

- Overhead Panels
  - Wind direction/speed gauge
  - Bridge time clock
  - Ship gyro heading
  - Ship speed
  - Rudder angle gauges
  - Combinator control
- Helm Console
  - Steering System Control
    - NFU
    - Autopilot
    - Track Control
    - Manual
  - Rudder command/angle gauges
  - Gyro repeater
- Chart Table
  - Navtex
  - Distress Alert Panel
  - VHF DSC panel
  - Ship Monitoring systems
  - Communication
    - Multi-channel VHF RT radio
    - Kongsberg VHF
- Gyrocompass repeater
  - Pelorus
- Engine Room communication
  - Sound powered telephone

270° Full Mission Bridge

STAR Center, Dania Beach, Florida



ARPA / Non-visual Simulators

There are three (3) radar/navigation simulators. Non-visual Bridges are primarily set up for radar and electronic navigation and are all fully equipped bridges. The three non-visual bridges are used for training in areas such as anti-collision and advanced navigation techniques, including ECDIS training. The non-visual bridge simulators are augmented by a variety of own ship models, harbor and waterway databases that reproduce a realistic and diverse sailing environment. All the simulators are capable of interactive operation with each other or may be operated as individual trainers. The following is a listing of the equipment and instrumentation contained on the non-visual bridge simulators:

- **Overhead Instrument Panel** – There are two (2) overhead digital LCD displays located above the chart table. The port overhead LCD panel displays: Depth, heading, speed log, rate of turn, true/relative direction and speed of the wind, rudder angle and list. The starboard overhead LCD displays: Echo sounder, speed log, distance, gyro repeater, and Doppler log.
- **GPS Navigator** – Display shows geographic coordinates of ship's position and GMT. Function keys are provided to emulate those found on a standard GPS Receiver.
- **Communication Equipment** – Comprises a multi-channel VHF radiotelephone. External communications include a panel for ship's whistle, bell, and gong on a Sound Signal Control Panel.
- **Ship Control Console** – The ship control console includes digital readout of course, rudder command, and course set point for the autopilot. There is a rate of turn indicator, steering mode selector (auto & manual) and joystick for steering. It also has the engine order/throttle control which may be used for bridge control, engine room control or as a combinator control (fixed, combi, and variable pitched) for the simulated ship's propulsion plant. This control is flexible and may be used as a single screw control or separated to provide for dual engine control (separate throttles). For Diesel-powered ships, a digital indication of available Start Air is located on the Conning Page display which is mounted on the console.
- **Fathometer** – The controls for the fathometer and the digital readout are located on the forward console. This panel includes selectable depth readouts in meters, fathoms or feet, along with alarm limits.
- **Control Station** – A console from which the simulator operators or instructors can start, monitor, and terminate simulator exercises on all three ARPA/Radar non-visual /bridges is available. From this console, they can control other traffic vessels, adjust environmental conditions, and initiate ship system failures. All this data can be plotted or recorded for post-exercise playback.

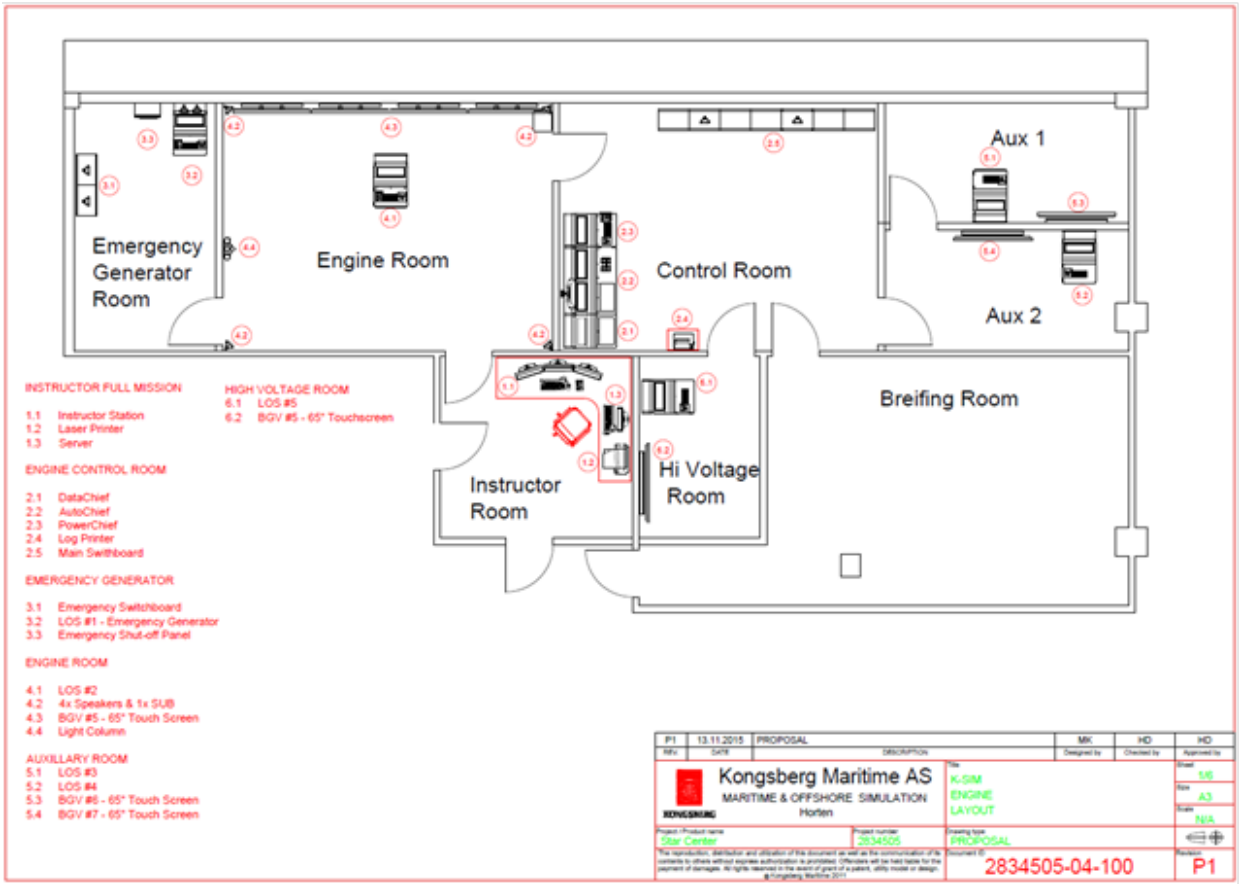
ECDIS – The Electronic Chart System (ECS) using Wärtsilä Navi-Sailor 4000 marine navigation software will display official ENC chart data as well as RNC's. With this software, data exchange with navigational sensors and external output devices enables the vessel position coordinates to be continuously obtained and the vessel controlled in navigational situations. The electronic chart system is capable of route planning, route monitoring, and able to display ARPA targets and AIS information.

- **RADARS** – There are two (2) Kongsberg RADAR consoles on each bridge. Each RADAR console can display multiple RADAR skins such as Kongsberg's Polaris K RADAR / ARPA, Sperry Bridge Master E, and Furuno FAR 28x7.

Full Mission Engine Room Simulator

The Full Mission Engine Room Simulator (K-Sim Engine) is separated into six (6) different spaces (Emergency Generator Room, Engine Room, Engine Control Room, High Voltage room or Auxiliary room 3, and two other Auxiliary rooms). Each auxiliary room can be configured differently to maximize the training effectiveness e.g., generator room, separator room, start air system room, steering gear room, etc. This allows more flexibility and adds to the fidelity and realism of the simulator. K-Sim Engine is currently capable of running four different engine models: MC-90-V MAN B&W 5L90MC (VLCC), RT-Flex Wärtsilä (Container ship), M11 MaK 8M32C-V (Container ship), DE-III (Cruise ship).

Full Mission Engine Room Simulator Layout



Customizable Solutions

K-Sim Engine can be tailored to fit any specific requirement. This means that all equipment normally associated with an engine room is available. The operation of the engine room's subsystems can be conducted on interactive mimic panels and consoles or monitor-based local operating stations in any combination. An example is the BigView configuration, which is an advanced interactive mimic system displaying K-Sim Engine model process diagrams on large 65" HD touchscreen monitors including 3D pop-up display for vital parts of the engine room. BigView provides full size simulation but with complete, touch of a button flexibility.

Realistic Training Environment

K-Sim Engine offers a true physical shipboard environment with all equipment normally associated with an engine room. To enhance the experience, dynamic engine room sounds are included in the system, which reproduce sounds of e.g. variation in main engine speed, malfunctions in turbo charger air filters, start/stop of pumps, oil fired boilers and compressors, and drain and safety valves. By adding realistic engine room sounds, noises and alarms, total realism is achieved.

Using physical models, we can offer real-time simulation models providing an effect on adjacent sub-systems. Faults and alarms will have cascading effects throughout the system if not acknowledged properly. In addition to an extremely high level of realism, K-Sim Engine offers user-friendliness and flexibility, key features for providing high levels of instructor control and greater variety of course offerings.

3D Virtual Simulation

By using the latest available 3D technology, some of our K-Sim Engine models are available as a 3D virtual engine room system, allowing students to navigate through the engine room and operate the equipment from within a virtual environment. The 3D presentation allows students to get a logical approach of for example, opening and closing valves, faultfinding, and handling of normal and anomalous situations, without danger to life or equipment.

Integrated Automation Systems

All K-Sim Engine Room models feature an Integrated Automation System (IAS) that covers the user interface for important remote control and monitoring functions in the simulator, such as:

- Power management
- Auxiliary machinery control
- Ballast/bunker monitoring and control
- Cargo monitoring and control
- Alarm handling
- Trend systems
- Trapped key system (High Voltage Only)

Integrated Complete Training Scenarios

The K-Sim Engine architecture allows it to be used across a range of different interfaces, offering benefits in value and realism. K-Sim Engine can for example connect to STAR Center's 360° ship's bridge simulator. By integrating these two (2) systems, customers can run Crew Resource Management training, enhancing interaction skills, improving performance, and building even stronger teams.

The simulator has a variety of uses for the training of maritime professionals and licensed engine officers. The offered courses are specific in nature for equipment familiarization, high voltage safety; or more general with plant management or Engine Room Resource Management (ERM).

For high voltage safety, the user interface in the simulator High Voltage Room provides a real time "Trapped Key System" that mimics physical trapped key systems that use a series of mechanical locks and keys to control access to motor control center doors ensuring safe access and lowering the potential of risk to life or limb due to exposure to high voltage to its lowest possible level.

The simulator uses realistic scenarios requiring machinery operations, maintenance actions, troubleshooting and casualty control, enabling real-time assessment of knowledge and proficiency.

Engine Room Panorama

Engine Control Room Panorama

High Voltage Room Panorama

Auxiliary 2 Room Panorama

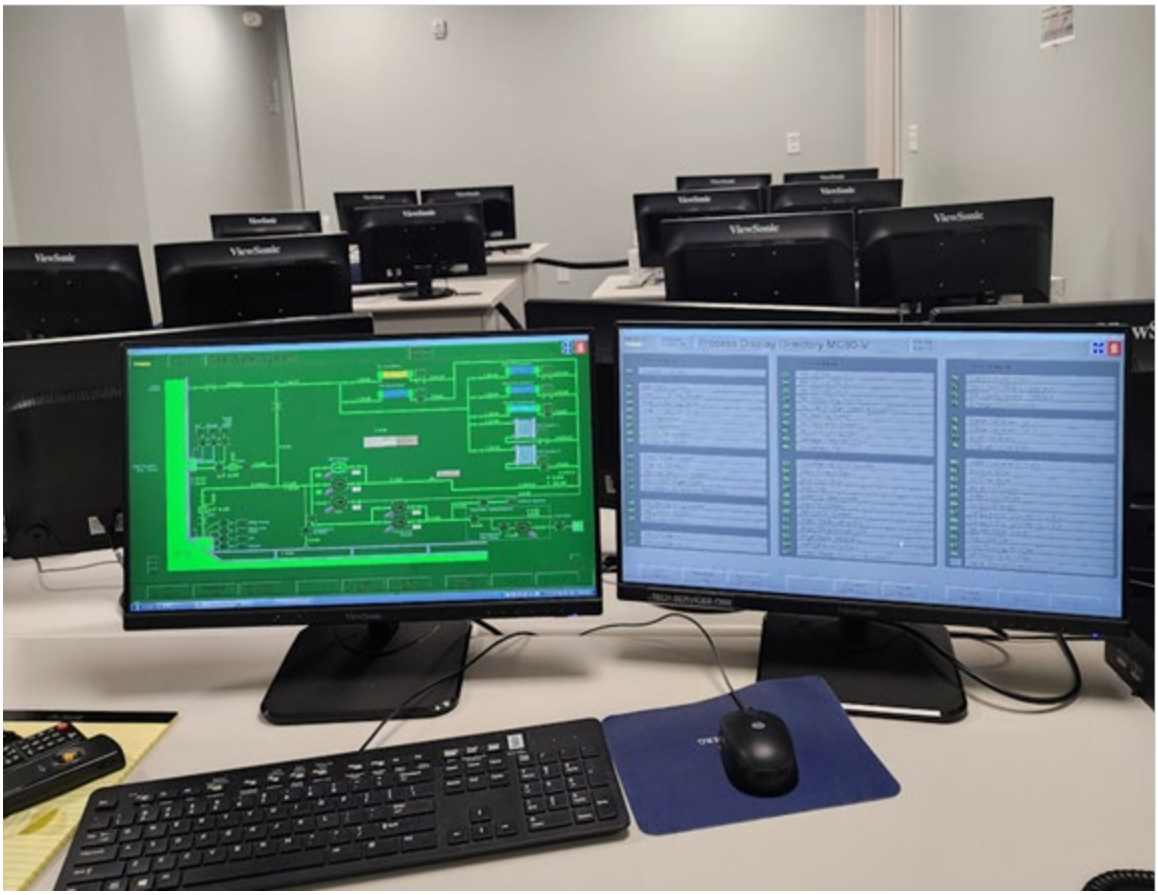
Auxiliary 1 Room Panorama

Emergency Generator Room Panorama

Interactive Desktop Simulator Workstations

The designated simulator rooms consist of one (1) instructor computer station and multiple student stations. The system uses the Kongsberg Neptune Simulator System with eight (8) programmable, fully interactive propulsion models that can run on each desktop student station. Models include a M11 MaK, MC90, GT25, M22PC, RT-Flex, SP Duel Fuel, and DE III, and M11 CNTNR.

The ship's propulsion engine room system trainers consist of the main plant monitoring and control system of modern diesel-powered motor ships, including electrical generation/distribution and other auxiliary systems. Sophisticated computer models insure the proper response to operator action as well as system degradation due to wear and tear and component failure.



Pictured above is Neptune Instructor Desktop Computer Station

Steam plant operations workstation trainers provide a computer model of a steam turbine propulsion system featuring dynamic system and subsystem schematics which the student can interact with to gain a strong background in the system's operation. The simulators and workstation trainers place students in realistic exercises operating the plant, troubleshooting problems, and reacting to emergency conditions.

Poseidon Pharos GMDSS Simulator

The Poseidon Pharos GMDSS Simulator consists of several computer workstations connected by a network system, headsets, and printers. The maximum size of the system is one (1) instructor station and six (6) student stations.

Instructor Station

The instructor station acts in a multi role capacity as coast station, ship station and shore subscriber. The instructor can make up and store exercises for later use. When planning and setting up an exercise, the instructor can easily select what systems (instruments) each individual student will be allowed to operate i.e. sea area AI, A2, A3 and A4. Student stations will then be automatically allocated the appropriate radio equipment. Alternatively, a student station can be customized for special SAR exercises, i.e. small vessels with only VHF and MF/HF may be designated.

Within the same exercise, there can be a combination of ships equipped for different sea areas. The instructor station software can be loaded with information on the most relevant coast stations worldwide. All variable parameters can be edited by the instructor to create various scenarios.

Several selectable charts or exercise maps are included. These areas range from a world map to selected areas - North Atlantic, East, and West coast of North America, Eastern Canada, Pacific and Indian Oceans.

The instructor station will function as the control unit of various systems. All systems can function at the same time and continuously stay under the surveillance of the instructor. The instructor will communicate with each student via the communication system assigned i.e. radio voice, radiotelex, Satcom B etc. Within the GMDSS simulator the instructor may act in the role of any coast radio station around the world, shore subscriber for radio telex or Sat B telephone, or another ship station for radio telex/voice or as an RCC for a SAR exercise.

Poseidon Pharos GMDSS Simulator

The scenario consists of six (6) “ships” (student computer workstations) and one “Coast Station” (instructor station) for both radio and satellite communications. Using exercises designed for distress, urgency, safety and ship’s business communications, students learn how to set up and operate the GMDSS equipment in a variety of settings and situations.

Software Capability

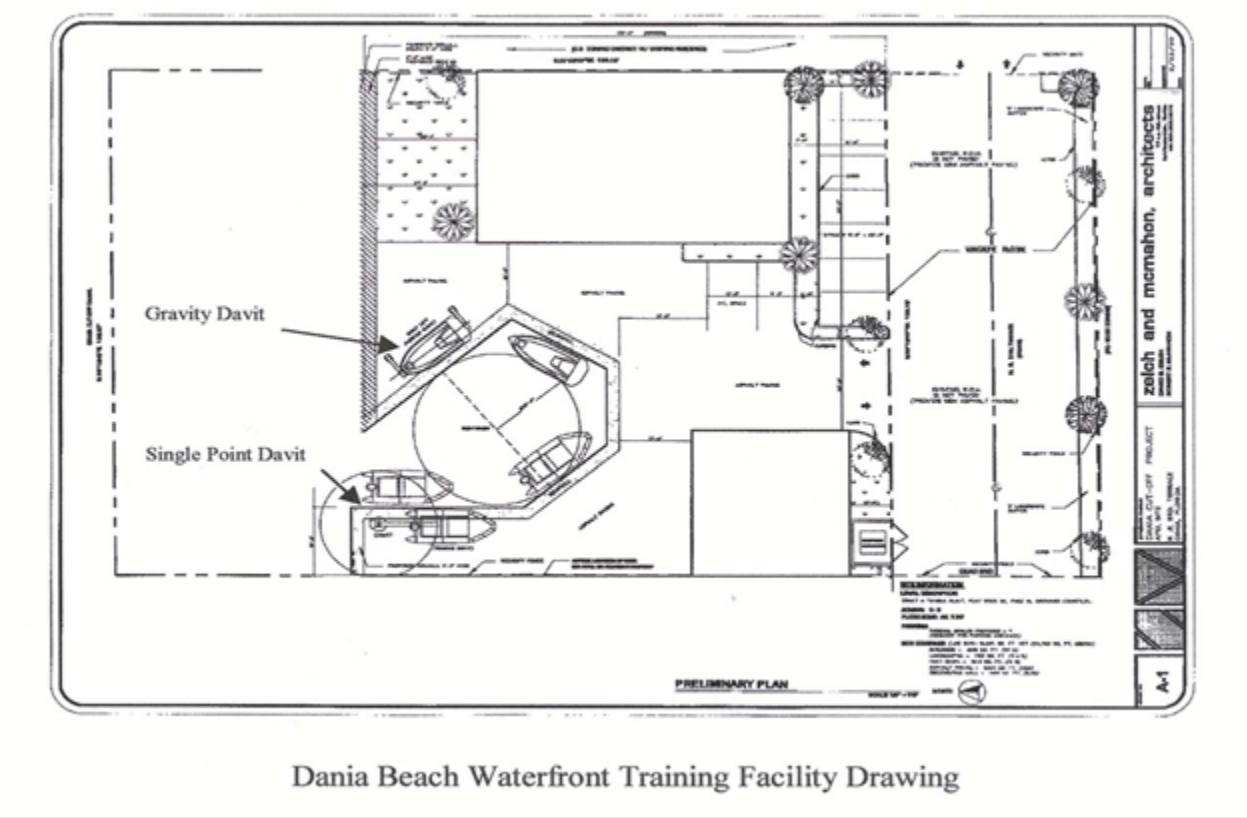
Additional software serves the following equipment:

- VHF and MF/HF radiotelephone
- VHF DSC controller/receiver
- MF/HF DSC controller/receiver
- SAT C
- Radiotelex Receiver, and telex with Safety NET
- Radar
- SART (Search and rescue transponder)
- EPIRB (Emergency position indicating radio beacon)
- NAVTEX (Navigational telex)

Supplementary Functions:

- Selecting exercise chart area, setting date and time
- Making and storing exercises in selected chart areas
- Creating and sending NAVTEX messages via selected transmitting station(s)
- Creating and sending Safety NET messages via selected satellite(s)
- Maintenance and extension of system data such as, coast radio station lists, NAVTEX transmitting station lists, and INMARSAT land earth station lists.

STAR CENTER WATERFRONT FACILITY DESCRIPTION



Dania Beach Waterfront Training Facility Drawing

The Dania Beach Waterfront Training Facility, located on the NE 3rd Terrace, is located on the Dania Cut-off Canal approximately 1 mile west of the Intracoastal Waterway. The facility is located on the south bank of the canal and has been in operation since Spring 2002. The facility itself features a 40' turning basin for sheltered launch and recovery, 100' of unobstructed face dock, and a workshop building.

The Waterfront Facility is designed to support classes in Proficiency in Fast Rescue Boat, Proficiency in Survival Craft and MSC Damage Control training. There is an Alexander-Ryan Marine SOLAS Gravity Davit for the 25-person totally enclosed Survival Craft, and a Titan Industries 5B Single Point Crane for the launching and recovery of the Fast Rescue Boats.

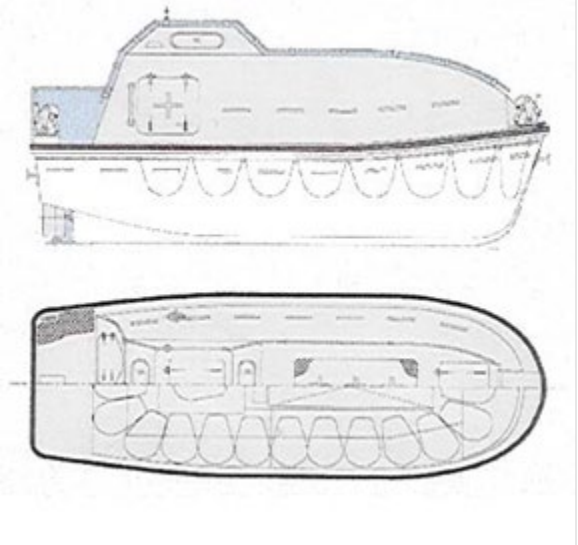
The Waterfront Training Facility has the following boats:

- Ambar Marine/Silverships 8-meter SOLAS Rigid Hull Inflatable Fast Rescue Boat with Twin Outboard 175HP motors.
- Ambar Marine/Silverships 8-meter SOLAS Rigid Hull Inflatable Fast Rescue Boat with an inboard Cummins diesel engine and Hamilton Jet Drive.
- Alexander-Ryan Marine SOLAS 25-person totally enclosed Lifeboat
- Norwegian Maritime Equipment 12-person open lifeboat
- 12‘ RIB Boat

General Description – Enclosed Survival Craft

The lifeboat is a totally enclosed motor propelled survival craft (TELB). It is designed to be launched by a Standard Gravity Davit. The hull, superstructure, hatches, buoyancy tanks, steering nozzle, water, and provision containers are made of fire-retardant glass fiber reinforced polyester (GRP).

Hull and Superstructure



Main Specifications

No. of pers. (max.)		25
Length (moulded)		5.90m
Breadth (moulded)		2.30m
Depth (moulded)		1.20m
LOA		5.98m
BOA		2.38m
H		2.70m
Weight:	Tanker version	2890kg (unloaded)
		4765kg (full loaded)
	Cargo version	2605kg (unloaded)
		4480kg (full loaded)
Hook		BG-3
Hook dist.		5.40 m
Height	fore:	1.83 m
	aft:	1.63 m
Boat color:	Exterior:	international orange
	Interior:	light gray

The hull and superstructure (made of fire-retardant GRP) are assembled into one (1) unit. With the internal GRP structure this forms a double skinned boat; preventing water from flooding the cabin if the outer hull should be damaged.

Hooks

The boat is equipped with an ON/OFF load-lifting hook forward and aft. The hooks are operated from a release handle mounted on starboard side of the steering position and will release simultaneously when the craft is fully waterborne. There is a hydrostatic override switch for emergency release of the hooks. The system is protected against accidental release.

Stability

The craft has a positive stability up to 180°. It is self righting under intact and flooded conditions, even when fully loaded. The superstructure, sides, all seats, bow and the bottom of the craft have buoyant compartments filled with polyurethane foam; making the craft virtually unsinkable.

Embarkation and Seating

The craft has a large watertight embarkation door in the stern. Additional hatches are installed at the helmsman’s position and on the forward part of the canopy. This ensures that the boat may be boarded in a minimum of time. The rescue deck’s low freeboard gives good embarkation capabilities at sea. All seats are equipped with safety belts according to regulations.

Fire Protection

A water spray system is installed for fire protection. The spray system consists of an engine driven pump, which draws seawater from the lowest possible location under the boat ensuring that no flammable liquid is drawn into the system.

The spray system provides water over the entire surface of the craft (1200 l/min). One portable fire extinguisher is installed inside the boat.

Compressed Air and Ventilation System

The boat has both normal ventilation and a compressed air system installed. This caters for the personnel inside and allows operation of the boat engine.

The compressed air system can sustain the boat for a minimum period of ten (10) minutes if the boat needs to be isolated from a dangerous external environment. It creates an over pressure inside the boat, preventing an ingress of toxic fumes or gas.

An overpressure relief valve is mounted on the port side of the aft bulkheads. This removes the risk of the cabin becoming excessively pressurized during operation of the emergency compressed air system. The compressed air system can be recharged from the ship's own system.

Natural ventilation is achieved via an automatic valve located on the starboard side of the aft bulkhead. The valve is above the waterline in all angles of heel (0-180°). The valve prevents the cabin becoming hazardously under pressurized when the boat engine is running.

The engine air inlet is located on top of the engine casing and is above the waterline at all angles of heel when flooded.

Engine

- Diesel engine approved for use in totally enclosed survival crafts
- It is freshwater cooled with heater tank and external cooler, mounted in a sturdy engine frame with an enclosed propeller shaft
- Double electric starting system
- The fuel tank has sufficient capacity for the fully loaded boat to have a range of 6 knots in 24 hours.
- The engine can run for a minimum of five (5) minutes in the boat's permanent suspension position.
- The watertight and fire-retardant engine compartment is located under the helmsman position and has a good access hatch.
- The entire engine casing can be removed for maintenance.
- The gearbox enables the craft to be driven both ahead and astern.

Steering and Controls

The boat has a hydraulic steering system. The GRP steering nozzle gives excellent maneuverability both astern and ahead.

The helmsman's position is in the aft part of the boat giving a 360° view. The helmsman operates:

- Hook release handle
- Engine controls and instruments
- Steering control
- Compressed Air System
- All electrical equipment

Electrical Equipment

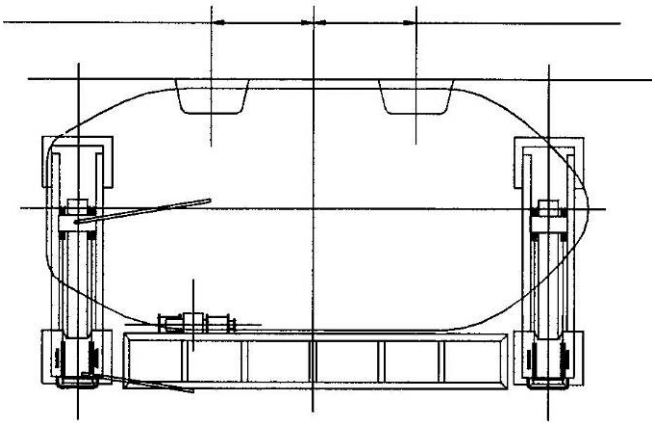
Following electrical equipment is installed:

- Main starter
- Power supply for radio/VHF
- Interior Lighting
- Navigation Light
- Batteries
- Main Switch
- Circuit Breakers with reset buttons for all electrical equipment
- Battery charger for maintenance charging. The battery charger is equipped with an external male socket input placed on top of the steering tower.
- The engine has a 12V electric alternator.
- Instrument panel with alarm for low oil pressure and high-water temperature, charge control and glow control lamp, glow starter switch, stop button and power outlet.

Alexander/Ryan Marine SOLAS Gravity Davit Description

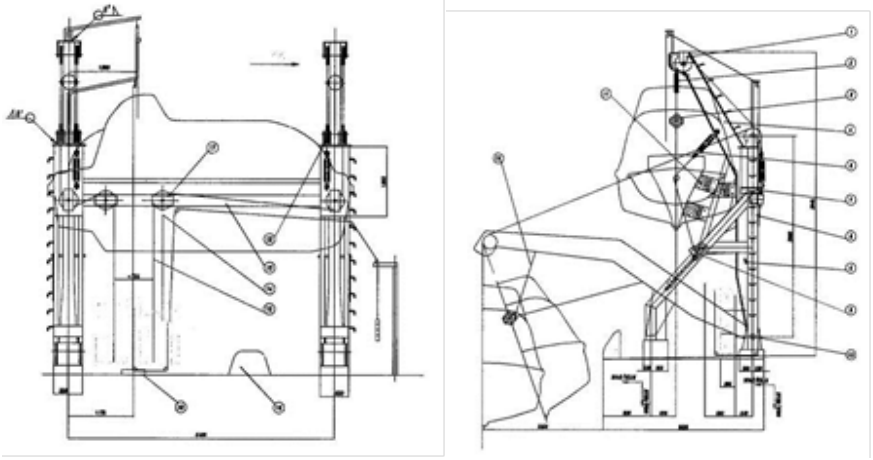
The davit is designed and built in accordance with SOLAS 1974 and its amendments and International Lifesaving Appliance (LSA) Code.

Top View



- The davit is a hinged type davit and it lowers the boat to the water by the help of its own weight (gravity davit).
- The davit is designed for boarding the boat in stowed position. The boat may be lowered without stopping as turning out and lowering is a continuous movement at a minimum of lost time.
- The boat is turned out and lowered by means of remote control that the crew can release and stop the hand brake of the winch from inside of the boat via wire connection to the brake arm and wire spool on the small drum. Alternatively, the crew can operate the hand brake on the deck.
- Lashing arrangement for boat can be released manually by using the slip hooks on fore and aft lashing.

- A permanently mounted motor on the winch is used for hoisting the lifeboat with two (2) persons.
- The winch driver is equipped with a one-way brake, disc type axial friction clutch and manual hoisting crank with safety device.



Titan Hydraulic Marine Crane 5B Description

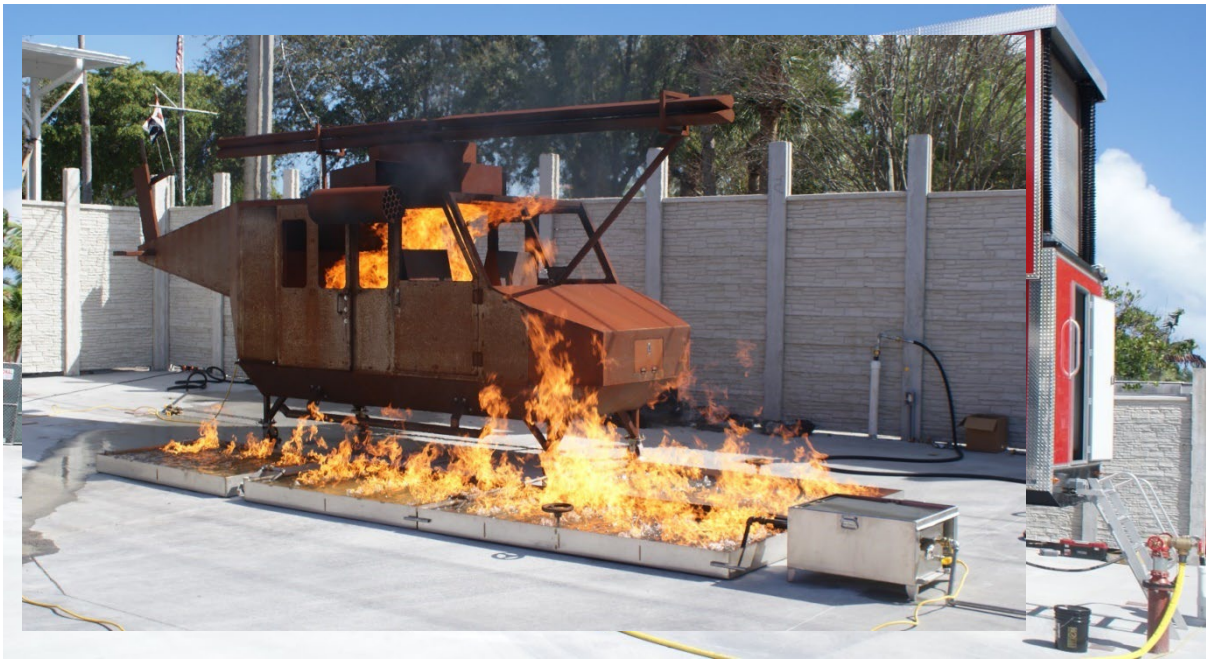
The Titan 5B Pedestal Mounted Hydraulic Crane is designed, built, and certified in strict accordance with API Specification 2c, April 1995, and bears the API medallion. The Titan cranes are tailored to the special needs of the offshore operator. The Titan 5B will be used in the launch and recovery of the Fast Rescue Boats at the waterfront facility in support of the FRB Courses.

Titan 5B Specifications

- 20 ft boom
- Minimum of 6,000 lbs. @ 20 ft radius
- Remote power pack
- Remote operator station
- Electric motor with starter
- Single part main hoist
- Pedestal adapter
- Pedestal reaction

STAR CENTER FIRE FIELD

STAR Center's newly installed in-house/on campus Fire Field and Fireblast Advanced Fire Training Unit are located at, 2 West Dixie Highway, Dania Beach, FL. This allows STAR Center to conduct all USCG and MSC approved firefighting courses (including Helicopter Firefighting) at our facility and main campus giving students a more enhanced and convenient training experience.



STAR Center's Military Sealift Command MSC Training Facility

STAR Center has constructed a purpose-built 14,000 sq. ft building to accommodate the full range of Military Sealift Command's required training, including classified training in a secure classroom. The building features three (3) large classrooms (one of which is secure), a 9-lane, 25-yard range for pistol, shotgun and rifle qualification, specialty areas for Security Watchstander Basic and Advanced (less lethal weapon) training, as well as a training facility for Ship's Reaction Force practical training. This multi-functional area has been designed to provide realistic tactical training in a procedural area that creates an onboard environment, including a decontamination setup for CBRD Officer training.

Figure 1 - MSC Training Facility Building

1. Small Arms

Our onsite secure armory is equipped with:

- 16 x M-14 Springfield rifles
- 16 x M-9 Beretta pistols
- 16 x Mossberg shotguns

Training for class sizes up to sixteen (16) students is provided in a 4-day MSC approved ***Initial and Sustainment Small Arms*** training. Practical assessments are carried out on our range.

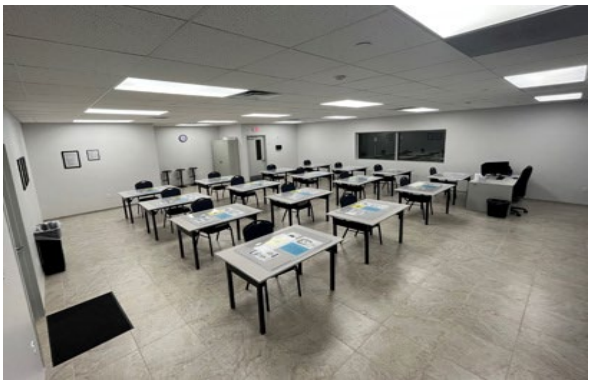


Figure 2 – Rifle Qualification on the 9-lane Range

Figure 3 – Dedicated Small Arms Classroom

2. Basic Chemical, Biological & Radioactivity Defense Orientation

Training for class sizes up to sixteen (16) students is provided in a 1-day MSC approved course. CBR-D dressing and undressing, as well as the use of respirators, is carried out.

3. Damage Control

Training for class sizes up to sixteen (16) students is provided in a 1-day MSC approved ***Damage Control*** training. Practical training to include shoring techniques and pipe patching, is carried out at our Waterfront Facility using exact replicas of those located at MSC's Training Center East in Freehold, NJ.

4. Marine Environmental Programs

This MSC seminar is offered in combination with CBRD training.

5. **Security Watchstander Basic**

   Required once in a career (old Ship Security and Tactics (SST) meets the requirement), this 1-day class is a prerequisite for entry into the Security Watchstander Advanced class.

6. **Security Watchstander Advanced**

   Required annually, this 1-day class is a prerequisite for entry into the 3-day Ship's Reaction Force (SRF) class. This course makes use of the rubber mat space for training in baton use, handcuffing and various take-down drills.

7. **Ship Reaction Force**

   Required every 3 years for those assigned as onboard SRF members, this 3-day class makes use of various locations, including our engineering space, for training in a variety of roles that the SRF may be called upon to deal with. Prerequisite requirements for entry into this class are: current Security Watchstander Advanced and MSC Small Arms qualified in 9mm pistol and 12-gauge shotgun.

8. **Helicopter Fire Fighting**

   Required every 5 years, this 1-day class is delivered using STAR Center's fire training facility with full helicopter mock-up.

9. **CBRD Officer**

   This 5-day MSC classroom and practical course is provided to meet training demand.

10. **Anti-Terrorism Officer Level 2**

    This 5-day MSC classroom course is provided to meet training demand.

11. **Water Sanitation Afloat**

    This ½-day MSC classroom seminar is provided as necessary to meet training demand

12. Health and Safety Aspects of Marine Sanitation Devices

This 1-day MSC classroom seminar is provided as necessary to meet training demand.

13. Heat Stress Afloat

This ½-day MSC classroom seminar is provided as necessary to meet training demand.

14. Hearing Conservation Afloat

This ½-day MSC classroom seminar is provided as necessary to meet training demand.

