Outline Specification for ST-361

36,1 m Fishery Training Vessel

for

Maaloey High School, Norway

Reference:
General Arrangement Plan, no. GA2020099-00, rev. 30.10.2020

General
The **ST-361** is designed by **SKIPSTEKNISK AS** for coastal fishery training service. The core activity for the vessel will be educational activity. This includes following operations;

- Short day trips to nearby fishing grounds
- Up to three day trips to more distant fishing banks
- Once a year, a trip of several weeks to the north of Norway
- Fishing for white fish and several other species with longline
- Fishing for white fish and several other species with gillnets
- Other educational activities, such as MOB drills, maintenance tasks, galley duty, manoeuvre training etc.

All fish caught, will be bled and iced on board and delivered fresh to shore

Operational area

The vessel to be designed for operation in Norwegian coastal waters restricted to the following designation:

- "Small coastal transit" (Liten kystfart)
- "Coastal fishing 1" (Bankfiske 1)

Ice conditions according to specified ice class for vessel.

Main particulars

Length over all	36.10m
Length between p.p	33.00m
Breadth moulded	9.50m
Depth to tanktop	2.10 m
Depth to main deck	4.70m
Design draft	3.60m
Gross tonnage	Below 500

Speed

Trial speed 10.0 knots in SS4.

Seakeeping

A passive anti-rolling tank will be built in order to provide the vessel with proper sea-keeping abilities. Baffles at 1\3 and 2\3 of the tank breadth to be built according to approved drawings.

Tank capacities

Fuel oil	abt. 80 m^3
Potable Water	abt. m^3

Class and statutory requirements

Class is not a requirement. The vessel shall however comply with all national requirements as required by NMA (Norwegian Maritime Authority).

Flag

The Vessel to run the Norwegian(NOR) flag.

Environmental conditions

Design conditions

- Seawater temperature: -2ºC to 28ºC.
- Minimum air temperature: -15ºC
- Maximum air temperature: +32 ºC at 70% relative air humidity.
- Wind speed up to 25 m/s

Acoustic insulation:

Acoustic insulation to be fitted as required in order to meet the given Noise Specification.

Accommodation

- Accommodation for 20 persons.
  - 3 crew
  - 17 students

Accommodation to include;

- 3 single officer cabins with separate bathrooms
- 2 double crew cabins, common WC&shower
- 1 single crew cabin, common WC&shower
- 3 each 4-person scientist cabins, common WC&shower
- Common WC and Shower room on Tanktop.
- 1 Wardrobe with toilet and laundry equipment.
- 1 Galley with normal/adequate outfitting
- 1 Messroom with seating capacity of 13 persons.
- 1 Lounge with TV/Audio/Entertainment system.
- 1 Linen store
- Other public and service rooms as shown on GA plan

Provision room/storage:

The vessel to be arranged with a provision store in the bow on main deck. Room to be arranged with shelves for dry provision.
Two each freezer and refrigerator cabinets to be installed in galley/provision room.
One refrigerator to be installed in the pantry area in messroom.

Service spaces, special rooms/areas:

Fish hold:
A fish hold for iced fish stored in insulated plastic containers to be arranged as indicated on the GA.
The fish hold to be insulated for maintaining a temperature between 2 and 4 °C when the containers in the hold is filled with fish and ice. Unloading hatch with smaller access hatch integrated to be arranged.

Bait hold:
A bait hold for frozen bait stored in frozen blocks to be arranged as indicated on the GA.
The bait hold to be insulated for maintaining a temperature of -25 °C.
A suitable freezing compressor system to be arranged.
Cooling medium to be R-449 or equal, according to rules and regulations.
An Air-cooled condenser unit of sufficient size to be placed in suitable location.
"Fan unit cooler" to be placed inside the bait hold below the ceiling. Simple protective grid in front of the unit to be installed to prevent damaging the unit.

Line working area:
The area to be arranged for longline operations. A raised floor of removable aluminium floor plates in the working part, in front of the magazines, to be arranged in appropriate working height (Approx. 1.4 m from floor to top of magazines). Around the baiting machine, the raised floor may be GRP grating.

Line hauling area:
The area to be arranged for line hauling through the moonpool. A raised floor of removable aluminium floor plates to be arranged. Water and residue from the hauler/hook cleaner to be led to the SB side bilge chute by simple gutter. Fish is gaffed at the roller or by long gaff in the moonpool. A chute for fish to be arranged from the hauler position to a hydraulic lifting bin. Railing towards moonpool to be constructed from 316L SS.

Gillnet area:
Gillnets to go via the hauler to the gillnet chute, where fish is separated from the nets by hand, further the nets will go through the grader and into the net bins. A chute for fish to be arranged below the main net chute. Fish to be lead to the bleeding bin.

Fish handling area:
The area to be arranged for simple fish handling (mainly bleeding). A raised floor of GRP plates to be arranged where its required. The flow of fish from the line hauling area and gillnet area to the bleeding bin to be achieved by hydraulic lifting bins and chutes. Offal to be transported by a gutter to a side bilge chute. Fish to be transported to the fish hold by hydraulic bins and chutes.

Deck and fishing equipment

Deck crane:
A deck crane to be placed as indicated on the GA.
Capacity: 1.5t @ 6m.

Line hauling system:
To be arranged as indicated on the GA. Line hauling system to be a Mustad Coastal system. Ref. basic allowance No. 3.

Gillnet system:
To be arranged as indicated on the GA. Shall include, but not limited to, the following:

- Hauler (Basic allowance No.:4)
- Grader (Basic allowance No.:4)
- Gillnet chute in 316L SS.
- Fish chute in 316L SS, below gillnet chute
- 2 x Gillnet bins. Above deck part to be aluminium.

Fish handling system:
To be arranged as indicated on the GA. Shall include, but not limited to, the following:

- 1 x hydraulic lifting bin from longline area
- 1 x hydraulic bleeding bin
- 2 x hydraulic bins for intermediate fish storage (water filled)
- Chutes for fish handling and offal handling

All equipment and el. cabinets to be stainless steel.

Anti-Rolling tank system

The vessel is arranged with bilge keels and a passive anti-rolling tank.

Rudder and Steering gear

The vessel to be arranged with a flap rudder, size abt. 2500 mm in height, 1500 mm in length. Rudder to be of free-hanging type.

A steering gear with adequate torque of rotary vane type to be installed.

Manoeuvring thrusters

The vessel to be arranged with a azimuthing bowthruster for general manoeuvring and as an emergency take-me-home facility;

The thruster to be of water-jet/pump-jet type.

Thruster power, max continuous/max operating	:	250/400 kW
Thruster diameter(abt.)	:	1700 mm

Fish finding acoustic equipment

The vessel is arranged with following fish finding equipment;

- Navigational echosounder according to applicable regulations
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Bridge, Navigation and Radio equipment

The vessel to be arranged with a navigational bridge in compliance with applicable regulations, including;

- Radars
- Radios
- Automatic Identification System(AIS)
- Engine Monitoring System

LAN/Ethernet system

The vessel shall be fitted with one Ethernet distribution network (LAN), dimensioned for transferring data as well as Infotainment and voice and email communication.

The LAN shall be split into several virtual networks (VLAN), minimum:

1. Ship Admin network
2. Communication and Entertainment Network.

A wi-fi system covering the complete vessel to be installed.

Safety equipment

- One MOB boat, 4 m with outboard engine.
- Approved davit for launch and recovery of the boat
- Safety equipment according to NMD regulations.

Ventilation plant

Design conditions:

Summer	:	32 deg C, 70% RH
Winter Outside	:	- 15 deg C
Inside	:	+ 22 deg C

Accommodation

The accommodation area to be provided with a high pressure single-duct VAV ventilation system with preheated or cooled air supply. The units in each room or space to be equipped with thermostatic controlled electric re-heater.

Capacities for cooling, heating and humidification shall be based on 100% fresh air. No re-circulation is allowed.

Bathroom/showers

Dedicated extraction fan from this area to be installed. Manual + humidity-controlled start/stop.

Galley

The galley to be supplied from the main AC-unit and a separate fan.

Ventilation system for Wheelhouse:

To cool and heat the wheelhouse a separate air conditioning/defroster unit designed for 100 % return air shall be installed.

Engine room fans

Adequate ventilation to be provided in the engine room to keep the maximum ambient temperature to a comfortable minimum according to ISO standard, both for engines and electric motors operating limits, and personnel working in the engine room. Filters for conditioning of air in the engine room to be installed if possible, to make air suitable for switchboards and el. components located in the engine room.

The system to consist of a supply system and an exhaust system.

2 x 100% capacity, frequency controlled fans

Sewage system

The sewage system to be arranged with vacuum toilets. Sewage drains from toilets to holding tank. Separate discharge pump with auto start/stop.

Hydrophore plant

One automatic hydrophore water system to be installed to supply lavatories, wash basins, showers, galley etc. System to be arranged with two pumps.

- One hot water tank, 1500 l
- Two hot water circulation pumps
- One UV sterilizing unit

Water maker

One water maker of reverse osmosis type to be installed. Capacity to be minimum 2 m3 / 24hrs.

Main propulsion plant

The vessel to be arranged with a Diesel Electric propulsion plant comprising;

- Single shaft arrangement with controllable pitch 4 bladed propeller with nozzle, ø abt. 2200 mm.
- 2 x AC electric motors, each abt. 500 kW, 1800 rpm. Gear ratio max. 8.
- 1 x low noise marine gearbox, with dual intakes.

Power generation plant

The vessel to be arranged with a power generating plant comprising;

- 1 x abt. 550 ekW/max 1800 rpm, diesel generator set
- 1 x abt. 150 ekW/max 1800 rpm, diesel generator set
- Alternators, 400 V/50 Hz, variable frequency.

Generating sets to be installed on flexible mounts.

Energy Storage System (ESS)

An energy storage system including BMS, inverter, sine filter, transformer and charging system to be installed.

Energy:	Approx. 950 kWh
Power output:	Approx. 600 kW
Functions:	Peak shaving, generator optimization, propulsion.
Battery type :	Corvus Orca
Design Life :	10 years
Cooling Method :	Air

NMA test # 1 compliant -True cell-level thermal runaway isolation

Dedicated cooling AC unit inside the battery room to be installed.

Automation System

A modern automation system to be integrated and installed. To include IAS and PMS. Automations system to deliver the necessary functions to run the ship efficiently with focus on user friendliness, reduced fuel consumption and effectiveness.

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