Food and Agriculture Organization of the United Nations

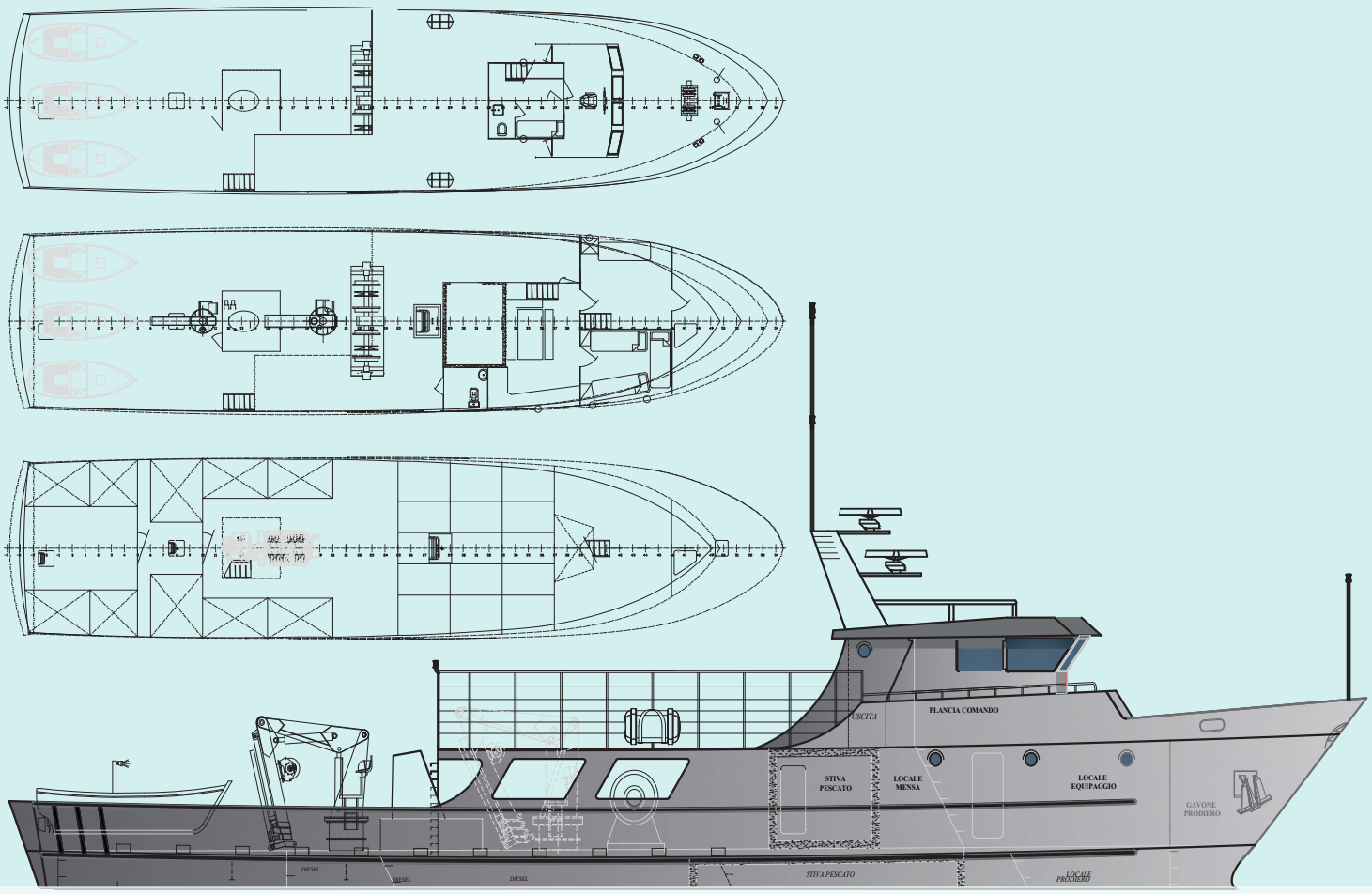
FAO FISHERIES AND AQUACULTURE TECHNICAL PAPER

267

ISSN 2070-7010

Classification and definition of fishing vessel types

Second edition



Cover illustration: 31m American type purse seiner – General arrangement.

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Rome, 2023

Required citation:
Thermes, S., Van Anrooy, R., Gudmundsson, A. & Davy, D. 2023. *Classification and definition of fishing vessel types.* Second edition. FAO Fisheries and Aquaculture Technical Paper, No. 267. Rome, FAO. https://doi.org/10.4060/cc7468en

ISSN 2070-7010 [Print]
ISSN 2664-5408 [Online]

ISBN 978-92-5-138104-5

Preparation of this document

This document is an updated version of FAO Fisheries Technical Paper 267, *Definition and classification of fishery vessel types*, published in 1985.

There are two reasons for producing this second edition. The first is the design, size and other characteristics of the main types of semi-industrial and industrial fishing vessels, which have changed significantly in the intervening decades since the original publication. The second reason was the revision of the International Standard Statistical Classification of Fishery Vessels by Vessel Types (ISSCFV), which was reviewed and endorsed at the Twenty-sixth Session of the Coordinating Working Party on Fishery Statistics (CWP), held in Rome, Italy, from 15 to 18 May 2019.

The document provides illustrations of most vessel types, as well as drawings of the general arrangements of many vessels, but also includes several important updates with respect to the 1985 edition. Most notably, the vessel type classification codes employed have been updated, as has the approximate relationship between vessel length overall (LOA) and gross tonnage (GT), based on global data from IHS Markit. The present edition also includes an extensive glossary of commonly used terminology in the description of fishing vessels and their operations.

The text was written in 2020–2021 by Stefano Thermes, Naval Architect, supported by Daniel Davy, Naval Architect, Ari Gudmundsson, Naval Architect, and Raymon van Anrooy of the FAO Fisheries and Aquaculture Division. The general arrangement drawings and related vessel pictures included were provided by various shipyards and naval architects. The 3D vessel illustrations were procured by Navalia – marine design software specialists. The draft document was reviewed by naval architects and FAO fisheries statistics officers.

The publication was edited by Edward Fortes, with formatting and design assistance was provided by Chorouk Benkabbour and Marianne Guyonnet of the FAO Fisheries and Aquaculture Division.

Abstract

This technical paper provides descriptions and classification of the main semi-industrial and industrial fishing vessel types: trawlers, purse seiners, seiners, dredgers, gillnetters, trap setters, longliners, pole-and-line vessels, trollers, and multipurpose vessels. It also covers vessels supporting fishing-related activities such as fish carriers, motherships, fisheries research vessels and vessels involved in aquaculture operations. It includes illustrations of most of the vessel types and drawings of the general arrangements of selected vessels. The design, size and other characteristics of the main types of semi-industrial and industrial fishing vessels have changed significantly in recent decades, so the second edition includes several important updates with respect to the 1985 version. The vessel type classification codes employed have been updated, as has the approximate relationship between fishing vessels' length overall (LOA) and their gross tonnage (GT).

The classification of the fishing vessel types follows the International Standard Statistical Classification of Fishery Vessels by Vessel Types (ISSCFV) that was endorsed by the Coordinating Working Party on Fishery Statistics (CWP) in 2019. The descriptions and classification are valid worldwide.

The main purpose of this technical paper is to assist FAO Members, regional fishery bodies, as well as those working on fishery statistics and management, with updated information on vessel types and characteristics. It provides users, including non-specialists, with sufficient information to identify and classify all types of semi-industrial and industrial fishery vessels for reporting purposes.

The paper also contributes to FAO's work in support of the implementation of the 1999 International Plan of Action for the Management of Fishing Capacity (IPOA-Capacity), with regard to the prevention, deterrence and elimination of illegal, unreported and unregulated (IUU) fishing. It does so by providing monitoring, control and surveillance personnel with information to identify the type of fishery vessels in terms of their licensing and authorization to carry out fishing and fishing-related operations. The paper also complements the International Standard Statistical Classification of Fishing Gear (ISSCFG) and the FAO publication *Classification and illustrated definition of fishing gears*.

Contents

Figures

Acknowledgements

The authors would like to acknowledge the support received from the following ship design offices, shipyards and industry specialists, which contributed to this paper with technical documentation, vessel illustrations and information on vessel particulars:

Damen Maaskant Shipyards Stellendam
Stellendam, Kingdom of the Netherlands
www.damen.com

European Commission
Directorate-General for Maritime Affairs and Fisheries
Brussels, Belgium
https://ec.europa.eu/info/departments/maritime-affairs-and-fisheries_en

IHS Markit
London, United Kingdom of Great Britain and Northern Ireland
https://ihsmarkit.com/industry/maritime.html

Kooiman Marine Group
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Reykjavik, Iceland
www.skipasyn.is

Skipsteknisk A/S
Aalesund, Norway
www.skipsteknisk.no

Studio Navale Samarelli
Molfetta, Italy
www.samarellistudionavale.com

The authors would also like to express their gratitude to: Derrick Menezes, Naval Architect (FAO consultant), Liming Song (Shanghai Ocean University), Rajdeep Mukherjee (Bay of Bengal Programme Inter-Governmental Organization), Isara Chanrachkij (Southeast Asian Fisheries Development Center), Stefania Vannuccini, Jennifer Gee, José Acuna, Marc Taconet, Jon Lansley and Aureliano Gentile from the FAO Fisheries and Aquaculture Division (NFI). We are grateful to these individuals for their advice on the International Standard Statistical Classification of Fishery Vessels (ISSCFV), the sharing of data and information from the Global Record of Fishing Vessels, Refrigerated Transport Vessels and Supply Vessels (Global Record) and the FAO fishing fleet statistical database, as well as for reviewing this publication.

Acronyms and abbreviations

CWP	Coordinating Working Party on Fishery Statistics (FAO)
EEZ	exclusive economic zone
FAD	fish aggregating device
FAO	Food and Agriculture Organization of the United Nations
GHG	greenhouse gas
GPS	global positioning system
Global Record	Global Record Fishing Vessels, Refrigerated Transport Vessels and Supply Vessels (FAO)
ILO	International Labour Organization
IMO	International Maritime Organization
IPOA	international plan of action
ISSCFG	International Standard Statistical Classification of Fishing Gear
ISSCFV	International Standard Statistical Classification of Fishery Vessels
IUU	illegal, unreported and unregulated fishing
LOA	length overall
NEI	not elsewhere included
PSMA	Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing
RFMO	regional fisheries management organization
RSW	refrigerated sea water

1. Introduction

The global fishing industry is dynamic: fishing fleets have to adjust to economic, financial, technological, social, and environmental developments. The financial and economic performance of fishing fleet operations is thus affected by many factors: the status of fisheries resources, fisheries policies, legislation and management regimes, seafood market prices and consumer preferences, macroeconomic and fiscal policies, fisheries agreements, technological innovations and socioeconomic conditions.

The fishing vessels which make up the semi-industrial and industrial fishing fleets have changed significantly in recent decades. Vessel and gear technologies, as well as innovations in fishing vessel design, propulsion systems, onboard equipment and fishing methods, have impacted the characteristics of fishing vessels and their operations. Similarly, the vessels that have entered the semi-industrial and industrial fishing fleets worldwide are generally larger in length overall (LOA), gross tonnage (GT) and engine power (in kilowatts) than in the past (Van Anrooy *et al.*, 2021). The average fishing vessel size, the number of fishing vessels and the overall fishing fleet capacity to catch fisheries resources are all greater today than at the start of the twenty-first century.

The increase in vessel size and fishing capacity has been largely driven by profitability goals and technological innovation, as well as national legislation and international conventions on the safety of fishing vessels, and the safety and working conditions of fishing vessel personnel.

Any assessment of fishing fleet capacity requires, as a bare minimum, estimates of fishery vessel numbers and main vessel characteristics. If the fleet consists of only one type of vessel, the number of fishing vessels may be used to express the total fishing power (or "capacity") of the fishing fleet. If the fleet consists of vessels of different types, any survey to determine the capacity of a given fishing vessel would need to collect information on a number of vessel characteristics including vessel type, gross tonnage, length, and engine power. The exact fishing capacity indicator used will depend on the characteristics of the fishery or fleet, and the availability of reliable data. For example, it is generally accepted that the single most important factor for trawlers is engine power. For gillnetters, on the other hand, engine power would be of limited importance. Applying a universal capacity measure across a range of fisheries may therefore prove inadequate when addressing the issue of global fishing capacity measurement (FAO, 2023c).

This technical paper provides descriptions and classification of the main semi-industrial and industrial fishing vessel types: trawlers, purse seiners, seiners, dredgers, gillnetters, trap setters, longliners, pole-and-line vessels, trollers, and multipurpose vessels. It also includes vessels supporting fishing-related activities such as fish carriers, motherships, fisheries research vessels and vessels involved in aquaculture operations. Illustrations of most of the vessel types and drawings of the general arrangements of selected vessels are also provided.

The main purpose of this paper is to assist FAO Members, regional fishery bodies, as well as those working on fishery statistics and management with updated information on vessel types and characteristics. It provides users, including non-specialists, with sufficient information to identify and classify all types of semi-industrial and industrial fishery vessels clearly for reporting purposes .

The paper constitutes an update on the FAO publication *Definition and classification of fishery vessel types* (FAO, 1985) and incorporates the revised (2019)

fishery vessel type codes from the International Standard Statistical Classification of Fishery Vessels by Vessel Types (ISSCFV), as endorsed by the Twenty-sixth Session of the Coordinating Working Party on Fishery Statistics (FAO, 2019). The focus of this paper is on decked fishing vessels of 18 metres in length and over (ISSCFV Length Classes code 120 and higher).

The paper also contributes to the implementation of the 1999 International Plan of Action for the Management of Fishing Capacity (IPOA-Capacity) (FAO, 1999), and to the prevention, deterrence and elimination of illegal, unreported and unregulated (IUU) fishing. It does so by providing monitoring, control and surveillance personnel with information to identify the type of fishery vessels in terms of their licensing and authorization to carry out fishing and fishing-related operations.

FAO collects fishing fleet information from its Members on an annual basis, using statistics reporting forms agreed by the Coordinating Working Party on Fishery Statistics (FAO, 2021). The data collected include the number of decked vessels and their total gross tonnage (GT), total engine power (kW) by length overall (LOA) class and by fishing vessel type, as well as the number of undecked, powered and unpowered vessels, by LOA class and fishing vessel type. The received data are published in the FAO Yearbook on Fishery and Aquaculture Statistics (FAO, 2021a). The proper identification of fishing vessel types is therefore essential for statistical reporting on fishery fleets.

The descriptions of the types of fishery vessel provided in this technical paper, as well as those of vessels that support fishing-related activities, cover most of these vessels used worldwide. Users should note that vessel type descriptions are simplified and indicative: while individual vessels may perform similar fishing operations and/or use similar fishing gears, they may have significantly different general arrangements and characteristics, including differences in GT, LOA, and kW.

The 2019 ISSCFV is included in Appendix 1, and the International Standard Statistical Classification of Fishery Vessels by Length Classes (ISSCFV – Length Classes) can be found in Appendix 1A. Appendix 2 contains illustrations of the definition of length (L) of a vessel. An approximate relationship between the length overall (LOA) of fishery vessels and their gross tonnage (GT) is provided in Appendix 3.

The main energy source of almost all semi-industrial and industrial fishing vessels is fossil fuel. Appendix 4 provides information on some options that could contribute to reducing the fisheries industry's greenhouse gas (GHG) emissions.

This technical paper refers to a variety of fishing gears and should therefore be read in conjunction with the FAO publication, *Classification and illustrated definition of fishing gears* (He *et al.*, 2021), as well as the International Standard Statistical Classification of Fishing Gears (ISSCFG, 2016), included here in Appendix 1B.

2. Description of the categories of fishery vessels

This chapter contains description of the major categories and subcategories of fishery vessels, together with the codes and standard abbreviations as per ISSCFV Rev. 1, 2019 (FAO, 2021c), contained in Appendix 1.

2.1 TRAWLERS (TO)

ISSCFV Code 1

Overview

Depending on the area of operation and trawl used, trawlers range in size from open boats powered by outboard engines to large freezer and factory trawlers, which can fish in the most distant waters. Trawling is carried out from very shallow waters up to a depth of 2 000 m. These deepwater fishing vessels have machinery of sufficient power to tow the gear at the appropriate trawling speed. This will vary according to the species sought, from 1.5 knots (2.8 km/h) for shrimp trawls to 6 knots (11.1 km/h) or more for pelagic trawls.

Deck arrangement

From the point of view of deck arrangement, a distinction can be made between three main types of trawlers: side trawlers, stern trawlers and outrigger trawlers.

Equipment

Deck equipment – There are various arrangements of the deck equipment possible, depending on the type of trawler. All trawlers have trawl winches for the handling and storage of towing warps. Gilson winches, net drums and other auxiliary winches are commonly installed to handle the gear and the catch. Pelagic trawlers may be equipped with fish pumps for emptying the codend.

Fish detection equipment – Typical fish detection equipment of trawlers includes a sonar, net sounder, various types of echo sounders and trawl control and monitoring equipment.

Fishing gear – Mainly bottom trawls (TB), beam trawls (TBB), midwater trawls (TM), semipelagic trawls (TSP), and trawls NEI (TX).

Catch handling and processing equipment – Trawlers generally keep fresh fish in ice or refrigerated seawater (RSW) and/or frozen fish in blocks or boxes. Onboard cold chains with processing lines for slaughtering, sorting, and chilling fresh fish, as well as glazing and freezing systems (including plate and blast freezers and individually quick frozen systems) are also commonly installed on industrial trawlers.

FIGURE 1
Pelagic Stern Trawler

2.1.1 Beam trawlers (BT)

ISSCFV Code 1.3

Overview

A beam trawler's basic equipment is its outriggers, on which the gear is towed. Beam trawlers are the most widely used type of fishing vessel for flat fish and shrimp trawling in shallow waters. A single trawl or a twin trawl can be towed on each side. Beam trawlers are normally medium-sized, high-powered vessels and tow the gear at speeds between 2.5 and 8 knots (4.6 to 14.8 km/h), depending on the species targeted. Beam trawlers are named after the outriggers, which are steel beams to which the nets are attached and which holds the nets open. The bottom trawls used are cone-shaped nets, which are towed on the seabed and designed to catch fish living on or near the seabed. Safety release systems are sometimes incorporated in the boom stays or winch brakes to prevent the vessel from capsizing should the gear become snagged. For safety (stability) reasons, the engine power of beam trawlers may be limited in some countries.

Otter trawlers (OT) generally also use outriggers, though not necessarily steel beams. They are named after the otter boards used in single-boat bottom trawls, which help keep the net in contact with the seabed and are mainly used in Asia. Pair trawlers (PT) generally tow the bottom trawl net between two boats.

Deck arrangement

Beam trawlers that use outriggers may have their superstructure positioned forward with the working deck aft, as is the frequently the case when shrimp are targeted. The towing winch will then be located just aft of the superstructure (Figure 2). Beam trawlers that employ trawls rigged with large beams may have the wheelhouse and living quarters at the aft part of the vessel, with the working deck amidships. This arrangement allows for easier stowing and handling of large beams. In this case the outriggers will be located in association with a mast or A-frame set amidships or forward, and the towing winch will be located in front of the superstructure. The principal characteristic of beam trawlers is the presence of beams which are usually fastened to the mast or at the foot of the mast and extend out over the sides of the vessel during fishing operations.

Equipment

Deck equipment – Warp winches with capstans are installed on the deck of the vessels. Catch handling is supported by sorting devices and washing machines.

Fish detection equipment – Fish detection equipment, such as multibeam fish finders are used extensively on board beam trawlers. Fish finders have become common components of integrated systems with marine radar, compass, ECDIS and GPS navigation systems.

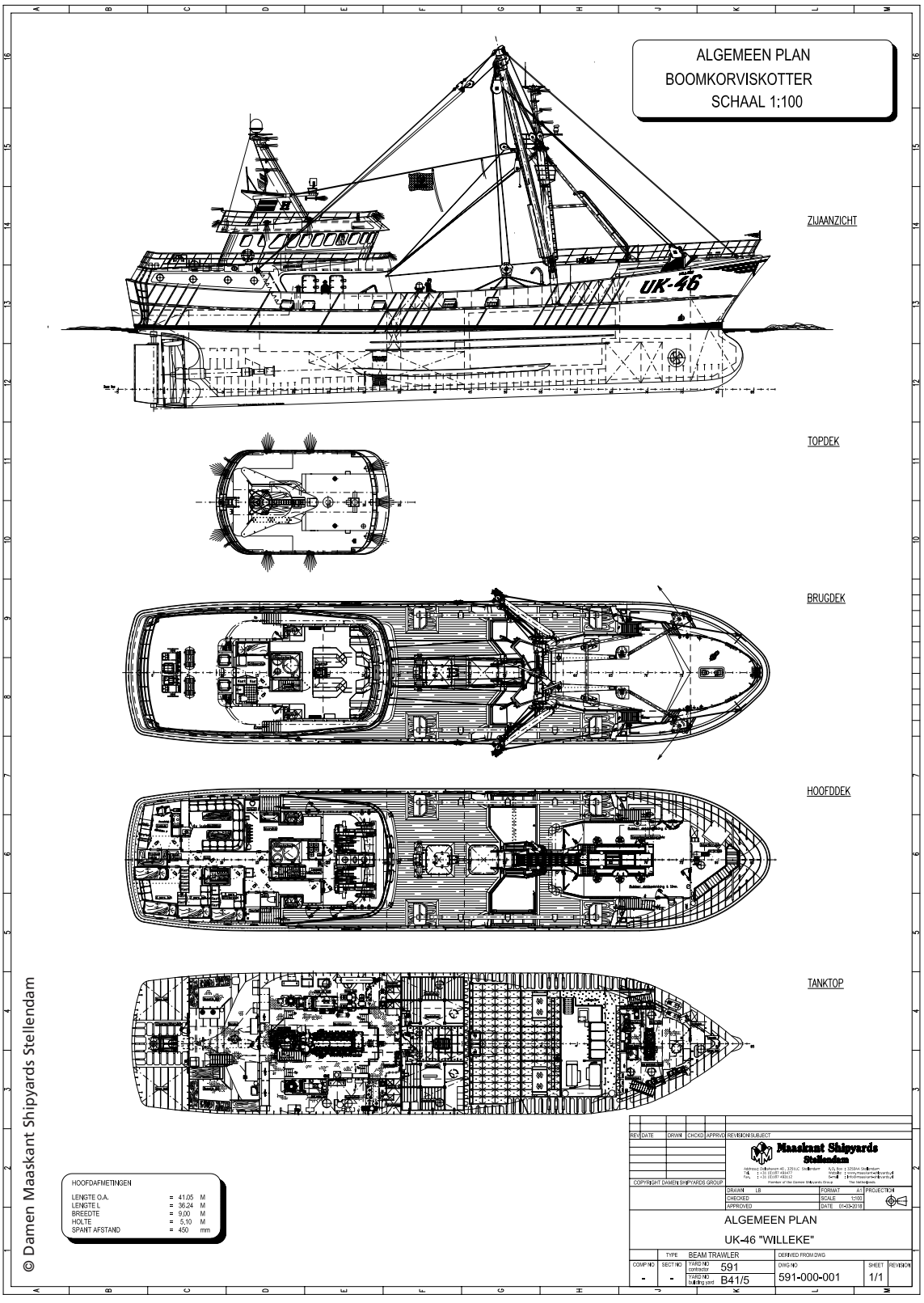
Fishing gear – Twin bottom otter trawls (OTT), beam trawls (TBB); single-boat bottom otter trawls (OTB), trawls NEI (TX).

Catch handling and processing equipment – All.

FIGURE 2
Gulf shrimp beam trawler (outrigger)

FIGURE 3
41m Beam trawler

FIGURE 4
41m Beam trawler – General arrangement



2.1.2 Side trawlers (TS)

ISSCFV Code 1.4

Overview

These vessels set the trawl over the side and the trawl warps pass through blocks hanging from two gallows, one located forward and one aft. The side trawler was the most common vessel in the North Atlantic deep-sea fishing industry until the late 1960s. This type of vessel is still used in some areas, although it is gradually being replaced by the stern trawler.

Deck arrangement

Generally, the superstructure and the wheelhouse are placed aft, the fish hold is situated amidships and a trawl winch transversally at the front of the superstructure. The hull's topsides are strengthened against chafing caused by the otter boards.

Equipment

Deck equipment – Typical equipment on side trawlers consists of two gallows for the towing blocks. There may be a derrick at the foremast and a boom rigged on the mast to assist in hoisting the codend over the side for shooting. Between the hatches and the deckhouse there is a winch from which the warps run forward and aft to the gallows. Sometimes the vessels are equipped with gallows on both sides. Some side trawlers are now equipped with net drums.

Fish detection equipment – Fish finders are used extensively on board side trawlers according to the size of the boat; typical equipment may consists of a sonar and an echo sounder.

Fishing gear – Bottom trawls (TB), midwater trawls NEI (TM), trawls NEI (TX).

Catch handling and processing equipment – Side trawlers either have equipment to handle fresh fish (wet-fish side trawler) or block frozen fish (freezer side trawler).

FIGURE 5
European side trawler

2.1.3 Stern trawlers (TT)

ISSCFV Code 1.5

Overview

Stern trawlers are the most common trawler type and may be built for operation in severe weather in deep-sea locations. The trawl is set and hauled over the stern, and some vessels are fitted with a stern ramp, depending on the vessel size. Trawlers can work as single vessel in bottom or midwater trawling, or as pair trawlers where two vessels tow one large trawl or a double trawl.

Operations are carried out over the stern; nets are led from the trawl winch to the aft deck area and set over the stern. The towing blocks may be attached to stern gallows or, on larger vessels, on a fixed A-frame structure aft. The trawl winches are placed transversely, behind the wheelhouse or near the stern, sometimes on different decks, according to the space needed by the trawl gear.

Prior to the revision of the ISSCFV in 2019, i.e. in the 1984 version, the stern trawlers were divided into four subcategories: stern trawlers (TT); wet-fish stern trawlers (TTW); freezer stern trawlers (TTF); and factory stern trawlers (TTP). In the 2019 version of the ISSCFV, the last three types have been replaced by one subcategory: 1.9 Trawlers NEI (TOX).

Deck arrangement

The superstructure is generally situated forward with the working deck aft. On medium-sized vessels the fish hold is situated amidships, while on larger vessels it is situated forward. In most cases the handling of catch and processing of fish takes place below deck or in deck houses.

Equipment

Deck equipment – Arrangements of deck equipment may vary depending on the type of trawler. All trawlers will carry trawl winches for the handling and storage of towing warps. Gilson winches, net drums and other auxiliary winches are commonly installed to handle the gear and the catch. Pelagic trawlers may be equipped with fish pumps for emptying the codend. Most deck equipment uses hydraulic or electric drives. On larger vessels a stern ramp is fitted to facilitate hauling the net onto deck.

Fish detection equipment – Stern trawlers may be fitted with a combination of fish detection equipment such as a multibeam fish finder, sonar, net sounder, various echo sounders. Gear control and monitoring equipment is commonly used, such as:

- catch sensors that give information about the filling rate of the codend;
- symmetry sensors that provide information about the trawl's optimal geometry;
- tension sensors that give information about the tension in warps or sweeps;
- "trawl eyes", that give additional information about fish concentrations over, under and in the trawl opening, and about the clearance from the bottom and opening of the trawl.

Fishing gear – Bottom trawls (TB), single-boat bottom otter trawls (OTB), midwater trawls NEI (TM), semipelagic trawls (TSP), single-boat midwater otter trawls (OTM), trawls NEI (TX).

Catch handling and processing equipment – On wet-fish stern trawlers, the fish is fresh and stored with ice in the fish hold, in boxes covered with ice or ice slurry, or in refrigerated sea water (RSW). For this reason, the time at sea of such vessels is limited and they generally operate in areas not too far from the landing port. On freezer stern trawlers, the catch is kept frozen in blocks, boxes or in refrigerated sea water, and on factory stern trawlers it is processed at sea.

FIGURE 6

50m Wet-fish stern trawler – General arrangement

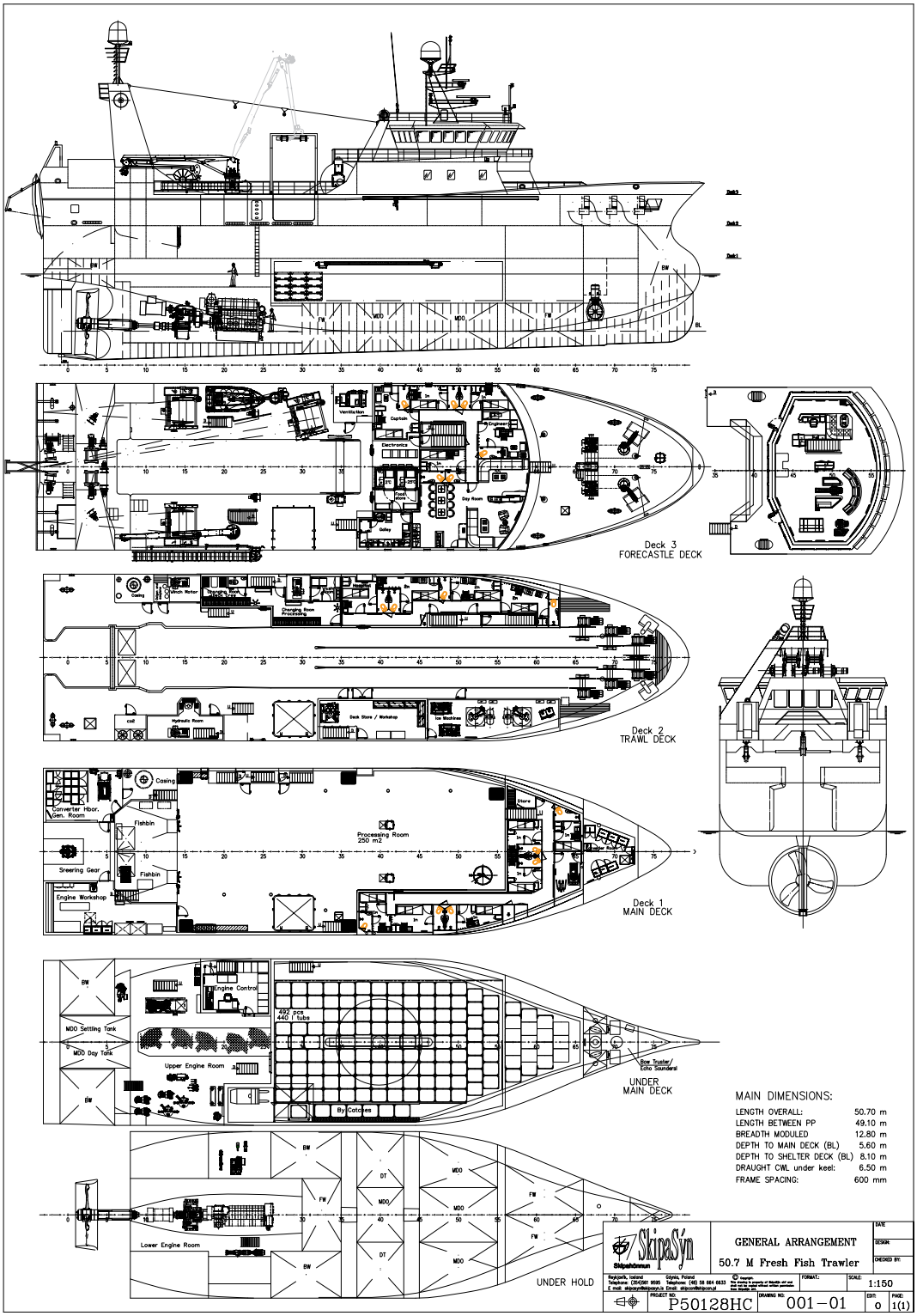


FIGURE 7
50m Wet-fish stern trawler

FIGURE 8
42m Freezer stern trawler

2.1.4 Trawlers NEI (TOX) – (Freezer trawlers)

ISSCFV Code 1.9

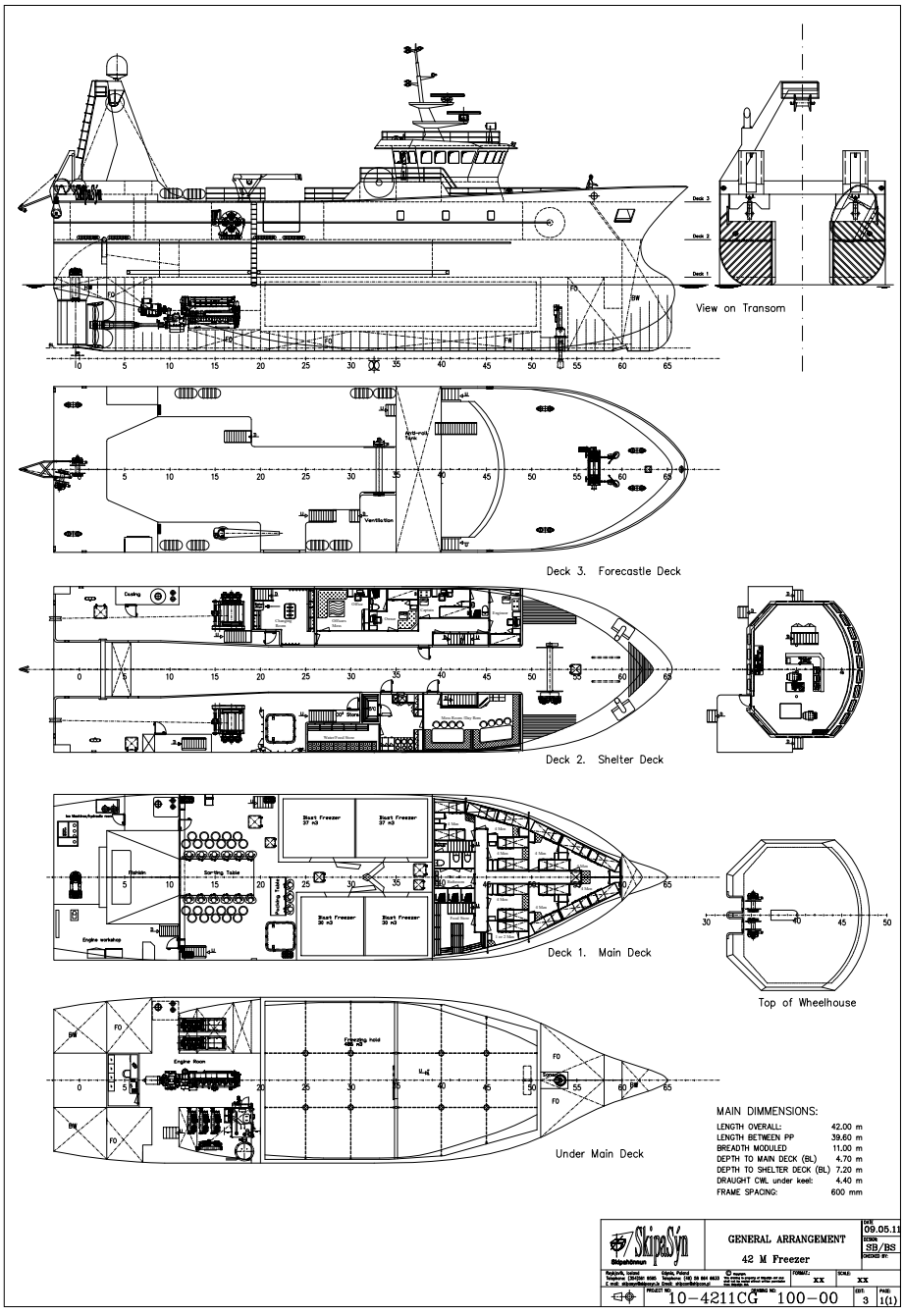
Overview

Freezer trawlers preserve the catch on board by freezing. The frozen product is stored in insulated holds. Most freezer trawlers are industrial fishing vessels with a length overall larger than 24 m. Many of the freezer trawlers operate in the high seas.

Deck arrangement and equipment (see Section 2.1.3 Stern trawlers (TT)).

FIGURE 9

42m Freezer trawler – General arrangement



2.1.5 Trawlers NEI (TOX) – (Factory trawlers)

ISSCFV Code 1.9

Overview

A factory trawler is a large (stern) trawler equipped with a complete fish processing plant. The vessels have a high degree of onboard automation, with facilities for mechanical fish gutting and filleting, full refrigeration and freezing, and in some cases packaging or canning. Crew numbers can be large, with many working on processing the catch. Factory trawlers are large-scale industrial fishing vessels, commonly 60 m or more in length; they may be outfitted to operate as motherships.

Deck arrangement and equipment (see Section 2.1.3 Stern trawlers (TT)).

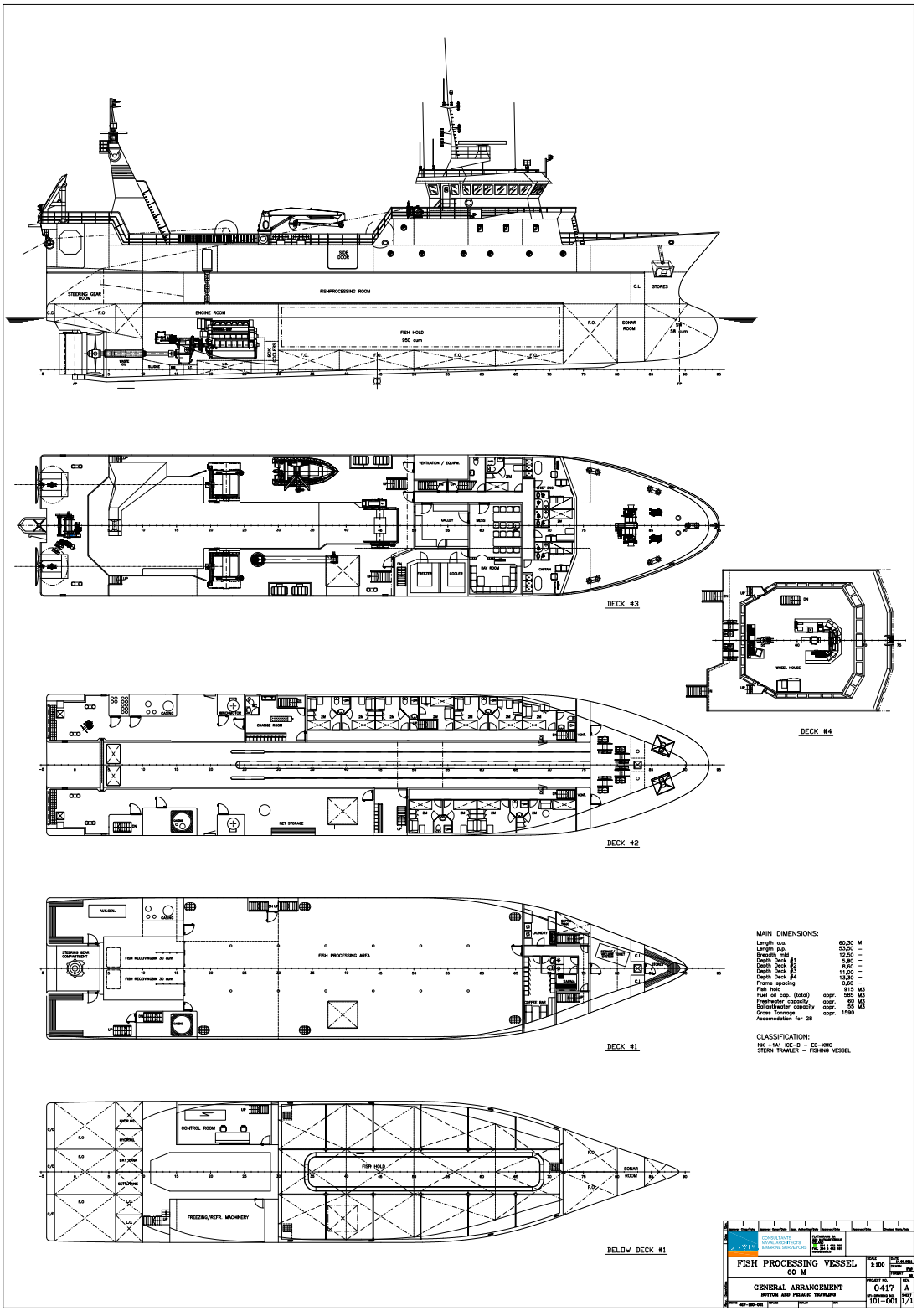
FIGURE 10
Factory trawler in operation

© Navalia/FAO

FIGURE 11
60m Factory trawler

© NAVIS

FIGURE 12
60m Factory trawler – General arrangement



2.2 PURSE SEINERS (SP)

ISSCFV Code 2

Overview

Purse seine vessels exist in all sizes, ranging from small-scale open boats operating in coastal waters to large-scale industrial fishing vessels that operate in the high seas. Purse seiners are the most important and effective vessels for catching aggregating species near the surface. The vessel surrounds the shoal with a deep curtain of netting. The bottom of the net is then pursed (closed) underneath the shoal by hauling a wire which runs from the vessel through rings on the bottom of the net and back to the vessel.

Searching for shoals and assessing the size and direction of their movement are the most important part of the purse seiner fishing operation. To assist in fish detection, crows' nests are sometimes arranged on masts, while large vessels are equipped with observation towers and helicopter landing decks. Operating, a purse seiner requires good manoeuvrability. Large vessels are therefore fitted with bow thrusters.

There are two main types of (one-boat) purse seiner, distinguished by their deck layout:

- The American type (SPA), with the bridge and accommodation forward and working deck aft.
- The European type (SPE), with the bridge and accommodation in the aft section of the vessel.

Equipment

Deck equipment – Typical equipment on purse seiners usually consists of a power block or triple roller (triplex) and storage equipment for hauling and stowing the net aboard. On industrial vessels the fish is pumped on board, while on smaller vessels the use of brailers is more common. The net drums, purse seine and other winches, as well as the fish pumps, are electric on most industrial purse seiners.

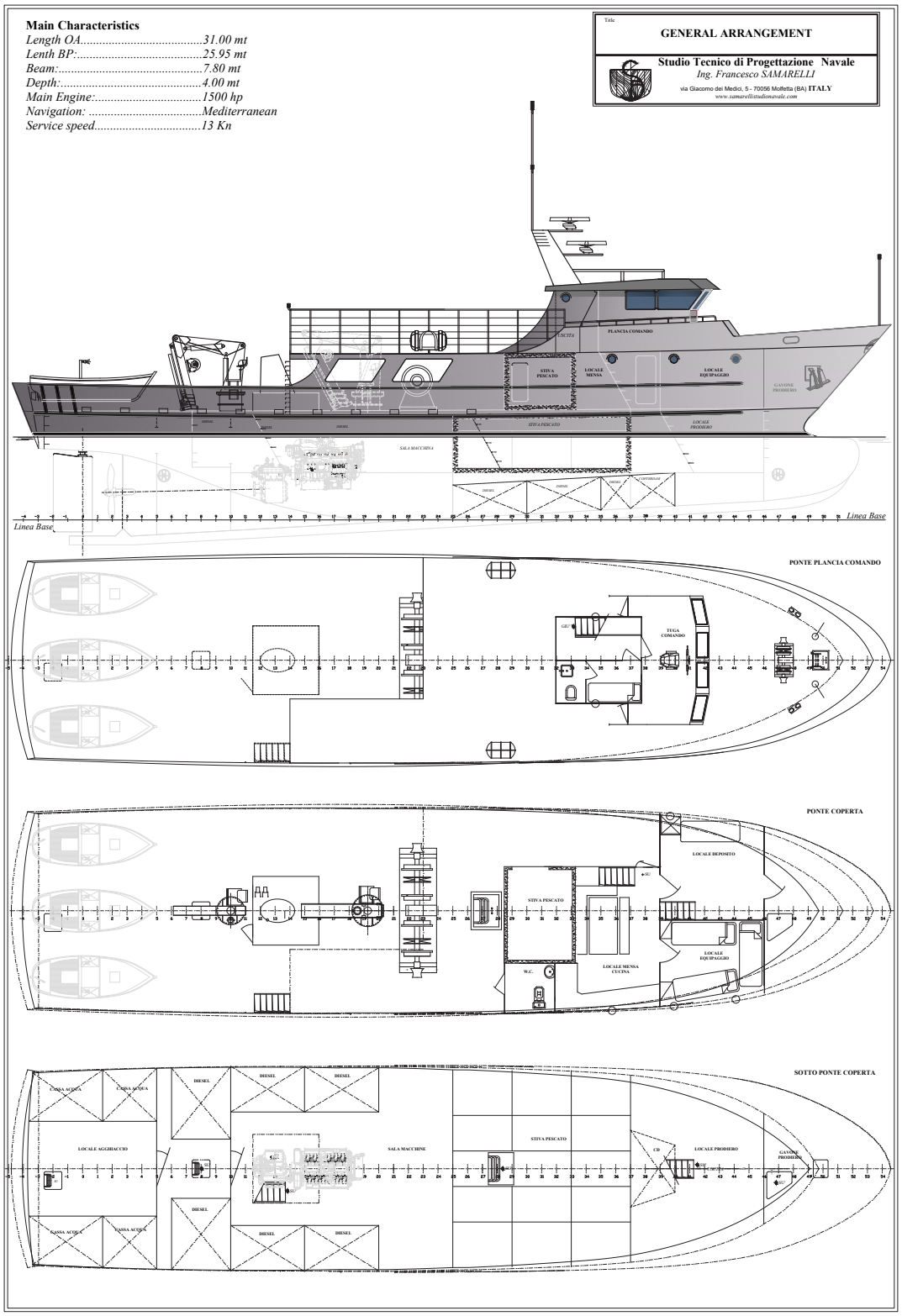
Fish detection equipment – Semi-industrial and industrial purse seiners are equipped with echo sounders and sonar, ECDIS and track plotters. Smart fish aggregating devices (FADs) are used to support the search for schools, assess the size and movement of the schools, and to keep in touch with a school while surrounding it with the seine. Smart FADs have an electronic transmitter for transferring information (via satellite) to the purse seine vessel. These FADs commonly have sonar, fish finder and GPS incorporated, and contain radar reflectors. Helicopters and spotter planes may also be employed to detect fish schools.

Fishing gear – Purse seines (PS), surrounding nets without purse lines (LA), and surrounding nets NEI (SUX). Many purse seiners use smart drifting fish aggregating devices (dFADs). Especially industrial tuna purse seine vessels use hundreds of smart dFADs per vessel, which are important for their catch efficiency.

FIGURE 13
31m American type purse seiner targeting tuna in the Mediterranean

FIGURE 14

31m American type purse seiner – General arrangement



2.2.1 Purse seiners – American type (SPA)

ISSCFV Code 2.1

Overview

American type purse seiners are common on both coasts of North America and Oceania. These type of purse seiners are also found in the Mediterranean (see Figure 12 and Figure 13). Vessels of this type are fast, operating at speeds of 12–17 knots (22–31 km/h). The purse seiners' fishing activity takes place at much lower speeds of 0–3 knots. Larger vessels are often equipped with bow thrusters to improve manoeuvring during fishing operations.

Deck arrangement

These vessels usually have the bridge and accommodation placed forward, with the working deck aft. On larger vessels there may be a mast in a central position, with a crow's nest or observation platform. This platform may work as a secondary bridge, fitted with duplicate controls. On some vessels the search for tuna schools is carried out by helicopter; the landing platform is generally positioned above the wheelhouse.

Equipment

Deck equipment – American type purse seiners are equipped with drum winches, power block and winches to haul booms and purse seine nets. A sloped stern is often featured, to facilitate net shooting and stowage. These vessels are usually equipped with one or more skiffs, located aft, on top of the nets, or amidships, on cradles. The power block is normally attached to a boom from a mast located directly behind the superstructure. A purse line winch is located near the hauling station, usually on a preferred side amidships, where the rings are taken on board. The net is stowed and carried at the stern of the vessel, from which position the setting will take place.

Fish detection equipment and fishing gear (see Section 2.2 Purse seiners (PS))

Fishing Gear – Purse seines (PS) and surrounding nets NEI (SUX).

Catch handling and processing equipment – Industrial purse seiners have significant hold volume, often > 1 000 m^3. Freezing and storage capability down to -50 °C is usually provided.

FIGURE 15
American type purse seiner in operation

2.2.2 European Purse seiners (SPE)

ISSCFV Code 2.2

Overview

European purse seiners are most common in Scandinavia, the North Sea, the Baltic and waters fished by European nations. They are also often found in Chile, in Latin America . They are effective vessels for catching aggregating species near the surface.

Deck arrangement

These vessels generally have the bridge and accommodation located in the aft part of the vessel, with the working deck and the fish hold amidships.

Equipment

Deck equipment – The gear is stowed at the stern of the vessel and the net is set from this position. The power block is installed near the bridge, with a system to move the net to the launching area. The pursing winch is generally located at the forward part of the working deck, close to the pursing davit. For hauling the net a triple roller (Triplex) is used. Seine transport systems aid the movement of seine to the bin and one or more cranes are fitted to move net and catch around the deck. Fish pumps are used for emptying the seine.

Fish detection equipment and fishing gear – (see Section 2.2 Purse seiners (PS))

Fishing gear (see Section 2.2 Purse seiners (PS))

Catch handling and processing equipment – RSW systems are common on board these vessels. Processing lines for bleeding (tunas), slaughtering, sorting and chilling of fresh fish, as well as freezing systems, are also commonly installed on industrial purse seiners.

FIGURE 16
European type purse seiner

2.3 SEINERS (OTHER) (SO)

ISSCFV Code 3

2.3.1 Seiners NEI (SOX)

ISSCFV Code 3.9

Overview

Seiners assume characteristics dependent on where they are operating. In northern Europe the basic types of seiners are the and the Scottish seiner. Both types commonly have the bridge aft and the working deck amidships, but the latest vessels commonly have the bridge forward and working deck aft. The target species of these seiners are demersal fishes such as cod, haddock, whiting and flatfishes.

In Asia the seiners are generally configured with the wheelhouse forward and the working deck aft. Semi-industrial (ring) seiners in some Asian countries are characterized by a midship wheelhouse, many crew and a 'lo—technology' approach.

This fishing method includes the use of cone-shaped nets with long wings and a codend, or a long piece of net without a codend, catching fish by encircling and herding. Danish seiners commonly use a buoy (preferably brightly coloured) which will be anchored; this type of seining is often called anchor seining as a result. The buoy will be the "marker" and will serve as the fixed point for the hauling of the seine. When the vessel returns to the buoy, the vessel attaches to the anchor line and hauls the seine net. In contrast, the Scottish seiner uses a technique called "fly dragging" or "fly shooting" in which the buoy (highflyer) is not anchored but free-floating. Upon retrieving the buoy, the vessel steams forward slowly at first but with increasing speed to haul the net.

The seine net is commonly operated with two long ropes at the nets end to aggregate and haul the fish. Since the ropes involved are of considerable length (> 1 000 m), their onboard stowage requires care. They may be coiled or put in bins or stored on large hydraulic or electrically driven drums on deck.

Deck arrangement

Many seiners in Europe generally resemble side trawlers, with the wheelhouse and accommodation aft and the working deck amidships. The Scottish seiners commonly have the coiler and winch mounted in the forward part, while the Danish seiners have the coiler and winch mounted amidships. These vessels may carry a power block and the seine net is normally stored and shot from aft behind the superstructure. The seiner vessels constructed in Europe and Asia in the last two decades generally resemble stern trawlers in their deck configuration, with the working area aft.

Equipment

Deck equipment – Older seiners have rope hauling and coiling equipment installed on deck. Newer seiners store the seine warps on reels rather than in coils. The winch itself is generally small, fast and powerful, and a power block is fitted aft.

Fish detection equipment – Seiners commonly are equipped with echo sounders and/or multibeam fish finders. Fish finders have become common components of integrated systems with marine radar, compass, ECDIS and GPS navigation systems.

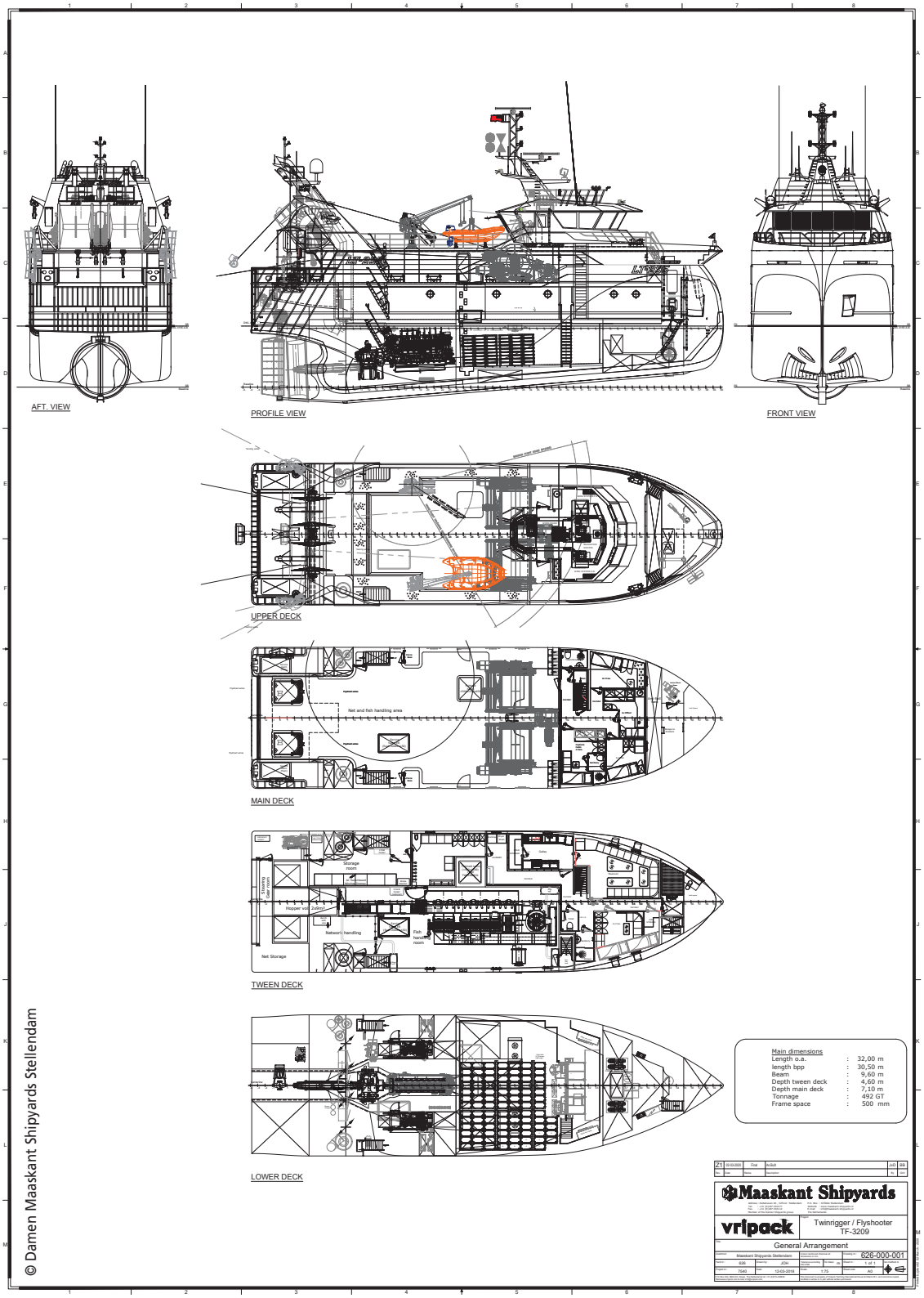
Fishing gear – Seine nets NEI (SX) and boat seines (SV).

Catch handling and processing equipment – Fresh fish is generally processed (i.e. sorted, weighed, graded, gutted, iced) and stored in ice at a temperature of 0 °C. Larger industrial vessels are often equipped with fileting and packaging lines and freezers.

FIGURE 17
43m Twin rigger seiner

FIGURE 18

43m Twin rigger seiner – General arrangement



2.4 DREDGERS (DO)

ISSCFV Code 4

Overview

These vessels use a dredge for collecting molluscs (such as scallops, mussels, oysters, and clams) from the bottom. The vessel drags the gear over the seabed, digging the shellfish from the ground. The dredges are towed in a manner similar to beam trawlers, but they may have up to four outriggers. Large dredgers may work three or more dredges on each side. On other types of dredgers, heavy mechanical dredging units are operated by special gallows from the bow of the vessel.

Equipment

Deck equipment – Dredgers do not have typical deck arrangements. The bridge and accommodation can be located aft or forward. Where the vessel is employing a hydraulic dredge then a powerful water pump is needed to flush the molluscs from the bottom. Derricks and winches may be installed to handle the dredge.

Fish detection equipment – Typical detection equipment on dredgers consists of a (multibeam) echo sounder to estimate water depth and various navigation devices.

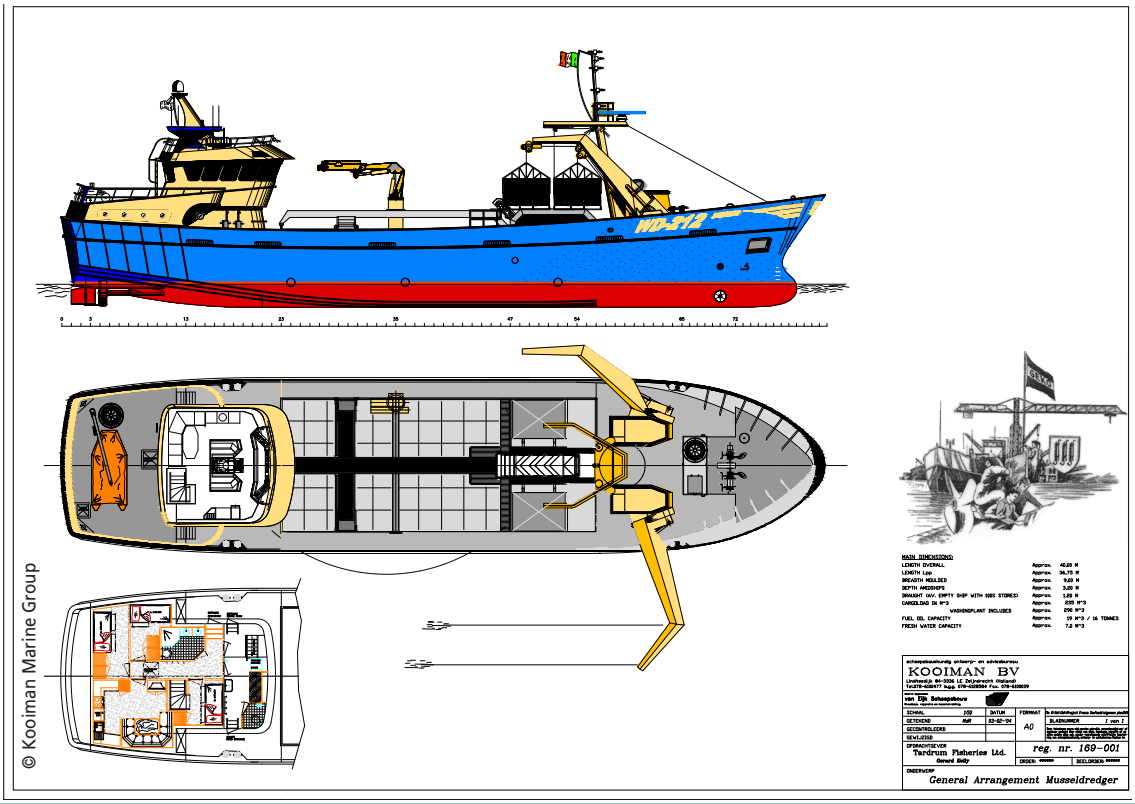
Fishing gear – Mechanized dredges (DRM), towed dredges (DRB), and dredges NEI (DRX).

Catch handling and processing equipment – Water pumps, mollusc-washing equipment, sorting belts, and conveyor belts to transport molluscs to the cargo hold.

FIGURE 19
Dredger in operation

FIGURE 20
40m North Sea dredger

FIGURE 21
40m North Sea dredger – General arrangement



2.5 LIFT NETTERS (NO)

ISSCFV Code 5

Overview

Lift netters are equipped for the operation of large lift nets, which are lowered and raised over the vessel side by means of long beams or outriggers and supported by masts. These vessels will range from open boats of approximately 10 m to larger, semi-industrial vessels with the capacity to operate further offshore. Their engine power requirements are modest, since they work on short fishing trips, usually overnight. The target species can be fish for human consumption, but most commonly lift netters target baitfish for use as live bait for pole-and-line fisheries and a few longline fisheries.

Deck arrangement

The vessels, if decked, will generally have the bridge amidships.

Equipment

Deck equipment – Larger vessels are equipped with mechanized (hydraulic) operated derricks and winches for handling lifting lines, outriggers and light booms. They are often fitted with powerful lights to attract and aggregate the fish on the surface at night. Open boats operating as lift netters may be unmechanized or use hand-operated winches.

Fish detection equipment – Multibeam fish finders are used extensively on board lift netters, in line with the size of the vessel. Other equipment used are sonar and echo sounders.

Fishing gear – Boat-operated lift nets (LNB) and lift nets NEI (LN).

Catch handling and processing equipment – Live bait holding tanks, cold storage, RSW systems and sorting/grading lines on larger vessels.

FIGURE 22
Lift netter operating

2.6. GILLNETTERS (GO)

ISSCFV Code 6

Overview

Gillnetters may be decked or undecked. The size of gillnetters varies from open boats operating in coastal waters up to semi-industrial and industrial vessels, specialized in driftnets and operating on the high seas. Gillnets and related entangling nets are long panels of netting that catch fish by gilling, edging, snagging entangling and entrapping them.

Gillnetters generally operate by setting panels of net hanging from a top line supported by floats. Gillnetters can set their nets on the bottom with anchors, drifting with the current, or encircling around a fish aggregation. The ISSCFV Rev.1, 2019 distinguishes between three gillnetter vessel types: drifters (GD), set netters (GS) and gillnetters NEI (GOX). The type of gillnet used, and the mesh sizes, vary greatly and depend on the target species and regulations in place.

Deck arrangement

Gillnetters in the semi-industrial and industrial fishing fleets reveal a wide variety of deck arrangements. Since many of the semi-industrial gillnetters are less than 20 m long, and as they sometimes use more than one type of gear, there are considerable limitations on the deck equipment and working deck layout which may be adopted. Decked gillnetters can have their wheelhouse either aft, amidships or forward. On medium-sized vessels using drifting gillnets and referred to as drifters, the bridge is usually located aft.

Equipment

Deck equipment – Most gillnetters are equipped with hydraulic or occasionally mechanical net haulers. The necessary transportation of the gear from the hauling position in the forepart of the vessel to the setting position in the aft part may be accomplished by haulers supported by plastic tubes. Net drums may also be used for gillnets.

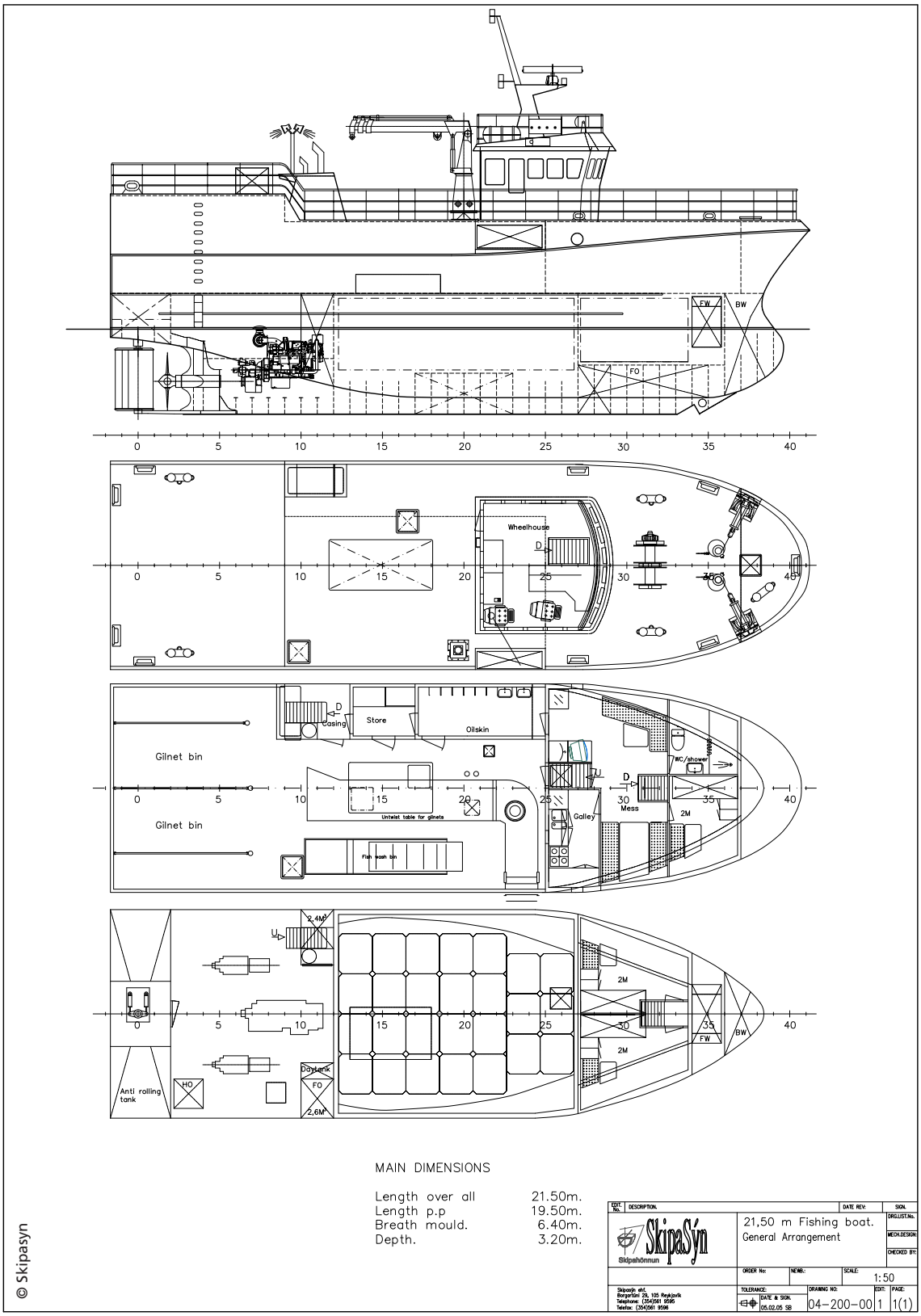
Fish detection equipment – The search for fish is more often linked to the fisher's personal knowledge of fishing grounds than the use of special detection equipment. However, gillnetters increasingly use GPS and other devices to support navigation and safety. These types of vessels may be equipped with a (multibeam) echo sounder.

Fishing gear – Set gillnets – anchored (GNS), drift gillnets (GND), encircling gillnets (GNC), gillnets and entangling nets NEI (GEN).

Catch handling and processing equipment – Semi-industrial gillnetters commonly carry ice and handle wet fish. Industrial gillnetters generally stay at sea for longer periods and are often equipped with sorting, grading, gutting, fileting, and packaging lines and freezers.

FIGURE 23
22m Gillnetter

FIGURE 24
22m Gillnetter – General arrangement



MAIN DIMENSIONS

Length over all	21.50m.
Length p.p	19.50m.
Breath mould.	6.40m.
Depth.	3.20m.

EDIT. No.	DESCRIPTION.	DATE REV:	SIGN.

Skipasýn
Skipahönnun

21,50 m Fishing boat.
General Arrangement

DRG.LIST.No.
MECH.DESIGN:
CHECKED BY:

ORDER No: | NEW/E.: | SCALE: 1:50

Skipasýn ehf.
Borgartún 29, 105 Reykjavík
Telephone: (354)561 9595
Telefax: (354)561 9596

TOLERANCE: | DATE & SIGN. 05.02.05 SB | DRAWING NO: 04–200–00 | EDIT: 1 | PAGE: 1(1)

FIGURE 25
37m Gillnetter

FIGURE 26
37m Gillnetter – General arrangement

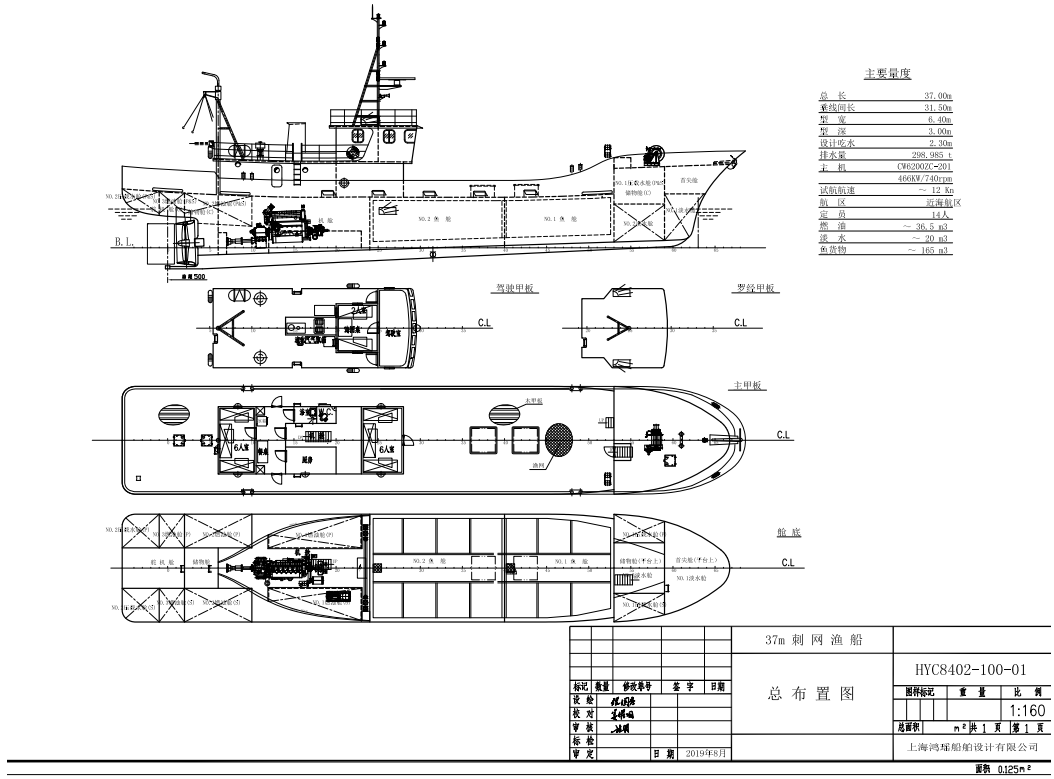


FIGURE 27
Typical pot set

2.7 TRAP SETTERS (WO)

ISSCFV Code 7

Overview

The term trap setters is used for fishing vessels setting traps and pots, but also for vessels operating with pound nets, fyke nets, stow nets and various kinds of barriers. Trap setters range from open boats operating inshore to larger decked vessels of 20–50 m in length, which can operate on the edges of a continental shelf. Trap setters operating with pots are classified as pot vessels (WP), while vessels using other types of traps are classified as trap setters NEI (WOX). Pots are small enclosures that attract fish, lobster, crabs and crayfish through one or more entrances that allow entry but prevent or retard their escape. Inshore pot vessels are often designed to operate at relatively high speed: the aim is to obtain a better price by delivering early to the marketplace.

Deck arrangement

On small, decked trap setters the wheelhouse is located either forward or aft and the fish hold amidships. On larger vessels the wheelhouse is usually located forward.

Equipment

Deck equipment – Larger trap setters are equipped with derricks, cranes or other lifting devices to haul pots on board. Smaller vessels are fitted with hydraulic or mechanical pot haulers.

Fish detection equipment – The search for fish is more often linked to the fishermen's personal knowledge of fishing grounds rather than the use of special detection equipment. Decked vessels are usually equipped with an echo sounder and GPS.

Fishing gear – Pots (FPO), traps NEI (FIX), fyke nets (FYK), stow nets (FSN), stationary uncovered pound nets (FPN), barrier, fences and weirs (FWR), aerial traps (FAR).

Catch handling and processing equipment – Trap setters commonly carry ice for wet products and some have live fish or live lobster holding tanks.

FIGURE 28
Inshore pot vessel

FIGURE 29
Offshore pot vessel

2.8 LONGLINERS (LL)

ISSCFV Code 8

Overview

A longliner is defined as a fishing vessel employing longlines. Longlines can be operated from vessels of any size adapted to the length of longline to be set. Several automatic or semi-automatic systems are used on larger boats to bait the hooks, and to shoot and haul the lines. Longliners are generally decked vessels. The number of hooks and lines handled depends on the size of vessel, the degree of mechanization and the size of the crew. Almost any vessel can function as a longliner to some degree; however, there are semi-industrial and industrial, purpose-built longliners, which engage in single-species fisheries, such as those for tuna. Longlining involves the use of a mainline, which can be several km in length and to which a large number of branch lines are connected at given intervals. The number of branch lines can add up to several thousands. Each branch line has a baited hook and is set to the desired position in the water column.

Within the longliners category, there are three subcategories: Bottom longliners (LB), midwater longliners (LM) and longliners NEI (LLX). Bottom longliners generally use set longlines (LLS), which are longlines that are anchored or otherwise fixed to the seabed, at either end of the mainline. Midwater longliners use drifting longlines (LLD) that drift passively, usually with the vessel (also drifting) attached to one end of the longline.

Deck arrangement

The bridge can be situated aft or forward, but on larger vessels it is generally located aft. In typical arrangements the lines are set over the stern, the gear is then hauled from the bow or from the side with a mechanical or hydraulic line hauler.

Equipment

Deck equipment – Small-scale longliners may haul by hand into baskets or tubs, or thanks to a hand-cranked line drum. Semi-industrial and industrial longliners use automatic or semi-automatic systems to bait the hooks and to shoot and haul the lines. Reel machines, line haulers and capstans are common equipment for tuna longlining. Bait thawing racks are sometimes used. Line-setting machinery is common on industrial vessels. Line storage on larger vessels normally incorporates a line drum, given that the lines may be as long as 80 km in large-scale, midwater longliner operations with drifting longlines. There are often tanks for the storage of bait or artificial bait until use, or water tanks for maintaining live bait; it depends on the type of operation, the bait to be used, and the baiting and shooting apparatus. In line with the 1999 International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries (IPOA-Seabirds) (FAO, 1999), regional fisheries management organization (RFMO) measures and national regulations, many longliners are now arranged so that the shooting of the line may be done from an underwater position to minimize bird strikes. Equipment to monitor water temperature may also be carried.

Fish detection equipment – Typical fish detection equipment on longliners includes (multibeam) echo sounders. On larger vessels, sonar is also present on board. Midwater longliners that operate drifting longlines often attach satellite buoys to the mainline to monitor the gear position via GPS, including at night.

Fishing gear – Set longlines (LLS), drifting longlines (LLD) and longlines NEI (LL).

Catch handling and processing equipment – Semi-industrial longliners are commonly equipped with systems for bleeding, chilling and grading catches for storage in a refrigerated fish hold. Industrial longliners – which make fishing trips of one month to several months and target tunas or deep-sea species – are often equipped with freezer systems that can freeze the catch rapidly to ultra-low temperatures (-50 °C to -60 °C) to maintain product quality.

FIGURE 30
20m Mediterranean Longliner operating in the Mediterranean sea

FIGURE 31
20m Mediterranean Longliner – General arrangement

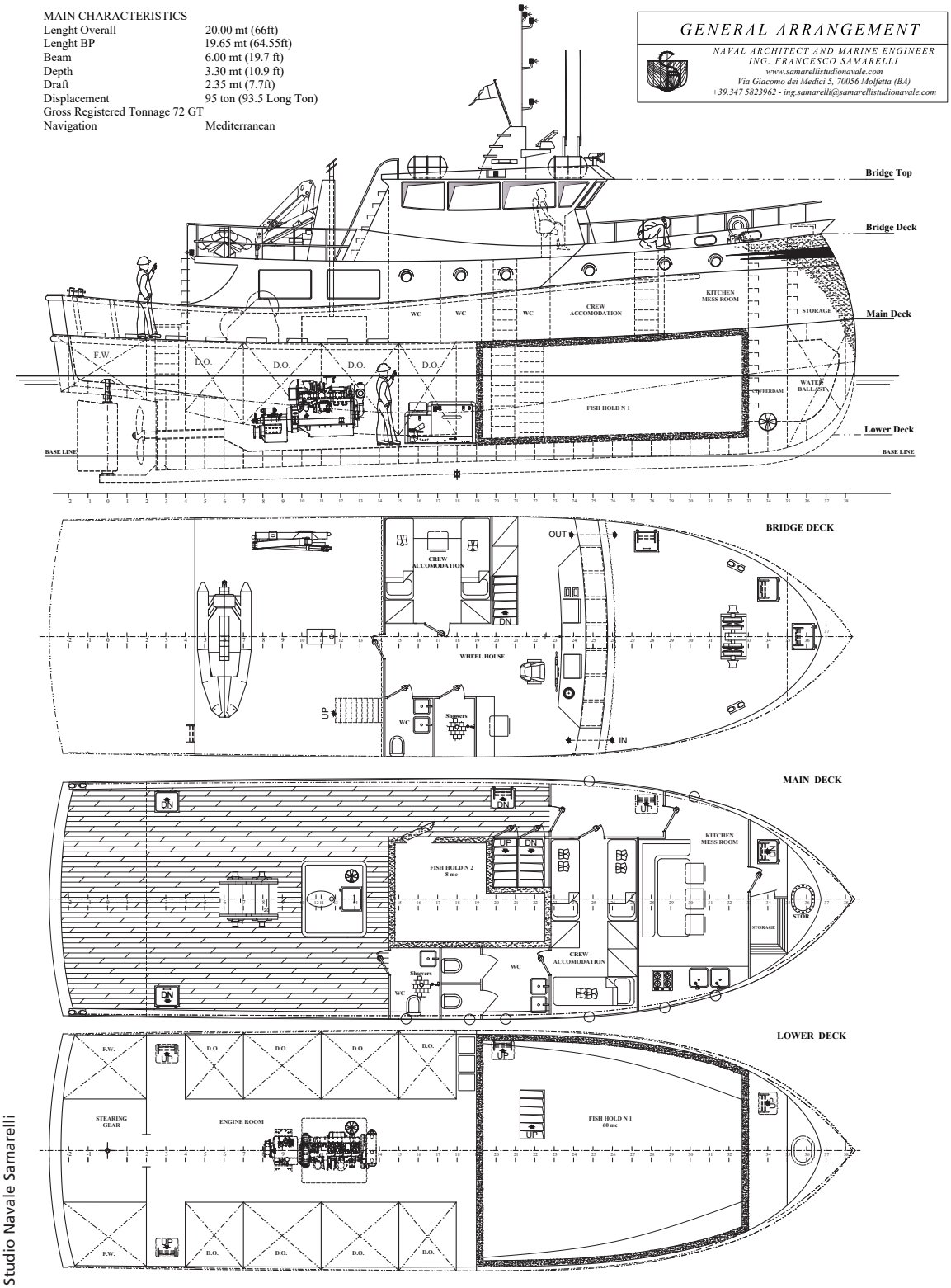
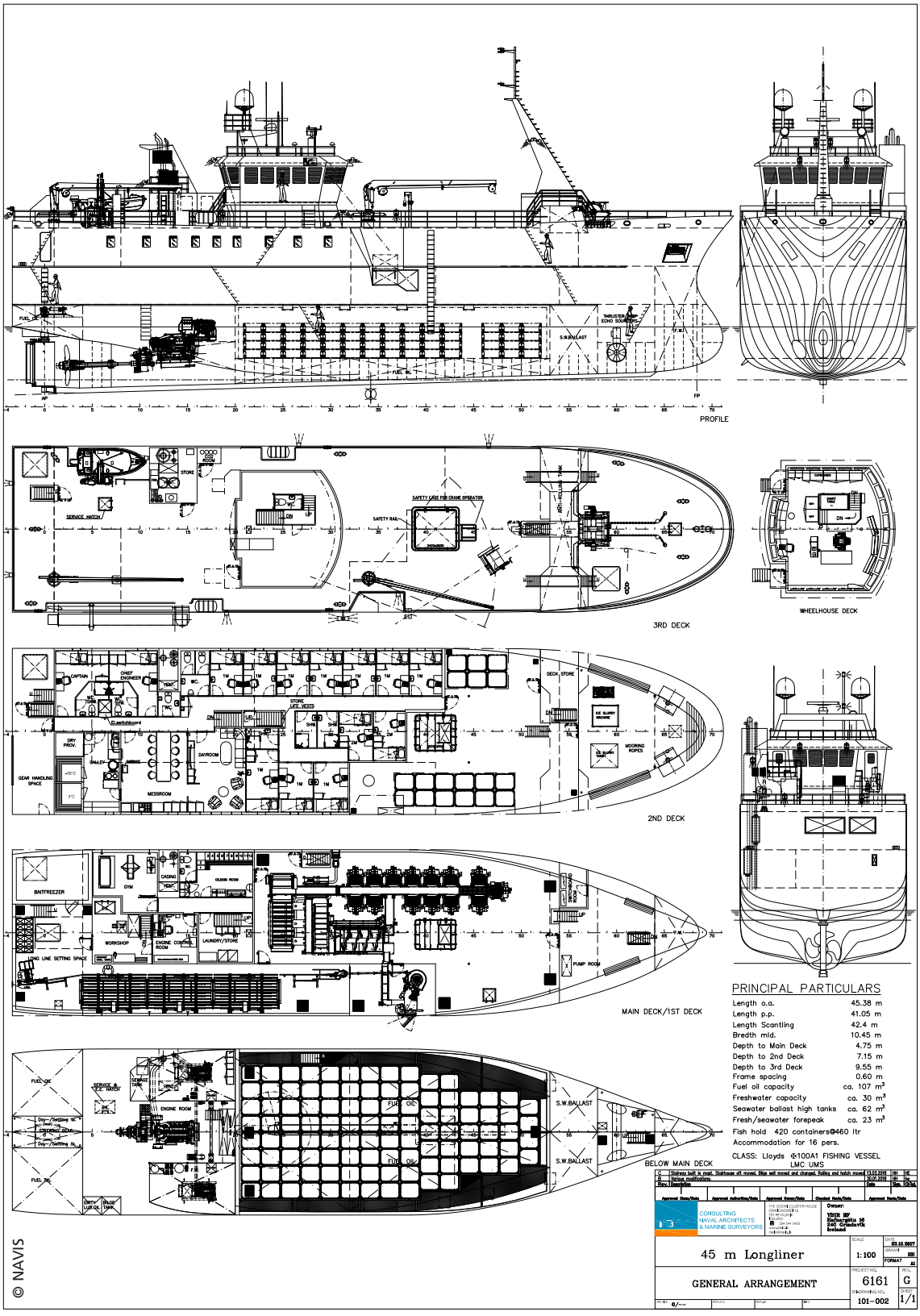


FIGURE 32
45m Longliner

FIGURE 33
45m Longliner – General arrangement



2.8.1 Midwater longliners (LM)

ISSCFV Code 8.2

Overview

Midwater longliners are generally industrial fishing vessels operating worldwide; they are purpose-built to target pelagic species such as tuna and billfishes, as well as other large pelagic species.

The basic characteristics of this type of longliner are:

- speed, to reach distant fishing grounds;
- endurance, to conduct continued fishing in distant oceans;
- facilities for efficient freezer storage to keep highly valued catch;
- equipment to shoot and haul up longlines efficiently; and
- storage for fishing gears and accessories.

Deck arrangement

The wheelhouse can be situated aft or forward, but on larger vessels the bridge is generally placed aft.

Equipment

Deck equipment – Generally, midwater longliner equipment consists of a roller, a de-hooker and cleaner, a line hauler, a hook separator, and a storage rack or drum. The line hauler is generally located on the starboard side forward. A baiting table and chute are located on the stern where the lines are set. To avoid the incidental catch of seabirds, a line-setting machine is used, and a funnel or chute guides the main line down to a depth of 2–3 m, thereby reducing the availability of baited hooks to seabirds.

Fish detection equipment – see Section 2.8 Longliners (LL).

Fishing gear – Drifting longlines (LLD) and longlines NEI (LL).

Catch handling and processing equipment – see Section 2.8 Longliners (LL).

FIGURE 34
Midwater (tuna) longliner in operation in Asia

2.9 LINE VESSELS (OTHER) (LO)

ISSCFV Code 9

Overview

Line vessels are fishing vessels that use lines and hooks, with or without bait or lure. Line vessels comprise vessels of any size: their classification depends on the method of line fishing, area of operation, species targeted, duration of fishing trips and preservation systems.

The category of line vessels includes subcategories for jigger vessels (LJ), pole-and-line vessels (LP), trollers (LT), handliner vessels (LH) and line vessels NEI (LOX).

Typical features of a line vessel are:

- containers to store the bait;
- baskets or bins to store lines with hooks; and
- a dedicated area for the preparation of lines for shooting and hauling.

This type of fishing is often highly selective, allowing for the targeting of specific species, and with low levels of bycatch.

FIGURE 35
Pole-and-line vessel (LP) (Tuna clipper)

© Navalia/FAO

2.9.1 Pole-and-line vessels (LP)

ISSCFV Code 9.2

Overview

Pole-and-line vessels are primarily used for catching tuna and skipjack species. The fishers stand at the railing or on special projecting platforms and fish with long poles to which lines and hooks are attached.

With reference to the larger types of pole-and-line vessels, three main deck arrangements can be distinguished:

- Japanese type pole-and-line vessels, on which fishers stand at the railing on the forward part of the vessel and the bridge is accommodated aft. The fish holds are placed amidships.
- American type pole-and-line vessels, on which the platforms for the fishers are arranged around the stern of the vessel with bait tanks on the deck aft and the bridge located forward.
- Maldivian type of pole-and-line vessel (the Masdhoni), on which fishers stand around the stern with the bridge located forward.

Equipment

Deck equipment – Deck equipment is minimal on a pole-and-line vessel. A capstan is always useful for landing the catch and an anchor windlass is also available on most pole-and-line vessels. Tanks with live bait and a water spray system for fish attraction are typical features, as well as the presence of a main central fish hold.

Fish detection equipment – Typical fish detection equipment consists usually of a fish finder or echo sounder and a sonar on larger vessels. Traditional methods, such as seabird and dolphin sightings are still frequently used.

Fishing gear – Handlines and hand-operated pole-and-lines (LHP), mechanized lines and pole-and-lines (LHM), hooks and lines NEI (LX).

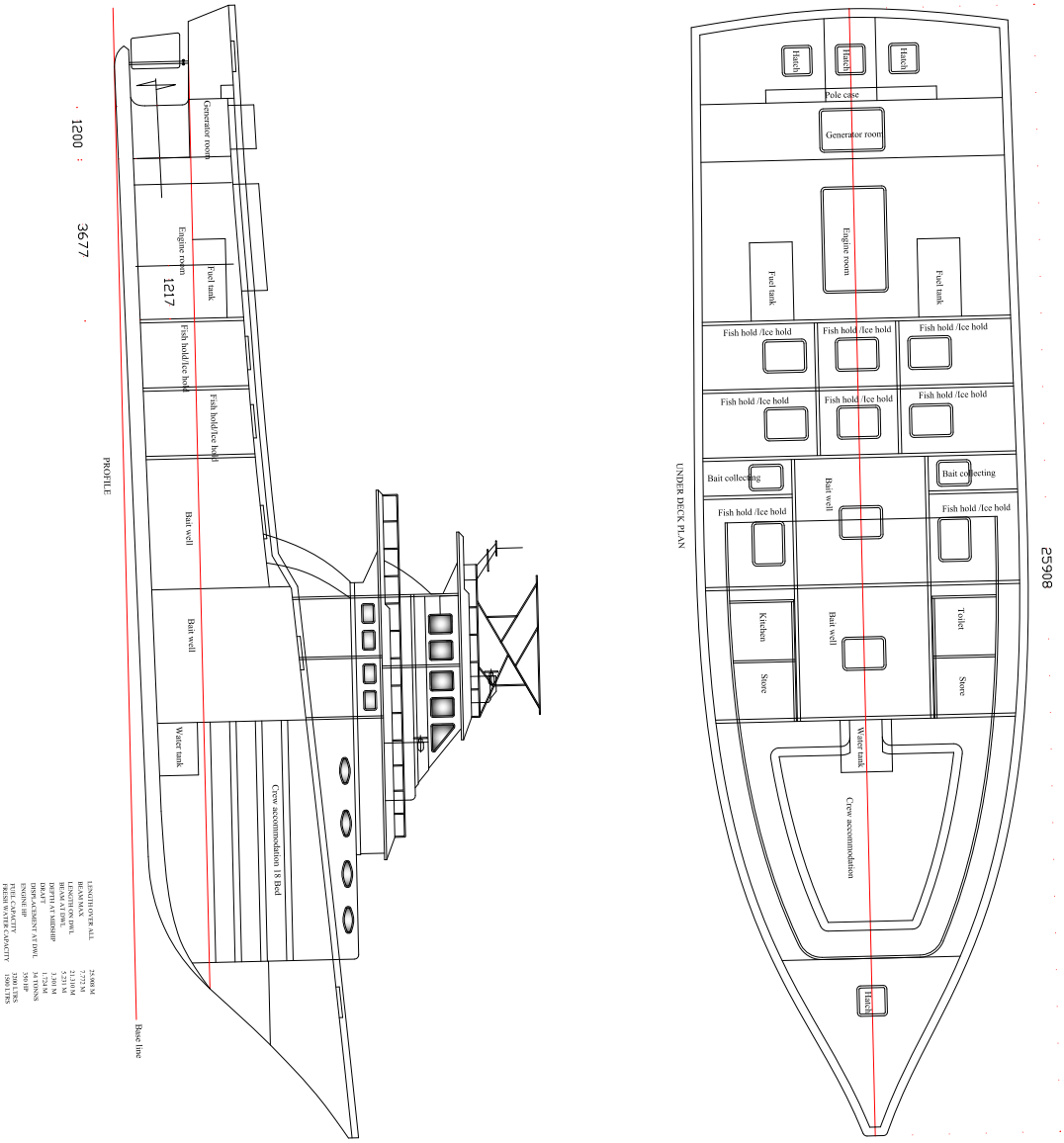
Catch handling and processing equipment – The fish hold is divided into a main central hold and smaller holds or tanks. The main hold where the caught fish are stored is usually refrigerated on the larger vessels. Smaller "day boats" carry ice to preserve the catch.

FIGURE 36
Pole-and-line vessel (LP) (Japanese type)

FIGURE 37
30m Pole-and-line vessel (LP) (Maldivian type – Masdhoni)

FIGURE 38

26m Pole-and-line vessel (LP) (Maldivian type) – General arrangement



2.9.2 Trollers (LT)

ISSCFV Code 9.3

Overview

Trollers are vessels targeting pelagic fish species such as tuna, dolphinfish, mackerels and billfishes, by towing several lines with baited hooks or lures. Trollers range from small undecked boats up to industrial, refrigerated vessels of up to 30 m in length. Trolling vessels may work day trips or long voyages. Trolling vessels are mainly motorized and are very common in recreational fishing. However, if they are used for recreational purposes the vessels are classified as recreational fishing vessels NEI (ROX) instead.

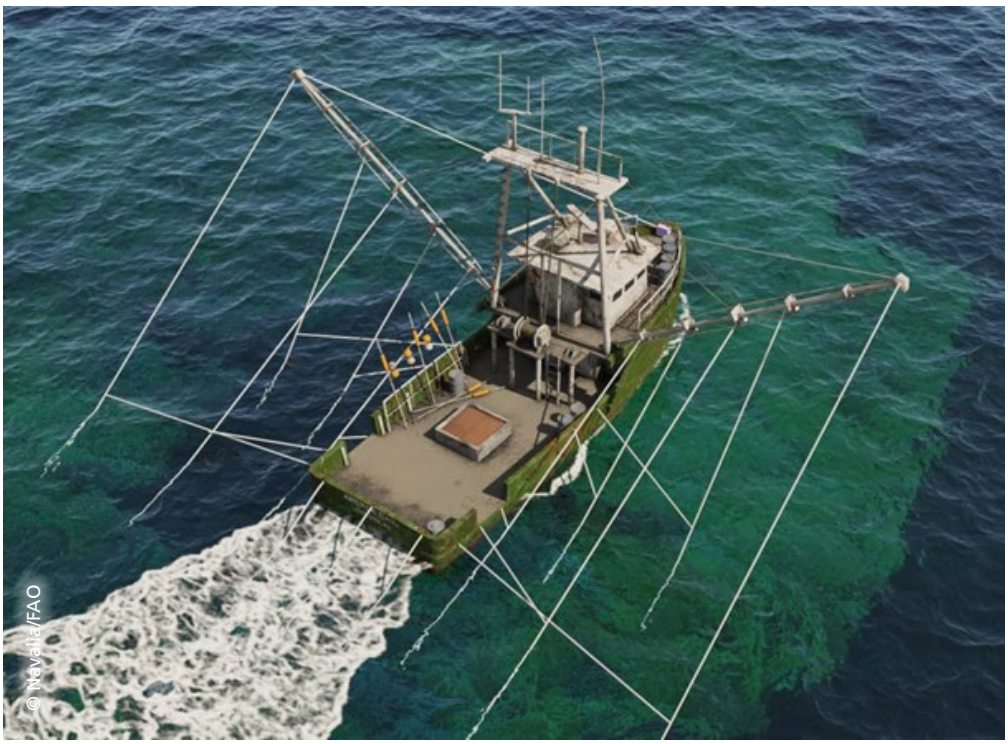
Equipment

Deck equipment – Undecked small-scale trollers generally have no deck equipment, or only a hand-cranked reel, and a limited number of trolling lines. Purpose-built trollers are usually equipped with two or four trolling booms (or outriggers), each with some lines. The booms can be raised and lowered and held in their fishing position by adjustable stays. Hydraulic or electrically powered reels (gurdies) are frequently used to haul in the lines. The lines may be near the surface or further below the surface depending on where in the water column the fish aggregate, which can be adjusted by the amount of weight on each line, the length of the line and the trolling speed.

Fish detection equipment – No specific fish detection equipment is required for trolling, but most trollers are equipped with (multibeam) sonar, fish finders and GPS systems. The use of moored fish aggregating devices (mFADs) in trolling operations has become common practice. Visual scouting to detect fish aggregation areas, such as floating weed lines, is also applied.

Fishing gear – Trolling lines (LTL).

FIGURE 39
Troller in operation



2.10 MULTIPURPOSE VESSELS (MO)

ISSCFV Code 10

Overview

A multipurpose vessel is designed to operate two or more fishing gears without significant modification to the vessels.

The choice of gears is often driven by seasonal changes. For example, vessels working purse seines during pelagic migrations may work longlines for the rest of the year.

Other usual combinations are:

- gillnetter/longliner;
- trawler/gillnetter; and
- pelagic trawler/purse seiner.

Deck arrangement

The combination of fishing gears used defines the deck arrangement.

Equipment

Deck equipment – The combination of fishing gears requires deck equipment to be planned and designed for dual use.

Fish detection equipment – A range of fish detection equipment is used, depending on the fishing gears employed.

Fishing gear – The following gears are commonly used by multipurpose vessels, depending on their fishing operations: Trawls NEI (TX), midwater trawls NEI (TM), purse seines (PS), seine nets NEI (SX), gillnets and entangling nets NEI (GEN), traps NEI (FIX), and longlines NEI (LL).

Catch handling and processing equipment – All.

2.10.1 Purse seiners/pelagic trawlers (MTS)

ISSCFV Code 10.1

Overview

This combination of fishing gear requires the deck arrangement and equipment to be planned for dual use. Since the power requirement for trawling is higher, the vessel may be designed as a trawler with a combination winch for both fishing gears.

Equipment

Deck equipment – The lead of warps and pursing lines is assured by rollers, blocks, trawl gallows and purse davit with the layout planned to reduce to a minimum the time needed for conversion from one type of fishing to another.

Fish detection equipment – According to the size of the boat, the typical fish detection equipment for purse seine/pelagic trawlers usually consists of a sonar, echo sounder, multibeam fish finder, supported by ECDIS maps and GPS systems.

Fishing gear – Trawls NEI (TX), midwater trawls NEI (TM), purse seines (PS) and seine nets NEI (SX).

Catch handling and processing equipment – All.

FIGURE 40
Large purse seiner/pelagic trawler

2.10.2 Multipurpose trawlers (MTW)

ISSCFV Code 10.2

Overview

For the combination of trawling gear with gillnets, longlines, traps or dredges, the deck layout and equipment must be planned carefully and designed for best dual use. Since the power requirement for trawling is higher, the vessel may be designed as a trawler and outfitted with combinations of winches, rollers, blocks, trawl and netting storage areas, cranes and davits – thus providing functional operations in both configurations.

Equipment

Deck equipment – The combination of fishing gear requires that the deck equipment be planned in advance for dual use and minimum time spent on converting from one gear system to another.

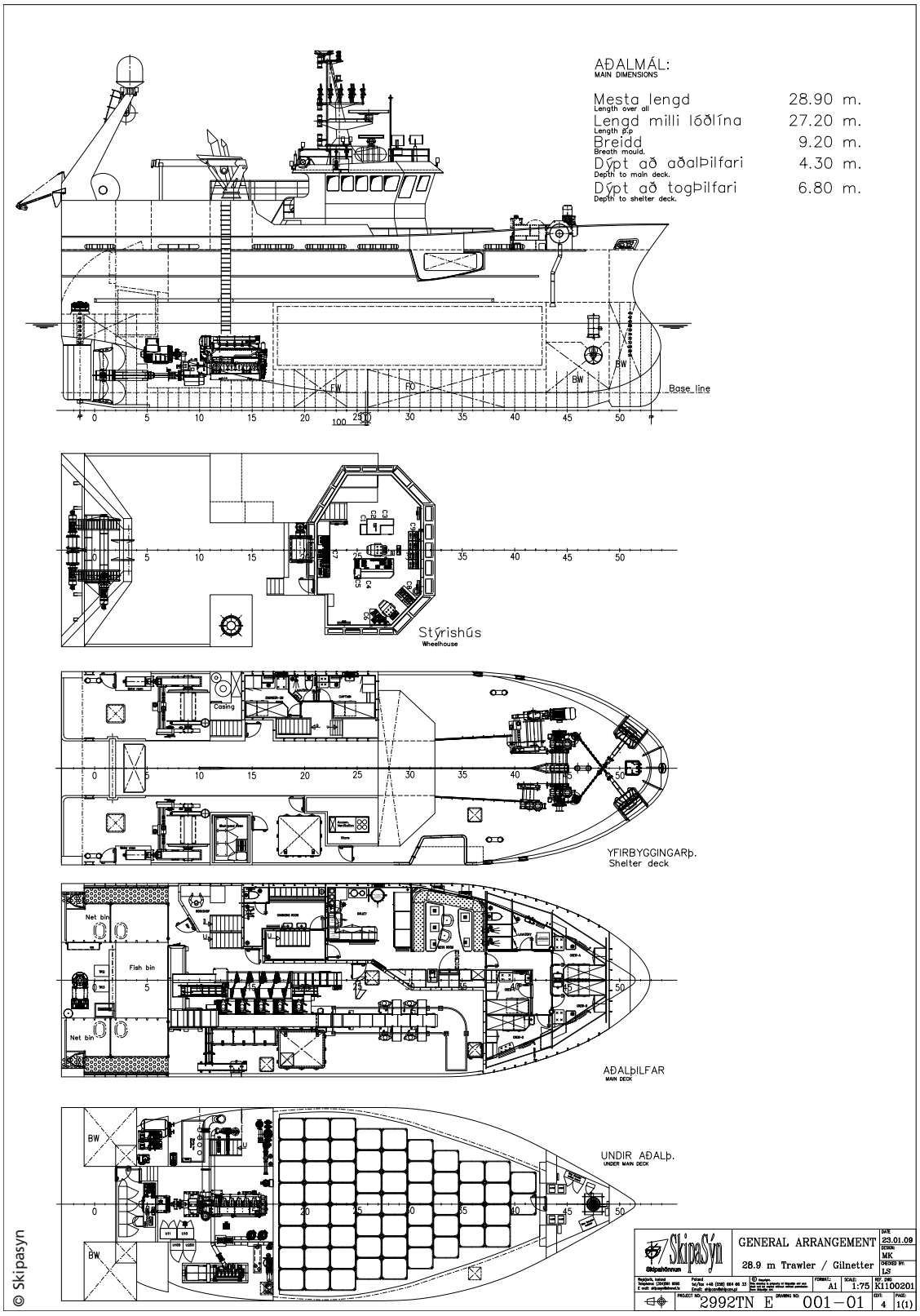
Fish detection equipment – According to the size of the boat, typical fish detection equipment includes sonar and an echo sounder.

Fishing gear – Trawls NEI (TX), bottom trawls NEI (TB), midwater trawls NEI (TM), drift gillnets (GND) and gillnets and entangling nets NEI (GEN).

Catch handling and processing equipment – All.

FIGURE 41
29m Trawler/Gillnetter

FIGURE 42
29m Trawler-Gillnetter – General arrangement



2.11 RECREATIONAL FISHING VESSELS (RO)

ISSCFV Code 18

Overview

Recreational fishing vessels of many types operate worldwide. Most are small-scale and operate inshore or in coastal waters. Larger recreational fishing vessels are capable of operating further offshore in deeper waters, in rough weather and challenging sea conditions. Offshore recreational fishing vessels are built to operate at a good speed for fishing with trolling lines, and generally equipped with powerful inboard engines as a result. The trolling speed used depends on the species targeted and normally ranges from 5 to 12 knots (9–22 km/h).

Larger recreational fishing vessels are often equipped with outriggers for trolling operations, in order to increase the lines that can be trolled with. The main fishing gears are fishing rods with reels and lines that can handle game fish. The lines have hooks, which are baited with squid, ballywoo, other small bait fish or artificial lures. Target species include billfishes (e.g. marlins, sailfish), wahoo, dolphinfish and tuna.

Offshore recreational fishing vessels are equipped with facilities and accommodation for multiday trips, but they are mostly used for short (day-time) fishing trips.

Deck arrangement

Recreational vessels will generally have the bridge amidships with an enclosed wheelhouse. On top they commonly have a tower with a second helm station with engine and steering controls. The foredeck is often flat and the after body provides a working area.

Equipment

Deck equipment – Larger recreational fishing vessels are equipped with outriggers and downriggers. They are often also fitted with boat fishing chairs with rod holders.

Fish detection equipment – Multibeam fish finders are used extensively, as well as ECDIS, GPS charts/navigation system, sonar and echo sounders.

Fishing gear – Trolling lines (LTL), handlines and hand-operated pole-and-lines (LHP), vertical lines (LVT) and hooks and lines NEI (LX).

Catch handling and processing equipment – (Live) bait tanks and cool boxes for the catch. Cutting boards or catch-cleaning stations are often also installed aft.

FIGURE 43
18m Recreational fishing vessel

3. Description of vessels supporting fishing-related activities

3.1 MOTHERSHIPS (HO)

ISSCFV Code 20

Overview

A mothership is a large vessel which supports fishing vessels at sea on multiday trips. These vessels receive the catch from fishing vessel for storage, processing and preservation, and finally transport the product to port. They also service the fishing vessels with fuel, food, water, crew medical needs and other assistance.

These vessels may also carry small-scale fishing vessels on deck or in tow, launching them on arrival at the fishing grounds and returning them to port when fishing operations are complete. This is practised in particular by tuna motherships, which are therefore equipped with heavy lifting equipment to allow the hoisting of daughter vessels (often small tuna longliners) on board, by means of cranes and derricks.

3.1.1 Motherships (HOX) (Factory motherships)

ISSCFV Code 20.9

Overview

This type of mothership takes fresh catch from the surrounding fishing vessels on board, at sea, and carries out similar processing and preservation as seen on factory trawlers.

The machinery and crew accommodation are often located aft and the bridge is placed forward. The processing, freezing and refrigerated holds are located amidships.

FIGURE 44
Mothership – fish factory vessel

3.2 FISH CARRIERS AND REEFERS (FO)

ISSCFV Code 21

Overview

Fish carriers and reefers are non-fishing vessels used exclusively for fish transport. Generally, they are large vessels with refrigerated holds configured for the transport of fish and fish products. The arrangement of large fish carriers is similar to that of other refrigerated ships. In some cases, smaller vessels adapted for fish transport (including in a wet condition) may be classified in this category.

FIGURE 45
Catch transfer into a fish carrier

© Adam Baske/The Pew Charitable Trusts

FIGURE 46
Live salmon carrier

© Navalia/FAO

3.3 FISHERY RESEARCH AND SURVEY VESSELS (RT)

ISSCFV Code 25

Overview

A modern fisheries research vessel is capable of collecting data on fish populations and the marine environment in deep-sea locations. The vessel provides a versatile platform, with a range of equipment and configurations which can be adapted to different activities. Its sophisticated equipment enables sampling and measurements to be taken from the sea surface down through the water column to the seabed, and beneath it.

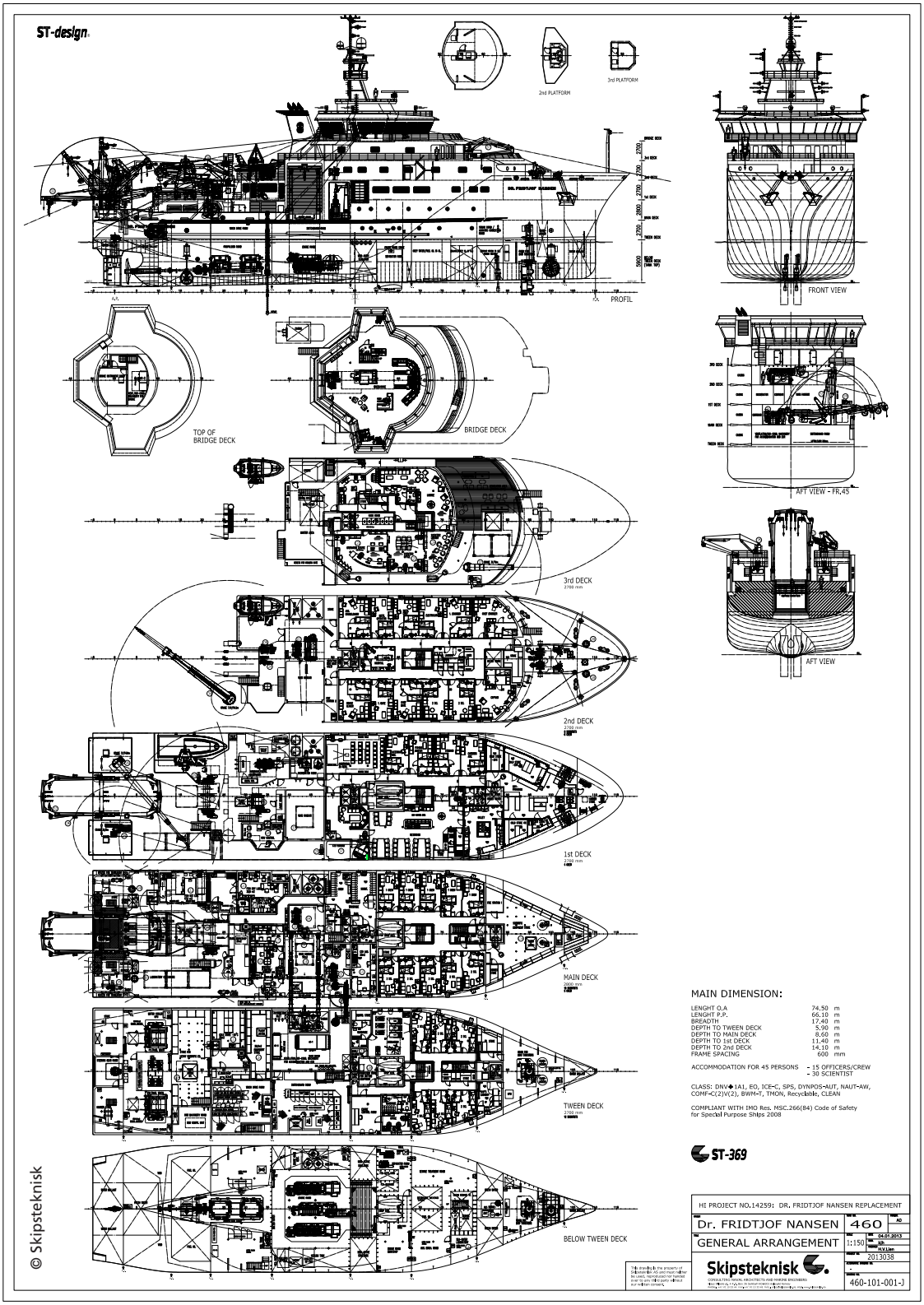
The vessel may be similar to a large fishing vessel, but with space allocated to special equipment and laboratories instead of bulk fish storage. Preservation and freezing facilities will be available for the conservation of samples. The vessel's design may also allow for silent operation and make use of Dynamic Positioning (DP), either to remain stationary or track a precise course.

On deck the vessel is generally equipped with an A-frame aft along with other deck gear and winches. The vessel is capable of undertaking trawling and other fishing operations as well as the towing of scientific equipment, and launching remotely operated vehicles (ROVs). Other equipment will allow the collection of plankton, water samples from various depths, and fish-finding equipment.

FIGURE 47

75m Research vessel "*Dr. Fridtjof Nansen*"

FIGURE 48
75m Research vessel "*Dr. Fridtjof Nansen*" – General arrangement



3.4 PATROL VESSELS (PX)

ISSCFV Code 26

Patrol vessels are often operated by the coast guard, navy or maritime authorities. This type of vessel is used for maritime safety, search and rescue services, fisheries inspection and control activities, marine environment protection, border control, and for the prevention of illegal, unreported and unregulated fishing in territorial waters and within an exclusive economic zone (EEZ). Vessels operating within EEZs are generally medium-sized (40–80 m LOA), while for coastal and inshore duties smaller and faster boats are deployed.

This vessel type is designed to suit the requirements of a coastal state, to address patrol and protection issues as they arise. Generally, the design of the ship will be more aligned with a navy vessel, with an emphasis on speed and range of operation.

Large patrol vessels may be designed and constructed for emergency towing operations, firefighting and environmental responses, and fitted with in-flight refuelling facilities for helicopters, as well as a landing/pick-up area. The equipment these vessels carry varies, but a rigid inflatable boat (RIB) for boarding fishing vessels for inspections is common.

FIGURE 49
94m Patrol vessel "*Þór*"

3.5 FISHERY TRAINING VESSELS (CO)

ISSCFV Code 27

Overview

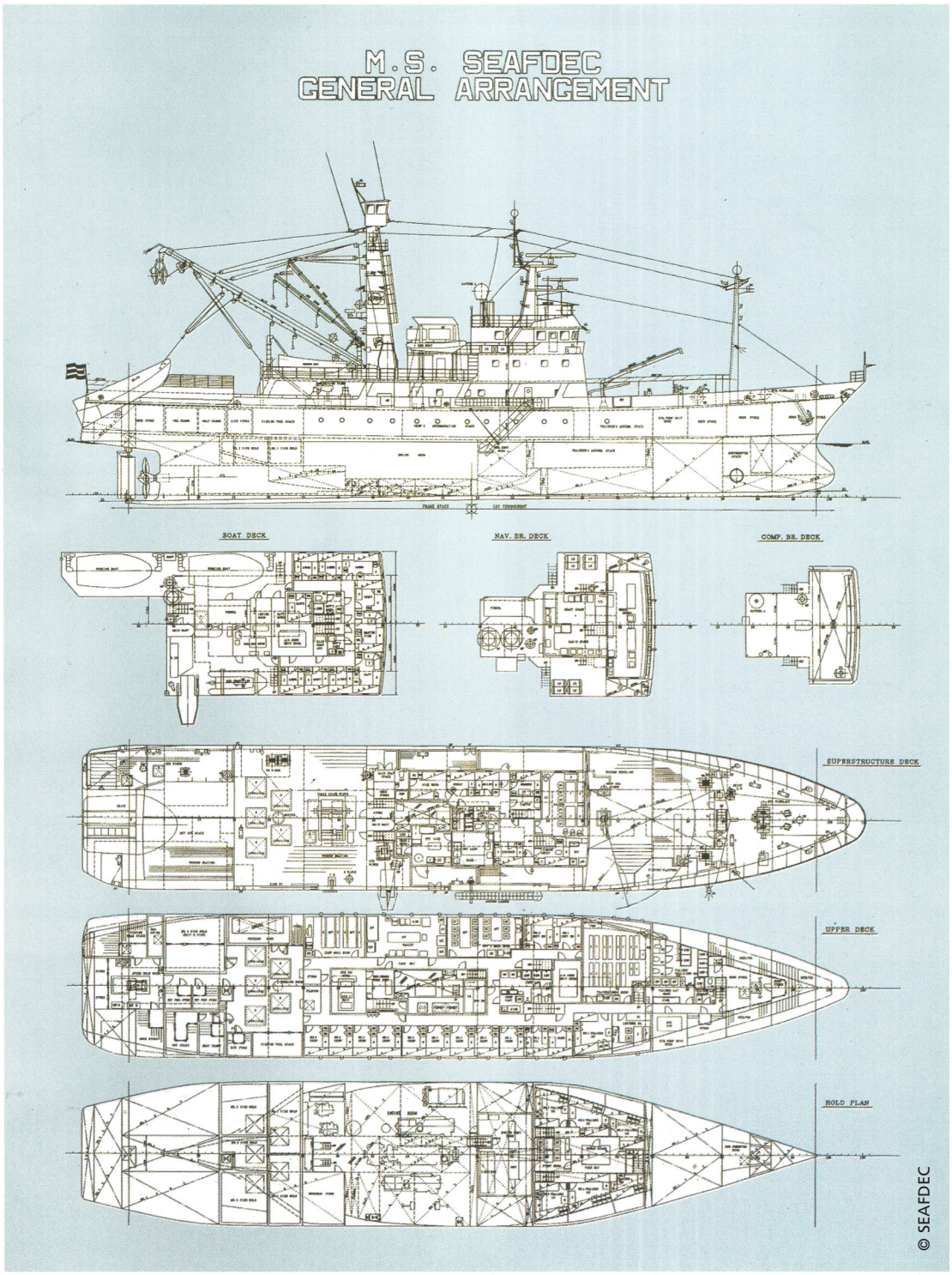
Fishery training vessels of various sizes are operated worldwide. Training vessels for the crew of industrial fishing vessels are constructed in such a way that they can operate a range of gears. The vessels have accommodation for the trainees, a trainee mess/class room, larger galley, simulators for practising navigation and engine operations, and often a wet laboratory. Many fishery training vessels are also used for research purposes and carry one or more smaller boats on deck.

Given that the vessel's main purpose is training, modern vessels of this type are built to meet the international standards of the 2012 Cape Town Agreement and to facilitate training on the 1995 International Convention on Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel (STCW-F) issued by the International Maritime Organization (IMO).

Deck arrangements are often similar to a large fishing vessel, with the bridge placed a bit forward to have a large working deck aft. The vessel is generally equipped with beams, trawl winches, purse winches and drums, as well as power blocks, and line and net haulers. A capstan for mooring and a windlass for lowering and raising equipment are commonly included as well. The deck provides space for various types of nets as well as traps and jigging machinery. Commonly, fishery training vessels have the capacity to undertake bottom and pelagic trawling, longlining, trap- and pot fishing, gillnetting, seining, jigging and even lift netting operations with lights.

FIGURE 50
65m Fishery training Vessel "*M.V. SEAFDEC*"

FIGURE 51
65m Fishery training Vessel "*M.V. SEAFDEC*" – General arrangement



4. Description of vessels supporting fishing-related activities not listed in ISSCFV Rev.1, 2019

4.1 AQUACULTURE PLANT WORKBOATS (VOX)

ISSCFV Code 29.9

Overview

Most marine offshore fish farms rely on a range of workboats for their operations; these include fish carriers, tugs, patrol boats, feed barges, crew transfer vessels, supply vessels, dredgers and other utility craft. These vessels provide services to offshore fish farms, often in remote areas. While not listed specifically in the ISSCFV Rev.1, 2019, aquaculture workboats are classified as "Vessels supporting fishing related activities NEI" (VOX).

Specialist vessels serve the following three primary activities:

- **Fish handling**: Workboats transport and distribute fish and feed, perform mechanical delousing treatments, in addition to sorting, grading and other fish-handling tasks. Some of these vessels, such as feed barges, are autonomous and do not require crew shifts or reduced night-time operations.
- **Infrastructure installation and deactivation**: Crane barges, dredgers, and platforms for divers are used for the installation of offshore marine fish farming cages and their mooring systems, as well as for the maintenance and eventual removal of installations.
- **Maintenance, support and transfer**: These vessels carry out tasks including personnel transfers, anchoring, mooring, diving and ROV operations. They also carry and distribute feed, carry out net cleaning, and dredge the seabed. Vessels can operate in most sea conditions and can service distant offshore farms.

FIGURE 52
Inshore fish farm workboats

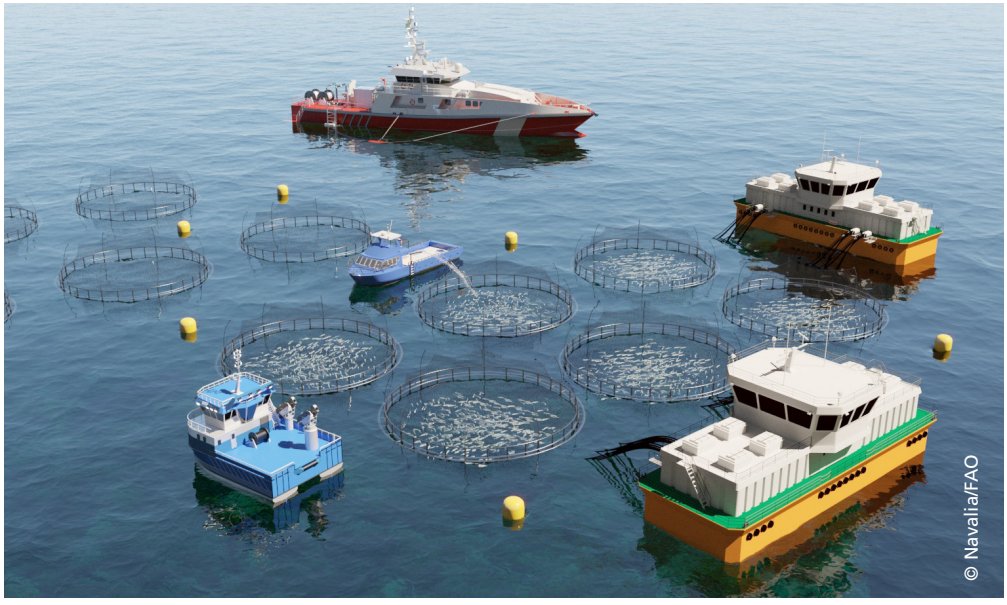


FIGURE 53
Fish farm fast crew boat

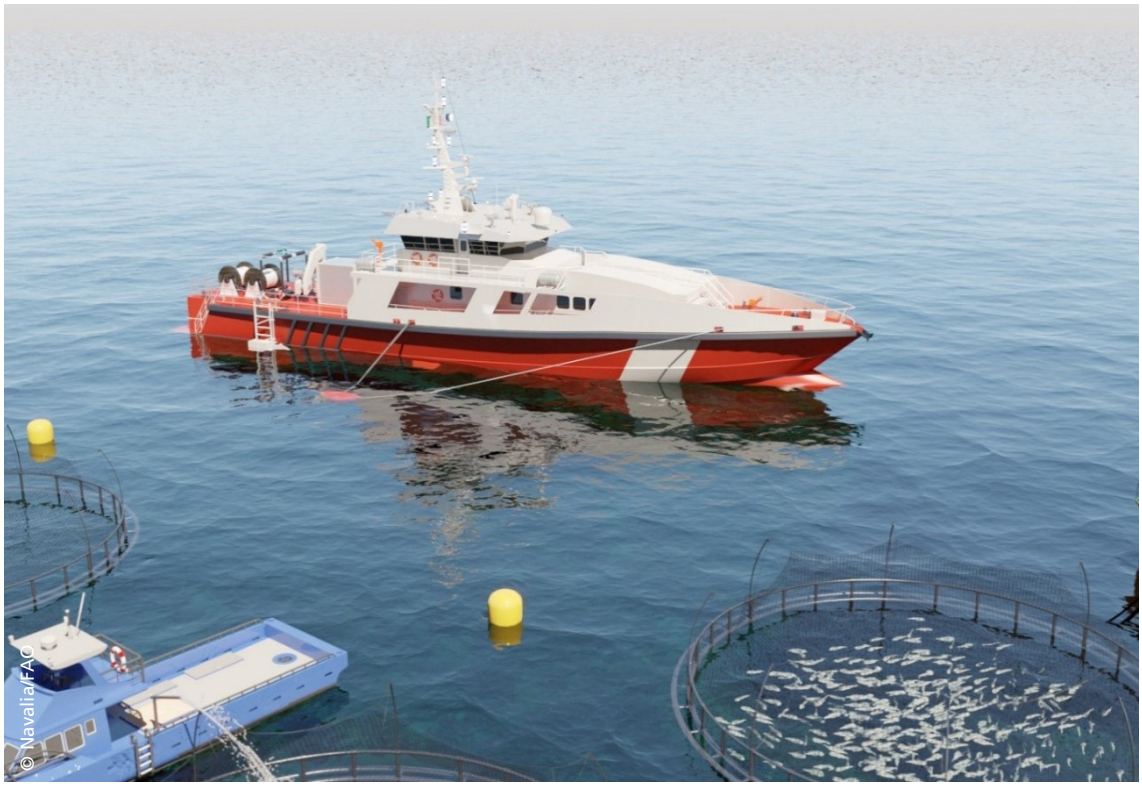
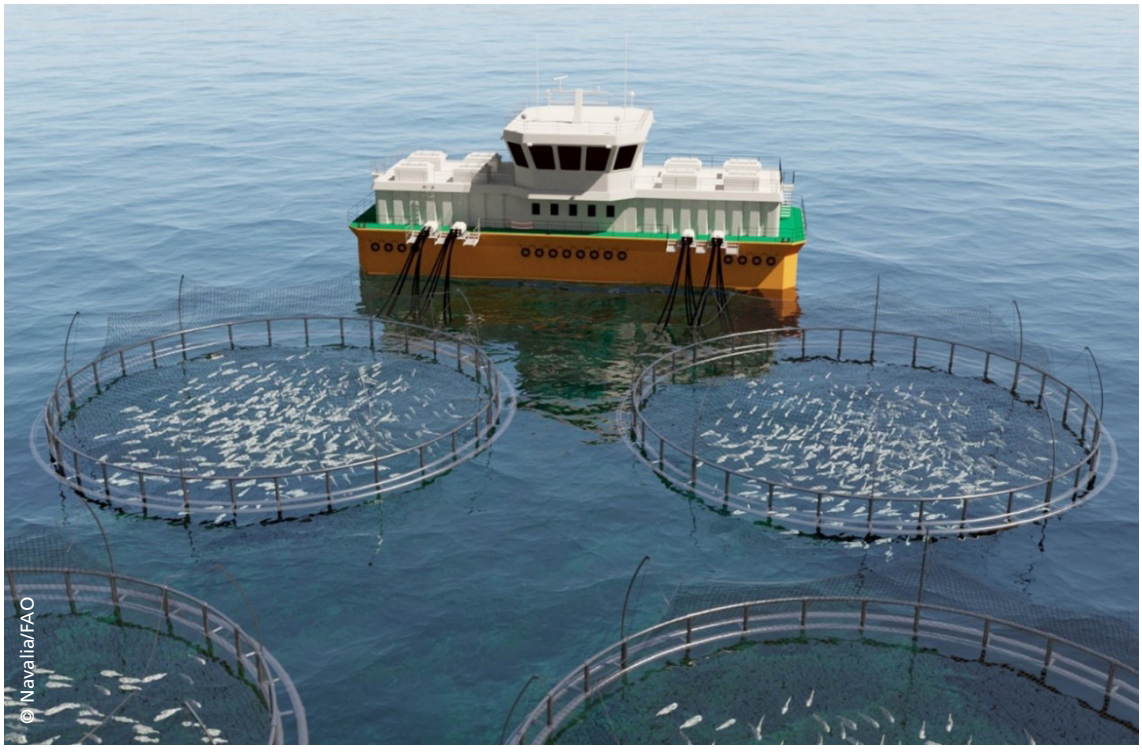


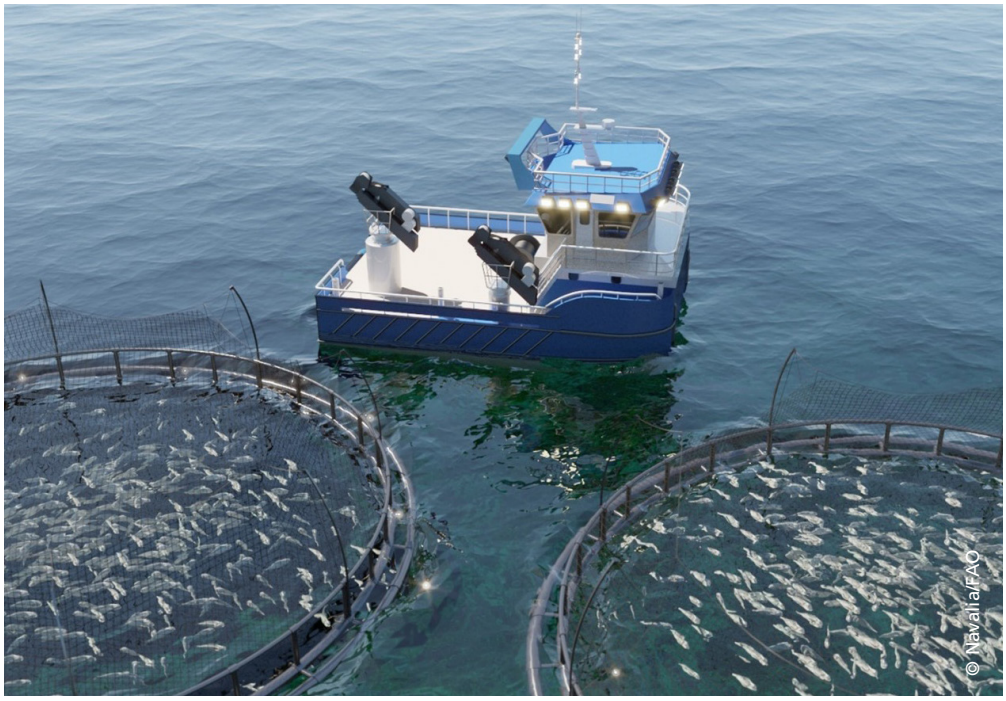
FIGURE 54
Feed barge



Feed barges provide self-contained fish feeding systems, generator(s), control rooms, accommodation, safety equipment and other functional services such as silage systems, camera systems and sensors. The barges may be configured as monohulls or catamarans, can have feed capacities of up to 850 tonnes and do not generally have propulsion machinery.

FIGURE 55
Feeding/harvesting boat

FIGURE 56
Support catamaran



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Glossary

This glossary provides definitions of maritime terms, some of which are used in this document. The sources for the terms include the FAO term portal (FAO, 2023d), FAO Fishing Equipment Fact Sheets (FAO, 2023e), the Safety Recommendations for Decked Fishing Vessels of Less than 12 metres in Length and Undecked Fishing Vessels (FAO/ILO/IMO, 2012), the Maritime Dictionary (OOW, 2023), Modern Shipbuilding Terms (Forrest Pease, 1918), and the Wärtsilä Encyclopedia of Ship Technology (Babicz, 2015).

A-frame	A support structure, in the shape of an A which is widely used on fishing vessels. It may be used for setting and hauling large nets, lifting catch, or for special purposes on research vessels and other ship types.
Aft	Towards the stern of the ship.
After body	The part of the ship aft of midships. The term is often used to express the aft part of the ship.
Aft peak	A compartment located aft of the aftermost watertight bulkhead.
Aft perpendicular (A.P.) (See also: Forward perpendicular)	Forward and after perpendiculars should be taken at the forward and after ends of the length (L). The forward perpendicular should coincide with the foreside of the stem on the waterline on which the length is measured. (See also Appendix 2).
Aftermost	Nearest the stern.
Amidships	The midway point between the forward and aft perpendiculars.
Appendage(s)	Parts of the vessel's structure that extend beyond the hull, such as bilge keels, rudders, stabilizing fins, shaft brackets, etc.
Astern	1. In a location behind a vessel. 2. A vessel moving backwards moves astern.
Athwartships	Across the ship, at right angles to the fore and aft centreline.
Auxiliary machinery	Machinery other than the ship's main engines.
Ballast	Solid or liquid loaded onto a ship to change draught or trim, or to regulate stability.
Baseline	The horizontal line intersecting at amidships the keel line. (See Appendix 2).
Bay	The space between two adjacent transverse frames or bulkheads.
Beam	1. The width of a vessel, measured at its widest point. 2. A transverse structural member supporting a deck and/or strengthening a hull.

Bilge	1. Intersection or curved transition of bottom and sides of the hull. 2. Lowest points within hull compartments where liquids may accumulate.
Bilge Keel	Fixed longitudinal plates protruding from the bilge used for damping rolling motions.
Block	The name given to a pulley or sheave, or system of these mounted in a frame. Used to multiply power when moving objects by means of ropes.
Bollard	A substantial, low post mounted on the deck to which mooring lines are attached.
Boom	A long round spar used in the handling of heavy items.
Bow	The structure and form of the forward end of the vessel.
Bow Thruster	A powered propeller located in a transverse tunnel near the bow to improve manoeuvrability.
Breadth	The maximum breadth of the vessel, measured at maximum beam to the moulded line of the frame in a vessel with a metal shell and to the outer surface of the hull in a vessel with a shell of any other material.
Bridge	The elevated location from which the vessels control and navigation is exercised. [Alt. wheelhouse in smaller vessels.]
Bulbous Bow	A bulb-shaped bow at or below the waterline, extending forward to reduce wave-making resistance and control pitching motions.
Bulkhead	A vertical structural partition dividing a vessel's interior into watertight compartments.
Bulwark	Stiffened plating enclosing the perimeter of a main deck for protection of crew or objects on the deck.
Cabin	A room or space within the vessel provided for a passenger or crew member.
Capstan	A vertically mounted warping head. Used for hauling ropes, it has the advantage that it can take ropes coming from any horizontal direction without the need for guiding blocks and other rope leading systems, provided that the rope is perpendicular to the capstan shaft and approximately on the same horizontal plane as the warping head.
Catamaran	A vessel with two hulls and structure between.
Centreline	The longitudinal vertical plane of a vessel, dividing it in two symmetrical halves.
Chine	An angle or bend in the hull running along the vessel length.
Chine hull	It is a hull made of flat plates. There are two types of chine hull: 1. Soft chine, soft-edged bend in the hull 2. Hard chine, sharp-edged bend in the hull.
Coaming	A raised border around an opening to prevent water from entering the opening.

Davit	Lifting device for handling boats, anchors, or cargo.
Deadrise	The upward slope of a vessel bottom from the keel to the bilge.
Deadweight	The difference between the **displacement** and the mass of empty vessel (lightweight) at any given draught. It is a measure of ship's ability to carry various items: cargo, stores, ballast water, provisions and crew, etc.
Deck	A horizontal working platform within the vessel, corresponding to a floor in a building.
Decked/Un-decked vessel	*Decked vessel* is a vessel having a fixed watertight deck covering the entire hull above the deepest operating waterline. Where open wells or cockpits are fitted in this deck, the vessel is considered a decked vessel if flooding of the well or cockpit will not endanger the vessel. *Undecked* vessel is a vessel which is not a decked vessel.
Depth	Depth (moulded) is the distance between the underside of the deck amidships to top of the keel. (See Appendix 2).
Derrick	A crane consisting of a boom and a mast connected to a deck winch, used for lifting cargo.
Displacement	The weight of the water displaced by a floating vessel, it is the product of the volume underwater and the density of the water.
Draught or Draft	The vertical distance from the baseline amidships to the actual waterline. in question. *Moulded Draught* is measured from the inside of the keel plating.
DWL	Design Waterline or Datum Waterline. Basis for the fundamental design parameters of the ship.
ECDIS	Electronic Chart Display and Information System (ECDIS). Electronic charts which can be displayed on a monitor and manipulated by zooming, scrolling, etc. Navigation can thus be carried out by manipulation cursors on a monitor rather than using parallel rules and compasses on a paper chart.
Echo sounder	An apparatus used on a fishing boat for the detection and identification of fish and the determination of depth of water and nature of the seabed.
Engine power	The unit of measurement for engine power used in this paper is kilowatt (kW). (See also: HP).
Engine room	The space/compartment on a vessel that accommodates the main propulsion machinery, the auxiliary machinery (generators) and other equipment.
Fishery fleet or fishery vessels	The term "fishery fleet" or "fishery vessels" used in this document refers to mobile floating objects of any kind and size, operating in freshwater, brackish water and marine waters which are used for catching, harvesting, searching, transporting, landing, preserving and/or processing fish, shellfish and other aquatic organisms, residues and plants.

Fishing vessel	The term "fishing vessel" is used to distinguish fishery vessels only engaged in catching operations. The term "non-fishing vessel" applies to vessels performing other functions related to fisheries; this includes vessels providing supplies, motherships, fish carriers, and vessels involved in fisheries resources protection, aquaculture operations, and vessels rendering assistance or conducting fisheries related research or training.
Forecastle	An enclosed superstructure which extends from the **forward perpendicular** aft to a point forward of the **after perpendicular** (or forwardmost space below deck, where no superstructures are fitted) at the forward end of the vessel, usually used for stores and the position of the chain locker.
Forward Perpendicular (F.P.) (See also: Aft perpendicular)	Forward and aft perpendiculars should be taken at the forward and after ends of the length (L). The forward perpendicular should be coincident with the foreside of the stem on the waterline on which the length is measured. (See also Appendix 2).
Freeboard	The distance measured from the waterline to the upper edge of the deck plating at side of the freeboard deck amidships.
Freeboard deck	The uppermost complete deck exposed to weather and sea, which has permanent means of weathertight closing of all openings in the exposed part, and below which all openings in the vessel's sides are fitted with permanent means of watertight closing.
Gallows	A large steel open U-frame fitted to the side of a trawler from which the trawling gear is towed. A support on the deck of a vessel.
Gantry	High-level structure supporting a transverse lifting appliance.
Gear (fishing)	The general name for the equipment used for fishing. This might include lines, nets, warps, floats, deck equipment and any other specific fishing items.
General arrangement	Detailed plan to communicate the layout of a vessel. Including spaces, compartments, decks, equipment, tanks, machinery etc.
GPS	Global Positioning System (GPS). The GPS system consists of many Earth-orbiting satellites. These satellites allow any person who owns a GPS receiver to determine his or her precise longitude, latitude and altitude anywhere on the planet.
Gross tonnage (GT)	The term "gross tonnage" (GT) is used as measure of the overall size of a vessel. An updated approximate relationship between the length overall (LOA) of fishery vessels and their gross tonnage (GT) is presented in Appendix 3 of this document.
GRP	Glass-fibre Reinforced Plastics.
Gunwale	The upper edge of the side of the vessel.
Hatch	A hatchway is an opening in a vessel providing access for cargo, personnel, stores, etc. The cover of the opening is called a hatch cover.

Helm	1. The place from which the ship is steered and controlled. 2. Steering device; a tiller or wheel generally installed on the bridge or in the wheelhouse of a ship to turn the rudder.
HP	Horsepower (hp) is a standard unit of mechanical power: 1 HP is equal to 0.745 kW.
Hull	The main body of a ship or vessel, providing strength, buoyancy and hydrodynamic qualities.
Inboard	Toward the centre of a vessel or inside her deck edge.
Industrial fisheries	"Industrial fisheries" means: (a) catching fish from large and medium-sized vessels fitted out with mechanized methods of operating the fishing gear and installations for preservation of fish on board; (b) processing the catch either in land base or on board – in which case the vessels are provided with appropriate processing installations; and (c) distributing the fish products around the country and abroad using mechanized means of transportation adapted for fish and fish products. All these activities are generally organized for the financial benefit of the companies or organizations operating the fishing vessels, processing plants and fish product transportation.
Industrial fishing vessel and semi-industrial fishing vessel	The term "industrial fishing vessel" is used for large fishing vessels, typically of 24 m in length and over, engaged in catching operations, outfitted with mechanized methods of operating the fishing gear and installations for preservation of fish on board. The term "semi-industrial fishing vessel" is generally used for medium sized vessels, typically of 12 m in length and over but less than 24 m in length, engaged in catching operations, outfitted with mechanized methods of operating the fishing gear.
Keel	The centre line backbone structure along the base of the ship, which supports the ship's structure.
Launch	1. A motorized open boat. 2. The transfer of a vessel from land to water. 3. Deployment of item such as a net.
Length (L)	The length (L) is defined as 96 percent of the total length on a waterline at 85 percent of the least moulded depth measured from the keel line, or as the length from the foreside of the stem to the axis of the rudder stock on that waterline, if that be greater. In vessels designed with rake of keel the waterline on which this length is measured shall be parallel to the designed waterline (International Convention on tonnage measurement of ships, 1969) (See also Appendix 2).
Length between perpendiculars (LBP)	The distance measured along the summer load waterplane between the aft and fore perpendicular (See also Appendix 2).

Length overall (LOA)	Taken as the distance in a straight line parallel to the design waterline, between the foremost point of the bow and the aftermost point of the stern.
Length waterline (LWL)	The length of a vessel measured along the waterline from forward to aft (see also Appendix 2).
Lightship	Lightship is the weight of a ship complete in all respects, but without consumables, stores, cargo, crew, passengers and their belongings and without any liquids on board.
Lines plan	A design drawing showing the form of the hull projected onto three perpendicular planes, it consists of three views: – the elevation or profile of the hull – the plan on the hull – transverse sections across the hull. It shows the shape of the vessel at level and water lines, transverse sections and longitudinal bow and buttock and diagonal lines from which the naval architect carries all necessary design calculations. Traditionally, the bow is shown to the right.
Machinery	Mechanical equipment including main engines, auxiliary engines, pumps, compressors, hydraulics, air conditioning and ventilation.
Midship or amidships	The midpoint between the aft and the forward perpendicular is known as midship or amidships. The section passing through this point, and which is normal to the waterplane is called *Midship Section.*
Moulded breadth	The greatest breadth of a vessel, measured to the inside of the shell plating.
Moulded depth	The extreme height of a vessel amidships, from the top of the keel to the top of the upper deck beam.
Net sounder	An echo sounder with a transducer mounted on the headline of the net rather than on the bottom of the vessel.
Outboard	In a direction away from the centreline of the ship.
Outrigger	A spar rigged out from vessel side.
Perpendiculars	Forward perpendicular – vertical line through the intersection of the foreside of the stem with the datum waterline.
See also: Length between perpendiculars (LBP).	Aft perpendicular – vertical line through the intersection of the axis of the rudder stock with the datum waterline (See also Appendix 2).
Port / starboard	Port side of the ship is to the left of an observer facing forward on a ship. Starboard is to the right of an observer facing forward on a ship.
Pontoon	A floating box to which boats can be moored.
PSV	Platform Supply Vessel
PLC	Programmable Logic Controller is an industrial digital computer that can automate specific processes.
Power block	A mechanized pulley used to haul in nets, purse seines and cables.

Registration	Commercial vessels are required by international law to be registered in the country whose flag they fly.
Rise of Floor or Deadrise	At the amidships region the bottom of the ship is extended out to intersect with the *moulded breadth line*. The rise or the height of this intersection above the keel is known as *rise of floor or deadrise*.
ROV	Remotely Operated Vehicle.
Rudder	A steering and manoeuvring device located at the stern of the ship (see also Appendix 2).
Semi-industrial fisheries	"Semi-industrial fisheries" means: (a) catching fish from medium- (and/or small-) sized vessels fitted out with mechanized methods of operating the fishing gear; (b) processing the catch in land bases; and (c) distributing the fish and fish products around a limited area, and in exceptional cases only for export. These activities are aimed at the financial benefit of the companies or organizations operating the fishing vessels, processing plants and transport facilities.
Sheer	The longitudinal curve of the vessel decks in a vertical plane, the usual reference being the ship side.
Skiff	A light rowing boat or sculling boat, typically for one person. A powered boat used to assist a purse seiner with net handling. Skiffs used in tuna purse seine operations are generally 8–12 m in length and have powerful engines and large propellers to provide the necessary bollard pull.
Sonar	An apparatus that uses sound waves to detect objects under water by measuring or classifying the echoes received from them. An echo sounder is a sonar that transmits vertically. In practice, a sonar is an apparatus other than an echo sounder, i.e. a sonar transmits horizontally.
Stem	The bow frame forming the apex of the intersection of the forward sides of a ship.
Stern	The after end of the vessel.
Summer load waterline or design waterline (DWL)	The line that runs along the waterplane, from aft to the fore of the ship is known as *Summer Load Waterline*. It is the line at which the ship is generally floating with its load.
Superstructure	The superstructure is any decked structure above the uppermost continuous deck.
SWL	Safe Working Load. Certified load limit applied to lifting appliances and gear.
Tonnage	A measure of the size or capacity of a ship. Gross tonnage (GT) means the measure of the overall size of a ship. Net tonnage (NT) means the measure of the useful capacity of a ship. Tonnage is defined by internationally agreed formulae and is used for port and other dues. It should be noted that tonnage represents a dimensionless function of volume and should not be confused with deadweight, lightship or displacement.

Topside	Portion of the outside side of the hull which is above the water line.
Transom	A flat, transverse part which forms the stern of a square ended boat.
Trim	The difference between the draughts at forward and aft.
Water lines	Lines showing the longitudinal curvature of the vessel at different draughts. Sometimes called water planes.
Weather deck	Uppermost deck which is completely exposed to the weather from above and at least two sides.
Width	See beam.
Well	The space between the first bulkhead of a long poop deck or deck house and a forecastle bulkhead. 1. Space in the bottom of a ship to which bilge water drains so it may be pumped overboard. 2. Any area on the deck exposed to the weather, where water may be entrapped.
Wheelhouse	An enclosed space in which the main steering wheel and engine controls are located.
Winch	A pulling machine fitted with a drum with rope, cable or chain. Used for hauling, pulling or hoisting.
Windlass	A machine used on ships to lower and raise equipment such as anchors or fishing gear.

APPENDIX 1. International Standard Statistical Classification of Fishery Vessels by Vessel Types (ISSCFV Rev.1, 2019)

Note: The revision of the ISSCFV was initiated in 2005, further amended in 2007 and 2019, and endorsed by CWP at its Twenty-sixth Session in 2019 (FAO, 2019). More information is available in the CWP Handbook page (FAO, 2023a).

	Fishing Vessel			
	Category	*Sub-category*	*ISSCFV Code*	*Standard abbreviation*
Fishing vessels[1]	**Trawlers**		**1**	**TO**
		Otter trawlers[2]	1.1	OT
		Pair trawlers	1.2	PT
		Beam trawlers	1.3	BT
		Side trawlers	1.4	TS
		Stern trawlers	1.5	TT
		Trawlers NEI*	1.9	TOX
	Purse seiners		**2**	**SP**
		Purse Seiners – American type	2.1	SPA
		Purse Seiners – European type	2.2	SPE
		Drum seiners	2.3	SPD
		Purse seiners NEI	2.9	SPX
	Seiners (other)		**3**	**SO**
		Seiners NEI	3.9	SOX
	Dredgers		**4**	**DO**
		Dredgers NEI	4.9	DOX
	Lift netters		**5**	**NO**
		Stick-held dip netters	5.1	NS
		Lift netters NEI	5.9	NOX
	Gillnetters		**6**	**GO**
		Drifters	6.1	GD
		Set netters	6.2	GS
		Gillnetters NEI	6.9	GOX
	Trap setters		**7**	**WO**
		Pot vessels	7.1	WP
		Trap setters NEI	7.9	WOX

[1] The Global Record Working Group (GRWG) judged that this terminology is in line with international instruments such as the Port State Measures Agreement (PSMA).

[2] CWP 26 decided to keep the subcategory "Otter trawlers" as a distinct vessel type of particular regional relevance.

	Fishing Vessel			
	Category	*Sub-category*	*ISSCFV Code*	*Standard abbreviation*
Fishing vessels	**Longliners**		**8**	**LL**
		Bottom longliners	8.1	LB
		Midwater longliners	8.2	LM
		Longliners NEI	8.9	LLX
	Line vessels (other)		**9**	**LO**
		Jigger vessels	9.1	LJ
		Pole and Line vessels	9.2	LP
		Trollers	9.3	LT
		Hand liner vessels	9.4	LH
		Line vessels NEI	9.9	LOX
	Multipurpose vessels		**10**	**MO**
		Purse seine/pelagic trawlers	10.1	MTS
		Multipurpose trawlers (in combination with longline, trap, gillnet, dredge)	10.2	MTW
		Multipurpose non trawlers (longline, gillnet, trap)	10.3	MLG
		Multipurpose vessels NEI	10.9	MOX
	Recreational fishing vessels		**18**	**RO**
		Recreational fishing vessels NEI	18.9	ROX
	Other fishing vessels		**19**	**FX**
		Other fishing vessels NEI	19.9	FXX
Vessels supporting fishing related activities[3]	**Motherships**		**20**	**HO**
		Motherships NEI	20.9	HOX
	Fish carriers and reefers		**21**	**FO**
		Refrigerated transport vessels	21.1	FR
		Fish carriers and reefers NEI	21.9	FOX
	Support vessels		**23**	**SA**
		Bunkering tanker vessels	23.1	SB
		Towing vessels	23.2	ST
		Support and auxiliary ships NEI	23.9	SAX
	Fishery research and survey vessels		**25**	**RT**
		Fishery research and survey vessels NEI	25.9	RTX
	Patrol vessels		**26**	**PX**
		Patrol vessels NEI	26.9	PXX
	Fishery training vessels		**27**	**CO**
		Fishery training vessels	27.9	COX
	Vessels supporting fishing related activities		**29**	**VO**
		Multipurpose vessels supporting fishing related activities	29.1	VOM
		Vessels supporting fishing related activities, NEI	29.9	VOX

* "NEI" is the abbreviation for the phrase "not elsewhere identified"

[3] The Global Record Working Group (GRWG) judged that this terminology is in line with international instruments, such as the Port State Measures Agreement (PSMA).

APPENDIX 1A. International Standard Statistical Classification of Fishery Vessels by Length Classes (ISSCFV – Length Classes) (ISSCFV, 1982)

Note: The vessel length classes were agreed by the Coordinating Working Party on Fishery Statistics (CWP) in 1982 and have been used since then (FAO, 2021b).

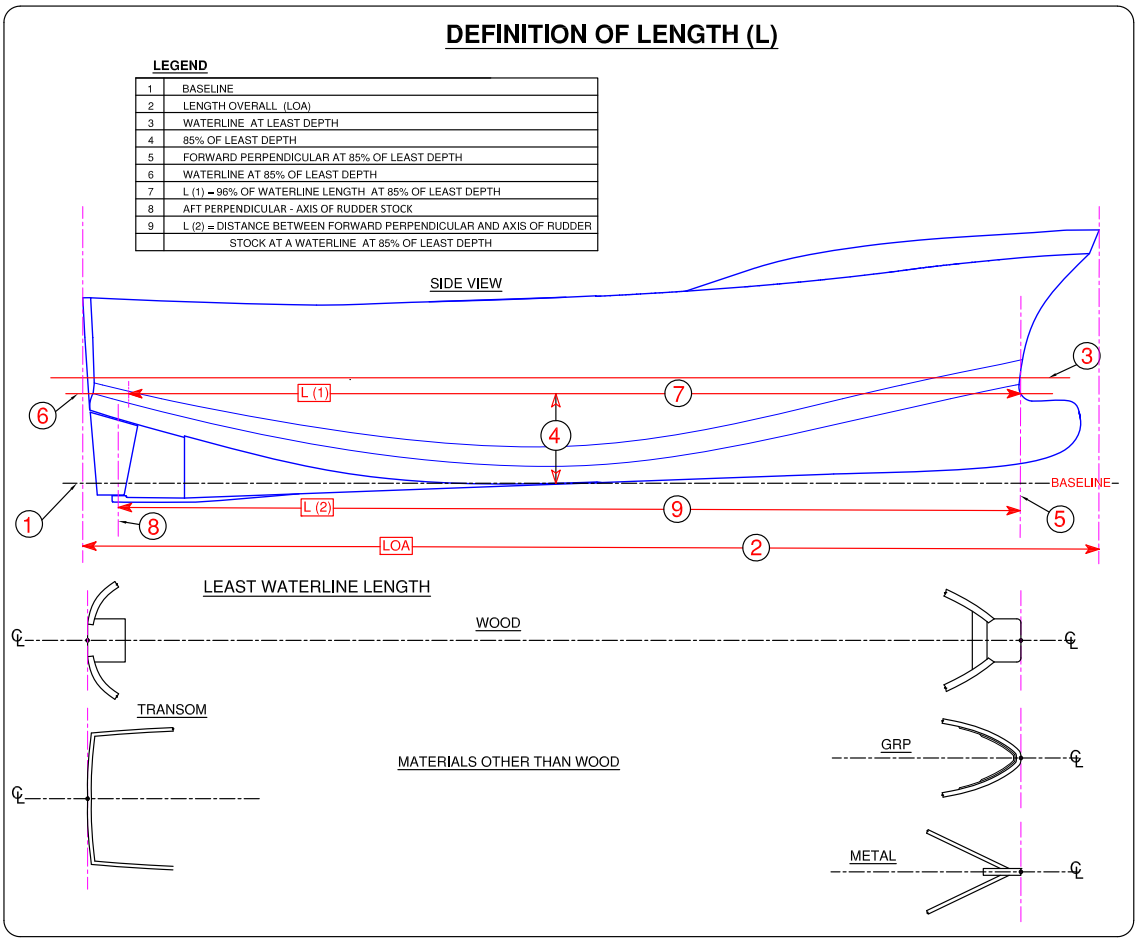
Vessel Size by length Overall Class (metre)		
Decked Vessels		
Code	*Lower Limit*	*Upper Limit*
100	0	11.9
110	12	17.9
120	18	23.9
130	24	29.9
140	30	35.9
150	36	44.9
160	45	59.9
170	60	74.9
180	75	…
Vessel Size by length Overall Class (metre)		
Undecked Vessels		
Code	*Lower Limit*	*Upper Limit*
200	0	5.9
210	6	11.9
220	12	17.9
230	18	23.9
240	24	29.9
250	30	…

APPENDIX 1B. International Standard Statistical Classification of Fishing Gear (ISSCFG, 2016)

Gear categories	Standard abbreviations	ISSCFG code
SURROUNDING NETS		**01**
Purse seines	PS	01.1
Surrounding nets without purse lines	LA	01.2
Surrounding nets (NEI)	SUX	01.9
SEINE NETS		**02**
Beach seines	SB	02.1
Boat seines	SV	02.2
Seine nets (NEI)	SX	02.9
TRAWLS		**03**
Beam trawls	TBB	03.11
Single boat bottom otter trawls	OTB	03.12
Twin bottom otter trawls	OTT	03.13
Multiple bottom otter trawls	OTP	03.14
Bottom pair trawls	PTB	03.15
Bottom trawls (NEI)	TB	03.19
Single boat midwater otter trawls	OTM	03.21
Midwater pair trawls	PTM	03.22
Midwater trawls (NEI)	TM	03.29
Semipelagic trawls	TSP	03.3
Trawls (NEI)	TX	03.9
DREDGES		**04**
Towed dredges	DRB	04.1
Hand dredges	DRH	04.2
Mechanized dredges	DRM	04.3
Dredges (NEI)	DRX	04.9
LIFT NETS		**05**
Portable lift nets	LNP	05.1
Boat-operated lift nets	LNB	05.2
Shore-operated stationary lift nets	LNS	05.3
Lift nets (NEI)	LN	05.9
FALLING GEAR		**06**
Cast nets	FCN	06.1
Cover pots/Lantern nets	FCO	06.2
Falling gear (NEI)	FG	06.9
GILLNETS AND ENTANGLING NETS		**07**
Set gillnets (anchored)	GNS	07.1
Drift gillnets	GND	07.2
Encircling gillnets	GNC	07.3
Fixed gillnets (on stakes)	GNF	07.4
Trammel nets	GTR	07.5
Combined gillnets-trammel nets	GTN	07.6
Gillnets and entangling nets (NEI)	GEN	07.9

Gear categories	Standard abbreviations	ISSCFG code
TRAPS		**08**
Stationary uncovered pound nets	FPN	08.1
Pots	FPO	08.2
Fyke nets	FYK	08.3
Stow nets	FSN	08.4
Barriers, fences, weirs, etc.	FWR	08.5
Aerial traps	FAR	08.6
Traps (NEI)	FIX	08.9
HOOKS AND LINES		**09**
Handlines and hand-operated pole-and-lines	LHP	09.1
Mechanized lines and pole-and-lines	LHM	09.2
Set longlines	LLS	09.31
Drifting longlines	LLD	09.32
Longlines (NEI)	LL	09.39
Vertical lines	LVT	09.4
Trolling lines	LTL	09.5
Hooks and lines (NEI)	LX	09.9
MISCELLANEOUS Gear		**10**
Harpoons	HAR	10.1
Hand implements (Wrenching gear, Clamps, Tongs, Rakes, Spears)	MHI	10.2
Pumps	MPM	10.3
Electric fishing	MEL	10.4
Pushnets	MPN	10.5
Scoopnets	MSP	10.6
Drive-in nets	MDR	10.7
Diving	MDV	10.8
Gear NEI	MIS	10.9
GEAR NOT KNOWN		**99**
Gear not known	NK	99.9

APPENDIX 2. Definition of vessel length (L)[4]



[4] See also the definitions provided in Glossary.

APPENDIX 3. Approximate relationship between the length overall (LOA) of fishery vessels and their gross tonnage (GT)

1. INTRODUCTION

Tonnage is a measure of the cargo-carrying capacity of a vessel and is commonly used to assess fees to be paid by the vessel, such as port fees. Tonnage measurement originates from the days of sailing vessels when the carrying capacity of vessels, which were used to transport wine in casks, was established by counting the number of "tuns" (casks) for each vessel.

In modern maritime usage, "tonnage" specifically refers to a calculation of the volume or cargo volume of a vessel. Tonnage measurement is, therefore, a volumetric system and should not be confused with the weight-based terms "deadweight" and "displacement", which are expressed in either metric tons (tonne) or long tons. The deadweight is the displacement weight of the vessel minus the lightship weight. The deadweight of a fishing vessel typically includes the catch, fishing gear, fuel, water, stores and the crew.

2. THE INTERNATIONAL CONVENTION ON TONNAGE MEASUREMENT OF SHIPS, 1969

The International Convention on Tonnage Measurement of Ships (1969) is the current international system for tonnage measurement of vessels. The Convention, which was the first successful attempt to establish an internationally acceptable system for tonnage measurement, was drafted to ensure that gross tonnage (GT) and net tonnage (NT), calculated under the new system, did not differ too greatly from the traditionally used terms gross register tons (GRT) and net register tons (NRT), calculated under previous methods. Gross tonnage forms the basis for manning regulations, safety rules and registration fees. Both gross and net tonnages are used to calculate port fees.

The Convention, which applies to vessels of 24 metres in length and over, entered into force on 18 July 1982 and was progressively implemented to cover all eligible vessels over the following 12 years.

Gross tonnage (GT), which is a function of the moulded volume of all enclosed spaces of the vessel, is determined by the following formula:

$$GT = K_1 V$$

where:

- V = Total volume of all enclosed spaces, including superstructure and deck houses, of the vessel in cubic metres; and
- $K_1 = 0.2 + 0.02 \log_{10} V$.

The net tonnage (NT) is produced by a formula which is a function of the moulded volume of all cargo spaces of the vessel. The net tonnage shall not be taken as less than 30 percent of the gross tonnage.

An International Tonnage Certificate (1969) is issued to every vessel, of which the gross and net tonnages have been determined in accordance with the Convention.

3. THE VESSEL LENGTH AS THE BASIS FOR MEASUREMENT

The length is another measure of the size of the vessel. The most common vessel lengths used in international instruments are the following:

- the length (L), which is defined as 96 percent of the total length on a waterline at 85 percent of the least moulded depth measured from the keel line; or as the length from the foreside of the stem to the axis of the rudder stock on that waterline, if that be greater. In vessels designed with rake of keel the waterline on which this length is measured shall be parallel to the designed waterline; and
- the length overall (LOA), which is defined as the distance in a straight line parallel to the designed waterline between the foremost point of the bow and the aftermost point of the stern.

While most International Maritime Organization (IMO) and International Labour Organization (ILO) vessel-related instruments use the length (L) as the base for measurement, FAO uses mainly the length overall (LOA) for vessel-related statistics as information on the latter is generally more readily available.

4. APPROXIMATE VALUES OF VESSEL LENGTH (L) RELATED TO VESSEL LENGTH OVERALL (LOA)

In order to find the approximate mean values of vessel length (L) that are related to a vessel's length overall (LOA), the following formula can be used for vessels of 24 m in length and over:

$$L = 0.88 * LOA - 0.12 \text{ (m)}$$

This formula is based on an analysis of the global database of fishery vessels from IHS Market.

5. APPROXIMATE VALUES OF GT RELATED TO VESSEL LOA – FOR VESSELS OF 24 M IN LOA AND OVER

Figure A1 provides a graph of the approximate relationship between the length overall (LOA) of fishery vessels and their gross tonnage (GT). This graph is based on data from IHS Market, consisting of almost 23 000 fishery vessels.

As the vessel length and gross tonnage are not directly related, the graph should only be used as a guide. The actual GT value of a specific vessel can deviate as much as 20 percent from the value obtained from the graph (in particular cases, and even more for small vessels). It also must be considered that before entering into force of the International Convention on Tonnage Measurements of Ships, the gross tonnage was obtained using national rules, which often gave different values for the same vessel. The International Convention does not apply to vessels of less than 24 m in length (L), and because of widely varying vessel types in the smaller range, any attempt to relate GT to length is not advisable.

The graph shows two curves, one for the GT/LOA ration of the global fleet and the other for the European region. Comparison of the GT/LOA ratio between regions shows that the ratio is similar for all regions except Europe, where the GT/LOA ratio is higher.

6. APPROXIMATE VALUES OF GROSS TONNAGE RELATED TO VESSEL LOA – FOR VESSELS OF 18 M IN LOA AND OVER BUT LESS THAN 24 M IN LOA

As stated above, the International Convention on Tonnage Measurement of Ships (1969) applies to vessels of 24 metres in length and over. However, many countries use the formula of the Convention to calculate the gross tonnage of vessels that are less than 24 m in length.

Figure A2 provides a graph of the approximate relationship between the length overall (LOA) of European fishery vessels of 18 m in LOA and over but less than 24 m in LOA, and their gross tonnage. This graph is based on data from the European Commission Fleet Register Database (European Union, 2021).

7. GROSS TONNAGE/LENGTH EQUIVALENCES IN INTERNATIONAL INSTRUMENTS

The length (L) is used in several international instruments as the basis for measurement of fishing vessels. However, as many countries use the vessel gross tonnage or vessel length overall (LOA) in their national legislation for that purpose, the **ILO Work in Fishing Convention (No.188)** (ILO, 2016) and the **IMO Cape Town Agreement** (IMO, 2023) allow the competent authorities to use gross tonnage equivalences in place of length (L) as the basis for measurement. For competent authorities that decide to use such equivalences in measurement, the following provisions apply:

ILO Work in Fishing Convention (No.188)		
Vessel length (L)	**Equivalent length overall (LOA)**	**Equivalent gross tonnage (GT)**
15 m	16.5 m	75
24 m	26.5 m	300
45 m	50 m	950

IMO Cape Town Agreement	
Vessel length (L)	**Equivalent gross tonnage (GT)**
24 m	300
45 m	950
60 m	2 000
75 m	3 000

In addition, the phased implementation of the FAO Global Record of Fishing Vessels, Refrigerated Transport Vessels and Supply Vessels (Global Record) (FAO, 2023b), which is based on vessel size (i.e. gross tonnage (GT or GRT) or vessel length), uses the following gross tonnage/length equivalences as a guide:

- Phase 1: vessels of 100 gross tonnage or 24 m in length, and above;
- Phase 2: vessels between 50 and 100 gross tonnage, or length between 18 and 24 m; and
- Phase 3: vessels between 10 and 50 gross tonnage, or length between 12 and 18 m.

Sample GT calculations for a 60m vessel, using the Worldwide set of fishing vessels regression line in Figure A1

LOA = 60m

The formula is:

$$\mathbf{GT = 2.350 \cdot 10^{-3} \cdot LOA^3 + 4.767 \cdot 10^{-2} \cdot LOA^2 + 4.034 \cdot LOA}$$

Therefore:

$$GT = ((2.350 \cdot 10^{-3} \cdot (603)) + ((4.767 \cdot 10^{-2} \cdot (602)) + (4.034 \cdot 60)$$

$$GT = (2.350 \cdot 10^{-3} \cdot 216000) + (4.767 \cdot 10^{-2} \cdot 3600) + 242.04$$

$$GT = 507.60 + 171.61 + 242.04$$

GT = 921 (no decimals)

Sample GT calculations for a 20m vessel, using the general fishing vessels regression line in Figure A2

LOA = 20m

The formula is:

$$\mathbf{GT = 4.497e^{-2} \cdot LOA^3 - 1.544 \cdot LOA^2 + 16.036 \cdot LOA}$$

Therefore:

$$GT = ((0.04497 \cdot (20^3)) - ((1.544 \cdot (20^2)) + (16.036 \cdot 20)$$

$$GT = (0.04497 \cdot 8000) - (1.544 \cdot 400) + 320.72$$

$$GT = 359.76 - 617.6 + 320.72$$

GT = 63 (no decimals)

Note 1: The formulas presented above should only be used as a guide. Any attempt to relate GT to the vessel length is not advisable.

Note 2: Because a majority of the vessels in the EU Fleet Register database are trawlers, the general vessel regression line and the formula above reflect best the length–GT relationship for trawlers.

FIGURE A1

Approximate relationship between LOA and GT – Globally and in Europe

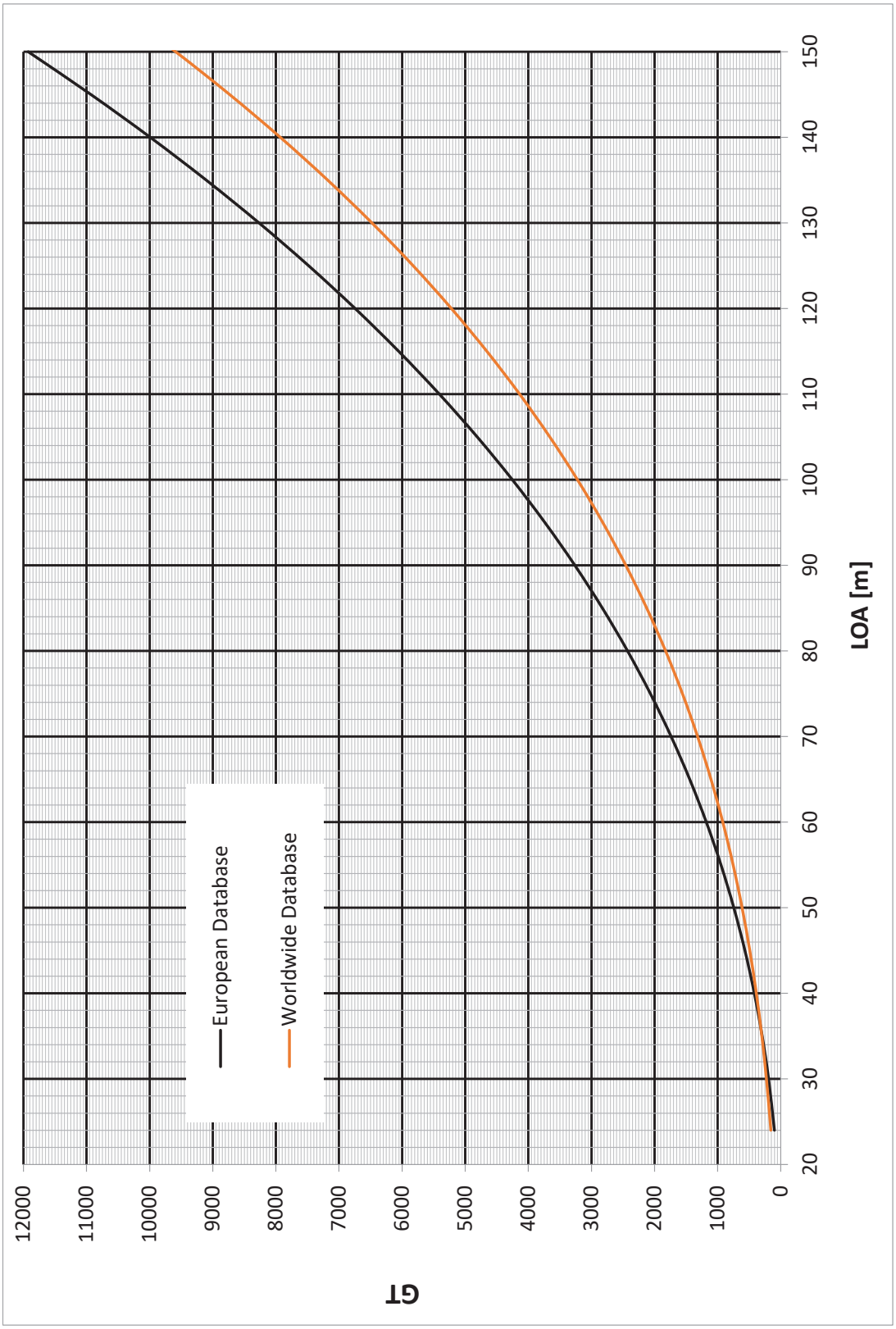
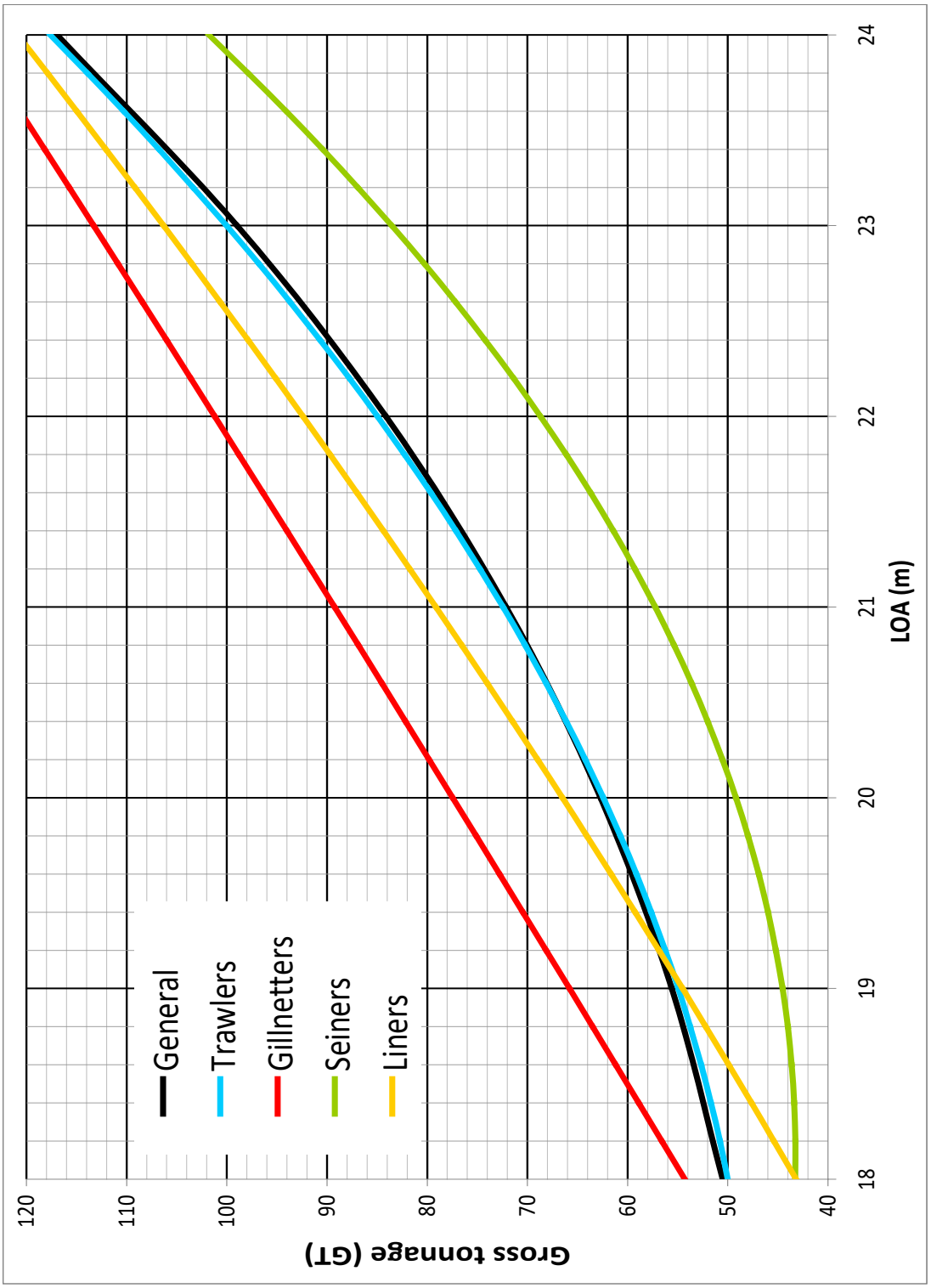


FIGURE A2

Approximate relationship between LOA and gross tonnage for selected subcategories of European vessels of 18 m in LOA and over but less than 24 m in LOA



APPENDIX 4. Innovative vessel designs to reduce greenhouse gas emissions

According to FAO statistics, approximately 61 percent of the global fishing fleet (estimated at 4.1 million fishing vessels in 2020) is made up of motorized vessels. The main energy source that is used by almost all these motorized vessels is fossil fuel, which results in greenhouse gas (GHG) emissions into the atmosphere.

FAO has estimated that the global fishing fleet (including inland vessels) consumed 53.9 million tonnes of fuel in 2012, emitting 172.3 million tonnes of CO_2 (Barange *et al.*, 2018). This was about 0.5 percent of total global CO_2 emissions that year. While overall fish production is relatively energy-efficient compared with other high-quality animal protein production on land, opportunities for further reduction in energy use and emissions are available. For example, the vessel GHG emissions could be reduced by 10–30 percent with more efficient engines, larger propellers, better vessel shape and hull modifications, and speed reductions.

In addition, and in order to find alternatives to fossil fuels, several renewable energy options are being designed and constructed, such as: electric vessels equipped with lithium-ion batteries charged from shore power; vessels fitted with a hydrogen power generation system (hydrogen fuel cells); and solar-powered vessels with lithium-ion batteries. The use of these renewable energy sources provides opportunities for designing innovative vessel hulls, with different general arrangements. Several hybrid solutions are also in operation since 2019/2020, such as vessels equipped with battery packs and a diesel engine that power the vessel together for a full day of operation. An example of an innovative electric longliner design is provided in Figure A3. Figures A4 and A6 present a multi-purpose electric fishing vessel which has been in operation in Norway since 2015. Hydrogen powered, zero emission, fishing vessels are under construction in various countries. An example of a zero emission fishing vessel, which is under construction in 2023, is provided in Figures A5 and A7.

Wind propulsion, which was historically a common energy source in fisheries is rare today. However, a new generation of innovative propulsion technologies that utilize wind power, either alone or in combination with the above-mentioned sources of energy, may also be part of the future design of fishing vessels.

FIGURE A3

15m Electric longliner – General arrangement

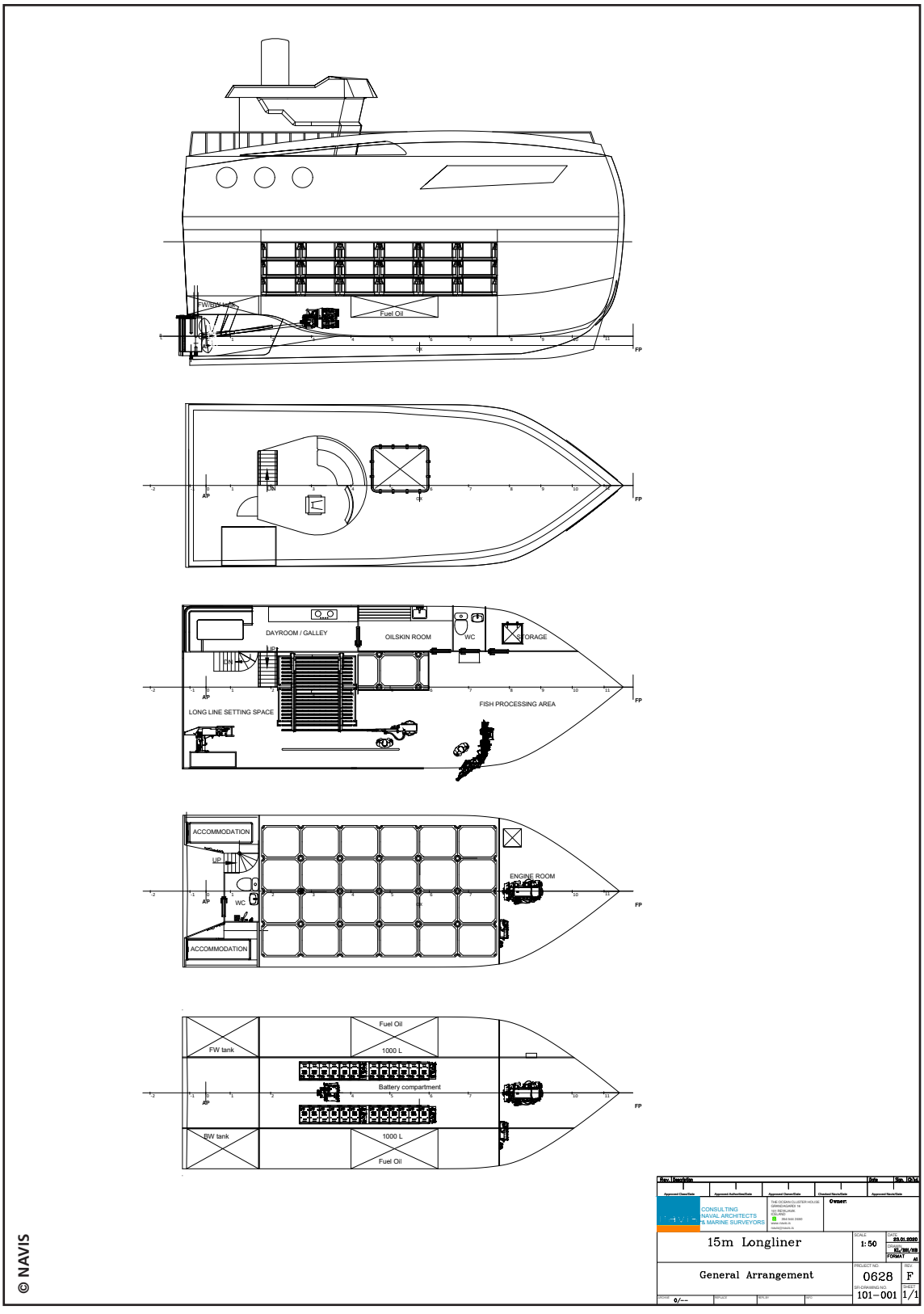
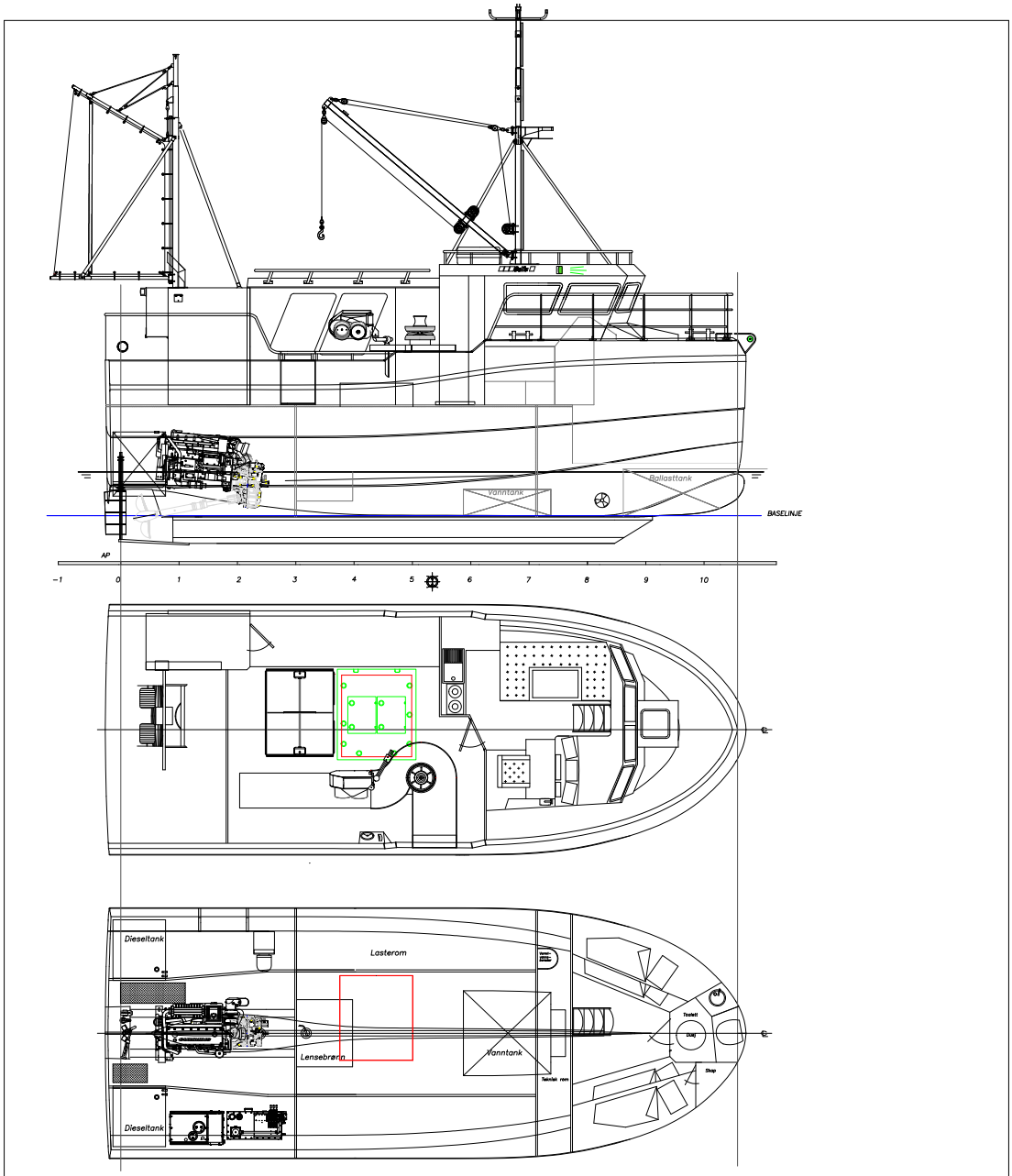


FIGURE A4
11m Electric fishing vessel "Karoline"

FIGURE A5
13m Hydrogen powered fishing vessel – artist impression

FIGURE A6

11m Electric fishing vessel "Karoline" – General arrangement



HOVEDDIMENSJONER

LOA	:10990 mm
LPP	:10690 mm
(BREDDE uten fenderlist	: 4300 mm)
D riss (ved LPP/2)	: 1920 mm
DYPG. TIL K.V.L.	: 750 mm
STYRLAST	: 0 mm

TEKNISKE SPESIFIKASJONER

Fast stålkjøl	: 2000 kg
Ballasttank forut	: 830 l
Ballasttank akter,sb	: 0 l
Ballasttank akter,bb	: 0 l
Ferskvannstank	: 500 l
Lasterom	: 22 m³
Dieseltanker	: 2x800 l

NØDUTSTYR (En del er ikke inkludert i spesifikasjon):

1. Redningsflåte (Styrehustak) 4 mann ikke inkl.
2. Livbøye (Styrhus bb)
3. Overlevingsdrakt (Benk styrehus), 2 stk, ikke inkl.
4. Nødleider (Akterspeil)
5. Røkdetektor (maskin, lugar)
6. Brannalarmsentral
7. Brannslukningsapparat, 3 x 6kg pulver
8. Redningsvester (Benk styrehus) 2 stk, ikke inkl.
9. VHF radio (Styrehus)
10. Medisinskrin (WC)
11. Brannøks (Styrehus),
12. Horn
13. Nødsteng Brennstofftanker
14. Nødbatteri
15. Nødluke

OBS Tegningen kan omfatte utstyr/leveringer som ikke er inkludert i spesifikasjon/kontrakt

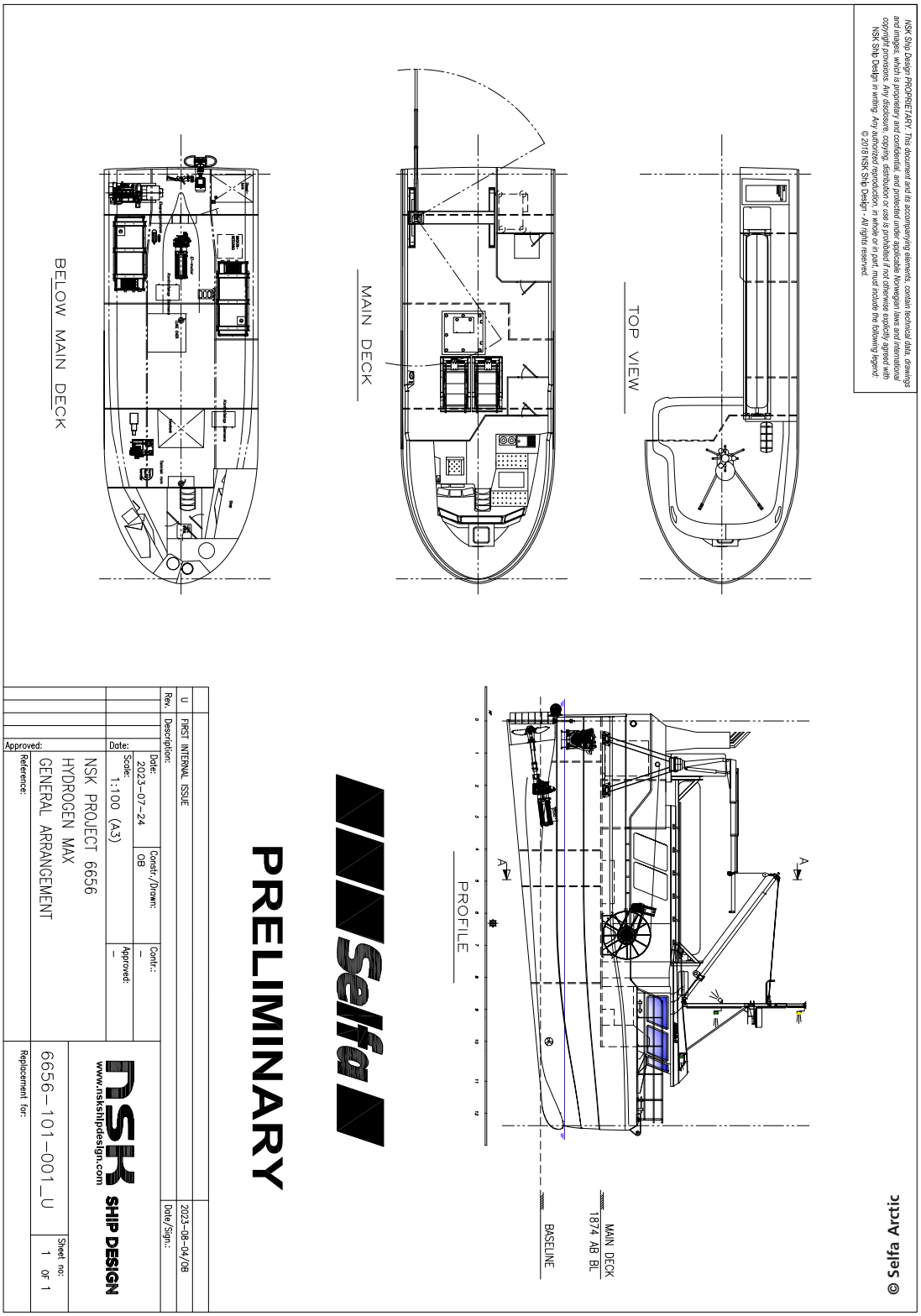
Rev	Alterations	Date	Name
		30.08.16	U

Drawn
Checked
Approved

GA 1099 MAX

Drawing code	Size	Scale	Rev
1099.1.0721	A3	1:60	2

FIGURE A7
13m Hydrogen powered fishing vessel – General arrangement



This technical paper constitutes an update on the 1985 FAO publication *Definition and classification of fishery vessel types*, and provides descriptions and classification of the main semi-industrial and industrial fishing vessel types: trawlers, purse seiners, seiners, dredgers, gillnetters, trap setters, longliners, pole-and-line vessels, trollers, multipurpose vessels. It also features vessels supporting fishing-related activities such as fish carriers, motherships, fisheries research vessels and vessels involved in aquaculture operations. Illustrations of most vessel types and drawings of the general arrangements of selected vessels are provided. The design, size and other characteristics of the main types of semi-industrial and industrial fishing vessels have changed significantly in recent decades, and this technical paper includes several important updates with respect to the 1985 document. The vessel type classification codes employed have been updated, as has the approximate relationship between fishing vessels' length overall (LOA) and their gross tonnage (GT). The classification of the fishing vessel types follows the International Standard Statistical Classification of Fishery Vessels by Vessel Types (ISSCFV) that was endorsed by the Coordinating Working Party on Fishery Statistics (CWP) in 2019. The descriptions and classification are valid worldwide. The main purpose of this paper is to assist FAO Members, regional fishery bodies, as well as those working on fishery statistics and management, with updated information on vessel types and characteristics. It provides users, including non-specialists, with the information to identify and classify all types of semi-industrial and industrial fishery vessels clearly for reporting purposes. Finally, it contributes to FAO's work in support of the implementation of the 1999 International Plan of Action for the Management of Fishing Capacity (IPOA-Capacity) regarding the prevention, deterrence and elimination of illegal, unreported and unregulated (IUU) fishing. It does so by providing monitoring, control and surveillance personnel with information to identify the type of fishery vessels in terms of their licensing and authorization to carry out fishing and fishing-related operations. This technical paper complements the International Standard Statistical Classification of Fishing Gear (ISSCFG) and the FAO publication, *Classification and illustrated definition of fishing gears*.

ISBN 978-92-5-138104-5 ISSN 2070-7010

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CC7468EN/1/09.23