The FAO/ILO/IMO Safety Recommendations for Decked Fishing Vessels of Less than 12 metres in Length and Undecked Fishing Vessels – a major milestone to improve safety for small fishing vessels

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ABSTRACT

Fishing continues to be recognized as one, if not the most, hazardous occupation in the world. The large majority of fatal accidents takes place on board small vessels. The purpose of the Safety Recommendations is to provide information on the design, construction, equipment, training and protection of the crew of small fishing vessels with a view to promoting the safety of the vessel and safety and health of the crew. This paper provides information on the Safety Recommendations, in particular on stability and associated seaworthiness, and puts forward an issue that stability researchers may wish to resolve with high priority.

KEYWORDS

FAO; ILO; IMO; Safety Recommendations; Implementation Guidelines; Code of Safety; Voluntary Guidelines; Stability criteria for small fishing vessels.

INTRODUCTION

Fishing continues to be recognized as one, if not the most, hazardous occupation in the world. In 1999, it was estimated by ILO that there are 24,000 deaths annually, the large majority of these on board small vessels. There is a long-standing cooperation between IMO, ILO, and FAO in developing guidelines and standards on the safety of fishing vessels and fishermen. The latest publication, jointly developed by the three organizations, is the *FAO/ILO/IMO Safety Recommendations for Decked Fishing Vessels of Less than 12 metres in Length and Undecked Fishing Vessels* which was recently published. This international instrument applies to more than 90% of the world fishing fleet and is therefore an important step in improving the safety of small fishing vessels and the crews serving on board those vessels.

STATE OF WORLD FISHERIES SECTOR

Employment in the capture fisheries sector and the size of the global fishing fleet

The most recent estimates from FAO indicate that in 2010 there were 38.3 million people engaged in capture fisheries, of whom 83% were in Asia. In the last five years for which data are available, the number of people engaged in capture fisheries has increased at 0.8% per year.

In 2010, the total number of fishing vessels in the world was estimated to be about 4.36 million vessels. The fleet in Asia was the largest, consisting of 3.2 million vessels accounting for 72% of the global fleet, followed by Africa (11%), Latin America and the Caribbean (8%), North America (3%) and Europe (3%). Among the global fleet, 74% were considered to operate in marine waters, with the remaining 26% operating in inland

waters. Globally, 60% of fishing vessels were engine-powered in 2010. While 69% of vessels operating in marine waters were motorized, the corresponding value for those operating in inland waters was only 36%.

Importance of small vessels

In 2010, more than 85% of the motorized fishing vessels in the world were less than 12 m in LOA. Such vessels dominated in all regions, particularly the Near East, and Latin America and the Caribbean. About 2% of all motorized fishing vessels corresponded to industrialized fishing vessels of 24 m in length and over. Almost all of the non-motorized fishing vessels, or about 98%, are less than 12 m in LOA. Therefore, motorized and non-motorized vessels of less than 12 m in length combined comprise more than 90% of the world fishing fleet.

SAFETY AT SEA IN THE FISHERIES SECTOR

Fishing - probably the most hazardous occupation in the world

As stated above, it was estimated by ILO that the accident death toll in the fisheries sector is more than 24,000 lives annually, the large majority of these on board small vessels. This estimate is based on a world average figure of 80 lives per 100,000 fishermen from countries that have an accident reporting and analysis system in place. It seems plausible that the fatality rates in countries for which data is not available might be higher than it is in those that do keep records and thus the global estimate of fatalities might be even higher. The consequences of loss of life fall heavily on the dependents. In many developing countries, these consequences can be devastating: widows have often a low social standing, there is no welfare state to support the family and with lack of alternative sources of income, the widow and children may face destitution.

Safety at sea in the fisheries sector has been a matter of concern to FAO since its establishment in 1945 and is being addressed in the FAO Code of Conduct for Responsible Fisheries.

Difference between fishing vessels and merchant ships

Why is fishing so hazardous and why is work on fishing vessels more dangerous than work on merchant ships? One of the reasons is probably in the big difference between fishing vessels and merchant ships and in the way they are being operated. During the fishing operations, the crew aboard decked fishing vessels work in exposed areas, in all weather conditions and, unlike merchant ships, the hatches are open! Furthermore, many of the smaller vessels and in particular the undecked vessels, do not operate from safe havens. Instead, the craft are launched from exposed beaches, often through heavy surf conditions.

FAO/ILO/IMO COOPERATION

Instruments jointly developed by the three organizations

There is a long-standing cooperation between IMO, ILO, and FAO in developing guidelines and standards on the safety of fishing vessels and fishermen. The first attempt to address the safety of fishing vessels and fishermen on an international level took place in the early 1960s when the three organizations entered into an agreement to co-operate, within their respective fields of experience. The agreement acknowledged that the respective areas of competence were:

FAO – fisheries in general (which includes areas such as safety in fishing operations and the relationship between fisheries management and safety at sea);

ILO – labour in the fishing industry; and

IMO – safety of life, vessels and equipment at sea.

The voluntary instruments that have been jointly developed by IMO, ILO and FAO are the following:

- Code of Safety of Fishermen and Fishing Vessels, Parts A and B;

- Voluntary Guidelines for the Design, Construction and Equipment of Small Fishing Vessels;
- Document for Guidance on Training and Certification of Fishing Vessel Personnel;
- Safety Recommendations for Decked Fishing Vessels of Less than 12 metres in Length and Undecked Fishing Vessels; and
- Guidelines to Assist Competent Authorities in the Implementation of Part B of the Code of Safety for Fishermen and Fishing Vessels, the Voluntary Guidelines for the Design, Construction and Equipment of Small Fishing Vessels, and the Safety Recommendations for Decked Fishing Vessels of Less than 12 metres in Length and Undecked Fishing Vessels (the Implementation Guidelines).

Table 1: Application of binding and voluntary safety instruments for vessels of different size categories and their personnel

Vessel type and length / Instruments	Decked < 12 m and all undecked	Decked ≥ 12 m and < 24m	Decked ≥ 24 m
Cape Town Agreement			✓
Part B of the Code of Safety			✓
Voluntary Guidelines		✓	
Safety Recommendations	✓		
Implementation Guidelines	✓	✓	✓
ILO C.188/ ILO R.199	✓	✓	✓
STCW-F			✓
Document for Guidance		✓	✓
Part A of the Code of Safety	✓	✓	✓

The three organizations have also cooperated on the development of mandatory instruments, such as the STCW-F Convention; the ILO Work in Fishing Convention (No.188) and accompanying Recommendation (No.199); the Torremolinos Convention and Protocol; and the Cape Town Agreement.

Table 1 provides an overview of various instruments, binding and voluntary, applying to fishing vessels and their personnel.

Design, construction and equipment of fishing vessels

Three of the joint FAO/ILO/IMO voluntary instruments deal mainly with vessel-related issues, i.e. Part B of the Code of Safety; the Voluntary Guidelines; and the Safety Recommendations. The main purpose of these instruments is to provide information on the design, construction, and equipment of fishing vessels with a view to promoting the safety of fishing vessels and safety and health of the crew. The purpose of these voluntary vessel-related instruments is not to be a substitute for national laws and regulations but to serve as a guide to those concerned with framing such national laws and regulations.

Part B of the Code of Safety was originally developed in the early 1960s, and the Voluntary Guidelines in the early 1980s. Both instruments have been revised and were published in 2005.

At the time when IMO approved the revised Fishing Vessel Safety Code and Voluntary Guidelines, the Organization agreed with the proposal by FAO to develop safety standards for small fishing vessels that were not covered by the revised Code and Guidelines. This led to the development of the FAO/ILO/IMO Safety Recommendations.

THE SAFETY RECOMMENDATIONS

Introduction

The Safety Recommendations are the result of the continuing cooperation between FAO, ILO and IMO, in relation to the safety of fishing vessels. They provide guidance to competent authorities for the design, construction, equipment and training of the crews of small fishing vessels, as well as operational safety. The IMO Sub-Committee on Stability and Load Lines and on Fishing Vessels' Safety (SLF) undertook the development of this

instrument in collaboration with FAO and ILO and established a correspondence group that commenced work in 2005. The correspondence group consisted of more than 30 entities, which was a good indication of the importance of the task.

In addition to the IMO competence in relation to safety of life, vessels and equipment at sea, the correspondence group drew heavily on the wide experience of FAO in the design, construction and operation of small fishing vessels, particularly in developing countries where the majority of small fishing vessels operate. It also drew on the competence of ILO regarding conditions of work and service aboard small fishing vessels.

The cooperation between FAO and IMO in relation to measures to combat Illegal, Unregulated and Unreported (IUU) fishing was recognized with particular regard to the adverse impact these kinds of fishing activities have on the safety of small fishing vessels in many parts of the world.

FAO applied the draft Safety Recommendations in various countries through its field projects. The objective was to confirm their relevance to diverse fishing vessel types and operations. The positive feedback was very useful in further developing the final content of the Safety Recommendations.

The correspondence group was coordinated by Capt. Nigel Campbell from South Africa. During its work, from 2005 to 2010, the group used its website (http://www.sigling.is/FVS-ISCG), hosted by the Icelandic Maritime Administration, to exchange and disseminate information and papers.

Contents

The Safety Recommendations has 12 chapters on the following subjects that are supported by 34 annexes, many of which provide useful illustrations.

- General provisions
- Construction, watertight integrity and equipment
- Stability and associated seaworthiness
- Machinery and electrical installations
- Fire protection and fire fighting
- Protection of the crew
- Life-saving appliances
- Emergency procedures and safety training
- Radio communications
- Navigational equipment
- Crew accommodation
- Manning, training and competence

Purpose and scope

The purpose of the Safety Recommendations is to provide information on the design, construction, equipment, training and protection of the crews of small fishing vessels with a view to promoting the safety of the vessels and safety and health of the crews. The Safety Recommendations can also serve as a guide for those concerned with the safety of vessels used in support of aquaculture activities. They should be read in conjunction with Part A of the Code of Safety, as it provides guidance that concerns the safety and health of fishermen on small vessels.

The Safety Recommendations are not intended as a substitute for national laws and regulations but may serve as a guide to those concerned with framing such national laws and regulations. Each competent authority responsible for the safety of vessels should ensure that the provisions of the Safety Recommendations are adapted to its specific requirements, having due regard to the size and type of vessels, their intended service and area of operation. Before doing so, competent authorities should consult with the vessel owners and fishermen, and their representative organizations, and other relevant stakeholders such as vessel designers, builders and equipment manufacturers. When adapting the Safety Recommendations, the competent authority should endeavour to ensure a level of safety at least equivalent to the provision or provisions concerned.

Unless otherwise stated, the provisions of the Safety Recommendations are intended to apply to new decked vessels of less than 12 m in length and new undecked vessels of any length intended to operate in oceans, rivers, lakes and

dams, or any body of water. Nevertheless, even where not otherwise stated, the competent authority should as far as reasonable and practical give consideration to the application of these provisions to existing vessels. The provisions of the Safety Recommendations do not apply to vessels used for sport or recreation.

Design categories

The Safety Recommendations defines four categories of operating conditions, called design categories, which were originally developed by the International Organization for Standardization (ISO). The design categories below indicate sea and wind conditions for which a vessel is assessed by this standard to be suitable, provided the vessel is correctly operated and is operating at a speed appropriate to the prevailing sea state.

Table 2: Design categories

Design category	A	B	C	D
Significant wave height	> 4 m	≤ 4 m	≤ 2 m	≤ 0.3 m *
Wind speeds (Beaufort Force)	> 8 ** (19 m/s)	≤ 8 (19 m/s)	≤ 6 (12 m/s)	≤ 4 (7 m/s)

Notes: * with occasional waves of 0.5 m in height, for example from passing vessels

** but excluding abnormal conditions, e.g. hurricanes

Construction, watertight integrity and equipment

This chapter should apply to all vessels other than wooden vessels of simple construction such as rafts, dugouts, canoes and vessels of proven historical design.

The strength and construction of the hull and other structures, and the vessel's equipment should be sufficient to withstand all foreseeable conditions of the intended service and should be to the satisfaction of the competent authority. Recommended construction standards for wooden, GRP, steel and aluminium vessels are provided in annexes.

The recommended construction standards for wooden fishing vessels apply to single-hull vessels of conventional form and wooden construction and with a speed up to 16 knots. Vessel types that are not covered by the standards are vessels constructed of plywood or glued wood, vessels of simple construction, such as rafts and dugout canoes and vessels judged by the competent authority to be outside the scope of these standards. The recommended construction standards for GRP fishing vessels apply to vessels of conventional form and of single-skin GRP construction.

Stability and associated seaworthiness

Chapter 3 on stability and associated seaworthiness may be applied to vessels other than those of a multihull design and outrigger canoes. It provides stability criteria for decked vessels of all design categories as well as undecked vessels of design categories A, B and C.

The Safety Recommendations provide competent authorities with some flexibility, including by allowing for a limited number of possible options for stability criteria. One option is to apply the IMO criteria to decked fishing vessels of all design categories. However, for decked vessels for which, by reason of insufficient stability data, the IMO criteria cannot be applied or where the competent authority is satisfied that operating experience justifies departure from the IMO criteria, one of the following criteria should be used as the criterion:

- Approximate formula for the minimum metacentric height GM_{min};
- A rolling period test – option 1 (useful for vessels mainly in European region);
- A rolling period test – option 2 (useful for traditionally built vessels in South East Asia region);
- Required metacentric height GMr combined with a rolling period test (Refer to an approximate determination of small vessels stability by means of a rolling period tests); and
- Offset load test.

For undecked vessels of design categories A and B, an inclining test should normally be carried out to establish the metacentric height

GM. The initial metacentric height GM_0 should not be less than 350 mm. However, where the competent authority is satisfied that operating experience justifies departure from this requirement, one of the alternative stability criteria for decked vessels should be used. For undecked vessels of design category C, one of the alternative stability criteria for decked vessels should be used with the exception of the offset load text, which is not applicable.

Table 3: Summary table of stability criteria for decked and undecked vessels

	Existing stability data for the vessel	Criteria for vessels of different design categories	A/B	C	D
Decked vessels	sufficient	IMO criteria	•	•	•
	insufficient (1)	Approx. GM formula	•	•	•
	insufficient (1)	Rolling test option 1	•	•	•
	insufficient (1)	Rolling test option 2	•	•	•
	insufficient (1)	GM + rolling test	•	•	•
	insufficient (1)	Offset load test	•	•	•
Undecked vessels	data from an inclining test	Min. GM =350 mm	•		
	insufficient (1)	Approx GM formula	•	•	
	insufficient (1)	Rolling test option 1	•	•	
	insufficient (1)	Rolling test option 2	•	•	
	insufficient (1)	GM + rolling test	•	•	
	insufficient (1)	Offset load test	•		

Notes: (1) Or where operating experience justifies departure from IMO criteria.

As in the Code of Safety and the Voluntary Guidelines the Safety Recommendations have also requirements on: flooding of fish-holds; particular fishing methods; operating conditions; ice accretion; inclining test; stability information; portable fish-hold divisions; bow height; and maximum permissible operating draught. In addition Chapter 3 has a section on *built-in buoyancy for undecked vessels* which requires every undecked vessel to be fitted with buoyancy compartments, which are filled with solid buoyancy material, acceptable to the competent authority. They should be distributed so that the vessel will stay afloat and on an even keel in order that bailing is possible, without listing if flooded. This buoyancy should be demonstrated by a calculation and/or by a practical test.

Machinery and electrical installations

Machinery and electrical installations should be designed, constructed and installed in accordance with good marine engineering practice. Equipment should be installed, protected and maintained so as not to constitute a danger to persons and the vessel. This chapter has also requirements on outboard engines. Guidance on tools and spares, steering gear, exhaust systems and electrical equipment is provided in the annexes to the Safety Recommendations.

Fire protection and fire fighting

Fire-retardant materials should be used in any part of the vessel where the risk of fire is increased due to proximity of heat sources. Vessels should carry fire extinguishers, one of which should be located near the machinery space. The competent authority may, however, exempt the smallest vessels from this requirement.

Protection of the crew

This chapter covers miscellaneous items, such as deck openings and doors; bulwarks, rails and guards; stairways and ladders; cooking facilities; deck machinery, tackle and lifting gear; lighting in working spaces and areas; ventilation in working spaces; and medical services.

Life saving appliances

This chapter deals with evaluation, testing and approval of life-saving appliances and arrangements as well as vessel requirements. Every vessel of design categories A and B should be provided with at least one life raft or buoyant apparatus, unless the vessel complies with the requirements for built-in buoyancy in Chapter 3 on stability and associated

seaworthiness, having the capacity to accommodate at least the total number of persons on board.

Table 4: Life-saving appliances for vessels of different design categories

Distance from safe haven	≤ 5 nm	≤ 20 nm	≤ 100 nm	≤ 200 nm	> 200 nm
Life raft	A+ B+	A+, B+	A, B, C, D+	A, B, C, D	A, B, C, D
Buoyant apparatus		C♣, D♣			
Lifejacket♥	A, B, C♦, D♦♣	A, B, C♦, D♦♣	A, B, C♦, D♦♣	A, B, C, D	A, B, C, D
Immersion suit♠	A, B	A, B	A, B	A, B	A, B
Lifebuoy●	A, B, C, D	A, B, C, D	A, B, C, D	A, B, C, D	A, B, C, D
Distress signals: 4 parachute rockets+++	A, B	A, B	A, B	A, B	A, B
Distress signals: 2 handheld flares	C, D	C, D	C, D	C, D	C, D
Capsize rope	A, B, C, D	A, B, C, D	A, B, C, D	A, B, C, D	A, B, C, D
Whistle, mirror and torch	A, B, C, D	A, B, C, D	A, B, C, D	A, B, C, D	A, B, C, D

Notes: + The life raft may be substituted with a buoyant apparatus.
♣ Recommended.
♥ For every person on board.
♦ The lifejacket may be substituted with a personal flotation device.
♠ For every person on board a vessel operating in areas where low water or air temperature can be expected.
● Where the vessel is decked and 7 m in LOA or over.
+++ Two of the rockets may be replaced by handheld flares.

The competent authority, taking into account the vessel's navigational area, conditions of operation and size, may permit the vessel to carry other survival craft of a type and number to the satisfaction of the competent authority. Such survival craft may be of rigid or semi-rigid construction. The competent authority should consider the local meteorological conditions and area of operations and may require a life raft or buoyant apparatus to be carried on any vessel.

Emergency procedures and safety training

The chapter contains requirements on emergency instructions and training. The competent authority should ensure that all owners provide clear instructions written, where practicable, for the crew which should be followed in case of emergency. These instructions should be given to a new crew member before sailing on his or her first trip.

Radio communications

The requirements of this chapter follow requirements of the GMDSS for vessels of design categories A and B. Vessels of design categories C and D are only required to carry a VHF radio installation or a handheld VHF apparatus to the satisfaction of the competent authority as well as a radio receiver for weather forecasts. However, where the competent authority is satisfied that local circumstances justify the use of mobile telephones, vessels engaged exclusively within the coverage of a mobile telephone network may carry, in lieu of the VHF equipment, a mobile telephone.

Furthermore, where practicable, in addition to meeting the requirements of the VHF equipment and radio receiver, every vessel of design categories C or D engaged on voyages beyond sea areas with a continuously operating VHF station, should be provided with an MF or HF radio installation or a satellite EPIRB.

Navigational equipment

Vessels should be fitted with a compass, which may be handheld or substituted by an alternative acceptable to the competent authority, such as a satellite navigation system. Due to the nature of the voyage or the proximity to land, the competent authority may consider exempting a vessel or group of vessels from this requirement.

Consideration should be given to fitting vessels with radar. It is recommended that the installation should be capable of operating in the 9 GHz frequency band

If practicable, every vessel should be equipped with a radar reflector meeting widely accepted performance standards for such devices. A recommended performance standard for a radar reflector is provided in an annex. The chapter also provides recommendations on: nautical instruments and publications; signalling equipment; navigating bridge visibility; and navigation lights. Further guidance on these items is provided in the annexes.

Crew accommodation

This chapter is in line with Annex III of the ILO Work in Fishing Convention, 2007 (No.188). Unless expressly provided otherwise, the chapter should apply to decked vessels of design categories A and B that are at sea for more than 24 hours. The chapter contains recommendations on miscellaneous items, such as lighting, heating and ventilation; sleeping spaces; eating spaces and cooking facilities; sanitary facilities; and water facilities.

Manning, training and competence

The competent authority should ensure that vessels are sufficiently and safely manned with a crew necessary for the safe navigation and operation of the vessel, and under the control of a competent skipper. When deciding on the manning, the competent authority should take into account:

- seasonal weather conditions;
- sea states in which the vessel could operate;
- the type of vessel;
- the range and risk of the fishing operation;
- the length of time the vessel is at sea;
- the distance from shore;
- the training and experience of the fishermen;
- the need to minimize fatigue; and
- the need to ensure fishermen are given regular periods of rest.

The chapter also provides recommendations on certification of skippers; skippers' standard of competence; and skipper and other crew training.

THE IMPLEMENTATION GUIDELINES

In 2007, IMO agreed to FAO's proposal regarding the development of new guidelines to assist Competent Authorities in the implementation of voluntary FAO/ILO/IMO instruments on the design, construction and equipment of fishing vessels of all types and sizes, i.e. Part B of the Code of Safety, Voluntary Guidelines and the Safety Recommendations. The Implementation Guidelines have now been completed and it is expected that they will be published in 2013.

The Implementation Guidelines are intended for the attention of maritime, labour and fisheries ministries and any other relevant government ministry as and when it is decided to implement Part B of the Code, the Voluntary Guidelines and the Safety Recommendations. The cooperation and coordination between administrations on a national level is important, particularly where the responsibilities for safety of fishing vessels are divided under relevant Acts.

While the intention is not to provide a single prescription to improve safety, the Guidelines do seek to raise awareness and offer guidance on a broad range of issues which must be addressed in an effective and holistic manner.

The Guidelines cover areas such as:

- Development of a safety strategy;
- Legal implications;
- Administrative requirements;
- Capacity-building;
- Training of crew members;
- Enforcement of regulations; and
- Operational safety.

Although the main purpose of the Implementation Guidelines is to assist competent authorities in the implementation of voluntary instruments, it could also be useful when implementing the provisions of the Cape Town Agreement.

CONCLUSIONS

The Safety Recommendations apply to more than 90% of the world fishing fleet and are therefore a major milestone to improve safety for small fishing vessels. They have already been used by a few countries in upgrading their national laws and regulations related to safety at sea in the small-scale fisheries sector.

Stability is a fundamental aspect of the safety of a fishing vessel and normally there is a need for professional expertise to carry out the necessary calculations in order to determine whether the vessel meets some minimum criteria. Such expertise is often not available to those who are involved with the design and construction of small fishing vessels, in particular in developing countries.

The Safety Recommendations provide several alternative stability criteria when the existing stability data for the vessel is insufficient or where operating experience justifies departure from the IMO criteria. Such alternative criteria are often based on the operating experience of traditionally built vessels in a limited number of countries. As such criteria may not be representative globally they have to be applied with special care. For these reasons, there is a need for more research into the stability of small fishing vessels with the aim to develop criteria that could be applied globally without complicated and time-consuming calculations.

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