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Enacting the new UK Code of Practice for the Safety of Small Fishing Vessels of less than 15m Length Overall

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CONTEXT

Fishing remains the most dangerous peacetime occupation in the UK, with a fatality rate approximately 100 times higher than that of the general UK workforce. 2021 saw the tragic death of 10 commercial fishermen in accidents at sea, the highest in a decade, highlighting the importance of improving safety in the UK fishing industry. This endeavour aligns with The United Nations Sustainable Development Goal 8 which aims to promote decent work for all.

Small fishing vessels are the most vulnerable to accidents at sea due to their size relative to the sea state and are the most likely to capsize due to insufficient stability. This is a major source of concern as more than 80% of the UK fishing fleet is comprised of vessels of less than 15m overall length.

The safety of small fishing vessels continues to be under-regulated worldwide with no legally binding international safety requirements currently in place. Safety guidelines have been released by the International Maritime Organization (IMO), the Food and Agriculture Organisation (FAO) and the European Union (EU) in addition to several individual countries, but few countries have mandatory national safety regulations for small fishing vessels. Examples are Ireland, Canada and the Scandinavian nations.

On 6th September 2021, the Maritime and Coastguard Agency's Code of Practice for the Safety of Small Fishing Vessels of less than 15m Length Overall came into effect. The Code's primary aims are to improve safety in the small-scale UK fishing industry and to raise the safety awareness of all those involved with the construction, operation and maintenance of small commercial fishing boats.

Whilst most areas of the Code provide transitional arrangements until 6th September 2023, when all vessels must be in full compliance, there are no transitional arrangements for vessel stability. This is a key focus of the new Code, as accident investigation reports demonstrate that stability deficiencies are the common denominator of small fishing vessel casualties worldwide. The new Code utilises the Wolfson Stability Method in conjunction with simplified tests for assessing vessel stability and, as of 6th September 2021, was underpinned by Marine Guidance Note (MGN) 526 F 'Stability guidance for fishing vessels - Wolfson method' [1] and MGN 503 F 'Procedure for Carrying out a Roll or Heel Test to Assess Stability for Fishing Vessel Owners and Skippers' [2].

Whilst the new Code aims to reduce the rate of fatal fishing incidents in the UK, it is expected that most existing vessels will fail to comply with the new stability requirements as they were not designed to do so.

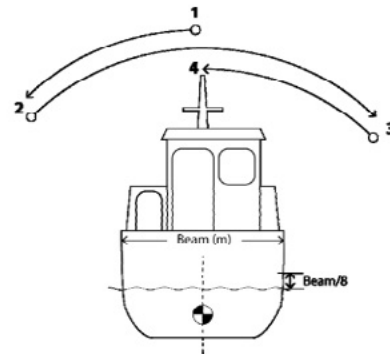
Relevant Sustainable Development Goals:



KEY FINDINGS

F1 One of the tests specified in the new Code is the Roll Test. This is an approach to infer initial stability, whereby the roll period (time taken by a vessel to roll from one side to the other and back again) is used to infer metacentric height (GM).¹ Vessels whose roll period in seconds is greater than their beam (i.e. 'width') in meters are said to be 'tender' and fail the Roll Test. Vessels whose roll period in seconds is less than their beam in metres are said to be 'stiff' and pass the test.

Figure 1 Diagram of a complete roll, from position 1 to 4, as relevant for a roll test. Source [2]



Naval architecture principles discussed in [3], model test results presented in [4], [5] and selected marine accident investigation reports presented in [6] consistently indicate that roll period measurements provide an approximate method of determining GM, a stability characteristic that is not necessarily a measure of safety at large angles of heel. Those references also confirm that the principal value of the roll period test is in identifying a change in the stability of the vessel. The roll test, therefore, is useful for a surveyor or consultant to identify whether a vessel has been modified and, in addition, whether the initial stability has been eroded by any modification.

F2 Evidence presented in [6] shows that hard chine, bilge keel vessels consistently fail roll tests whereas vessels without bilge keels consistently pass. Features such as hard chines, a large keel or bilge keels, or other large underwater appendages increase roll damping and therefore roll period without affecting GM, which is a direct measure of initial stability.

F3 Two additional tests specified in the new Code are the Heel Test and the Offset Load Test. Both these tests are conducted in the port departure condition and require heeling the vessel to one side until it reaches equilibrium. The Heel Test consists in conducting a heavy lift over the side, such that the heeling moment applied represents typical fishing operations. The Offset Load Test consists in distributing a known weight, dependent upon the length and beam, along one side of the vessel. Whilst these two tests are intended to assess the vulnerability of the vessel to capsizing whilst undertaking an onerous lift or loaded asymmetrically, their outcome is a simple pass/fail. No guidance is given to the skipper/crew as to which lifts can safely be performed given the prevailing sea state, and how close to the limit a vessel may be whilst overloaded or lifting. Conversely, as pointed out in [7], the Wolfson Stability Method provides a simple traffic light system that, in real-time, enables the fishermen to self-assess the envelope of safe operation of their own vessels in the prevailing sea state, and to operate within that envelope.

RECOMMENDATIONS

The findings provide a clear route to improving the vessel stability requirements presented in the new Code of Practice and, therefore, its overall fitness for purpose. Accordingly, we make the following recommendations:

R1 Downgrade the Roll Test as presented in the new Code (direct assessment of roll period against overall beam) from a stability criterion to a tool available to owners, skippers and vessel safety advisers for assessing stability changes over time. Roll tests conducted at regular intervals over the lifetime of a vessel will enable assessment of significant alterations or cumulative small modifications over time.

R2.1 Recognise in future marine legislation and guidance that the Roll Test as presented in the new Code (direct assessment of roll period against overall beam) is potentially misleading for vessels fitted with roll damping features such as hard chines and large underwater appendages, and explicitly provide alternative routes for assessment.

R2.2 Redraft MGN 503 F 'Procedure for Carrying out a Roll or Heel Test to Assess Stability for Fishing Vessel Owners and Skippers' of May 2014 in a manner to present:

- the simplified stability tests outlined in the new Code,
- the assessment routes available to each fishing vessel type / fishing method, and
- the alternative arrangements available to vessels that fail to meet a stability tests.

R3 Redraft MGN 503 F 'Procedure for Carrying out a Roll or Heel Test to Assess Stability for Fishing Vessel Owners and Skippers' of May 2014 to describe how the Wolfson Stability Notice and Wolfson Freeboard Mark may be used in conjunction with the Heel Test and Offset Load Test, to provide fishing vessel owners and skippers an indication of the safe operational envelope of their vessels and allow vessels with marginal stability to operate in a controlled manner within an evidence-based, seastate orientated allowance.



REFERENCES

[1] Maritime and Coastguard Agency. Marine Guidance Note 526(F) 'Stability guidance for fishing vessels – Wolfson method', November 2018.

[2] Maritime and Coastguard Agency. Marine Guidance Note 503 (F) 'Procedure for Carrying out a Roll or Heel Test to Assess Stability for Fishing Vessel Owners and Skippers', May 2014.

[3] Wolfson Unit. 'MCA Research Project 529: Loading Guidance for Fishing Vessels Less than 12m Registered Length – Phase 1'. Report No.1778, Maritime & Coastguard Agency, UK.

[4] Wolfson Unit. 'MCA Research Project 571: Intact Stability Severe Wind and Rolling Criterion – An Equivalent Standard'. Report No.1995, Maritime & Coastguard Agency, UK.

[5] Deakin, B. and Weynberg P.A. 'Practical Solutions to Common Ship Motion Problems', Project '97, Amsterdam, November 1997.

[6] Scarponi, M., Dbouk, W. and Booth, A. 'Outcome monitoring protocol and post-implementation review in support of the new Code of Practice for the Safety of Small Fishing Vessels.', Wolfson Unit Report ref. 2873ms, Southampton Marine and Maritime Institute, UK.

[7] Wolfson Unit. 'MCA Research Project 559: Loading Guidance for Fishing Vessels Less than 12m Registered Length – Phase 2'. Report No.1903/2, Maritime & Coastguard Agency, UK.

¹ Given a loading condition, GM is the distance between the vessel's centre of gravity at that condition and the vessel's initial metacentre. GM is a measure of the initial stability of a boat that is, the ability of a boat inclined by an external force to a small angle to return to the upright position. Raising a vessel's centre of gravity reduces initial stability.



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