NIPWG 6-09.1

Paper for Consideration by NIPWG

Proposed Definitions for Underkeel Clearance Management (UKCM) Systems definitions for S-32 (IHO Hydrographic Dictionary)

Submitted by:	United States (NGA)
Executive Summary:	New proposal for definitions regarding Underkeel Clearance Management Systems.
Related Documents:	NIPWG 5-08.6 (Global Underkeel Clearance Management (UKCM) System) Standardization of Mariners' Routeing Guides (S-49) IHO Hydrographic Dictionary (S-32)
Related Projects:	S-127 (Marine Traffic Management Test Data Set)

Introduction / Background

The S-100 Working Group Underkeel Clearance Management Project Team (UKCMPT) requested NIPWG to include underkeel clearance and underkeel clearance management system information in the Marine Traffic Management (S-127) Test Data Set.

NIPWG added the Jussland Underkeel Clearance Management System to the S-127 Test Data Set.

NIPWG realized no official definitions existed for underkeel clearance management systems. NIPWG is working with the UKCMPT to develop definitions for Underkeel Clearance Management System, Static Underkeel Clearance Management System (original NIPWG term), and Dynamic Underkeel Clearance Management System (original NIPWG term).

Based on an action item from NIPWG 5 the final definitions will be submitted to the Hydrographic Dictionary Working Group (HDWG) for eventual inclusion in the IHO Hydrographic Dictionary.

Analysis / Discussion

The only definition in the Hydrographic Dictionary involving a vessel's underkeel clearance is an official definition for Underkeel Clearance:

> "The distance between the lowest point of the ship's hull, normally some point on the keel, and the sea floor." (IHO Hydrographic Dictionary)

Normally, calculating a vessel's required underkeel clearance involved mathematical computations based on one or more defined characteristics, with no shore- or internet-based interactions, such as:

1. A strictly defined value (example: 1 meter).
2. Vessel characteristics (length, beam, draft, type).
3. Geographical location.
4. Simple tidal conditions (rising, falling, slack water)
5. Percentage of available water depth.

NIPWG originally proposed these systems be referred to as Static UKCM Systems. The UKCMPT was concerned the use of the term static might create confusion regarding

measuring a vessel's draft from a static (not making way) position. Potential alternatives to the word static are predetermined, set, fixed, or passive.

Technology has improved to the point where dynamic/interactive/real-time underkeel clearance management systems involving various degrees of shore- or internet-based interactions are being developed. The two most well-known are:

1. Underkeel Clearance Management System in the Torres Strait (Australia)—Requires certain vessels to register on the system's web site in order to participate.
2. St. Lawrence Seaway Draft Information System (Canada)—An optional system where vessel's wishing to participate must purchase and install an approved Draft Information System tested and certified to the Implementation Specifications developed by St. Lawrence Seaway Authorities which has been verified to be in compliance by a member of the International Association of Classification Societies.

NIPWG originally proposed these systems be referred to as Dynamic UKCM Systems. The UKCMPT was concerned with the use of the term dynamic, stating the word is included in the title of one system, which may cause proprietary use issues. Potential alternatives to the word dynamic are real-time, agile, live, or active.

Based on the concerns of the UKCMPT, the words "static" and "dynamic" will be placed in quotation marks to indicate the terms are placeholders until acceptable alternative terms are agreed to.

Conclusion

Official definitions for Underkeel Clearance Management Systems have never been created, especially since the development of dynamic/interactive/real-time systems which operate using different methodologies when compared to the legacy underkeel clearance management systems. These terms need to be appropriately defined to avoid any confusion regarding how the different systems operate.

NIPWG Recommendations

Add official definitions to S-32 for Underkeel Clearance Management System, "Dynamic" UKCM System, and "Static" UKCM System.

The following definitions proposed by NIPWG are recommended to be submitted to the Hydrographic Dictionary Working Group (HDWG) for inclusion in the IHO Hydrographic Dictionary:

1. **Underkeel Clearance Management System—**An aid to navigation which contributes to navigational safety and efficiency. It uses data modelling consisting of detailed bathymetry, predicted and real-time environmental data, and vessel particulars and motion, giving the vessel the information needed to effectively manage its underkeel clearance.
2. **"Static" Underkeel Clearance Management System—**Vessels use pre-calculated information to determine their underkeel clearance, with no shore or web-based interactions.
3. **"Dynamic" Underkeel Clearance Management System—**Vessels monitor their underkeel clearance in real-time using either a web-based system (vessel must pre-register to participate in the system) or a hardware/software-based system (vessel must purchase an approved system loaded with appropriate software to obtain real-time information concerning its underkeel clearance).

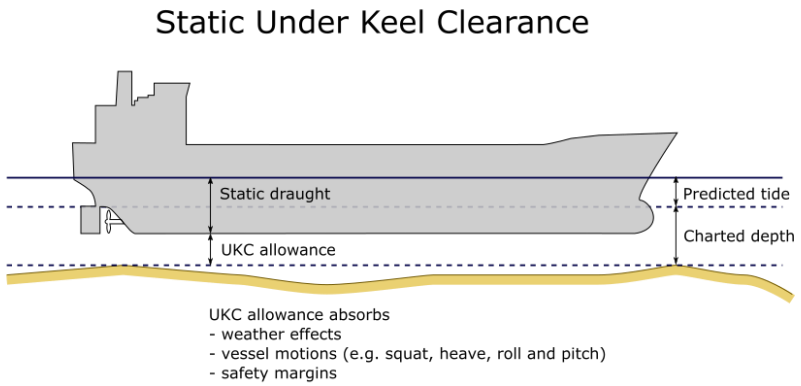
UKCMPT Recommendations

Results of S-129 Project Team discussion on definitions of static and dynamic UKCM (meeting from 17 and 18 Sep 2018):

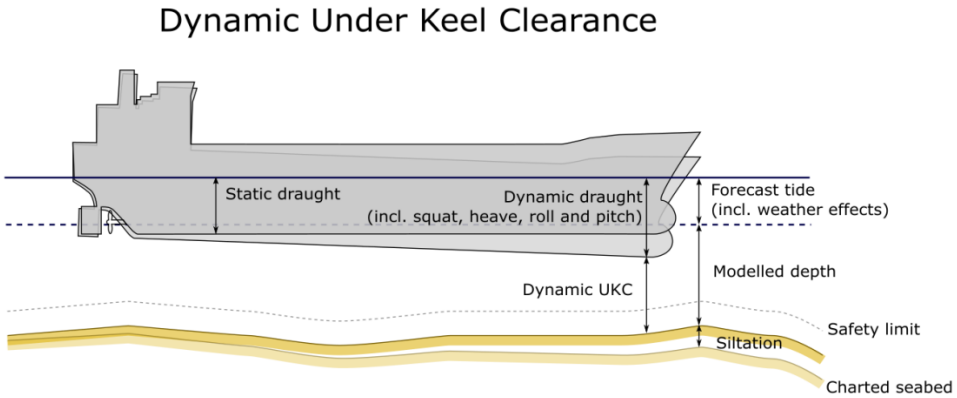
1. Use of the words “static” and “dynamic” was agreed as being readily understandable due to the existing uses of the words.

2. The S-129 PT further developed definitions of Static and Dynamic Under Keel Clearance Management as follows:

    a. Static Under Keel Clearance Management — A method based on rules that uses a vessel’s static draught measurements and predicted tidal or water level information to estimate a vessel’s under keel clearance when underway in a depth constrained waterway. Static Under Keel Clearance Management approaches do not involve real-time interaction between vessels and shore-based service providers.



    b. Dynamic Under Keel Clearance Management System — A system that typically involves interaction between vessels and shore-based service providers and which calculates a vessel’s under keel clearance. Dynamic Under Keel Clearance Management Systems use sophisticated models and real-time met-ocean inputs to produce vessel-specific services (e.g. tidal windows, routes, no-go and almost no-go areas) to ensure minimum under keel clearances are maintained.



Justification and Impacts

Note: FOR REASONS OF ECONOMY, THE DELEGATES ARE KINDLY REQUESTED TO BRING THEIR OWN COPIES OF THE DOCUMENTS TO THE MEETING

Justifications and impacts would be:

1. Update the Hydrographic Dictionary with up-to-date information on UKCM Systems.
2. All work done by correspondence.
3. Liaison with HDWG.
4. Medium priority.

Action Required of NIPWG

NIPWG is invited to:

a. Note this paper.

b. Finalize definitions for Static UKCM System, Dynamic UKCM System, and Underkeel Clearance Management System.

c. After agreement, NIPWG sends official definitions to the HDWG for approval.