2nd NCWG MEETING
Monaco 26-29 April 2016

Paper for Consideration by the Nautical Cartography Working Group (NCWG)

Report on the Establishment of an Under Keel Clearance Management Product Specification Project Team

Submitted by:	NCWG Chair
Executive Summary:	The HSSC has approved the establishment of a Project Team to develop a Product Specification in S-100 for Under Keel Clearance Management.
Related Documents:	HSSC7-05.1D *UKC Information*
Related Projects:	eNavigation

Introduction / Background

At HSSC7 (November 2015), it was approved to establish a Project Team under the S-100WG to develop an S-100 based Product Specification for Under Keel Clearance (UKC) management. This is a good example of the application of the S-100 *Universal Hydrographic Data Model* in support of the eNavigation concept to provide additional navigational safety and efficiency benefits to the foundation ENC data displayed in ECDIS; and the requirement for the NCWG to participate in the evaluation of the portrayal requirements for additional S-100 based products when displayed in conjunction with the ENC in ECDIS.

Analysis / Discussion

Under Keel Clearance (UKC) management systems are relatively common in Australian ports. Such systems are also being used in an increasing number of ports and waterways around the world. For example a UKC management system will be implemented in the Straits of Malacca and Singapore.

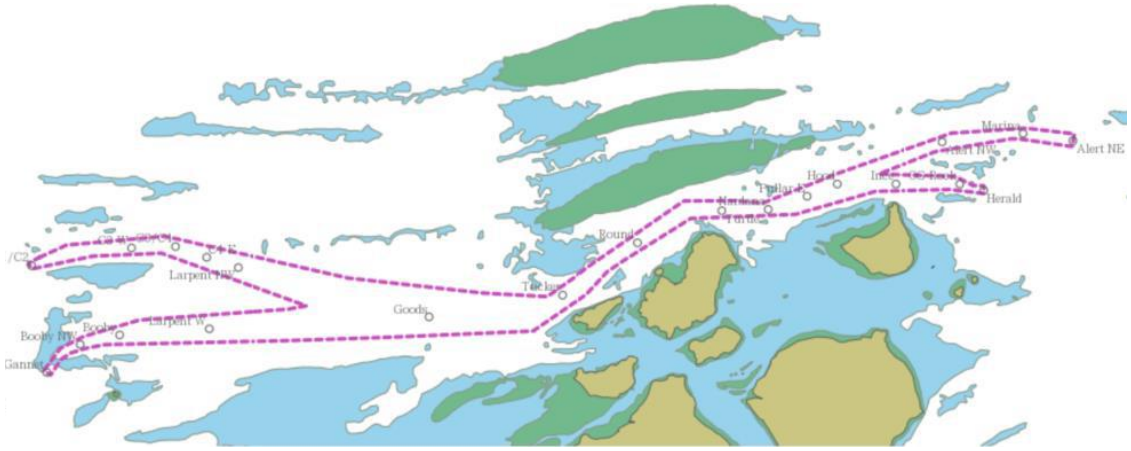
Shipmasters and marine pilots typically use UKC management system information either with a hard copy printout of a proposed UKC-managed transit plan, electronically on a Portable Pilot Unit (PPU) or within similar 'connected' devices (for instance laptop computers). In Australia, licensed coastal pilots are required to use the Australian Maritime Safety Authority's (AMSA's) UKC management system in Torres Strait. Many commercial ports in Australia and in other countries also use real-time UKC management systems to assist manage tight UKC margins and maximise cargo uplift.

UKC management systems are prime examples of user needs being addressed by the application of current and emergent technology. They are also good examples of e-navigation-like solutions, as they meet the IMO definition of e-navigation (which involves the collection, integration, exchange, presentation and analysis of maritime information on-board and ashore by electronic means, so as to provide navigational safety and efficiency benefits).

Currently, real-time UKC management system information cannot be displayed on a ship's Electronic Chart Display and Information Systems (ECDIS). A first step in remedying this situation is to develop an S-100 based Product Specification for UKC management system information.

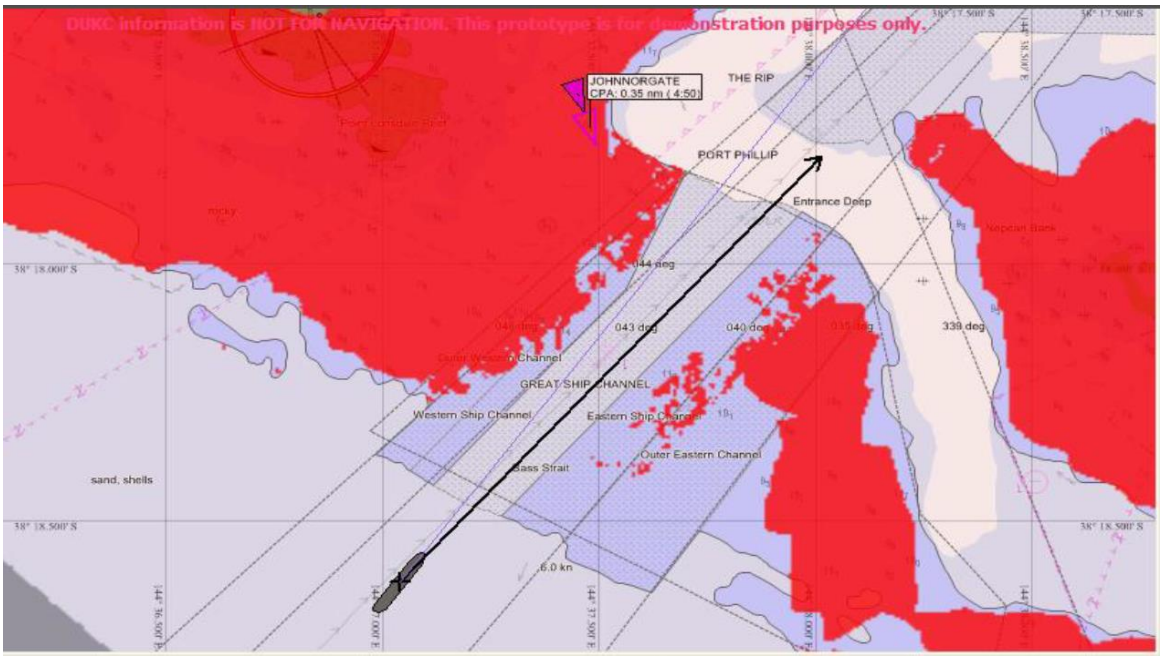
S-10X UKC management products proposed to the HSSC may include:

- Areas (polygons) where UKC management may be implemented. This will assist in transit planning and real-time monitoring by ship's crews;



ENC data showing defined UKC management areas (in magenta)

- Real-time 3 dimensional (3D) and 4 dimensional (4D) chart overlay information, over and above simple safety contour display, showing horizontal distribution of UKC information. This will include locations where, given certain nominated parameters, a potential UKC breach condition (or grounding) may occur (see Figure 2). This will improve situational awareness for pilots and masters within a single integrated display; and
- Sub-metre, high resolution and high accuracy gridded bathymetry in support of chart overlay products. This may support the generation of safety contours and integration of chart overlay data.



Real-time chart overlay information showing areas (in red) of insufficient UKC for a vessel transiting a channel

It is important to note that the UKC management information when utilised by the ECDIS will not change, and is not intended to replace, the underlying fundamental ENC data. The UKC management information is considered to be an “overlay” (or perhaps more appropriately and “underlay”) of supplementary information to the ENC data. These are factors that the NCWG will be required to consider in evaluating the interoperability display requirements in general for products other than the ENC as directed by yhe HSSC.

Conclusions

This paper has been submitted as an example of the impact of the implementation of S-10X products as they may be utilised in an ECDIS and/or an Integrated Navigation System.

Recommendations

The NCWG to consider this paper in the context of HSSC Action 18:

AGENDA ITEM	SUBJECT	ACTION No.	ACTIONS (in bold, action by)	TARGET DATE/EVENT
5.5, 5.6	S-1xx Portrayal Issues	HSSC7/18	**NCWG** to compile portrayal requirements relating to product specifications in general as part of its programme of work.	**NCWG-2**

Justification and Impacts

None.

Action required of NCWG

The NCWG is invited to:

a. **Discuss** this paper in the context of HSSC7 Action 18.