5th IRCC meeting, Wollongong, AU, 3-4 June 2013

Developing C-55 – a UKHO Perspective since IRCC4

Submitted by:	UK
Executive Summary:	The use of CATZOC's to populate a digital C-55
Related Documents:	IRCC4 – Annex B, Discussion on the Validity and Updating of C-55
Related Projects:	IHB projects to host certain publications digitally i.e. P-5, S-11

Introduction
1) IRCC4 – Annex B, Discussion on the Validity and Updating of C-55 identified two Action outcomes:-
* Action 1 Outcome - IRCC Members agreed that simplicity of collection of information in order to maintain its currency were the overriding considerations
* Action 2 Outcome - IRCC Members agreed that CATZOC polygon and depth information would be a reasonable initial approach to the hydrographic quality layer of C-55 but that the system should be extensible to allow future improvements

The UKHO response
2) The UKHO uses ArcGIS to manage the ENCs in its AVCS (Admiralty Vector Chart Series) and this application was deemed ideal to test Action 2 above.
3) The next step was to extract the CATZOC layer from each of the c2500 GB ENCs recognising that this layer is already geo-referenced

Adding a risk based approach to CATZOC depiction
4) The CATZOCs are allocated one of the following six categories:-

A1
A2
B
C
D
U

Using the following approach - when a date of survey is clearly identifiable, either through examination of the source chart or by meta-data within the ENC, the following technology horizons will aid in identifying an appropriate CATZOC value. Noting that date of survey does not always correlate with quality of survey, therefore a recent multibeam survey may not necessarily attain A1 or A2 status.

Date	Sounding Method	Fixing Method	Maximum Attainable ZOC Value for Sounding Method
Pre-- 1865	lead line	Angles to local landmarks	D
1865	lead line	Angles to local landmarks	D
1905	lead line	Angles to local landmarks	D
1935	single beam echo sounder	Angles to local landmarks	C
1950	single beam echo sounder	Electronic position--fixing	C
1973	single beam echo sounder and side--scan sonar	Electronic position--fixing	B
1985	single beam echo sounder	Satellite	B

	and side--scan sonar	position--fixing	
2000	Swathe echo sounder	Satellite position--fixing	A1

And UKHO decided to use a RAG (Red, Amber, Green) approach to depict the status of hydrographic survey, consequently coding the CATZOCs as follows:-

A1 and A2 = Green   (survey method = Multi beam only)
B = Amber   (survey method = Single Beam and Side Scan)
C = Red   (survey method = Single beam only)
D = Red   (survey method = Lead line)
U = Grey

Following the rationale that:-

GREEN = The available survey data are **considered to be adequate** to support safe navigation

AMBER = Some single beam survey data are available but they are **not considered to be adequate** to support safe navigation

RED = Either there aren't any survey data available or the data are from leadline surveys or from sparse soundings taken by passing vessels and, therefore, **considered to be very inadequate** to support safe navigation

A compelling picture which is easy to update
5) The resulting graphics are compelling in their depiction of what IRCC4 – Annex B set out to achieve when drafted, and in accordance with 'Action 1 Outcome' above are easy to update.

The next steps
6) The UKHO will seek to include a 30m depth contour to fully meet the requirements set out in 'Action 2 Outcome' together with AIS data when a suitable source is identified.

Afterthought
7) Several nations have yet to populate the CATZOC layer within their national ENCs so this solution is not perfect.

Conclusions
8) This was a valuable experiment but the UK's rationale for coding the CATZOCs is open to challenge/debate (especially where SB & SSS lies – is this A2 (Green) or B (Amber)? It is hoped that the DQWG can refine the visualization of survey indicators such that this subjectivity can be removed.

Action required of IRCC
9) The IRCC is invited:
i.   to consider the contents of this paper;
ii.   to determine which elements (if any) might feature in future IRCC work.