NCWG2-11.4B

2nd NCWG MEETING

IHB, Monaco 26-29 April 2016

Paper for Consideration by NCWG

Proposal for a Shared INT1 Symbol Repository

Submitted by:	NCWG Secretary
Executive Summary:	Some history to assist members in considering paper NCWG2-11.1A
Related Documents:	INT1; S-4 (in earlier excerpts referred to by former number M-4)
Related Projects:	None

Introduction / Background:

US suggests sharing INT1 symbols via a 'S-4/INT1 Raster Nautical Chart Symbol Graphic Repository (or Library)'. Some former CSPCWG and current NCWG members may recall similar or related subjects being discussed in the past. In order to save time trawling through old records, I have assembled some excerpts (in blue below) from previous explanatory notes and meeting records. Besides saving some time, it will refresh memories of longer serving members and provide background details for newer WG members.

Analysis / Discussion:

Excerpts from CSPCWG/NCWG papers and meetings on the subject of a symbol library:

EN CSPCWG4-10.1A

Proposed adoption of the M-4 symbols as the IHO paper chart symbol library

Submitted by:	AU
Executive Summary:	As the CSPCWG adopts new symbols, it is imperative that an official IHO symbol be released to IHO member states for adoption onto their own charts, and to chart production software manufacturers.
Related Documents:	Chart Specifications of the IHO (M-4), Official INT1s
Related Projects:	CSPCWG task E – maintenance of M-4 supplementary publications INT1, INT2 and INT3. Proposed principles of CSPCWG (paper CSPCWG4-07B)

Introduction / Background

Following the CSPCWG Report to CHRIS18, there was some discussion about the authority of the Chart Specifications of the IHO (M-4) and it is Australia's understanding that M-4 is the specification and that INT1 is supplementary to M-4. Following CSPCWG Letter 06-2007 it would appear that the CSPCWG Chairman and Secretary do not regard M-4 as the 'symbol library' for paper charts.

> [Note: this is probably a reference to a proposal from the INT1 subWG noted in the last paragraph of its report, Annex A to CSPCWG Letter 6/2007, as follows:

Future developments:

Although an IHB tri-lingual version of INT 1, with an IHO approved symbol library, remains an ambition, it is accepted that there is currently no possibility of pursuing this. As a compromise suggestion, the subWG considered that an Annex to M4, with each symbol shown in INT 1 order, with agreed English, French and Spanish terms alongside, would be useful for hydrographic offices. As no international symbol library is available, the symbols used would be those in M4 (mostly currently derived from UK symbols). The WG would be asked to endorse and prioritize this as a future work item. (Noted for CSPCWG4 as paper CSPCWG4-12.1).

In fact, this proposal was rejected at CSPCWG4, see next item.]

Accordingly, if this is the case, the official INT1s cannot be regarded as the 'symbol library' for paper charts either, as they all have differences. As the DE INT1 is the official English INT1, AU has up until this time, adopted the German symbols for use on INT and Aus paper charts and RNCs. We knew there were significantly (in some cases) different symbols in M-4, but as the original publication was so old, we disregarded the symbols shown in it and adopted the DE INT1, being far more recent. Now that M-4 is undergoing a complete review, including the adoption of UKHO symbols, AU believes it needs to be made clear to all IHO member states which set of symbols should be adopted and used for paper charts. This is very important when new symbols such as the sea plane landing area is adopted, as those member states with these charted features will need to add this new symbol and hopefully chart production software houses will also adopt these for their own systems. AU has raised the matter before that it is a huge duplication of work if every MS has to design and implement new symbols. This was one of the reasons for specifying the dimensions of all new symbols in M-4 as we carry out the review.

Analysis / Discussion

We know that historically many MS have slightly different paper chart symbols. But as more and more MS move towards producing paper charts by digital methods and software, we have an opportunity to standardise our symbols into digital symbol libraries. This is precisely what the IHO CSMWG has done over the last couple of years for ECDIS. They have produced a symbol library showing the exact dimensions and colours for every ECDIS symbol (see S-52 Presentation Library Addendum (Edition 3.3), which is freely downloadable from the IHO website. The CSMWG is now moving towards producing a symbol library in compliance with the ISO 19100 series of standards which will eventually go into the proposed IHO registry as a new symbol register.

When the CSPCWG introduce a new symbol for the paper chart, we promulgate it as an update to M-4 via an IHO Circular Letter. This usually has the proposed new or revised wording as well as any new symbol included. As MS adopt the new specifications, often the new symbol will be added to national and official INT1s and the IHO is now promulgating Notice to mariners Corrections for the official INT1s. However there has never been any specific advice as to which symbol is the official one. As CHRIS has now agreed that M-4 is the specification, surely the symbols included within it must be considered as the official paper chart symbols until such time as a separate (or inclusive) paper chart symbol library is actually produced.

As the new editions of M-4 are now adopting the UKHO symbols, the CSPCWG members need to agree that these are suitable for adoption as the official IHO paper chart symbols. These could be reviewed as part of the on-going review of the whole of M-4 Part B. This in turn must lead to the official INT1s also adopting these symbols leading to improved consistency in paper charts. The implications for such a decision are huge for many MS but if a staged approach was adopted, starting off with all new or revised symbols, the process can be looked at as a long term solution. More and more MS are adopting commonly used chart production tools which are now including symbol libraries. Gradually paper chart symbols will become more consistent.

If adopted there is also an additional benefit to those MS who still rely on 'one-off' software solutions and who contract out such work. Once there is IHO advice as to what is the official paper chart symbol set, there can be no argument on what is or isn't an 'official' IHO chart symbol.

Conclusions

The world is moving towards digital symbol libraries. The IHO is moving towards a registry and various registers to hold, maintain and develop its hydrographic features and symbols. It is likely that once the IHO registry is operational, many of the CHRIS WGs may be tasked to produce a digital symbol library for their products. This will lead to more consistent portrayal of hydrographically related products.

The IHO is about supporting one another and consistency in navigational products. We have produced charts for more than 200 years with many of the original symbols still being used today. It's time to use our authority in these matters and declare what the official IHO paper chart symbol set is.

Recommendations

1. That the CSPCWG issue an IHO Circular Letter to all MS advising that M-4 is to be used to construct new or revised paper chart symbols.

2. That full dimensions be provided for all new and revised symbols introduced to M-4.

3. That the official INT1s adopt the M-4 symbols over the next 2 years.

4. That the CSPCWG consider as a long tern goal, to produce an official digital symbol library.

Justification and Impacts

Our priority must be to maintain and review the IHO chart specifications and we mustn't detract from this important task. However in the longer term we should encourage the use of our symbols for any hydrographic features and any product, not just for the traditional paper chart.

Action required of CSPCWG

The CSPCWG is invited to agree to the above recommendations.

From CSPCWG4 Record

10.1 Symbol library

Annex to M-4 suggested by INT1 subWG

Docs: CSPCWG 4-12.1 Report of INT1 subWG (Secretary)

Adoption of M-4 symbols as IHO paper chart symbol library

Docs: CSPCWG 4-10.1A Proposed adoption of M4 symbols as IHO paper chart symbol library (AU)

Acknowledging that there may be slight differences between the chart symbols shown in M-4 and those in the three language versions of INT 1, the meeting discussed whether an international symbol library was desirable and achievable. Possible options were:

- to adopt M-4 as 'the international symbol library' (which is effectively the UK symbol library); add an annex to M-4 which would serve as a symbol library and collection of INT1 terms and descriptions in English, French and Spanish;
- engage a contractor to produce a symbol library separate from M-4;
- maintain status quo, ie no formal symbol library; all HOs free to prepare their own, or adopt those they prefer from other HOs, or use whatever is available from software companies. It was noted, for example, that CARIS has its own symbol library, and also those of France, UK and others, are available.

No definite way forward was decided, except to ask for opinions from the full CSPCWG.

ACTION 17: Secretary to draft WG letter asking for views on a way forward on proposal for symbol library. [This was letter 09/2008, see below]

EN CSPCWG5-09.2A

Symbol Library

Submitted by:	Chairman
Executive Summary:	At the 4th CSPCWG meeting in November 2007, Action 17 charged the Secretary to draft WG letter asking for views on a way forward on proposal for a symbol library. The subsequent correspondence is covered in the related documents.
Related Documents:	CSPCWG4-10.1A (original paper by AU); CSPCWG Letters 09/2008 and 13/2008.
Related Projects:	None

Introduction / Background

At the 4th CSPCWG meeting in November 2007, Action 17 charged the Secretary to draft WG letter asking for views on a way forward on proposal for a symbol library. The subsequent correspondence is covered in the related documents.

Analysis / Discussion

Four possible options were suggested in CSPCWG Letter 09/2008. These options, with a summary of responses and comments, are as follows:

Option	Proposal	YES				NO
		1	2	3	4	
1	to adopt M-4 as 'the international symbol library' (which is effectively the UK symbol library)	DK, JP, IN, IT, NZ, PK,	AU, CA, NL, SE, US, ZA	FI, NO		DE, ES, FR
2	add an annex to M-4 which would serve as a symbol library and collection of INT1 terms and descriptions in English, French and Spanish	DE, FI	IN, IT, NO, PK	CA	AU	DK, ES, FR, JP, NL, NZ, SE, US, ZA
3	engage a contractor to produce a symbol library separate from M-4			AU		CA, DE, DK, ES, FI, FR, IN, IT, JP, NL, NO, NZ, PK, SE, US, ZA
4	maintain status quo, ie no formal symbol library; all HOs free to prepare their own, or adopt those they prefer from other HOs, or use whatever is available from software companies. It was noted, for example, that CARIS has its own symbol library, and also those of France, UK and others, are available	AU, CA, ES, FR, NL, NO, SE, US, ZA	DK, FI, JP, NZ			DE, IN, IT, PK

Members were asked to indicate their preference in the columns above, and add any comments below. They were asked to indicate in the 'YES' columns their order of preference (1,2…), and in the 'NO' column tick (√) any option they consider should not be pursued.

Comments by responding WG members

AU: Given that most Hydrographic Offices have invested considerable time, effort and money into developing and maintaining their own symbol libraries based on what is depicted in M-4 and the

official IHO INT1's (with some minor variations in some cases) for their production systems, AU cannot see any immediate benefit to the IHO or HOs in undertaking the huge task of developing a generic international symbol library at this time. While it would be desirable to move forward with options 2 or 3 above, this would probably be difficult to implement on completion as it would be required for HOs and/or software manufacturers to implement the symbols into their production systems (if they have the functionality and capability). HOs would also be hesitant in implementing such a change where it will cause inconsistency in portrayal in their paper chart/RNC portfolio, and as such would probably retain their national INT1 as their symbol library – can the IHB force HOs to cancel their national INT1's in favour of an international symbol library?

There is work being done by groups such as the Defence Geospatial Information Working Group (DGIWG) in establishing international portrayal registers within their registry, and CSMWG is doing similar work in relation to S-100 for ECDIS symbols. AU recommends that CSPCWG monitor the work being done by these groups for possible future development of a paper chart portrayal register within S-100 at a later date.

CA: Canada prefers to maintain the status quo as we see little immediate benefit to users by adopting a slightly different symbol library considering the large amount of work it would take to update our chart inventory.

DE: M-4 serves as the lead document for cartographers to produce charts. Adding an annex containing "the international symbol library" is therefore supported in principle. The INT1 editions of DE, ES and FR are considered model representations for other HOs to produce their national specifications of symbols, abbreviations and terms for chart users, and are available as repromat files. The differences between the four symbologies are not really important for the chart user, there is mainly consistence in the terms and descriptions (see CSPCWG Letter 10/2008). The vector graphics for the symbols as contained in the current M4 edition differ in some parts from the original M-4 symbols specified by CSC and should be updated to an agreed set of international symbols. An annex to M-4 providing the international symbology should primarily facilitate to HOs adopting this symbology. But then one can dispense with terms and descriptions in the annex (they could be taken from the INT1 editions), one needs only the INT1 reference number and symbol. DE favours a unique table to achieve with the best digitized symbols, which could be some days of work for the INT1 SubWG. The advantage is that new or amended symbols could be developed together and easily and rapidly included in this table, much earlier than in the next INT 1 editions of DE, ES and FR. The proposed DE solution would be equivalent to option 3, but as part (annex to) of M-4, and without contractor which is not seen necessary. We should discuss the topic further at CSPCWG5.

ES: We support comments by France.

FI: We agree with DE comments on option 2.

FR: An offer of paper charts production systems already exists for HOs. Also, there is no such a need to help manufacturers with a strict standardization of symbols.

The added value for end users is low and the cost for CSPCWG (lot of work with other priorities), HOs and manufacturers (to be in accordance with a strict standard) is heavy.

NZ: Whilst New Zealand uses the symbol library in M4, we would also be happy with option 4, maintain status quo.

PK: Int charts, for their nature, are a documents that are compile in the same way and have a standard representation, this for safety and for simplify the use of the chart to the mariner, particularly near the coast or approaching harbour. We have the same system with the ENC where the chart symbols are standard.

US: Many nations already have devoted considerable resources to developing symbol libraries and are unlikely to abandon them. Options number 2 and 3 would slow the progress of the working group.

ZA: South Africa supports the comments made by Australia (AU) under CSPCWG4-10.1A (Annex A).

Conclusions

(As in CSPCWG Letter 13/2008). It will be readily seen that option 3 can be dismissed; there is clearly no desire to engage an external contractor. Options 1 and 4 are finely balanced: 14 accept option 1 and 13 accept option 4. Of those which accept these options, more make option 4 their first or second choice. Although Option 2 gets less support than options 1 and 4, Germany has made a proposal based on option 2 (but not quite the same) which came fairly late among the responses and has therefore not been fully considered by everyone (although Finland has indicated support for Germany's suggestion).

Recommendations

The Chairman, as also representative of UK, has deliberately abstained from the votes above.

Justification and Impacts

Adopting Options 1 or 4 would have little impact in terms of work to be done. Option 2 would produce significant work, especially for the members of the INT1 subWG, but also for the WG members as a whole, as it is unlikely that the subWG members will find it easy to decide which is the 'best digitized' version of a particular symbol.

Action required of CSPCWG

The CSPCWG is invited to discuss Germany's suggestion and then decide on whether to accept options 1, 2 or 4.

From CSPCWG5 Record

9.2 Symbol library

Docs: CSPCWG 5-09.2A Symbol library (see CSPCWG Letter 13/08)

The meeting agreed that in view of the split vote on the use of M-4 as a symbol library, and that there is little impact for chart users, that option 4 (the status quo) would be retained. For future consideration, paper chart symbols could be included in an S-100 portrayal register, but not to be progressed before the revision of M-4 is completed.

There may be some symbols where the differences between M-4 and the 3 INT1 is significantly different. The INT1 subWG were invited to examine this and seek ways of reducing the differences.

ACTION 19: The INT1 subWG to examine which chart symbols in M-4 and the three official INT1s are significantly different and seek ways of reducing the differences.

Extract from CSPCWG6-11.1A - INT1 subWG report

Outcome: The members of the subWG have undertaken to each check a section of INT1, comparing the 4 symbols (ie in M-4 and each of the 3 official INT1s) and make a list of any where they consider the difference in appearance is 'significant'.

Spain has checked section A to I

France will check sections J to P

Germany will check sections Q to U.

All will forward the outcomes of their checks to the secretary, who will produce a consolidated list for further consideration by the subWG members.

It is suggested that CSPCWG5 Action 19 should be closed and a new action should be opened for the subWG to complete its review of significant differences in symbols in M-4 and the 3 official INT1s.

This became CSPCWG6 Action 41:

INT1 subWG to continue and complete its assessment of possible significant differences between symbols in the three official INT1s and S-4.

It was reported to CSPCWG7 that this action was completed at an INT1 subWG meeting and noted for next editions of INT1. No further actions were placed on the subWG deriving from this sequence. However, a related action was placed on AU:

CSPCWG7- Action 26: **AU** to discuss at TSMAD whether INT1 references should be included as a register in the S-100 Registry and advise CSPCWG.

AU reported to CSPCWG8 as follows:

The concept of using the S-100 registry to register INT1 references was demonstrated by J Wootton. This would enable keeping track of used INT1 references to avoid inadvertent reuse. [This has now been covered pro tem by S-4 B-151.2]. Typical registers can be seen on the IHO website in the 'Publications download' section, in the 'IHO Registry' link (below S-100). He considered at present it would be too difficult to include actual symbols (a portrayal register for INT1 symbols), but a 'feature type' list would additionally allow the including of some data about the symbols, such as 'disposal' dates.

CSPCWG8 ACTION 30: Chairman to take advice from UKHO colleagues on practicalities of populating an INT1 references register.

Chairman submitted CSPCWG9-INF4:

INT1 REGISTER

Submitted by:	Chairman
Executive Summary:	CSPCWG8 Action 30 required Chairman to take advice from UKHO colleagues on practicalities of populating an INT1 references register
Related Documents:	None
Related Projects:	None

Background

The S-100 standard creates a framework which includes a series of registers which sit within the IHO Registry. Each register has a number of domains for example the feature concept dictionary covers hydro (ENC), and nautical publications. Currently registers are also separated into main (IHO) and supplementary (other organizations) although this division is to be removed (HSSC4).

The registers allow definitions of the following items to be registered in a single location for re-use and harmonisation between domains. They are submitted and can be superseded with new versions or retired if required. The processes for this are laid out in IHO standard S-99.

The registers are as follows (some are not currently available);

Feature Concept Dictionary – features (objects), attributes, attribute values

Portrayal Register – symbols, colours

Product Specification Register – Product specifications

Producer Agency Register – Producer agency codes

Metadata Register – metadata values

S-100 based product specifications take items from the register and use them as the building blocks within catalogues. These define the objects and attributes allowable within a product and the symbols and rules which determine their display.

The S-100 Portrayal Registry is now available in test form. This will allow symbols from S-52 and new symbols for S-101 and other products to be registered and used. It has been proposed that the paper chart can be considered a product specification although not defined in an S-100 format. Therefore paper chart symbols could be registered in the S-100 Portrayal Register.

http://registry.iho.int/s100_gi_registry_test/PortrayalRegisters/pr_home.php?register_type=6

Screenshots explaining the layout of the register can be found in Annex.

How this might work

Firstly all the symbols would need to be listed and defined in a suitable graphic format for inclusion within the register. This would require separation into individual point symbols for composite symbols.

CSPCWG would register as a submitting organisation and nominate a point of contact.

A domain would need to be created with an appropriate name.

Then the symbols would need to be submitted in accordance with the procedures laid out within S-99.

In future, any changes (new symbols, retired symbols) could then be proposed through the registry system and procedures. A CSPCWG rep would need to be included on the appropriate control body for the register. This control body approves submissions.

Advantages of this approach

- INT1 paper chart symbols would be available in an accessible form to all (however, not as a user document)
- A common set of digital symbol files could be used by different HOs to improve commonality and avoid the manual creation of new symbols
- The register would allow tracking of retired symbols [B-151.2 now does this]
- Aligns (to some extent) paper chart with the S-100 family of products
- Paper chart symbols can be reused within other digital products where appropriate
- A process for consideration by wider stakeholders will be in place using the control body mechanisms

Disadvantages of this approach

- Effort required, creating and sorting out the list of symbols is a significant task

Summary

Inclusion of INT 1 paper chart symbols within the IHO Registry would have a number of benefits. However, significant effort would be required and ongoing resources (albeit small) would be required to support the registry process.

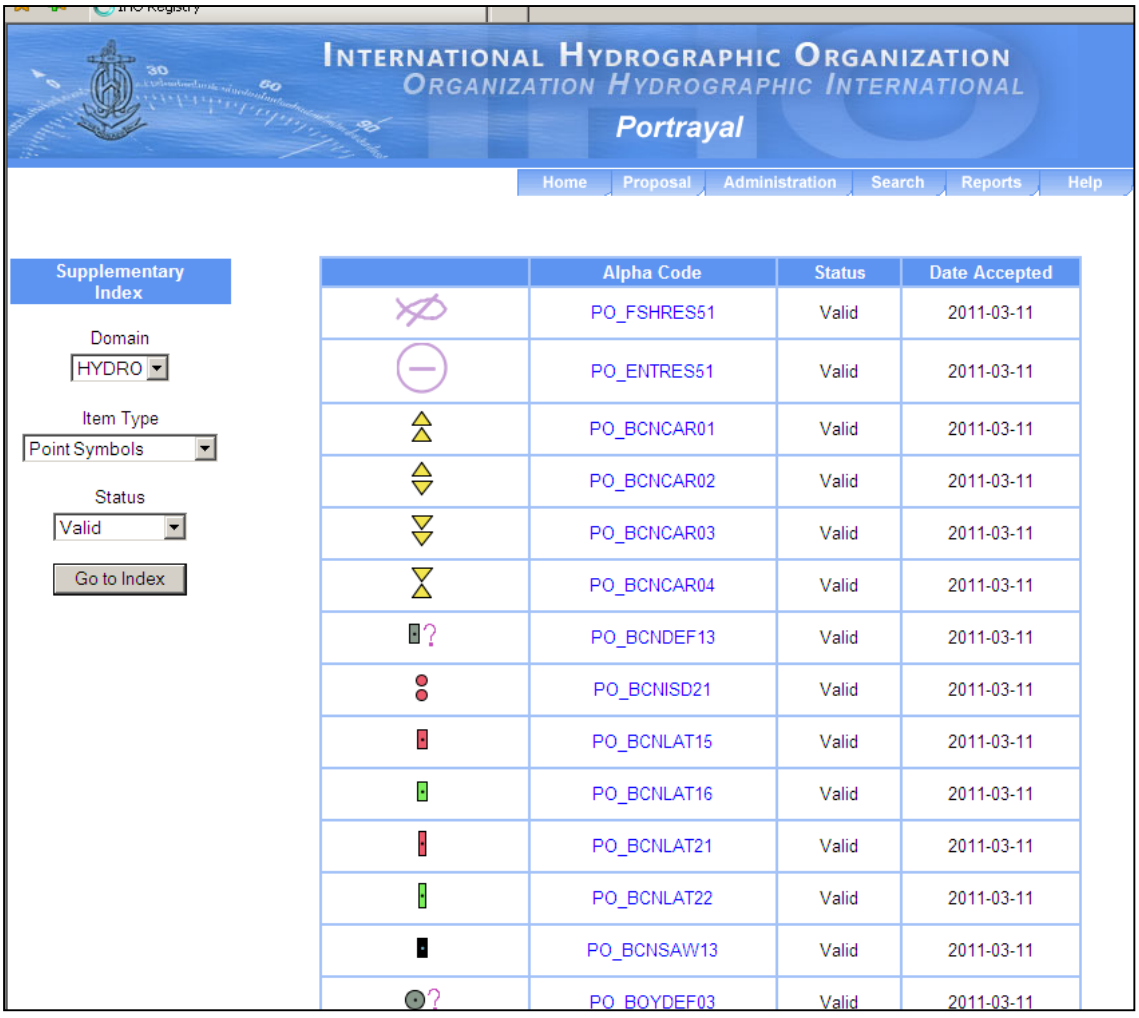

Figure 1 Point symbol register

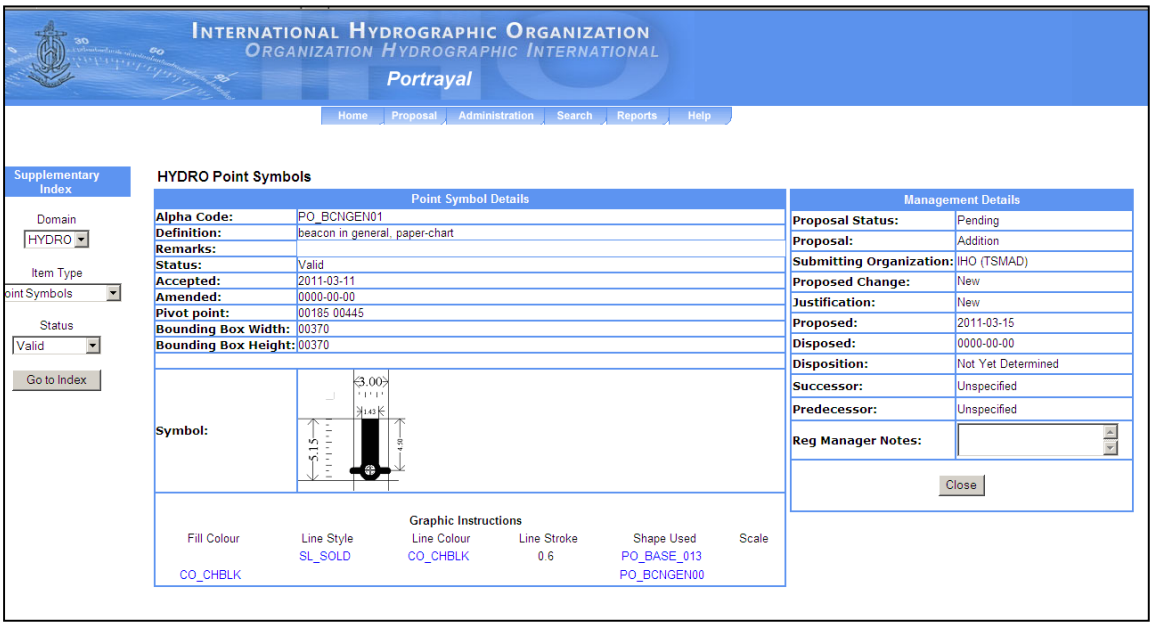

Figure 2 – Detailed point symbol information

Figure 3 – Shape (symbol component) register

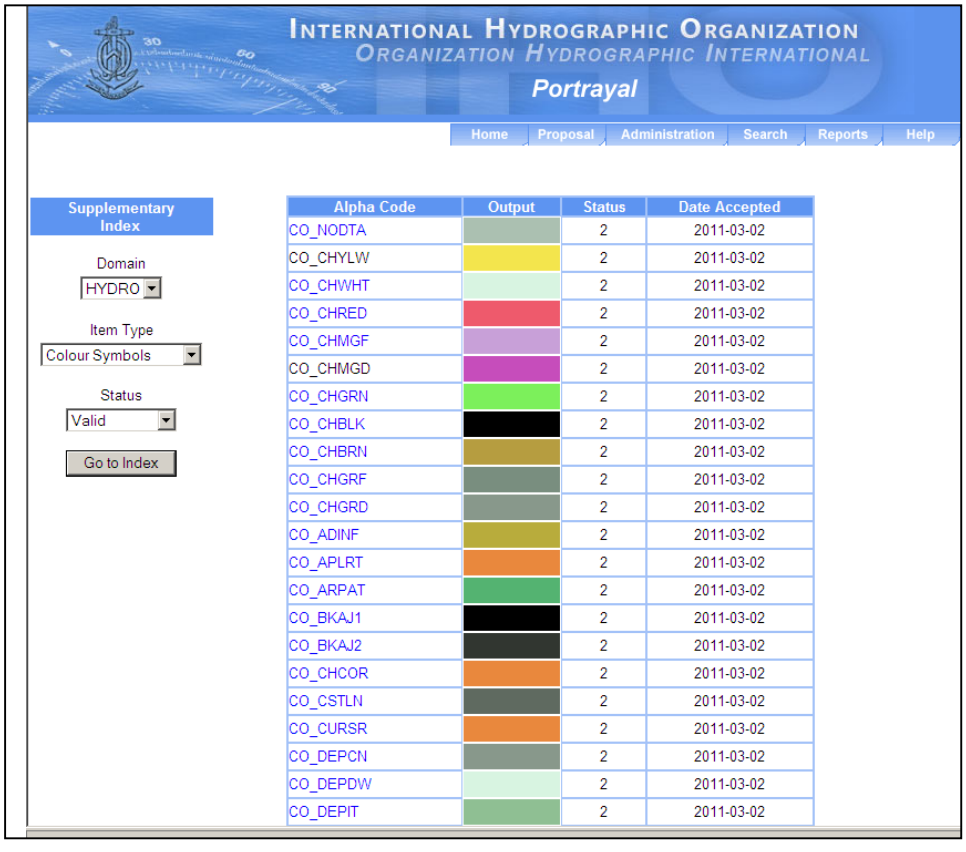

Figure 4 – Colour register

INTERNATIONAL HYDROGRAPHIC ORGANIZATION
ORGANIZATION HYDROGRAPHIC INTERNATIONAL
Producer Agency Codes

Main
Producer Code Index

Domain: IHO MS

Status: Accepted

Go to Index

Country	Agency	Alpha Code	Numeric Code	Date accepted
Algeria	Service Hydrographique des Forces Navales	DZ	610	2008-10-16
Argentina	Servicio de Hidrografía Naval (SHN)	AR	1	2008-10-16
Australia	Australian Hydrographic Service (AHS)	AU	10	2008-10-16
Bahrain	Hydrographic Survey Office	BH	20	2008-10-16
Bangladesh	Hydrographic Department	BD	660	2008-10-16
Belgium	MDK – Afdeling Kust – Division Coast	BE	30	2008-10-16
Brazil	Directorate of Hydrography and Navigation (DHN)	BR	40	2008-10-16
Cameroon	Port Autonome de Douala (PAD)	CM	740	2008-10-16
Canada	Canadian Hydrographic Service (CHS)	CA	50	2008-10-16
Canada	Canadian Forces	C4	51	2008-10-16
Chile	Servicio Hidrográfico y Oceanográfico de la Armada (SHOA)	CL	60	2008-10-16
China	Maritime Safety Administration (MSA)	CN	70	2008-10-16
China	The Navigation Guarantee Department of The Chinese Navy Headquarters	C1	71	2008-10-16
China	Hong Kong Special Administrative Region	C2	72	2008-10-16
China	Macau Special Administrative Region	C3	73	2008-10-16
Colombia	Ministerio de Defensa Nacional	CO	760	2008-10-16
Congo (Dem. Rep. of)	Ministère des Transports et Communications	CD	590	2008-10-16
Croatia	Hrvatski Hidrografski Institut	HR	80	2008-10-16
Cuba	Oficina Nacional de Hidrografia y Geodesia	CU	90	2008-10-16
Cyprus	Hydrographic Unit of the Department of Lands and Surveys	CY	100	2008-10-16
Denmark	Kort-Og Matrikelstyrelsen (KMS)	DK	110	2008-10-16
Dominican Rep.	Instituto Cartografico Militar	DO	120	2008-10-16
Ecuador	Instituto Oceanográfico de la Armada (INOCAR)	EC	130	2008-10-16
Egypt	Shobat al Misaha al Baharia	EG	140	2008-10-16
Estonia	Estonian Maritime Administration (EMA)	EE	870	2008-10-16
Fiji	Fiji Islands Maritime Safety Administration (FIMSA)	FJ	150	2008-10-16
Finland	Finnish Maritime Administration (FMA)	FI	160	2008-10-16
France	Service Hydrographique et Océanographique de la Marine (SHOM)	FR	170	2008-10-16
Germany	Bundesamt für Seeschiffahrt und Hydrographie (BSH)	DE	180	2008-10-16
Greece	Hellenic Navy Hydrographic Service (HNHS)	GR	190	2008-10-16
Guatemala	Ministerio de la Defensa Nacional	GT	200	2008-10-16

Figure 5 – Producer Agency Code Register. This is also used to generate the S-62 PDF document automatically.

Extract from report of CSPCWG9:

J Wootton explained that the paper (which had been produced by T Richardson, UK) went too far in its suggestion of producing a register of INT1 symbols, rather than references. This possibility had been previously rejected by CSPCWG as there is no defined international symbol set available. However, a register of INT1 references may be useful. He would raise this possibility with the registry manager and present a sample of how it might be organized at the next CSPCWG meeting.

ACTION 58: AU to produce a sample INT1 register for next meeting.

At CSPCWG10, AU (J Wootton) advised that he was waiting for a suitable example (ie the 'producer code register'). Accordingly, this action is to be kept open.

He further advised the CSPCWG11/NCWG1 meeting: This action is on hold, at present. Discussions with IHO Geospatial Registry Manager required to scope requirement.

Conclusion:

1. None

Recommendation:

2. None

Justification and Impacts:

3. None

Action required of NCWG:

4. The NCWG is invited to:

   Be aware of this history when discussing new paper NCWG2-11.4A