11th CSPCWG/1st NCWG Meeting
Rostock, Germany, 27-30 April 2015

Paper for Consideration by CSPCWG/NCWG

Charting Maximum Authorized Draught in Lieu of Bathymetry

Submitted by:	CSPCWG Chair
Executive Summary:	This Paper summarises discussions between Italy, the CSPCWG Secretariat and the TSMADWG in regard to charting maximum authorized draught information and outlines a proposal from Italy and associated issues related to charting maximum authorized draught in lieu of physical bathymetry.
Related Documents:	1. CSPCWG9-08.14A Maximum Draught Areas; 2. CSPCWG Letter 07/2013 Actions from 9th CSPCWG Meeting: Group 3'Hydrography'; 3. CSPCWG Letter 13/2013 Follow Up to Letter 07/2013; 4. CSPCWG10-08.02A_Minimum_Depth_and_Maximum_ Authorized_Draught 5. CSPCWG Letter 09/2014 CSPCWG10 Actions 10-14 (Dredged areas and maximum authorized draught); 6. CSPCWG Letter 13/2014 CSPCWG10 Actions 10-14 (Dredged areas and maximum authorized draught) – follow-up to Letter 09/2014.
Related Projects:	INT1 and S-4 Maintenance

Introduction / Background

The references (2) to (6) listed above relate to CSPCWG Actions resulting from Paper CSPCWG9-08.14A (ref (1)), submitted by Italy. These Actions were confined to the revision of guidance for the depiction of maximum authorized draught information on paper charts. The conclusion of the CSPCWG, as summarised in ref (6), was to expand on the existing S-4 guidance related to the depiction of maximum authorized draught, while retaining the existing symbols as approved during the CSPCWG revision of S-4 Section B-400 and expanded on via references (2) and (3).

Italy's response to CSPCWG Letter 13/2014 and correspondence with the IHO TSMAD regarding the encoding of maximum authorized draught information on ENC's indicated that an intent of Paper CSPCWG9-08.14A was to provide guidance in S-4 allowing for maximum authorized draught information to be depicted on nautical charts in lieu of physical depth information. As this was not included within the scope of discussions at CSPCWG9 or CSPCWG10, it is considered that this requires further discussion of the Working Group.

Analysis / Discussion

A copy of Paper CSPCWG9-08.14A is included at Annex A for reference during discussions. The summary of discussions at CSPCWG9, as included in the Minutes of the meeting, is as follows:

****

8.14. Maximum draught areas (IT)
Docs: CSPCWG9-08.14A Maximum draught areas

The meeting accepted the proposal for expanding the use of 'maximum authorized draught', but considered that it should not be added to the fairway specification; it would be more appropriate to provide a new specification (place to be determined) and new symbol (INT1 I26). For completeness, a specification and symbol for minimum depth should also be included.

****

During discussions at CSPCWG9, there was no mention of showing maximum authorized draught information only, without any underlying bathymetry. The resultant CSPCWG9 Action and draft revised Specification, as included in Ref (2), is as follows:

****

ACTION 36: Secretary to draft new specification on maximum draught and minimum depth (and consider placement in S-4). New Work Plan item.

A short section on maximum draught and minimum depth already exists at B-432.4, which can be amplified. A cross references from B-410 is useful.

A question arises about the colour of the legend:

- At present, we use magenta for maximum draught in fairways (and by extension in other routeing measures). However, we use black in recommended tracks (which is where the < > symbol derives from) and in fish havens. As a regulatory concept, perhaps we should be consistent and always show in magenta (and that would be consistent for recommended tracks with the treatment at M5 of other regulatory information combined with a black track). It would mean further changes at B-434.3 (and INT1 M6) and B-447.5 (M46.2). The latter (fish haven) is unlikely to affect many existing charts, but the former (tracks) would take a long time to change.
- At present, we use magenta for minimum depth in a DW route and Fairway (and by extension in other routeing measures), but black in a dredged area. As minimum depth is a more physical concept than the maximum draught above, black is more logical (and would assist the differentiation between the two). However, it would mean changing B-434.5 (and INT1 M18) and B-435.3f (and M27.2). It may take a long time to change on charts and in the intervening period the black on recommended tracks could mean either maximum draught or minimum depth. (As maximum draught should be less than minimum depth, this may not matter).

The proposals below assume we will not make changes to the existing use of colour.

B-410 REPRESENTATION OF DEPTH: GENERAL

Some of the principles of depth depiction are summarized below (see also B-403.1): …

h. For an indication of minimum depth or maximum authorized draught within a channel or area, see B-432.4.

Note: This will actually become sub-paragraph 'i' when the new clarification about sounding selection has been included; see WG9 Actions Group 1 (WG Letter 04/2013 refers).

B-432.4 Maximum draught and minimum depth

a. In areas where the tidal range is not appreciable, it may be useful to state the **maximum draught** of vessels authorized by a regulatory authority to navigate ~~pass along~~ a recommended track (see B-434.3), ~~or within~~ a fairway (see B-434.5b) or within any other area. The maximum authorized draught must be charted between arrowheads, eg: <*18.5m*> (I26) and should normally be in magenta. Exceptions are on recommended tracks (see B-434.3) and in fish havens (see B-447.5), where the symbol should be black. The size of the legend is at the discretion of the cartographer, but it should stand out clearly from other detail in the area.

Note: The difference in value between the actual minimum depth and the authorized (or recommended) maximum draught will vary according to the situation (eg whether the sections of track are sheltered or not). This will be determined by the regulatory authority.

b. All other depths quoted on tracks, in deep water routes and dredged channels must indicate the **minimum depth** of water at chart datum (and a survey year date if not maintained), eg: *18.5m* (I27), as decided by a port or hydrographic authority (see also B-435.3f). It should be in magenta, except that in dredged areas and channels (where actual depths are not shown) it should be black (see B-414). No statements of minimum depths must be made in changeable areas unless the critical depths are regularly examined and updated. ~~For depths within a Deep Water route, see B-435.3f.~~

Note: I26 and I27 do not yet exist. They can either be included in the next editions of INT1, or could possible justify an NM to update INT1. This question will be put to the INT1subWG at their meeting in July.

****

The Working Group voted unanimously to approve the amended wording as included in Letter 07/2013, as summarised in Letter 13/2013. The response from Italy I regard to this action was as follows (Chairman's comments as included in Letter 13/1013 in red) – note the response at (3):

****

Action 36:
B-432.4:

1) We suggest that the end of the first sentence be modified as follows:

a. ……..a fairway (see B-434.5b) or within any regulated area (see B-439.1).

In this way we give some instructions on how to represent the limit for an area where a maximum draught has been defined.

2) We suggest that the following be inserted at point b:

b. ……in deep water routes and dredged areas or channels…..

3) Where a maximum draught has been assured/defined by regulatory authority, in order to avoid confusion by the chart user, we suggest that soundings, depth contours and depth areas, already represented into the area, be deleted.

Chairman: We have asked AU to include these suggestions in his submission to WG10.

****

Australia prepared a Paper as requested for CSPCWG10 (Ref (4)). Unfortunately, while the above comments from Italy were included in the Annex to that Paper, there was no mention of the omission of physical depth information in preference for maximum authorized draught information within the body of the paper. As a consequence, there was no discussion on this at CSPCWG10. As a result of the discussions and actions from CSPCWG10, and further post-meeting discussion between the CSPCWG Chair, CSPCWG Secretary and FI, the following revised clauses for S-4 were submitted for Working Group approval via Ref (5):

****

B-410 REPRESENTATION OF DEPTH: GENERAL

Some of the principles of depth depiction are summarized below (see also B-403.1): …

i. For an indication of minimum depth or maximum authorized draught within a channel or area, see B-432.4.

(Note: 'i' rather than 'h' when the new sub-paragraph on sounding selection has been included).

In the following, changes to the draft submitted in Letter 07/2013, as applied in response to WG member's comments or in accordance with current S-4 convention, are indicated in red.

B-432.4 Maximum draught and minimum depth

a. In areas where the tidal range is not appreciable, it may be useful to state the **maximum draught** of vessels authorized by a regulatory authority to navigate a recommended track (see B-434.3), a fairway (see B-434.5b) or within any other regulated area. The maximum authorized draught must be charted between arrowheads, for example <*18.5m*> (**I26**). The colour should be consistent with the feature to which it relates, for example magenta in a routeing measure such as a fairway (see B-434.5) and black on a recommended track (see B-434.3) or in a fish haven (see B-447.5). The size of the legend is at the discretion of the cartographer, but it should stand out clearly from other detail in the area.

Note: The difference in value between the actual minimum depth and the authorized (or recommended) maximum draught will vary according to the situation (for example, whether the sections of track are sheltered or not). This will be determined by the regulatory authority.

b. All other depths quoted on tracks, in deep water routes and dredged areas or channels must indicate the **minimum depth** of water at chart datum (and a survey year date if not maintained), for example *18.5m* (**I27**), as decided by a port or hydrographic authority (see also B-435.3f). It must never be shown between arrowheads. As in (a) above, the colour should be consistent with the feature to which it relates. In dredged areas and channels (where actual depths are not shown) it should be black (see B-414). No statements of minimum depths must be made in changeable areas unless the critical depths are regularly examined and updated.

****

Again, almost universal acceptance of the proposed changes to S-4 was achieved (Ref (6)). Additionally, in response to the question of whether the responding HO or any other HO that they are aware of uses the concept of maximum authorized draught, it was noted that all "yes" responses were from countries charting waters in which tides are minimal. Italy, in voting against the proposed S-4 changes, supplied the following comment:

****

After discussions at WG9 and WG10, we agreed on the need to review specifications regarding maximum draught and minimum depth using mariner feedback, but, at the same time, we inform you that this problem has become more and more serious for Italian HO.

We have discussed the problem also with the TSMAD (Mr. Jeff Wootton) in order to define a better solution both for paper charts and ENCs.

To better explain a real case, we'll show you the situation in a new INT chart which is being constructed.

In the area shown in fig.1 we have multibeam hydrographic data acquired in 2012. The competent maritime authority, 2 years later, assured a maximum draught of 9,6 m. The same authority could not give the Italian HO any other official information about minimum depth.

Therefore, the inconsistency between maximum draught value and soundings is clearly represented in fig.1, where there is a sounding showing 11m (Chairman: I assume the better example soundings here are the depths that are shoaler than 9.6m in the maximum authorized draught area) of depth inside the area where the maximum draught ia 9,6m.

The Italian HO together with the local maritime authority has decided to represent only the maximum authorized draught using INT N1.2 magenta limit and the legend *Maximum draught <9.6m>*. As you can see in fig.2, soundings and depth contours are deleted, due the inconsistency with draught information.

Waiting for review specifications, we suggest to modify B-432.4 as following:

B-432.4 Maximum draught and minimum depth

a. In areas where the tidal range is not appreciable, it may be useful to state the **maximum draught** of vessels authorized by a regulatory authority to navigate a recommended track (see B-434.3), a fairway (see B-434.5b) or within any other regulated area. The maximum authorized draught must be charted between arrowheads, for example *<18.5m>* (**I26**). The colour should be consistent with the feature to which it relates, for example magenta in a routeing measure such as a fairway (see B-434.5) or regulated areas and black on a recommended track (see B-434.3) or in a fish haven (see B-447.5). The size of the legend is at the discretion of the cartographer, but it should stand out clearly from other detail in the area.

b. All other depths quoted on tracks, in deep water routes and dredged areas or channels must indicate the **minimum depth** of water at chart datum (and a survey year date if not maintained), for example *18.5m* (**I27**), as decided by a port or hydrographic authority (see also B-435.3f). It must never be shown between arrowheads. As in (a) above, the colour should be consistent with the feature to which it relates. In dredged areas and channels (where actual depths are not shown) it should be black (see B-414). No statements of minimum depths must be made in changeable areas unless the critical depths are regularly examined and updated.

Note: The difference in value between the actual minimum depth and the authorized (or recommended)

maximum draught will vary according to the situation (for example, whether the sections of track are sheltered or not). This will be determined by the regulatory authority.

When it is possible, minimum depth and authorized maximum draught should both be quoted. In unusual cases, where the inconsistency between these data is manifest, only the maximum authorized draught may be represented.

****

As mentioned in the response from Italy, a discussion had taken place with the TSMAD regarding encoding options for ENC where maximum authorized draught information is available but there is no underlying physical depth information. The full record of this discussion is included at Annex B. The issue was raised for discussion as part of the CSPCWG report to TSMAD29/DIPWG7.

Discussion on ENC encoding options at TSMAD29/DIPWG7 (February 2015):

There was no decision made at the meeting as to whether it should be allowable to encode maximum authorized draught information in ENC without also including physical depth information – it was decided that this was best left to the CSPCWG. However, if it is determined that showing maximum authorized draught information only is acceptable, the encoding of such depth information in ENC could be as follows:

- A **DEPARE** (depth area) object, covering the area of maximum authorized draught, having attributes:
    - DRVAL1 = value of the maximum authorized draught
    - DRVAL2 = [unknown] (empty (null) value)
    - QUASOU = 7 (least depth unknown, safe clearance at value shown)
    - INFORM = "Maximum authorized draught = *XX.XX* metres" [optional]

Additional objects encoded in support of this encoding for maximum authorized draught (**SWPARE** (swept area), **SOUNDG** (sounding) **M_QUAL** (quality of data), **CTNARE** (caution area)) would also need to be considered.

Subsequent testing of a depth area encoded in an ENC with an "empty" value for the attribute DRVAL2 was carried out on an ECDIS, and it was found that there were no adverse display issues with this encoding.

Summary:

In terms of both paper chart and ENC, there are portrayal options that make it possible to depict maximum authorized draught information without any underlying physical depth information. However, the following factors require discussion in order to determine whether such depiction on charts is in the best interest of the mariner:

- Is such portrayal a safe option? Noting the diagram included in the Italy response to CSPCWG Letter 09/2014 (see above) – in the example where the physical depth information has been omitted, there are physical depths that have been removed (soundings of value 9.2m and 9.4m) that are actually shoaler than the maximum authorized draught value (9.6m).

- What is considered to be the definition of "draught"? A vessel may have a different draught depending on whether it is laden or unlade (including ballast); and vessel speed and sea conditions (heave, yaw and squat). Is this to be determined based on the class of vessel; by the port; by the Master (or are these regulatory considerations that may be considered to be out of scope of discussions)?

- During discussions, it was noted that depicting maximum authorized draught information only may be considered to be similar to depiction of dredged or "maintained" depth information. However, it should be noted that dredged or "maintained" depth information does provide an indication of a physical depth (the minimum depth that would be expected in the dredged area). Maximum authorized draught information is regulatory in nature – there is no under-keel clearance information included with this value from which a mariner may determine a physical depth.

- Requirements for vessels experiencing an emergency situation: If such a situation exists, is the decision-making capability of the Master compromised by having an absence of physical depth information allowing them to make an informed decision as to where they can and cannot go to alleviate the emergency (e.g. collision avoidance)?

- Depiction of maximum authorized draught information without any underlying physical depth information may avoid some confusion for the mariner.
- Such a depiction (if approved) must only be used in water where the tide is minimal. This must be clearly stated in the Specifications.
- Would there be any impact on INT1?

Conclusions

The paper CSPCWG9-08.14A, prepared by Italy, included as an intent the proposal to exclude physical depth information in preference to showing maximum authorized draught. Unfortunately this has not yet been discussed by the CSPCWG. Investigations have determined that it is possible to portray (encode) such information on paper charts and ENC's. The CSPCWG is now requested to discuss and determine whether such portrayal should be permitted on charts.

Recommendations

The recommendation from Italy is that such portrayal should be allowed. The CSPCWG is requested accordingly to develop specifications for inclusion in S-4. This recommendation is aimed at completing Work Item A13 of the NCWG Work Program.

Justification and Impacts

It is considered that, in waters where the tide is minimal, depiction of maximum authorized draught information only may avoid some confusion for the mariner.

Impact is on S-4, ENC Product Specification (ENCWG), S-101 (S-100WG) and possibly INT1. As this is an ongoing CSPCWG/NCWG Work Item (with Medium priority), it may be considered to be "business as usual" for the Working Group.

Action required of CSPCWG

The CSPCWG is invited to:

a. **Note** this Paper.

b. **Discuss** the issues identified in the Analysis

c. **Consider** the recommendation

d. **Determine** appropriate actions (if any)

Annexes:

A: CSPCWG9-08.14A – Maximum draught areas.

B: Chronological record of correspondence between Cristina Tirone (IT), the CSPCWG Chair and CSPCWG Secretary related to maximum authorized draught.

Annex A

CSPCWG9-8.14A

9th CSPWG MEETING
Seoul, Republic of Korea, 13-16 November, 2012

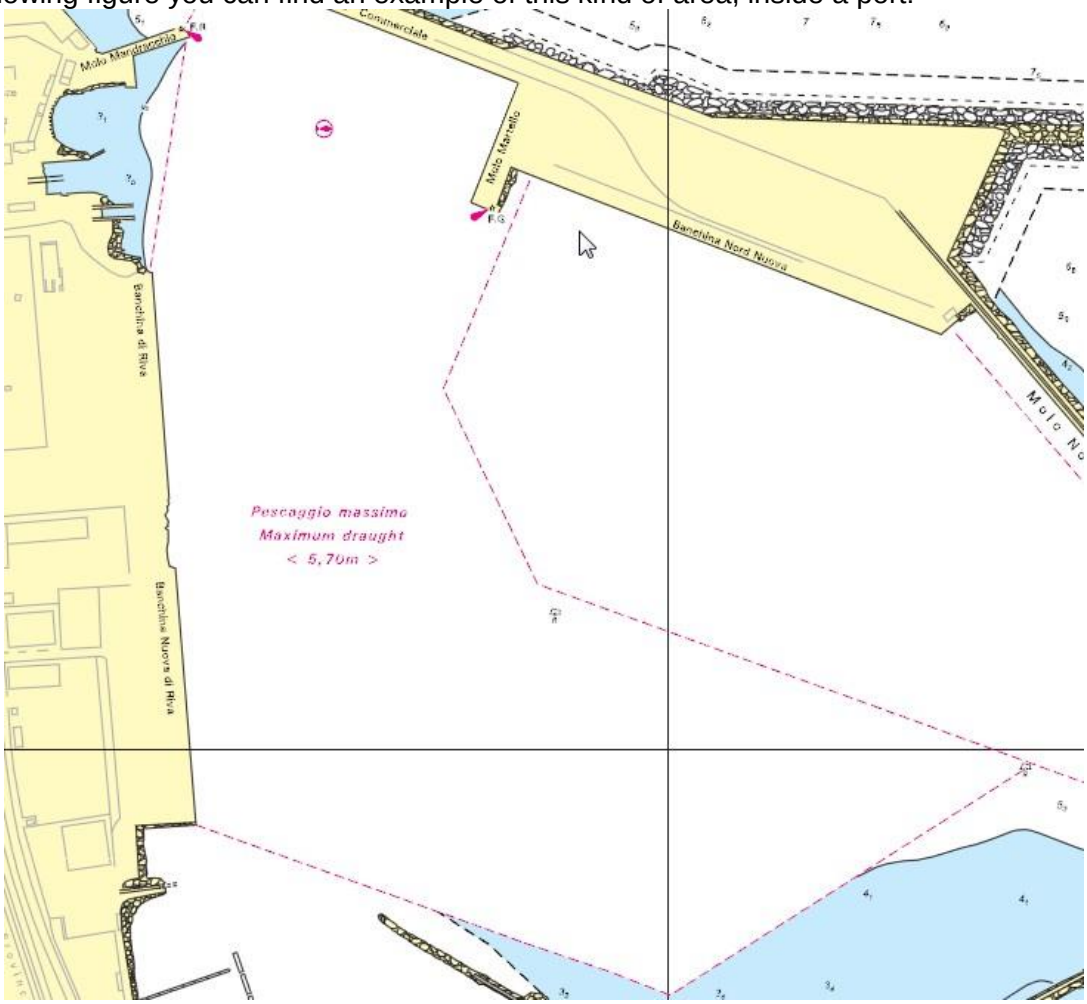
Paper for Consideration by CSPCWG

Maximum draught areas

Submitted by:	Italian Hydrographic Office
Executive Summary:	The purpose of the paper is to focus on the maximum authorised draught defined by regulatory authority.
Related Documents:	S4, INT1
Related Projects:	Review of S4 and INT1

Introduction / Background

Item n.20 (Agenda ref 8.18) refers to fairways with maximum authorized draught.
Sometimes the maximum authorized draught designated by the regulatory authority isn't related to a fairway but to an area.
In the following figure you can find an example of this kind of area, inside a port:



Analysis / Discussion

In S4 the maximum draught is only related to Fairways (B-434.5) and to Fish havens (B-447.5).
We suggest to represent this kind of area with bold magenta dashed line (M15); the maximum draught could be indicated as for *FAIRWAY,* eg:

As for a Fairway, soundings and depth contours or any other data should be included as appropriate. If the boundary of maximum draught area coincide with the limits of a dredged or maintained area, or light sector limit, the usual cartographic principles apply, see B-439.6.

Conclusions

The suggested solution would enable HOs to insert this sort of data directly on the chart in order to increase the readiness of information. If necessary, a note may be added to refer to further information in other publications, such as Sailing Directions.

Justification and Impacts

If these suggestions are accepted, it will be necessary to modify S-4 at B-434.5 and update or insert a new item in INT1 M18.

Action required of CSPCWG

The CSPCWG is invited to:

a. endorse …….

b. agree …….

c. note ……...

etc.

The following the chronological record of correspondence between Cristina Tirone (IT), the CSPCWG Chair and CSPCWG Secretary related to maximum authorized draught. This correspondence has been ordered to read from "top to bottom" for ease of reading, and paragraphs not directly related to the subject of maximum authorized draught have been removed in the interest of expediency and privacy.

From: **Tirone Cristina - C2** <cristina_tirone@marina.difesa.it>
Date: Fri, Sep 26, 2014 at 7:53 AM
Subject: Questions about maximmum draught and TECSOU value
To: Barrie.Greenslade@ukho.gov.uk, julia.powell@noaa.gov
Cc: "Demarte Maurizio - C.F." <maurizio.demarte@marina.difesa.it>

Good morning,

First of all I introduce myself: my name is Cristina Tirone and I work in the "ENC Production and Updating Department" of the Italian Hydrographic Institute.

I am writing to you about three problems relating to maximum draught and TECSOU value.

I tried to submit my questions using the online form in "ENC Frequently Asked Questions (FAQs)", but I have not succeeded in entering a table, so I thought I would write to you directly.

In attach you find the file with my questions.

Thanks in advance

Best regards,

Cristina Tirone

Cristina Tirone

ENC Production and Updating Department

Italian Hydrographic Institute

[ATTACHMENT]:

1° problem: coding "maximum draught " in ENCs

Until a year ago, the Italian HO used soundings and depth contours to draw depth situation inside ports and channels on paper charts and ENCs. The hydrographic surveys in these areas were carried out by Italian HO's hydrographic ships

Now the Italian Maritime Authorities, responsible for the approach to a port or a channel, provide the Italian HO with the value of "maximum draught" for the vessels. The Italian HO, together with the Maritime Authorities, has decided to insert this information in their nautical paper charts in the following way:

- a blank area with inside one or more areas bounded by a magenta limit (INT N1.2) and associated with the sentence: "Maximum draught <9.8m>" (the value of 9.8m is an example).

If the Italian HO owns new hydrographic data, having carried out a new MB survey in these areas, the new data is not used. In some cases this new data, however , can be slightly conflicting with the actual depth

because of later dredging . (The Maritime Authorities prefer to supply the value of maximum draught instead of minimum depth and the year in which the dredging has been carried out).

In the corresponding ENC we cannot use a DRGARE object as Group 1 object because we don't have the value of DRVAL1 confirmed by the Maritime Authority and we cannot use DEPARE objects because soundings and depth contours have been omitted in the paper chart (we want to have the same information in paper charts and in the corresponding ENCs).

So we have decided to codify this situation in the ENCs in the following way:

- an UNSARE (geometry area) as Group 1 object and one (or more if we have more values) overlapping CTNARE object in which the attribute INFORM is compiled with the following sentence: "maximum draught 9.8 m"

However, in this way ECDIS will supply an alarm for the UNSARE and the CTNARE

Can you suggest to us a better solution?

I know that this subject is under discussion among members of CSPCWG, so I would like to know if also TSMD WG has discussed this subject and if TSMAD WG intends to create in the future a new object among Group 1 objects in which it is possible to put the maximum draught value without any other depth values.

From: Wootton, Jeff MR [mailto:jeff.wootton@defence.gov.au]
Sent: Tue 30/09/2014 4:25 PM
To: 'ctirone'
Cc: 'Julia Powell - NOAA Federal'
Subject: RE: Questions about maximum draught and TECSOU value

UNCLASSIFIED

Hi Cristina:

Please find attached a copy of your questions with my comments and observations in red. To summarise:

- I think you have issues with your "maximum authorized draught" areas having no underlying bathymetry, particularly in regard to S-4 conformance but also in terms of encoding for ENC, and consider that this needs further discussion, initially by the CSPCWG.

I would appreciate it if you would give me permission to initiate further discussion, using our correspondence as a starting point, within the CSPCWG regarding the maximum authorized draught issue in anticipation of face to face discussion at CSPCWG11. I will also be happy to discuss further with the TSMAD S-57 Maintenance Sub-Working Group regarding alternate encoding options if you like.

I would also welcome any comments that you may have in regard to this response, and am happy to provide further clarification or comment as required.

Regards,

Jeff.

Jeff Wootton
Deputy Director Charting Specifications and Standards
Charting Services Directorate
Australian Hydrographic Service - R.A.N.

Ph +61 2 4223 6508
Fx +61 2 4223 6599
Em jeff.wootton@defence.gov.au

[ATTACHMENT]:

1° problem: coding "maximum draught " in ENCs

Until a year ago, the Italian HO used soundings and depth contours to draw depth situation inside ports and channels on paper charts and ENCs. The hydrographic surveys in these areas were carried out by Italian HO's hydrographic ships

Now the Italian Maritime Authorities, responsible for the approach to a port or a channel, provide the Italian HO with the value of "maximum draught" for the vessels. The Italian HO, together with the Maritime Authorities, has decided to insert this information in their nautical paper charts in the following way:

- a blank area with inside one or more areas bounded by a magenta limit (INT N1.2) and associated with the sentence: "Maximum draught <9.8m>" (the value of 9.8m is an example).

If the Italian HO owns new hydrographic data, having carried out a new MB survey in these areas, the new data is not used. In some cases this new data, however , can be slightly conflicting with the actual depth because of later dredging . (The Maritime Authorities prefer to supply the value of maximum draught instead of minimum depth and the year in which the dredging has been carried out).

In the corresponding ENC we cannot use a DRGARE object as Group 1 object because we don't have the value of DRVAL1 confirmed by the Maritime Authority and we cannot use DEPARE objects because soundings and depth contours have been omitted in the paper chart (we want to have the same information in paper charts and in the corresponding ENCs).

So we have decided to codify this situation in the ENCs in the following way:

- an UNSARE (geometry area) as Group 1 object and one (or more if we have more values) overlapping CTNARE object in which the attribute INFORM is compiled with the following sentence: "maximum draught 9.8 m"

However, in this way ECDIS will supply an alarm for the UNSARE and the CTNARE

Can you suggest to us a better solution?

I know that this subject is under discussion among members of CSPCWG, so I would like to know if also TSMD WG has discussed this subject and if TSMAD WG intends to create in the future a new object among Group 1 objects in which it is possible to put the maximum draught value without any other depth values.

There have been some draft changes made to S-4 in regard to the depiction of maximum authorized draught for areas other than along recommended tracks or within fish havens, as proposed by Italy in a paper presented at CSPCWG9 (November 2012). However, none of these proposed changes specify that the bathymetry in an area can be replaced entirely by an indication of maximum authorized draught only. The Italian paper for CSPCWG9 (CSPCWG9-8.14A), includes the statement "As for a Fairway, soundings and depth contours or any other data should be included as appropriate", and the decisions made at CSPCWG9, and the subsequent S-4 actions, were progressed based on this premise. From this perspective I do not consider that the removal of all bathymetry from these "maximum authorized draught areas" is appropriate (and was certainly not considered at CSPCWG9), and indeed do not consider such removal of bathymetry to conform with the specifications for the representation of depth detail at S-4 – B-410, nor with the removal of such depth detail to be in accordance with any depth generalization rules (B-403) given that the charts concerned appear to be the largest scale chart coverage for these areas. Given that the specifications and guidance for the encoding of ENC's were based on the charting specifications (S-4), including the rules regarding complete, non-overlapping coverage of Group 1 objects for areas on ENC containing data, I would expect that TSMAD would be equally concerned with the removal of bathymetry from an area in lieu of including only maximum authorized draught information.

While understanding the problem that you have in regard to Maritime Authorities only providing authorized draught information, I would make my first course of action a request to these Maritime Authorities to provide, in addition to the maximum authorized draught, a minimum depth value (at least) for these areas so as to provide all the information required for safe navigation (and I would site instances where vessels may have to depart from their planned route in an emergency situation, and the use of the echosounder by the mariner as an additional route monitoring tool, as examples of this requirement). If the Maritime Authority has concerns over any legal interpretation of the term "maintained" (i.e. in terms of a maintained dredged area), this may be mitigated by encoding this information as "not regularly maintained" (QUASOU = 11) for these dredged or depth areas. You may then compile this information for your chart products appropriately. I would also point out that one of the main tools used by mariners in terms of both route planning and route monitoring using ECDIS is the representation of the mariner defined safety contour (and safety depth) – a tool which cannot be utilised in the absence of bathymetry information in areas within which the manoeuvring availability for vessels is most likely to be restricted.

I do not consider encoding these maximum authorized draught areas as unsurveyed areas (UNSARE) and caution areas (CTNARE) to be appropriate, and would consider that the international mariner would have concerns over seeing such areas within or approaching port areas in their ECDIS, particularly as these areas are supposedly navigable. Additional to the problems with ECDIS alarms that you have identified above, there is the problem of the maximum authorized draught information (the only depth information being made available to the mariner) being available only through an ECDIS Pick Report (for the CTNARE), which I also consider to be unsatisfactory. Given that the underlying Group 1 object is UNSARE, how does the mariner know that this is where the "depth" (or "draught") information is encoded? Given your current situation, a possible solution is to encode a single depth area covering an area of maximum authorized draught, having:

- DRVAL1 = the "maximum authorized draught" value, or the minimum depth from the latest source information that you have, whichever is deeper

- DRVAL2 = the deepest depth in the area from the latest source that you have

- QUASOU = 2 (depth or least depth unknown) or 7 (least depth unknown, safe clearance at value shown)

- INFORM = Maximum authorized draught = ….. (optionally, you may choose to continue to encode this using CTNARE, noting ECDIS alarms, or on another object class such as FAIRWY).

However, as stated above, I think the best course of action is to pursue obtaining the latest bathymetry from the Maritime Authorities, and the above option is still inadequate.

I suggest that this issue be raised with the CSPCWG in the first instance, through submission of a Paper to CSPCWG11 (scheduled for April 2014 in Rostock, Germany). Encoding options in S-57, and possible new modelling for S-101, can then be considered by the TSMADWG based on the conclusions of the CSPCWG. If you consider appropriate, I would be happy to circulate this discussion to a wider audience, beginning with the Secretariat of the CSPCWG.

From: Cristina Tirone [mailto:cristina.tirone@persociv.difesa.it]
Sent: Tuesday, 7 October 2014 7:58 PM
To: Wootton, Jeff MR
Cc: 'Julia Powell - NOAA Federal'; Demarte Maurizio - C.F.
Subject: R: Questions about maximmum draught and TECSOU value [SEC=UNCLASSIFIED]

Dear Jeff,
thank you very much for your exhaustive and prompt reply.
As regards the maximum authorized draught issue, I will be glad if you initiate further discussion using our correspondence as a starting point within the CSPCWG and TSMADWG.

I have discussed the topic with my colleagues in charge of paper charts and they also agree on the need for further discussion and investigation taking into account the report of the 10th CSPCWG Meeting (January 2014)

Best regards,
Cristina

Cristina Tirone
ENC Department
Italian Hydrographic Institute

From: Wootton, Jeff MR [mailto:jeff.wootton@defence.gov.au]
Sent: 03 October 2014 00:44
To: Coleman Andrew
Cc: Webb Nick
Subject: RE: RE: Draft follow-up letter about VC Webb and B-160 [SEC=UNCLASSIFIED]

UNCLASSIFIED

Andrew.

Related to possible agenda items for CSPCWG11, I received some questions from Italy in my role as the coordinator of the IHO S-57 Frequently Asked Questions page on the IHO web site. The first question asked relates to the inclusion of maximum authorized draught information in ENC (and on paper charts), however Italy is doing this in lieu of any bathymetry information at all, which is causing problems with their ENC encoding and Group 1 coverage. My response raised concern that the removal of all bathymetry in lieu of only showing maximum authorized draught may not be in the best interest of safe navigation, and cited conformance with S-4 - B-410 (which does not explicitly state that bathymetry must be shown on the largest scale charts where the source data is available). I suggested that in this regard IT should consider submitting a paper on this to CSPCWG11. I have attached my response - please refer to the detail in the Word document embedded in this response. Note the reference to the Paper submitted to CSPCWG9, where IT first raised this. I would appreciate your views on this, as I do not recall that we discussed replacing bathymetry with maximum authorized draught at CSPCWG9, and there is no mention of this in the record of the meeting.

Regards,

Jeff.

Jeff Wootton
Deputy Director Charting Specifications and Standards
Charting Services Directorate
Australian Hydrographic Service - R.A.N.

Ph +61 2 4223 6508
Fx +61 2 4223 6599
Em jeff.wootton@defence.gov.au

From: Coleman Andrew [mailto:Andrew.Coleman@UKHO.gov.uk]
Sent: Tuesday, 7 October 2014 10:22 PM
To: Wootton, Jeff MR
Cc: Webb Nick
Subject: RE: RE: Draft follow-up letter about VC Webb and B-160 [SEC=UNCLASSIFIED]

Hi Jeff

Italy's paper at WG9 was about extending the concept of maximum authorised draught to 'areas' as well as 'fairways'. Of course, they did not present the paper themselves, nor did Peter and I realise that they planned to use it on their charts to clear out the bathymetry (although that is what they showed in the example in the paper). If we thought about that at all, it would have been that the example had been simplified to show the relevant detail for the

discussion (about maximum draught 'areas'), but as you stated in your reply to IT, their paper still reference including bathymetry 'as appropriate'. And yet, is this really any different from doing the same in dredged areas (and possibly swept areas and 'safe clearance' areas)? Is the underlying bathymetry actually useful in such areas? It is why I think that the concept of dredged areas and maximum draught areas from a chart user perspective amounts to the same thing; i.e. this is the maximum draught vessel that can enter this area. The main difference is that for dredged areas, the tidal height can be added, but **presumably** not for the maximum draught. As tidal movement is very small in Italian waters, they would probably ignore it. I think a wider discussion on this would be of benefit and may give us an opportunity to get a clearer understanding of what 'maximum recommended/authorized draught' is all about.

Perhaps we can encourage IT to get involved in a 'round the table' discussion at WG11; Rostock is not so far to travel and they did get to Finland. I think we could have a really interesting discussion and there may be scope for simplifying chart presentation.

Grace and peace
Andrew

Mr Andrew Heath-Coleman
Senior Cartographer, Regional Team 2 and
Secretary Chart Standardization and Paper Chart Working Group (CSPCWG)

Operations Standards
United Kingdom Hydrographic Office
Admiralty Way
TAUNTON
Somerset
TA1 2DN

Tel: +44 (0) 1823 337900 ext 3656
Email: andrew.coleman@ukho.gov.uk
www.ukho.gov.uk

From: Wootton, Jeff MR [mailto:jeff.wootton@defence.gov.au]
Sent: 08 October 2014 02:34
To: Coleman Andrew
Cc: Webb Nick
Subject: RE: RE: RE: Draft follow-up letter about VC Webb and B-160 [SEC=UNCLASSIFIED]

UNCLASSIFIED

G'day Andrew:

I have received a response from Cristina, who is happy for us to pursue the maximum authorized draught and underlying bathymetry issue within the CSPCWG (and TSMAD). I will make sure that any future correspondence on this is copied to Manuela (IT representative to CSPCWG). There will be a TSMAD meeting prior to CSPCWG11 (in February 2015), at which I will be reporting the issue as part of the S-57 maintenance Sub-WG report, so there may be some feedback from TSMAD/DIPWG to contribute towards CSPCWG discussions.

In regard to the depiction (or non-depiction) of bathymetry in areas where maximum authorized draught is declared, I will continue my argument that bathymetry is required to allow mariners to assist in reacting to unforseen emergency or other situations. A maximum authorized draught may have been declared, but I do not think this will prevent a port from allowing a vessel of deeper draught from entering if the vessel is experiencing an emergency or other critical situation, and the depth of channels and berths in the port will allow the vessel to enter. The vessel (and possibly the port from a VTS perspective) will need the bathymetry for situational awareness and decision making in such situations.

Regards,

Jeff.

Jeff Wootton
Deputy Director Charting Specifications and Standards
Charting Services Directorate
Australian Hydrographic Service - R.A.N.

Ph +61 2 4223 6508
Fx +61 2 4223 6599
Em jeff.wootton@defence.gov.au

From: Coleman Andrew [mailto:Andrew.Coleman@UKHO.gov.uk]
Sent: Thursday, 9 October 2014 6:09 PM
To: Wootton, Jeff MR
Cc: Webb Nick
Subject: RE: RE: RE: Draft follow-up letter about VC Webb and B-160 [SEC=UNCLASSIFIED]

Hi Jeff

I think I agree your reasoning about including bathymetry in max draught areas, but have not yet thought the whole thing through 'in depth'. It does leave dredged areas as the odd one out. There may be arguments the other way. It could make an interesting discussion at CSPCWG11. Hopefully, we will have some input from TSMAD/DIPWG already available.

Grace and peace
Andrew

Mr Andrew Heath-Coleman
Senior Cartographer, Regional Team 2 and
Secretary Chart Standardization and Paper Chart Working Group (CSPCWG)

Operations Standards
United Kingdom Hydrographic Office
Admiralty Way
TAUNTON
Somerset
TA1 2DN

Tel: +44 (0) 1823 337900 ext 3656
Email: andrew.coleman@ukho.gov.uk
www.ukho.gov.uk

From: Wootton, Jeff MR [mailto:jeff.wootton@defence.gov.au]
Sent: Tue 14/10/2014 10:04 AM
To: Coleman Andrew
Cc: Webb Nick
Subject: RE: RE: RE: RE: Draft follow-up letter about VC Webb and B-160 [SEC=UNCLASSIFIED]

UNCLASSIFIED

G'day Andrew:

In regard to dredged areas, at least the mariner is supplied with the minimum depth that can be considered to be encountered within the dredged area, which will assist in decision-making in an emergency situation. Unless I am mistaken, a declared maximum authorized draught includes an under keel clearance component that, as far as I am aware, is not standardised world-wide and can therefore be any value as determined by the relevant regulatory authority. The mariner cannot easily determine the actual physical depth based on just a maximum authorized draught figure. There are also many factors that contribute to a vessel's "draught", which may cause confusion in interpretation from the chart.

I must admit that I am not coming at this from any weight of experience or requirement, as Australian waters are all subject to tidal influences and as such we do not utilise the concept of maximum authorized draught (however, in some depth critical areas we use "minimum under keel clearance" as a function of actual physical depth, vessel speed and draught, sea state, and tide). I would like to obtain the views of those HO's for which tide is not appreciable and for which the concept of maximum authorized draught may therefore be viable.

Regards,

Jeff.

Jeff Wootton
Deputy Director Charting Specifications and Standards
Charting Services Directorate
Australian Hydrographic Service - R.A.N.

Ph +61 2 4223 6508
Fx +61 2 4223 6599
Em jeff.wootton@defence.gov.au