9th CSPCWG MEETING
Seoul, South Korea, 13-16 November 2012

Paper for Consideration by CSPCWG

Maintained / Dredged Areas

Submitted by:	Australia/UK
Executive Summary:	An action was placed on UK and Australia to develop a proposal to clarify the terms of dredged/maintained area symbols in INT1 and S-4 (if required). This paper is a summary of discussions so far.
Related Documents:	INT1 – I21-23; IHO S-4 – B-414; CSPCWG8-08.9A; CSPCWG8 Minutes.
Related Projects:	INT1 and S-4 maintenance.

Introduction / Background

1. At CSPCWG8 (Turku, Finland in 2011), Australia presented paper CSPCWG8-08.9A – Maintained / Dredged Areas. This paper recommended that consideration be given to retiring symbol INT1 – I21 (Dredged channel or area with depth of dredging in metres and decimetres); and amending the description at INT1 – I23 slightly to indicate that a dredged channel may be maintained through regular control surveys as well as dredging. The result of discussions on this paper at CSPCWG8 were inconclusive, and Australia and UK were given an action to work up a proposal in terms of further clarifying symbols INT1 – I21-23 and, if considered necessary, corresponding guidance in S-4.

Analysis / Discussion

2. Discussions between UK and Australia were conducted by correspondence, with internal office meetings being held at both UKHO and AHO to consider respective national views in terms of the CSPCWG8 paper and resultant discussions at CSPCWG8. The attachment to this paper provides a summary of the discussions held so far and any recommendations that have resulted from these discussions, in order to prompt further discussion at CSPCWG9.

Conclusions

3. While more mature interpretations of the INT1 symbology and corresponding S-4 guidance related to maintained / dredged areas may have been formed by both UK and Australia, it is considered that the results of the discussions so far should be reported to the full CSPCWG for consideration and further discussions.

Recommendations

4. It is recommended that CSPCWG review the summary of discussions provided in the Attachment to this paper, and assess the progress made so far in terms of improving the interpretation in symbology on paper charts between dredged areas that are maintained and dredged areas that are not regularly maintained.

Justification and Impacts

5. It is anticipated that these discussions and resultant actions will result in more consistent interpretation of the symbols for maintained and not regularly maintained dredged areas by the mariner. Impacts are on INT1 and possibly S-4.

Action required of CSPCWG

6. The CSPCWG is invited to:

a. consider this paper, particularly the summary of discussions as contained in the Attachment; and

b. discuss progress made and suggest a way forward.

7. Attachment:

Annex A: Maintained / Dredged Areas – Summary of UK and Australian Discussions.

CSPCWG9

Maintained / Dredged Areas – Summary of UK and Australian Discussions

CSPCWG8 Action 15

AU & UK to work up proposal to clarify terms of dredged/maintained area symbols in INT1 and, if required, S-4

During discussions at CSPCWG8, it emerged that practice in the use of the INT1 symbols I21-23 varies widely, including the interpretation of the meaning of 'maintained'. There was particular concern that the difference (if any) between the left hand versions of I21 and I23 was not clear.

S-32 definitions:

- dredged area An area of the bottom of a body of water which has been deepened by dredging.
- maintained depth The depth at which a channel is kept by human influence, usually by dredging.

Notes: Associated terms 'design depth' and 'project depth' are not defined in S-32. Although they may have meaning for the local authority, they would not help the chart user to know what the actual depth might be.

The 'maintained depth' definition could be improved as 'The minimum clearance depth at which….'

[Jeff: could you take this to HDWG? As far as we know, this is the usual implication of the term; the area/channel may actually be deeper than the stated maintained depth over much of the area.]

An Australian port authority had expressed concern that mariners would interpret 'maintained' dredged areas as 'areas that were regularly maintained by dredging to the control or design [ie the stated] depth'. Indeed, this seems likely as that is exactly the message that the symbol I23 is intended to convey (as implied by the S-32 definition above)! For the mariner, the description in INT1 is clear, so is any change necessary at all?

However, there are many port authorities (possibly including in Australia?) who maintain their dredged areas but, because of silt, they cannot guarantee that the stated depth will always be present. Others may dredge as necessary only when a vessel requiring the stated depth is expected. For others, silting does not occur so dredging is required very infrequently.

Even where frequent maintenance surveying and dredging is carried out, some authorities will not allow HOs to use the term 'maintained' because of the risk of liability. (In UK, generally only port authorities which dredge well below the stated depth and then monitor until the depth reduces to close to the stated depth before re-dredging, allow the term 'Maintained' to be used). Where 'maintained' cannot be used, despite frequent dredging, it would be an intolerable chart maintenance load to update the dredged date every time a new post-dredging control survey is carried out (even if the HO is notified, which is unlikely). Consequently, there does need to be a third option, which is currently I21.

Although in INT1 the left hand depiction of I21 and I23 appear to be the same (apart from the example depth), it will usually be evident from chart context which is meant. But it is evident (from discussions at CSPCWG8) that port authorities, and therefore possibly the mariner, may be confused over the meaning of a dredged depth without either the word 'maintained' or a date. (However, note that the recent DQWG survey identified 'dredged to…' as one of the best understood quality indicators.) In such cases, therefore, an explanatory note is usually included.

In the case of I21, there should always be an explanatory note (if we include that in the revised specification). In the case of I23, there will be at least a 'Maintained depth' legend in those channels and areas that are big enough, implying a similar dredging programme applies in other dredged areas of the port; if not, that should also be explained by a note.

It may be that more use could be made of the 'maximum authorized draught' symbol, eg *<5.3m>*, or possibly controlling minimum depth (INT1 M18), provided that this is agreed by the local authority. Would this be black in a dredged area and magenta where there is no artificial deepening, or always magenta because it is regulatory?

[Jeff: following discussions at CSPCWG8 item 8.18 (FI), is it worth considering whether 'maximum recommended draught' and 'maximum authorized draught' should be differentiated by colour, ie black for the former, as used on a recommended track (M6 term to be amended) and magenta for the latter (as agreed for M18). Or is this too subtle for the mariner?]

Proposal

add to S-4 414:

> If possible, one of the methods of defining the type of dredged area below (I22 or I23) should be used, in consultation with the local authority. However, if that is not possible, eg:
>
> - because frequency of dredging means maintaining the dates would be impracticable;
> - because the local authority does not permit the use of the term 'Maintained',
>
> then the depth only* should be charted (I21), but always accompanied by an explanatory note, eg:
>
> DREDGED [or MAINTAINED] DEPTHS
>
> Dredged [or Maintained] depths may be less than charted. For the latest information, consult the Port Authority [or Harbour Master or Pilot].
>
> Consideration may also be given to charting a maximum authorized draught (M18, see B-434.5) instead of a dredged or maintained depth, if agreed by the local authority.

In INT1:

- Amend right hand example at I21 to '***Dredged to 3,5m (see Note)***'
- Amend term at I23 to 'Channel or area with minimum depth maintained'.

[Jeff:

*I21: I do not understand why the legend 'Dredged to' does not precede the depth, where space permits (ie for the RH example at I21). Surely the real difference from I22 is that there is no date. And if there is always to be a note, then that should also be shown in the example (there are plenty of precedents in INT1).

I23: the term 'regularly' does not really help the mariner, nor is he really interested in how the depth is maintained (surveys/dredging). What he needs to know is whether he can expect the stated depth to be present whenever he uses the channel or enters the area. We should keep INT1 as simple as possible. I would rather omit the option to use the note in association with 'Maintained' areas, as I think that term should only be used when there is no expectation that the depth would be less than stated.

I think these changes to S-4 and INT1 should help to make the 3 different depictions more distinctive and help cartographer, port authority and mariner alike to better understand which is appropriate and what the exact meaning is].

Summary of Australian discussions 12 September 2012:

History:

BA5011 Edition 4 (1979) at Q5 and Q6 distinguishes a dredged area that is maintained from a dredged area that is not maintained by inserting the year (for not maintained), and describes these as "Dredged channel or area, with controlling depths". BA5011 Edition 5 (1984) is where the term "Maintained depth" was first introduced onto the face of the chart (Q6), to replace the former Q6 "Dredged to …" (no date), which was made obsolescent. New example symbology was also introduced in Edition 5 showing smaller dredged areas without the terms "dredged to" and "maintained depth", again only distinguished by having a year (not maintained) or not having a year (maintained). The descriptions for Q5 and Q6 remained as they were in Edition 4.

Discussions were held at the AHS and with port authorities that provided dredged depth information to the AHS (control surveys) on publication of BA5011 Edition 5 in order to determine the circumstances for use of the term “maintained depth” on Australian charts. As far as we can determine, there was no discussion at the time with UKHO regarding their use of these representations, other than the possibility of some communication through the old “quarterly letter” process (unfortunately I have not had time to research this further). The agreement reached between the AHS and the ports at that time was that dredged areas for which regular control surveys are conducted, and re-dredging done as required, would be shown on our charts as “maintained depth” areas (i.e. annotated as “Maintained depth” and/or no year of dredging). The depth shown would be the depth as indicated by the control survey, we assume because of the use of the term “with controlling depths” in the description at Q5 and Q6. These “controlling depths” would be amended by (T)NM as indicated by new control surveys, or through re-dredging of the area. This has been the policy for depiction of maintained dredged areas on our paper charts since then. Note that the definition for “controlling depth” in the Hydrographic Dictionary is “The least depth in the approach or channel to an area, such as a port or anchorage, governing the maximum draft of vessels that can enter”.

Discussion:

S-32 definitions: Even though the terms “design depth” and “project depth” are not used in terms of charting, this does not mean that there is no requirement for a definition in the Hydrographic Dictionary. There may be use in having definitions for these terms in regard to the understanding/interpretation of terms such as “maintained depth” by port and other regulatory authorities. A brief discussion on this indicated our interpretation of “design depth” to be the depth required by the relevant authority in order to allow the maximum size vessel intended for the port to enter and berth, while “project depth” is the depth intended to be the depth of dredging. In terms of the UK use of the term “maintained”, the design depth is the “stated depth” and the “project depth” is the intended depth of re-dredging when the “stated depth” is approached through siltation.

In regard to the current Hydrographic Dictionary definition for “maintained depth”, our conclusions were that the definition be amended to something similar to: “The depth at which a channel is kept by human influence, usually by regular control survey and dredging as required”.

Maintained depth: There were two interpretations of the term evident at the meeting, these being the actual charted depth being maintained by dredging to a depth deeper than the charted “design depth” and re-dredging when control survey indicates that the actual depth is approaching the “design depth” as a result of siltation (UK interpretation – what we termed charting the “intended depth”); and maintaining the charted depth as the “controlling depth” by (T)NM as indicated by the latest control survey (historic Aus interpretation as explained above – which we termed the “actual depth”). The example of the Aus interpretation provided at the meeting was a channel dredged to 14.7m in order to allow for vessels with a draught of 14m to enter the port. The charted maintained depth for the dredged area is 14.7m, and this is adjusted by (T)NM as control surveys indicate that siltation has occurred, until the port authority decides to re-dredge. The decision to re-dredge may not necessarily be related to the depth as indicated by the latest control survey, but may be influenced by money available for dredging; and the schedule of vessels due to visit the port. In other words, the port does not (or will not) indicate a defined depth at which it will re-dredge (or a “design depth”). When re-dredged, the post-dredge survey may indicate that the intended dredged depth (14.7m) has not been reached – again this will be promulgated by (T)NM. It was stated at the meeting that this concept is well understood by most Australian ports (and particularly those ports for which their maintained dredged areas are subject to regular siltation), and is consistent with the decisions made on discussion with the ports in the early 1980’s.

In terms of our ENC production, we have incorporated our own specification for indicating the depths in maintained dredged areas in accordance with our interpretation. For information I have included this guidance below. Note that in this guidance we have used the term “design depth” to mean the depth to which the area is intended to be re-dredged.

Areas not regularly maintained: There was a clear consensus as to the meaning of the insertion of a year date with the dredged depth, and agreement that the addition of the words “Dredged to” resulted in a clearer interpretation. However, it was considered that the description at I22 –

"Dredged channel or area with depth and year of latest control survey" – was in error, and should be amended to read "Dredged channel or area, not regularly maintained, with depth and year of dredging". Our interpretation is that the term "control survey" (not defined in Hydrographic Dictionary) implies that the area is maintained (use of word "control"), and may be confusing to the mariner. We also considered that a clearer indication should be provided to the mariner in regard to what is an area that is not regularly maintained, and what is regularly maintained, as is clearly given in S-4. Some minor re-wording was also suggested for S-4 – B-414.1.

Discussion with mariners and interpretation of INT1 – I21-23: Mariner feedback was that where they see "Maintained depth" and/or no year date in a dredged area, they would not expect any depths shoaler than the depth indicated to exist in the area (taking into account application of NMs). Where they see a year date in association with the dredged depth in a dredged area, they would be more likely to assume that shoaler depths than the depth indicated may exist, and seek further information from the port authority/harbour master/pilot. This indicated that mariners were not making any distinction in regard to the INT1 – I21 and I23 left examples, but were interpreting these as maintained depth areas. This was further indication to the meeting that I21 is not required, as previous mariner feedback indicated that I21 is generally ignored as it does not provide any qualitative information. There appeared to be agreement between the mariner interpretation of I22 and the guidance at S-4 – B-414.1 in terms of these being considered to be areas that are not regularly maintained.

UK Proposal: Given that our discussions confirmed our earlier suggestion that I21 be retired, much of the suggested new S-4 wording is not required. During our discussions, it was noted that Australia has already placed chart Notes against some maintained dredged areas. It was considered that this did not need to be reflected in INT1, but a paragraph could be inserted at S-4 – B-414.

Addition of maximum authorised draught: It was considered that this should be discussed further by CSPCWG, although what has occurred on a couple of Australian charts, at the request of port authorities, is that dredged areas are being replaced by full depth depiction, and the area of the dredged area defined as a fairway, with the maximum authorised draught, if considered important, indicated for the fairway. This tends to be relevant for areas that are not subject to siltation, given the amount of chart maintenance that would be required in a changeable area covered by full depth depiction that is regularly the subject of control surveys and re-dredging. One thing we did agree on in terms of maximum authorised draught was that if this was to be indicated, it must be in addition to a dredged depth, not instead of a dredged depth. An indication of the depth should always be provided, and in discussing this we also considered the requirements for ENC and the indication of the mariner's selected safety depth. Our conclusion was that because the dredged depth was required to be shown, showing a maximum authorised draught in addition would be overkill.

Unfortunately due to time limitations we did not have a chance to discuss the differentiation of "maximum authorised draught" and "maximum recommended draught".

Recommendations:

1. CSPCWG to discuss possible addition of definitions for the terms "design depth" and "project depth" in the Hydrographic Dictionary, and possible recommendation to HDWG.

2. CSPCWG to suggest to HDWG an amendment to the Hydrographic Dictionary definition for "maintained depth" to read similar to: "The depth at which a channel is kept by human influence, usually by regular control survey and dredging as required".

3. Amend S-4 – B-414.1 to read similar to: "……., the legend on the largest scale chart must give both the depth, and either the last known year of dredging or, if available, the year of the latest survey covering the area which confirms the dredged depth since the last known year of dredging."

4. Add a paragraph to B-414 similar to: "Where it is considered that the mariner requires additional information in regard to depths indicated in dredged areas (eg: where it is known that the area is subject to regular siltation), a cautionary note may be added.". If considered necessary, a sample Note may be included.

5. Further CSPCWG discussions in regard to allowing the option to depict the maximum

authorised draught, in addition to the dredged depth, in a dredged area.

4. Remove diagram and reference to I21 from S-4 – B-414.
5. Retire I21 from INT1.

Australian specification for ENC related to maintained dredged areas (AUOC Clause 5.5):

- In many Australian ports, dredged areas are subject to siltation, resulting in shoaler depths being identified in the dredged area than the designed dredged depth. Where the dredged area is maintained, this information is regularly reported to the AHO and it is required to provide this information to the mariner through Temporary Notices to Mariners for paper charts and Updates to ENCs. When compiling a new ENC cell or a New Edition of an ENC cell, compilers must consult with MNAM to determine whether encoded **DRGARE** within the cell are subject to siltation, and if so obtain the latest depth information for the area(s) available to the Office. Where this information is available, the design depth for the **DRGARE** must be populated using the attribute DRVAL2, and the actual depth populated using the attribute DRVAL1. Where the area has been recently re-dredged so that the actual depth is equal to the design depth, both DRVAL1 and DRVAL2 must be populated with the design depth (NOTE: This may generate Warnings in some validation software, which can be ignored). Where the area has been recently re-dredged so that the actual depth is deeper than the design depth, DRVAL1 must be populated with the deeper dredged depth, and DRVAL2 must not be populated (in such cases, NAM staff must compare subsequent control surveys with the control depth for the dredged area and populate DRVAL1 and DRVAL2 in accordance with the above guidance). In all cases, the attribute SORDAT should be populated with the date of the post dredging survey from which the values of DRVAL1 and DRVAL2 have been derived. Where MNAM indicates that a dredged area is not subject to siltation, the dredged depth must be populated using DRVAL1.
- Where siltation occurs within a dredged area servicing multiple berths, the degree of siltation may differ from berth to berth. Where MNAM indicates that this is a possibility, a separate **DRGARE** must be encoded for each berth in the berth pocket, with the attributes DRVAL1 and DRVAL2 populated in accordance with the above bullet point. (NOTE: This may generate Warnings in some validation software related to areas which can be merged where the attributes of adjoining **DRGARE** are identical, which can be ignored). The attribute SORDAT should be populated with the date of the post dredging survey from which the values of DRVAL1 and DRVAL2 have been derived.