INTERNATIONAL HYDROGRAPHIC ORGANIZATION

ORGANISATION HYDROGRAPHIQUE INTERNATIONALE

IHB File N° S3/4405

CIRCULAR LETTER 58/2013
28 October 2013

CHART SPECIFICATIONS OF THE IHO (S-4)
New and revised Specifications related to Sections B-100 – General and B-400 – Hydrography and Aids to Navigation

Reference: IHO Publication S-4 Part B - *Chart Specifications of the IHO*, Edition 4.4.0

Dear Hydrographer,

1. In accordance with its Terms of Reference, the IHO Chart Standardization and Paper Chart Working Group (CSPCWG) has a responsibility to "*advise the IHO on suggestions put forward by Member States to update S-4, in accordance with IHO Specification B-160, with the goal of achieving the maximum possible adherence by Member States to the Regulations and Specifications*" (CSPCWG Terms of Reference 3a.ii).

2. Accordingly, the CSPCWG has recently considered in detail the following subjects, based on various questions or proposals raised by Member States and chart users:

a. Updating order of charts according to scale;
b. Selection of soundings;
c. Definition of major lights;
d. Specification of direction lights;
e. 'Highlighting' of navigation lights;
f. Status of 'Large Automatic Navigational Buoy' (LANBY).

Items c to f have also been discussed with experts from the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA).

3. As a result, the CSPCWG proposes certain new and revised Specifications for inclusion in S-4. Draft texts for new or revised Specifications are provided in Annex A to this Circular Letter for Member States to review.

4. According to Specification B-160 of S-4, Member States should inform the IHB (info@iho.int) within three months if they have any major objections to the adoption of these revised or additional specifications, or any other comments. Therefore, any comments from Member States should reach the

IHB **no later than 31 January 2014**, using the Response Form in Annex B. If no objections are received, the IHB will announce in a follow-up Circular Letter that the revised Specifications have come into force. The CSPCWG will then include them in the next edition of S-4.

On behalf of the Directing Committee
Yours sincerely,

Gilles BESSERO
Director

Annex A: Draft new Specifications (with brief explanations)
Annex B: Response Form

PROPOSED NEW AND REVISED SPECIFICATIONS

a. Updating order of charts according to scale
b. Selection of soundings
c. Definition of major lights
d. Specification of direction lights
e. 'Highlighting' of navigation lights
f. Status of 'Large Automatic Navigational Buoy' (LANBY)

Proposed additions and amendments to S-4 are shown in red below.

a. Updating order of charts according to scale

Background: The CSPCWG agreed the principle that the largest scale charts should be updated at the same time or before associated smaller scale charts and agreed that it would be useful to state this explicitly in S-4.

In general, S-4 provides detailed guidance on how to chart objects and information, but only limited guidance on underlying 'general' principles. New, more general guidance was included in the revised section B-300 of S-4 Edition 4.4.0, but only related to topography. CSPCWG proposes, therefore, that this new 'general' item should follow B-100.4, which was added very recently, as a new paragraph B-100.5:

B-100.5 **Compilation procedure: largest scale first.** The mariner requires charts to be consistent throughout the scales, at least for essential data content; this is called 'vertical consistency'. For this reason, as far as possible, the original compilation and subsequent updating of charts, whether by Notice to Mariners or new edition (see section B-600), should proceed from the largest scale, through the series, to the smallest scale. In practice, this is best achieved by compiling from original source data into the largest scale chart and then compiling the next smaller scale using the largest scale chart as source, and so on to the smallest scale appropriate for the data type.

Within a series of different scale charts covering the same location, chart content in terms of its cartographic detail and resolution is greatest at the largest scale. At smaller scales, detail must be generalized, with only a selection of the available source data (including soundings) being portrayed, so that the information which is selected is clearly presented. This selection is based upon the significance of the information to the mariner and the purpose of the chart (see B-300.3 and B-403). This will ensure that the charts are vertically consistent; consequently, any sounding on the smallest scale chart will also be present on the largest scale.

Updating. Vertical consistency also benefits hydrographic offices by simplifying the task of updating all charts covering the same location when new data is received. Note also that B-620.2 states that 'where differences exist between charts, the largest scale national and, where appropriate, INT chart is accepted as the authoritative document and must therefore be given priority for updating'.

****

b. Selection of soundings

Background: The CSPCWG considers that it would be helpful to explain the best practice for the selection of charted soundings in order to avoid the mariner wrongly interpolating the depth between soundings. The following draft new sub-paragraph is mainly derived from Australian and United States HO guidance. The existing sub-paragraphs of B-410 will be re-lettered as a consequence of introducing this new guidance.

B-410 REPRESENTATION OF DEPTH: GENERAL

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

a. The main principle is the selection of soundings based on a 'shoal biased' pattern. For well surveyed areas, this is achieved through the 'triangular method of selection', whereby:

- no actual sounding will exist within a triangle of charted soundings which is less than the least of any of the soundings defining the edges of the triangle; and
- no actual sounding will exist between two adjacent charted soundings forming an edge of the triangle which is less than the lesser of the two charted soundings.

The latter principle should also be applied between adjacent charted soundings in areas covered only by passage soundings. In order to provide an indication to the mariner of the location of the tracks, charted soundings along tracks may be much closer together than soundings in surveyed areas (see also B-417.4 and B-418.2).

The final test of depth selection is that no source material should contain depths shoaler than the mariner would expect by interpolating between the depths on the chart.

b. The least depth over shoals and banks…

****

c. Definition of major lights

Background: Despite references to 'major lights' in S-4, no clear IHO definition exists. The advent of multicoloured paper charts and ENC displays requires a method of distinguishing such lights from less important lights. Accordingly, CSPCWG proposes better guidance for the compiler. A recent proposal was made to define such lights by nominal range (i.e. 10 M) for use when compiling ENCs, but this seems too rigid and not necessarily appropriate given the current tendency of some light authorities to reduce light ranges. IALA does not have a clear definition, either, but a working definition has been developed in consultation with IALA experts.

The main reference to major lights in S-4 is currently at B-472.1. However, CSPCWG proposes that the following improved definition should preferably be added to the paragraph on 'Definitions of technical terms' at B-470.2.

Proposed addition to B-472.1 (as agreed with IALA experts):

B-470.2 **Definitions of the technical terms** used in these specifications are given in IHO publication S-12 'Standardization of List of Lights and Fog Signals'.

Charts and LL should agree in definitions, names and abbreviations used, as well as in the characteristics of the aids to navigation. However, short term differences may have to be tolerated, due to different maintenance mechanisms.

Major lights. For the purposes of charting, this term describes navigationally significant lights which are considered essential for:

- marking landfalls, off-shore dangers, shipping routes and port access channels; or
- the protection of the marine environment.

The above definition is derived from IALA recommendation O-130 Edition 2 'Navigational significance - Category 1'. Major lights may be on land, on platforms or floating structures at sea. Lights inside harbours are generally excluded.

Other minor changes will be required in S-4, where there are references to 'major lights':

B-435.7 (no action required)
B-462.8 (no action required)
B-470 (add cross reference to B-470.2)
B-470.1 (no action required)

B-470.4 (add cross reference to B-470.2)
B-470.5 (amend cross reference to B-470.2)
B-470.7 (add cross reference to B-470.2)
B-472.1 (replace parenthesis by cross reference to B-470.2)
B-474.1 (add cross reference at end of 2nd sentence. Paragraph is under review by the CSPCWG)
B-477 (no action required)

****

d. Specification for Direction Lights

Background: CSPCWG is concerned that the term 'Dir' as used to indicate a 'direction light' is no longer fully understood. The IALA experts agree that the original usage (to designate a specific type of sector light developed by the 'Physics and Engineering Laboratory', known as 'PEL') was no longer relevant. Lights of this type tend to be used where leading lights cannot be established. CSPCWG considers that the abbreviation 'Dir', in lieu of 'Ldg Lts', is useful to mark the centre line to be followed through a narrow sector (whether the sectors are charted or not).

The abbreviation is also useful where the character of a light is too complex to describe it in a normal light description (for example in the case of an oscillating light where the character changes from fixed W, through Fl/Iso/Oc alternating WR and WG). CSPCWG considers that the existing guidance should be clarified and simplified and proposes the following revised specification:

B-475.7 **Direction (or directional) lights** of several types are in use. All have in common a very narrow sector intended to mark a direction to be followed. They are generally used where leading lights cannot be established but serve the same purpose as leading lights. The narrow sector may be flanked by:

- unlit sectors
- unintensified sectors
- coloured sectors
- sectors of a different character (usually caused by the light oscillating from side to side).

If charted, the centre line of the sector must be depicted in a manner similar to a leading line (see B-433) but with the **international abbreviation** 'Dir', and the course to be followed, against the line, eg:

P30.1

[*symbol references refer to INT1; actual graphics will be included in S-4*]

In the case of multicoloured direction lights, the mariner will expect to see coloured (usually green and red) sectors either side of a central white sector. To avoid chart clutter, or if the sectors are too narrow to chart, it is sufficient to show only the centre line of the leading sector, with the light description and course to be followed shown against the line, eg DirFl(2) 255.5°. If a more comprehensive light description is required, this should be shown at the light star to avoid chart clutter in navigation areas, eg Fl(2)WRG.15s11M, with only Dir 255.5° alongside the line.

P30.2

The sector limits and arcs may, if considered useful and the scale allows, be charted instead of, or in addition to, the centre line, in the same way as for other sectored lights (see B-475.1).

If a light oscillates from side to side, there will be sectors either side of the fixed sector where the light phase decreases as the deviation from the central sector increases. If charted, such sectors should be labelled as 'Oc', although in practice they vary between

occulting and flashing. For multicoloured lights, there will also be sectors which alternate between white and green or red. Again, the duration of each colour will vary across the sector. For oscillating lights, therefore, the abbreviation 'Dir' should be used in place of any attempt to describe the more complex character abbreviations at the light description, eg: DirWRG.11m15-10M or, if the sectors are shown, as in the following examples:

P30.3

P30.4

****

e. 'Highlighting' of navigation lights

Background: Lighthouse authorities are using various different devices to highlight navigation lights where background light pollution makes their identification difficult from sea. Consequently, CSPCWG considers that it will be useful to include an explanatory paragraph in S-4 to inform compilers and provide advice on how 'highlighting' devices may be charted. CSPCWG does not consider it practical to devise special symbols to cover all examples currently in use or which may be developed in future.

The following new Specification is proposed[1]:

B-478.4 **Highlighting of navigation lights.** Light pollution, (eg: street lighting, harbour area floodlighting, architectural lighting, illuminated signage) adjacent to an important navigation light can make it difficult to identify the navigation light by a mariner.

In these circumstances, lighthouse authorities and ports use various methods to draw attention to navigation lights to make them more easily detected and identified.

Many of the methods used to improve the identification of a light can be described using standard light descriptions. These include:

- rapidly alternating colours (as on emergency wreck marking buoys) (see B-466.2f);
- faster rhythm (see B-471.2 and B-471.5);
- alternating flashing pairs of lights (similar to road lights at a level crossing) (see B-471.2 and B-471.8);
- increased intensity (see B-471.7 and B-475.2);
- the disposition (see B-471.8);
- floodlighting the structure (see B-478.2);
- synchronizing (including sequencing) groups of lights (see B-478.3).

Other methods of improving the identification of a light (some still experimental) are more difficult to chart using current methods; these comprise:

- Including a higher frequency flicker (at a frequency of around 10Hz) in the flash profile of a flashing light.
- Displaying a high intensity strobe light next to the navigation light at the beginning of its rhythmic sequence to draw the observer's eye to the navigation light.
- Using 'Pointer' lights: an arc of light installed next to an existing navigation light that displays a circular sequence of lights to give the impression of a moving pointer that 'points' to the position of a navigation light. An 'arc-pointer' is considered more conspicuous against the background ambient light because of its shape, colour and the apparent movement caused by the sequenced flashing.

[1] IHB note: the text proposed by the CSPWG has been edited by the IHB to facilitate understanding by non-specialists.

- Adapting the shape of the Light Source: an illuminated shape that provides a very conspicuous marker, used either as a pointer to an aid to navigation (AtoN) or as an AtoN in its own right.
- Using floodlights to periodically illuminate a mark or by periodically changing the colour of the illuminating floodlight.
- Using low luminance lighting to highlight the outline of a structure.

This is not an exhaustive list, and further devices may be introduced in the future. There is no generic symbol available to chart these (and future) arrangements. In these cases, details should be provided in the relevant List of Lights (LL). A legend '(see Note)' may be added to the light description, with a description of the method of highlighting the navigation light being provided in the note or a reference to a List of Lights (LL).

****

f. Status of 'Large Automatic Navigational Buoy' (LANBY)

Background: The CSPCWG Secretary sought advice from IALA experts on whether LANBYs (as defined at B-460.4b), still exist. This was because of a request to reinstate the symbol for a light vessel because it is very distinct in physical shape from a LANBY. IALA experts have advised that it is their understanding that there are no 'LANBYs' still in service.

It is therefore proposed to add to B-460.4b, 3rd bullet:

It is understood (2013) that there are no longer any LANBYs in service.

Note: "navigation buoy" will be amended to "navigational buoy" in B-460.4 b and B-470 to be consistent with the terminology adopted by IALA and used in B-122.1 and B-474.1.

****

CHART SPECIFICATIONS OF THE IHO (S-4)

a. Updating order of charts according to scale
b. Selection of soundings
c. Definition of major lights
d. Specification of direction lights
e. 'Highlighting' of navigation lights
f. Status of Large Automatic Navigational Buoy (LANBY)

Response Form

*(to be returned to the IHB **by 31 January 2014**)*
E-mail: info@iho.int - *Fax: +377 93 10 81 40)*

Note: The boxes will expand as you type your answers.

Member State:
Contact:
E-mail:

Do you agree with the new or revised Specifications? If you answer 'No', please explain in the comment section below the tables.

No	S-4 references	Title	Yes	No	Comment (Y/N)
a	**B-100.5**	Updating order of charts according to scale			
b	**B-410a**	Selection of soundings			
c	**B-470.2**	Definition of major lights			
d	**B-475.7**	Specification of direction lights			
e	**B-478.4**	'Highlighting' of navigation lights			
f	**B-460.4b**	Large Automatic Navigational Buoy (LANBY)			

Comments:

Signature:
Date: