



CHART STANDARDIZATION & PAPER CHART WORKING GROUP (CSPCWG)

[A Working Group of the Hydrographic Services and Standards Committee (HSSC)]

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To CSPCWG Members

Date 17 July 2012

Dear Colleagues,

Subject: Actions arising from 8th CSPCWG meeting – Group 2

Many of the actions listed at CSPCWG8 require the Secretary (sometimes in consultation with others) to draft various papers. Work has started on most of these but it seems best to present them for consideration by Working Group members in small groups. Letter 06/12 covered miscellaneous actions 7, 10, 11, 17 and 21. Letter 07/12 dealt with action 34.

This letter now deals with actions 12, 14, 36 and 37 (all to do with lights). Annex A lists each action item highlighted between <>, followed by notes from the CSPCWG8 report and any further discussion if required, before the proposed draft (new words in red).

Each action is separated by *****

Please study each carefully and let me have your comments by 11 September 2012, using the response Form at Annex B. Responses are invited from all WG members, not just those who attended CSPCWG8.

Yours sincerely,

Andrew Heath-Coleman,
Secretary

Annex A CSPCWG8 Secretary drafting actions – Group 2
Annex B Response Form

CSPCWG8 Secretary drafting actions – Group 2 (Lights)

Action 12: <Sec to amend S-4 guidance on lights on multicoloured charts:

- two different lights charted in same position to have separate flares
- if coloured sector arcs shown, there should be no flare>

In consideration of the various questions detailed in the paper, the meeting decided that:

- Charts falling by scale under S-4 Part C specifications would be omitted from the multicoloured style.
- Magenta should be specified for light flares on platforms and for Aero navigation lights.
- Multiple coloured flares should be used when two or more separate and different coloured lights are depicted at a single light star.
- Light flares should be omitted if coloured arcs are shown on light sectors.
- Where coloured circles are placed around all-round lights, the diameter should not be related to the range of the lights.
- Unusual lights which do not conform well to the guidance should be explained by a charted note. (The example of J4655 was considered by the meeting.)

UK asked if any other HOs give advice to mariners on how to update their charts for multicoloured sectors; no WG members were aware of such advice.

It is assumed that the S-4 Section on lights as shown on multicoloured charts (B-470.4a) should also be updated for other agreed or proposed changes. The following is a revised text for B-470.4a, including additional clarifications from CSPCWG correspondence (see Letter 06/2011) and discussions at CSPCWG8. The order of the guidance has also been improved. New guidance and changes from existing guidance is in italics; this will revert to upright type when approved and published in S-4. It is suggested that these changes are 'clarifications' under the definitions in TR 2/2007, and therefore do not need to be approved by Member States.

a. **General rules on 'multicoloured' charts:**

The use of colours additional to the minimum four colours (see B-140) is particularly useful for depicting light sectors marking intricate inshore channels. The following specifications should be adhered to on multicoloured charts, to achieve conformity. For further guidance on placing sectors, see IHO Specs B-475. *Note that charts of scale smaller than 1:2 000 000 should be produced in the standard four colours and conform to the specifications in Part C.*

- Colours for flares and sector arcs** should be chosen to be easily distinguishable from any background tint. They should also be tested for visibility under vessels' bridge lighting.
- Light flares** must be in the appropriate colour:
 - Yellow/orange should be used for white, yellow, amber and orange lights.
 - Red should be used for red lights. Alternatively, magenta may be used.
 - Green should be used for green lights.
 - Blue/cyan should be used for blue lights.
 - Magenta may be used for violet lights. *For another use of magenta flares on multicoloured lights, see (vi) below.*
- Sector limits** should be fine dashed lines, but may be shown as fine continuous lines. Emphasis may be provided by 1mm wide colour bands where marking the sides of a fairway (see B-475.1, B-475.5 and INT1 P41.2).
- Sector arcs** should be fine dashed lines, but may be shown solely by coloured arcs. *Additionally:*

- Coloured sector arcs (or circles for all-round, ie 360°, lights; see (v) below) should be 1mm wide. Faint sectors may be 0.5mm wide *and/or distinguished by the legend 'Faint'*. In very narrow sectors, a wider wedge of colour should be shown, so that it is clearly visible.
 - Coloured sector arcs (or circles for all-round lights) should be used on all major lights. A *major light is not defined by range, but by the importance of the light in the context of the chart - a matter of cartographic judgement*. Leading lights (with narrow sectors) and minor lateral lights should usually be shown by flares.
 - The **international abbreviation** for the colour or character of the light should be added *on the arc*, in case the colour is difficult to distinguish under a vessel's bridge lights. For omission of the colour abbreviation in the light description, see B-472.3.
 - Where coloured arcs (including circles for all-round, ie 360°, lights) are *placed within 30mm of the light star, shown*, the flare(s) *may should* be omitted. *In the latter case, coloured flares should be located at the light star.*
 - Coloured sector arcs should be situated to avoid conflict with significant detail. Where this cannot be achieved, coloured arcs should be broken to clear significant detail, or the arc moved further from the light, but not beyond the range of the light. *Avoid clashes with legends, soundings and symbols if possible; consider the possibility of moving legends. If unavoidable, yellow may overprint black or magenta, but other coloured bands should be broken.*
- v. **Major all-round navigational lights** should normally be surrounded by a circular 1mm band of the appropriate colour, radius approximately 10mm. No attempt should be made to make the radius of the circle proportional to the range of the light. The circle should continue across land and be unbroken if possible, including through dark sectors invisible from the sea. The following exceptions are marked by flares instead of circles:
- *Lighted platforms usually have a 15M white light, but also have lower power red lights. They should have a single magenta flare; where necessary, the flare(s) on adopted charts should be changed accordingly. Note that renewable energy devices, such as wind turbines, marked according to IALA convention have only yellow navigation lights and therefore should have yellow flares.*
 - *Major floating lights should be treated as buoys and marked by a flare of the appropriate colour.*
 - *Lights without descriptions on small-scale charts are conventionally shown by a light star with a flare but no description. They are the only lights on the chart, and the flare is simply there to draw attention to the existence of a major light rather than give information about its character. They should continue to be charted with a generic magenta flare.*
- vi. **Multicoloured lights.** If a light is multicoloured and the sectors (or circles for all-round lights) are not charted, a single magenta flare must be used, except as follows:
- *Where there is a major all round light, with a separate red sector light covering a danger, this should normally be symbolised by the all round light circle around the light, with the red light symbolized separately by its sector, with red arc, covering the danger. If the chart scale is too small to show the red sector, then omit the associated light description too.*
 - *Where two or more separate and different coloured lights are charted at the same light star (because they are on the same structure or because of scale), separate flares for each colour should normally be shown. If this would obscure detail, then a single 'generic' magenta flare may be shown.*
 - *Where lights include subsidiary 'reserve' lights of a different colour, use the flare colour for the main light only; reserve lights should not be charted.*
- vii. **Alternating and oscillating** lights should be shown by parallel ~~or overlapping~~ different coloured arcs (or circles for all-round lights), *normally with no gap between (P30.4). Exceptionally, if a light alternates between blue and green, a visible but small gap should be left, to assist perception that there are two separate colours.*
- viii. The **Moiré effect** symbol (P31) should be charted by a magenta triangle.
- ix. The **floodlit** (illuminated) symbol (P63) should be yellow/orange.
- x. The **strip light** symbol (P64) should be coloured as appropriate to the light.

- xi. *Aero navigation lights (P60) may be single or multicolour (often alternating colours) and are assumed to be all-round. However, as they are not intended for marine navigation (and information may not be available as to status of the light), it is not appropriate to give undue prominence to these lights. They should therefore be charted with a generic magenta flare.*
- xii. *Unusual lights, or other lights which do not readily conform to the instructions above, may need to be explained by a charted note.*

Action 14: <Sec to research further the issue of 'major' lights and, if required, propose any changes to S-4 and INT1 by correspondence>

J Wootton (AU) explained that the DIPWG decision to define major lights as those with a range of 10M is intended solely to drive the ENC presentation of such lights; it is not intended to be the basis for a wider definition of major lights. Nevertheless, there was some evidence that light ranges were tending to be reduced, which may require further consideration on whether a change is required to the generally accepted convention that a major light has a range of 15M or more. 'Major' could be a subjective term, varying according to scale and navigational situation. There is a need for further investigation, after which the subject should be continued by correspondence.

Following several communications with IALA (Mike Hadley, IALA Technical Co-ordination Manager) it seems there is not, and never has been, a formal definition of 'major' light. We have looked at 'availability targets' but these are no help from a charting perspective and the IALA categories of 'navigational significance' are not particularly useful either, as we would need to further define such features as primary and secondary routes. Consequently, it seems to come down to cartographic judgment which lights should be charted with a coloured circle for emphasis or just a flare; this will vary from chart to chart for the same light. This is reflected in the draft guidance at Action 12 above. It is still possible that IALA will come to a more definite conclusion, which the IALA Council will communicate directly to IHB, by a 'liaison note'. Any further amendments to S-4 should await the outcome of IALA deliberations.

ACTION 36: <Sec to further research into defining Dir lights, in consultation with IALA and HDWG>

Direction lights are defined in IHO publications as having a 'very narrow' sector. Some countries have interpreted this as 3° or less, while other countries designate lights with much wider leading sectors as 'Dir'. DE, SE and UK all consider 3° to be the maximum width of a Direction light leading sector. AU asked for a clearer definition, as some local authorities were requesting AU to chart all sector lights as Dir.

IALA Navguide 2010 84 does not use any more specific term than 'narrow sector'. It does refer to the sort of lights (eg PEL lights) that started this discussion as 'Precision Direction Lights' (or PDL). Is this a term we should be using? Mike Hadley, IALA Technical Co-ordination Manager, has undertaken to refer this to the next IALA Aids to Navigation Management (ANM) meeting, in November 2012. We suggest no further action until IALA have communicated further.

ACTION 37: <Sec to further research into Arc-pointer, and any other methods of making light positions more visible, and suggest options to CSPCWG.>

Spain is experimenting with shaped 'Pointer' lights to draw attention to the position of an AtoN amongst heavy background lighting. In the port of Barcelona a new prototype of a device pointer, in the shape of an arc, was installed in mid-2007. The main aim of this arc-pointer was to improve the identification of the AtoN light. Since installation, user feedback has been collected and the opinion of users is highly positive. Whether there are any other examples of this prototype is unknown.

IALA Guideline 1073 (June 2011) provides helpful information including interesting technical information. In brief:

With the proliferation of built up shorelines and consequent increase in light pollution, the mariner often has difficulty in detecting and identifying AtoN lights against a background scene of general lighting and individual bright light sources. Features such as town or street lighting, harbour area floodlighting, architectural lighting and lit signage can cause serious problems for a mariner trying to identify an important AtoN light.

There are various options for highlighting AtoN lights to make them more easily detected and identified. Some are more useful close up, others further out to sea. Some options, such as choosing a colour which contrasts with the background or rival lights, may not be available because the navigational purpose of the light dictates its colour (ie red, green, yellow or white). Even so, some adjustment to the precise colour may be useful, eg a 'bluey-white' light, such as a white LED, may contrast sufficiently with yellowy-white sodium street lights. Similarly, a rhythmic light is usually more easily seen, but again, the character may be dictated by the navigable purpose. Also, there may be scope for using a faster flash rate, which is more easily detected than a slow one.

Many methods of increasing the conspicuity of a light are covered by existing charting methods; these include:

- increased intensity;
- faster rhythm;
- synchronizing (including sequencing) groups of lights;
- alternating flashing pairs of lights (similar to road lights at a level crossing);
- rapidly alternating colours (as on emergency wreck marking buoys);
- floodlighting the structure (possibly by a different colour from the background lights);
- the shape of a group of lights.

Other methods of increasing the conspicuity of a light (some still experimental) would be difficult to chart using current methods; these include:

- Flickering the AtoN light within the flash profile at a frequency of around 10Hz
- Exhibiting a high intensity strobe light next to the AtoN light at the beginning of its rhythmic sequence can have the effect of drawing the observer's eye to the AtoN.
- 'Pointer' lights. This device is an arc of light that is installed on the shore next to an existing AtoN light. The arc-pointer displays a circular sequence of lights that gives the user the impression of a moving pointer. This is used to 'point' to the position of an AtoN light. The arc-pointer is not itself an AtoN but can be used as such by the mariner until the actual AtoN light is identified. This 'arc-pointer' is more conspicuous than background light because of its shape, colour and the apparent movement caused by the sequenced flashing. Also, since the arc is oriented perpendicular to the direction of approach to the port, the observed shape of the arc can also give an indication of position: if the mariner is taking a direct approach to the port entrance, a circular shaped arc will be seen; if the mariner is taking an oblique approach, the mariner will see an elliptical shaped arc.
- Shape of Light Source. A lit shape can provide a very conspicuous marker, used either as a pointer to an AtoN or as an AtoN in its own right.
- Flashing floodlights on and off, or repeatedly changing the colour of the floodlight, can significantly enhance conspicuity. (This may be unacceptable in populated areas).
- Contour Lighting. Highlighting the outline shape of a structure with low luminance strips of light can be useful for two reasons: it provides a recognisable shape and it gives an impression of size and distance.

This may not be an exhaustive list, and anyway is likely to be added to as further devices are invented. It does not seem appropriate to try and devise methods of separately charting all these (and future) possibilities. An option may be to devise a sufficiently generic abbreviation, term or symbol to alert the mariner that some highlighting device is in use for a particular navigation light (or group of lights), details of which can be given in publications, such as Lists of Lights, or possibly in a chart note.

Comments and suggestions are welcome, noting that CSPCWG8 considered that it would be useful for the mariner, on seeing the arc-pointer light, to know which charted light was being highlighted. The preference was for a text legend (in parenthesis) next to the light description, rather than a new symbol. The recommendation from an IALA consultant was that no chart symbol is necessary, although a note in the List of Lights or Sailing Directions would be useful.

CSPCWG8 ACTIONS 7, 10, 11, 17 and 21

Response Form

(please return to CSPCWG Secretary by 11 September 2012)

andrew.coleman@ukho.gov.uk

CSPCWG8 Action No	Question	Yes	No
12	Do you agree with the draft rewording of B-470.4a?		
	Do you agree that these changes are 'clarifications' in accordance with TR 2/2007?		
14	Do you agree that nothing further should be done about defining 'major' lights, until IALA provide more advice?		
36	Do you agree that nothing further should be done about defining 'Dir' light sector widths, until IALA provide more advice?		
37	a. Do you agree that no specific symbol should be invented for the 'arc-pointer' light?		
	b. Is there a need to devise a generic method to show on charts that a navigation light is 'highlighted'? If you answer 'Yes', please provide your suggestion(s) in the comment section below.		
	c. Should detail of any 'highlighters' be described in an associated publication (eg Lights List or Sailing Directions)?		

Further comments:

Name:

Member State: