INTERNATIONAL HYDROGRAPHIC ORGANIZATION

ORGANISATION HYDROGRAPHIQUE INTERNATIONALE

CHART STANDARDIZATION & PAPER CHART WORKING GROUP (CSPCWG)

[A Working Group of the Committee on Hydrographic Requirements for Information Systems – CHRIS]

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CSPCWG Letter: 03/2008

UKHO ref: HA317/010/031-05 & HA317/004/058-05

To CSPCWG Members Date 31 January 2008

Dear Colleagues,

Subject: Draft revision M-4 Section B-450 to B-479 – Round 2

We are grateful to 16 WG members who responded to CSPCWG Letter 12/2007, covering the first draft revision of M-4 sections B-450 to B-479. Annex A shows how the members responded to the specific questions which were included as a response form, plus some additional comments. There were also some 'track change' copies of the draft from some members, which you should have seen on the 'reply to all' emails they sent.

Andrew and I have worked our way through all the responses, reviewing all the comments and amending the draft as we believe to be appropriate; this has been a significant task. Our conclusions on the specific questions are:

B-450.2: 'Or' and 'Am' should be retained as INT abbreviations. There is no requirement to have abbreviation for 'metal coloured' structures.

B-455.8: Although a majority agreed that there is no need to show radar reflectors on beacons (to be consistent with buoys and buoyant beacons), we were convinced by the points made by CA, DE and US and have expanded the relevant paragraphs accordingly.

B-456.1: We have made the 'withy' symbols obsolescent (INT 1 editors please note for next editions).

B-458: We have retained the specification for 'Special-purpose beacons', with a few minor changes. We do not agree with AU's suggestion to move to B-455.5, as 'Beacon in general' is a very different concept from 'Special-purpose beacons', which by definition are not beacons in general. We can think of no better term to use and note that these are not necessarily IALA special marks either (eg leading beacons are excluded from IALA). We have raised this issue with the Chairman of TSMAD to reconsider the application in S-101.

B-460.5 & B-462: We have not added any special symbols or specifications for ice buoys or racing 'flag' marks.

B-462.8: We have removed the non-IALA version of light floats. We see no reason why there should be a special non-IALA symbol for light floats; there are no special non-IALA symbols for other buoys and beacons. (INT1 editors please note for next edition).

B-466.1: We have removed the references to 'colour patches' as an alternative to light flares. We believe only one country still does this, so it should not be an international symbol.

B-470.4: We have removed the '30mm' rule, but improved the guidance about the placement of sectors.

B-470.5: We have removed the use of a dot for a light, in accordance with the majority view. This depiction has been 'not recommended' in M-4 for many years, so we believe it is time to remove it as a permitted international variant.

B-474.5 & B-478.1: We have removed the specifications for Watch buoys and Bearing lights.

In addition to the above, several more points were raised. These can be found in the summary at Annex A, or in the accompanying 'track change' versions of AU, FR and NO. We have studied all suggestions carefully and arrived at what we believe to be the appropriate decision, taking account of all the members' responses. To respond individually to every suggestion would make this letter far too long, so if we have not made a change based on a suggestion which you still feel to be important, please ask for an explanation of our reasoning.

Please review all the changes in the 2nd draft (Annex C, sent separately). Where the change is significant, we have included a brief comment in the margin. There are also some specific questions, which we have included at Annex B and some further comments below:

1. AU (first comment after table at Annex A) commented on the order of specifications in this section. We agree that the present order is illogical; it would perhaps be better to have:

   B-450 General remarks on aids to navigation
   B-451-459 Lights
   B-460 Buoyage systems
   B-461-466 Buoys
   B-470-474 Beacons
   B-476-479 Fog signals

   However, besides the effort of rearranging and amending all internal M-4 references, this would have significant effect on references in INT1, S-57, S-52 and probably many other national and international documents. Given that most users dip into M-4 to look up particular items, the order is not very important and cross references (or the use of searches) should ensure the user finds the information required. Our view is therefore not to make major changes to the current layout, but would be interested to know whether this is generally shared by WG members.

2. There were several comments about graphics. In this MS Word version, we cannot easily amend the existing graphics, but have included a comment box, prefixed 'DID:', to indicate what will change in the final version.

3. B-455.9 We have included a new paragraph to better explain the terms daymark and daybeacon, based on the definitions in S-32. We have avoided using topmarks as examples of daymarks as requested by AU; however, it should be recognized that topmarks are daymarks, and some daymarks are topmarks.

4. B-460.4 & B-462.9 Following a remark by Colombia, we have added a statement that not all ODAS buoys are superbuoys. This is not new, but the existing specifications may have implied that ODAS buoys could only be charted as superbuoys.

5. B-461.3 AU asked for more information about IALA buoyage, based on UK's publication NP735 (IALA Maritime Buoyage System, Edition 6, 2006). We have added such information here and in other appropriate places where we consider it may be useful to the compiler.

As usual, we have turned earlier changes blue where they have been accepted, and also minor editorial corrections, so please concentrate your examination on the new insertions and deletions labelled as made in January 2008. **Please respond by 29 February 2008,** using the response form at Annex B.

Yours sincerely,

Peter G.B. Jones,
Chairman

Annex A: Summary of responses to CSPCWG Letter 12/2007
Annex B: Questions arising from the responses to Letter 12/2007
Annex C: B-450 to B-479 draft, second round (sent separately).

Summary of responses to CSPCWG Letter 12/2007

Para	Specification	Question	YES	NO
2	B-450.2	a. Should 'Or' and 'Am' be retained as INT abbreviations? *AU- see also comment below*	AU(Or), CA, ES, FI, FR, HR, IT, JP, NL, UK(Or), US	AU(Am), BR, DE, DK, NO, RU, UK(Am), ZA
		b. Should there be an abbreviation for 'metal colour' structures? *AU- see also comment below* *CA-Grey* *DE- Not used in DE in difference to red.* *DK- Not used in DK*	CA, FI, HR, ZA	AU, BR, DK, DE, ES, FR, IT, JP, NL, NO, RU, UK, US
8	B-445.8	Is there any reason why radar reflectors should be shown on IALA beacons, when they are not shown on IALA buoys or buoyant beacons? (If you answer Yes, please explain below) *AU- see also comment below* *CA- All buoys and buoyant beacons have radar reflectors therefore no need to chart this. Yet not every beacon has a radar reflector so they must be charted when they exist. Radar reflectors should be shown on beacons. There are many dangers to navigation that are marked by beacons and not by lights or buoys. In conditions of reduced visibility it would be useful to the navigator to know if these are radar visible or not.* *DE- Reflectors at buoys or buoyant beacons are of standard use, on beacons not. Therefore it could be helpful to keep this information for beacons.* *US- In U.S waters federally maintained floating aids to navigation are constructed so that by nature of the construction they are radar reflective, and a standard chart note indicates this. Federally maintained fixed aids to navigation must be individually fitted with radar reflective devices, and many are not. The United States Coast Guard publishes the fixed aids to navigation that are fitted with a radar reflector, and has requested that NOAA include a "Ra Ref" label on the fixed aids indicated in the Coast Guard Light Lists.*	CA, DE, US	AU, BR, DK, ES, FI, FR, HR, IT, JP, NL, NO, RU, UK, ZA
9	B-456.1	Do you agree to make the term 'withy' and its associated symbol obsolescent, in the interests of simplification? *AU- see also comment below*	AU, BR, CA, DK, ES, FI, FR, HR, IT, NO, UK, US, ZA	DE, JP, NL, RU

Para	Specification	Question	YES	NO
11	B-458	Do you agree to the deletion of this specification (and INT 1 subsequently amended)? *AU- see also comment below* *BR- There are some users that still use those and therefore they are depicted on our charts.* *FI- Leading beacons are widely in use and a vital part of the fairway system in archipelagic areas. Also leading lights are normally considered to be leading beacons with light and therefore depicted with beacon and flare.* *US- Special purpose beacons as described in section B-458 are still widely used in the water of the U.S. and depicted on NOAA charts.*	CA, DE, FR, HR, UK, ZA	AU, BR, DK, ES, FI,IT, JP, NL, NO, RU, US
12	B-460.5 & 462	Is there a need for a special ice buoy symbol? *AU has no experience with ice buoys, but S-57 has BOYSHP 8 (ice buoy) referring to it as a 'shuttle shaped buoy' whatever that means. It calls up the symbol used for the spar (spindle) buoy.* *CA-No, the Canadian Coast Guard says that they are similar to spar buoys and so we can use this symbol instead.* *DK– Not used in DK.* *FI- We are using 'pillar' symbol for all ice buoys.*		BR, CA, DE, DK, ES, FI, HR, IT, JP, NL, NO, RU, US, UK, ZA
13	B-462	Should the national racing topmark 'flag' be adopted as an international symbol? *AU- If used in the real world, which they are, AU supports this. S-57 already has TOPSHP 17 (flag).* *CA- The topmark flag is not beneficial to the mariner, therefore the symbol is not necessary*	AU, DE, DK, FI	BR, CA, ES, HR, IT, JP, NL, NO, RU, UK, US, ZA
14	B-462.8	Is there any reason to differentiate between IALA and non-IALA light floats? *AU- see also comment below* *BR- We only use IQ 31.* *US- The U.S. still makes this distinction, and has charting specifications for both IALA and non-IALA floats.*	US, FR	AU, CA, DE, DK, ES, FI, HR, IT, NL, NO, RU, UK, ZA
16	B-466.1	a. Does your HO still use coloured patches instead of flares?	US	AU, BR, CA, DE, DK, ES, FI, FR, HR, IT, JP, NL, NO, RU, UK, ZA
		b. Do you know of any HO which still uses colour patches? (If so, please advise below) *BR- We have some old charts that still have colour patches, but as we make new editions, we are replacing them with the flares.* *CA- We use magenta flares for our light flash symbol.* *US- If I understand the concept of a "colored patch", yes, the U.S. uses a magenta circular patch to indicate a lighted buoy. I am unaware of any other country that still uses this magenta circular patch.* *UK- US still uses them*	UK	AU, BR, CA, DE, DK, ES, FI, FR, HR, IT, JP, NL, NO, US, ZA

Para	Specification	Question	YES	NO
17	B-470.4	Do you agree to omit the 'rule' to place coloured sectors within 30mm of a light star? *AU see comment below – change the rule, don't omit it* *DK uses standards based on the range of the light; the greater the range the grater the circle. The circles vary in size from 3.1mm (for lights on mole heads) to 11.7mm (for lights with a range greater than 15M).*	BR, CA, DE, DK, ES, FI, HR, IT, JP, NL, NO, RU, UK, US, ZA	AU,
18	B-470.5	Do you agree to remove the option to use a dot instead of a star for a light position? *CA- We like the light dot, it doesn't take up as much space as the star and the flare can be placed right over top of the dot. The INT symbols for IP 50 – 65 have the flash slightly to one side of the star.* *DK uses the dot in small scale charts where the use of the star would break too much of the coastline (e.g. mole heads).* *US still uses the light dot as standard symbology for fixed lights on our charts.*	AU, BR, ES, FR, HR, IT, JP, NL, NO, RU,UK, ZA	CA, DE, DK, FI, US
21	474.5	a. Do Watch (station) buoys still exist?		AU, BR, CA, DE, DK, ES, FI, FR, HR, IT, JP, NL, NO, US, ZA
		b. Do we still need this specification?		AU, BR, CA, DE, DK, ES, FI, FR, HR, IT, JP, NL, NO, RU, UK, US, ZA
24	B-478.1	a. Do 'Bearing lights' still exist? *CA- We have direction lights; are they the same?*		AU, BR, CA, DE, DK, ES, FI, FR, HR, IT, JP, NL, NO, RU, US, ZA
		b. Do you agree to remove this specification if they are not to be identified in any special way on charts? *CA- Since these lights are not identified in any specific manner on the chart, we do not think this spec is necessary.*	AU, BR, CA, DE, DK, ES, FI, FR, HR, IT, JP, NL, RU, UK, US, ZA	NO

Further comments by AU *in answer to issues raised in Letter 12/2007, to comments within this section of M-4, to questions above and occasionally a new comment (and there are further comments embedded in the text of the revised section):*

B-450 Introduction: I know this is probably not within the scope of changes that the CSPCWG can make for the revision of M-4, but the order of this entire portion of M-4 is confusing and not logical. It looks like there have been changes made that were relevant at the time they were made (such as some IALA information in the section on Buoyage), but this has in many cases been expanded to include other types of aid to navigation (i.e. fixed marks) since and this is not reflected in M-4. Below are some examples of what AU sees are inconsistencies:

- *By far the most commonly used aids to navigation are the visual aids (fixed and floating marks and lights), yet the audible aids are the first ones covered in M-4. The most commonly asked question in the AHO in regards to this section is why are the audible aids explained first?*

- *If the current order is to be retained, the first and second bullet points in B-450.1 should be reversed for consistency.*
- *Colours used for aids to navigation have their own clauses at B-450.2, B-455.4, B-464 (which seems to be the most information), B-466.3, B-470.4 and B-471.3, and there is a paragraph on colour in B-456.3. While this may be required because of the nature of this section, the information given in each clause is inconsistent (eg much of the information given in B-464 is just as relevant for fixed aids to navigation). Perhaps B-450.2 should cover more than just international abbreviations for colour by incorporating, in particular, much of B-464?*
- *The IALA Maritime Buoyage System is not covered until B-461 (although there are references to these clauses earlier on). This may have been OK when the IALA Maritime Buoyage System was introduced, where the majority of aids to navigation complying with IALA were buoys, but this is no longer the case. In AU our IALA aids to navigation are split pretty much 50/50 between fixed and floating marks, therefore it would make more sense to have all of B-461 moved forward in M-4.*

B450.2: As blue is now IALA suggest we tag it for after the trial period for emergency wreck marking buoys for possible change to a principal colour (or if EWMB is accepted for this review). Regarding metal buoys, our NtM officer has advised that in AU many are rusty brown and for these he encodes as Or for their colour in our database. AU does not support the introduction of metal colours to nav marks. Do we also look at various plastics and fibreglass as well? In S-57 colour (see S-57 attribute COLOUR) is used for some man-made structures and there are various other colours available to the ENC encoder for nav marks (ie Brown, Grey, Magenta, Pink), none with definitions. In theory grey and brown could be used for various metal structures, including nav marks in ENCs. Our NtM officer says rust brown is a common colour for many buoys in AU and he suggests orange is suitable for rusty buoys. I guess grey could be used for galvanised. I don't think we should introduce terminology to M-4 about metal within aids to navigation section, just leave it to the colour of the actual marks. AU doesn't support pink (faded red) for marks, and we don't know what the distinctions are between orange and amber nor violet and magenta. This will have to be sorted for S-100 as every entry will require a definition.

B-450.3: AU agrees with the 'standard' arrangement proposed in this new section.

B-450.5: AU supports these charting considerations. You have added some really good information to round 1.

B-451.1: This section doesn't provide any real advice, ie the assumed bullets don't put anything into context. AU suggests that the second paragraph in B-451 be moved to immediately after the IALA definition of 'usual' range in B-451.1, or to after the bullet points in B-451.1.

B452.9: AU supports removal of 'submarine sound signals'

B-454.1: The introductory remarks in B-454 state that the text or the symbol R1 must be used, yet in the eg in B-454.1 both are used. Which is the correct method?

B-455: B-464 is titled "Colour of buoys", yet it is referenced here in respect to providing guidance on the encoding of colour for fixed marks. In the AU round 1 reply, we have suggested that B-464 could be re-named "Colour of fixed and floating aids to navigation", but AU feels that this could be better resolved through the re-structure of B-450 – B-470 as stated in B-450 Introduction above.

B-455.1: AU supports Bn as an INT abbrev.
As this is now the only reference in M-4 for Daymark, and as it is part of the sub-heading (B-455), suggest it be given its own section number (B-455.9?) as it is a separate object class in S-57 and expected to remain so in S-100. Note, though, that the term "daymark" is not used in INT1.

B-455.2: In AU we often have unlit lateral beacons painted white so that they can be picked up at night with a spot light. The topmarks nearly always comply with IALA, but as the beacon colour does not comply, it is not encoded as being IALA in the ENC. There are often arguments about what is IALA and what isn't as S-57 has an attribute MARSYS. Some advice in M-4 would be useful, in fact in AU, cartographers always reference NP 735 for IALA marks as M-4 does not provide as much detail. AU would therefore support the valuable and detailed information contained in NP 735 being added to M-4 so that cartographers are forced back to the Chart Specifications of the IHO.

B-455.5: Do we have to continue with a choice of symbols for beacon in general? Can't we make the combined symbol comprising a circle an text 'Bn' obsolete now, or at least state that the black symbol is preferred, but in cases where congestions is an issue, the circle 'may' be used? The combined symbol almost takes up the same space as the black symbol anyway. I'm always trying to reduce choices in M-4.

B-455.7 and B-460.6: AU supports the use of single quotation marks, but only as an option when clarity is the issue. S-52 already uses 'No' for buoy numbers to avoid being mistaken for soundings (when displayed).

B-455.8: There appears to be other basic inconsistencies here. Why show radar reflectors on beacons but not on IALA buoys? We have no background history why this is so. AU no longer charts radar reflectors, but suggests the inconsistency be addressed which is what the above question is for.

B-456.1: For S-57 Withy is BCNSHP = 2 with its own definition, but I agree that all of these could be categorized as minor or less permanent marks and see no reason to differentiate the symbols, including perch.

B-456.4: AU supports 'Ref' as an INT abrev for INT1 W and to have the reference shown as Q124. AU does not support the location of the statement on Antarctic refuges here. Antarctic refuges are more an example of the use of the symbol at INT1 – T14 (which in most cases would be the abbreviation "Ref" next to a building symbol). Note that there is no reference to T14 anywhere currently in M-4 but B-456.4 is the M-4 reference given (AU thinks mistakenly) against T14. AU does not believe that these are the same thing, and therefore should not be in the same place in M-4, but that Antarctic refuges should be mentioned somewhere in B-490, and agree that it also should be in B-300.

B-457.2: You suggest removal of symbols P3b and 4b, why? These are currently INT1 symbols. AU supports reducing choices but this is a significant change which needs to be discussed and agreed before simply deleting.

B-458: (important). For S-100, TSMAD is likely to use special purpose beacons (BCNSPP) only for IALA special purpose marks and all the rest of the catch alls, will become beacons in general (BCNGEN) as per paper charts. In effect all the examples in B-458 will likely be encoded as BCNGEN in S-101 ENCs. This change was approved as an extension to S-57 (but held in abeyance) and will be further considered for S-100/S-101, so there is time to thrash this out with TSMAD. AU supports the TSMAD extension and proposed use of beacon in general as the catch all for non-IALA beacons. AU would therefore like to retain all the graphics in B-458 but move these to B-455.5 as they are specific examples of the use of beacons in general. If this is agreed, they could be retained in INT1, but not under the sub-heading of Special Purpose Beacons. Examples of real IALA special purpose beacons from S-57 are referred to in a comment to this section within the document itself. (You may like to discuss this with Barrie Greenslade as we should try to make both M-4 and S-100 consistent).

B-461: See B-450 Introduction comments above.

B-462: IALA is now the norm for navigational systems and very well established, at least in AU, but in M-4, it only starts to be described in detail when we get to buoys, and the different types of IALA marks are not mentioned until we get to topmarks (B-463.1). Today we have IALA (most common marks) and others which are proposed to be classified in S-100/S-101 as 'beacon in general' and 'buoys in general' (and mooring/warping facilities, which amongst other features, include post or pile and mooring buoys). In AU we have more beacons than buoys, especially along dredged channels. As a compiler I would have expected to find information about IALA under beacons, which is not the case. However I think it would be too large a job to re-organise this section for say IALA and non-IALA marks, and this is also probably outside the review task. See further comments to this section within the document and above (eg B-450 Introduction).

B-462.8: Removing the reference to IALA and non-IALA marks would bring light floats in line with all other types of buoys, none of which have symbols that purposefully distinguish between IALA and non-IALA.

B-464: See comment for B-455 above.

B-464.1: AU does not like the term "black" but prefers "filled" for filled-in buoy symbols, as both the filled and open (unfilled outline) symbols are black. Also, "shaded" has been replaced with "unfilled outline" to be consistent with the change made at B-464.1(b).

B-466: There is a multitude of information all through this section on lighted buoys that is just as relevant for lighted beacons (ie all of the IALA stuff in B-466.2 to B-466.4). AU suggests that most of this could go in Lights (B-470s – if it is not already there) with references to the relevant clauses in the B-470s in both B-457 and B-466.

B-470.4a: Sector lights: AU is not aware of any nation still using light patches. AU does not use coloured light sector arcs at this stage, but would prefer some guidance be given in M-4, even if 30mm is extended further out. The sector colour banding needs to be in the area of navigation or very close to it. We don't want HOs encoding arcs and colours large distances from the main areas of navigation.

B-470.5: AU does not agree with the second bullet point in "Position of lights – special cases". For features on land, why do we want to emphasise the non-navigational feature over the navigational one (ie the light)? This is not AU policy. In such circumstances we show the major light star P1 with the appropriate abbreviation for the structure (if required) under the light description. For structures in the water, we consider the structure to be navigationally significant, and so show the relevant symbol with a flare, or a light beacon (P4) symbol. The "must" in the introductory sentence would result in many of our charts being non-compliant.

B-471.2: AU prefers 'rhythm', rather than 'character'. Fixed and some alternating lights are the only ones that technically do not fit the term "rhythm", but this is explained in the introductory sentence, therefore I think we can get away with it in the table.

B-471.8: AU supports the new triangle as it is commonly used for leading marks.

B-476.2: AU supports the simplification of air obstruction lights.

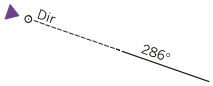
We always anticipated this would be a complex section to review. It certainly looks that way.

(Names: Chris Roberts, Jeff Wootton and Mark Bolger (NtM Officer))

Further comments by CA:

B473.7 F.Y(exting) P55
exting (to represent an extinguished light) beside the light characteristics at first glance looks too much like existing.

B475.8



P31

Currently, we chart them differently than IHO with no magenta triangle and use a note instead. We would like to keep using this format and to keep the word "shall" instead of "must" in the specification.

B478.3 Agree with additional information to be adopted.

Further comment by ES:
460.5 Seasonal Buoyage

Seasonal buoys are not always established for recreational purposes. There are also seasonal buoys established to mark the seasonal deployment of fish traps or tunny nets. Consequently, this paragraph should be reworded so as to cover this fact. For example:

> *"There are also seasonal buoys to mark seasonal deployment of fish traps or tunny nets."*

FR added numerous comments and suggestions for amendments as track changes to the draft revision.

Further comments by NO:
In attachment B450-479 round 1_NHS we have made comments to B-450.2, B-458, B-470.4, B-471.2, B-471.9, B-475.6 and B-478.2.
General comments:
- NHS would like M-4 to show more multi-colour symbols
- Due to cluttering and wrong interpretation (small islands) spaces should substitute full stops in light descriptions

Comment by Colombia:

We recommend that in Section 460.4 to erase the reference limit of 5m in diameter for superbuoys. Because there are ODAS buoys that are smaller in size than this diameter, and then these buoys would not be covered by existing symbols.

QUESTIONS ARISING FROM THE RESPONSES TO CSPCWG LETTER 12/2007

Response form

(please return to CSPCWG Secretary by 29 February 2008)
andrew.coleman@ukho.gov.uk

Specification	Question	YES	NO
All	Do you agree to retain the existing order of specifications?		
B455.4	Do you agree that the colour abbreviations for beacons should include topmark and structure (when known)?		
B-457.1	a. Should lit beacons always use the small light star (FR suggests the large star, and consequently there is a difference in depiction at P4/5 in the official INT1s)?		
B-470.5	When we drafted the specification for a wind turbine with a navigational light attached (B-445.8) we agreed to extend the principle to other landmarks. We propose examples should be included in INT1 at P7, eg water towers, tower. Do you agree to include these symbols at INT1 P7?		
B-470.8	FR proposed a new symbol for bearing lines to lights off chart limits. We have included this in a new specification at B-470.8, although we have described it slightly differently from the version in FR INT1, having examined several examples. We propose an example should be shown in INT1 at P8. Do you agree to include this symbol at INT1 P8?		
B-471.2	Do you agree with NO that all the illustrations of light characters should begin with a lit phase (means changing Oc, Group Oc and Composite Group Oc)? (This would have consequences for INT1).		
B-471.3, B-471.9, B-475.1	CSPCWG4 Action 22 requested comments on DK's proposals (CSPCWG4 Inf 2) to reduce the number of colour abbreviations used on multi-colour charts. It was agreed that they should be retained on sector arcs (in case the actual colours were not clear under bridge lights) but that in such cases they could be omitted from the light description. WG members were asked to comment in their responses to the first round, but in fact no such comments were received. Do you agree that on multicoloured charts, the colour abbreviations of lights can be omitted from the description at the light star, if shown on the sector arcs?		
B-472.1	Do you agree with the proposed definition of a major light?		
B-475.6	NO and AU ask which light (or mark) should be given first when describing the marks on a leading line. Which light should be given first?	Front	Rear
B-475.7b	Do you agree with AU's proposal for an option to chart the centre line as well as the sectors in the second example of a Dir Lt (P30.3)?		

Specification	Question	YES	NO
B-478.2	Should we adopt ‘(illum)’ as an International abbreviation for illuminated? French, Spanish and English equivalents all begin with ‘illum’.		

Further comments:

Name:
Member State:

Annex C to CSPCWG Letter 03/2008

B-450 AIDS TO NAVIGATION, AUDIBLE (SOUND) AND VISUAL: GENERAL

In the following paragraphs, aids to navigation refer to man-made features specifically constructed to assist navigation. Audible (sound) and visual aids are divided into the following categories:

a. Fog signals, which are usually associated with a lighthouse, major floating light or buoy. Associated lettering may be upright or sloping, depending on whether the supporting structure is fixed or floating.

b. Beacons, cairns, towers, and minor fixed marks, specially erected for navigational purposes. Associated lettering should be upright.

c. Buoys, including minor light-floats. Associated lettering should be sloping.

d. Major floating lights. Associated lettering should be sloping.

e. Lights on fixed structures and lighthouses of all sizes. Associated lettering must be upright.

For electronic aids to navigation, see B-480 and for signal stations, see B-490.

B-450.1 Aids to navigation have **international abbreviations** for:

- Colours of lights exhibited and colours of structures (ie the bodies and/or topmarks of buoys and beacons and, where required, lighthouses); see B-450.2. In certain cases, as described under the different types of aids to navigation, colour abbreviations may be omitted.
- Types of fog signals; see B-452.
- Characteristics of lights; see B-466.2 and B-471.

B-450.2 **The international abbreviations for colour are**:

Principal colours (as used in the IALA system)				**Subsidiary colours** (if required)		
White	W	**P11.1,**	**Q5**	Violet	Vi	**P11.5**
Black	B		**Q2**	Amber	Am	**P11.8**
Red	R	**P11.2,**	**Q3**	Orange	Or	**P11.7**
Green	G	**P11.3,**	**Q2**			
Yellow	Y	**P11.6,**	**Q3**			
Blue	Bu	**P11.4**				

Colour abbreviations must be in capital letters in all cases except for the second letter of two-letter abbreviations. These abbreviations must be used for the colours of lights and structures.

Multi-coloured structures. Where the colours are in bands, the sequence of colour abbreviations must be from top to bottom. Where the colours are in stripes (vertical or diagonal) or the sequence of horizontal bands is not known, the darker colour is to be given first.

For the application of colours to fixed and floating aids to navigation, see B-464.

B-450.3 **Legends and abbreviations associated with aids to navigation** should be inserted as close as possible to the symbol, but clear of any coloured circles around it if possible. They should also be placed clear of navigationally important detail, eg outside the navigation channel for lateral buoys if possible. Legends should usually be arranged in the following order:

Light description, eg:	*Fl.G.3s*
Fog signal	*Whis*
Any designation	*No 2*

Supprimé : considered as

Supprimé : listed below

Supprimé : of the abbreviations for fog signals

Supprimé : shall

Supprimé : when used

Supprimé : In certain cases, as described under the different types of aids, abbreviations may be omitted.¶

Commentaire [c1] : Assumes IALA have accepted blue as used for EWMB trial.

Electronic aid (in magenta) *Racon(Z)*

For **major fixed lights**, the name (if named separately from the feature on which it stands), may be the most important detail, and should be at the top of the list, see B-470.1 and B-470.7.

Designations should ideally be as shown on the structure, see B-455.7 and B-460.6.

Abbreviations for the colour of structures must be placed under the symbol if space permits.

Supprimé : should

B-450.4 **For information about buoyage systems**, including the IALA buoyage system which may also apply to fixed marks, see B-461.

B-450.5 **Charting considerations.** Charted aids to navigation should normally be updated by Notice to Mariners. Details that are of little or no use to the mariner should not be charted, as this may result in unnecessary chart maintenance and/or chart clutter. Whether to include particular aids to navigation and their detailed description must be part of a general assessment on how to portray an area at the chart scale; they should not be considered in isolation. For example:

- It would be inconsistent to include buoys in the upper reaches of an estuary if the depths were not shown in sufficient detail to navigate in that area of the chart. However, lights with ranges that will make them visible in areas that are navigable when using the chart should be included.
- If it is known that a channel is stable and the aids to navigation rarely moved or changed, they should be considered for inclusion on charts. However, if they are subject to frequent change it may be better to omit them, especially on smaller scales. In such cases, consideration should be given to the inclusion of a legend, eg:

Channel marked by buoys and/or beacons

When considering the omission of aids to navigation from smaller scale charts, the following should be taken into account:

- Vessels may not carry all the largest scale charts but may be forced by circumstance (eg adverse weather, equipment malfunction) to approach the coast, perhaps to shelter in a bay or to reach a port or harbour, on a smaller scale chart.

- Though pilotage may be compulsory, the master is responsible for the safety of his vessel and should be provided with enough detail to safely monitor the performance of the pilot or to take over if necessary.

- If the chart is of sufficient scale to be used in an emergency, at least the principal aids to navigation should be shown, with the most important details (see B-472).

Supprimé : lights, buoys and beacons

B-451 AUDIBLE (SOUND) FOG SIGNALS

The term 'fog signal' refers to the sound emitted, not the apparatus. Fog signals are short range aids to navigation and are, for various reasons, unreliable as indicators of position. Their importance relative to other aids to navigation has declined but they are still considered useful for the safe navigation of vessels with very limited (or non-functioning) electronic equipment.

Supprimé : fairly

Supprimé : , and also of well-equipped vessels whose equipment is not functioning

Brief details of the type and characteristics of fog signals may be shown on charts on which vessels may navigate within range of the fog signals. The type of fog signal should be indicated by a legend (see B-452), at least on buoys (see B-454).

If it is appropriate to show only the existence of a fog signal on charts, without specifying the type of fog signal, it must be portrayed by the magenta symbol (see B-452.8):

Supprimé : should do so preferably by using the

R1

Fog signals on shore are usually described in List of Lights and Fog Signals (LL), unlike fog signals carried by buoys, which are not always listed in LL.

For fog detector lights, see B-477.

Supprimé : charting of

B-451.1 **Whether to chart a fog signal** depends on some definition of its probable range. IALA defines the 'usual' range of a fog signal as:

> 'the distance at which, in foggy weather, an observer has a 50% probability of hearing a sound signal when he is situated on the wing of a ship's bridge [on a vessel with an average ambient noise level]… in relatively calm weather, with no intervening obstacles'

Although not precise enough to chart, for the guidance of cartographers, the following 'usual' ranges are assumed;

- Powerful diaphone: 4 to 5 miles,
- Horn: up to 3 miles (but signals at harbour entrances are usually much weaker).
- Wave actuated bell or whistle: about 1/2 mile or less.

B-451.2 **The position** from which a fog signal is emitted is usually on a buoy, or close enough to a light to be treated as sounded from the same position as the light. In cases where a fog signal is **not** closely associated with a light, its position should be shown by a small position circle and the magenta symbol **R1** (see B-451), with the type and/or name added if appropriate, eg:

Supprimé : as

Siren(1) R1

B-451.3 **Abbreviations** for type, characteristic and period of a fog signal are the same for all **automatic** signals, whether ashore or afloat. For wave actuated signals on buoys, see B-454.1.

B-451.4 **Reserve fog signals,** eg a gong sounded when the normal siren is not functioning, should not be charted. For wave-actuated signals on buoys sounded in conjunction with automatic signals, see B-454.3.

Supprimé : normally

B-451.5 For more details of fog signals, see IHO publication M-12 'Standardization of List of Lights and Fog Signals'.

B-452 TYPES OF FOG SIGNAL

It is impossible to indicate on charts all the variations in the sounds emitted but some major differences can be conveyed to the mariner by distinguishing the following types of fog signal.

If it is required to include the type of fog signal, the following **international abbreviations** or legends must be used. To avoid clutter, at another aid to navigation the fog signal legend or the symbol **R1** should be shown, but not both.

B-452.1 Explosive:

Explos **R10**

A sound signal produced by the detonation of an explosive charge. It is now mainly used as a reserve signal and, if so, should not to be charted.

B-452.2 Diaphone:

Dia **R11**

A generally powerful, one or two-tone sound (a one-tone sound ends in a suddenly lowered pitch known as a 'grunt'). It is produced by release of compressed air.

B-452.3 Siren:

Siren **R12**

A sound produced by the release of compressed air through a rotating disc. Power and pitch vary considerably; it may emit a wailing sound.

B-452.4 Horn:

Horn **R13**

A sound produced by a vibrating membrane or reed within a tube, it varies greatly in strength and pitch. The nautophone, reed, tyfon and klaxon are types of horn.

B-452.5 Bell:

Bell **R14**

A ringing sound with a short range. The apparatus may be operated automatically or by wave action.

B-452.6 Whistle:

Whis **R15**

A shrill sound made by releasing compressed air or steam across an opening. The apparatus may be operated automatically or by air being forced up a tube by waves acting on a buoy.

B-452.7 Gong:

Gong **R16**

A sound produced by vibration of a disc, or discs, when struck. The apparatus may be operated automatically or by wave action.

B-452.8 Type of signal not stated. In these cases, the magenta symbol **R1** (oriented and placed as necessary for clarity) must be shown on the appropriate scale charts (see B-451.1). Examples of its use, alone or in conjunction with other aids to navigation are given below:

Alone	With floating navigational aids		With shore lights		With electronic aid
				Fl.3s	Rc Racon **R1**

B-452.9 Submarine sound signals are no longer used.¶

B-453 FOG SIGNALS: RHYTHM AND PERIOD

Supprimé : easily

Supprimé : Where a nation states the type of fog signal on its charts,

Supprimé : with a light,

Commentaire [c2] : FR asks 'why change the rule'. But there is no change, this has always been implicit in existing M-4 B-451, B-451.2, B-452.8, B-454. This paragraph attempts to clarify these dispersed statements, with the aim of reducing magenta clutter at lights and buoys. Also, fog signals are a relatively minor feature which should not be over-emphasized.

Supprimé : lowpitched

Supprimé : controlled by a piston actuated by compressed air

Supprimé : , by hand,

Supprimé : , by hand,

Supprimé : by hand,

Supprimé : three arcs of concentric circles within an angle of 45°,

Supprimé : radio station

Commentaire [c3] : DID: please change Rc to AIS

The characteristic rhythm of fog signals (other than those actuated by waves, which are irregular) may be more important than their type when mariners are attempting to identify them. The number of sound emissions (eg blasts, strokes) and the period may be charted, as described below.

Supprimé : well

Supprimé : together with the period if thought useful,

Supprimé : In cases where the symbol R1 is used, instead of an abbreviation for the type of signal, it is preferable **not** to give the characteristics of the signals (to avoid confusion with the characteristics of the lights with which most fog signals are co-located).

B-453.1 **A single sound (blast)** repeated at intervals should be shown by '(1)' following the type of signal, eg:

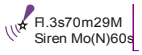
Horn (1).

Unless (1) is shown, it may not be clear to the mariner whether a single blast is implied or merely that the scale of the chart is considered too small to show the number of blasts. At a buoy, it also helps to distinguish from a wave-actuated sound signal, see B-454.1.

B-453.2 **Multiple sounds (blasts)** (other than Morse or composite signals) repeated at intervals must be shown by '(2)', '(3)', etc, following the type of signal, eg:

Horn (3)

B-453.3 **Morse code rhythms** must be shown by 'Mo' followed by the Morse letter in brackets, eg:



R20

Commentaire [c4] : DID: please delete the 3 arcs from the graphic.

B-453.4 **Composite rhythms** (other than Morse) where groups of blasts are sounded must be shown as eg:

Siren (2+3).

B-453.5 **The period** of a fog signal is the time taken for a complete sequence of sound emissions. Where space permits, it must be charted for major signals (and on the largest scale charts for minor signals where considered useful) following the number of blasts. The period must be given in seconds, even for periods of one minute or longer, eg:

Dia(1)30s Horn(2+3)90s.

B-454 **FOG SIGNALS ON BUOYS**

The existence of fog signals on buoys must be indicated by legends such as '*Bell*', '*Whis*' or '*Gong*' or the symbol R1 if there is no requirement to define the type of fog signal. For general characteristics of buoys, see B-460 to B-469.

Supprimé : rather than by the symbols for buoys' shapes,

B-454.1 **Wave-actuated fog signals** have no regular rhythm and must be charted by a legend indicating the type of signal eg '*Bell*', '*Whis*', '*Gong*' against the buoy symbol, eg:

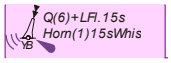
R21

Commentaire [c5] : DID: please delete the 3 arcs from the graphic

B-454.2 **Fog signals operated automatically** should be charted on appropriate scales (see B-451.1) by a legend which includes the number of blasts (or strokes) and the period. Legends must follow the specifications in B-452 and B-453.

Supprimé : , where space permits

B-454.3 **Wave-actuated signals in conjunction with automatic signals** should be charted as in the following example:



R22

Commentaire [c6] : DID: please delete the 3 arcs from the graphic, and insert a space between 15s and Whis.

Note: there is no R1 symbol included as the type of fog signal is shown; see B-452.

B-455 VISUAL AIDS: BEACONS AND DAYMARKS, IN GENERAL

The features described below are all types of fixed structures erected primarily in order to assist navigation by day. Most of these features (except leading marks) are included in the IALA Maritime Buoyage System (see B-461). The specifications for IALA marks are given in more detail from B-460 onwards but generally also apply to those fixed marks which are part of the IALA System.

For natural and artificial landmarks, see B-340.
For light beacons, see B-457.
For buoyant beacons, see B-459.
For topmarks, see B-463.
For colours, see B-450.2 and B-464.

B-455.1 **The term 'beacon'** and equivalents, eg 'balise','bake' **(international abbreviation 'Bn')** is used as a generic nautical term for a wide range of structures from simple poles to built-up towers. There are numerous other terms for particular types of beacon, but for the purposes of international standardization, such features should be classified primarily by their appearance and represented by symbols rather than legends. Where the appearance is not adequately known to the cartographer, a symbol for a 'beacon in general' must be used; see B-455.5.

Supprimé : it is recommended that

For an explanation of the terms **'daymark' and 'daybeacon',** see B-455.9. The following specifications for beacons apply equally to daymarks and daybeacons.

B-455.2 **Distinctive features.** Shapes and colours of beacons are standardized in the IALA Maritime Buoyage System (see B-461) but this standardization applies principally to topmarks, permitting great variations in the supporting structures. Beacons should be charted in sufficient detail on the largest scale charts to permit positive identification.

Supprimé : painted in distinctive colours and those having special topmarks

Supprimé : generally

B-455.3 **Upright symbols** and associated legends must be used for fixed structures to help distinguish them from floating spar buoys, which are less reliable for position fixing; see B-462.6. Except for impermanent features (see B-456.1 and B-456.2) and light beacons (see B-457), each symbol includes a small position circle (without central dot).

Supprimé : shall

B-455.4 **Colours** of beacons must be indicated by the appropriate **international abbreviations** (see B-450.2 and for placement see B-450.3). For use of colours in the IALA System, see B-464. Where the structure and topmark are different colours, both colours should be given, in sequence from top to bottom, eg 'RW' for a red topmark on a white painted base.

Supprimé : as used for buoys

Commentaire [c7] : Proposal by UK to address AU's concerns regarding colour (eg White) of many beacons, even when they have an IALA topmark (and should therefore be encoded as IALA Bns for ENC)

B-455.5 The symbol for a **'Beacon in general'** is:

Q80

and must be used where:

- it adequately represents the feature,
- when the scale is too small to show additional detail,
- where the actual shape of the beacon is unknown.

Supprimé : it

The symbol (without legend 'Bn') should be used if space permits.

B-455.6 **Beacons on submerged or drying rocks.** Spars or poles placed on submerged or drying rocks should be charted as follows (topmark and rock symbol as appropriate), so that the rock symbol is retained, eg:

Supprimé : **situated above and below high water**

Supprimé : must be charted by the same symbols, except for the special case of s

Q83

The symbol should be sloping to the right unless this is precluded by the need to avoid other detail.

Supprimé : shown

B-455.7 **Numbered or lettered beacons** should, on at least the largest scales, have the numbers or letters placed alongside in upright figures, where space permits, in the form painted on the actual beacons if known. However, if necessary for clarity (eg to avoid the risk of a beacon number being mistaken for a sounding) they may be surrounded by single quotation marks, or preceded by the abbreviation 'No' (for number) or equivalent. Where there is a sequence of numbered beacons, all the designations in the sequence should be depicted in the same manner.

B-455.8 **Radar reflectors** are not generally charted on buoys and buoyant beacons within the IALA System as they are commonly constructed to be radar reflective, see B-465. However, beacons do not consistently have radar reflectors, therefore where it is known that a beacon has a radar reflector installed, it should be charted by the symbol **S4,** placed above the beacon if space allows, eg:

Q10

B-455.9 **Daymark** refers to the identifying characteristics of an aid to navigation which are visible in daylight. On structures that are indistinct at the required distance, the aid is made more visible by affixing a daymark to the structure. It will have a distinctive colour and shape depending upon the purpose of the aid. The term '**daymark**' may also simply refer to any unlighted navigational mark. In North America, the term '**daybeacon**' is used for an unlit beacon.

B-456 **SYMBOLS FOR VARIOUS TYPES OF BEACON**

Beacons conforming to the IALA Maritime Buoyage System should be represented by 'supports' and topmark symbols similar to those used for IALA buoys (see B-463.1) but upright instead of sloping (see B-455.6 for exception), eg:

Q81 **Q82**

For the associated colour abbreviations, see B-455.4.

The following illustrations cover 'non-standard' structures and indicate the type of structure on the left and the chart symbol (for the largest scales) on the right.

B-456.1 **Minor impermanent marks, usually in drying areas.** Perches, withies, poles, etc, without topmarks and usually marking one or both sides of minor channels must, if required, be charted by symbols as shown below. Alternatively, a legend, eg 'Marked by poles', or equivalent, may be shown.

Pole  **Q90**

Perch  Port Hand Starboard Hand **Q91**

The former withy symbols (Q92) are obsolescent. Q90 or Q91 should be used instead.

B-456.2 **Minor marks, usually on land**

Cairns (piles of stones) must, if required, be charted by the symbol below (on the largest scale charts). Most cairns have no navigational significance; those that do will usually be distinguished by a leading, clearing or transit line, see B-433.

Commentaire [c8] : Revised following responses to Round 1

Commentaire [c9] : DID: please insert Q10 symbol.

Commentaire [c10] : Definitions derived from S-32

Supprimé : , OR DAYMARK

Supprimé : an upright

Supprimé : System

Supprimé : generally

Supprimé : should

Commentaire [c11] : DID: the following symbols are contained in an invisible table. Please achieve a similar layout when converting to InDesign.

Supprimé : should

Supprimé : shown

Q100

Coloured (or white) marks on cliffs, rocks, walls, etc, must, if required, be charted by a fine outline of the patch and the international abbreviation 'Mk', see symbol below. The actual colour may be shown, usually underneath, using the appropriate **international abbreviation**, see B-450.2

Supprimé : should

Q101

Notice boards indicating speed restrictions, cable landings, etc, must, if required, be charted by the symbol below. For leading beacons in the shape of painted boards, see B-456.3.

Supprimé : may

Supprimé : scale permitting,

Supprimé : shown

Supprimé : should be charted as beacons with rectangular topmarks and position circles to indicate the precise position;

Q126

B-456.3 **Beacons** are usually individually identifiable by colour and shape; in particular, they usually have distinctive topmarks. They should be charted by the 'Beacon in general' symbol Q80 plus topmark, unless one of the following special symbols is appropriate.

Supprimé : (proper)

International abbreviations for colour must be used, if required, see B-450.2. On multi-coloured charts, the symbol (or just the topmark) may be shown in the actual colour, but the abbreviations will still be useful, as the colour may not be readily distinguishable under certain bridge lighting conditions. Illustrations of some typical beacons below show the appropriate symbol (for the largest scales) to the right of each drawing.

Supprimé : should

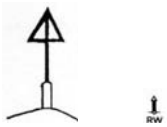
Supprimé : normally

Commentaire [c12] : Note CSPCWG4 Action 22. No additional comments were received. Please consider for Round 2.

Beacon with no distinctive topmark. Use symbol for 'beacon in general', with colour abbreviations:

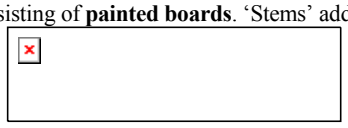
Q81

Beacon, colour known or unknown, with topmark (ie daymark, see B-455.9) emphasised:



Q102.1

Leading beacons consisting of **painted boards**. 'Stems' added to show that these are beacons:



Q102.2

Commentaire [c13] : DID, please transfer graphic from existing M-4

B-456.4 **Beacons which are major structures,** should be charted in their true position by the symbols

Supprimé : having a support as distinctive as the topmark,

Supprimé : individually designed pictorial

below, or by pictorial sketch or image (size at compiler's discretion); see B-456.5, eg:

Supprimé : charted in their true position as shown below,

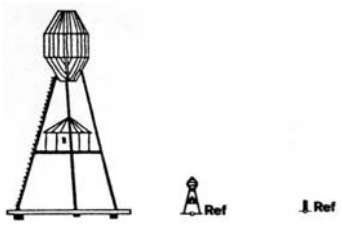
Beacon towers.

Q110

Commentaire [c14] : DID: please replace the rather fuzzy symbols by eps versions, in this whole section.

Refuge beacon. The symbol includes the **international abbreviation** 'Ref' (**T14**) alongside.

Supprimé : size at compiler's discretion, and with



Q124

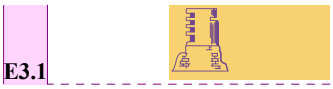
Note: This abbreviation should also be used for refuges in the Antarctic region.

Commentaire [c15] : Noted for inclusion at B-370.8 (from CSPCWG2) and for consideration during revision of B-493.

Lattice beacon.

Q111

B-456.5 **Beacons** with distinctive shape and colour may be shown by a small pictorial sketch, in black, with a small position circle showing the actual position of the beacon. Alternatively, a small pictorial sketch or image may be placed nearby, normally in magenta but a different colour (other than black) may be used, and having no position circle at the base. (The use of colour is necessary to indicate that the sketch is not in its true position). If the sketch is placed some distance from the symbol (eg in a group of sketches), the name and geographic position of the beacon should be inserted in the same colour close to the sketch.



E3.1 **E3.2**

Commentaire [c16] : DID: insert the same graphic as in the latest M-4 edition, but removing the lighthouse. Also include a black version with a small position circle at the centre of the bottom, with number E3.1 alongside.

B-457 **LIGHT BEACONS**

Supprimé : as daymarks

Some structures which may primarily be considered beacons (particularly those marking leading lines) also exhibit lights. On large-scale charts important light beacons should be charted in such a way as to indicate the colour and shape of the features when used by day, in addition to showing the characters of the lights exhibited.

Commentaire [c17] : FR suggests delete 'small' (as FR uses large star). Does any other HO use a large star?

B-457.1 **On large-scale charts** the same symbols as specified in B-456.3 and B-456.4 should be used for light beacons, but with small light stars in place of position circles, except for beacon towers, eg:

Commentaire [c18] : This exception is current practice. Does anyone know why and is there any reason to change it? FR responded 'No', AU does not use.

P3

P4 (see also Q7 and 8)

The details of the light character must be charted in the usual way, see B-471.

B-457.2 **On smaller scale charts** on which navigation within recognition range of a beacon by day is unlikely, light beacons must be charted solely as lights (P1), unless the scale is so small that they should be omitted altogether.

B-457.3 **Lighthouses,** ie large structures with distinctive shape and colour, must be shown as light stars (see B-470) but may in addition have a small pictorial sketch placed nearby, normally in magenta, but a different colour (other than black) may be used; see B-456.5.

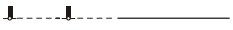
E3.2

B-458 **SPECIAL-PURPOSE BEACONS**

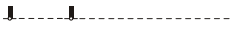
Beacons which conform to a standard shape and colour throughout a nation's waters may be charted in less detail (eg colour abbreviations may be omitted) where an adequate description of the standard system is in the Sailing Directions. The functions of beacons marking leading lines, cables, outfalls or measured distance should be clear from the associated line symbols, so there is no need for such legends as 'Cable Beacons', 'Leading Beacons', or equivalents.

Some, but not all, such beacons may conform to IALA yellow Special Marks.

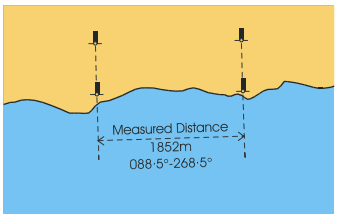
The following are some examples of special-purpose beacons.



Q120 Leading beacons



Q121 Beacons marking a clearing line



Q122 Beacons marking measured distance with quoted bearings

Q123 Cable landing beacon (example)

B-459 **BUOYANT BEACONS**

B-459.1 **A buoyant beacon** has a tall, spar-like body, fitted with a permanently submerged buoyancy chamber. The lower end of the body is secured to a seabed sinker either by a flexible joint or by a cable under tension. Other terms sometimes used for buoyant beacons include: resilient or elastic beacon, pivoted beacon, floating light beacon, Sarus tower and articulated light. The beacon usually carries a light and topmark and conforms with the rules of the IALA Maritime Buoyage System. A buoyant beacon has very little freedom of movement; it does not rise and fall with the tide and normally remains in a vertical or nearly vertical position, so should be charted as other beacons, not

Commentaire [c19] : DID: please add version without topmarks or colour.

Commentaire [c20] : In view of AU comments, we suggest a 'beacon in general' example should be added to INT1 at P4

Commentaire [c21] : It is only intended to delete the symbols with Bn or BnTr from this specification, because they contradict the wording. The symbols are still valid for use where it is possible to navigate within range of the daymark.

Supprimé : ¶
BnTr **P3** Bn **P4**¶
¶

Commentaire [c22] : DID: insert magenta versions of the lighthouse sketch from existing M-4 B-456.5

Supprimé : This practice is best suited to offshore lights.¶
¶

Commentaire [c23] : Specification retained following responses to round 1. Cannot improve on Special-Purpose Beacons for title. That is not same as 'Special marks' in IALA. These should not be located at B-455.5 as they are not 'beacons in general', but ones having a specific function (which may or may not be shown by a beacon in general symbol, depending on circumstances).

Supprimé : may be found

Supprimé : ; this is

Supprimé : As the IALA System is extended in application many special-purpose beacons will become

as buoys.

B-459.2 **The symbols used for buoyant beacons** must be the same as those used for fixed beacons, eg:

Q81 **Q82**

The symbols used for buoyant light beacons must be the same as those used for fixed light beacons, eg:

P5

In all cases, the symbol and associated legends must be upright.

Radar reflectors should not normally be charted but the qualifications in B-465 ‘Radar reflectors on buoys’, are appropriate for buoyant beacons also.

B-460 VISUAL AIDS: BUOYAGE

The following paragraphs apply to all buoys, except mooring buoys. For mooring buoys, see B-431.5-7 and B-445.4b.

The physical characteristics of buoys affect charting practice and are therefore briefly described below.

All associated legends should be in sloping text.

B-460.1 **Mooring ground tackle** usually consists of a sinker and chain, the length of the chain being generally about three times the depth of water, where tides are significant. Accordingly, there may be a difference between flood and ebb positions of a buoy, which may be plottable at chart scale. Also, buoys are liable to drag their moorings out of position at times. **The position to be charted** is the position assigned by the buoyage authority. This is generally the mean of flood and ebb positions, and the position to which the mooring will be returned if the buoy is found to have dragged it away.

B-460.2 **The body** of a buoy is principally a float which may be given a distinctive shape (see B-462), or may be a support for a superstructure which can be given a distinctive shape by means of lattice-work 'wings' or 'cages'. Some buoys, eg a fairway entrance buoy, have a tall superstructure to carry a light, fog signal, radar reflector, and possibly topmark. In such cases, the superstructure may not have been given any special shape; such buoys should be charted as pillar buoys, see B-462.5.

B-460.3 **Topmarks** are fitted to most buoys and are distinctively shaped for identification; for details see B-463. Topmarks are liable to be damaged by ice, and so buoys in areas where the sea freezes may not be fitted with topmarks. For radar reflectors, which may be almost as prominent on buoys as topmarks, see B-465.

B-460.4 **The size** of buoys varies with both the range of visibility required and the difficulties of the location (deep water and strong tidal streams need longer, heavier moorings and therefore larger floats). It is considered practicable to distinguish on charts between only two sizes of buoys (apart from major floating lights - see B-474, and spar buoys - see B-462.2):

a. 'Standard' buoys, including tall ones sometimes described as 'high focal plane'.

b. Superbuoys. Very large buoys, generally more than 5 m in diameter, which should be distinguished on charts because their unusually large size renders them a potential hazard even to large vessels and/or their function or attachments render them unusually costly, or are such that their destruction could result in a disaster. The three principal types of superbuoy are:

- Offshore tanker loading/discharge buoys, often known as Single Point Moorings (SPM). (Very large floating offshore oil terminals, incorporating oil storage and regularly manned, should not be classified as superbuoys - they usually resemble fixed platforms rather than buoys: see B-445.2).
- Very large Oceanographic Data Acquisition Systems (ODAS) buoys, usually moored in deep water, for the automatic collection of oceanographic and meteorological information. See B-462.9. Note: not all ODAS buoys are of superbuoy size.
- Large Automatic Navigation Buoys (LANBY) designed to take the place of a light vessel where construction of an offshore light station is not feasible. A LANBY generally has a principal dimension of 8m or more in the water-plane, and the elevation of the light is generally at least 10m above the waterline, see B-474.

B-460.5 **Seasonal buoyage.** In certain waters many buoys and major floating lights are withdrawn for the duration of adverse seasonal conditions eg ice conditions in winter and heavy seas associated with

Supprimé : to navigational and special-purpose

Supprimé : other than

Commentaire [c24] : This ref is to the draft revised version of B-445.

Supprimé : Some of the remarks may not apply to spar buoys.

Supprimé : Buoy

Supprimé : m

Supprimé : s

Supprimé : ; this

Supprimé : it is recommended that

Supprimé : invariably

Supprimé : and may be intended either

Supprimé : of a particular buoy in a line of channel-marking buoys, or to be the principal means (other than colour and light-character) of showing where safe water lies in relation to the buoy

Supprimé : Radar reflectors may be almost as prominent on buoys as topmarks but are to be charted, if at all, solely by the special symbol ¶
S4¶
not as a topmark. In the case of the IALA Maritime Buoyage System buoyage, it is recommended that radar reflector symbols should normally be omitted; see B-465.

Supprimé : those

Commentaire [c25] : May need to amend reference

Supprimé : Certain v

Supprimé : oceanographic

monsoons. Charts must show buoyage as found in summer or fair weather. Details of withdrawal in winter, heavy seas etc, should not normally be given on paper charts, although these details may be mentioned in a chart note. Their withdrawal and subsequent re-establishment is more usually the subject of a temporary Notice to Mariners.

Some buoys are laid seasonally in coastal waters, eg: racing marks in summer, fish traps and tunny nets in fishing seasons. Such buoys may be charted with an appropriate legend, eg:

Q71

B-460.6 **Names or numbers** of buoys are normally painted on them. Names are sometimes abbreviated. Where space permits, the names, letters or numbers should be shown in sloping text, in the form painted on the buoys themselves if known, eg *Banc Fairy Sud, No3, NR3.E, ODAS*. However, if necessary for clarity (eg to avoid the risk of a buoy number being mistaken for a sounding) numbers or letters may be surrounded by single quotation marks, or preceded by the abbreviation '*No*' (for number) or equivalent. Where there is a sequence of numbered buoys, all the designations in the sequence should be depicted in the same manner.

Supprimé : as

Supprimé : , or f

Supprimé : or other recreational purposes

Supprimé : in summer only; nations should use their own discretion in charting such marks

Supprimé : are of real interest for navigation they

Supprimé : ll charts, w

B-461 BUOYAGE SYSTEMS

Systems of buoyage are described as **lateral, cardinal,** or a combination of lateral and cardinal. Lateral systems depend on a **direction of buoyage** being defined, generally in accordance with the direction of the flood tide or an approach from seaward. The cardinal system depends solely on the main **points of the compass.**

Supprimé : basically

Special-purpose buoys often mark the limits or centre of an area (eg an exercise area, a dumping ground) and do not necessarily have lateral or cardinal system characteristics.

B-461.1 **The 1936 Agreement for a uniform system of maritime buoyage,** commonly referred to as the 'Geneva Convention', provided for both lateral and cardinal systems. Its origins were an agreement in 1889 when some countries standardized on red conical buoys to mark the starboard hand and black can buoys to mark the port hand. Unfortunately, when lights for buoys were first introduced, some European countries placed red lights on the black port hand buoys to conform with the red lights to mark the port side of harbour entrances, whilst in North America red lights were placed on the red starboard buoys. The 1936 Agreement stated that lights should be red to port and white to starboard, but the USA and others were not signatories, and preferred their own system of using red lights and red daymarks to mark the starboard side of a channel.

The Geneva Convention was not ratified. However, aids to navigation established from 1946 onwards in Europe were broadly based on the Convention, though fairly wide differences in interpretation caused difficulties.

Supprimé : prevented by World War II but the

Supprimé : re-

Supprimé : which have

B-461.2 **The International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA)** set up a committee in 1965 to harmonize the existing rules. By 1976 the rules for System 'A' (red to port) were completed and implementation began in 1977. The rules for System 'B' (red to starboard) were completed early in 1980 but were so similar to those for 'A' that the two were combined to become **'The IALA Maritime Buoyage System'**. Within the single system, lighthouse authorities are allowed the choice of using red to port or red to starboard on a regional basis, the two regions being known as Region A and B, respectively. To achieve this single set of rules some minor additions to System A rules were implemented and adopted in November 1980.

IALA definitions are taken from the 'International Dictionary of Aids to Marine Navigation' published by IALA in several languages.

B-461.3 **The IALA Maritime Buoyage System** details, including the extent of Regions A and B, are given in other publications (eg UK's booklet NP 735 'IALA Maritime Buoyage System'). Although it is

Supprimé : The new IALA System rules were

Commentaire [c26] : AU suggests a major reorganization of this section, along the lines of NP735. However, NP735 (a UK publication) is intended as a user guide, M-4 is a cartographer's guide. We agree there is further information from NP735 that could usefully be included and have done this in the following paragraphs.

called a buoyage system, it applies to all fixed and floating marks except lighthouses, some sector lights, leading lights and marks, major floating lights and lights on offshore structures. Five types of marks are provided by the system: Lateral, Cardinal, Isolated danger, Safe water and Special marks, which may be used in any combination. Emergency Wreck Marking Buoys were added on a trial basis in 2006. Most lighted and unlighted beacons, except leading marks, are included in the IALA System. The following specifications apply to both Regions, and most apply to buoys and beacons.

Lateral marks are generally used for well defined channels, in conjunction with a direction of buoyage (see B-461.4). They indicate the port and starboard sides of the route to be followed. A preferred channel mark is a modified lateral mark.

Cardinal marks are used in conjunction with the compass to indicate where a mariner may find best navigable water, taking their name from the quadrant in which they are placed in relation to the point marked. The mariner should pass N of a North mark, E of an East mark, etc.

Isolated danger marks are erected on, or moored above, isolated dangers of limited extent with navigable water all around them. As the danger must be charted in its correct position, the symbol for an isolated danger buoy will inevitably be slightly displaced on paper charts.

Safe water marks are used to indicate there is safe water all around the mark. It may be used as a centre-line, mid-channel or landfall buoy, or to mark the best point of passage under a bridge.

Special marks are used to indicate to the mariner a special area or feature, the nature of which is usually apparent from the chart or associated publication. They are also used to mark channels within channels, eg yellow buoys marking a deep channel within a channel for normal navigation marked by lateral buoys. In such cases, the special marks will conform with lateral shapes.

Emergency Wreck Marking Buoys (EWMB) (on trial from 2006) are used to mark new dangers until a permanent form of marking has been established and the danger itself has been promulgated by Notice to Mariners, or removed.

B-461.4 **IALA System: Direction of buoyage.** The conventional direction of buoyage for lateral marks is defined by IALA as being governed by two principles:

> 'A direction specified for an area of sea or inland water in order to define the port and starboard sides of navigable water in the area. It may be indicated on charts or in other appropriate nautical documents. It is either:
>
> - the general direction taken by a vessel on approaching a harbour, river, estuary or other waterway from seaward, or
> - the direction determined by the appropriate authority, but it should be based wherever possible on the principle of following a clockwise direction around continents'.

Each hydrographic office should therefore consider issuing a suitable diagram (in Sailing Directions or elsewhere) to illustrate the second principle in its area of interest.

B-461.5 **Charting the direction of buoyage.** On charts, the following assumptions are made:

Supprimé : are concerned

Supprimé : herein

1. In harbour approaches and estuaries, a knowledge of the first general principle quoted above, together with the channel buoy symbols, give competent navigators a clear indication of the conventional direction of buoyage without the need for a special arrow or other means of indication.

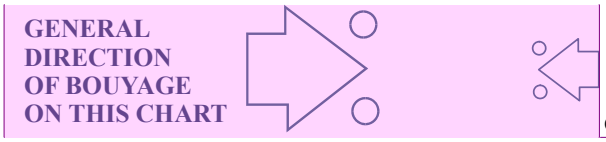
2. Isolated offshore buoys will generally be cardinal buoys (which do not depend on a conventional direction of buoyage).

3. Difficulties for navigators may arise:
   - if a lateral system is used in a one-way traffic lane where the direction of buoyage is opposed to the traffic direction;
   - where 'straight through' buoyage of a strait overrides the 'approach from seaward' convention;
   - where two opposing directions meet;
   - where the lateral system extends a long way offshore and, at its outer part, has a local direction opposed to the general direction (eg, as occurs in the northern part of the outer River Thames estuary in UK);
   - knowing which side to pass when confronted with a 'new danger' (described by IALA as one which has been marked by buoys but not yet charted).

Supprimé : or

For such potentially confusing situations, it is advisable to include a magenta symbol to indicate the direction of lateral buoyage. The symbol may be accompanied by an explanatory legend (in magenta), particularly if both general and local direction arrows are included on the same chart. The size of the arrows is at the discretion of the cartographer; however, usually a single 'general direction' arrow should be significantly larger than 'local direction' arrows.

Supprimé : recommended (in magenta)



Q130.2

Commentaire [c27] : DID: please correct spelling of BUOYAGE.

On 'multi-coloured' charts (see B-140), the circles may be coloured red and green as appropriate.

B-462 SHAPES OF BUOYS

The principal shapes are those recommended in the IALA Maritime Buoyage System, namely: conical, can (cylindrical), spherical, pillar and spar. As far as possible, variants of these basic shapes must be classified under these headings, for symbolization on charts. In practice, there will remain some additional shapes, eg minor light-floats and barrel buoys, which will require their own symbols. Special marks may have any shape but must not conflict with those used for lateral or safe water marks, eg an outfall buoy on the port hand side of a channel could be can-shaped, but not conical.

Supprimé : 'not conflicting with navigational marks'

B-462.1 **Features common to all buoys.** The position of the buoy must be indicated by a small circle (without central dot) in the middle of the base of the buoy symbol.

Supprimé : ¶
Nations adopting the new buoyage rules are recommended to adopt the standard symbols shown below.¶
¶

Q1

Supprimé : The reference 'IALA Dictionary', refers to the 'International Dictionary of Aids to Marine Navigation' published by IALA in several languages.¶
¶

The buoy symbol must be a stylized pictorial representation of the actual shape seen in profile from sea level.

Buoy symbols, excluding major floating lights, light-floats and super-buoys, should normally be shown sloping to the right. To avoid other detail, the slope may be varied in particular instances, but the base of the buoy symbol must always be horizontal.

Supprimé : minor

B-462.2 **Conical.**

Supprimé : France: Bouée conique. Germany: Spitztonne.

Q20

IALA definition:

'A buoy of which the part of the body above the waterline, or the greater part of the superstructure, has approximately the shape or the appearance of a pointed cone with the point upwards'.

A conical buoy indicates that the buoy should be left to starboard when following the direction of buoyage. The '**ogival**' shape (a shape in profile like that of a pointed arch) and the American '**nun**' buoy must also be represented by the conical symbol.

Supprimé : The American '**nun**' buoy is a variation of the conical shape and should be represented by the conical symbol.

The conical symbol must not be used for the type of tall framework structure used **solely** as a support for a light and other aids to navigation: for this type of buoy, see **Pillar** B-462.5.

B-462.3 **Can (cylindrical).**

Supprimé : France: Bouée cylindrique. Germany: Stumpftonne.

 Q21

IALA definition:

'A buoy of which the part of the body above the waterline, or the greater part of the superstructure, has the shape or the appearance of a cylinder, or of a truncated cone that approximates to a cylinder, with a flat end uppermost'.

A can buoy indicates that the buoy should be left to port, when following the direction of buoyage. Tall cylindrical spar buoys must not be charted as can buoys; see B-424.6.

B-462.4 **Spherical.**

Supprimé : France: Bouée sphérique. Germany: Kugeltonne.

 Q22

IALA definition:

'A buoy of which the part of the body above the waterline, or the greater part of the superstructure, has the shape or the appearance of a part of a sphere'.

A spherical buoy indicates that there is navigable water all around its position.

B-462.5 **Pillar.**

Supprimé : France: Bouée charpente; bouée pylône. Germany: Bakentonne.

 **Q23**

IALA definition:

'A buoy of which the part of the body above the waterline is a pillar, or of which the greater part of the superstructure is a pillar or a lattice tower'.

Buoys (other than spars) which are relatively tall in relation to their diameter, but otherwise have no distinctive shape, must be charted by the symbol shown. This symbol should be used for both 'high focal plane' and similar, smaller pillar buoys. In the cardinal system, most such buoys will be fitted with topmarks and many with lights.

The shape of a pillar buoy has no navigational significance.

B-462.6 **Spar.**

Supprimé : France: Bouée espar. Germany: Spierentonne. Sweden: Prick.

 **Q24**

IALA definition:

'A buoy in the form of a pole, or a very long cylinder, floating

upright'.

Many such buoys carry topmarks; a few carry lights; the representation of these is shown in B-466.

The term 'floating beacon' should not be used. See B-459 for Buoyant Beacons.

Spindle buoys are similar in shape to spar buoys, but pointed, and should be charted by the same symbol.

The shape of a spar or spindle buoy has no navigational significance.

B-462.7 **Barrel.**

IALA definition:

'A buoy in the form of a barrel or cylinder floating horizontally'.

It may be used in the IALA Maritime Buoyage System, but only as a special mark. For mooring buoy symbols, see B-431.5.

B-462.8 **Light-float**. A boat-shaped structure used instead of a light buoy in waters where strong streams or currents are experienced, or when a greater elevation than that of a light buoy is necessary,, eg:

Q30

Formerly, unmanned light vessels were called 'major light floats'. These are now charted as major floating lights, see B-474.

B-462.9 **Superbuoy.**

Q26

Very large buoys (generally larger than 5m in diameter) are referred to as 'superbuoys', see B-460.4b.

The purpose of an Ocean Data Acquisition System (ODAS) buoy should be indicated by a legend.:

Q58

Note: not all ODAS buoys are of superbuoy size; the appropriate buoy symbol should be used.

For a superbuoy used as a tanker loading mooring, see B-445.4b.

For major floating lights (see B-474).

B-463 **TOPMARKS ON BUOYS (AND BEACONS)**

Many different topmarks are used on buoys (and on beacons) but in the IALA Maritime Buoyage System the variations are reduced to a few important shapes: can, conical, spherical, and X-shaped. The trial emergency wreck marking buoy has a new upright cross (cruciform) shape.. The term 'daymark' may be used instead of 'topmark' in the US.

A topmark must be in the same orientation as the symbol to which it is attached, eg, a buoy topmark must slope at the same angle as the rest of the buoy, a beacon topmark must be upright.

Supprimé : (France: Fuseau. Germany: Spindeltonne)

Supprimé : fairly

Supprimé : France: Bouée tonne. Germany: Fasstonne.

Commentaire [c28] : INT1 editors, please note to add another example (eg red with can topmark) to Q30 and remove ref to IALA and Q31

Commentaire [c29] : DID, please add example of red (open) light float, with can topmark.

Supprimé : (part of IALA System)

Supprimé : ¶ ¶ Fl.10s **Q31** (not part of IALA System)

Supprimé : for larger light-floats serving as major floating lights

Supprimé : The basic symbol

Supprimé : for major floating lights (see B-474).

Supprimé : is

B-463.1 IALA Maritime Buoyage System - Topmarks

a. Cardinal marks have double topmarks. There must be a clear separation between each cone; in particular, two cones base to base must not be shown as a diamond shape. The topmarks are all black.

Supprimé : Examples of recommended symbols are shown.

Supprimé : painted

Supprimé : See also B-464.1.

Q9

The order of the topmarks above is North, South, East, West. It helps to remember that the point of the cone reflects the position of the black band(s) on the body of the buoy (or beacon), eg for a West cardinal mark, the black band is in the middle.

b. Isolated danger marks, which indicate the location of an isolated danger of limited size that is completely surrounded by navigable water, have two black spheres, one above the other.

Supprimé : all around

Supprimé : , painted black

Q9

c. Safe water marks, as used for centre-lines of channels or as landfall marks, may have a single red sphere as a topmark. Spherical buoys indicate by their shape that there is navigable water all around them, so such buoys may not be fitted with topmarks.

Q9

d. Lateral marks may have a single can (cylindrical) topmark on the port hand and a single conical topmark (point up) on the starboard hand, coloured red or green as appropriate for Region A and Region B. Can and conical buoys indicate by their shape which is the correct side to pass, so these buoys may not be fitted with topmarks. If the buoy does not have a distinctive shape, a topmark will usually be fitted.

Supprimé : ly

Q9

The order of the topmarks above is Region A: red to port, green to starboard, Region B: green to port, red to starboard.

e. Special marks, not primarily intended to assist navigation but indicating a special area or feature, may have a single yellow 'X' (diagonal cross) shaped topmark.

Q9

Special marks may also be used to mark Traffic Separation Schemes, or channels within channels (eg a Deep Water route within a wider navigation channel marked by standard lateral buoys) or special purpose channels (eg for small craft).

f. Emergency wreck buoys, intended for the temporary marking of a new wreck (on trial from 2006), may have a yellow standing/upright (cruciform) cross topmark.

Q9

Commentaire [c30] : DID, please create a new topmark, consisting of a cruciform style cross, sloping 15° to the right.

B-464 COLOUR OF BUOYS (AND BEACONS)

These paragraphs refer only to the colour of buoy (or beacon) bodies, not to the colour of any lights exhibited. Retroreflective material is not charted.

Supprimé : and topmarks,and any retroreflective material applied to them, but

Where buoys are painted in more than one colour, 'stripes' are vertical (or exceptionally on non-IALA buoys, diagonal) and '**bands**' are horizontal.

Within the IALA buoyage system:

- red and green are used for lateral marks,
- yellow is used for special marks,
- black and yellow bands are used for cardinal marks,
- black and red bands are used for isolated danger marks,
- red and white stripes are used for safe-water buoys,
- blue and yellow stripes are used for emergency wreck marking buoys (on trial from 2006).

Red and green on lateral buoys mean different things in IALA Regions A and B, therefore the applicable region must be stated on charts – see B-241.8.

B-464.1 **Colour representation** is effective in the case of filled and open (ie unfilled outline) symbols. The old scheme of lines, dots and chequers to represent colour(s) is obsolete and should no longer be used, as it cannot satisfactorily be used for topmarks and some types of buoy symbols (eg spar buoys and most multi-coloured buoys). On multi-coloured charts, buoys may be shown in their actual colour, or follow the rules for 'standard' coloured charts, which are:

a. A filled symbol must be used to represent a black buoy and, where green and black buoys have exactly the same significance to a navigator, it must also represent a green buoy,eg:

Q2

Note: a spar buoy is always charted filled, irrespective of its actual colour, eg:

Q5

b. An open symbol (ie unfilled outline) must be used to represent any other colour of buoy, or multi-coloured buoy (except spar buoys and some preferred channel buoys), eg:

Q3

c. A buoy symbol with a single line from top to bottom must be used to represent a striped buoy (if it is an open symbol), eg:

Q5

d. No change is made to the buoy symbol to represent bands. This can be deduced from the multiple letter abbreviations, the topmark and lack of vertical line, eg:

Q4

e. **Preferred channel (or bifurcation) buoys** are modified lateral marks within the IALA Maritime Buoyage System (ie green with red band, or red with green band). The symbol used should follow the lateral convention, ie a filled symbol must represent a predominantly black or green mark, eg:

Q130.1

B-464.2 **International abbreviations for colours** are specified in B-450.2. Where there is insufficient space on charts for abbreviations, the topmarks alone (for cardinal buoys) or the filled and open symbols (for lateral buoys) may be considered adequate to indicate colours, without abbreviations.

B-464.3 **Abbreviations for multiple colours on buoys** must be shown in accordance with the following

Supprimé : very

Supprimé : black

Supprimé : unshaded

Supprimé : For the IALA System, and possibly other systems, it is recommended that:¶
¶

Supprimé : black (ie

Supprimé : -in)

Commentaire [c31] : DID, please add open can buoy with letters RGR, a open conical buoy with letters RGR and a filled in can buoy with letters GRG underneath. (There are examples in Q130.1)

conventions:

a. Where the colours are in bands the sequence of colour abbreviations must be from top to bottom, eg in the IALA System:

- a north buoy (black above yellow): *BY*
- an east buoy (black with single broad horizontal yellow band): *BYB*
- a south buoy (yellow above black): *YB*
- a west buoy (yellow with a single broad horizontal black band): *YBY*
- a preferred channel buoy: *GRG* or *RGR*.
- an isolated danger buoy (black with one or more broad horizontal red bands): *BRB*

Q4

Note: It helps to remember that the points of the topmark cones (for cardinal marks) reflect the position of the black band(s) on the body of the buoy (or beacon), eg for a north cardinal mark, the black band is at the top.

b. Where the colours are in stripes (vertical or diagonal) or the sequence of horizontal bands is not known, the darker colour is to be given first, eg in the IALA System:

- a safe water buoy (red and white vertical stripes): *RW*

Q5

- an emergency wreck marking buoy (blue and yellow vertical stripes): *BuY*

B-465 RADAR REFLECTORS ON BUOYS

Note: this section also applies to buoyant beacons, but not to other beacons; see B-455.8.

B-465.1 **Areas where radar reflectors are fitted to most buoys.** In many areas of the world, radar reflectors are fitted to nearly all major buoys and to many minor ones. In such areas, the symbol for a radar reflector should not be shown on buoy symbols in order to reduce the complexity of buoy symbols and associated legends.

In these areas, nations wishing to show the radar reflector symbol on **unlit** buoys may, exceptionally, do so but should insert on each chart a note explaining why they are not shown on light buoys.

B-465.2 **In other areas** where radar reflectors are not widely fitted to buoys, the existence of a radar reflector should be indicated by the symbol **S4** (in black), eg:

Q11

B-466 LIGHT BUOYS

Some nations give full details of their light buoys in their Lists of Lights and Fog Signals (LL); others do not. The largest scale charts should show the rhythm, colour (unless white) and period of lights on buoys, if scale permits, irrespective of LL practice.

B-466.1 **The symbol for a light buoy** must be the same as that for an unlit buoy but with the addition of the

Supprimé : As an aide-memoire, it may be noted that the black topmarks on a cardinal buoy are a 'pointer' to the position of the black bands on the body of the buoy, ie, N topmarks point up, and black is above yellow; E topmarks point up and down, and black is above and below yellow; and so on.

Supprimé : commonly

Supprimé : , or abbreviation,

Supprimé : ED

Supprimé : give

Supprimé : full characteristics

Supprimé : including rhythm, colour (unless white) and period,

Supprimé : ed

light description and light flare symbol.

a. Light descriptions on floating marks, including the order of the various elements, should be the same as those used for fixed marks (see B-471). Height and range should not generally be charted for buoys, except superbuoys (see B-466.4). The text should be sloping.

b. The flare should be in magenta, or in the appropriate colour on multi-coloured charts. It should be positioned about 1 millimetre from the point indicating the exact position of the buoy, orientated to avoid overprinting other detail, eg:

Q7 and 8

Q41

B-466.2 **Rhythm of lights on light buoys.** The special features of the IALA Maritime Buoyage System require the following range of abbreviations (and definitions). (Note: these also apply to light beacons which are part of the IALA System).

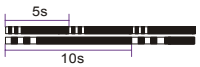
a. Cardinal marks:

Where two similar cardinal buoys are laid fairly close to each other, a Buoyage Authority may distinguish them from each other by different flashing rates.

North Cardinal mark. A white light that is either 'very quick flashing' (either 120 or 100 flashes per minute) or 'quick flashing' (either 60 or 50 flashes per minute), without interruption. The **international abbreviations** are: VQ (for Very Quick Flashing) and Q (for Quick Flashing):

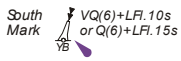
Q130.3

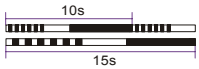
East Cardinal mark. The VQ or Q white light is interrupted after 3 flashes, the total period of a sequence of flashes followed by an eclipse being 5 or 10 seconds respectively. The **international abbreviations** are VQ(3) and Q(3), with periods being added on the largest scale charts, where space permits:



Q130.3

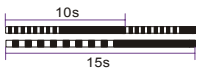
South Cardinal mark. The first phase of the white light is 6 VQ or Q flashes, followed immediately by a 'long flash' of two seconds or more, and then an eclipse; the total period of a sequence of flashes followed by an eclipse being 10 or 15 seconds respectively. The **international abbreviations** are VQ(6)+LFl and Q(6)+LFl, with periods being added on the largest scale charts, where space permits.





Q130.3

West Cardinal mark. The VQ or Q white light is interrupted after 9 flashes, the total period of a sequence of flashes followed by an eclipse being 10 or 15 seconds respectively. The **international abbreviations** are VQ(9) and Q(9), with periods being added on the largest scale charts, where space permits:



Q130.3

Supprimé : "patch" (or "

Supprimé : The star, which duplicates the latter, should no longer be shown so as not to confuse the important information conveyed by the topmarks.

Commentaire [c32] : Sentence referring to old buoy symbols deleted – time expired.

Commentaire [c33] : DID: these graphics are badly cropped, please replace.

Supprimé : some extension of

Supprimé : uninterrupted

Supprimé : Where two North (or other cardinal) buoys are laid fairly close to each other, certain Buoyage Authorities wish them to be distinguishable from each other by the different flashing rates.

Commentaire [c34] : DID please replace the graphic bars with ones similar to 5011 for all the cardinal marks (ie triangles for quick flashes and thinner triangles for very quick). Retain the period time bars on the E, S and W marks.

Supprimé : darkness

Supprimé : for the VQ and Q lights

Supprimé : also

Supprimé : for 6

Supprimé : either

Supprimé : (VQ) or 15 seconds (Q).

Supprimé : either VQ or Q,

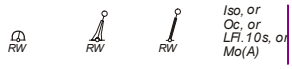
Supprimé : either

Supprimé : seconds (VQ)

The unique character of these lights is such that periods could be omitted to avoid excessive length.

As an aide-memoire, the numbers of flashes: 3, 6 and 9, were chosen by IALA to correspond to the positions of figures on a clock face.

b. Safe Water mark. A white light that may be Isophase (Iso), or Occulting (Oc), or a single Long Flash with a period of 10 seconds (LFl.10s), or Morse (A) (Mo(A)).



Q130.5

c. Isolated Danger mark**.** A white light that will exhibit a group of two flashes (Fl(2)).

d. Lateral marks may exhibit red or green lights of any rhythm (but not fixed), including Long Flashing lights. A composite group flashing red or green light (eg Fl(2+1)R) is exhibited only from modified lateral (preferred channel) buoys, see B-464.1e.

Q130.1

e. Special marks. A yellow light is exhibited, which may have any rhythm except those used for white lights on Cardinal, Isolated Danger or Safe Water marks. An ODAS buoy will have a group of five flashes in a period of 20s (*Fl(5)Y.20s*).

f. Emergency Wreck Marking buoy. (On trial from 2006). The proposed light is an alternating occulting blue and yellow light, with 1 second periods of light separated by 0.5 second eclipses (*Al.Oc(2)BuY.3s*) **.**

B-466.3 **The colour of a light on a light buoy** must be shown by the **international abbreviations** listed in B-450.2, except that the omission of a colour abbreviation from the chart means that a light is white. The abbreviation for colour (if any) must follow the abbreviation for the rhythm.

B-466.4 **The period of a light on a light buoy** is the time taken to exhibit one full sequence of phases. It must be expressed in seconds, using the **international abbreviation** 's', eg 15s (with no space between figure and letter). Periods of less than 3 seconds may be given to the nearest 0.1 of a second, eg *2,4s*.

The period should normally be the final part of the light-description, except in the case of 'superbuoys' (see B-460.4b and B-462.9) where height and/or range may be added. For periods of light buoys in the IALA System see B-466.2 and B-471.5. In general, the period is the least important part of a light description and must be omitted first if there is no space to give full details, or if the chart is on a relatively small scale. However, the positive identification of a single aid to navigation is often vital to mariners. If, for example, adjacent buoys have Iso 4s and Iso 8s lights respectively, they should not both be abbreviated simply to 'Iso', but should also include the period of the light.

Supprimé : Single

Supprimé : ing

Supprimé : It is proposed to use, in the last case, the abbreviation: LFl with the period.

Commentaire [c35] : DID: please add flares to buoys

Commentaire [c36] : DID: please add graphic bars (could be taken from NP735), but add a period time bar to the LFl 10s bar.

Commentaire [c37] : DID: please add graphic Q130.4 and time bar from NP735

Commentaire [c38] : DID: please insert graphic Q130.1. (both panels) with the coloured graphic bars from NP735 in columns underneath the appropriate regions.

Supprimé : abbreviations

Supprimé : shall

Supprimé : See also B-450.3 for capitalization of the letters of the abbreviation.

Supprimé : half

Commentaire [c39] : To be consistent with B-471.5

B-470 **LIGHTS: GENERAL**

These specifications include lights of all types other than those on buoys and minor light-floats. Major floating lights (light-vessels, major light-floats and Large Automatic Navigation Buoys (LANBY) have functions similar to those of major lights on land; see B-474.

B-470.1 **Charts and other publications.** Positions of lights, and bearings of leading and sectored lights, are best shown graphically, but full details of a major light and its structure cannot easily be charted. There is inevitably duplication of some information on charts and in Lists of Lights and Fog Signals (LL) and Sailing Directions.

Full (or abridged – see B-472) descriptions of lights should be shown on charts, but limited information about light structures (such as lighthouses) can be shown. Details of the structure and additional details about the light (eg intensity, phases) should be given in LL, so the name of a light or its location should be shown to facilitate reference between the chart and the LL.

B-470.2 **Definitions of the technical terms** used in these specifications are given in IHO publication M-12 'Standardization of Lists of Lights and Fog Signals', and are repeated or expanded here only where special distinctions are needed in chart symbols and abbreviations.

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

B-470.3 The IALA Maritime Buoyage System rules will apply to minor lights but not to leading lights, some sector lights, landfall lights or major floating lights. Increasingly sector lights follow IALA convention when used for marking a channel. General information on the IALA System is given in B-461.

B-470.4 **Colours of lights**

a. **General rules on 'multi-coloured' 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. For further guidance on placing sectors, see B-475. The following specifications should be adhered to on multi-coloured charts, to achieve conformity:

- 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 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.
- 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 B475.1, 475.5 and INT1 P41.2).
- Sector arcs should be fine dashed lines, but may be shown solely by coloured arcs. The **international abbreviation** for the colour or character of the light (see B475.1 and INT1 P40.2) should be added, in case the colour is difficult to distinguish under bridge lights.
- Coloured sector arcs should be situated to avoid conflict with significant detail. If colour arcs (including circles for 360° lights) are placed within 30mm of the light star, the flare(s) may be omitted. Where this cannot be achieved, coloured arcs should be broken to clear significant

Supprimé : POINTS

Supprimé : points relating particularly to them are given in

Supprimé : the

Supprimé : very

Supprimé : the name of

Supprimé : together with an effective means of finding a charted light in the other publications. Normally a light is found first by looking up its name or the name of the locality and then, if necessary, by latitude and longitude.

Supprimé : obviously

Supprimé : when major changes, such as in the definition of the range at which a light is visible, are in progress.

Supprimé : ed

Supprimé : primarily concerned with buoyage, so general information is

Supprimé : : use of colour plates

Supprimé : such

Supprimé : charts

Commentaire [c40] : No longer necessary as the option to use colour patches has been removed.

Supprimé : <#>Flares should be used rather than circular patches, as more than one colour flare can be located at a light star (when the actual sectors are not charted).¶

Supprimé : depicted within 30mm of the light star,

Supprimé : if possible

detail, or the arc moved further from the light, but not beyond the range of the light. In the latter case, coloured flares should be located at the light star.

- Coloured sector arcs (or circles) should be 1mm wide. Faint sectors may be 0.5mm wide. In very narrow sectors, a wider wedge of colour should be shown, so that it is clearly visible.
- Coloured sector arcs (or circles) should be used on all major lights, including un-sectored lights. Leading lights (with narrow sectors) and minor lateral lights should usually be shown by flares.
- Alternating and oscillating lights should be shown by parallel or overlapping different coloured arcs (or circles).
- The floodlight symbol (P63) should be yellow/orange.
- The Moiré effect symbol (P31) and strip light symbol (P64) should be coloured as appropriate to the light.

b. On 'four-colour' charts.

Complex sector lights must be charted in black, with magenta light flares. Fairway sectors may be emphasised by using continuous lines (see B-475.5). This economical representation does not prevent navigators from hand colouring sectors of interest to them and, indeed, may be quite adequate for the masters of piloted ships. It has some advantages relative to multi-coloured portrayal: it is easier for the user to correct charts, and is not subject to changing appearance under certain types of bridge lighting.

B-470.5 **Position of lights.** The exact position of a light should be shown by a five-pointed star in one of two sizes. The larger star should be used for the majority of lights. The smaller star may be used where there are numerous minor lights, eg the corners of quays and dolphins in a harbour.

P1

Position of lights - special cases. A light star must not be used for:

- Floating lights, see B-460 (light buoys) and B-474 (major floating lights);
- Navigational lights on landmarks or other structures charted by pictorial symbols, eg water towers, stranded wrecks, wind turbines. These should be indicated by a light flare from the small position circle (similar to the depiction of a light buoy), eg:

P7

- Offshore platforms, see B-445.2;
- Air obstruction lights on masts, chimneys, etc which are to be indicated only by legends in brackets against the features, see B-476.2;
- Strip lights, see B-478.5;
- Signal stations, see B-490.2.

To avoid clutter and to give precedence to the symbol, the term 'light', or its equivalent, must not normally be inserted against the position of a light. When a light description is unavoidably sited some distance from the light star (eg to avoid obscuring detail close to the light, the light falls outside the chart limits - see B-470.8), it is permissible to include the **international abbreviation** 'Lt' **(P1)** in the name, eg Eddystone Lt. The abbreviation may also be used in legends: eg '(R Lts)' against masts, indicating air obstruction lights, 'LtHo (disused)' where no light is now exhibited.

B-470.6 **Light flares.** The point of a light flare **P11** should be about 1 mm from the charted position of the light.

On 'multi-coloured' charts, the flare(s) should be in the colour(s) of the light, see B-470.4.

The orientation of flares should be such as to avoid obscuring other detail. In the case of a leading

Supprimé : bold

Supprimé : (as on many Swedish charts).¶
Saut de page

Supprimé : , and printing is easier and cheaper. In charting the tidal estuaries of the German and Netherlands coasts, where complex light sectors are also common, the correctional problem is very significant, especially for "multi-coloured charts".

Supprimé : In the specifications which follow, emphasis is given to standardizing legends and line symbols on the black plate. The meaning of the terms "multi-coloured chart" and "standard chart" should be clear from the above.¶
¶

Supprimé : , the size depending on the relative importance of the light

Commentaire [c41] : Use of a dot, which has been 'not recommended' for many years, should not be retained in INT specs, and this is supported by a clear majority.

Supprimé : A bold dot in lieu of a light star, is permissible but is not recommended because the star symbol is more distinctive (dots are used for spot heights, posts, small islets, etc) and widely used on the charts of many nations.¶

Supprimé : Dots can be hand-drawn more easily on compilation drawings but, lacking a coloured flare, they are not sufficiently distinctive when editing and revising drawings and single colour proofs.¶
¶

Supprimé : non-navigational

Commentaire [c42] : This principle was agreed by CSPCWG for wind turbines (see B445.8) and that it would be made more general when B470 was reviewed. It is a question of which is more important, the daymark or the light, with the draft priciple that both are shown by symbol (eg flare + water tower symbol) without reliance on text. The same applies to buoys; we show a symbol + flare, not a star + *BUOY*. It will need an entry in INT1; we ... [1]

Commentaire [c43] : DID, please insert 5011 Pc.

Supprimé : Minor a

Commentaire [c44] : Added because this is the convention, but we ask why not use light stars and flares? Please consider in advance of ... [2]

Supprimé : such

Supprimé : the point showing

light (see B-475.6), lights in line (see B-475.6) and direction lights (see B-475.7), the flares should be oriented to seaward along the line, provided this does not obscure the front light star, or other detail.

Flares must not be inserted against air obstruction lights (see B-476.2), traffic signal stations (see B-495) or strip lights (see B-478.5) where light stars are usually omitted.

B-470.7 **Names of major lights** are very important, as stated in B-450.3 and B-470.1. If a light has a name which is unrelated to any other charted feature, the name must be inserted against the position of the light, above or preceding the description of the character of the light, and should be in the same style as the light character.

If the name of a light is obviously that of the named feature on which the light stands, eg Saint Catherine's Point, the name of the light need not be repeated above the light description. The name must be in the style appropriate to the feature, eg a headland or a shoal, and in many cases can be sited immediately above the light description. Where, as mentioned in B-470.5, a light description is unavoidably sited some distance from the light star, the name of the light should be repeated above the light description, in the same style as the description.

Minor lights may be identifiable in LL by a charted general name and a (possibly uncharted) descriptive term, eg Royal Pier. Names or descriptions of individual lights of a pair of leading lights, eg 'Rear' or 'Upper', 'Front' or 'Lower', can normally be deduced from the positions shown on the chart and, to save clutter and translation, should not be inserted on paper charts.

Rear Lt *or* Upper Lt **P22** Front Lt *or* Lower Lt **P23**

For names of major floating lights, see B-474.

B-470.8 **Lights off chart limits.** Where a light falls outside the limits of a chart, but would be useful as an aid to navigation for a mariner using the chart, it is useful to provide the chart user with a means of plotting bearings to that light.

If the light is a **sectored light**, the sectors should be charted as normal. Sufficient details about the light should be shown on the sector arcs for identification purposes, usually including the name of the light, in addition to the light description.

For **leading lights and lights in line**, the transit lines should be charted as normal. Sufficient details about the lights should be shown on the transits for identification purposes, usually including the name of the lights, in addition to the light description.

For **all-round lights**, or lights where only one sector is visible, short magenta bearing lines at regular intervals (eg 1°) should be placed along the chart border or at some other convenient point in the portion of the chart where the light might be used for navigation. These bearing lines can be used in conjunction with a compass rose; however, if there is no convenient compass rose, two sets of bearing lines should be portrayed, which can be joined up by the chart user. The interval of bearings selected will depend on the distance the light plots off chart limits. The value of the bearing should be added for every tenth line. The length of the lines is at the cartographer's discretion, but the tenth and fifth lines should be emphasized in the same pattern as the compass rose. The name of the light, and its description, should be inserted in magenta along the spread of lines, eg:

P8

Commentaire [c45] : This is the convention, but we ask why not use light stars and flares? Please consider in advance of reviewing section B490.

Supprimé : minor

Supprimé : or

Supprimé : fairly

Supprimé : normally

Supprimé : , SE Head

Supprimé : only exceptionally

Commentaire [c46] : This additional specification suggested by FR (but more widely used) will require a new INT1 entry. We suggest P8 (P7 proposed for lights on landmarks).

Commentaire [c47] : Examples we have seen vary considerably, and may need to vary according to the prominence the light needs to be given. (Examples seen: NL1456, GB2221, FR INT1 Pa).

Commentaire [c48] : DID: please insert symbol in accordance with the agreed wording. The legend should read: Cape Lt. Fl.5s12m23M

B-471 LIGHT DESCRIPTIONS

The various elements of a complete (but abbreviated) description of a light must be charted in the order of the following paragraphs. Light descriptions may be **abridged** but the characteristic rhythm, number of flashes or occultations in a group, and colour (unless white) must all be charted if any details of the light are shown.

B-471.1 **The type** of light is only shown on charts in a few special cases, in particular:

- Aeronautical lights (Aero), see B-476.
- Direction lights (Dir), see B-475.7 and B-475.8.
- Leading lights (Ldg), only where, because of scale, the two lights appear at a single position on the paper chart, and the leading line cannot be charted, see B-475.6.

B-471.2 The principal character of a light is its rhythm (although, strictly, fixed lights and some alternating lights are not 'rhythmic'). The basic **international abbreviations** are:

Character of light	Abbreviation	Illustration (period shown)	INT1 ref.
Fixed	F		P10.1
Occulting (total duration of light longer than total duration of eclipse)	Oc		P10.2
Isophase (duration of light and eclipse equal)	Iso		P10.3
Flashing (total duration of light shorter than total duration of darkness)	Fl		P10.4
Long-flashing (flash 2s or longer)	LFl		P10.5
Quick (repetition rate of 50 to 79 - usually either 50 or 60 - flashes per minute)	Q		P10.6
Very quick (repetition rate of 80 to 159 - usually either 100 or 120 - flashes per minute)	VQ		P10.7
Ultra quick (repetition rate of 160 or more - usually 240 to 300 - flashes per minute)	UQ		P10.8
Morse code	eg Mo(K)		P10.9
Fixed and flashing	FFl		IP10.10
Alternating	eg Al.WR		P10.11

Supprimé : in many instances

Supprimé : Minor lights may be omitted entirely from some medium scale charts, see B-472.

Supprimé : only

Supprimé : <#>¶ (Some lights are not always exhibited throughout the hours of darkness and must have, for example, a warning that they are 'occasional'. This should follow the rest of the light description. See B-473).¶ Saut de section (page suivante)

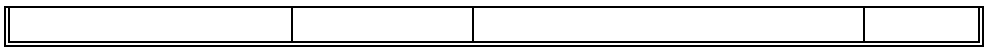
Commentaire [c49] : AU suggests rearranging columns below as INT1. However, they serve a different purpose: INT1 the user has an abbreviation and needs to know what it means, M-4 the compiler has a light and needs to know what abbreviation to use.

Commentaire [c50] : The term 'class' does not appear in S32 or M12. It may be a 'higher level' than character, ie fixed, rhythmic or alternating. If so, it is not appropriate here (which will affect INT 1). 'Character' is consistent with the opening sentence.

Commentaire [c51] : NO suggests starting with light phase. This seems logical as a mariner will always measure time from start of the lit signal. It will need change to M-4 and INT1 diagrams. Also affects Gp and Comp Oc over page.

Supprimé : darkness

Supprimé : darkness



Commentaire [c52] : DID: use improved version of tables in current M-4, but reverse letters in the diagram for alternating, to agree with description, ie W/R/W/R etc

Some examples of abbreviations derived from the basic ones:

Character of light	**Abbreviation**	**Illustration** (⊢⊣ **period shown)**	**INT1 ref.**
Group occulting (showing 2 occultations)	Oc(2)		P10.2
Composite group occulting (showing 2 + 3 occultations)	Oc(2 + 3)		P10.2
Group flashing (showing 3 flashes)	Fl(3)		P10.4
Composite group flashing (showing 2 + 1 flashes)	Fl(2 + 1)		P10.4
Group quick (showing 3 quick flashes)	Q(3)		P10.6
Interrupted quick	IQ		P10.6
Group very quick (showing 3 very quick flashes)	VQ(3)		P10.7
Interrupted very quick	IVQ		P10.7
Interrupted ultra quick	IUQ		P10.8

Commentaire [c53] : See above re Oc. Lt

One of the principles on which the abbreviations above are based is that a capital letter is always used for the first letter of any word abbreviated; other letters are lower case. Another principle is to keep the abbreviations as compact as possible; see B-471.9.

B-471.3 **The colour(s)** of a light must always be charted by the **international abbreviations** listed in B-450.2. They must be charted in capital letters (except for the second letter of two-letter abbreviations).

The omission of a colour abbreviation signifies that a light is white. However, where there is more than one colour exhibited, as in some sector lights and in alternating lights, the abbreviation W must be included. In the case of sector lights, the longest range colours (as listed in the List of Lights and Fog Signals (LL)) are given first, eg WRG. For the charting of colours on the sectors, see B-475.

Supprimé : brightest

B-471.4 **Appropriately coloured flares** may be used on 'multi-coloured charts', **in addition to the abbreviations,** to indicate the colour of lights (see B-470.4a). For the additional use of colours on sectored lights see B-475.

Supprimé : C

Supprimé : or circular "patches"

Supprimé : red, green and white (shown as yellow)

B-471.5 **The period.**

IALA definition:

'The time taken for the completion of all the different **phases** of a light signal.'

IALA defines a phase as:

'A visually discrete part of a light signal. It is bounded by changes

between darkness and light, or between different colours, or between distinctly different luminous intensities, and it may be further discriminated by its duration.'

The period must be expressed in seconds, even where it is one minute or more, and the **international abbreviation** 's' must be used, eg:

1.2s 90s **P12**

Where periods are quoted in the LL to an accuracy of better than one second, they may be quoted on the chart to 0,1s, eg 1,3s, 7,5s to accord with the LL.

Supprimé : These specifications also apply to lighted buoys (B-466.4).

Navigators may time the period of an observed light to confirm an identification obtained firstly from the character (rhythm) and colour. The period is important in identifying a simple flashing light but less important when a light has a more distinctive character, eg group occulting. This should be taken into account when abridging a light description by omission of the period. Where practicable, periods of all lights should be shown on the largest scale charts at least.

B-471.6 **The elevation** of a light is the vertical distance between the light source and the plane of reference for lights, as quoted in the chart title notes. It must be expressed in metres, using the **international abbreviation** 'm', eg:

12m **P13**

The elevations of lights must normally be referred to a High Water datum. Elevations should be referred to Mean Sea Level where the tidal range is not appreciable. The datum used should be clearly stated on all charts, see B-241.6.

Supprimé : The elevation must be measured from mean sea level where there is little appreciable tide at the adjacent shoreline. Elsewhere, an appropriate High Water datum must be used.

Commentaire [c54] : Derived from the revised TR A2.5 (IHO CL 98/2007 refers)

The height of a light structure is the vertical distance between its top and ground level and should not normally be shown on paper charts. Exceptionally, where the height of the structure is particularly remarkable, it may be shown as specified in B-303, but not as part of the light description.

To a mariner, the significance of a charted elevation may be:

- In estimating or looking up (in the Geographical Range Table in LL) the distance at which a landfall light should first be sighted.
- In identifying particular lights, eg leading lights, where they could be confused with other lights.
- In warning him that a light is at a relatively high elevation and is more likely to be obscured by cloud than one at a lower elevation.
- In enabling distance off a headland to be calculated, by day, if radar or other aids are not available.

Supprimé : (the elevation becomes more important as charted geographical ranges are replaced by luminous ranges, see B-471.7)

Supprimé : great

Elevations of landfall lights should be charted, at least on the largest scale charts. Elevations of other lights where the elevation seems significant, eg leading lights, should also be charted on the largest scale charts. The elevations of minor lights are of little significance and should be omitted from charts.

Supprimé : It follows that the e

B-471.7 **The range** (distance) at which a light will be visible can be calculated either from its brightness (giving a **luminous range)** or from the eclipsing effect of the earth's curvature (giving a **geographical** range). Luminous range depends not only on the intensity of the light but on the variable conditions or meteorological visibility. IALA defines **nominal range** as:

'the luminous range of a maritime signal light in a homogeneous atmosphere having a meteorological optical range of 10 nautical miles for an observer of conventional threshold of illuminance.'

The nominal range is given in LL and must normally be used for charts. It must be expressed in sea miles, rounded to the nearest whole mile (0,5M rounded down) using the **international**

abbreviation 'M', eg:

15M **P14**

Exceptionally, where the 'normal' visibility of an area differs widely from 10 miles, a non-standard luminous range may be charted (agreeing with that given in the LL), provided a note defining the range is given on the charts affected.

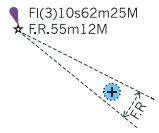
Geographical range (standardized on an observer's height of eye of 5 metres) should not normally be charted because it does not indicate a light's intensity and the arbitrary height of eye does not apply to all vessels. However, in areas where geographical range is known to be useful it may be inserted, where it is less than nominal range, in place of or in addition to nominal range, with a suitable explanatory note.

The ranges of minor lights within very restricted waters are of little significance and should generally be omitted. Where space permits, ranges of all other lights are useful to the mariner and should be charted on at least the largest scales. Ranges of landfall lights should be shown on all appropriate large and medium scale charts.
For ranges of sector lights, including those intensified on certain bearings, see B-475.
For lights with more than one range, see B-471.9.

B-471.8 **Lights exhibited from the same structure** (or charted at the same light star).

a. If more than one light is exhibited from a light structure the description of the main one (eg a light visible from all directions) should be shown on one line and the subsidiary light (eg a red sector of different character, covering a danger) on a line below.

Supprimé : preferably



P42

Two short descriptions may be shown on one line linked by '&'. This also applies where two separate lights which are close together are charted by one light star, because of scale, eg:

Supprimé : they

Ldg Oc.R & F.R **P20.3**

Emergency lights should not be shown on paper charts.

b. Disposition of lights. Lights exhibited from the same structure which are disposed horizontally or vertically must be charted by the abbreviation '(hor)' or '(vert)' **P15**, as appropriate, immediately following the colour in the light description.

Two (or more) fixed lights **of the same colour** disposed horizontally or vertically must be charted, eg:

Supprimé : respectively,

- 2F.G(hor) means that two fixed green lights are disposed horizontally
- 2F.R(vert) means that two fixed red lights are disposed vertically
- 3F.R(vert) means that three fixed red lights are disposed vertically

It is possible to show lights exhibited from the same structure arranged in other ways by means of a geometric symbol, eg:

- 3F.R(Δ) means 3 fixed red lights disposed in the shape of a triangle (the appropriate way up).

Two (or more) lights **of different colour** disposed horizontally or vertically must be charted, eg:

- F.GR(vert) means that 2 fixed lights are disposed vertically, the uppermost being green, the lower

being red.
- F.RGR(hor) means that 3 fixed lights are disposed horizontally, the middle one being green.

The '&' sign is not required, as the qualifier (vert) or (hor) clearly indicates that there is more than one light. These conventions must not be used for Traffic Signals (see B-495).

c. If a fixed light is varied at intervals by a flash of greater intensity, it is charted as FFl, **P10.10.**

B-471.9 **Combining the elements of a light description** must be achieved in a way that enables complex descriptions to be shown compactly. However, some spacing of the elements is needed for ease of interpretation. Full stops are specified below to ensure spacing, but the full stops may be omitted providing the spacing is retained:

Supprimé : spacing alone is adequate if desired, it is recommended that the following rules be applied:

a. Insert full stops (or spaces):
- at the end of the characteristic rhythm (except where there is a bracket);
- at the end of all colours (not between colours);
- after Al (Alternating) - although Al is not a rhythmic characteristic it is often juxtaposed with one.

b. Omit full stops:
- after s (seconds);
- after m (elevation);
- after M (range);
- where there is a bracket;
- at the end of the light description.

c. If more than one range is given in the light description for a single light, show as follows:

eg	15/10M	P14	Light with two different ranges (use forward slash).
eg	15-7M	P14	Light with three or more different ranges (use hyphen).

Colours of a light must be arranged in the same order as the ranges, with the longest range normally given first (see B-471.3). However, in the case of a FFl light, where the flash is always brighter, the ranges should be shown in the same order as the character to which they refer, eg: FFl.10/15M

Commentaire [c55] : Paragraph rearranged to improve comprehension

d. Example of a full light description:

☆ Name
Fl(3)WRG.15s21m15-11M **P16**

Fl(3) *Character of light: group flashing repeating a group of three flashes*

WRG. *Colours: white, red, green, exhibiting the different colours in defined sectors (in this example, with full stop, see B-471.9a)*

15s *Period: the time taken to exhibit one full sequence of 3 flashes and all eclipses: 15 seconds*

21m *Elevation of focal plane above height datum: 21 metres*

15-11M *Nominal range: white 15 miles, red between15 and 11 miles, green 11 miles*

(For additional remarks see B-475.5).

B-472 **LIGHT DESCRIPTIONS: ABRIDGING, OMISSION**

The significance of the various elements of a light description is stated in B-471. For paper charts, the order of omission of details in an abridged (shortened) description is given below. It is not the same for all types of lights. For light buoys, see B-466.4.

B-472.1 **Major lights** (ie lights intended for use at sea, usually with a range of 15 miles or more, and in outer approaches to harbours). When reducing the detail to be charted as the chart scale decreases, the following must be the order of omission:

a. Elevation of light, eg 23m
b. Period of light, eg 10s
c. Range (visibility) eg 22M
d. Character and colour (however, where useful on some smaller scale charts, a light star, major floating light symbol, or offshore platform symbol may be shown with flare and possibly name but without light description); see also C-414.1.

B-472.2 **Lights within harbours and in restricted channels.** It may be advisable to abridge light descriptions even on the largest scale charts to eliminate details of little interest to the mariner, especially where space is very limited. The order of omission must be:

a. Range
b Elevation
c. Period
d. Character and colour. Where numerous quays, wharves, etc, along a river channel have similar lights, the light star and flare may be retained and a standard note covering them all may be used, eg:

LIGHTS
Light stars without legends represent two fixed lights displayed vertically. They are seen as red to port *[or starboard]* and green to starboard *[or port]* when proceeding upriver.

B-472.3 **Omission of all details (including light stars).** In general, the lights selected for insertion on a chart should be those within range of which navigation on the particular chart is possible. As a guide, only those lights visible from 15 miles and over should be inserted on charts at scales smaller than 1:500 000. B-401 to B-404 deals generally with full and partial depiction of chart detail. A well designed chart should not require any warning about omission of certain lights, but if particular attention to omissions is required, a brief note such as 'Only the principal lights are shown on this chart', or equivalent, is sufficient.

B-473 **LIGHTS: TIME OF EXHIBITION**

Lights are normally exhibited from about sunset to about sunrise, although, in fog, some lights may be shown during the day also. The following paragraphs refer to circumstances in which charts may carry warnings that a light cannot be relied on, or that its characteristics may differ from those charted. Usually such comments will be contained in List of Lights and Fog Signals (LL), but if required, may be added to the chart.

B-473.1 **Unwatched (unmanned) lights** have in some instances been noted as such on charts. The reliability of unwatched lights is now such that using the former abbreviation '(U)' is no longer needed on charts.

B-473.2 **Occasional and private lights.** Some lights are exhibited only in response to a specific request or during the occurrence of a particular local condition. Examples are harbour lights shown only when required by particular vessels, eg fishing vessels, ferries and lights exhibited during military exercises. Privately-maintained lights which are not regularly exhibited, eg leading lights to a

Supprimé : OF ALL DETAILS¶

Supprimé : In B-471 t

Supprimé : quite

Commentaire [c56] : We can find no definition of major light, so this is proposed. The term appears a number of times in M-4.

Supprimé : end of

Supprimé : are uniformly lighted

Supprimé : rough

Supprimé : a nation wishes

Supprimé : ly to draw

Supprimé : it is recommended that

Supprimé : , or need not,

Supprimé : Lights may still be accidentally extinguished but important unwatched lights are likely to have standby arrangements that can be brought into service automatically. There may also be an emergency light for service when the permanent or standby light has failed, often providing a reduced intensity or possibly different characteristics.

Supprimé : ¶
. Where no standby or emergency arrangements are available, important lights that are unwatched (unmanned) may be indicated by means of a suitable abbreviation (U).¶
¶
eg . . ☆ Fl.5s(U)
. . . **P53**¶
The characteristics of temporary lights put into service for a limited period eg during repair work, are not to be charted.¶
¶

private quay, are also considered 'occasional'. **The international abbreviation** '(occas)', must be inserted at the end of the light description, for all types of occasional lights, where required to be charted.

P50

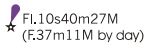
Private lights required to mark a danger such as an outfall, which are regularly exhibited, are not 'occasional'. They may have the **international abbreviation** '(priv)', eg:

P65

For descriptions of lights used for signalling purposes, see B-490.4.

B-473.3 **In high latitudes** lights may not be exhibited in the midsummer period, or in winter when ice closes an area to traffic. For such lights, a charted note is not required.

B-473.4 **Daytime lights** of high intensity may be used in ports for such purposes as marking a leading line. Where lights are shown throughout the 24 hours without change of character no special note is required on the chart. **Where the character shown by day differs from that shown at night,** the former together with the word 'Day', or equivalent, must be shown in brackets beneath the night-time character, eg:



P51

B-473.5 **Fog lights** may be exhibited by day in reduced visibility. They can be synchronised with audible (sound) fog signals so that an estimate of range can be made. The fog light description, together with the word 'Fog', or equivalent, must be shown in brackets beneath the main light character, eg:

P52

For Fog detector lights, see B-477.

B-473.6 **Temporary lights** should not normally be charted. However, if required to be charted, the **international abbreviation** '(temp)' may be added to the light description.

P54

B-473.7 **Extinguished lights.** A light which is known to be temporarily extinguished, or even destroyed, may be marked by the **international abbreviation** '(exting)' if there is a possibility that it will be re-established, eg:

P55

B-474 MAJOR FLOATING LIGHTS

B-474.1 **Major floating lights** are generally classed as those with a nominal range in excess of 10 nautical miles. Special circumstances, eg an isolated location, may mean that a floating light of lower range is given this status. The structure on which the light is fixed will be a light-vessel, a major light-float or a LANBY (Large Automatic Navigational Buoy).

B-474.2 **The symbol for a major floating light** must be

P6

Supprimé : in brackets,

Supprimé : or equivalent added,

Supprimé : No

Supprimé : great

Commentaire [c57] : DID: use graphic from latest version of M-4, including use of Univers type

Commentaire [c58] : DID: use graphic from latest version of M-4

Supprimé : usually

Supprimé : , circular float diameter approximately 12 metres, unmanned

The colour of the structure does not indicate on which side it should be passed and therefore should not be charted (this is consistent with the omission of colour from major shore light structures on paper charts). Details of the structure should be given in List of Lights and Fog Signals (LL).

B-474.3 **The name of the light** must be given, in sloping lettering, on all large and medium-scale charts and must be in the same form as that painted on the structure. It should be placed above the light description, space permitting.

Supprimé : normally

B-474.4 **The light description**, which should be in sloping lettering, must otherwise conform to the specifications for shore lights, including the charting of both height and range on larger-scale charts (see B-470 to B-473). The heights of lights are, of course, above sea level rather than above a fixed datum. Riding lights (lights shown by an anchored or moored vessel), which are of relatively low power, should not be charted.

B-475 SECTOR LIGHTS AND OTHERS NOT VISIBLE ALL ROUND

Supprimé : B-474.5 Watch (or station) buoys are sometimes moored near manned light-vessels to give crews an indication of dragging. They are normally unlit and may be moored up to a mile from the light-vessel. They should be shown on at least the largest scale charts because they are a collision hazard at night or in fog.¶
¶

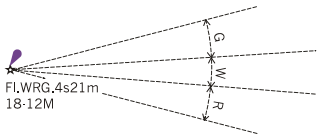
Commentaire [c59] : This section has been rearranged. INT1 editors need to check the M-4 references.

An all-round (or omni-directional) light is one that presents the same character over the whole horizon of interest to marine navigation. Where a large-scale chart shows a light without sector or leading lines (or where the light description does not indicate different sectors, 'Ldg' or 'Dir') the mariner will assume that it is an all-round light. If a light is not visible on some bearings, or changes its character as the bearing changes, this must be shown, usually by inserting sector limits and arcs on at least the largest scale charts.

In the following specifications 'sector limit' is used to denote the line or bearing of a light where the character changes or the light is obscured. 'Sector arc' is used to denote the curved line against which the character of the light in that sector is inserted. In practice, on most lights there is a small 'angle of uncertainty' between sectors where, for example, the colour is indefinite, or at the edge of the arc of visibility, the intensity appears to be reduced. It is impracticable to indicate the angle of uncertainty on charts although, exceptionally a 'faint sector' may be represented, see B-475.3. It is possible, on certain lights which are specially designed to show a narrow sector with very small angles of uncertainty, to indicate this fact by using the abbreviation 'Dir' for 'Directional light': see B-475.7.

There are many different types of light visible on certain bearings only. The following specifications list the main ones, starting with the simpler cases.

B-475.1 **Symbols for sector limits and sector arcs.** Limits of sectors and arcs should be charted as fine dashed lines (about 10 dashes to 10mm), except for fairway sector limits, see B-475.5. Small arrowheads should be inserted at the ends of the sector arcs, eg:



P40.1

Commentaire [c60] : DID: use latest version of graphic from M-4 (currently shown as P40)

Sector limits should cover the area where they are useful to mariners. They must not extend beyond the nominal range of a light. Very short sector arcs may be omitted.

Where light is deliberately restricted from a sector, it must be shown without an arc, eg:

Supprimé : excluded

P44

Commentaire [c61] : DID: please insert P44 graphic

On 'multi-coloured' charts, the sector limits may be shown as fine continuous lines, emphasized by colour if required. Sector arcs may be shown solely by coloured arcs, (together with an abbreviation for the colour or character of the light, see B-475.5), eg:

Supprimé : firm

P40.2

Commentaire [c62] : DID: please insert multi-colour version of graphic.

For details of lights on multi-coloured charts, see B-470.4a.

Supprimé : No sector limits may extend beyond the nominal range of a light.

B-475.2 **Legends on sector arcs** must be **international abbreviations**, see B-450.2 and B-471.

Supprimé : , as specified in the following paragraphs,

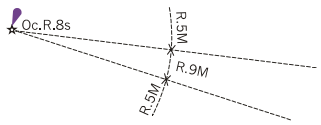
Where sectors are differentiated by colour only, the abbreviations for colours must be inserted on the sector arcs, (including on 'multi-coloured' charts where coloured arcs may be used **in addition** to the abbreviations, see B-470.4a). Where sectors are very wide and there is a risk of a single abbreviation being 'lost' in the charted detail, the abbreviation may be repeated at intervals. Light descriptions on sector arcs should not be inverted.

Supprimé : in abbreviated form, preferably using only the

Where sectors are differentiated by the use of various rhythms, the abbreviations for the rhythms must be inserted on the sector arcs, together with the colour where necessary.

The range of each sector may also be inserted on the sector arcs, following the character or colour, and omitted from the light description at the light star.

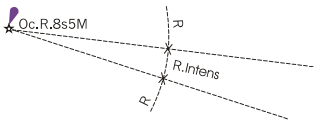
Where a light is intensified in a sector, the ranges of all the sectors should be shown on the sector arcs, eg:



P46

If this is impracticable for any reason, the **international abbreviation** 'Intens' should be used, as appropriate, eg:

Supprimé : or equivalent

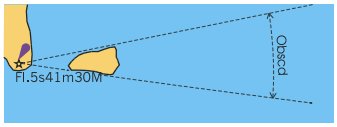


P46

Commentaire [c63] : DID: please amend light description in this graphic to Oc.R.8s9/5M

In exceptional cases where there could be confusion, full details including the name of the light may be shown on a sector arc. This also applies where it is necessary to show a sector of a light although the light itself lies beyond the limit of the chart, see B-470.8.

B-475.3 **All-round lights partially obscured by obstructions.** The arc over which a light is visible may be obscured by an obstruction, such as higher land. To alert the mariner to this deficiency (unless it is obvious) a sector limit, corresponding as closely as practicable to the bearing on which the light disappears, should be inserted on large-scale charts, together with the **international abbreviation** 'Obscd' on the obscured sector arc, eg:

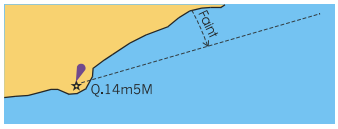


P43

Details of obscured arcs are normally taken from List of Lights and Fog Signals (LL). Where visibility is obscured by sloping land close to the light, the arc of visibility will increase with distance offshore so this should be taken into account when deciding where the lines should be drawn.

Where an arc of visibility is deliberately restricted (ie the light is not an all-round one) the above representation must not be used; see B-475.1.

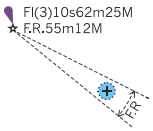
A decrease in the apparent intensity of a light may occur in the case of partial obstructions, such as vegetation. Where particularly important, an arc may be labelled with the word 'Faint' or equivalent, eg:



P45

For faint sectors on multi-coloured charts, see B-470.4a.

B-475.4 **Sector light marking a danger.** In some waters it is common to use a red subsidiary light to 'cover' a danger; see also B-471.8. The sector limits should extend at least as far as the danger and the character of the subsidiary light, eg 'F.R', should be inserted on the arc of visibility. The full description of the subsidiary light, including its range, must be given at the position of the light, below the description of the main (all-round) light, eg:



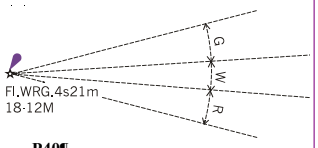
P42

In other cases, the main light itself may have a red sector over the danger; in such cases a single light description, eg 'Fl.WR', must be used and all sectors portrayed if scale permits.

B-475.5 **Sector lights marking fairways.**

Sector limits and sector arcs: where a narrow light sector marks a fairway between off-lying dangers, the sector limits marking the edges of the fairway should be long enough to show the extent of the channel, see B-432.1. The fairway may include a number of 'legs' demarcated by white sectors from more than one light. In such cases, on charts where the sector limits are normally

Supprimé : Legends (light descriptions) at positions of lights: Light descriptions at light stars must generally follow the specifications in B-471 and B-472. Colours must be charted in the order WRG eg:¶
¶
. . .



. **P40¶**
¶
Ranges may be omitted when shown on sector arcs (and in restricted waters where the ranges are of little significance). Where ranges are given in the main light description it is recommended that if two different ranges only are concerned they be shown, eg:¶
¶
15/10 M . . **P14¶**
. . ¶
. . and if three or more ranges are concerned they be shown, eg:¶
¶
¶
15-7 M **P14** (longest to shortest)¶

Supprimé : particular (major)

Supprimé : the

Supprimé : , or equivalent,

Commentaire [c64] : DID, use graphic from latest version of M-4

Supprimé : to be

Supprimé : is

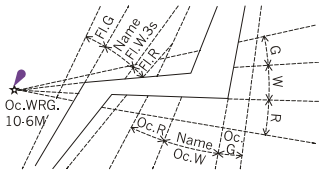
Supprimé : White fairway sectors flanked by red and green sectors, or sectors with different rhythms

Supprimé : fairway

Supprimé : leads

Supprimé : and the approximate margin of safety provided by keeping to the fairway sector. O

shown by fine dashed lines, those lengths of the sector limits which mark the sides of the fairway should be shown by fine firm lines, in order to highlight the channel. Sector limits may also be omitted where they cross the fairway, eg:



P41.1

On 'multi-coloured' charts the fairway edges may be emphasized by the use of a yellow/orange line in addition to and inside of the black lines, eg:

P41.2.

Commentaire [c65] : DID: please insert multi-colour version

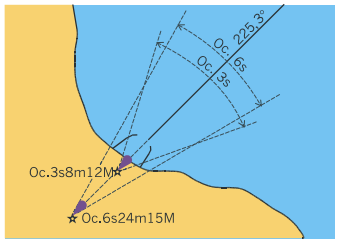
B-475.6 **Leading lights and lights in line.** For guidance on the portrayal of leading lines and associated legends, see B-433.

Supprimé : specifies the charting of leading lines and associated legends on the lines but does not cover the charting of arcs of visibility and legends specific to lights.

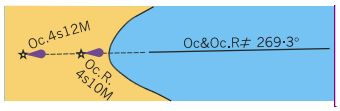
The 'in-line' symbol should not be used where only the bearing is shown on the transit.

Light flares should be oriented along the transit line for all leading lights or lights in line, unless the flare would thereby obscure the front light or other important detail. Where detail may otherwise be obscured, the flare should be orientated as close as possible to the transit line.

Where a chart shows lights with a leading line it will be assumed by the mariner that the lights are, to some extent, special purpose ones and not necessarily all-round lights; therefore it is not necessary to show the arcs of visibility unless there is a good reason for doing so (eg: the light has other sectors which are not visible on the leading line, the leading sectors are much wider than the actual lead). Where it is required to show the arcs of visibility, the legends on the sector arcs must repeat as much of the light description as necessary (including, possibly, the names of the lights), see B-475.2. Relatively uninformative legends such as 'Arc of visibility' must be avoided if possible.



P20.1



P20.2

Commentaire [c66] : NO & AU asks whether there is a reason to put the rear mark first. UKHO has a convention to give the rear mark first, NO the opposite. Do you apply a convention and is there any reason to choose one or the other?

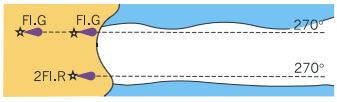
In the examples above, the cartographer will determine how much of the light details will be shown on the arc, on the lead and at the light star. It should not usually be necessary to duplicate the information, see B-433.2.

If the scale is too small to show both light stars, a light star should be shown in the mean of the two positions, with the description linked by '&', eg: Oc.W&R. Where the representation may leave the mariner in doubt whether a light is a leading light (eg if the scale is too small to show the leading line), the **international abbreviation 'Ldg'** must precede the light description, eg:

Commentaire [c67] : Guidance requested by AU.

P20.3 (on small-scale charts)

Lights in line marking a danger or a limit may be charted similarly except that the abbreviation 'Ldg' must not be used, and the transit (or clearing) line must be dashed throughout, eg:



P21

For leading lights and lights in line which are off chart limits, see B-470.8.

B-475.7 **Direction lights** of several types are in use but all have in common a very narrow sector intended to mark a direction to be followed. The narrow sector may be flanked by:

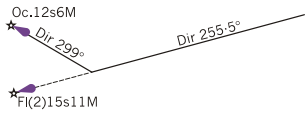
Supprimé : (a) darkness or unintensified light, or (b) sectors of different colour or character.

a. Unlit sectors or unintensified light. The centre line of the sector must be charted 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:

Supprimé : Darkness

Supprimé : central

P30.1



P30.2

The abbreviation 'Dir' should only be used in the light description at the position of the light if the course line cannot be charted.

Supprimé : only

b. Sectors of different colour or character. Some directional lights are so precise that a complete colour change at a sector boundary occurs over an angle of less than 1 minute (0.02°). This corresponds to a lateral distance of just 1 metre at a viewing distance of 3.5 km. In addition the intensity may be maintained right to the edge of the beam, and does not reduce the further the observer is away from the axis. The sector limits and arcs must be charted, if possible, in the same way as a sectored light (see B-475.1). However, 'Dir' may be inserted at the beginning of the light description, where appropriate, to inform the navigator that the fairway sector has a particularly precise 'cut-off' or very small angle of uncertainty (unlike the average fairway sector), eg:

Supprimé : This type of

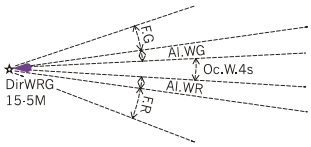
Supprimé :

Supprimé : is

Supprimé : also known as a Port Entry Light (PEL). PEL sector lights are

Supprimé : in most models

Supprimé : is



P30.3

Commentaire [c68] : DID: please insert additional coloured version, as example in French INT 1, but include abbreviations on arcs, against P30.4, and without flare.

P30.4

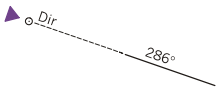
In the example shown, the light oscillates from side to side, so that between the fixed colour sectors, there is a narrow sector of alternating colour.

In addition to the sectors, the centre line of the leading sector may be charted 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.

Commentaire [c69] : AU propose this additional option on request of port authorities.

B-475.8 **A moiré effect mark (or variable arrow mark)** is a short-range (normally up to 2 km) type of direction 'light'. Sodium lighting gives a yellow background to a screen (up to 3 m square) on which a vertical black line will be seen by an observer on the centreline, or variable arrow marks when course alteration is needed. The system can be used by day and night. It can also be used as a stop line (seen abeam) for vessels berthing along quays; it should not normally be charted when used for this function (except on very large-scale berthing plans).

The symbol must be a small black position circle with a magenta triangle (all sides of 2.5 mm) pointing in the direction which the mark faces, with the abbreviation 'Dir' (in black), eg:



P31

The triangle is charted instead of a conventional light flare. On multi-coloured charts, it should be in the appropriate colour for the light.

B-476 AERONAUTICAL AND AIR OBSTRUCTION LIGHTS

B-476.1 **Aeronautical (Aero) lights,** established for aeronautical navigation, may be of higher power than marine lights and visible from well offshore. Where this is known or thought likely to be the case, their characteristics should be charted (with light star and flare), eg:

P60

The **international abbreviation** 'Aero' is a warning that they could be altered or extinguished without notification to mariners.

B-476.2 **Air obstruction lights** marking such features as radio towers and chimneys may, if likely to be visible from seaward, be charted (without light star or flare) by the appropriate **international abbreviations**, in brackets, against the structure, eg:

P61.2

B-477 FOG DETECTOR LIGHTS

Fog detector lights may be fitted to the structure of a major light or may be established some distance from the light. Their purpose is to detect fog automatically and to switch on fog signals. There are a variety of types in use, some only visible over a narrow arc; in some cases they are liable to alteration without notice. For these reasons their characteristics should not usually be charted. However, as they may be powerful lights and, in some cases, sweep back and forth so that they could be mistaken for signals, the **international abbreviation** 'Fog Det Lt' should be inserted where appropriate on at least the larger scale charts.

P62

If not at the same position as a charted light, a small position circle, B22, should be used.

Supprimé : prefixed by the **international abbreviation**

Supprimé : The cautionary note to that effect is given in the preface to LL. Eg:¶
¶
AeroAl.Fl.WG.7,5s11M **P60**¶

Supprimé : in one of two ways:¶
¶
a. If of high intensity their characteristics should be charted in the same way as aeronautical navigation lights, ie they should be prefixed 'Aero', eg:¶
¶
AeroF.R.353m11M
RADIO MAST (353) **P61.1**¶
¶
b. If of low intensity they should be charted

Supprimé : descriptive legend, preferably in

Supprimé : eg R Lts

Supprimé : it is recommended that

Supprimé : it is recommended that

B-478 VARIOUS SPECIAL FORMS OF LIGHTING

B-478.1 Not currently used

B-478.2 **Floodlighting** of a structure (eg a pier, pier-head lighthouse) or a danger close to navigable water, should be indicated by the symbol:

 or **P63**

The symbol must be in magenta, or yellow/orange on 'multi-coloured' charts. Alternatively it may be indicated by the legend '(illuminated)', the abbreviation '(illum)', or equivalent, against the structure or feature being lit, on the appropriate side if known.

Exceptionally on very large scale charts, if it is required to chart the actual floodlight, this should be by means of a small position circle and the legend 'Floodlight', or equivalent.

B-478.3 **Synchronized lights.** A group of lights, usually on buoys or beacons, which:

- all flash at the same time (synchronous),
- flash one after another in series (sequential),
- are a combination of the above,

are referred to as 'synchronized' lights. They often occur on lateral marks in a channel, or special marks marking an area or feature. Such lights may be linked as an 'aggregation' in ENC. Details of their type of synchronicity are best given in List of Lights and Fog Signals, Sailing Directions and/or a chart note. The **international abbreviation** '(sync)' may be added to the light description, eg:

P66

B-478.4 Not currently used

B-478.5 **A strip light** has a linear form, usually horizontal, which can reach a length of several metres. This type of light may be used, eg on heads of piers, along quay walls, at the corners of quays, on dolphins, replacing or in addition to a painted strip. Occasionally they are disposed vertically to enable bearings to be taken from them; in such cases, the legend '(vert)' should be included in the light description. A strip light may have a rhythmic character and may be coloured. The light-description should be in conventional form.

The symbol for a strip light must be a small black position circle with a serrated (zig-zag) line in magenta, or the appropriate colour on 'multi-coloured' charts, instead of the conventional flare, eg:

P64

Supprimé : A bearing light is one which enables its approximate bearing to be obtained without the use of a compass. Various systems can be employed, but all involve multiplying the interval of time between two specified flashes from two separate optical systems in the same light structure by a given factor, to give the bearing or its reciprocal.¶
¶
It is recommended that the light is charted with standard characteristics and is not identified on the chart in any special way.

Supprimé : either

Commentaire [c70] : DID, please insert additional yellow version of the symbol.

Commentaire [c71] : Can we adopt 'illum' as an INT abbreviation (and thereby remove the full word option? French, Spanish and English words all begin with 'illum'.

Supprimé : or

Supprimé : The symbol should be in magenta, but may be in yellow/orange on 'multi-coloured' charts.

Supprimé : For light structures as daymarks, see B-457.¶

Supprimé : s (bordures lumineuses). These are found mainly in French waters. A "bordure lumineuse" is described

Supprimé : is a light whose source

Supprimé : and normal light-description in abbreviated form,

Page 36: [1] Commentaire [c42] **colemana** **31/01/2008 18:05:00**

This principle was agreed by CSPCWG for wind turbines (see B445.8) and that it would be made more general when B470 was reviewed. It is a question of which is more important, the daymark or the light, with the draft priciple that both are shown by symbol (eg flare + water tower symbol) without reliance on text. The same applies to buoys; we show a symbol + flare, not a star + *BUOY*. It will need an entry in INT1; we suggest P7 (as the issue is the structure rather than being a special light).

Page 36: [2] Commentaire [c44] **colemana** **31/01/2008 18:05:00**

Added because this is the convention, but we ask why not use light stars and flares? Please consider in advance of reviewing section B490.