



## CHART STANDARDIZATION & PAPER CHART WORKING GROUP (CSPCWG)

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

Chairman: Peter JONES  
Secretary: Andrew HEATH-COLEMAN

UK Hydrographic Office  
Admiralty Way, Taunton, Somerset  
TA1 2DN, United Kingdom

### CSPCWG Circular Letter: 11/2004

UKHO ref: HA317/010/031-02 & HA405/005/023-01

Telephone:  
(Chairman) +44 (0)1823 723343  
(Secretary) +44 (0) 1823 337900 x 3656  
Facsimile: +44 (0)1823 325823  
E-mail: peter.jones@ukho.gov.uk  
andrew.coleman@ukho.gov.uk

To CSPCWG Members

Date 20 May 2004

Dear Colleagues,

### **Subject: New symbols for wind and current turbines (further to CL 02/2004)**

We received 11 responses from CSPCWG members to Circular Letter 02/2004, and a response from the Chairman of C&SMWG. Thank you all for your helpful comments. Most of you will have seen the various emails, so I will not restate them here. All have been considered in devising revised specifications, which are attached at Annex. I will limit myself to commenting on the most significant changes from the original draft.

1. There was little support for the side elevation (perspective) symbol (a). Most of you preferred a front elevation symbol, similar to (b), but with various suggestions for minor changes. Several of you pointed out the similarity to the existing S-52 symbol (WIMCON11) and there seems no reason to invent a new symbol. The draft specification therefore utilizes this symbol, reduced to 4mm high as appropriate for use on a paper chart.
2. Most of you agreed with the proposed location for the symbols at E26.2, L5.1 and L24 in INT 1. However, the question arises whether there is any value in retaining the existing wind motor symbol at E26, as it is doubtful whether such a small feature would ever be a useful navigational mark. If, rarely, one was prominent, then the new wind turbine symbol could be used (as in S-52).
3. Wind turbines have been included in specification M-4 B-374.6, rather than allocating a new number after flagstaff (B-374.7). Introducing such a separation might be confusing, particularly as they will be part of the same INT 1 entry as wind motor (if the existing wind motor symbol is retained).
4. Those that commented suggested that a light flare from the base (with no light star) is the appropriate way to show that the structure carries a navigational light, so an example has been included. This is on the basis that the structure is not principally for navigation, a point of view that will help us when we review the lights section in B-400. An example with a minimum clearance height under the blades has also been added, as navigation through wind farms is sometimes permitted.

5. Australia commented on the need for consistency in using hyphens, and also on the authority for the definitions. Consequently, we have come to the following conclusions:
  - In the revised specification hyphens have been omitted, in accordance with usage in the Oxford Dictionary of English (2003 edition).
  - In the dictionary, Windmill is all one word but Wind turbines and Wind farms are two separate words.
  - Wind motor is not in the dictionary but it is assumed that it should be amended to two words, if we decide to retain it. However, it seems that this term is questionable as it has no authority, and is actually inaccurate as the feature is not a motor.
  - Some elements of this dictionary's definitions have been used, although its definition of a wind turbine really describes what we mean by a wind motor. The draft definitions have been amended to apply to the present development of wind turbines and wind farms, so these definitions (suitable for use with nautical publications) will be a product of CSPCWG, when agreed. At that time, the agreed definitions could be added to the Hydrographic Dictionary S-32.
  - "Multi-bladed" has been used to avoid the description becoming out-of-date if technology moves on, a point well made by USA (NOAA).
  - As suggested, "modern" has been deleted from the definitions.
6. We have tried to give a definition or explanation of the feature before the symbol, with any further notes about its use following the symbol, and to avoid duplication.
7. Australia's suggestion to re-title B-445 as "Offshore Production Facilities" seems sensible.
8. Wind farms have been given a separate specification, with the S-52 symbol WNDFRM61 used to ensure that the centered symbol is not confused with an actual wind turbine.
9. Some examples of underwater turbines have been included, with swept and estimated clearance depth symbology and blue tint, and also examples where part of the structure is marked by an above water structure. For those completely below water, treated as an obstruction, the legend "Turbine" is sufficient, as the symbol demonstrates adequately that it is underwater.
10. A separate specification for a "Current farm" (or "Turbine field") has been included, to be consistent with the treatment of wind farms. "Current farm" seems to be a term consistent with Wind farm, but the only example brought to our attention was termed "Turbine field" by its owners; at least it also has an "agricultural sound".

**I would be grateful to receive your comments on the revised draft by 16 June 2004**, in accordance with our working procedures (CSPCWG CL 02/2003 refers). I would particularly welcome comment on whether the wind motor symbol and definition can be removed; if so, in INT 1 the land-based wind turbine would be IE26, with the old symbol being shown as obsolescent. This would simplify the numbering in both INT 1 and M-4.

Yours sincerely,



Peter G.B. Jones,  
Chairman

Annex A: Symbology for Wind and Current Turbines

(Please note that this annex has been formatted using the new format for M-4 which is under development, but not yet finalized.)

**Chart Specifications of the IHO  
Medium and Large-scale Charts****B-370**

(Page 1)

**B-374.6** **Wind motors** are comparatively small structures with a vaned wheel rotated by the wind to generate electricity. They are usually associated with a small isolated community for which they provide power. They shall be shown by the symbol:

 IE 26.1

**Wind turbines** are generally tall, multi-bladed structures, usually with two or three blades, often visible over long distances. Their purpose is to generate electricity for large communities, or to feed a national grid. They are often in groups (known as wind farms) and may be sited off-shore (see B-445.8-9). Individual wind turbines shall be shown by the symbol:

 IE 26.2

On-shore wind turbines are charted as landmarks. It is therefore preferable to chart the individual turbines in their actual positions. However, where scale or available information does not permit this, an on-shore wind farm may be shown by the same symbol as used for an off-shore wind farm (see B-445.9).

**B-445 OFFSHORE PRODUCTION FACILITIES** [Revised title for sub-section]

**B-445.8** **Wind turbines** are generally tall, multi-bladed structures, often visible over long distances. Their purpose is to generate electricity for large communities, or to feed a national grid. They are often in groups (known as wind farms) and may be sited on-shore (see B-374.6). Individual wind turbines shall be shown by the symbol:



If a navigational light is attached to the wind turbine, a flare should be added to the base, and the light description placed alongside. Where vessels may navigate close to the structure, it is appropriate to show the minimum clearance height under the blade, using symbol ID 20.

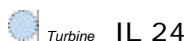
**B-445.9** **Wind farms** may be shown by groups of wind turbines in their actual positions (if scale and available information permits), or by a maritime limit with the centred symbol:



The symbol IN 1.1 (black maritime limit implying permanent physical obstructions) should normally be used for the limit of a wind farm. However, this may be replaced by IN 2.1 or 2.2 as appropriate, where restrictions on navigation apply.

Note: Individual wind turbines which have navigational lights attached should normally be charted, even within a wind farm, if scale permits.

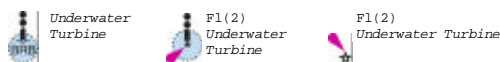
**B-445.10** **Underwater turbines**, for generating electricity from tidal currents, shall be represented:



Where the depth of water over the turbine is known, it may be inserted within the danger circle. The rules for blue tint, swept and safe clearance depths shall be applied as for wrecks and other obstructions. (see B-415 and 422). Examples:



Where part of the structure is above water, and marked (e.g. with a beacon or light), the appropriate symbol should be used, with the legend 'Underwater Turbine'. Examples:



- B-445.11 Current Farm (or Turbine Field)** Where groups of underwater turbines exist they should preferably be charted individually. However, where scale or available information does not permit this, then the symbol IN 1.1 (black maritime limit implying permanent physical obstructions) should normally be used for the limit of a current farm. However, this may be replaced by IN 2.1 or 2.2 as appropriate, where restrictions on navigation apply. A legend should be inserted within the boundary. Examples:

