

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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To CSPCWG Members

Date 2 February 2004

Dear Colleagues,

Subject: New symbols for wind and current turbines

Item D.4 of the CSPCWG Work plan requires us to consider proposals for various new symbols, submitted by Denmark to CHRIS15 (CHRIS15-5.6A refers). This Circular letter considers the symbology for wind turbines, and also for current turbines which are now being established in some waters.

The Danish submission repeats one which was originally made to CSC in 1999. CSC responded with a “holding” letter promising further consideration and reports on progress. CSC planned to address all such proposals for new symbology at the same time as revising the relevant section of M-4. However, the relevant sections of M-4 have not yet been revised (and in the case of land based wind turbines, which falls in section 300, is unlikely to be revised for some time). Consequently, CSC’s good intentions have not been realised.

Denmark’s new submission to CHRIS provides the opportunity to consider turbine symbols now. A different symbol for a wind turbine, originally proposed by Netherlands and Belgium in 1987, has been included in the discussion paper at Annex A, which also includes draft new specifications.

I would be grateful if you would indicate which of the two proposed wind turbine symbols should be accepted as the international symbol for a wind turbine, and whether you agree with the proposed symbology for underwater turbines. Please also comment on the suggested locations in INT 1 and M-4. **I would be grateful to receive your comments by 29 March 2004**, in accordance with CSPCWG CL 02/2003.

Yours sincerely,

Peter G.B. Jones,
Chairman

Annex A: Symbology For Wind and Current Turbines

SYMBOLGY FOR WIND & CURRENT TURBINES

The physical size and appearance of modern structures designed to harness wind power have raised a question over the continued appropriateness of the existing symbol (IE26) for a wind-motor. In 1987, The Netherlands proposed a new symbol to the CSC. A CSC CL was drafted but, because the CSC secretariat was unstaffed at the time, it was never circulated. Netherlands, Belgium and UK (and perhaps others) have subsequently used the proposed symbol. (UK initially only used the symbol on UK/NL co-published charts, but has also now adopted the symbol for wider use on their charts).

Subsequently, in 1999, Denmark proposed a different symbol, which is similar to, but not the same, as a wind-motor in S-52. CSC agreed to consider it, but left the consideration until the revision of M-4 section 300 (which has not yet been progressed). This symbol is also now in use on Danish and other national charts. The two proposed symbols are shown below. The actual symbol height would be about 5mm.

**Chairman's Comments**

The two proposed symbols, which both more closely represent modern wind-turbines than existing IE 26, are shown above. Both are already in use on some HO's charts, including INT charts. The delay in discussing these proposals by CSC is regretted, and demonstrates that it is best to progress proposals for new symbols as quickly as possible, rather than waiting for the relevant section of M-4 to be revised. Nevertheless, in the interests of chart standardization, only one of the proposed symbols should be selected as the International symbol.

When sited off-shore, some of the wind-turbines, especially at the periphery of wind farms (which is the appropriate English term for groups of these structures), may carry navigational lights. I do not consider it necessary to specify at revised spec 374.6 how such a light should be shown. At present, M-4 offers no guidance on combining landmark symbols with navigational lights, except for lighted beacons and beacon towers (IP 3 and 4). Some HOs add a flare to the position circle of the landmark (as IP3), others convert the position circle to a small light star (as IP4), in addition to the flare. Both methods would be easily understood by the chart user, have already been used for other types of landmarks, and with the proposed symbols. It is similar to the option to use a star or a dot for a light detailed in INT Spec 470.5, which may need to be clarified when the lights section of M-4 is revised, to explain the method of combining other marks with navigational marks.

It would seem appropriate to add whichever symbol is chosen to existing IE26 as a landmark. The windmotor would be IE26.1, the wind turbine IE26.2. However, as it will often be located off-shore, it should also be shown in the Offshore Installations section IL, I suggest numbered IL5 in the general section.

Within UK waters, and probably elsewhere, underwater turbines are being installed which use tidal

currents to generate electricity. I suggest these should be shown in a similar way to obstructions (IK40) and wells (IL20), with the legend *Turbine* and depth if known. The next available number in INT 1 is IL24 (unless other symbols for underwater installations are outstanding; perhaps Germany would advise if so).

Sometimes, although the turbine may be underwater, the structure may be partly above water and be marked with a beacon or light. In such cases, the appropriate beacon or light symbol would be used, with descriptors including the legend "Turbine", or similar.

Within M-4, part of Specification 374 will need to be amended to provide guidance on the use of the symbols and a reference added within section 400. I suggest sub-section 445 should be expanded to: "OIL AND GAS-FIELDS; ELECTRICITY GENERATION" and details of wind turbines and underwater turbine be given there.

Proposed Amendments to IHO Specifications

B-374.6 A wind-motor shall be represented:

[existing symbol] IE 26.1

Wind-motors are comparatively small, multi-bladed structures, usually for the purpose of generating electricity for a single building or small community.

A **wind-turbine** (modern structure for generating electricity from wind power) shall be represented:

[new symbol] IE 26.2


Wind-turbines are generally tall structures, usually with three blades, often visible over long distances. They are often in groups (known as wind farms) and may be sited off-shore (see B-445.8).

B-445.8 A wind-turbine (modern structure for generating electricity from wind power) shall be represented:

[new symbol] IL 5

Wind-turbines are generally tall structures, usually with three blades, often visible over long distances. They are often in groups (known as wind farms) and may be sited off-shore (see also B-374.6 for landmarks).

B-445.9 An underwater turbine (for generating electricity from tidal currents) shall be represented:

 *Turbine* IL 24

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).

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 associated legend "Turbine".