**B-445.4** **Offshore tanker loading systems.** Although the oil and gas from some fields are sent ashore by submarine pipeline (see B-444) a variety of forms of 'super buoy' or buoyant towers for loading tankers is used at other fields, or in addition to pipelines.

Very large tanker loading buoys shall be shown:


**L 16**

They will always be lighted and the light character shall be charted in the same way as for other major floating lights.

Articulated towers, referred to in B-445.2 shall be shown:

**L 12**

and treated generally as if they were production platforms. However, on charts on which it is useful to identify the functions of the towers or buoys, it is proposed to use the abbreviation 'SPM' (for 'single point mooring') as very widely used in maritime documents at present.

**B-445.5** **Submerged production systems.** In relatively deep water it may be economically preferable for a **production** wellhead to be a seabed installation only, eliminating the need for a permanent production platform. Such installations are normally of no concern to surface navigation but it is obviously essential that they should be adequately charted. In the oil industry, they are known as 'subsea completions'.

It is recommended that on scales of 1:150 000 or smaller, they should be charted in the same way as suspended wellheads (see B-445.1); they will normally be distinguishable from the latter by the charted pipelines leading to them. On larger scales, the international abbreviation 'Prod. Well' shall be used instead of 'Well'.

**L 20**

**B-445.6** **Flares.** As with refineries on land (see B-374.1), offshore terminals may burn off gas from production platforms or from 'flare stacks' set up as separate structures a short distance from the production platforms. In the latter case the stacks shall be charted by:



**L 11**

with the international abbreviation 'Fla', but without a coloured light flare (patch).

**B-445.7** **Above-water wellheads** are found in some shallow offshore fields, where the complex of pipes and valves (known as a 'christmas tree') capping a well may be visible as a 'dry tree'.

Where lit, a 'dry tree' shall be charted by a light star and light description. Where unlit, it shall be charted by a small position circle and the international term 'Pipe'.

**L 23**

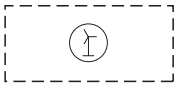
**B-445.8** **Wind turbines** are generally tall, multi-bladed structures, usually with two or three blades, often visible over long distances. Their purpose is to generate electricity for large communities, or to feed a national grid. They are often in groups (known as wind farms) and may be sited on-shore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

**L 5.1**

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 D 20.

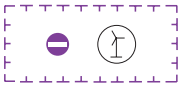
**B-445.9** **Wind farms** may be shown by groups of wind turbines in their actual positions (if scale and available information permits), or by a maritime limit with the centred symbol:

The symbol N 1.1 (black maritime limit implying permanent physical obstructions) should normally be used for the limit of a wind farm:



**L 5.2**

However, this should be replaced by N 2.1 or 2.2 as appropriate, where restrictions on navigation apply, eg:



**L 5.2**

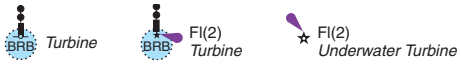
Note: Individual wind turbines which have navigational lights attached should normally be charted, even within a wind farm, if scale permits.

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

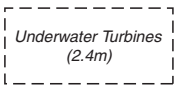

**L 24**

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 must be applied as for wrecks and other obstructions (see B-415 and 422), eg:


Where part of the structure is above water, and marked (eg with a beacon or light), the appropriate symbols must be used. On small scale charts, where it may not be practicable to show the danger circle, the legend '*Underwater Turbine*' should be used, eg:




**B-445.11** **Current Farm (or Turbine Field).** Where groups of underwater turbines exist they should preferably be charted individually. Where scale or available information does not permit this, then the symbol N 1.1 (black maritime limit implying permanent physical obstructions) should normally be used for the limit of a current farm. A legend should be inserted within the boundary:




However, this should be replaced by N 2.1 or 2.2 as appropriate, where restrictions on navigation apply, eg: