



UK Hydrographic
Office

New Symbols for Renewable Energy Devices

S-101PT12_6.7

15th Jan 2024



Background

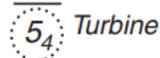
- A wide variety of renewable energy devices are being developed and tested, these take many forms and may be removed and relocated from time to time
- S-4 describes areas at B-445.10-12 covers the use of textual legends for Turbines (L24) Current farms (where individual devices are shown as an area) and symbol L6 for wave or solar farms



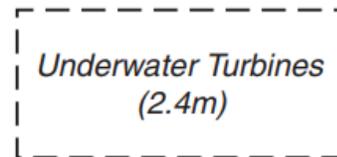
Turbine



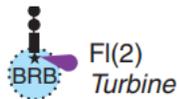
Turbine



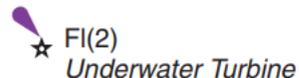
Turbine



Turbine



FI(2)
Turbine



FI(2)
Underwater Turbine



L6

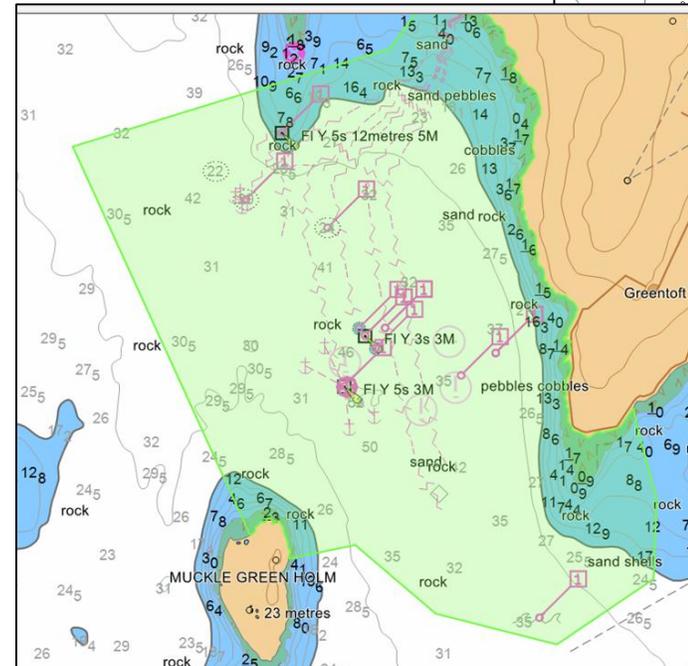
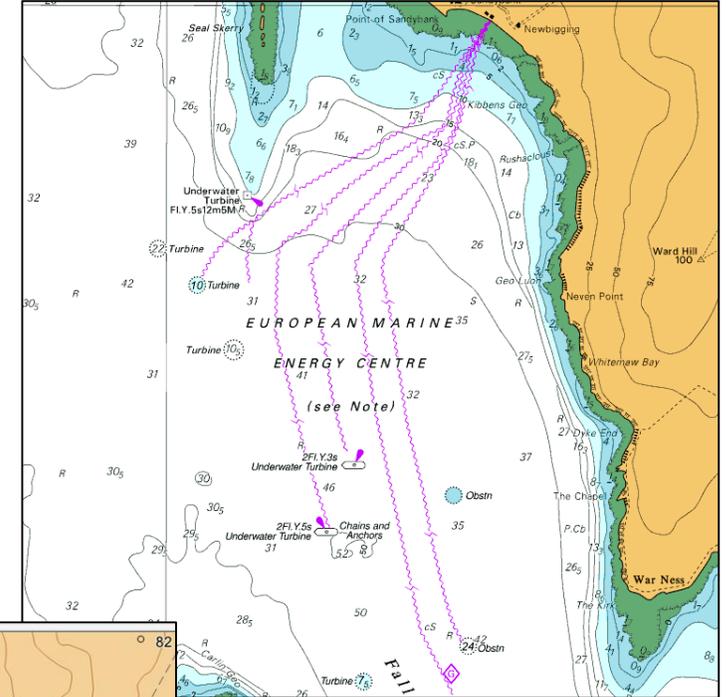


Current Encoding (S-57)

The EMEC* Test Site is currently captured in S-57 ENC using;

1. Caution Area (CTNARE) to describe the area of the site
2. Obstruction (OBSTRN) for underwater devices
3. Offshore Platform (OFSPLF) for surface devices category of offshore platform = CATOFP 8 FPSO

*European Marine Energy Centre





S-101 Data Model Enhancements

When S-57 was developed such devices were not generally in existence S-101 presents an opportunity to address this.

On the Obstruction feature the following values of Category of Obstruction have been added in S-101;

12 wave energy device

20 underwater turbine

On the Offshore Production Area feature the new attribute Category includes the values;

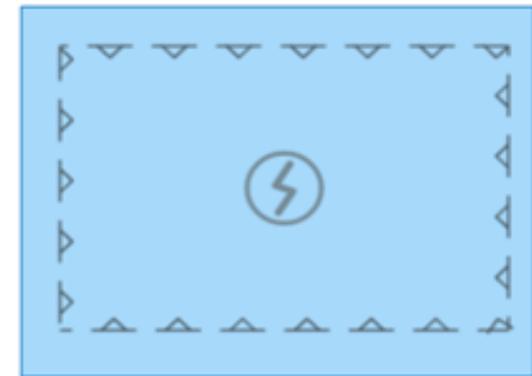
1 wind farm

2 wave farm

3 current farm

6 solar farm

```
-- set the symbol
if feature.PrimitiveType == PrimitiveType.Surface then
  if contains (COPA, {2,3,6}) then          -- Wave, Current, or Solar Farm
    symbol = 'RENERG51'
  elseif COPA == 1 then                    -- Wind Farm
    symbol = 'WINDFRM52'
  elseif COPA == 4 then
    symbol = 'TNKFRM'
end
```



area

However only Offshore Production area has had a new symbol Assigned based on S-4 L6 (values 2-3-6)

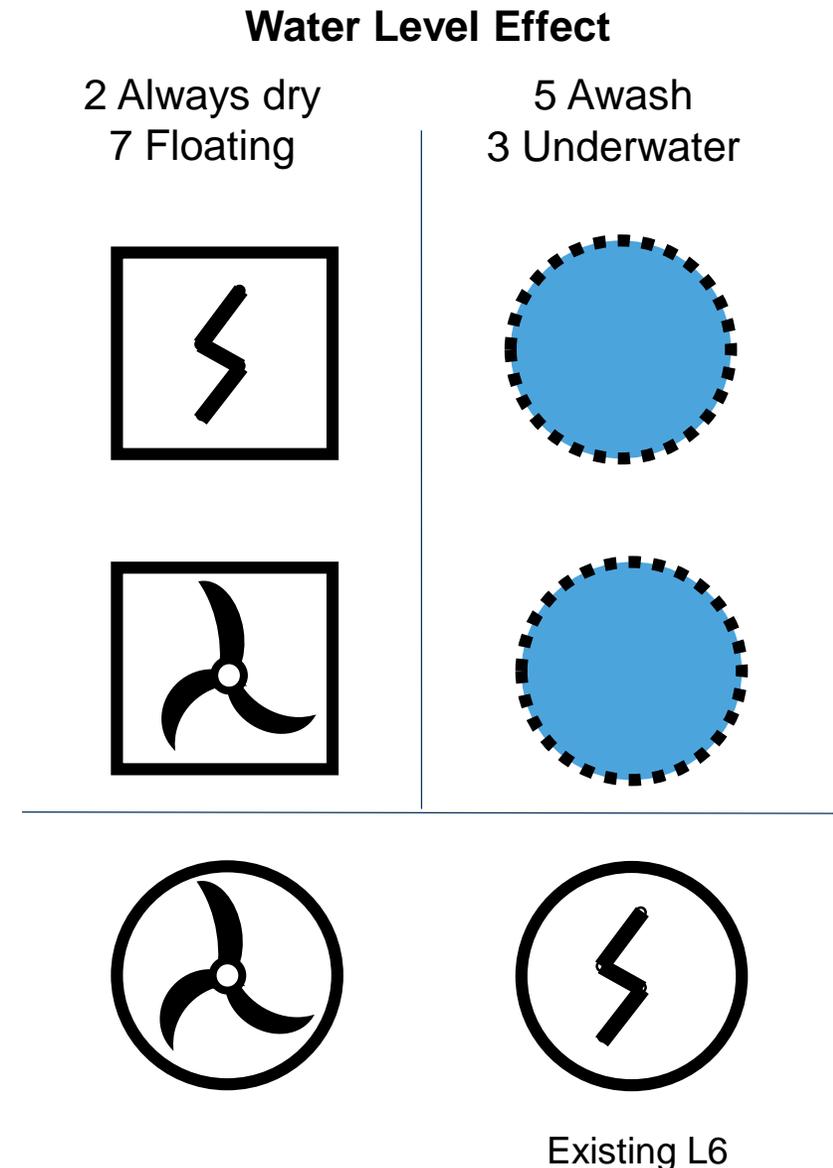


Data Model Comments

- Reviewing his with colleagues from the UK Maritime and Coastguard Agency identified the following suggestion to amend;
- Category of Offshore Production Area
- Value 3 Current farm to Tidal farm noting that the definition is as follows
- A collection of collocated devices which harness tidal energy and are organized as a single power generation unit.
- This change impacts the S-101 Feature Catalogue but wider impacts on Portrayal and software tools should be limited.

Items to Consider

- Adopting new symbols for category of obstruction 12 wave energy device (point)
- Adopting new symbols for category of obstruction 20 underwater turbine (point)
- The white symbol is for always dry features the blue is for underwater features and is based on the existing Obstruction symbol
- Two further symbols are derived from these to be used as centred symbols for area obstructions; one is the existing L6 symbol
- These symbols are mock ups for discussion at this stage, symbols have been created using the Symbol Editor but require review





Further Questions

- One observed limitation of the symbology for submerged or awash devices is that other than the Offshore Production Area nothing visually distinguishes these from static dangers such as wrecks
- Further discussion about the degree to which these devices cause turbulence that would affect vessels close to them is underway, one option would be a textual legend to follow S-4 but the potential for clutter would be a factor
- The UK considers that this could be discussed and addressed as the symbols are refined



Recommendations

1. Consider amending Current Farm to Tidal Farm in S-101 2.0.0
2. S-101 PT to consider the adoption of two new symbols for wave energy devices (for S-101 2.0.0)
3. S-101 PT to consider the adoption of two new symbols for underwater turbines (for S-101 2.0.0)
4. If approved, Portrayal SG to prepare changes to Portrayal Catalogue and NCWG to be informed to consider S-4 impact
5. If approved, make the ENCWG aware and request they consider the need for encoding guidance for S-57 ENCs (UOC impact)



Potential UOC Impact

- 11.7.4 (OSPARE) already describes specific values in INFORM for Wave and Current Farms S-65 Annex B should reflect
- At 6.2.2 the UOC should include similar guidance on consistent use of INFORM which similarly should be reflected in S-65 Annex B



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Questions

