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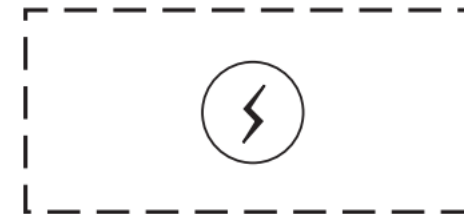
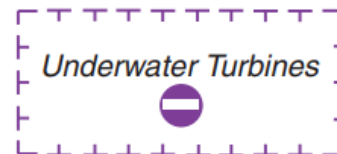
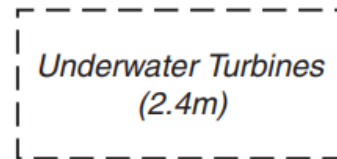
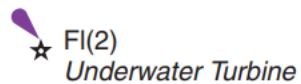
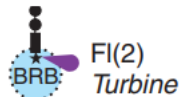
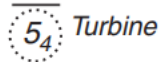
S-100 Implementation and Validation NCWG 10-10.1

18th Oct 2024



Background

- › A wide variety of renewable energy devices are being developed and tested, these devices take many different 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



L6



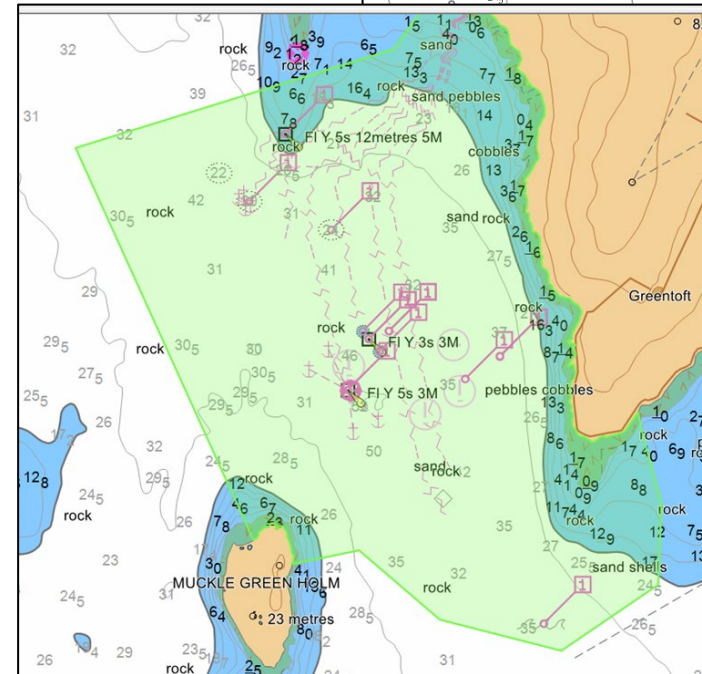
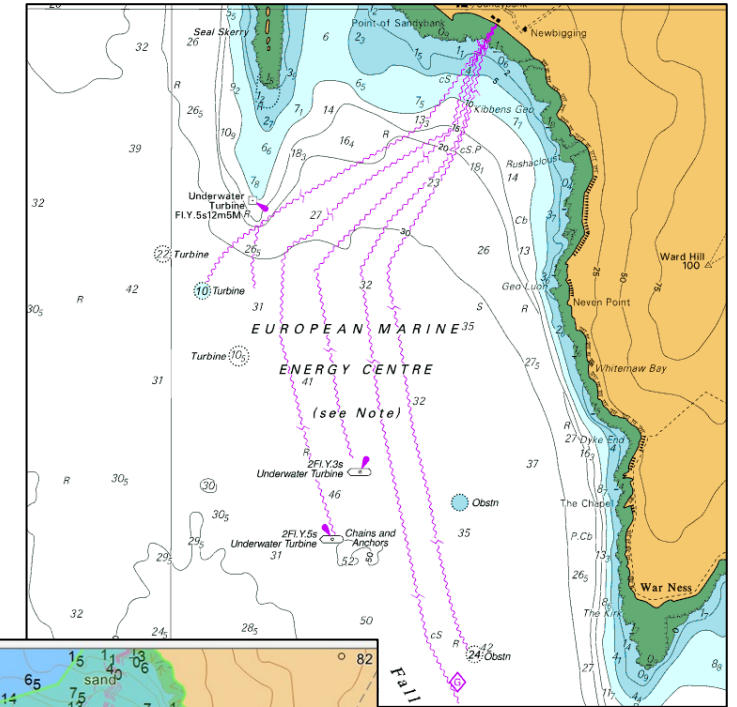
Context

- › This proposal was discussed at the S-101PT12 meeting in February 2024, S-101PT12 concluded (Decision @6.7) that NCWG should consider the need for new symbols before action in S-101
- › These slides are therefore ENC and S-101 centric, but the recommendations cover action for S-4 and S-101. No action is proposed for S-52 or within S-52:100 at this time



Current encoding (S-57 ENC)

- › 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





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 of Offshore Production Area includes the values;

1 wind farm

2 wave farm

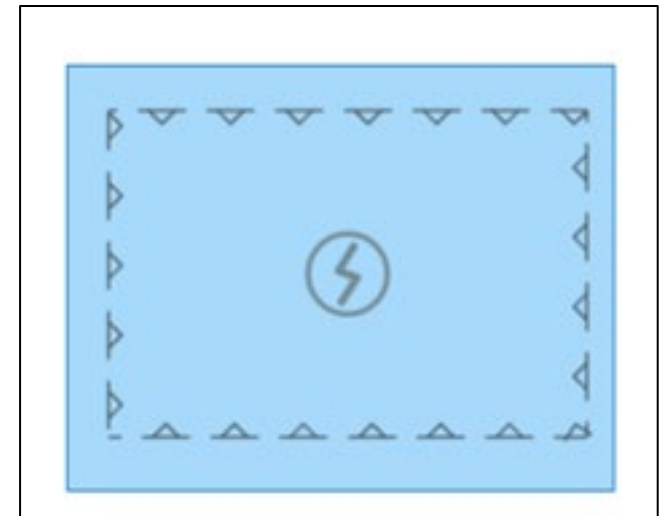
3 current farm

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
end
```

However, only Offshore Production area has had a new symbol

Assigned based on S-4 L6 (values 2-3-6)



Water Level Effect

2 Always dry
7 Floating

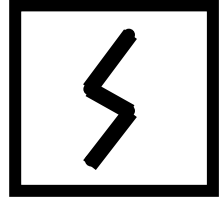
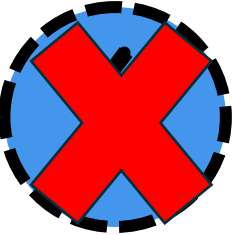
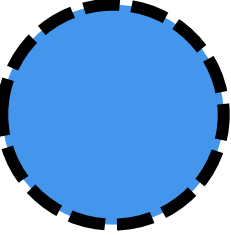
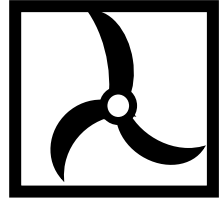
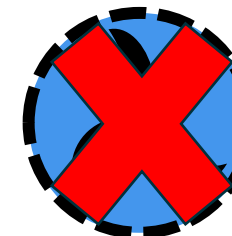
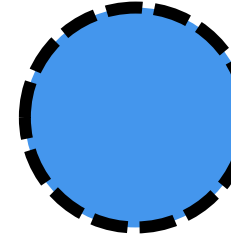
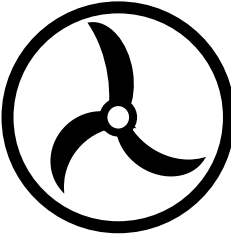
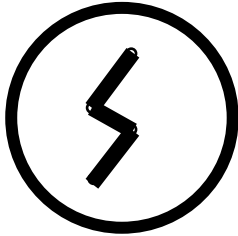
5 Awash
3 Underwater

Considered

Proposed

Items to consider

- › Adopting new symbol for category of obstruction 12 wave energy device (point)
- › Adopting new symbol for category of obstruction 20 underwater turbine (point)
- › Propose that existing symbols continue to be used for underwater and awash features noting associated conditional symbology in S-101 may result in isolated danger symbol
- › One additional symbol is proposed to be used with areas of underwater turbines this is similar to L6 but reflects new symbol B

<p>A</p> 		
<p>B</p> 		
<p>C</p> 	 <p>Existing</p>	

These symbols are mock ups for discussion at this stage, the designs seek to use existing symbols to some extent but for turbine add shapes that clearly indicate the device without reference to pick reports or the use of textual legends



Recommendations

1. NCWG to consider the adoption of one new symbol for wave energy devices (for S-4) (Slide 6 A)
2. NCWG to consider the adoption of two new symbols for underwater turbines (for S-4) (Slide 6 B and C)
3. If approved, S-101 to consider inclusion in S-101 post edition 2.0.0 (S-101PT)
4. If approved, consequential action may need to be considered by ENCWG for S-65 Annex B to support automated conversion of such features, consequentially the UOC may also be amended to reflect S-65 Annex B (ENCWG)



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ADMIRALTY

Thank you

