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Agenda item [[2]](#footnote-2) (from agenda) 3

Workplan Task Number / Technical Domain 2 IALA Recommendation O-139 Marking on

The Marking of Man-Made Offshore Structures

Working Group WG …………………………

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Revision of IALA-Recommendation O-139 on The Marking of Man-Made Offshore Structures

# Summary

Many wind farms have been marked according to IALA Recommendation O-139. However, the requirement of a 15 metres high painting has been detected as a severe obstacle for the profitable efficiency of Offshore Wind Energy. The industry is asking for alternative markings.

## Purpose of the document

The Committee is requested

* to consider whether the 15 metres high paintings is still necessary for the marking of a single wind turbine of an Offshore Wind Farm,
* to develop a new marking taking into account the maintenance of such a marking.

## Related documents

See Reference 6.

# Background

The IALA Recommendation O-139 is the basis for many Offshore Structures worldwide. The latest edition collected the recommendations on different offshore structures into a single document.

The German Federal Waterway and Shipping Administration uses the IALA-Recommendation O-139 (and the previous O-117) for more than 10 years to fix the specifications of Offshore Wind Farms in the German exclusive economic zone (EEZ) and territorial waters.

However a heated debate came up in Germany how to handle the 15 m high yellow painting on each wind turbine. This painting is very expensive and it is assumed that in cannot be repainted offshore at all. Therefore it is claimed that the 15 m high painting makes offshore windfarms economically inefficient. The discussion led to the conclusion that IALA-Recommendations O-139 and R0108 (surface colours) do not present the state of art marking of offshore wind turbines and therefore should not be used anymore.

# Discussion

The discussion in Germany about offshore wind turbines led to the following demands:

1. enlarge the recommended colour regions of R0108 or CIE 093.2-1983,
2. give up measuring colour and repainting,
3. remove the 15 m high yellow painting from O-139.

## 3.1 IALA Documents on Surface Colours used as Visual Signal on AtoN

IALA provides two documents on surface colours:

* Recommendation R0108
* Guideline G1134

The content of both comes from the former recommendation E-108.

The recommended IALA colour regions in R0108 are the same as in CIE Publication 039.2-1983 for Surface Colours for Visual Signalling. They are based on elaborate investigations and are in use for many applications in visual signalling for more than thirty years.

According to IALA guideline 1134, chapter 2.7 the regions themselves are extreme values which should not be transgressed. They are intended to apply throughout the entire service life.

In many cases it is often suitable to define even more restrictive limits. This can be done in order to harmonize the visual appearance of all daymarks in a certain region. A second aim is to get a very narrow specification for new colours far away from the limits of R0108. This may help to ensure that the degradation of pigments may not shift the colour outside the specified region of the IALA recommendation too soon.

As a result it should be avoided to make any changes to the IALA and CIE regions for surface colours for visual signalling.

## 3.2 Accept deterioration of surface colours

A solution which is proposed from windfarm industry is to apply 15 metres high painting when the structure is build. After that no further work is done to preserve the colour of the structure.

In this case the degradation of colour (in general fading towards white or grey) or the fouling (turns the surface into brown or black) should be accepted by the competent authority.

The proposal means that for a short time a yellow painting is required and for the rest of the lifetime of the structure it is not.

This is very inconsistent and directly leads to the question, why a 15 metres high yellow painting should be implemented at all.

According to the idea of the IALA recommendations every colour which is used for visual signalling on daymarks should fulfil the requirements throughout its entire service life (see IALA Guideline 1134).

## 3.3 IALA Documents on Man-Made Offshore Structures

IALA has provided several documents on the marking of Offshore Structures. The most important is Recommendation O-139. In the introduction, chapter 1 of O-139 we find:

The marking of offshore structures as defined in these recommendations may be considered as a minimum requirement to ensure the safety of navigation in the vicinity of the structures, however, National Authorities may require more stringent marking.

In chapter 2.3 Marking of Offshore Windfarms is stated for a single wind turbine (each structure of an Offshore Wind Farm):

The structures should be painted yellow all around from the level of HAT up to 15 metres.

Although alternative marking is mentioned in O-139 the reader can derive from recommendation O-139 that the 15 m high painting is obligatory and is considered as a minimum requirement.

The German Foundation Offshore Wind Energy (www.offshore-stiftung.de) has presented a paper which shows that national IALA members in Europe do not comply with the recommendation O-139 when approving Offshore Wind Farms.

Some members do not demand a yellow painting at all and some members do not ensure that the yellow painting fulfils the IALA Recommendations for surface colours.

As a consequence it must be stated that the 15 metres high painting is not an international accepted standard or convention for the marking of Man-Made Offshore Structures.

The German Foundation Offshore Wind Energy looked at the IALA Navguide 2014 as well. It interprets the content of chapter 6.4.3 in Navguide 2014 that the 15 metres high painting is for an isolated wind turbine only and is not applicable to the single wind turbine in a Wind Farm.

The content of the revised IALA Navguide 2018, chapter 6.4 has only a few words and does not contain detailed information on the marking of offshore structures. It only links to the Recommendation O-139.

# Conclusions

The 15 metres high painting of a single wind turbine in a wind farm affects the profitable efficiency of Offshore Wind Energy. Many IALA members do not claim that the painting is a suitable measure to mark an offshore windfarm

# Action requested of the Committee

The committee is requested to:

* investigate whether the 15 metres yellow painting is still necessary for the marking of a single wind turbine in an Offshore Windfarm,
* remove the demand for the painting from O-139, if it is found out not necessary,
* delevop a new marking,
* consider a painting or signs with smaller dimensions,
* consider a combination of small black and yellow elements for a new marking to improve contrast,
* consider to apply the marking only for the periphery.

# References

1. IALA Recommendation O-139 on The Marking of Man-Made Offshore-Structures
2. IALA Recommendation E-108 The Surface Colours used as Visual Signals on Marine Aids to Navigation(until December 2017)
3. IALA Recommendation R0108 The Surface Colours used as Visual Signals on Marine Aids to Navigation (since December 2017)
4. IALA Guideline G1134 Surface Colours used as Visual Signals on AtoN (since December 2017)
5. IALA Navguide 2014
6. IALA Navguide 2018

1. Input document number, to be assigned by the Committee Secretary [↑](#footnote-ref-1)
2. Input papers should be assigned to a work task as listed in the Committee work plan which is available in input papers. Leave open if uncertain but consider how the paper is to be processed if not relevant to a work task [↑](#footnote-ref-2)