Input paper: [[1]](#footnote-1) ARM14-3.2.1

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**□** ENAV **□** VTS **□** Information

Agenda item [[2]](#footnote-2) 3.2

Technical Domain / Task Number 2 ………………………………

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Proposal for revision of IALA guideline, the draft of the marking of Man-made structures, with a concrete amendment of 2-4-3 for the additional marking of Offshore Wind Farm (OWF) in operation

# Summary

Having considered the marking system as recommended in the current IALA guideline (the draft), a risk of collision with the existing Offshore Wind Farm (OWF) could be foreseeably anticipated with respective of misunderstanding the prevailing marking system. By contrastive analysis, a more practical solution is proposed to ARM committee for further reference.

## Purpose of the document

To amend the requirements and illustration figures as demonstrated in Article 2.4.3 of the IALA guideline of the marking of offshore man-made structures.

## Related documents

IALA Guideline - THE MARKING OF OFFSHORE MAN-MADE STRUCTURES

IALA Recommendation, R-0139 THE MARKING OF MAN-MADE STRUCTURES

# Background

In the meeting of ARM13, the O-139 was modified and subsequently divided into two parts, the marking of offshore man-made structures and the marking of breakwaters. One recommendation was also thereafter proposed as R-0139 for the marking of man-made structures.

The description about the Offshore Wind Farms (OWF) as depicted in the guideline is cited as follows:

*2.4.3 MARKING OF GROUP OF STRUCTURES (OFFSHORE WIND FARMS)*

*A Significant Peripheral Structure (SPS) will include the structures on the corners and other structures on the periphery of the OWF. It is recommended that:*

1. *These lights display a Special Mark characteristic, flashing yellow, with a minimal nominal range of 5 Nautical miles;*
2. *The Competent Authority (AtoN) may consider the synchronisation of all SPS;*
3. *In the case of a large or extended OWF, the distance between SPS should not normally exceed 3 Nautical miles.*

*Competent Authorities (AtoN) could consider Intermediate Peripheral Structures (IPS) selected on the periphery of an OWF:*

1. *Are marked with flashing yellow lights;*
2. *The flash character of these lights shall be distinctly different from those displayed on the SPS, with a nominal range of 2 Nautical miles;*
3. *Have a lateral distance between IPS or the nearest SPS which will not normally exceed 2 Nautical Miles.*

*SPS - lights visible from all directions in the horizontal plane. It is recommended to synchronize these lights in order to display a Special Mark characteristic, flashing yellow, with a range of not less than 5 Nautical miles*

**SPS**

*Intermediate structures on the periphery of an OWF other than the SPS - marked with flashing yellow lights which are visible to the mariner from all directions in the horizontal plane with a flash character distinctly different from those displayed on the SPS and with a range of not less than 2 Nautical miles*

**IPS**

It is rarely to have such a case that the distance between the two adjacent SPS exceeds 3 nm in a small scale OWF, but such distance quite often exceeds 3 nm for a large scale OWF. Be that as it may, the distance between any two adjacent SPS shall not exceed 3nm in accordance with the current requirements of IALA guideline. One or more SPS will be placed in the intermediate length alone the external boundary of OWF.

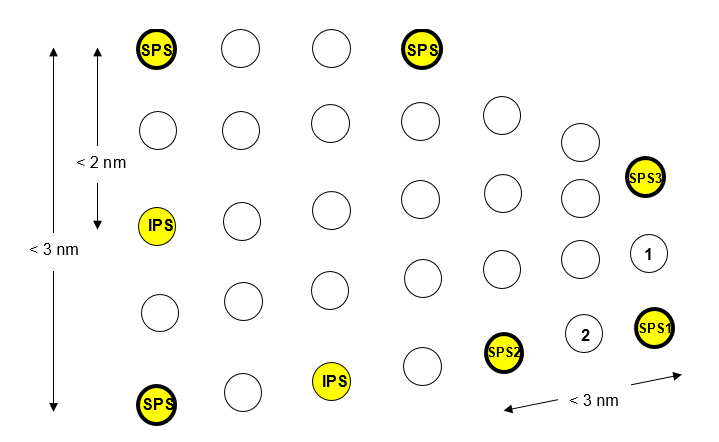
Based on the actual information of the OWF in the coastal water area in China, the length of external boundary for a medium scale of OWF could easily be 6nm and up to 12nm. For instance, the attached figures which abstracted from The Three Gorges SHA PA OWF and ZHONG GUANG HE YANGJIANG OWF illustrate the abovementioned case.

# Discussion

On condition that the marks are placed in accordance with the current standards and requirements as recommended in the guideline, the likelihood of the risk of colliding with OWF could be anticipated as follows:

* + 1. It might be ambiguous for the mariners to precisely estimate the scale of OWF;
    2. In the event of any failure in observing any one of SPSs, the dilemma of determining SPS as the termination point or intermediate point would make mariners confused if the SPS2 and SPS3 were mistakenly recognised as the boundary line of the OWF, so as to increase the likelihood of risk of colliding with OWF. For instance, as illustrated in the below figure, in the case that the SPS1 is damaged or extinguished in no way of being observed by the mariners, the No.1 and No.2 wind turbines are highly exposed to the risk of being collided by the ships navigating nearby.

If the SPS will not be used as the intermedia points but only used as external termination point of the OWF, some IPS will be placed in between of two SPS where the distance is over 3 nm on the condition that the distance between IPS and any adjacent SPS is no more than 2nm, the mode of setting as proposed could effectively avoid the aforementioned risks. As a matter of fact, such setting mode has been widely implemented and approved in China whereby it has been taken as mandatory national standards.



1. Current Guideline May Misleading Mariners

# proposal

The proposal in this regard will amend the description of the article 2.4.3 in the IALA guideline of the marking of offshore man-made structures as follows:

*In the case of a large or extended OWF（ the distance between SPS exceed 3 nautical miles），1 or several IPS must be set.*

The illustration figure should be amended as:

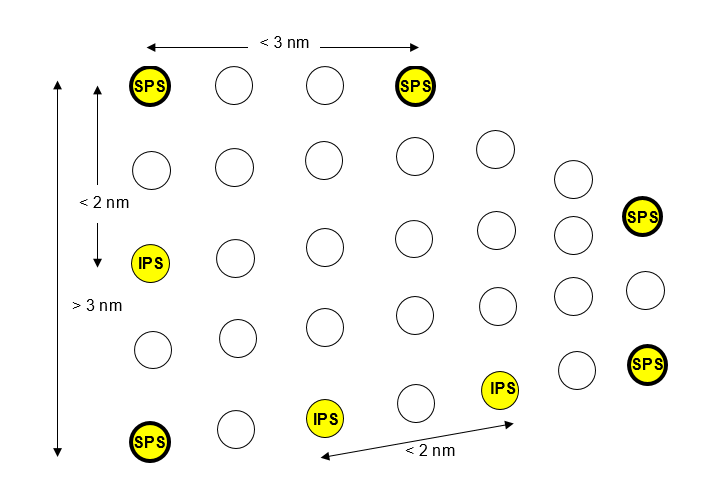


Figure 2  Sample marking of an OWF

All the proposed changes have mentioned above. It is recommended to amend the draft revised Guideline as an input paper to ARM 14 for consideration, and forward to council at the right time.

# References

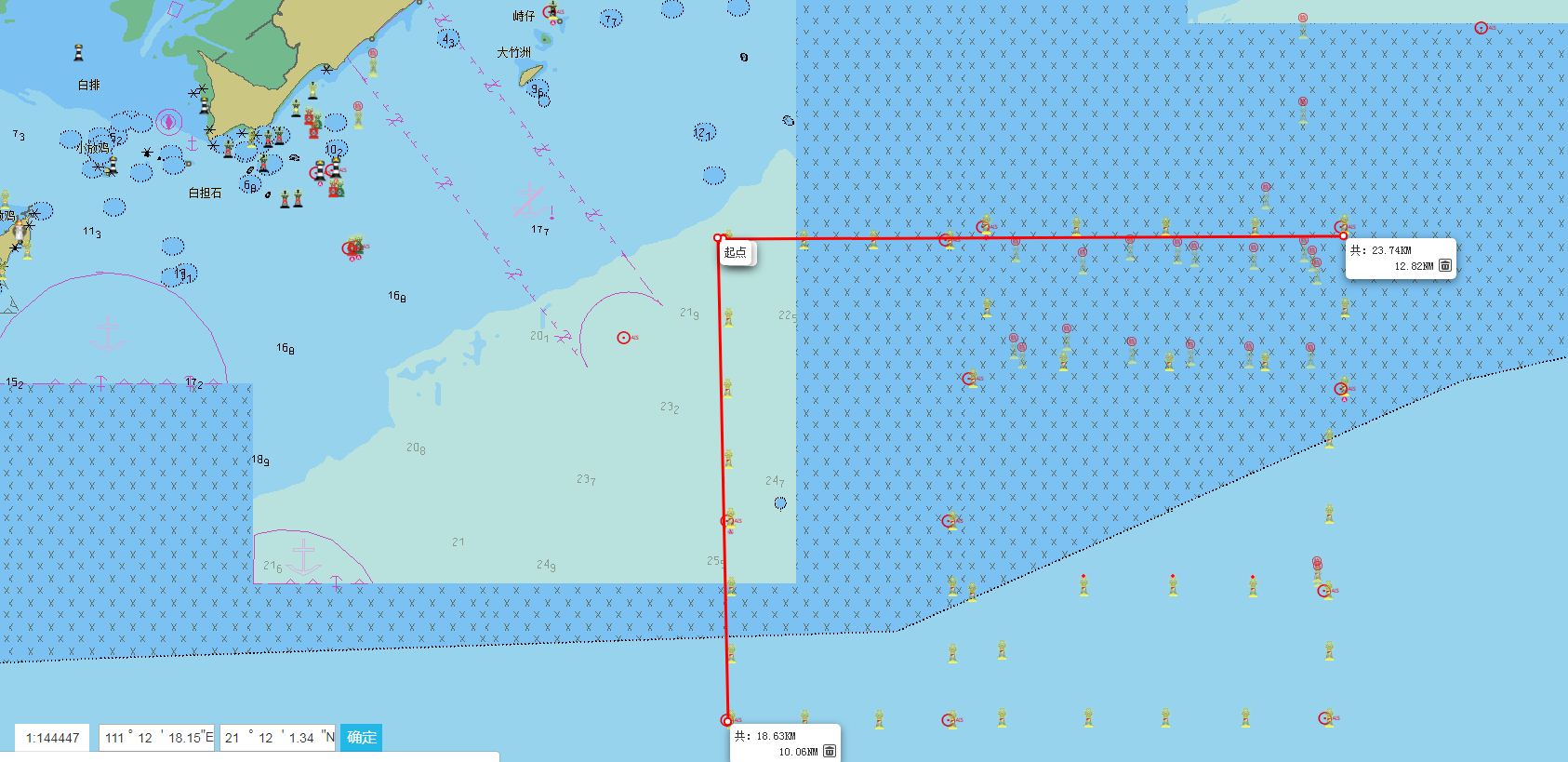
1. Regulation on Aids to Navigation for Marking of Offshore Structures, China

# Action requested of the Committee

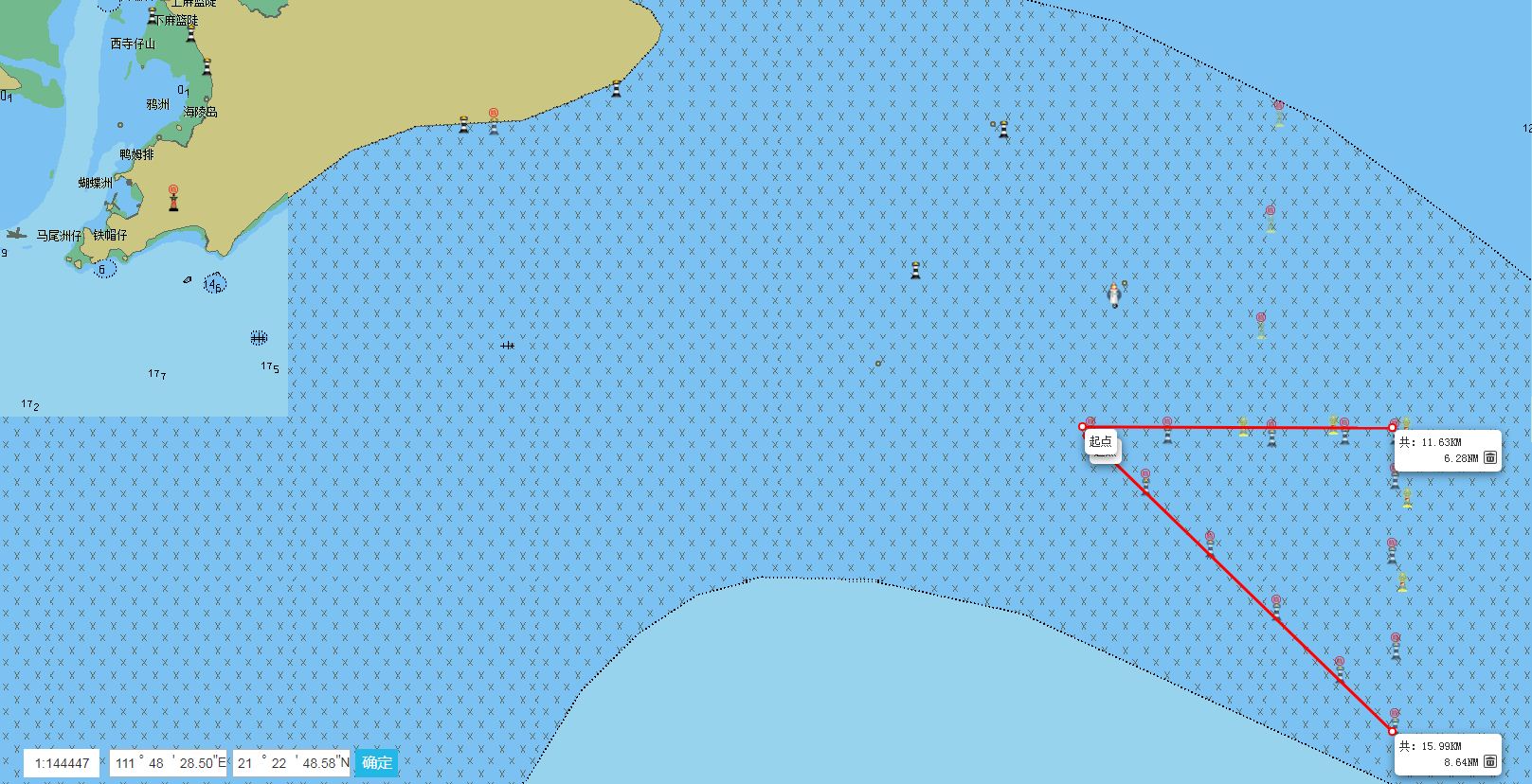
The ARM Committee is invited to consider the proposals in part 4, and take action as appropriate.

Annex

**Illustration figures of the OWF in Chinese coastal waters**



The scale and external boundary length in the Three gorges SHA PA OWF (10nm X 12nm)



The scale and external boundary length in the ZHONG GUANG HE YANGJIANG OWF (8.5nm , 6.3nm)

1. Input document number, to be assigned by the Committee Secretary [↑](#footnote-ref-1)
2. Leave open if uncertain [↑](#footnote-ref-2)