

5th WEND WORKING GROUP MEETING

Action 5/02

ADMIRALTY Information Overlay (AIO)

Submitted by UK

Introduction and Background

1. WENDWG5 considered a paper from France (WENDWG5-04B) titled “Relevance of information overlay services and their status in the global IHO ENC programme”.
2. This subject was originally raised by France at IRCC6 May 2014 (IRCC6-08B). IRCC Action 29 was that UK and France address the AIO issue bilaterally and report back to IRCC7 (deadline: IRCC7 June 2015).
3. However, in addition to the IRCC action for France and UK to address the issue bilaterally, France sent a letter to the Chair of HSSC (copy IHB) to investigate potential standardization issues. In a letter to the Chair of CSPCWG, the Chair of HSSC tasked the CSPCWG/NCWG to consider this request. In liaison with the Chair of the CSPWG, IHB submitted HSSC6-05.5D rev1 to HSSC6 accordingly. The introduction to the HSSC paper specified UK’s ‘Admiralty Information Service’ (AIO) as the case in point. In response, and as suggested by IHB, HSSC tasked CSPCWG/NCWG to consider standardization issues related to additional overlay services and provide recommendations as appropriate.
4. This paper responds to WENDWG5 Action 5/02 requiring UKHO to provide a report on the AIO benefits/risk assessments and to include an Annex depicting the AIO workflow process.

Analysis and Discussion

What is AIO?

5. The AIO is an optional additional overlay that can be turned on and off within ECDIS independently of the display of ENC data and is intended to support passage planning and demonstration of compliance. The ECDIS standards and IHO working groups always envisaged the production of value added data layers such as AIO, that is after all why it is a ‘Chart Display ***and Information*** System’, and many other examples exist including weather and piracy. It has three features:
 - a. EPNMs (Electronic Preliminary Notice to Mariner) - to help the mariner resolve problems (inconsistencies) they may face using ENCs and ADMIRALTY paper charts;
 - b. T&P information – to show the mariner where T&P notices apply to ENCs;
 - c. No Overlay – to show where the UKHO is unable to provide either EPNMs or T&P information;
6. AIO is an S-57 based data set that uses ‘private extensions’ to the object catalogue to describe the features and attributes. AIO features are shown as simple polygons drawn on top of the ENC data with the identifier encoded in the OBJNAM attribute and a description in the INFORM attribute. Where necessary text and picture files are included to provide further detail.

7. The following screen shot shows an AIO feature displayed over an ENC in a chart display system:

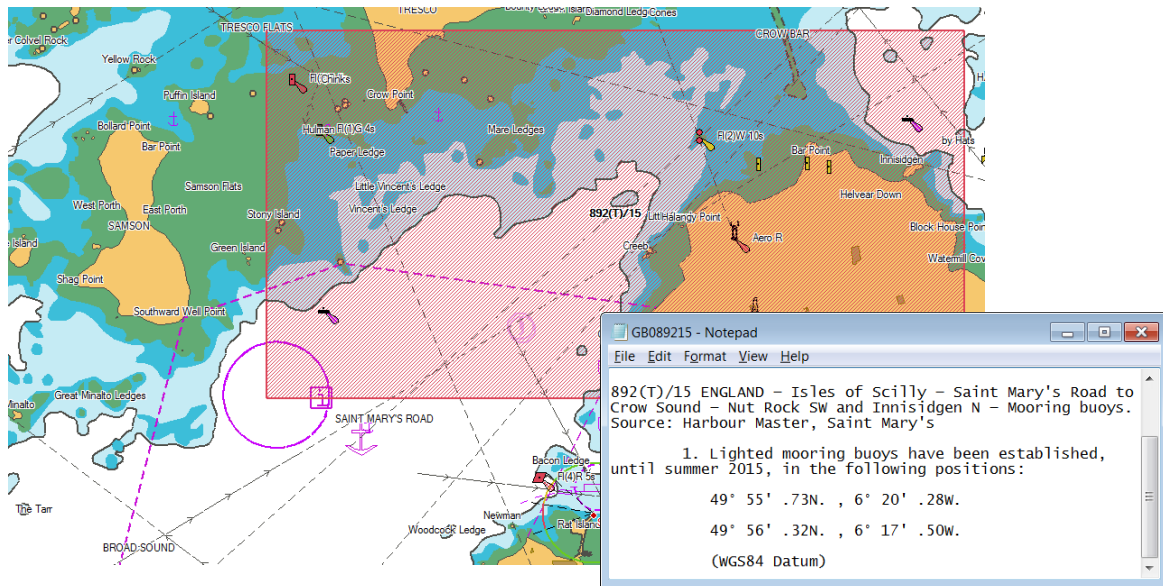


Figure 1 AIO feature displayed over an ENC in ECDIS

What is the requirement for AIO?

8. The AIO was born out of customer demand based on their experience of using ECDIS at sea and dealing with vessel inspections around the world. It has three features:
- a. EPNMs. Especially for those who are navigating in a mixed paper/digital environment (who remain the significant majority) there is a need to understand the reason for a difference between the ADMIRALTY paper chart and ENC. This is basically the same process that has always existed for paper P notices, that is: we have received some information which needs further investigation, or for which the chart cannot yet be fully updated for some other reason, but in the meantime here is some information to which the mariner can apply judgement. The 'further investigation' would include correspondence with the ENC producer to resolve the issue. Sometimes this takes some time, so a temporary method of informing the mariner of a potentially dangerous situation is necessary if we are to fulfil our duty of care as a Hydrographic Office.
 - b. T&P information. Port state and SIREs (Ship Inspection and Reporting) inspectors want to see evidence that a vessel is managing and taking note of T&P information; if the vessel cannot adequately demonstrate this, it gets a deficiency. The T&P part of AIO provides visual evidence of where T&Ps apply - both to the inspectors and to the crew during passage planning. Even where the T&P information has been incorporated into the ENC, in accordance with the S-57 UOC, this highlighting is still valuable. For example, many P notices may be encoded using DATSTA and DATEND attributes that hide the feature from view until the 'go-live' date; if a mariner does not know that such a feature exists as they plan a voyage in advance of the go-live, they may not be able to take its effect into account. PRIMAR has recognised a similar issue with the difficulty of identifying where an ENC has been updated and has launched its Update Tracker to offer a solution to this. Where T&P NM information is encoded in ENCs, it is often very difficult to distinguish from standard chart features. S-57 does allow features to be encoded with a start and/or end

date and periodicity using the DATSTA, DATEND, PERSTA and PEREND attributes. However the S-52 Presentation Library does not currently present this information adequately in the chart display. The new version of S-52 addresses this issue, to some degree, but it will not be fully implemented until late 2016. Annex A shows examples of T&P NMs in ENC from 2 producers that indicate that they do include T&P NM information in their ENCs, along with their depiction in AIO. Also many ECDIS do not display this time variable information in a clear way – often just displaying all features – both the new and the superseded on screen at the same time.

- c. No Overlay. AVCS contains all ENCs from ENC producers, which often have coverage beyond the extent of ADMIRALTY paper chart coverage. If UKHO is unable to provide EPNM and T&P information for a given area because there is no equivalent scale ADMIRALTY paper chart, then to ensure that users understand the limitations, the AIO displays a “No Overlay” feature in these areas that carries the note:

“The UKHO does not publish a comparable scale paper chart in this area and cannot therefore produce ENC Preliminary (EP) NMs or Admiralty Temporary (T) or Preliminary (P) NMs within it. The user should be aware that the local Hydrographic Office may produce T&P notices for their charts in this area”

Annex B shows an example of the No Overlay feature and note.

How we produce AIO

9. EPNMs. Where a navigational significant difference is identified between an ENC and an ADMIRALTY paper chart, we attempt to resolve the difference before we issue an EPNM. Differences arise for many reasons; including the fact that UKHO has been gathering ship’s reports (H-Notes) from vessels around the world and including them on our charts for many decades. Where evidence exists that the information on the ADMIRALTY chart is out of date, we will update it by Notice to Mariners or new edition. Where such evidence does not exist, we will retain the information on our charts in the interests of navigational safety. If this information is not reflected in the corresponding ENC and the difference cannot be resolved within a reasonable period of time, then we will issue an EPNM in AIO to alert ENC users to the presence of potentially navigational significant information. Annex D shows examples of differences that we have identified that have not been resolved and have resulted in the issue of an EPNM. There are over 2700 such differences in AIO (19 March 2015).
10. T&P NMs. Around 35% of ENC producers that publish T&P NMs for their paper charts do not include the information in their ENCs. This figure comes from the IHO’s Status of Temporary and Preliminary ENC Updates information paper to HSSC5 (HSSC5-INF2 rev3), updated by UKHO’s monitoring of ENC producer policies. A list of the latest available information from each ENC producer is available on the UKHO website [here](#). UKHO produces T&P NMs for its ADMIRALTY paper charts, often sourced from national NMs. These T&P NMs are incorporated in the AIO. GB ENCs incorporate T&PNMs and we also include these T&Ps in the AIO for GB ENCs because of the value to the user of making them visible.
11. Annex C shows the workflows for the inclusion of EPNMs and T&Ps in the AIO

T&P Management

12. Where vessels do not have access to AIO, alternative approaches are being adopted to manage T&P NM information and its use in electronic passage planning. A common approach, directly observed on a number of vessels, is to maintain a binder of T&P NMs extracted from weekly Notices to Mariners bulletins. Any NMs in the vessel's operational area are manually added to the ECDIS as Mariner's Information Objects so that they can be used in the ECDIS. This carries the inherent risks of manual processing – either missing relevant information or introducing an error in its transfer to the ECDIS.

Conclusions

13. AIO is valuable to the mariner as evidenced by the fact that 60% of AVCS users subscribe to the service, all the major OEMs have adapted their ECDIS at their own cost to support the service and major shipping companies are specifying that the ECDIS for their vessels must have AIO capability.
14. The technologies used to create AIO are all open and readily available to other organisations delivering ENC services. The underlying format is S-57, distributed using S-63. Considerable investment has been needed to establish the process of comparing ENCs to ADMIRALTY paper charts. However it is not complex. Further investment has been needed to capture T&P NMs in a digitally. UKHO has made these investments in response to demand from the users of AVCS.
15. AIO is a complementary service for the users of AVCS that acts to reduce navigational risk by highlighting information that may materially affect a vessel's passage plan, therefore allowing the navigating officer to exercise judgement.
16. AIO also reduces navigational risk by automating some of the manual plotting and data entry tasks currently carried out.
17. As the differences between paper charts and ENCs are resolved and the depiction of T&P NM information in ECDIS improves, AIO will gradually become less relevant and its use will decline.
18. There is no impediment to other ENC service providers developing similar value added data layers where they see the need and demand from their customers.

Recommendations

- a. The WEND WG continues to encourage chart producers to ensure that their ENCs and paper charts are consistent for navigationally significant content;
- b. WEND WG acknowledges the comparison work being undertaken by UKHO, and accepts the value to its customers of being made aware of unresolved navigationally significant differences between ENCs and ADMIRALTY charts;
- c. EPNMs can be avoided by quick resolution of issues; Member States are therefore encouraged to respond quickly when informed of issues;
- d. Until issues of presentation of T&Ps are resolved the use of overlays to highlight where they appear is recognised as a useful safety feature;
- e. Member states should be encouraged to include T&P information in their ENCs and work with service providers to ensure that any overlays produced are accurate and timely in presenting information.

Justification and Impacts

Reduction in navigational risk through increased awareness of T&P information, differences and automatic plotting

Annex A Examples of T&P NMs

19. T NM indicating buoys removed for repairs

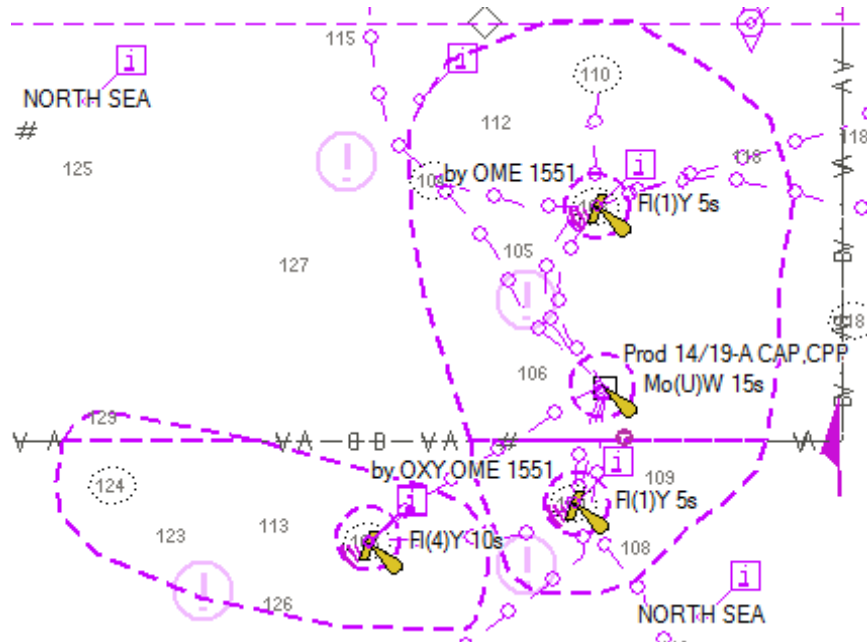


Figure 2 Standard ECDIS display in the vicinity of NM 5562(T)/14

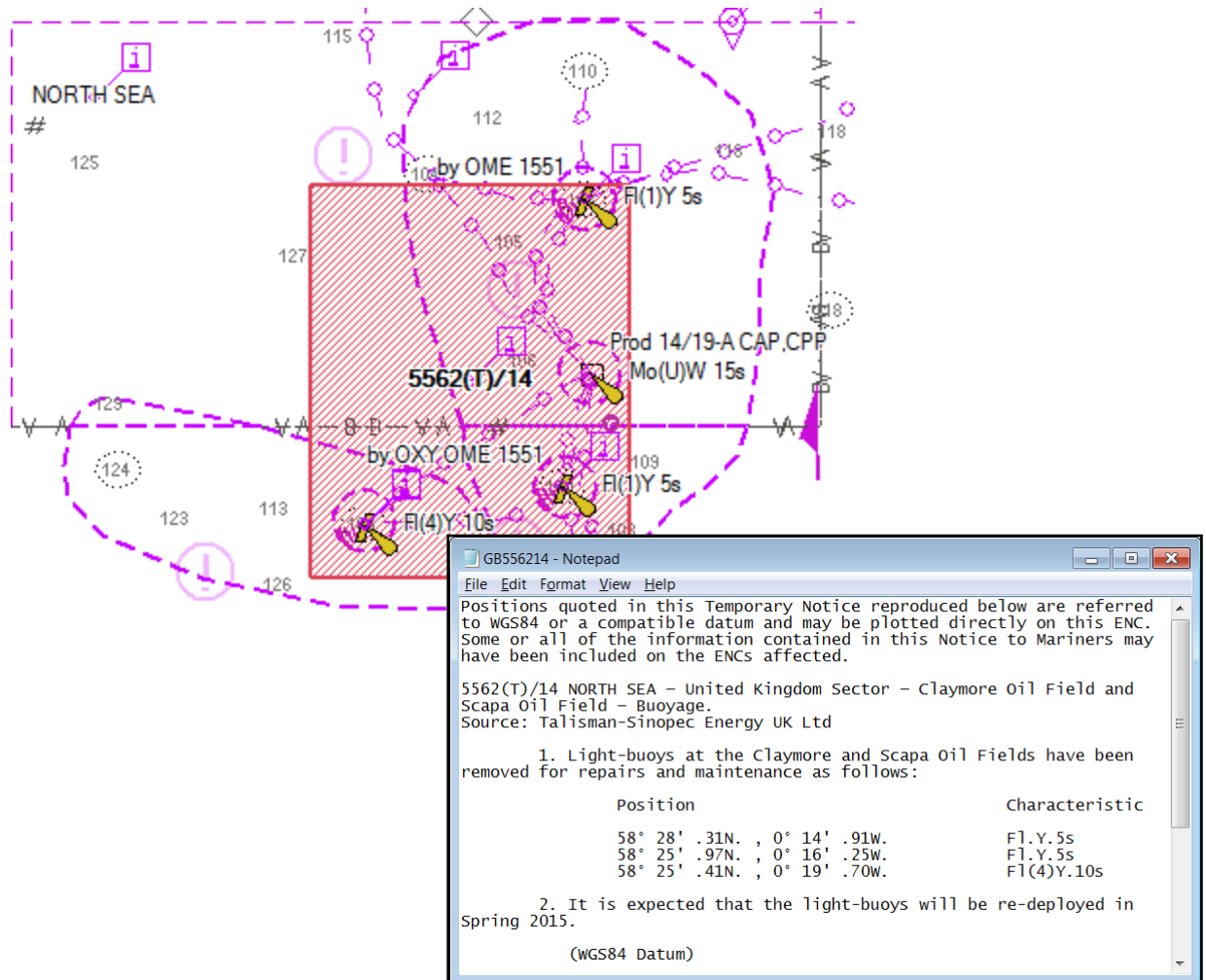


Figure 3 AIO showing NM 5562(T)/14

20. P NM showing a routing measure change that takes effect from 1 June 2015

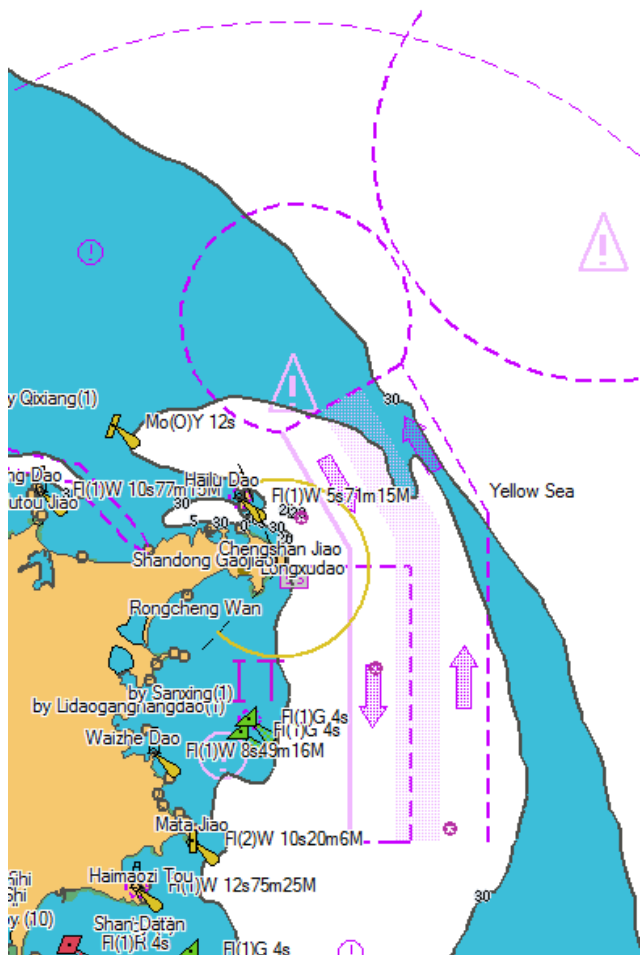


Figure 4 Standard ENC display in the vicinity of NM 1111(P)/15

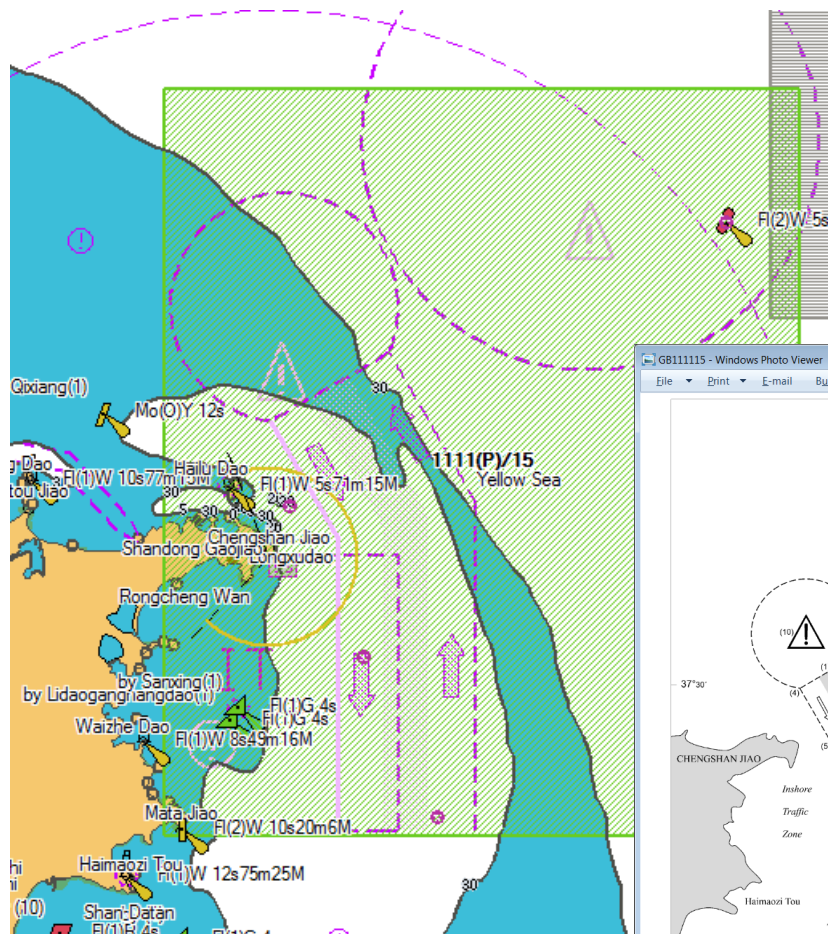
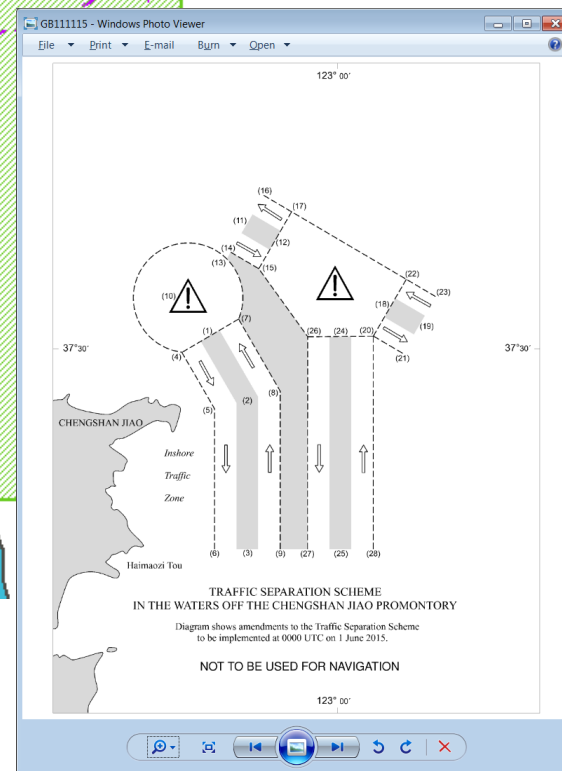


Figure 5 AIO showing NM 1111(P)/15



Annex B Example of the No Overlay feature

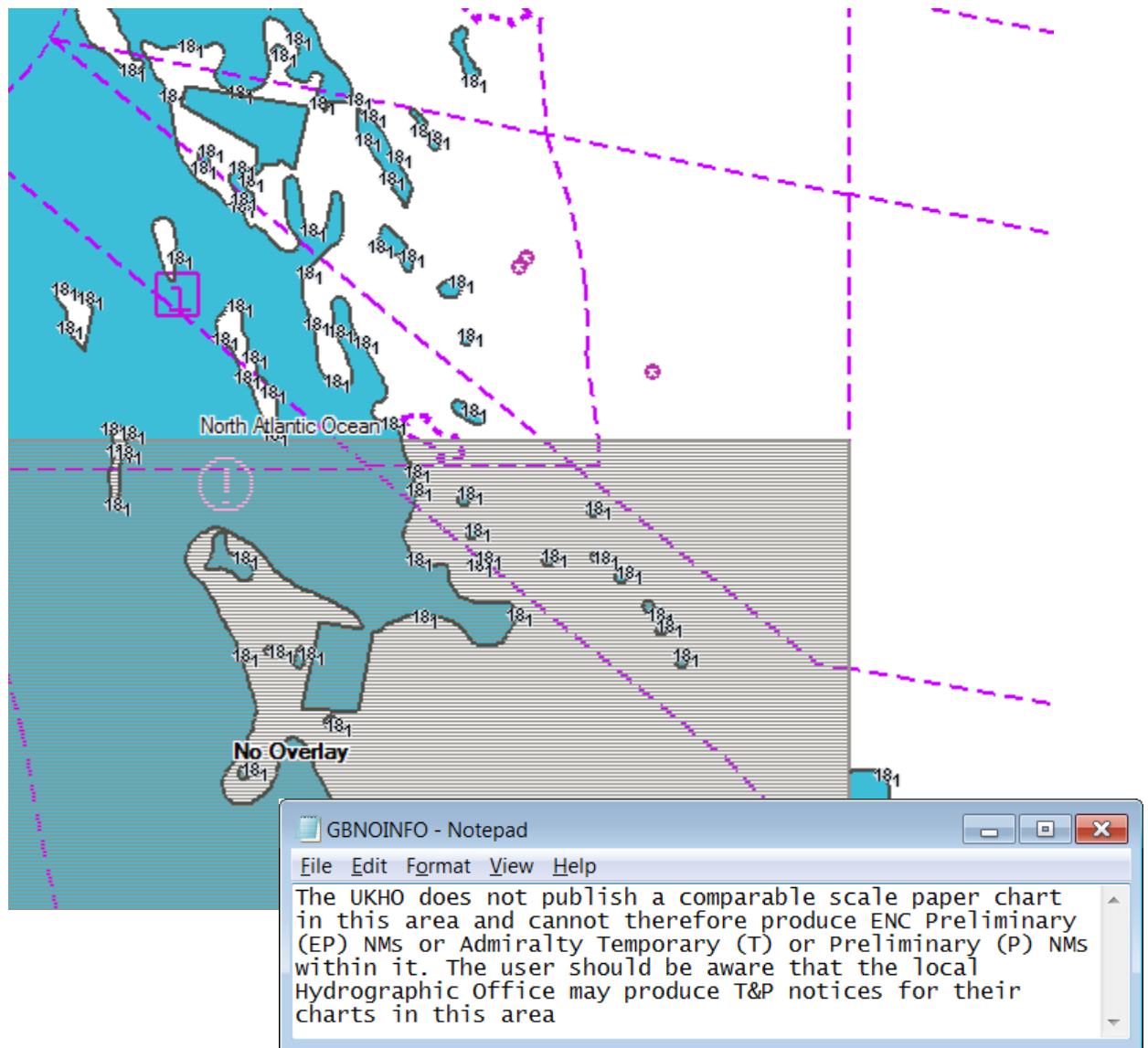
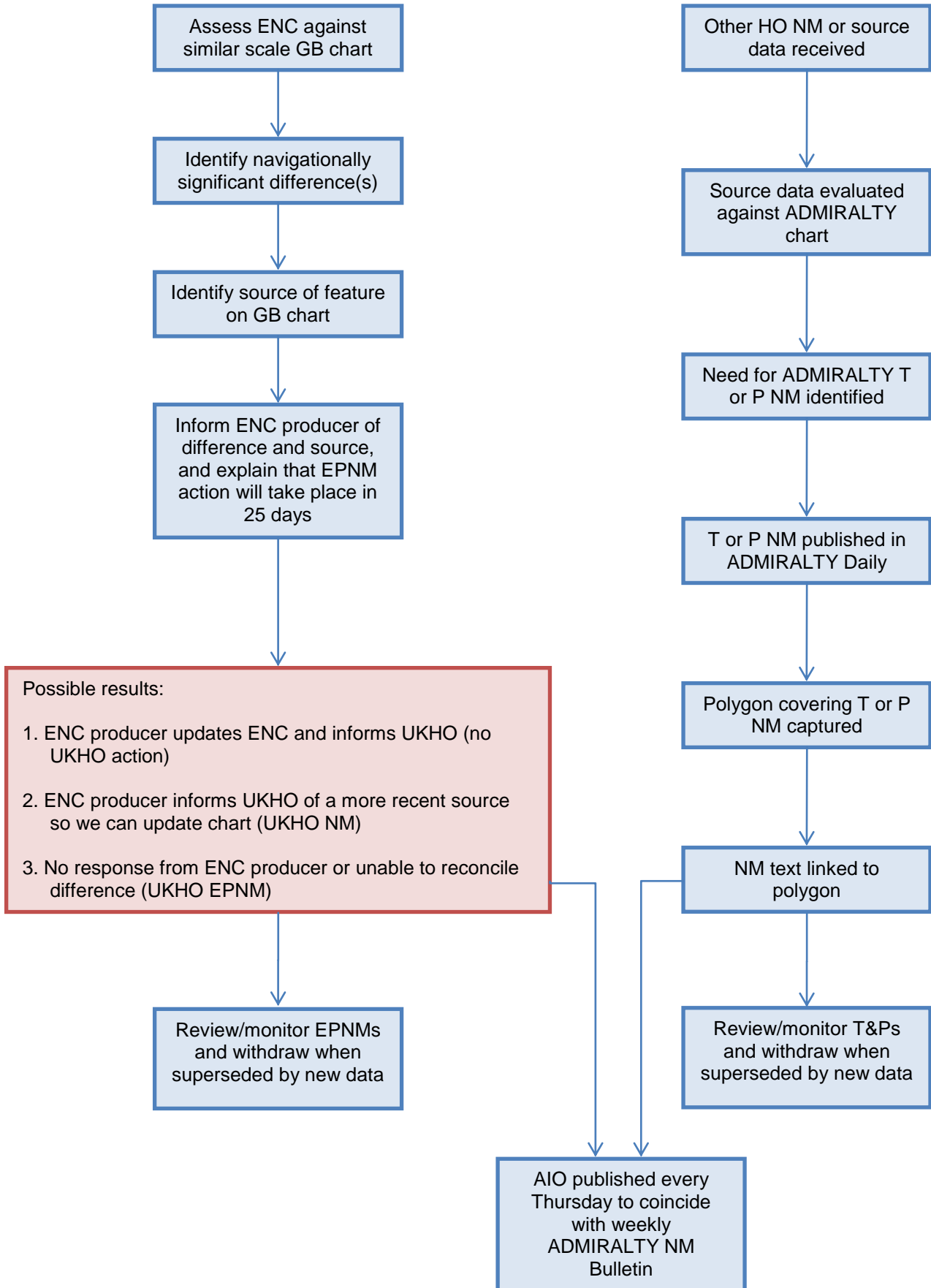


Figure 6 No Overlay feature and note

Annex C AIO Workflow



Annex D Examples of differences between ENC's and ADMIRALTY paper charts

21. Reported depths shown on the ADMIRALTY chart and not shown on the ENC

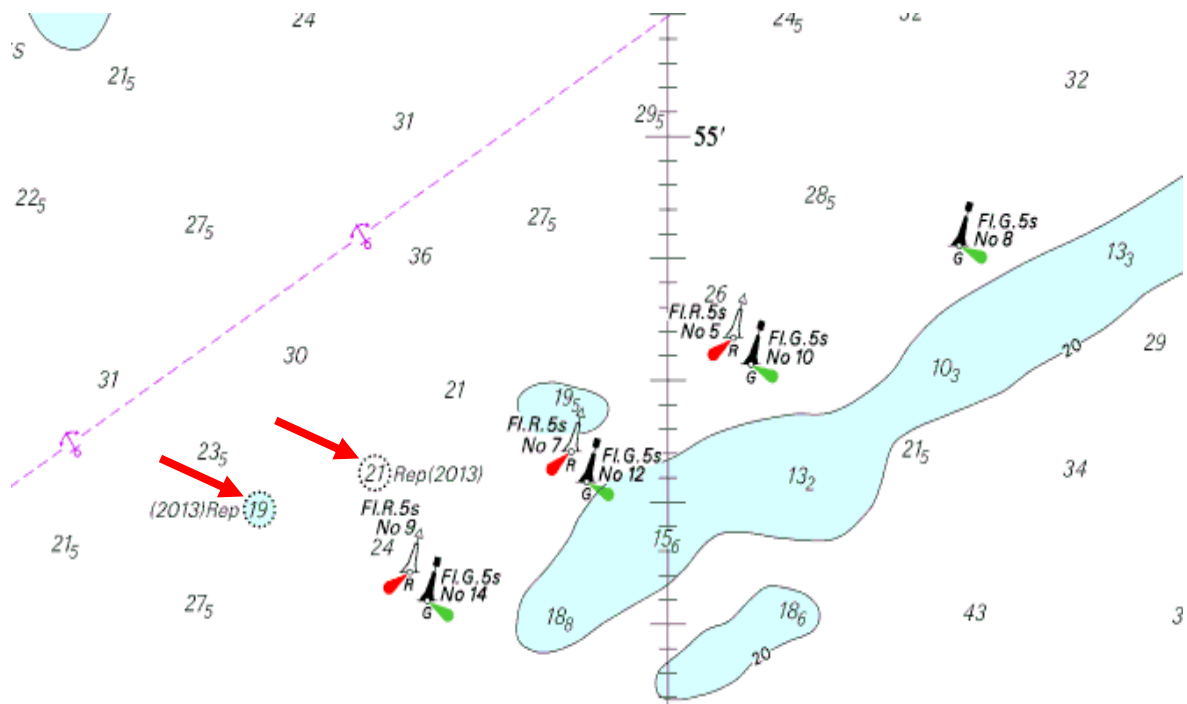


Figure 7 ADMIRALTY chart showing reported depths

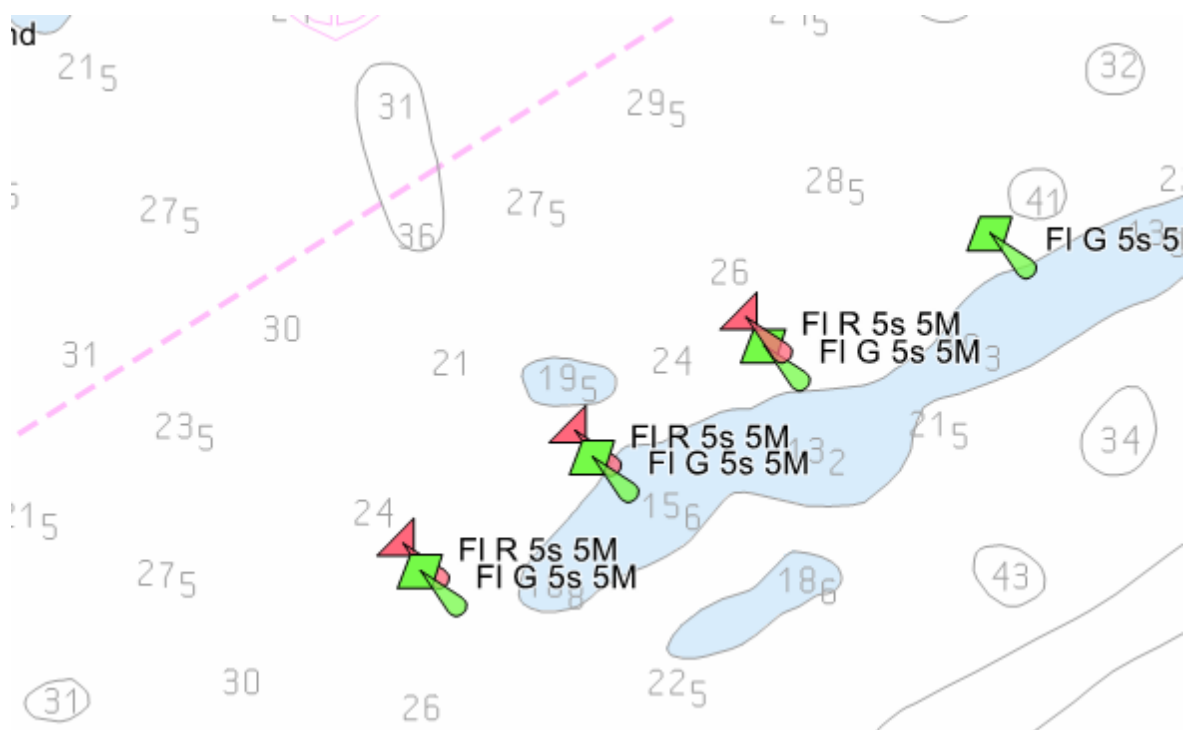


Figure 8 ENC with no reported depths shown

22. Obstruction shown on the ADMIRALTY chart and not shown on the ENC

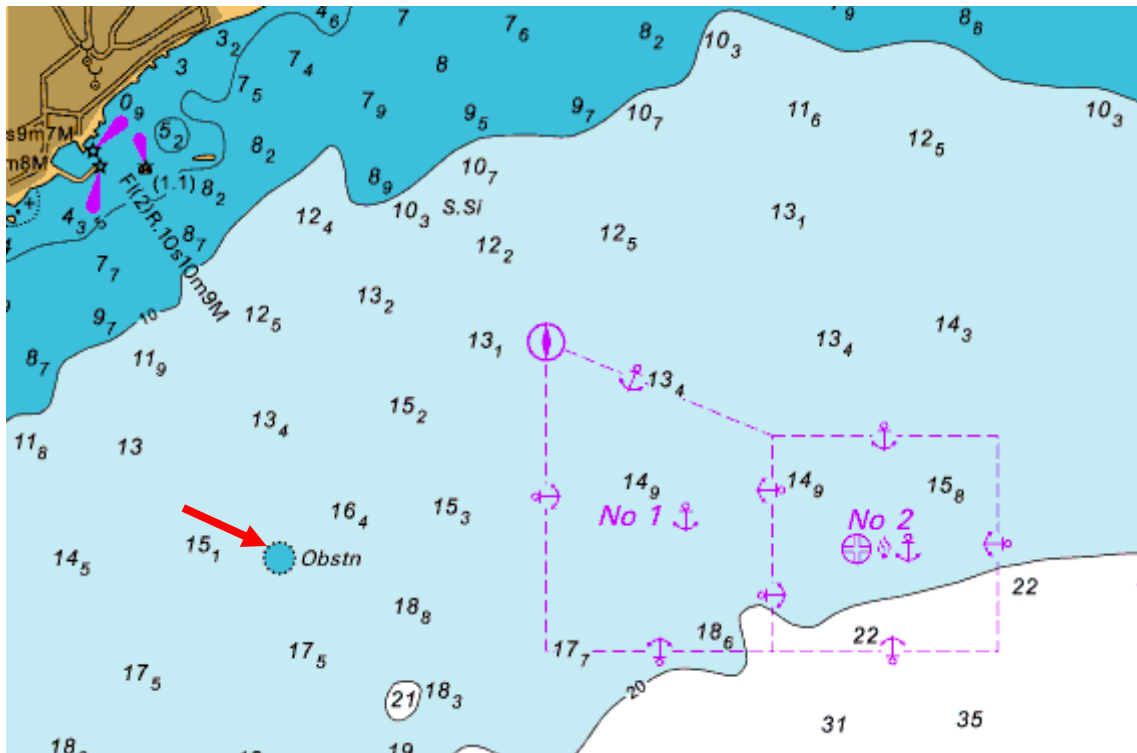


Figure 9 ADMIRALTY chart showing obstruction

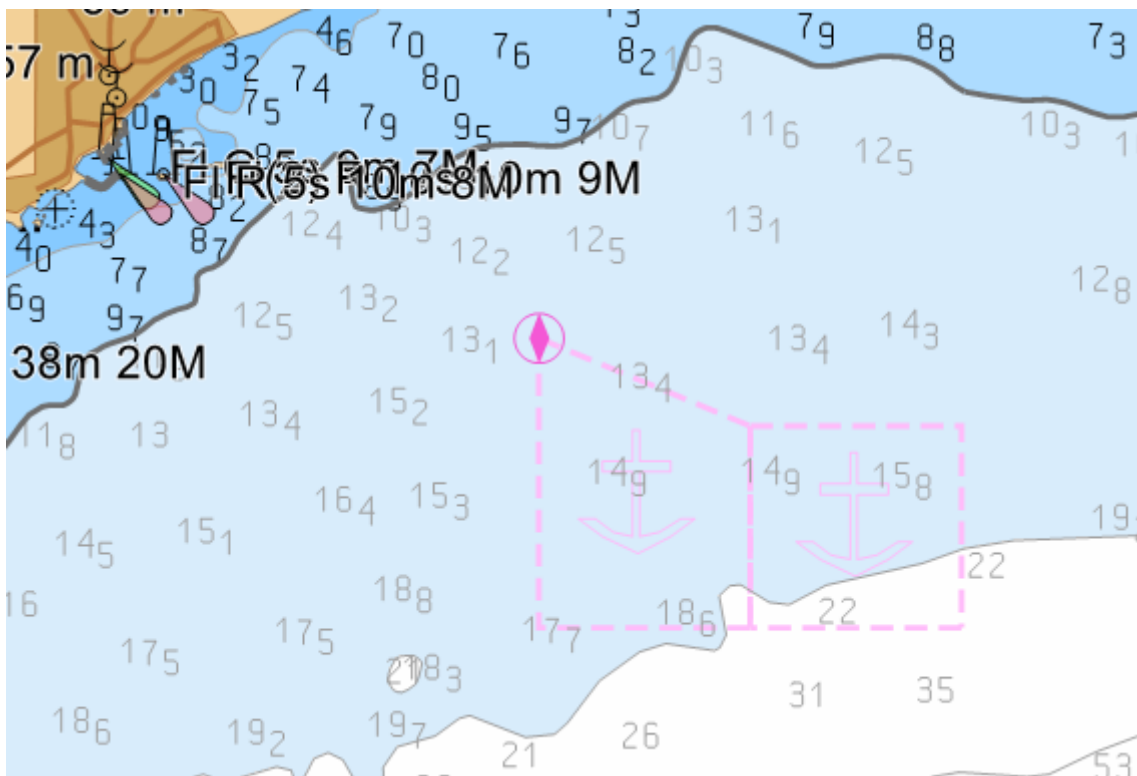


Figure 10 ENC with obstruction not shown

23. Dangerous wreck and note not shown on ENC, pilot boarding place in a different position

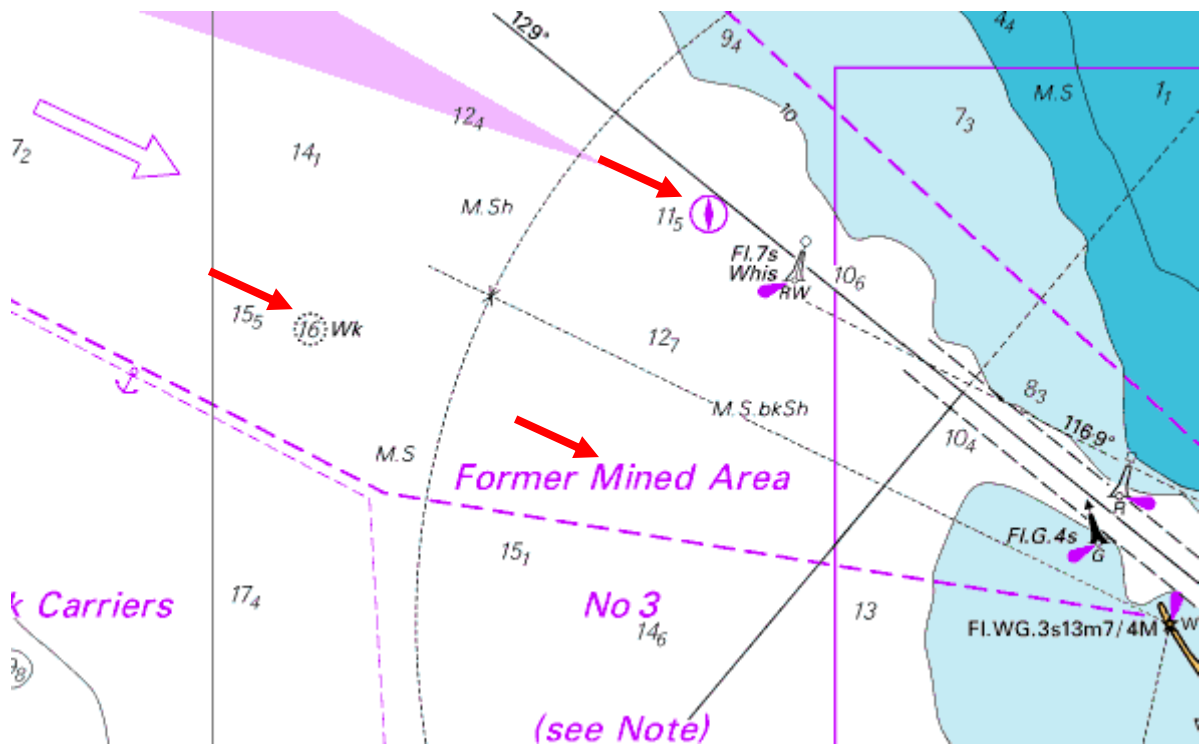


Figure 11 Paper chart showing dangerous wreck and former mined area note

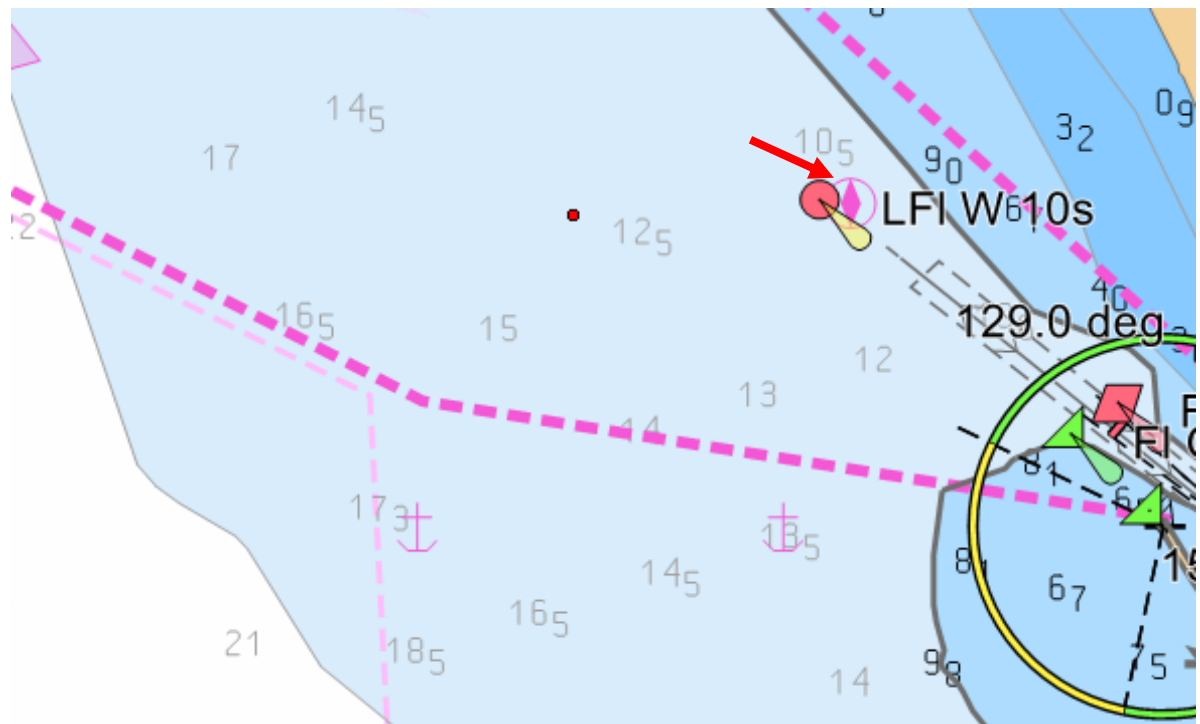


Figure 12 ENC with dangerous wreck and former mined area note not shown, pilot boarding place in a different position