ENC STANDARDS MAINTENANCE WORKING GROUP (ENCWG)

Paper by the AHO

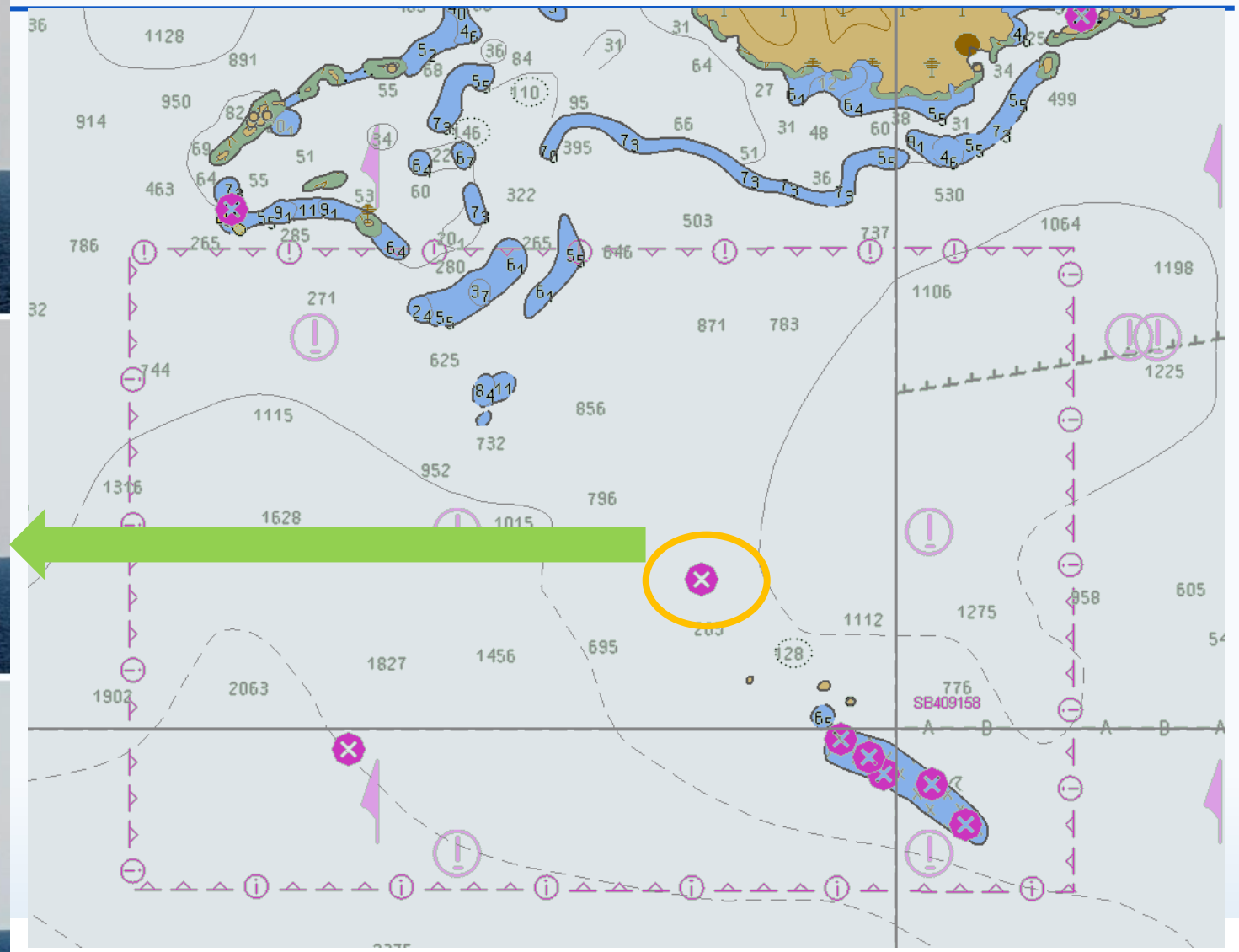
Encoding of active Submarine Volcanos in ENCs

Introduction

- In 2017 Carnival cruises approached the AHO seeking changes to the way active submarine volcanos display and interact with ECDIS. Their goal was to introduce changes that provide a better ‘warning system’ to mariners.
- At ENCWG3 Australia presented paper (ENCWG3-5.10) highlighting the way active submarine volcanos are usually encoded in ENCs and therefore how they display and interact with ECDIS.
- Australia was tasked to present amendments to the UOC in order to improve the way ECDIS safety route checking functions interact and therefore alert mariners of the presence of active submarine volcanos and the extent of areas that can be potentially covered by toxic gases.

The problem

- Currently there is no guidance in the UOC regarding the encoding of active submarine volcanos in ENCs.
- Despite this, submarine volcanos (active or not) are generally encoded as OBSTRN features having, as a minimum, the mandatory attributes WATLEV and VALSOU populated. There is not a CATOBS attribute value for ‘Submarine Volcano’ and there is no STATUS attribute values such as ‘Active’ or ‘Inactive’.
- This encoding displays all type of real world objects of ‘unknown’ nature using the ‘Isolated danger symbol’. This symbol is also displayed by UWTROCs and WRECKS when shallower than the safety contour.
- All these OBSTRN objects react to the in built ECDIS safety functions in the same way (Indication highlight).


SB409158

Conclusion

- **Active submarine volcanos, especially in remote areas, are a real threat to marine navigation. Their unpredictable nature and the serious consequences the may inflict to shipping deserve a higher level of alert in ECDIS.**

- **The AHO considers that the existing ENC product specification has to be updated in order to provide new encoding guidance that facilitates a more adequate interaction between active submarine volcanos and existing ECDIS safety checks.**

The proposed solution

- Add a new entry to the 'Remarks' of section 6.2.2 of S-57 Appendix B.1, Annex A (UOC) to read:

  Active submarine volcanos can be a significant navigational hazard; and harmful concentrations of volcanic gases emanating from active submarine volcanos can cover an extensive area (see S-4 – clause B-428.4). If it is required to encode an active submarine volcano, it must be done using an **OBSTRN** area, with attributes EXPSOU = *2* (shoaler than the range of depth of the surrounding depth area), QUASOU = *2* (depth unknown) and INFORM = *Active submarine volcano*. To indicate the unpredictable nature of the volcano (it may be periodically submerged or extend above the surface), the mandatory attributes VALSOU and WATLEV must be populated with an empty (null) value. In order to stand out visually as much as an OBSTRN point does, the minimum recommended size for the OBSTRN area object is 4mm (at compilation scale) on any direction. In order to increase the level of alert provided by ECDIS it is recommended that a DEPARE (e.g. 0-2m or intertidal) object is double encoded with the OBSTRN. The area that can be potentially covered by harmful volcanic gases, which may cover an area of up to 10 NM from the volcano, should be encoded using the feature object **CTNARE** (see clause 6.6), with attribute INFORM = *Volcanic activity*; and an appropriate cautionary note referenced using the attribute TXTDSC similar to:

VOLCANIC ACTIVITY

Active submarine volcanos exist in this area. Some volcanos have been reported to erupt breaking the surface of the sea and projecting ashes, other volcanic materials and harmful gases into the air. Changes to charted depths, uplifting of reefs and emerging of volcanic islets may occur throughout the area. Due to the unpredictable nature of these events mariners are strongly recommended to avoid the area.

The proposed solution

- The ENCWG is also invited to consider the need for a new CATOBS attribute ‘submarine volcano’ and STATUS of ‘Active’. This two new attribute values combined may be used to drive a different ECDIS performance and/or display a new dedicated symbol for active submarine volcanos.

- Refer this topic and agreed actions to the S101PT.