Paper for Consideration by ENCWG

Issues with display and alerts on OBSTRN objects

Submitted by:	France
Executive Summary:	It has been found that current S-52 rules on OBSTRN objects result in missing alerts and inadequate display
Related Documents:	NCWG4-12.5 INF5; S-52 Presentation Library Edition 4.0.2
Related Projects:	S-101 portrayal

Introduction / Background

Paper *NCWG4-12.5 INF5_Obstruction_Foul_Ground.pdf* was prepared by France and Australia and presented at the NCWG4 meeting (The Hague, Netherlands, 6-9 November 2018). The aim of the paper was to draw the attention on the lack of precise definitions between "Obstruction" and "Foul ground" in IHO standards (mainly S-4) and, as a consequence, different interpretations between HOs.

During the preparation of the paper, it was discovered that some dangerous objects are excluded from S-52 Conditional Symbology Procedure OBSTRN07 and consequently do not trigger alerts on the ECDIS.

Analysis/Discussion

The basic distinction between an obstruction and a foul ground is that the former is dangerous for surface navigation whereas the latter is not. Consequently, the classification does not only depend on the characteristics of the real world object, but also on its environment and the types of vessels navigating in the area.

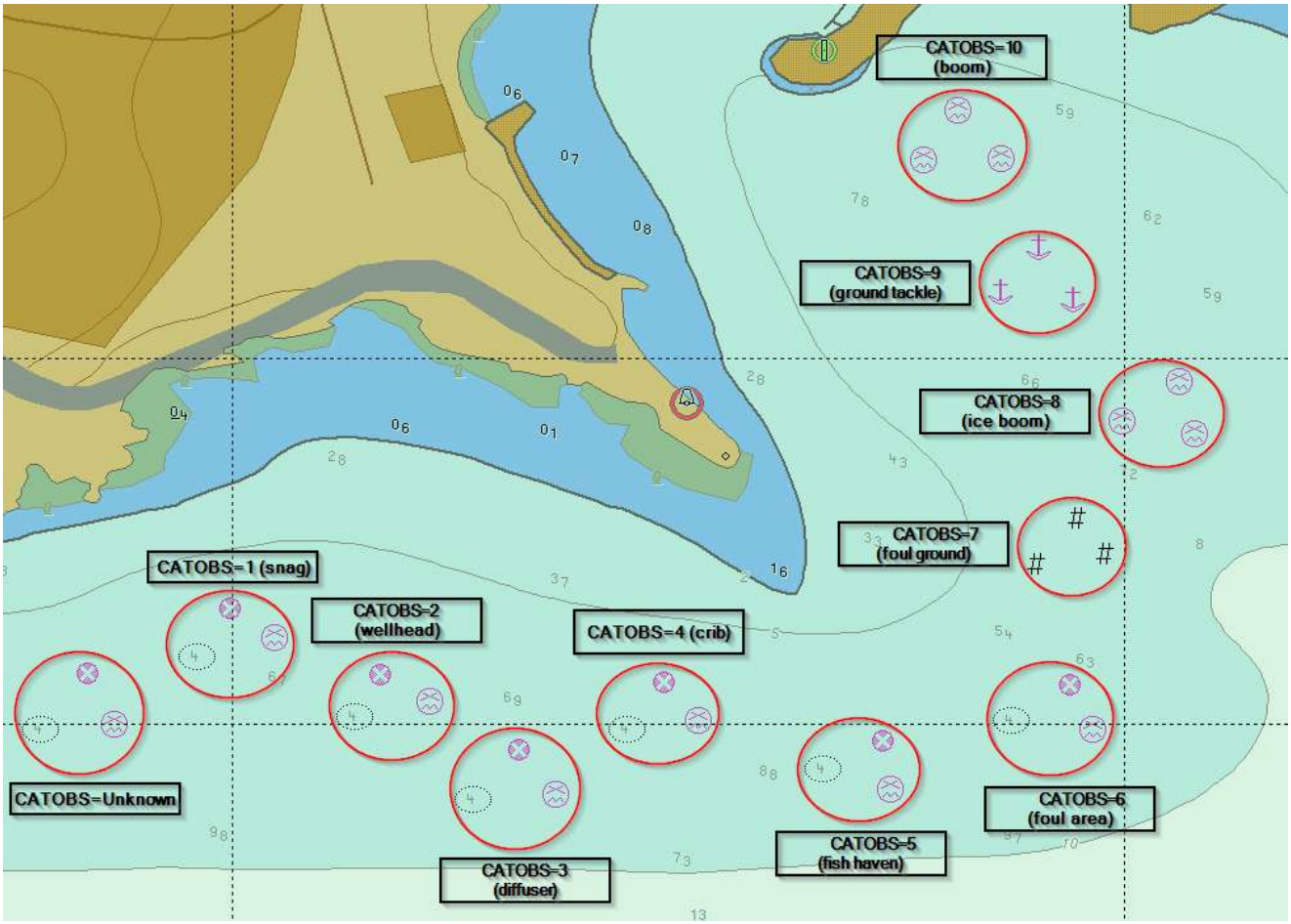
In S-57, obstructions and foul ground are both encoded by the same object class OBSTRN. Attribute value CATOBS=7 (foul ground) is used to specify that the object is a foul ground.

ECDIS alerts on OBSTRN objects are ruled by Detection and Notification of Navigational Hazards (S-52 Presentation Library Edition 4.0.2 - Part 1, clause 10.5.9) which, in turn, leads to Conditional Symbology Procedure OBSTRN07 (S-52 Presentation Library Edition 4.0.2 - Part 1, clause 13.2.5) by the statement: "*DEPTH_VALUE is not an S-57 attribute, it is derived from CSP OBSTRNnn and WRECKSnn. The safety contour value is set by the user. Objects not passing through the CSP are not part of Detection and Notification of Navigational Hazards*"

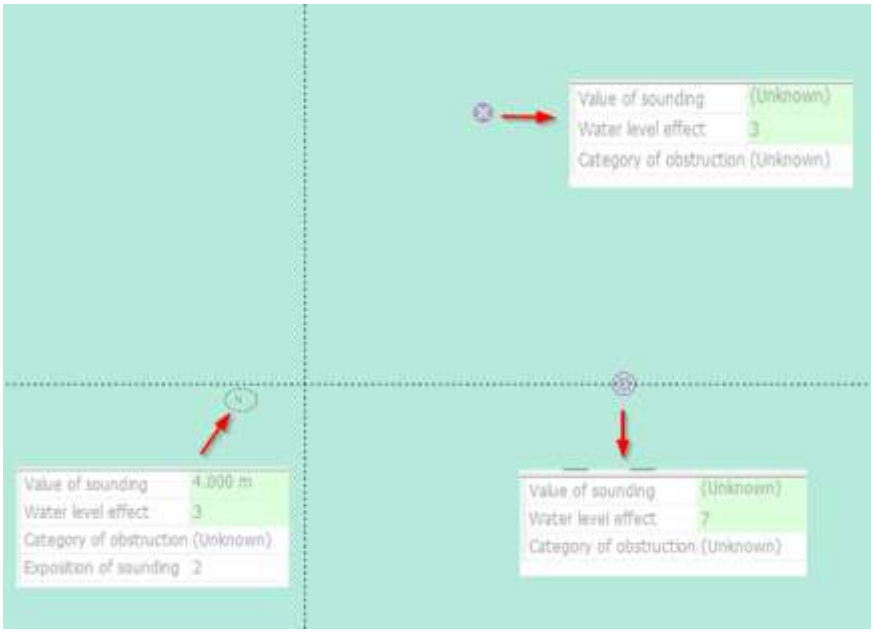
OBSTRN objects with CATOBS=7 (foul ground), 8 (ice booms), 9 (ground tackle) or 10 (boom) and objects with WATLEV=7 (floating) are excluded from CSP OBSTRN07, even if VALSOU is encoded, as shown in the look-up table for simplified point symbolization S-52 Presentation Library Edition 4.0.2 - Part 1, Appendix E *Look-up Table for Paper Chart Points* (the rule is the same for simplified point symbolization) hereafter:

"OBSTRN","","CS(**OBSTRN07**)","4","O","OTHER","34050"
"OBSTRN","CATOBS7VALSOU","SY(FOULGND1)","4","O","OTHER","34051"
"OBSTRN","CATOBS8VALSOU","SY(FLTHAZ02)","4","O","OTHER","34051"
"OBSTRN","CATOBS9VALSOU","SY(ACHARE02)","4","O","OTHER","34051"
"OBSTRN","CATOBS10VALSOU","SY(FLTHAZ02)","4","O","OTHER","34051"
"OBSTRN","CATOBS7","SY(FOULGND1)","4","O","OTHER","34050"
"OBSTRN","CATOBS8","SY(FLTHAZ02)","4","O","OTHER","34050"
"OBSTRN","CATOBS9","SY(ACHARE02)","4","O","OTHER","34050"
"OBSTRN","CATOBS10","SY(FLTHAZ02)","4","O","OTHER","34050"
"OBSTRN","WATLEV7","SY(FLTHAZ02)","4","O","DISPLAYBASE","12410"

To confirm this rule, a series of objects were encoded and the ENC displayed on an ECDIS.

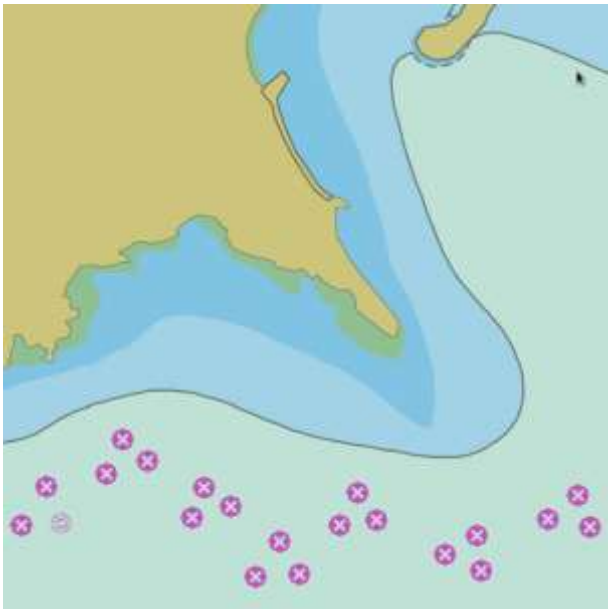


Within each group of 3 OBSTRN objects, the encoding was the same (apart from CATOBS):



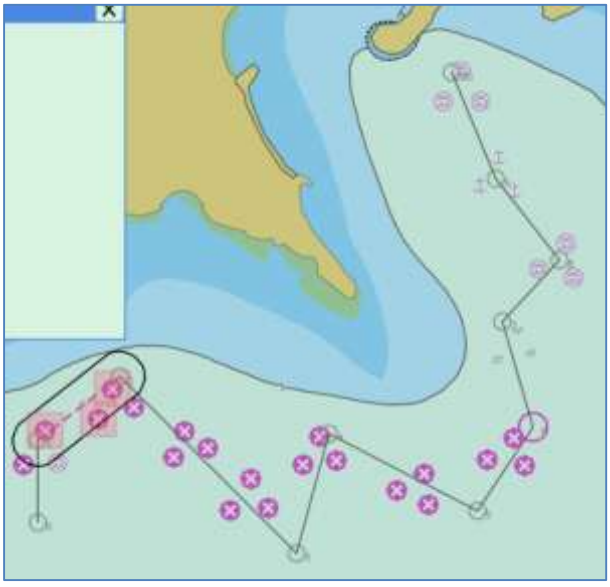
All objects are encoded in the “safe” area.

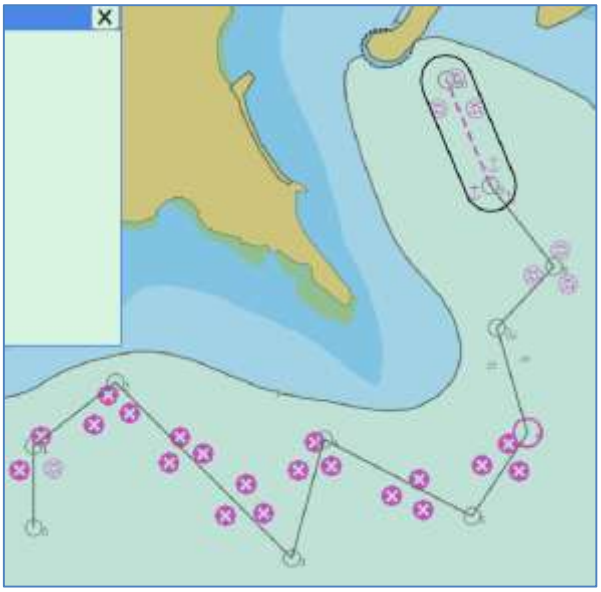
VALSOU was populated with a value (4 metres) less than the DRVAL1 of the underlying DEPARE (5-10).



ECDIS display confirmed that only objects with CATOBS= unknown, 1, 2, 3, 4, 5, and 6 are on the BaseDisplay

Base display + others is needed to see the objects with CATOBS=7, 8, 9 and 10





The ENC was tested in route planning. OBSTRN with CATOBS=7, 8, 9 and 10 are never shown as Isolated Danger and never trigger alerts.

Whatever CATOBS value is, it is necessary to compare every OBSTRN encoded with a value for VALSOU (i.e. different than unknown) to the safety contour value to determine whether the object is an isolated danger or not. It should thus go through CSP OBSTRN07.
If VALSOU is unknown, then EXPSOU should be considered. An OBSTRN with EXPSOU=1 or 3

To fix these issues, S-52 Presentation Library should be changed so that the following objects would go through CSP OBSTRN07

- Floating OBSTRN (WATLEV=7)
- OBSTRN with VALSOU populated with an explicit value

The tests performed for this paper have shown that all ECDISs do not have the same behavior with OBSTRN objects. It seems that some type approved ECDISs run all OBSTRN (including CATOBS=7 – 10) through CSP OBSTRN07. This changes the display and causes alarms.

Other Objects like WRECKS with CATWRK=3 (distributed remains of wreck) and MARCUL are also possibly concerned by the issue identified in this paper.

Conclusions

Current S-52 rules do not display OBSTRN objects correctly in all cases and subsequently the ECDIS does not trigger alerts on objects that can be dangerous for surface navigation.

Recommendations

It is recommended to modify the S-52 Presentation Library Edition 4.0.2 as follows:

- Floating OBSTRN (WATLEV=7)
  - Add a new condition in 10.5.9 Table in Annex A

S-57 Objects	Condition (if any)	Geometric primitive
...	...	...
PILPNT		POINT
PYLONS		POINT, AREA
OBSTRN	**DEPTH_VALUE < = safety contour value	POINT, LINE, AREA
OBSTRN	**WATLEV = 7 (floating)**	**POINT,LINE,AREA**
UWTROC	DEPTH_VALUE < = safety contour value	POINT
WRECKS	DEPTH_VALUE < = safety contour value	POINT, AREA
SOUNDG	EXPSOU=2 and VE3D subfield< = safety contour value	POINT

  - No changes needed for look-up tables
  - No changes needed to CSP OBSTRN07

- OBSTRN with CATOBS=7 to 10
  - No changes needed to 10.5.9 Table in Annex A
  - Changes (in yellow) needed in look-up tables:

Plain and symbolized boundaries

"OBSTRN","","CS(OBSTRN07)","4","S","OTHER","34050"
~~"OBSTRN","CATOBS7VALSOU","SY(FOULGND1);LC(NAVARE51)","4","S","OTHER","34051"~~
"OBSTRN","CATOBS7VALSOU","**CS(OBSTRN07)**","4","S","OTHER","34051"
"OBSTRN","CATOBS8"**VALSOU,"CS(OBSTRN07)**;,"4","S","DISPLAYBASE","12410"
"OBSTRN","CATOBS9"**VALSOU,"CS(OBSTRN07)**);","4","S","DISPLAYBASE","12410"
"OBSTRN","CATOBS10**VALSOU**","**CS(OBSTRN07)**,"4","S","DISPLAYBASE","12410"
"OBSTRN","CATOBS7","SY(FOULGND1);LC(NAVARE51)","4","S","OTHER","34050"
"OBSTRN","CATOBS8","SY(FLTHAZ02);LS(DASH,1,CSTLN)","4","S","DISPLAYBASE","12410"
"OBSTRN","CATOBS9","SY(ACHARE02);LS(DASH,1,CHMGD)","4","S","DISPLAYBASE","12410"
"OBSTRN","CATOBS10","SY(FLTHAZ02);LS(DASH,1,CSTLN)","4","S","DISPLAYBASE","12410"
"OBSTRN","WATLEV7","SY(FLTHAZ02);LS(DASH,1,CSTLN)","4","S","DISPLAYBASE","12410"

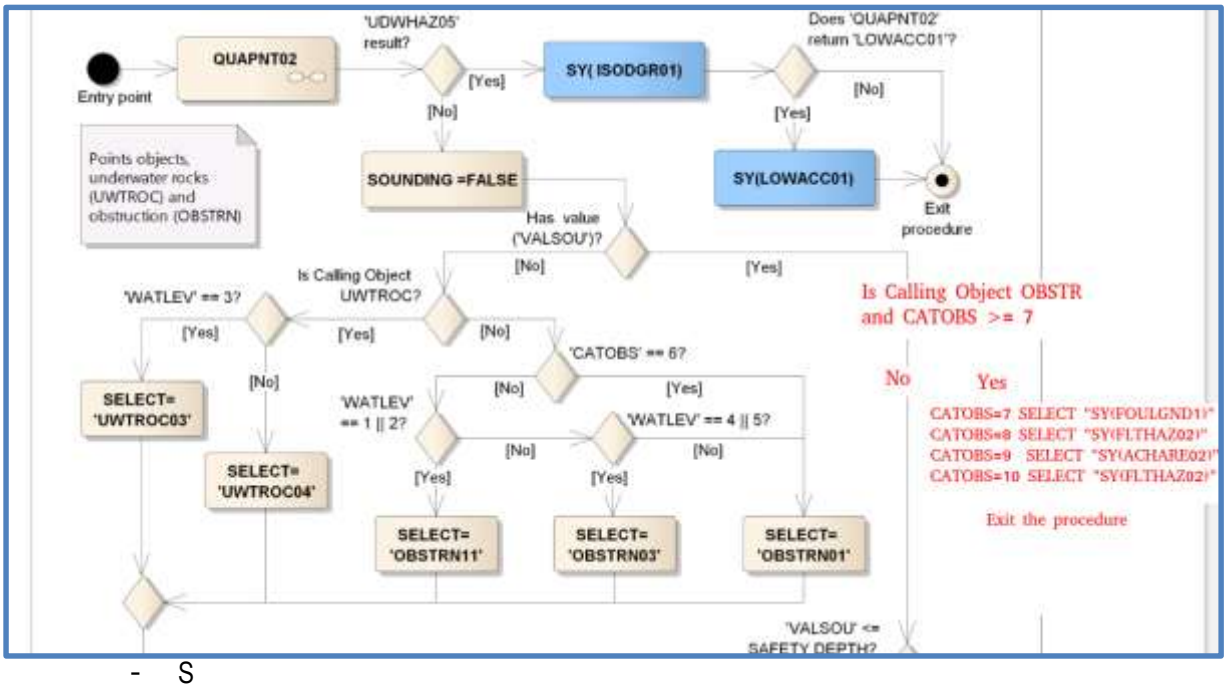
Lines

"OBSTRN","","CS(OBSTRN07)","4","O","OTHER","34050"
"OBSTRN","CATOBS8"**VALSOU,"CS(OBSTRN07)**;,"4","O","DISPLAYBASE","12410"
"OBSTRN","CATOBS9"**VALSOU,"CS(OBSTRN07)**);","4","0","DISPLAYBASE","12410"
"OBSTRN","CATOBS10**VALSOU**","**CS(OBSTRN07)**,"4","0","DISPLAYBASE","12410"
"OBSTRN","CATOBS8","LS(DASH,1,CSTLN)","4","O","DISPLAYBASE","12410"
"OBSTRN","CATOBS9","LS(DASH,1,CHMGD)","4","O","DISPLAYBASE","12410"
"OBSTRN","CATOBS10","LS(DASH,1,CSTLN)","4","O","DISPLAYBASE","12410"
"OBSTRN","WATLEV7","LS(DASH,1,CSTLN)","4","O","DISPLAYBASE","12410"

Paper Chart and Simplfied Points

"OBSTRN","","CS(OBSTRN07)","4","O","OTHER","34050"
~~"OBSTRN","CATOBS7VALSOU","SY(FOULGND1)","4","O","OTHER","34051"~~
~~"OBSTRN","CATOBS8VALSOU","SY(FLTHAZ02)","4","O","OTHER","34051"~~
~~"OBSTRN","CATOBS9VALSOU","SY(ACHARE02)","4","O","OTHER","34051"~~
~~"OBSTRN","CATOBS10VALSOU","SY(FLTHAZ02)","4","O","OTHER","34051"~~
"OBSTRN","CATOBS7VALSOU","**CS(OBSTRN07)**"","4","O","OTHER","34051"
"OBSTRN","CATOBS8VALSOU","**CS(OBSTRN07)**",4","O","OTHER","34051"
"OBSTRN","CATOBS9VALSOU","**CS(OBSTRN07)**","4","O","OTHER","34051"
"OBSTRN","CATOBS10VALSOU","**CS(OBSTRN07)**","4","O","OTHER","34051"
"OBSTRN","CATOBS7","SY(FOULGND1)","4","O","OTHER","34050"
"OBSTRN","CATOBS8","SY(FLTHAZ02)","4","O","OTHER","34050"
"OBSTRN","CATOBS9","SY(ACHARE02)","4","O","OTHER","34050"
"OBSTRN","CATOBS10","SY(FLTHAZ02)","4","O","OTHER","34050"
"OBSTRN","WATLEV7","SY(FLTHAZ02)","4","O","DISPLAYBASE","12410"

- Changes in CSP OBSTRN07 (Annex A, §13.2.5):
  Continuation A (Points)



- S
  - same type of changes to be done for continuations B (lines) and C (areas)

Justification and Impacts

Current S-52 rules do not show as isolated dangers some objects that may be considered dangerous for surface navigation. There is a risk that mariners will not be aware of these objects as they do not trigger alarms on the ECDIS. This can be considered as a critical situation.
This paper could also be passed to the S-101PT for consideration.

Action Required of ENCWG

The ENCWG is invited to:

a. discuss this paper
b. agree with the recommendations
c. take any additional action if needed