INTERNATIONAL HYDROGRAPHIC ORGANIZATION

IHO TEST DATA SETS FOR ECDIS

Draft Edition 3.0.0 – January 2014

Publication No. 64

APPENDIX - INSTRUCTION MANUAL FOR ENC TESTS DATA SETS

Published by the
International Hydrographic Bureau
MONACO

S-64 3.0.0 Test Instruction Manual

Draft 1.1 8th January 2014

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1.0 Introduction

1.1 Change Control History

Version Number	Date of Issue	Author(s)	Brief Description of Change(s)
2.0.0	01/01/2011		Additional test 7.1 added
3.0.0	??/??/2014		Comprehensively expanded and updated to reflect revised S-52 Presentation Library

1.2 Introduction

The International Hydrographic Organization (IHO) Test Data Sets (TDS) for Electronic Chart and Display Information System (ECDIS) have been produced to fulfil the requirement for a data set necessary to accomplish all ECDIS testing requirements as outlined in the IEC 61174 standard. The TDS have been published as IHO Publication Number 64 and consists of numerous data sets required for testing as well as this guide, the TDS Instruction Manual (TIM). The TIM provides supporting documentation about the organization, understanding, and use of the ENC TDS and is intended to be used along with the data sets included in the TDS. It aims to provide appropriate comments about each test including the information about the most suitable data elements, their location and the expected test results.

1.3 Acknowledgements

This document has been developed by the IIC Technologies Inc under contract to the National Oceanic and Atmospheric Administration (USA). Edition 3.0.0 was produced with assistance from BSH, Furuno, Jeppesen, Transas and UKHO.

1.4 Acronyms and Terms

This publication makes extensive use of terms and acronyms described in the IHO S-32 Standard. Additionally, the following acronyms are frequently used:

TDS – Test Data Sets
TIM - TDS Instruction Manual
EUT – Equipment Under Test

1.5 Normative References

This publication provides tests based on the requirements documented in IHO standards. References to the source for a specific test are provided within this document. As specified in the IEC 61174 standard the tests provided are used to ensure conformance to the ECDIS requirements laid out in the IMO performance standard for ECDIS.

Normative References;

IHO S-52 - Specifications for Chart Content and Display Aspects of ECDIS
IHO S-57 - Transfer Standard for Digital Hydrographic Data
IHO S-62 - List of Data Producer Codes
IHO S-63 - Data Protection Scheme

Informative References;

IHO S-32 - Hydrographic Dictionary (provides ECDIS related definitions)
IHO S-65 – ENC Production Guidance

1.6 Key Documents Organizations and Relationships

The development and application of the TDS involves several organizations and related specifications (see Figure 1). In simplest terms, the TDS was produced by the IHO to allow for the complete testing of ECDIS equipment (hardware and software) vis-à-vis the ECDIS Performance Standard. The ECDIS Performance Standard is specified by the International Maritime Organization (IMO) in MSC.232(82), and methods for testing this standard are the responsibility of the International Electrotechnical Commission (IEC) which publishes these requirements in document IEC 61174. All standards are subject to revision. Therefore, users of this are required to use the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid international standards.

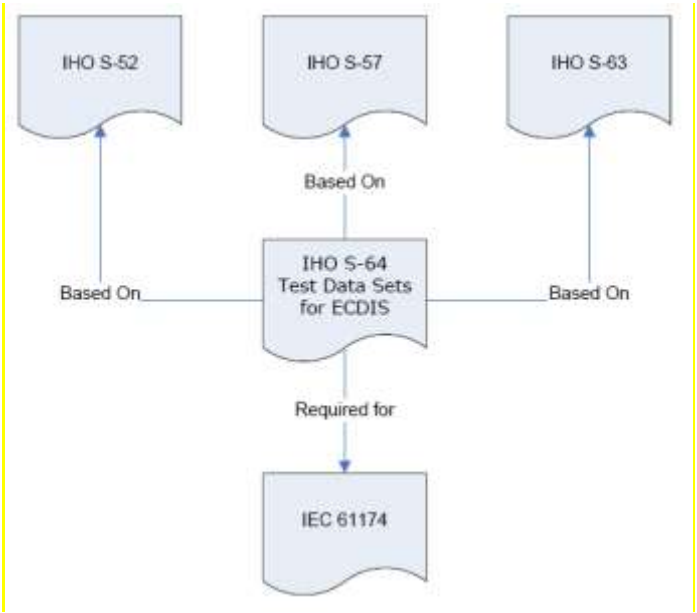


Figure 1 – The TDS and its relationship to other standards.

The S-64 test data set contains both encrypted and unencrypted data. The inclusion of an encrypted dataset, conforming to edition 1.1 of the ENC encryption standard S-63, is so that ECDIS data loading and management operations can be tested under IEC 61174. There is also an unencrypted dataset which tests visualisation and operation aspects of the ECDIS.

1.7 Structure of the Instruction Manual

This document consists of an introduction followed by tests arranged over 6 sections in a task based layout. All tests are listed in a common format which is shown in the example below;

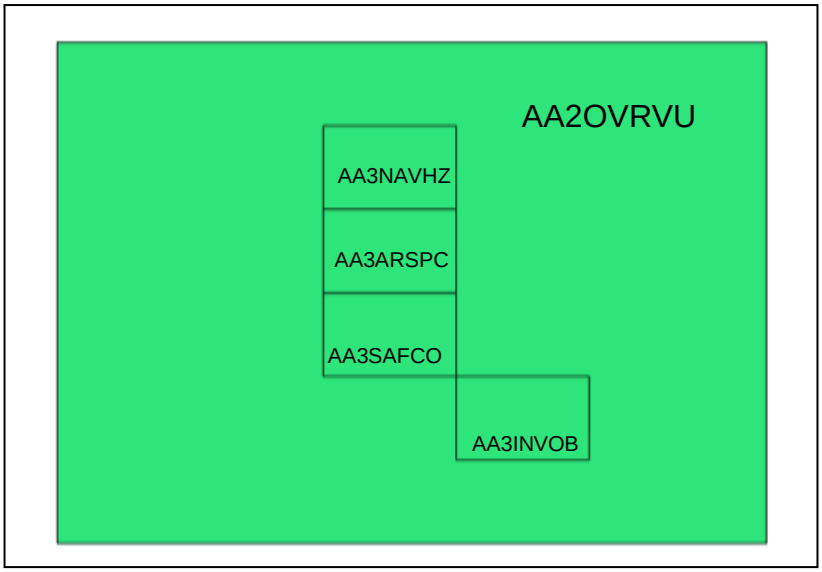
Test reference	(S-64 reference)	IHO reference	(S-52 Part I/S-57)*

Test description
As short description of what the test covers.
Set up
The configuration required to perform the test including cells to be loaded, settings to be applied and any other information as required. Where appropriate this should use the form centre the display on "location" set scale to "scale value".(within this document the scale value assumes the EUT has a screen of the minimum specified size)
Action
The action which the test executor must perform.
Result
The result which the test executor must observe to complete the test.

*References to S-52 without brackets are to Annex A Part I, references in square brackets refer to the main S-52 document itself.

1.8 Organization of the TDS

The TDS contains a folder/directory for each section of the TIM which requires test data. Depending on the test requirement, the folder may also contain an ENC_ROOT directory containing the files of the exchange set (CATALOG.031, .000, plus any updates or other optional/related files, e.g. .TIFF, .txt necessary). Each ENC_ROOT directory also contains a readme.txt file, which may have additional information regarding the content or usage of the files. The TDS data for encrypted data, located in section 2.5, contains multiple exchange sets, each with their own ENC_ROOT directory and full test scripts describing how to use the data. The location (or path) of ENC exchange set and/or ENC cell will be indicated using italic notation, e.g. *2.1.1 Power Up\ENC_ROOT\GB4X000.000* To conform to the directory structure as defined in S-57 Appendix B.1 Section 5.4.3, the ENC_ROOT directory should be located in the media's root directory. This should be viewed as a requirement. However, in practical terms, many systems can "browse" and load files from almost any location. Consult with the equipment manufacturer for further information.



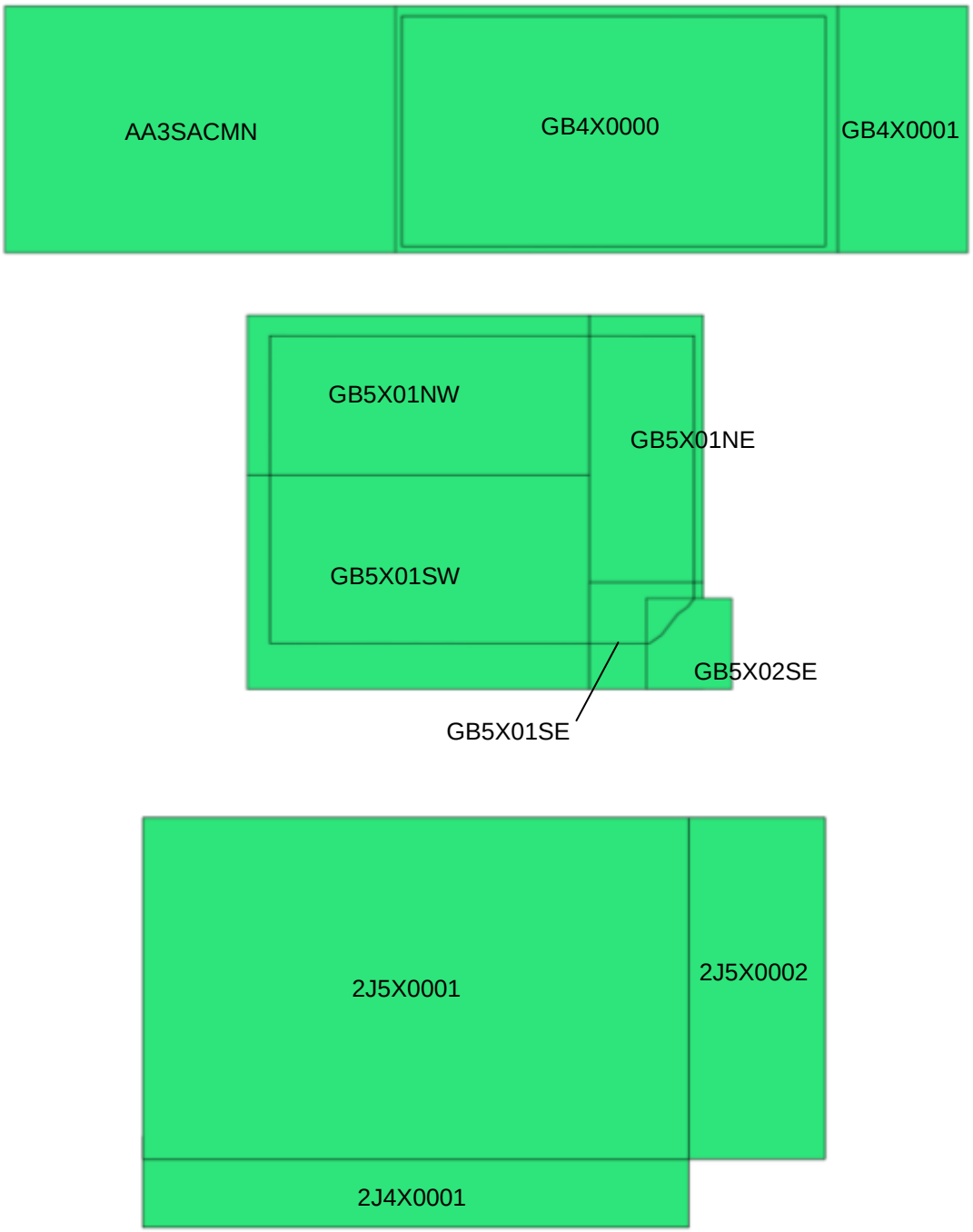


Figure 2 – ENC TDS Cell Coverage

1.9 Required Test Items and Use of the TDS

This section lists the items required for the execution of Tests specified in this document and how the TDS should be used. The following items are required;

– IHO ECDIS presentation library contained in S-52, appendix 2 including an ECDIS chart 1 and colour differentiation diagrams. If the manufacturer provides his own presentation library, Chart 1 has to be adapted accordingly;

– IHO S-64 test data sets for ECDIS which includes ENC data, both encrypted and unencrypted, and its updates, together with the associated instruction manual.

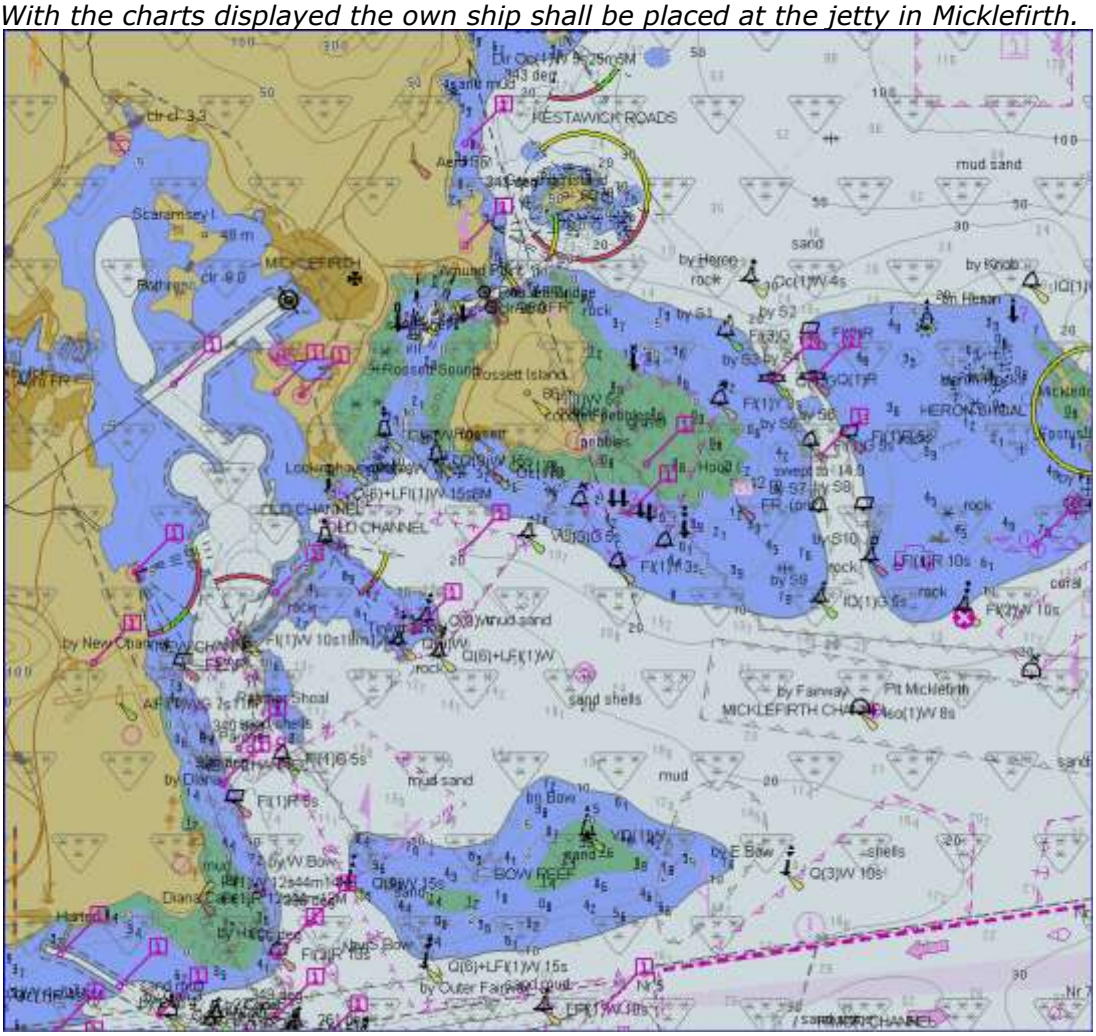
- SENC test data sets, if supported from each SENC distributor.

The first item in the list, the IHO ECDIS presentation library (from S-52, Appendix 2) including an ECDIS Chart 1 and colour differentiation diagrams must be acquired and installed on the equipment under test (EUT) by the manufacturer, prior to the beginning of the tests.
The second item, the IHO TDS is provided as part of S-64, including the encrypted data. ~~A second TDS for data encrypted using the IHO Encryption Scheme is available from the IHO (www.iho.int) as part of IHO Publication S-63.~~
This document is to be considered the "Instruction Manual". The third item on the list, SENC test data set, if supported, must be provided by the manufacturer.

2.0 Chart Loading and Updating

2.1 Chart Loading of Unencrypted ENCs

2.1.1 Preparation and Power Up

Test reference	2.1.1	IHO reference	IEC 61174/ 4.4.1
Test description			
Loading of initial datasets and indication of own ship stationary position.			
Set up			
Load cells *2.1.1 Power Up\ENC_ROOT\GB4X0000.000* *2.1.1 Power Up\ENC_ROOT\GB5X01NW.000* *with the following settings;* *Select Viewing group layer Other* *Set the safety contour value to 8 m* *Set the safety depth value to 8 m* *Select Symbolized Boundaries* *Select Paper chart symbols Ship position 32°29.66'S, 060°55.86'E* *Heading 234.0 degrees*			
Action			
Load cells and view the chart display.			
Result			
With the charts displayed the own ship shall be placed at the jetty in Micklefirth.  *After loading of GB4X0000.000, displayed scale 1:50 000*			

After loading of GB5X01NW.000, displayed scale 1:20 000

2.1.2 Number and date in chart library

Test reference	2.1.2	IHO reference	IEC 61174/ 4.4.1
Test description			
Loading of initial datasets and confirmation of information in chart library.			
Set up			
Load all cells from *2.1.1 Power Up\ENC_ROOT*			
Action			
Check that in the chart library the information about the cells is provided follows;			

ENC	Edition (EDTN)	Update Number (UPDN)	Update Application Date (UADT)	Issue Date (ISDT)
GB4X0000.000	2	0	20010409	20010409
GB5X01NE.000	1	0	20010406	20010406
GB5X01NW.000	2	0	20010406	20010406
GB5X01SE.000	1	0	20010406	20010406
GB5X01SW.000	1	0	20010408	20010408
GB5X02SE.000	1	0	20010407	20010407

Result
The information in the chart library shall be identical to the above table.

2.1.3 Load additional cell and check chart library

Test reference	2.1.3	IHO reference	IEC 61174/ 4.4.1
Test description			
Loading additional cell and confirmation of its addition to the chart library.			
Set up			
As for test 2.1.2			
Action			
Load the following cell 3.3 Settings\ENC_ROOT\GB4X0001.000 *Check that in the chart library the details of the cell have been added.*			
Result			
The information in the chart library shall reflect the cell loaded and the chart coverage shall have changed accordingly.			

2.1.4 Remove cell and check chart library

Test reference	2.1.4	IHO reference	IEC 61174/ 4.4.1
Test description			
Removing a cell and confirmation of its removal from the chart library.			
Set up			
As on completion of test 2.1.3			
Action			
Remove the following cell GB4X0001.000 *Check that in the chart library the details of the cell have been removed.*			
Result			
The information in the chart library shall reflect the cell loaded and the chart coverage shall have changed accordingly.			

2.1.5 Loading of Corrupted Data

Test reference	2.1.5	IHO reference	IEC 61174/ 4.4.1
Test description			
Loading corrupt data.			
Set up			
-			
Action			
Load the following cell: *2.1.5 Loading Corrupt Data\ENC_ROOT\GB5X01NE.000*			
Result			
The EUT shall generate a warning when loading of this file is attempted and reject installation.			

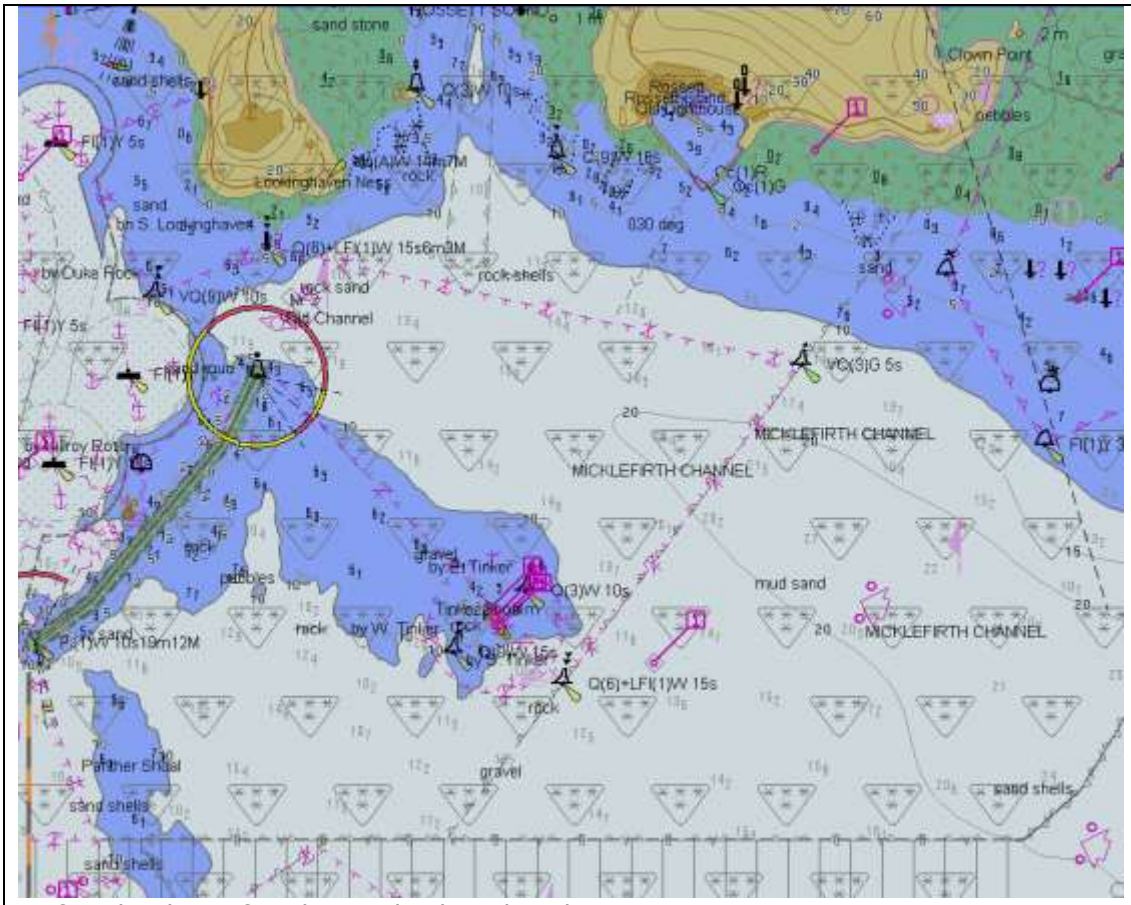
2.2 Automatic updates of Unencrypted ENCs

2.2.1 Loading corrupted update

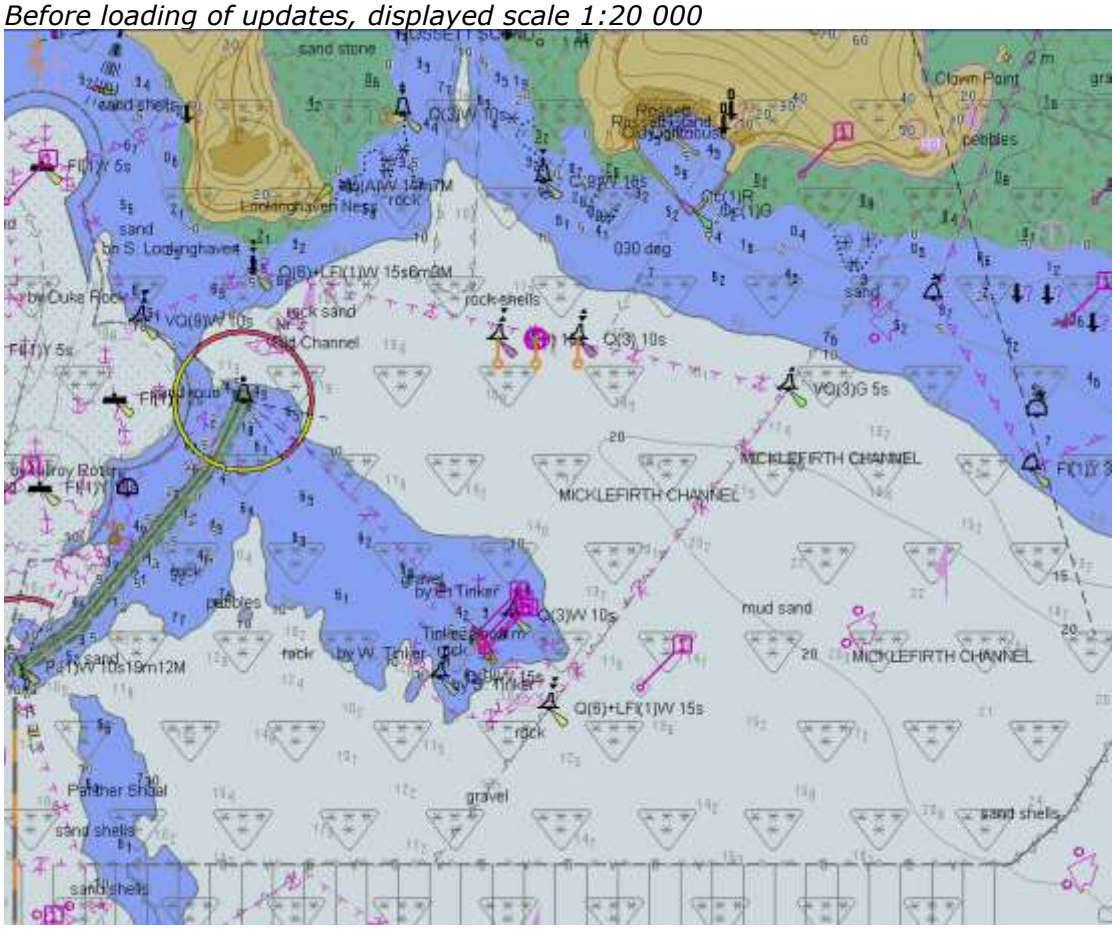
Test reference	2.2.1	IHO reference	S-52 appendix 1/3.4.1f, 3.4.2d and IEC 61174/ 4.4.2
Test description			
Loading corrupt update files.			
Set up			
Load the following cell: *2.1.1 Power Up\ENC_ROOT\GB5X01SW.000*			
Action			
Load the following updates: *2.2.1 Corrupt Update\ENC_ROOT*			
Result			
The update process shall stop, the update flagged as invalid, and the user provided with an appropriate message.			

2.2.2 Loading sequential update

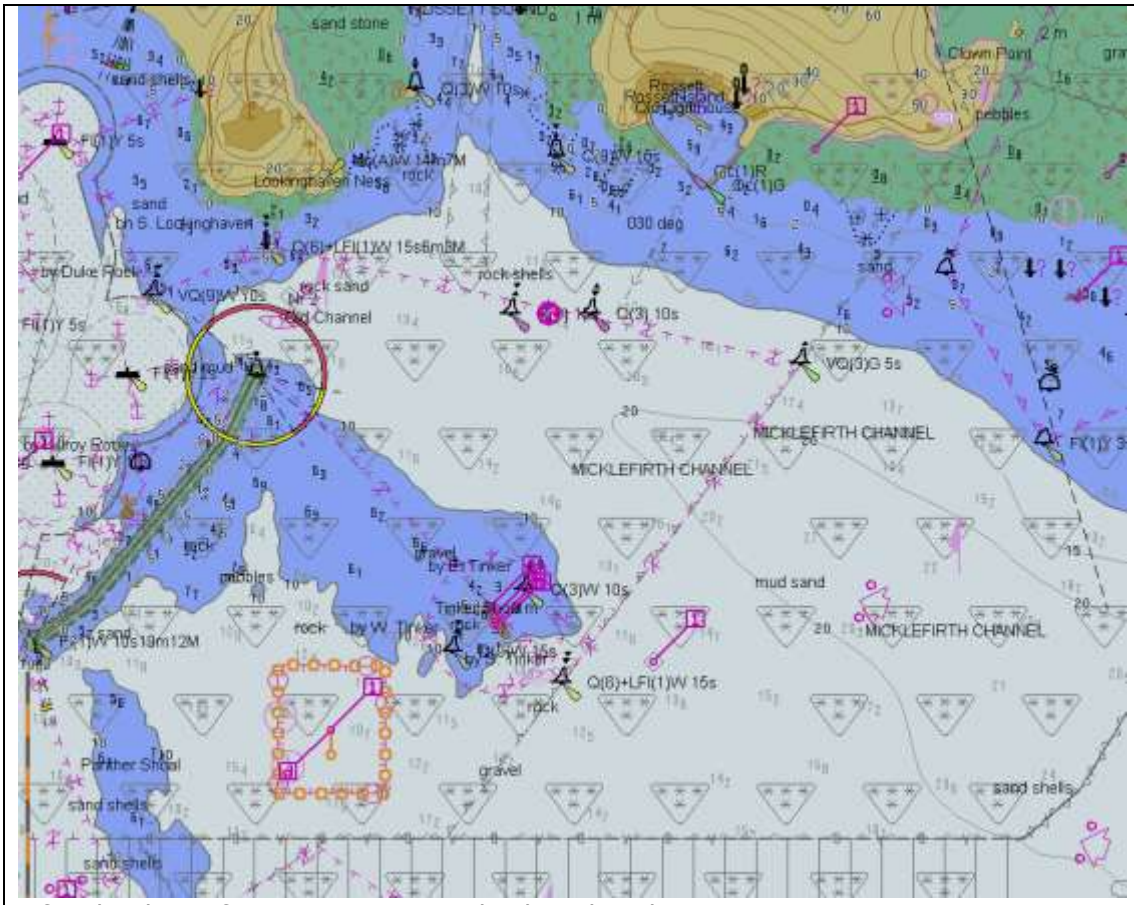
Test reference	2.2.2	IHO reference	S-52 appendix 1/3.4.2f and IEC 61174/ 4.4.2
Test description			
Loading correct sequential update files.			
Set up			
As for test 2.1.2			
Action			
Load the following five updates: *2.2.2 Loading of Updates\ENC_ROOT*			
Result			
The update process shall install all updates (up to update no. 5) and indicate it in an appropriate summary report which shall contain the following information: - *identification of issuing authority;* - *update numbers of the update files;* - *cell identifiers of cells affected;* - *edition number and date of cell involved;* - *number of updates in the affected cells.*			



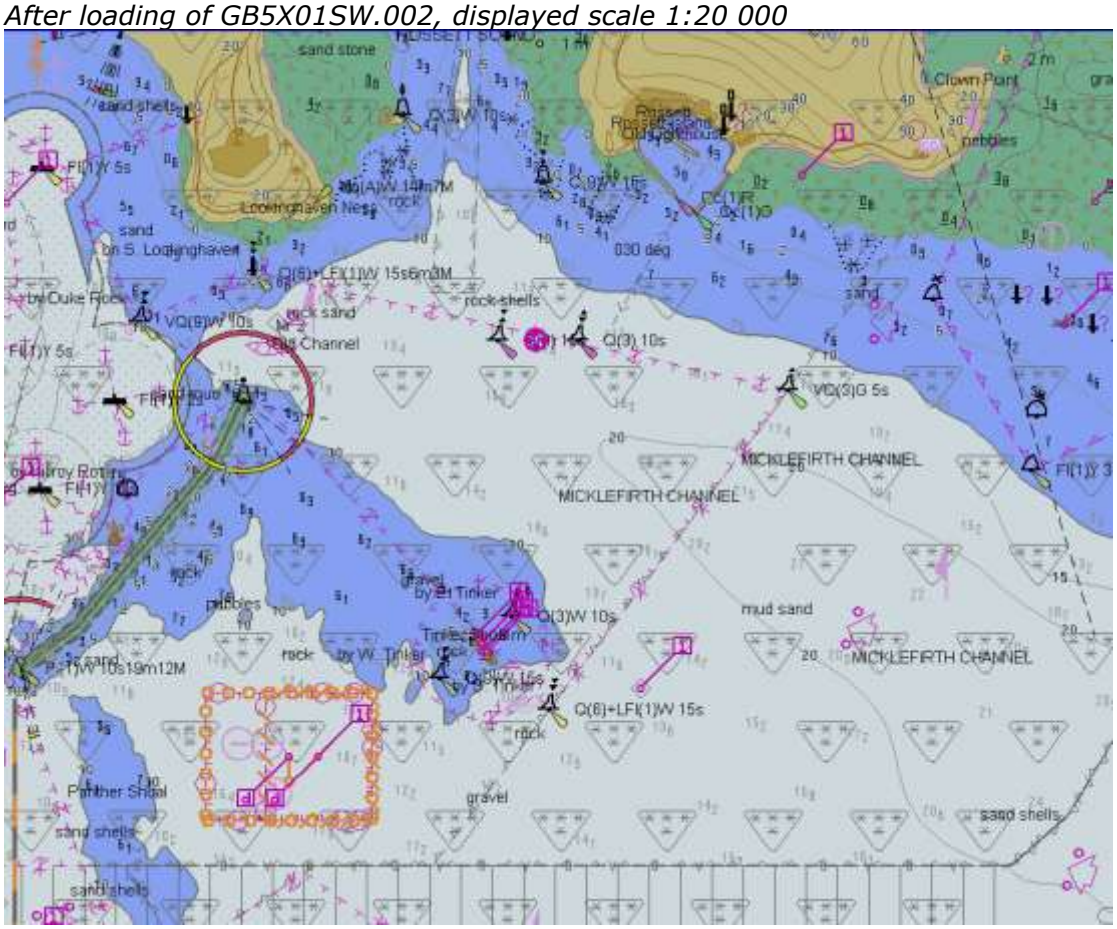
Before loading of updates, displayed scale 1:20 000



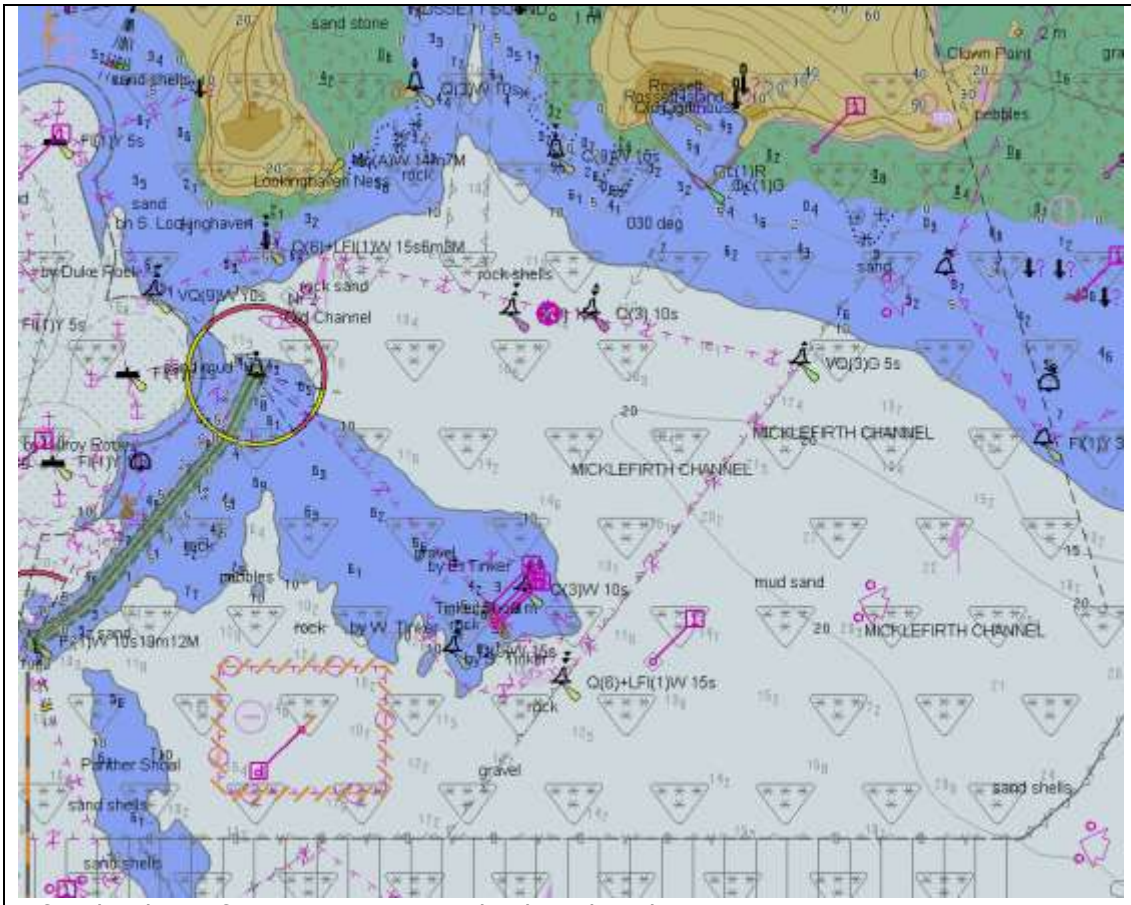
After loading of GB5X01SW.001, displayed scale 1:20 000



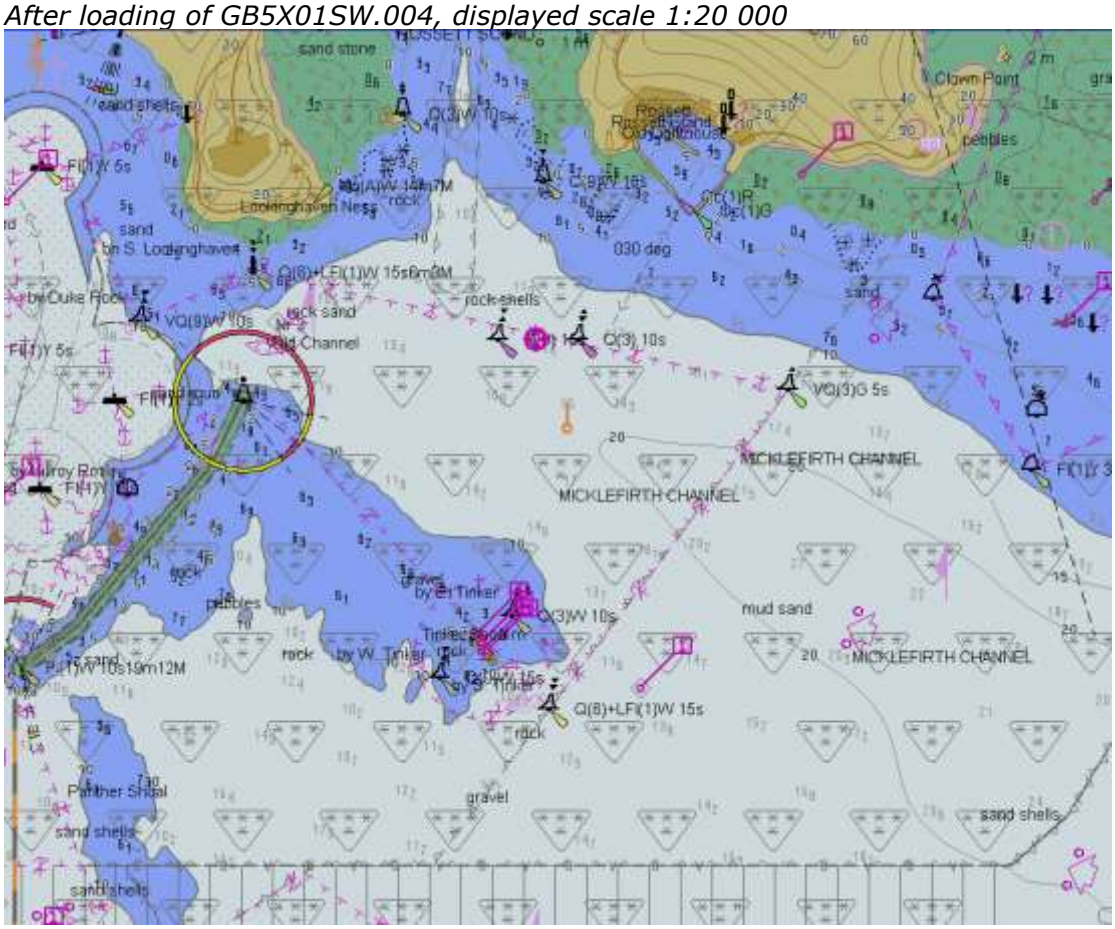
After loading of GB5X01SW.002, displayed scale 1:20 000



After loading of GB5X01SW.003, displayed scale 1:20 000



After loading of GB5X01SW.004, displayed scale 1:20 000



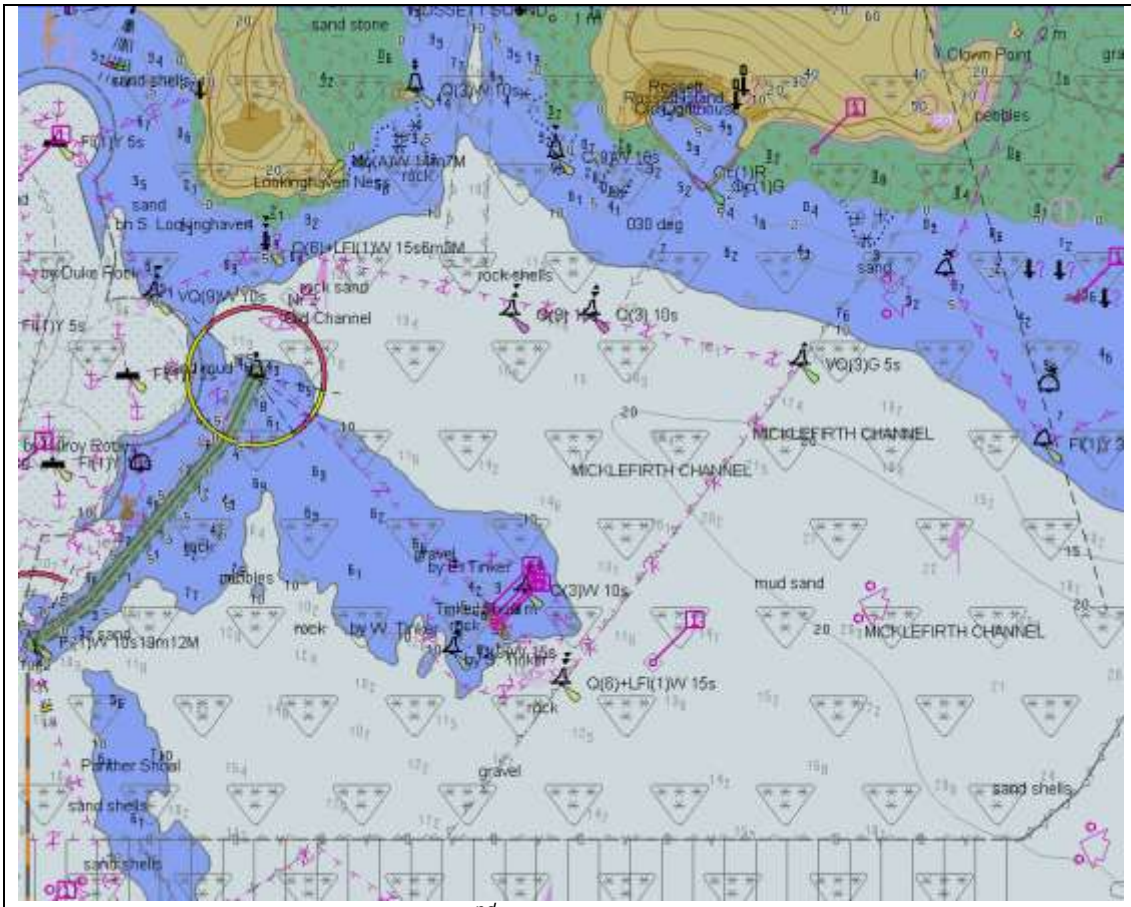
After loading of GB5X01SW.005, displayed scale 1:20 000

2.2.3 Loading update in an invalid sequence

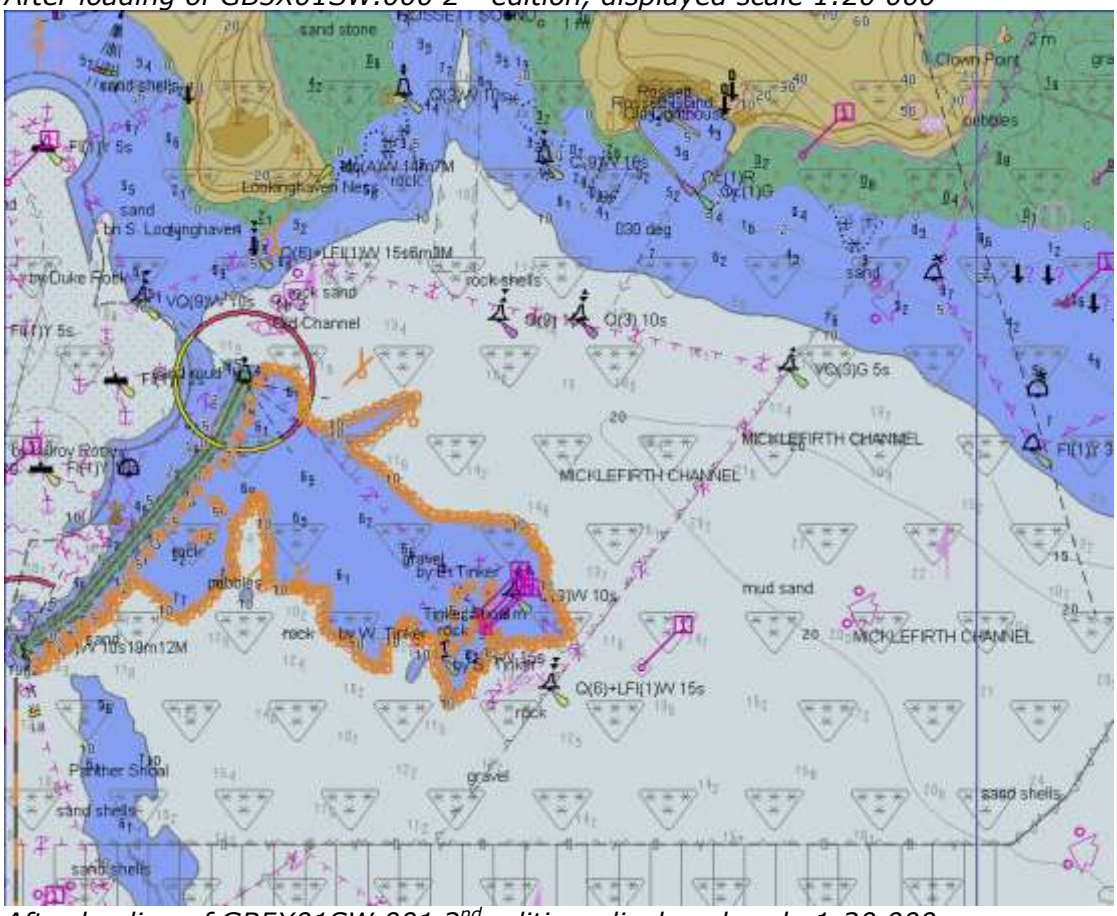
Test reference	2.2.3	IHO reference	S-52 appendix 1/3.4.2c and IEC 61174/ 4.4.2
Test description			
Loading update files in an invalid sequence.			
Set up			
As result of test 2.2.2 *Load the following cell:* *2.1.1 Power Up\ENC_ROOT\GB5X01SW.000*			
Action			
Load the following five updates: *2.2.3 Loading of Invalid Sequence\ENC_ROOT*			
Result			
The update process shall install the updates up to update no. 3 and reject the installation of updates no. 4 and 5 with appropriate indication.			

2.2.4 Loading update of newer edition

Test reference	2.2.4	IHO reference	S-52 appendix 1/3.4.2c and IEC 61174/ 6.8.16.1
Test description			
Loading update file of a newer edition than base cell installed.			
Set up			
As result of test 2.2.3 *Load the following cell:* *2.1.1 Power Up\ENC_ROOT\GB5X01SW.000 (edition 1)*			
Action			
1. Load the following update: *2.2.4 Loading of New Update\ENC_ROOT|GB5X01SW.001 (edition 2)* *2. Display installed chart.* *3. Install the following base cell:* *2.2.5\Good Base Cells\ENC_ROOT\GB5X01SW.000 (edition 2); and load the following update:* *2.2.4 Loading of New Update\ENC_ROOT|GB5X01SW.001 (edition 2)* *4. Display installed chart.*			
Result			
1. The update process shall refuse to install the update and inform the user that chart data of a newer edition are available by displaying SSE 27 (IHO Data Protection Scheme). *2. A warning SSE 27 shall be permanently available in the chart display area when such a chart is in use (either displayed on chart area or used as largest scale available for chart related alerts and indications).* *3. Base cell and update shall be installed without any warning or error.* *4. The SSE 27 shall not further be displayed.*			



After loading of GB5X01SW.000 2nd edition, displayed scale 1:20 000



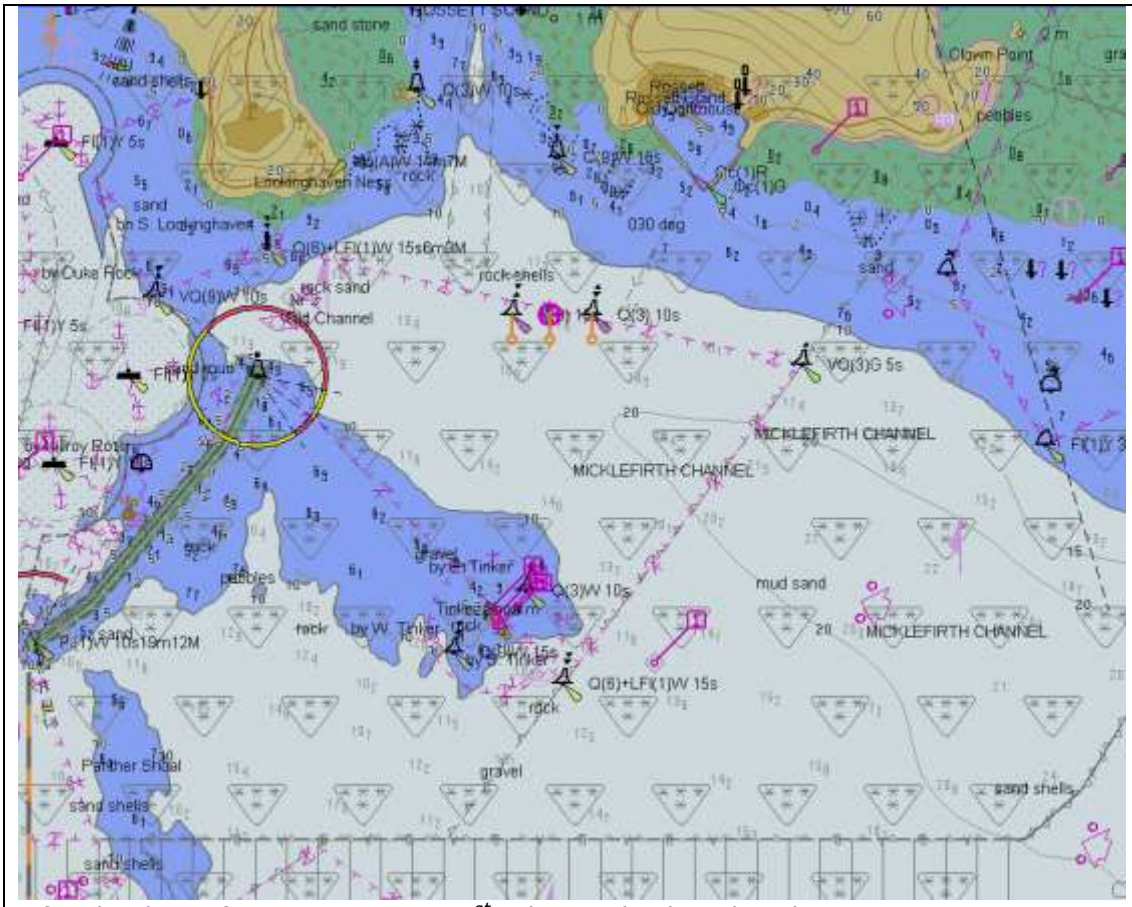
After loading of GB5X01SW.001 2nd edition, displayed scale 1:20 000

2.2.5 Loading update of older edition

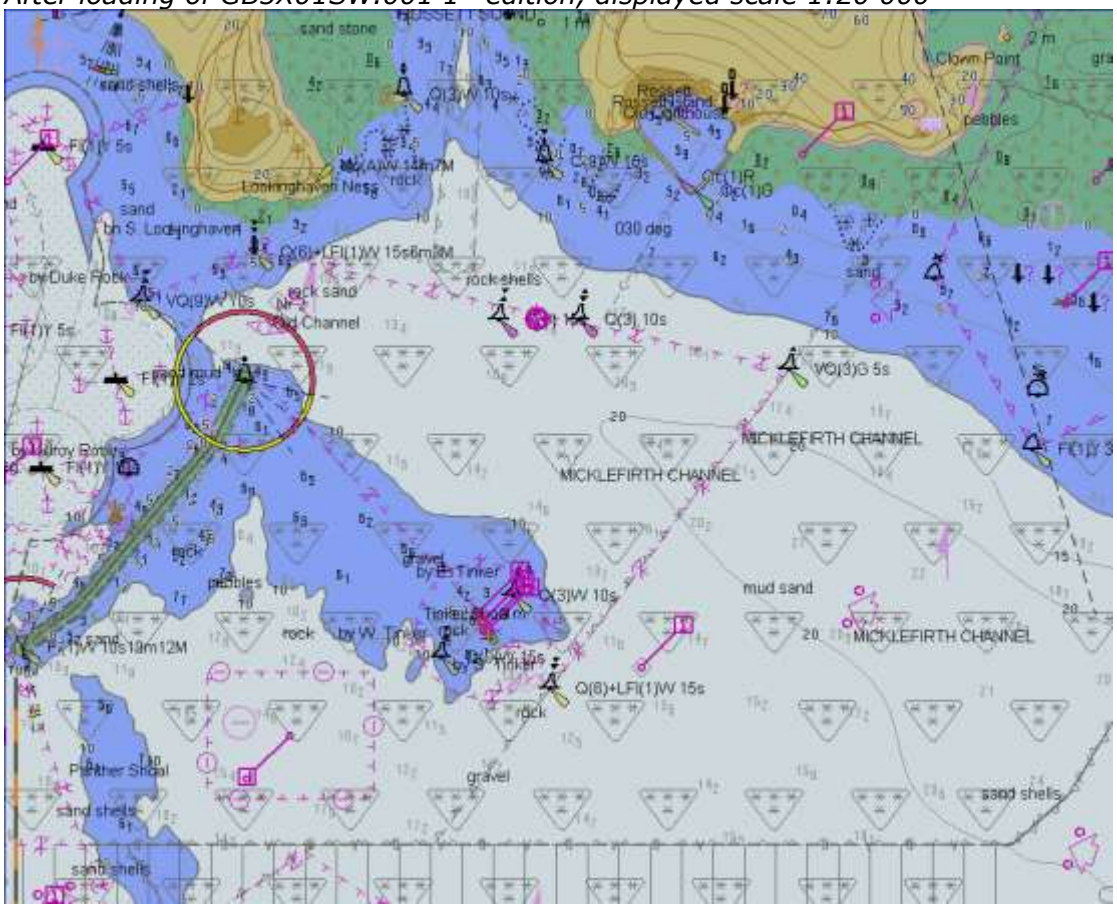
Test reference	2.2.5	IHO reference	S-52 appendix 1/3.4.2c and IEC 61174/ 4.4.2
Test description			
Loading update file of a newer edition than base cell installed.			
Set up			
Load the following cell: *2.2.5\Good Base Cells\ENC_ROOT\GB5X01SW.000 (edition 2)*			
Action			
Load the following update: *2.2.5\ Old Update\ENC_ROOT\ (edition 1)*			
Result			
The update shall not be applied successfully and the system shall provide an indication (either on screen or in an error log) the reason the update was not applied, e.g. "Incorrect Edition Number 1 [of update]: expecting 2"			

2.2.6 Loading a re-issue of a data set

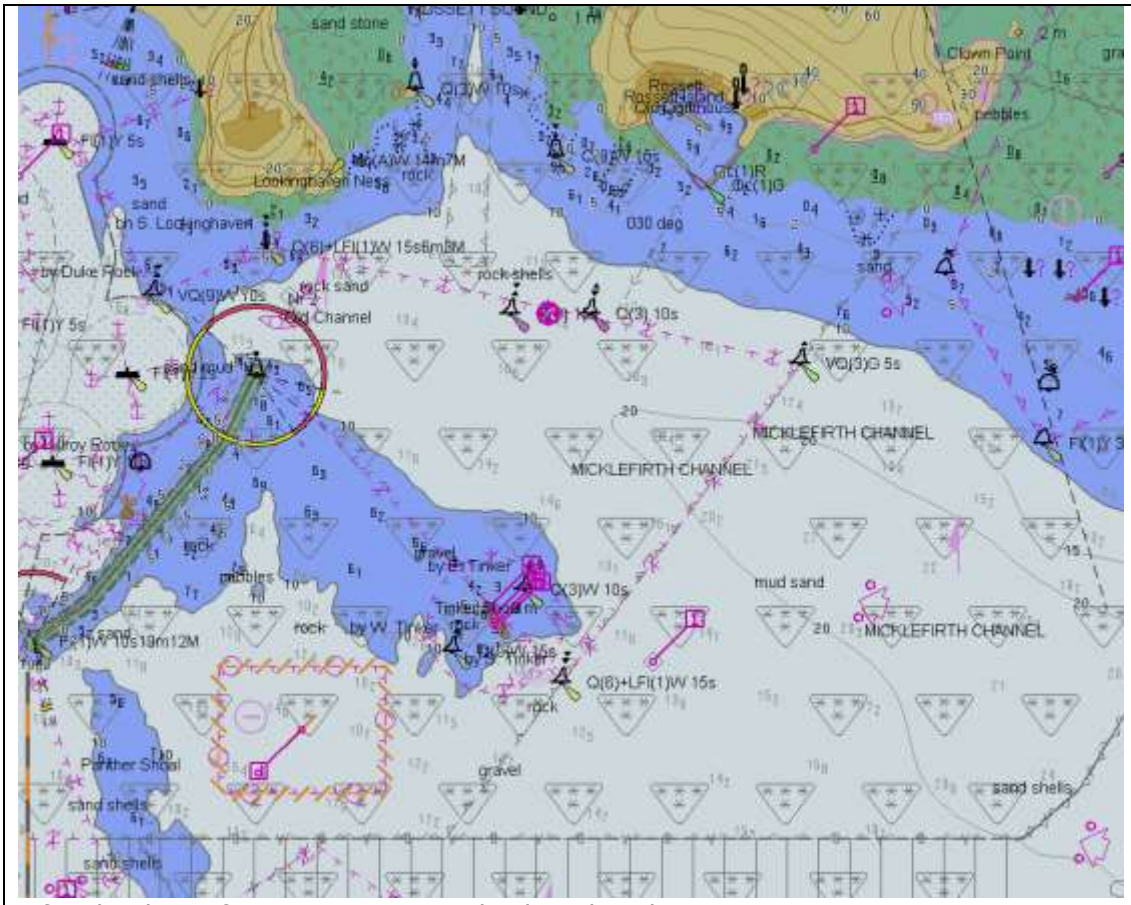
Test reference	2.2.6	IHO reference	S-52 appendix 1/3.4.1a and IEC 61174/ 4.4.2
Test description			
Loading a re-issue of a data set.			
Set up			
As result of test 2.1.1 *Load the following cell:* *2.1.1 Power Up\ENC_ROOT\GB5X01SW.000 (edition 1)*			
Action			
Load the following updates in sequence: *2.2.6 Reissue\GB5X01SW_001\ENC_ROOT\GB5X01SW.001 (edition 1)* *2.2.6 Reissue\GB5X01SW_004\ENC_ROOT\GB5X01SW.000 (reissue, edition 1, update 3 included)* *2.2.6 Reissue\GB5X01SW_REISSUE\ENC_ROOT\GB5X01SW.004 (edition 1)*			
Result			
The updates and re-issue shall be applied successfully.			



After loading of GB5X01SW.001 1st edition, displayed scale 1:20 000



After loading of GB5X01SW.000 reissue, edt 1, upd 3, displayed scale 1:20 000



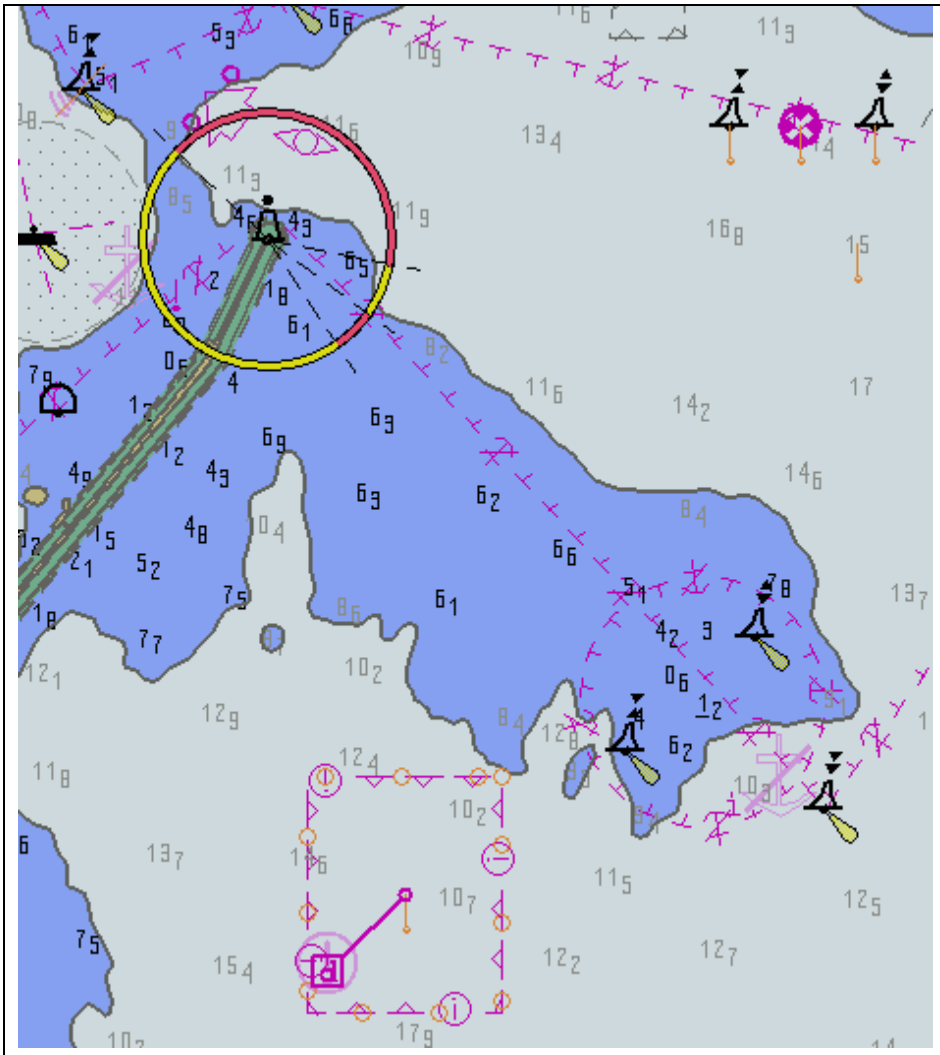
After loading of GB5X01SW.004, displayed scale 1:20 000

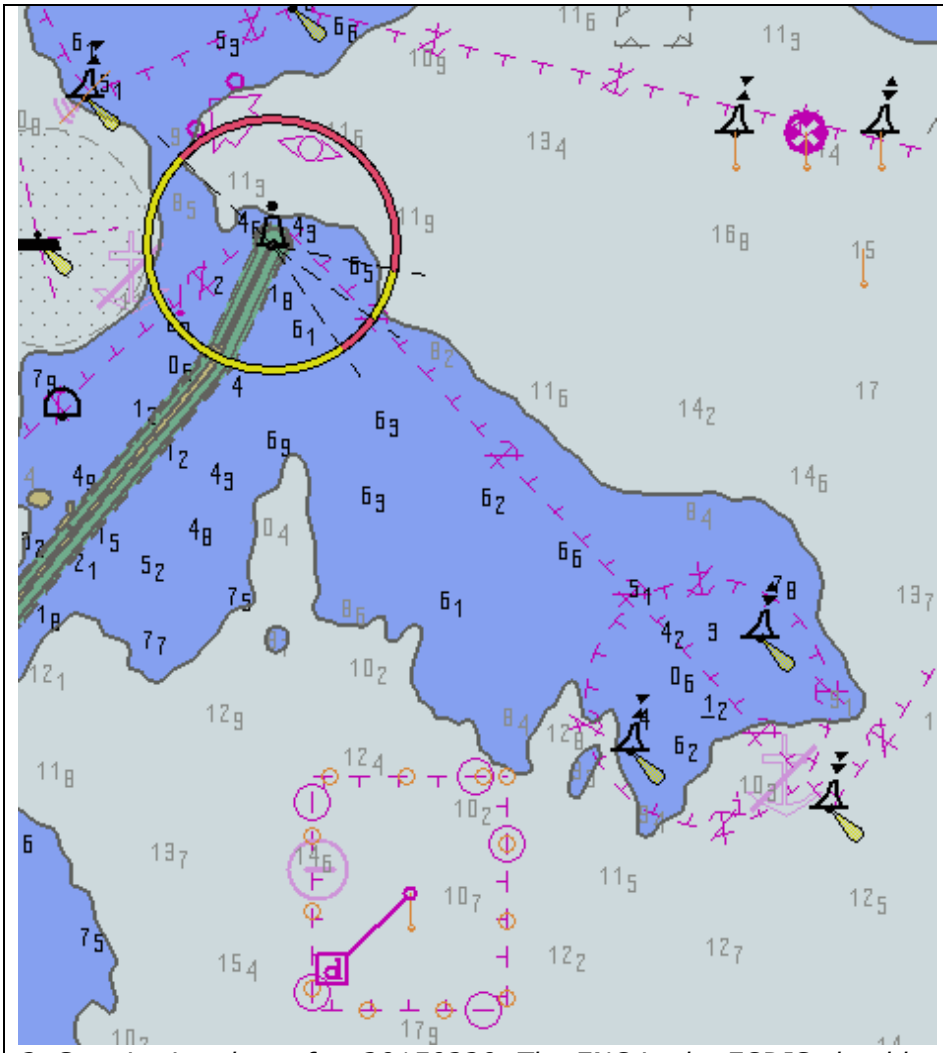
2.2.7 Loading cancellation update

Test reference	2.2.7	IHO reference	S-52 appendix 1/3.4.1a and IEC 61174/ 4.4.2
Test description			
Loading cancellation update.			
Set up			
Load the following cell: *2.1.1 Power Up\ENC_ROOT\GB4X0000.000*			
Action			
Load the following update: *2.2.7 Cancellation\ENC_ROOT\GB4X0000.001*			
Result			
The system shall report any cell(s) that have been identified as cancelled at load time. A message shall be displayed informing the user of the cell name. Depending on the method adopted by the OEM for managing cancelled cells one of the following conditions must be observed: *1. The cancelled cell cannot be viewed in the ECDIS* *2. The cancelled cell can be viewed in the ECDIS with the warning message defined in S-63 and specified below:* *"Cell <name> has been cancelled and may not be up to date. Under no circumstances should it be used for primary navigation".* ***Clarification:*** *Systems that remove cells without consulting the user do not have to provide a warning message at load time.*			

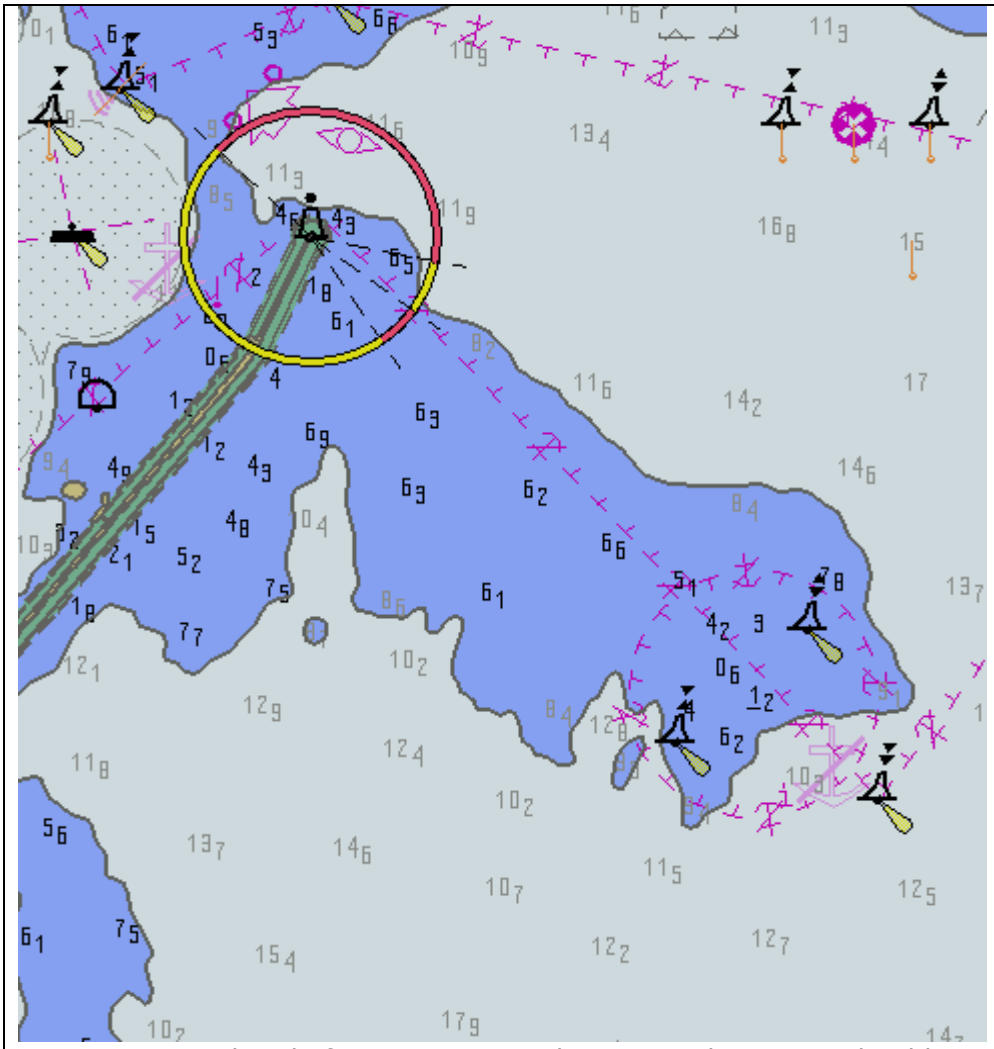
2.3 Manual Updates

Test reference	2.3	IHO reference	S-52 appendix 1/3.4.4 and IEC 61174/ 6.8.17
Test description			
Manual updates.			
Set up			
Load the following cell: *2.1.1 Power Up\ENC_ROOT\GB5X01SW.000*			
Action			
1. Using the editing tools available with the EUT, make the following changes and include a short textual description of the action to a-g: *a. insert a dangerous wreck near: 32 31.5S, 60 57.3E* *b. insert East Cardinal buoys near: 32 31.5S, 60 57.46E* *c. insert West Cardinal buoy near: 32 31.5S, 60 57.16E;* *d. insert a prohibited entry area between Panther and Tinker Shoals timed to come into force at 20150220;* *e. insert a cautionary area in the same location being in force from date of issue to 20150220;* *f. insert 15 metre sounding at 32 31.7S, 60 57.4E.* *g. delete fog signal of cardinal buoy at 32 31.444S, 60 55.842E* *2. Set viewing date before 201150220. Display chart cell with manual updates.* *3. Set viewing date after 201150220. Display chart cell with manual updates.* *4. Using the editing tools available with the EUT, make the following changes and include a short textual description of the action to h-j:* *h. extend western limits of the prohibited entry area;* *i. delete cautionary area;* *j. move cardinal buoy at 32 31.444S, 60 55.842E, including top mark and light, to 32 31.500S, 60 55.700E.* *5. Set viewing date before 201150220. Display chart cell with manual updates.* *6. Set viewing date after 201150220. Display chart cell with manual updates.* *7. Review manual updates.* *8. Retrieve textual description from record.* *9. Remove all manual updates from display and review them (system time and date may need to be adjusted for verification).*			
Result			
2. Set viewing date before 20150220. The ENC in the ECDIS should match the corresponding graphical plot shown below. Manual updates shall be distinguishable as described in S-52 appendix 2/2.3.4.			

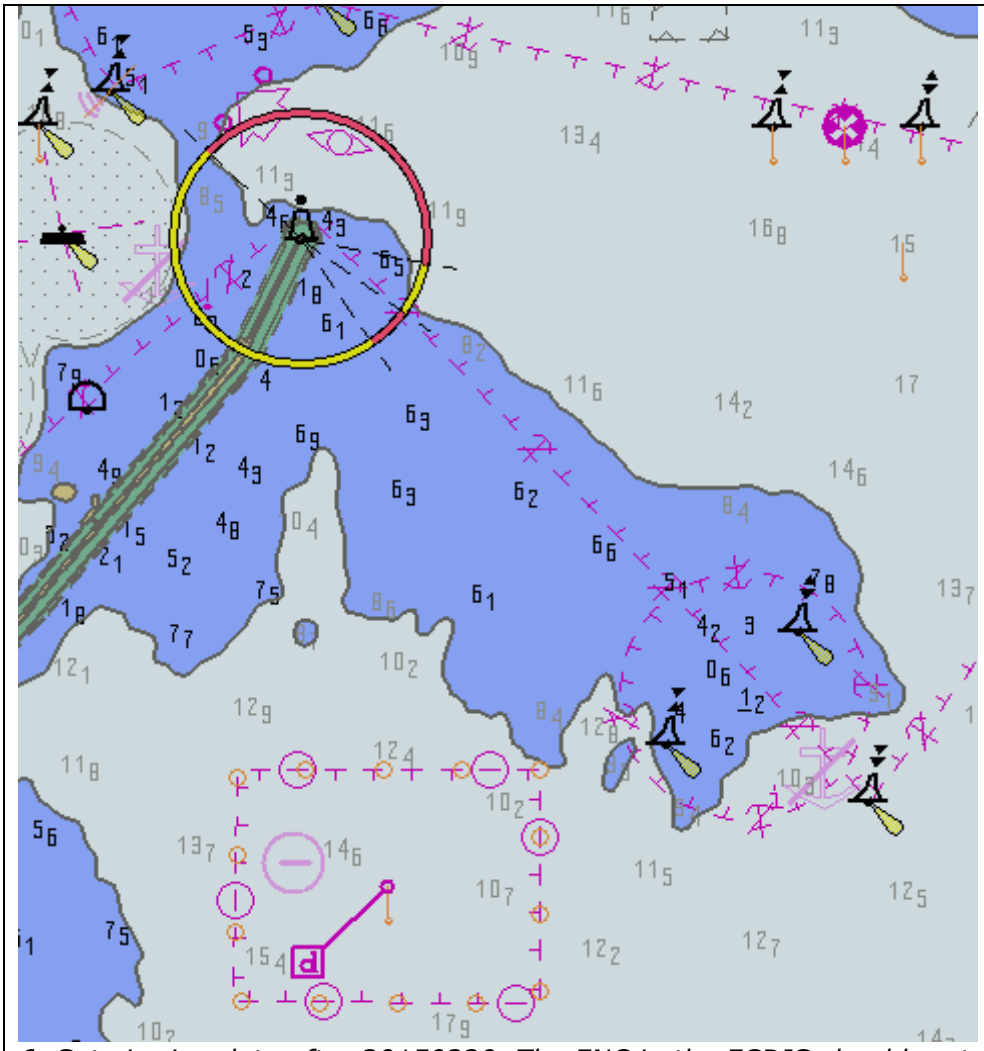




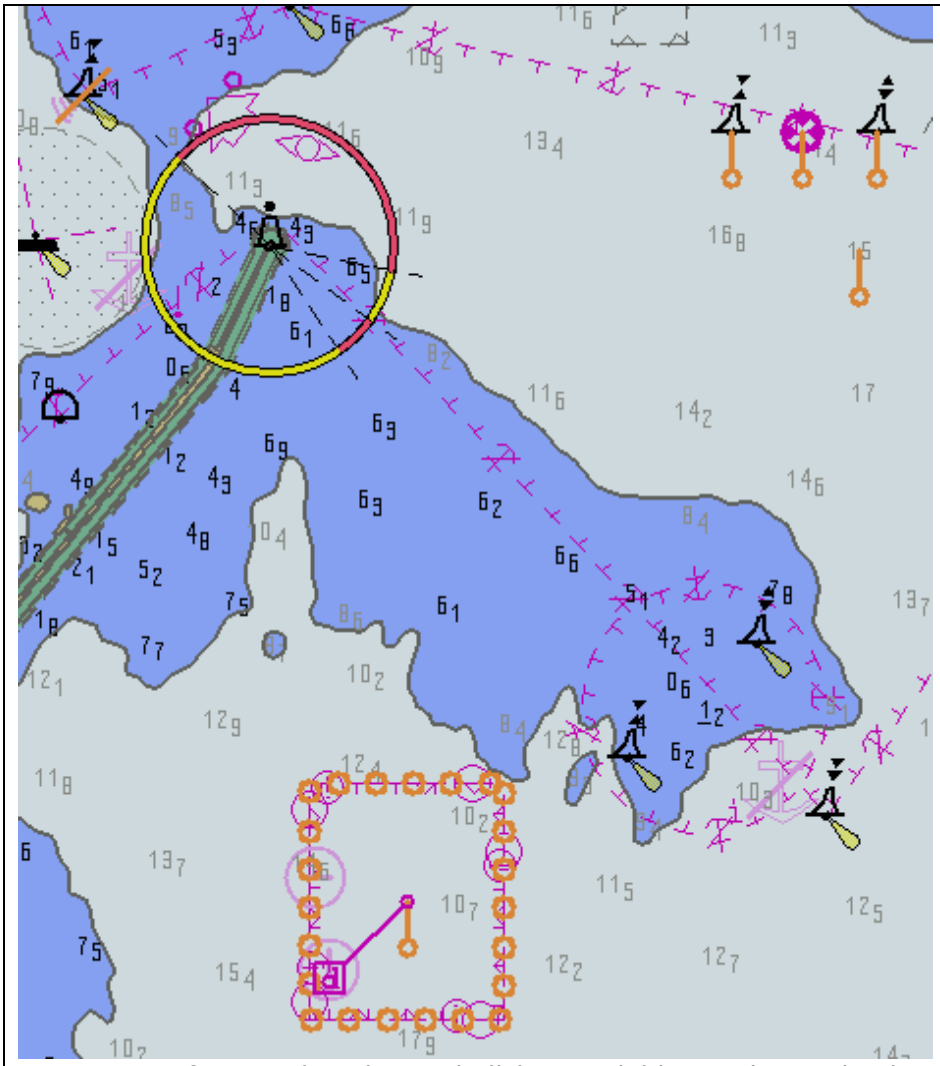
3. Set viewing date after 20150220. The ENC in the ECDIS should match the corresponding graphical plot shown above.



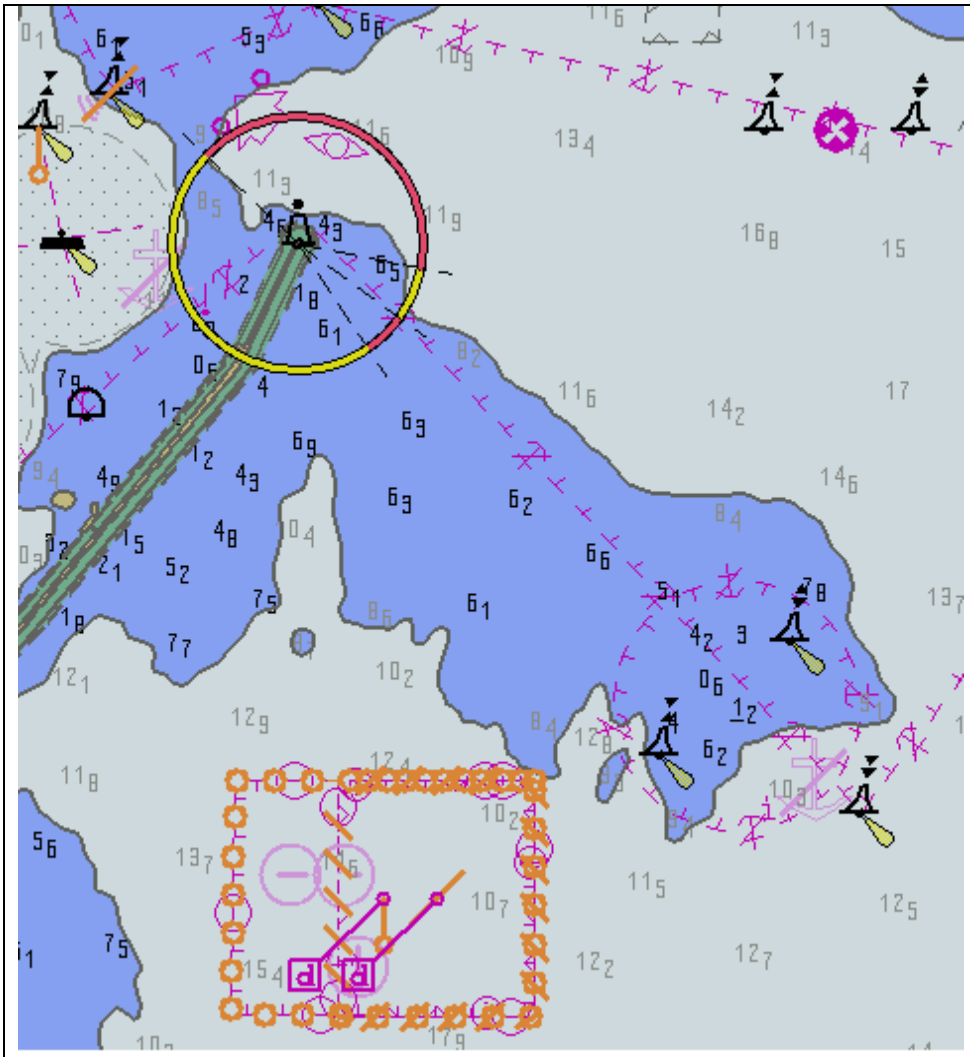
5. Set viewing date before 20150220. The ENC in the ECDIS should match the corresponding graphical plot shown above



6. Set viewing date after 20150220. The ENC in the ECDIS should match the corresponding graphical plot shown above.



7. Review of manual updates shall be available on demand. Above is review of updates a-g.



7. Review of manual updates shall be available on demand. Above is review of updates h-i.

8. Textual description of manual update shall be retrievable from record.

9. Manual updates removed from the display during the last 3 months period shall be retained and shall be available for review.

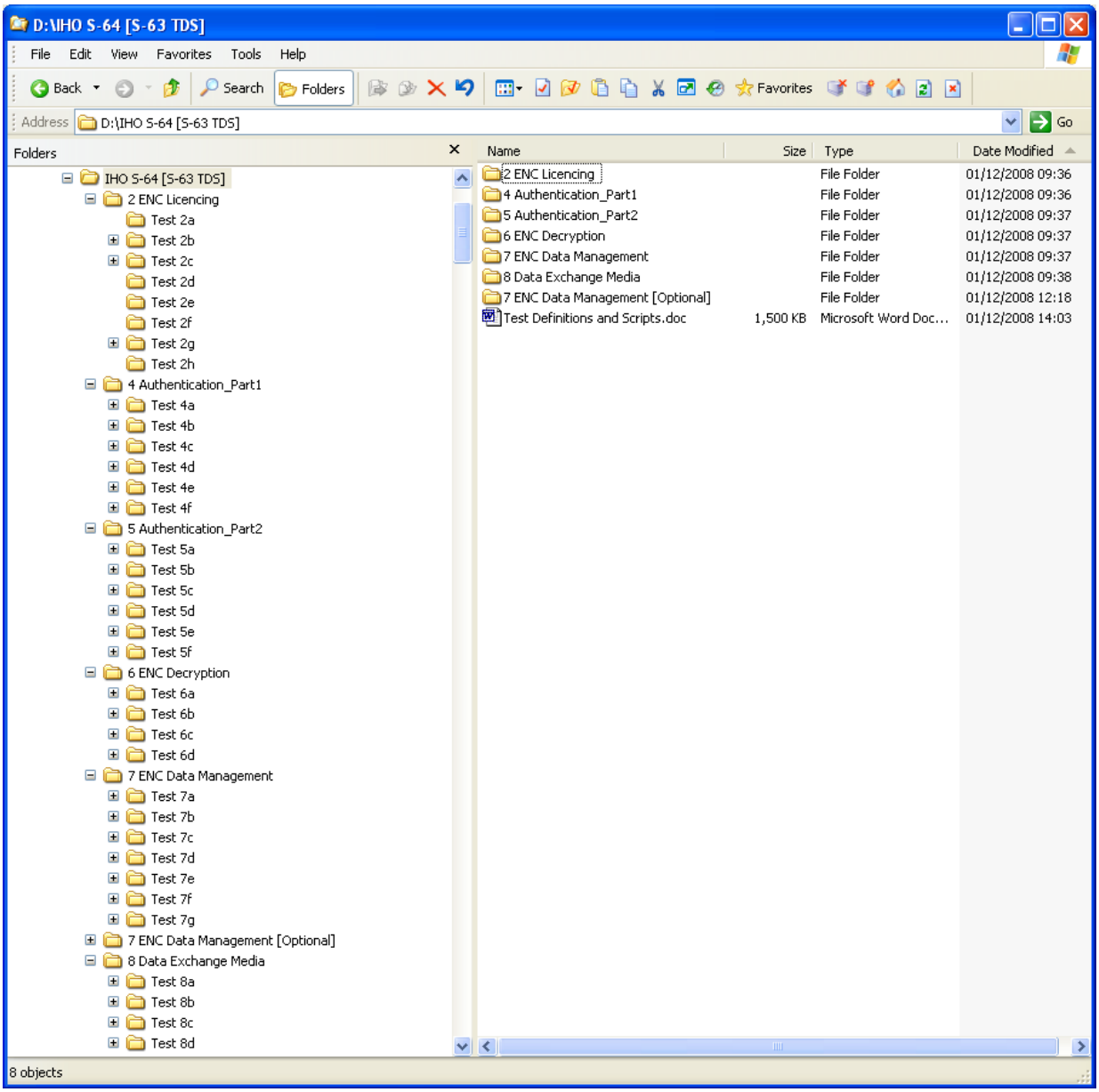
2.4 Loading and Updating using SENC delivery (if provided)

Test reference	2.4	IHO reference	IEC 61174/ 6.8.16
Test description			
Loading and Updating using SENC delivery (if provided).			
Set up			
If the ECDIS supports SENC delivery (accepting a SENC resulting from conversion of ENC to SENC ashore, in accordance with IHO TR A3.11, IHO Miscellaneous Publication M-3), then the manufacturer shall supply a SENC version of the IHO S-64 test data set for each SENC format for which SENC delivery is to be approved. ***NOTE*** *The test data sets should be provided by the SENC producers for each SENC distributor approved for use with the EUT.*			
Action			
For each SENC delivery format perform the following tests from section 2.1 and 2.2 above: *2.1.1, 2.1.2, 2.1.3, 2.1.4, (2.1.5);* *(2.2.1), 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.2.6, 2.2.7, 2.2.8*			
Result			
For each SENC test data set supplied, there shall be compliance with the corresponding test results noting that the outcome of each resultant update stage should be identical to that which results from application of the updates supplied in the above mentioned tests. *The ECDIS shall provide an update mechanism for delivered SENCs that is not inferior to the update mechanism of ENCs.*			

2.5 Loading and Updating of Encrypted ENCs

2.5.1 Organization of the Encrypted TDS

The various tests as described above are stored in the root directory "IHO S-64 [S-63 TDS v1.2]". The tests are subdivided into six categories as depicted below in the screenshot. Each category contains a number of tests which have corresponding test scripts which are detailed in Section 5 of this document.



NOTE: There are additional tests provided in "7 ENC Data Management [Optional]". These are provided to assist manufacturers who have included additional ENC Data Management functions into their systems.

2.5.2 ENC Licensing – Permit Management

2.5.2 a) Check permit string is availability

Test reference	2.5.2 a)	IHO reference	S-63 10.5.1
Test description			
Test how the system performs when loading a non-compliant permit file. Verify that the ECDIS returns the correct error message.			
Set up			
No pre-installed permits. *Test data used* *1) PERMIT.TXT file (empty file)* *2) TEXT.TXT file (wrong name)* *Test Data location* *D:\IHO S-64 [S-63 TDS v1.2]\2 ENC Licencing\Test 2a*			
Action			
1) Attempt to load a PERMIT.TXT file with no cell permits listed. *2) Attempt to load a non compliant text file.*			
Result			
Security Scheme Error (SSE 11) and accompanying description is displayed in the system at permit installation. *i.e.* ***SSE 11 – Cell permit not found***			

2.5.2 b) ENC cell permit string incorrect format

Test reference	2.5.2 b)	IHO reference	S-63 4.3 and 10.5.2
Test description			
ENC Licensing – Permit Management *ENC cell permit string incorrect format* *Test how the system performs when loading a PERMIT.TXT file with an incorrectly formatted permit string. Verify that the ECDIS returns the correct error message.*			
Set up			
No pre-installed permits or ENCs in the SENC. *Test data used* *1) PERMIT.TXT* *2) b) V01X01 (Exchange Set - GB100001, GB100002 plus updates)* *Test Data location* *D:\IHO S-64 [S-63 TDS v1.2]\2 ENC Licencing\Test 2b*			
Action			
Load the permit file (PERMIT.TXT) and then the exchange set (V01X01) from the location above.			
Result			
Security Scheme Error (SSE 12) and accompanying description is displayed in the system at permit installation. That is, *GB10001 (one character "0" has been deleted)* ***SSE 12 – Cell permit format is incorrect*** *GB100001 (edition #3 update # 6) not installed* *GB100002, valid to 31/12/2012 installed OK. (This message is only intended as indication of what should be displayed when a valid permit is installed.)* *Only GB100002 (edition #13 update # 5) and updates should be loaded into the SENC.*			

2.5.2 c) Validate permit CRC

Test reference	2.5.2 c)	IHO reference	S-63 10.5.4
Test description			
ENC Licensing – Permit Management *Validate permit CRC* *Test how the system performs when installing an ENC permit with an invalid checksum. Verify the system checks for a valid permit checksum and reports the appropriate message.*			
Set up			
No pre-installed permits *Test data used* *PERMIT.TXT* *Test Data Location* *a) D:\IHO S-64 [S-63 TDS v1.2]\2 ENC Licencing\Test 2c\1* *b) D:\IHO S-64 [S-63 TDS v1.2]\2 ENC Licencing\Test 2c\2*			
Action			
Attempt to load the PERMIT.TXT file from locations (a) and (b) above into the ECDIS.			
Result			
The system reports a CRC failure on GB100001 accompanied by the appropriate error message as follows: ***"SSE 13 – Cell Permit is invalid (checksum is incorrect)"*** *In both cases the permit for GB100002 imports without any error or warning.*			

2.5.2 d) Check remaining permit expiry period

Test reference	2.5.2 d)	IHO reference	S-63 10.5.5
Test description			
Test how the system performs when loading permits that expire within the next 30 days. Verify that the ECDIS returns the correct warning message.			
Set up			
No pre-installed permits. *Test data used* *PERMIT.TXT* *The expiry date set in this test permit is 20071231 (31st December 2007).* *Test Data Location* *D:\IHO S-64 [S-63 TDS v1.2]\2 ENC Licencing\Test 2d*			
Action			
Set the computer Date/Time properties to 3rd December 2007 and install the PERMIT.TXT file:			
Result			
The system must return a SSE 20 warning message as follows: ***"SSE 20 – Subscription service will expire in less than 30 days. Please contact your data supplier to renew the subscription licence."***			

2.5.2 e) Check for expired permits

Test reference	2.5.2 e)	IHO reference	S-63 10.5.5
Test description			
Test how the system performs when installing permits which have expired. Verify that the ECDIS returns the correct warning message.			
Set up			
No pre-installed permits. *Test data used* *PERMIT.TXT*			

The expiry date set in this test permit is 20071231 (31st December 2007). *Test Data Location* *D:\IHO S-64 [S-63 TDS v1.2]\2 ENC Licencing\Test 2e*
Action
Load the PERMIT.TXT file. [Note the expiry dates for these permits are set to 20071231 therefore the computer clock must be in advance of 20080101]
Result
The system must report the correct SSE 15 warning message as follows: ***"SSE 15 – Subscription service has expired. Please contact your data supplier to renew the subscription licence."*** *It should be possible to install expired permits but the system must display a permanent warning message to the user as described in 10.5.5 of S-63 Edition 1.1.*

2.5.2 f) Permit installation and reporting

Test reference	2.5.2 f)	IHO reference	S-63 4.3 & 10.5
Test description			
Test how the system performs when a valid set of ENC permits, with more than 30 days until expiry, is loaded. Confirm that the ECDIS installs valid permits and offers the user a meaningful report at the end of the process.			
Set up			
No pre-installed permits. *Test data used* *PERMIT.TXT* *Test Data Location* *D:\IHO S-64 [S-63 TDS v1.2]\2 ENC Licencing\Test 2f*			
Action			
Load the file PERMIT.TXT in the location stated above.			
Result			
The permit file must import without any errors or warnings. A report dialog should be available to the user so that they can confirm the successful import. *10 ENC Cell permits provided for this test created using the IHB manufacturer hardware ID and M_KEY.*			

2.5.2 g) Management of permits from multiple data servers.

Test reference	2.5.2 g)	IHO reference	S-63 4.3.3 & 10.5.6
Test description			
Test how the system performs when loading permit files from two different data servers. Confirm that the ECDIS manages permits supplied from different data servers correctly and stores them independently of one another.			
Set up			
No pre-installed permits. *Test data used* *PERMIT.TXT* *Test Data Location* *a) D:\IHO S-64 [S-63 TDS v1.2]\2 ENC Licencing\Test 2g\DS1* *b) D:\IHO S-64 [S-63 TDS v1.2]\2 ENC Licencing\Test 2g\DS2* *There are two ENC cells common to both PERMIT.TXT files. These common permits have been created using different encryption keys.*			
Action			
Load the PERMIT.TXT file at the test data location (a) above. *Load the PERMIT.TXT file at the test data location (b) above.*			
Result			

The two independently supplied permits should be stored in a Data Server specific location within the ECDIS. These permits must be available to view the contents at the user's request.

2.5.2 h) Management of installed permits .

Test reference	2.5.2 h)	IHO reference	S-63 4.3
Test description			
Test whether the system enables user to manage their permit holdings. Confirm that users have the ability to selectively remove permits from the system.			
Set up			
Use the pre-installed permits from the previous test 2g *Test data used* *PERMIT.TXT files loaded in the previous test 2g* *Two permit files have been supplied with this test imitating two different Data Servers (DS). These have been designated GB and PM.*			
Action			
Attempt to remove one of the installed sets of permits from the system.			
Result			
The user must be able to delete permits from the system. Suitable warnings/confirmations must be given.			

2.5.3 Not currently used

2.5.4 ENC Authentication Part 1

2.5.4 a) Install and validate the SA certificate and/or public key

Test reference	2.5.4 a)	IHO reference	S-63 10.6.1 & 10.6.2
Test description			
Confirm that the system can import a valid certificate/public key and supply the user with confirmation. Validate it against the SA signature contained in the ENC signature files of the supplied exchange set.			
Set up			
No pre-installed permits, Certificate/Public Key or ENC data. *Test data used* *1) UKHO.CRT and/or UKHO.PUB* *2) PERMIT.TXT* *3) V01X01 (Exchange Set)* *Test data location* *D:\IHO S-64 [S-63 TDS v1.2]\4 Authentication_Part1\Test 4a* *The signature files within this Exchange Set contain the UKHO "s self signed certificate. The SSE 26 warning is displayed because this certificate has not been provided by the Scheme Administrator (IHO). Validation can be carried by the system against the file name and/or the "Issuer" if the certificate file is pre-installed.* *The certificate expiry date is 16/08/2010.*			
Action			
Depending on the system install the certificate and/or the public key file(s). Install the PERMIT.TXT and install the exchange set from the location above			
Result			
1) The appropriate warning must be displayed "SSE 26 - This ENC is not authenticated by the IHO acting as the Scheme Administrator". The certificate or public key file must be installed and a message displayed informing the user that			

the file has been installed successfully. *2) The permit file installs without error* *3) When the exchange set is authenticated the system must display the SSE 26 warning, once, to alert the user as in 1 above. The exchange set must load without any authentication failures.* *ENC cell GB100001 (Edition #3, Update #6) installed without error or warning* *ENC cell GB100002 (Edition #13, Update #5) – installed with SSE26 Warning message*

2.5.4 b) Change and update installed certificate

Test reference	2.5.4 b)	IHO reference	S-63 10.6.1 & 10.6.2
Test description			
Confirm that the system can import a new certificate/public key and return a report informing the user of the fact. Validate it against the SA signature contained in the ENC signature files of the supplied exchange set.			
Set up			
Use the pre-installed information and data from the previous test 4a. *Test data used* *1) IHO.CRT and/or IHO.PUB* *2) PERMIT.TXT* *3) V01X01 (Exchange Set)* *Test data location* *D:\IHO S-64 [S-63 TDS v1.2]\4 Authentication_Part1\Test 4b* *IHO Public key used for this is the same as that posted on their website at the time this test data was produced.*			
Action			
Note: The certificate or public key file should be manually checked against the corresponding files on the IHO website (www.iho.int). See 10.6.1.1 in S-63. *Depending on the system install the certificate and/or public key file(s).* *Install the PERMIT.TXT and Install the exchange set from the location below.*			
Result			
1) The new certificate or public key file should load without error or warning, i.e. no SSE 26 message. A message should be displayed informing the user that the new file has been installed successfully. *2) The exchange set loads without any authentication failures.* *ENC cell GB100004 (Edition #7, Update #1) installed without error or warning* *ENC cell GB100005 (Edition #3, Update #2) installed without error or warning*			

2.5.4 c) No pre-installed certificate/public key on the system

Test reference	2.5.4 c)	IHO reference	S-63 10.6.2
Test description			
Test how the system performs when there is no pre-installed certificate. Confirm that the correct SSE 05 error message is displayed and that the system does not progress to the decompress/decrypt stage.			
Set up			
No pre-installed certificate, permits or ENC data. *Test data used* *1) PERMIT.TXT* *2) V01X01 (Exchange Set)* *Test data location* *D:\IHO S-64 [S-63 TDS v1.2]\4 Authentication_Part1\Test 4c* *IHO Public key used for this is the same as that posted on their website at the time this test data was produced.*			

Action
Install the permit file followed by the exchange set stored in the location above.
Result
The system must report a SSE 05 error message similar to the one below. ***"SSE 05 – SA Digital Certificate file is not available. A valid certificate can be obtained from the IHO website or your data supplier."*** *The system must abort at this point and not continue to install ENCs.* *ENC cell GB100001 (Edition #3, Update #6) not installed. "SSE 05" Error Message* *ENC cell GB100002 (Edition #13, Update #5) not installed. "SSE 05" Error Message*

2.5.4 d) Check SA Certificate Expiry Date

Test reference	2.5.4 d)	IHO reference	S-63 10.6.2
Test description			
Test how the system performs if the IHO digital certificate (IHO.CRT) has expired. To confirm that the correct SSE 22 error message is displayed and that the system does not progress to the decompress/decrypt stage. ***NOTE: This test is only intended for those systems that authenticate against the CRT file.***			
Set up			
No pre-installed certificate, permits or ENC data. *Test data used* *IHO.CRT* *PERMIT.TXT* *V01X01 (Exchange Set)* *Test data location* *a) D:\IHO S-64 [S-63 TDS v1.2]\4 Authentication_Part1\Test 4d\Expired* *b) D:\IHO S-64 [S-63 TDS v1.2]\4 Authentication_Part1\Test 4d\Current* *The IHO.CRT (Expired) certificate expired on 31st December 2004* *The IHO.CRT (Current) certificate expires on 29th August 2013*			
Action			
There are two folders one contains an expired certificate, an exchange set and a set of permits. The other a current certificate, an exchange set and a further set of permits. *1) Install the certificate and permits at location (a) below then attempt to load the exchange set.* *2) Then install the certificate and permits at location (b) below then attempt to load the exchange set (this test should result in the certificate & ExSet loading correctly). (Permits for this test expire in 2015)*			
Result			
1) When installing the expired certificate the system must report a SSE 22 error message similar to the one below. ***"SSE 22 – SA Digital Certificate file has expired. A new SA Public Key (certificate) can be obtained from the IHO website or your data supplier."*** *When attempting to install the exchange set the system must report the required SSE 05 message stating that no valid certificate is installed in the ECDIS.* *2) When installing the current certificate this should install OK and load the ExSet without error or warning.* ***Current*** *ENC cell GB100001 (Edition #3, Update #6) installed without errors and warnings* *ENC cell GB100002 (Edition #13, Update #5) installed without errors and warnings* ***Expired*** *ENC cell GB100001 (Edition #3, Update #1) not installed. "SSE 22 & 05" Error Messages*			

ENC cell GB100002 (Edition #12, Update #7) not installed. "SSE 22 & 05" Error Messages

2.5.4 e) Incorrectly formatted certificate and public key files

Test reference	2.5.4 e)	IHO reference	S-63 10.6.2
Test description			
Test how the system performs if the IHO digital certificate (IHO.CRT) or Public Key file is incorrectly formatted. Confirm that the correct SSE 08 error message is displayed and that the system does not progress to the decompress/decrypt stage.			
Set up			
No pre-installed certificate, permits or ENC data. *Test data used* *IHO.CRT* *PERMIT.TXT* *V01X01 (Exchange Set)* *Test data location* *D:\IHO S-64 [S-63 TDS v1.2]\4 Authentication_Part1\Test 4e* *1) The last hexadecimal pair, "F8", has been removed from the public key string (Big y) in the certificate file (IHO.CRT).* *2) The last hexadecimal pair, "F8", has been removed from the public key file (IHO.PUB).*			
Action			
Depending on which file the system uses install the relevant IHO.CRT and/or IHO.PUB file(s). Then attempt to load the exchange set using the permits provided.			
Result			
The system must report a SSE 08 error message similar to the one below. ***"SSE 08 – SA Digital Certificate file incorrect format. A valid certificate can be obtained from the IHO website or your data supplier".*** *When attempting to install the exchange set the system must report the required* ***"SSE 05 – SA Digital Certificate file is not available. A valid certificate can be obtained from the IHO website or your data supplier."*** *ENC cell GB100001 (Edition #3, Update #6) not installed. "SSE 08 & 05" Error Messages* *ENC cell GB100001 (Edition #13, Update #5) not installed. "SSE 08 & 05" Error Messages*			

2.5.4 f) Check certificate parameter values

Test reference	2.5.4 f)	IHO reference	S-63 10.6.1.1
Test description			
Test how the system performs if the IHO digital certificate (IHO.CRT) or Public Key file is incorrectly formatted. Confirm that the correct SSE 08 error message is displayed and that the system does not progress to the decompress/decrypt stage.			
Set up			
No pre-installed certificate, permits or ENC data. *Test data used* **Data Server 1 (DS1)** IHO.CRT [024100 Parameter] PERMIT.TXT V01X01 (Exchange Set)		**Data Server 2 (DS2)** IHO.CRT [0240 Parameter] PERMIT.TXT V01X01 (Exchange Set)	

Test data location *a) D:\IHO S-64 [S-63 TDS v1.2]\4 Authentication_Part1\Test 4f\DS1* *b) D:\IHO S-64 [S-63 TDS v1.2]\4 Authentication_Part1\Test 4f\DS2* ***NOTE:*** *This test is designed only for those systems using the IHO.CRT file to authenticate the SA signed data server certificate in the ENC signature file.*
Action
Depending on which file the system uses install the relevant IHO.CRT and/or IHO.PUB file(s). Then attempt to load the exchange set using the permits provided.
Result
Data Server 1 *certificate must install without error or warning. The exchange set should authenticate and import without error or warning.* ***Data Server 2*** *is using a non SA Certificate. The certificate should install but with the appropriate SSE 26 warning displayed. The exchange set should authenticate and import without error but a further SSE 26 warning should be displayed prior to import (See Test 2.3.4A).* ***DS1*** *ENC cell GB58932B (Edition #1, Update #0) Installed without errors or warning* *ENC cell GB60242T (Edition #2, Update #0) Installed without errors or warning* *ENC cell GB61011A (Edition #1, Update #1) Installed without errors or warning* ***DS2*** *ENC cell GB60242T (Edition #2, Update #0) Installed without error. "SSE 26" Warning Message* *ENC cell GB61011A (Edition #1, Update #1) Installed without error. "SSE 26" Warning Message* *ENC cell GB61021A (Edition #1, Update #1) Installed without error. "SSE 26" Warning Message* *ENC cell GB61021B (Edition #1, Update #1) Installed without error. "SSE 26" Warning Message* *ENC cell GB61032A (Edition #1, Update #2) Installed without error. "SSE 26" Warning Message*

2.5.5 ENC Authentication

2.5.5 a) Invalid SA signature in the ENC Signature File

Test reference	2.5.5 a)	IHO reference	S-63 10.6.2
Test description			
To test how the system performs when an invalid certificate element of an ENC signature file is authenticated against the installed IHO certificate and/or public key. Confirm the correct SSE 06 message id returned by the ECDIS.			
Set up			
No pre-installed certificate, permits or ENC data. *Test data used* *1) IHO.CRT* *2) PERMIT.TXT* *3) V01X01 (Exchange Set)* *Test data location* *D:\IHO S-64 [S-63 TDS v1.2]\5 Authentication_Part2\Test 5a* *The signature file associated with update GB61021A.001 contains the data servers self signed key (SSK) and not the SA signed data server certificate. GB61021A.000, GB61021B.000 and GB61021B.001 contain valid certificates.*			
Action			

Install the IHO.CRT and/or IHO.PUB, Permits and exchange set from the location above.
Result
The system must report the appropriate message as follows for ENC file GB61021A.001: ***"SSE 06 - The SA Signed Data Server Certificate is invalid. The SA may have issued a new public key or the ENC may originate from another service. A new SA public key can be obtained from the IHO website or from your data supplier"*** *The system should validate each certificate in turn and not halt at an error. Some systems may report an SSE 03 which is acceptable (similar validation)* *ENC cell GB61021A (Edition #1, Update #1) Update 1 is not installed (SSE 06 message)* *ENC cell GB61021B (Edition #1, Update #1) base cell and update installed without error or warning.*

2.5.5 b) Authentication against a non SA certificate/public key

Test reference	2.5.5 b)	IHO reference	S-63 10.6.2.1
Test description			
To test that the system will authenticate against an alternative certificate/public key stored on the system which is not issued by the Scheme Administrator. Test that the correct SSE 26 warning is displayed informing the user that the ENC data is not authenticated by the SA.			
Set up			
No pre-installed certificate/public key, permits or ENC data. *Test data used* *1) NONSA.CRT/.PUB* *2) PERMIT.TXT* *3) V01X01 (Exchange Set - GB61021A, GB61021B, GB61032A)* *Test data location* *D:\IHO S-64 [S-63 TDS v1.2]\5 Authentication_Part2\Test 5b* *This test uses an installed certificate/public key file which is the same as the public key contained in the signature file of the exchange set.*			
Action			
Install certificate and/or public key, permit file and exchange set stored in the location above.			
Result			
The system must authenticate the exchange set against the certificate and/or public key stored on the system. The system must identify that the data has been authenticated against a public key not issued by the IHO acting as the SA. A warning must be displayed as follows: ***"SSE 26 – ENC is not authenticated by the IHO acting as the SA"*** *This test should not prevent the exchange set from being loaded.* *ENC cell GB61021A (Edition #1, Update #1) Cells import without error but with a "SSE 26" Warning Message* *ENC cell GB61021B (Edition #1, Update #1) Cells import without error but with a "SSE 26" Warning Message* *ENC cell GB61032A (Edition #1, Update #2) Cells import without error but with a "SSE 26" Warning Message*			

2.5.5 c) ENC signature validation

Test reference	2.5.5 c)	IHO reference	S-63 5.3 & 10.6.3
Test description			
Test how the system responds when validating an incorrectly signed cell file. Confirm that the correct SSE 09 message is displayed.			
Set up			
No pre-installed certificate/public key, permits or ENC data. *Test data used* *1) IHO.CRT* *2) PERMIT.TXT* *3) V01X01 (Exchange Set)* *Test data location* *D:\IHO S-64 [S-63 TDS v1.2]\5 Authentication_Part2\Test 5c* *ENC Signature GBK01620.000 is in the correct format but the signature is invalid.* *ENC Signature GBK01640.000 is in the correct format and is valid.*			
Action			
Install the IHO.CRT file, PERMIT.TXT and ENC exchange set from the location described below.			
Result			
The system must display the correct SSE 09 error message for cell GB301620 as follows: ***"SSE 09 – ENC Signature is invalid."*** *The system must not load this cell as its integrity may have been compromised.* *The system should validate the signature file for GB301640 and load this cell in the normal way.* *ENC cell GB301620 (Edition #3, Update #0) Not installed. Error message SSE 09* *ENC cell GB61032A (Edition #1, Update #2) Cells import without error but with a "SSE 26" Warning Message*			

2.5.5 d) ENC signature format validation

Test reference	2.5.5 d)	IHO reference	S-63 5.4.2.7 & 10.6.3
Test description			
Test how the system responds when validating against an incorrectly formatted ENC signature. Confirm that the correct SSE 24 message is displayed.			
Set up			
Use data installed from the previous test (5c) *Test data used* *V01X01 (Exchange Set)* *Test data location* *D:\IHO S-64 [S-63 TDS v1.2]\5 Authentication_Part2\Test 5d* *GBK01620.000 has a valid ENC signature and is correctly formatted.* *GBK01660.000 has an invalid ENC signature format (deliberately corrupted).*			
Action			
Load the exchange set from the location above.			
Result			
The system displays the correct SSE 24 error message for cell GB301660 as follows: ***"SSE 24 – ENC Signature format is incorrect."*** *The system must not load this cell as its integrity may have been compromised.*			

The system should validate the signature file for GB301620 and load this cell in the normal way. *Some systems may report an SSE 09 (ENC Signature is invalid) error this is acceptable as the expected outcome is the same, i.e. the data file is rejected.* *ENC cell GB301620 (Edition #3, Update #0) installed without error or warning* *ENC cell GB301660 (Edition #5, Update #0) is not installed. Error message SSE24*

2.5.5 e) Check authentication is continuous and complete

Test reference	2.5.5 e)	IHO reference	S-63 5.3, 5.4.2.7 & 10.6.3
Test description			
The test that the system authenticates all signature files individually and continuously without hanging at an error. Check that the correct SSE 09 and SSE 24 messages are reported correctly.			
Set up			
Use data installed from the previous test (5d, with GB301620 & GB301640 already installed) *Test data used* *1) PERMIT.TXT* *2) V01X01 (Exchange Set)* *Test data location* *D:\IHO S-64 [S-63 TDS v1.2]\5 Authentication_Part2\Test 5e* *GB301820.000/GBK01820.000 (invalid signature)* *GB301860.001/GBK01840.001 (Incorrect signature format)*			
Action			
Load the PERMIT.TXT file and exchange set from the location above			
Result			
The system must authenticate each ENC signature continuously in turn. It must report the following errors at the end of the process: ***"GB301820.000 – SSE 09 – ENC Signature is invalid."*** ***"GB301860.001 – SSE 24 – ENC Signature format is incorrect."*** *The system must load all ENC data files with authenticated signatures but not those that do not.* *Some systems may report an SSE 09 (ENC Signature is invalid) error for both GB301820.000 & GB301860.001. This is acceptable as the expected outcome is the same, i.e. the data file is rejected.* ***Note:** GB301860.002 should also return a sequential update error as it was not possible to install GB301860.001.* *ENC cell GB301620 (Edition #3, Update #0) installed without error or warning* *ENC cell GB301640 (Edition #4, Update #0) installed without error or warning* *ENC cell GB301660 (Edition #5, Update #0) installed without error or warning* *ENC cell GB301820 (Edition #3, Update #0) is not installed Error message SSE09* *ENC cell GB301840 (Edition #8, Update #1) installed without error or warning* *ENC cell GB301860 (Edition #3, Update #2) Base cell is installed without error or warning. Update #1 is not installed. Error message SSE24*			

2.5.5.f Single exchange set with ENC signature files signed by multiple data servers

Test reference	2.5.5 f)	IHO reference	S-63 5.3
Test description			
To test how the system performs when an exchange set contains signature files			

from multiple data servers. That is, signed with different data server private keys and containing different SA signed certificates.
Set up
No pre-installed certificates, permits or ENCs. *Test data used* *1) IHO.CRT/IHO.PUB* *2) PERMIT.TXT* *3) V01X01 (Exchange Set)* *Test data location* *D:\IHO S-64 [S-63 TDS v1.2]\5 Authentication_Part2\Test 5f* **ENC Signature File components Signed by Data Server 1 (DS1) DS1"s SA signed certificate**: GB301620.000, GB301640.000, GB301660.000, GB301820.000, GB301840.000 **ENC Signature File components Signed by Data Server 2 (DS2) DS2"s SA signed certificate**: GB301840.001 GB301860.000, 001 &
Action
Install the certificate, permits and exchange set from the location below.
Result
The seven cells and accompanying updates must authenticate, decrypt and import to the ECDIS without any error or warning messages. *ENC cell GB301620 (Edition #3, Update #0) installed without error or warning* *ENC cell GB301640 (Edition #4, Update #0) installed without error or warning* *ENC cell GB301660 (Edition #5, Update #0) installed without error or warning* *ENC cell GB301820 (Edition #3, Update #0) installed without error or warning* *ENC cell GB301840 (Edition #8, Update #1) installed without error or warning* *ENC cell GB301860 (Edition #3, Update #2) installed without error or warning* *ENC cell GB302020 (Edition #4, Update #1) installed without error or warning*

2.5.6 ENC Decryption

2.5.6 a) Install ENCs when pre-installed permits have expired

Test reference	2.5.6 a)	IHO reference	S-63 10.7.1 & 10.7.1.1
Test description			
To test how the system performs when importing new ENCs where the previously installed permits have expired.			
Set up			
Only the PERMIT.TXT and IHO.CRT files installed from the location below. *Test data used* *1) IHO.CRT* *2) PERMIT.TXT* *3) V01X01 (Exchange Set - GB61021A & GB61021B)* *Test Data location* *D:\IHO S-64 [S-63 TDS v1.2]\6 ENC Decryption\Test 6a*			
Action			
Install the exchange set from the location below. ***NOTE:*** *The computer clock must be in advance of 30/11/2007.*			
Result			

The system must display the SSE 15 warning when importing the exchange set as follows: ***"SSE 15 – Subscription service has expired. Please contact your data supplier to renew the subscription licence",*** *(list affected cells)* *The system must display the following SSE 25 warning when viewing cells with expired permits.* ***"SSE 25 – The ENC permit for this cell has expired. This cell may be out of date and MUST NOT be used for NAVIGATION".*** *(Permits for this test are set to expire on 30th November 2007.)* *GB61021A (edition # 1 update # 1) should be installed.* *GB61021B (edition # 1 update # 1) should be installed.*

2.5.6 b) Permit expiry within 30 days

Test reference	2.5.6 b)	IHO reference	S-63 10.7.1.2
Test description			
To test how the system performs when importing new ENCs where the installed permits expire within 30 days.			
Set up			
No ENC data installed but with PERMIT.TXT and IHO.CRT installed for previous test (6a). *Test data used* *1) IHO.CRT (already installed)* *2) PERMIT.TXT (already installed)* *3) V01X01 (Exchange Set - GB61021A & GB61021B)* *Test Data location* *D:\IHO S-64 [S-63 TDS v1.2]\6 ENC Decryption\Test 6b*			
Action			
Set the computer clock between 01/11/2007 and 29/11/2007. Install the exchange set from the location above.			
Result			
The system must import the exchange set but display the appropriate SSE 20 warning message as follows: ***"SSE 20 – Subscription service will expire in less than 30 days. Please contact your data supplier to renew the subscription licence."*** *GB61021A (edition # 1 update # 1) should be installed (with "SSE 20").* *GB61021B (edition # 1 update # 1) should be installed (with "SSE 20").*			

2.5.6 c) Incorrect cell keys encrypted in the ENC permits

Test reference	2.5.6 c)	IHO reference	S-63 10.7.3
Test description			
1) Test how the system responds when loading ENCs encrypted with cell keys that are different to those used to generate the permits. Confirm that the correct SSE 21 error message is displayed. *2) Test that the system does not permanently halt for a single/multiple failures.* *3) Test the system reports the number of successful/unsuccessful imports.*			
Set up			
No pre-installed permits or ENCs. Certificate/Public key from previous tests, 6a and 6b. *Test data used* *1) IHO.CRT (Pre-installed)* *2) PERMIT.TXT* *3) V01X01 (Exchange Set - GB58910B, GB58910C, GB58911A, GB58911B, GB58913A, GB58932A & GB58932B)* *Test Data location*			

D:\IHO S-64 [S-63 TDS v1.2]\6 ENC Decryption\Test 6c
Action
Install the permits and load the exchange set from the location above.
Result
The system must check each installed permit in turn to see if there is a valid decryption key. If no valid key is available the system must report the appropriate SSE 21 error message as follows: ***"SSE 21 – Decryption failed no valid cell permit found. Permits may be for another system or new permits may be required, please contact your data supplier to obtain a new licence."*** *(Permits created from a different set of cell keys from those used to encrypt the test ENCs are as follows:-* ***GB58911A & GB58911B****.)* *The system must not halt at an error but continue on to the next ENC.* *The system must report on successful/unsuccessful imports.* *GB58910B (edition # 1 update # 0) should be installed (without error or warning).* *GB58910C (edition # 2 update # 1) should be installed (without error or warning).* *GB58911A (edition # 1 update # 1) should not be installed (with "SSE 21").* *GB58911B (edition # 1 update # 0) should not be installed (with "SSE 21").* *GB58913A (edition # 1 update # 0) should be installed (without error or warning).* *GB58932A (edition # 1 update # 0) should be installed (without error or warning).* *GB58932B (edition # 1 update # 0) should be installed (without error or warning).*

2.5.6 d) Validate ENC data file integrity

Test reference	2.5.6 d)	IHO reference	S-63 10.7.4
Test description			
To confirm that the system correctly validates decrypted ENCs and checks the integrity of each ENC data file. Confirm the system reports the correct SSE 16 error message when the calculated CRC is incorrect or does not agree with the value contained in the corresponding CATALOG.031 record. Also determine whether the system correctly reports the SSE 23 (sequential update error).			
Set up			
IHO.CRT/IHO.PUB from previous test (6c) but no pre-installed permits or ENCs. *Test data used* *1) IHO.CRT (Pre-installed)* *2) PERMIT.TXT* *3) V01X01 (Exchange Set – GB40162A, GB40162B, GB40162C & GB40164A)* *Test Data location* *D:\IHO S-64 [S-63 TDS v1.2]\6 ENC Decryption\Test 6d*			
Action			
Install the ENC cell permits and exchange set from the location above.			
Result			
1) The system must validate the CRC of each cell in the exchange set. The system must report the appropriate error message for all ENC files (see additional comments below) which fail to validate as follows: ***"SSE 16 – ENC <Cell Name> CRC is incorrect. Contact you data supplier as ENC(s) may be corrupt or missing data".*** *2) The system must also report an error message for any validated ENC files that cannot be imported resulting from (1) as follows:* ***"SSE 23 – Non sequential update, previous update(s) missing try reloading from the base media. If the problem persists contact your data supplier.".***			

(GB40162B.000 – CRC altered manually in CATALOG.031 file GB40164A.003 – ENC data intentionally corrupted.) *GB40162A (edition # 9 update # 3) should be installed (without error or warning).* *GB40162B (edition # 2 update # 1) should not be installed (with "SSE 16" followed by "SSE 23").* *GB40162C (edition # 1 update # 1) should not be installed (with "SSE 21").* *GB40164A (edition # 1 update # 5) should be installed with only two updates (edition # 1 update # 2) (with "SSE 16" followed by "SSE 23").*

2.5.7 ENC Data Management

2.5.7 a) Encrypted ENCs supplied by different Data Servers

Test reference	2.5.7 a)	IHO reference	S-63 6
Test description			
To test how the system performs when loading ENCs from two different data servers who have their own unique SA signed certificates and encrypt using their own unique encryption keys.			
Set up			
IHO.CRT/IHO.PUB from previous test (6d) but no pre-installed permits or ENCs. *Test data used* ***a) Data Server 1 (DS1)*** *1) IHO.CRT [Pre-installed]* *2) PERMIT.TXT* *3) V01X01 (Exchange Set - GB281600, GB281800, GB282000 & GB283000)* *Test Data location* *D:\IHO S-64 [S-63 TDS v1.2]\7 ENC Data Management\Test 7a\DS1* ***b) Data Server 2 (DS2)*** *4) IHO.CRT [Pre-installed]* *5) PERMIT.TXT* *6) V01X01 (Exchange Set - GB283000, GB283100, GB283200 & GB283300)* *Test Data location* *D:\IHO S-64 [S-63 TDS v1.2]\7 ENC Data Management\Test 7a\DS2*			
Action			
Install the permits and exchange set for Data Server 1 (DS1), then install the permits and exchange set for DS2 from locations above.			
Result			
Both exchange sets must authenticate against the same installed public key. The DSs' permits must be stored independently and decrypt the relevant exchanges sets when loaded. *(In this test both Data Servers (DS) have ENC cell GB283000 common to both. DS1 has GB283000.000 – 002 and DS2 has GB283000.000 – 004.* *This test scenario considers how the ECDIS performs when a user obtains ENCs from a two independent data providers.)* *The system should be up to date as follows:* *after installation of cells from DS1 (a):* *GB281600 (edition # 1 update # 1)* *GB281800 (edition # 1 update # 0)* *GB282000 (edition # 1 update # 0)* *GB283000 (edition # 1 update # 2)* *after installation of cells from DS2 (b):* *GB281600 (edition # 1 update # 1)*			

GB281800 (edition # 1 update # 0) *GB282000 (edition # 1 update # 0)* *GB283000 (edition # 1 update # 4)* *GB283100 (edition # 1 update # 3)* *GB283200 (edition # 1 update # 0)* *GB283300 (edition # 1 update # 0)*

2.5.7 b) Loading additional ENC cell permits and cells from a different data provider

Test reference	2.5.7 b)	IHO reference	S-63 6
Test description			
Check that a pre-existing licence subscription is not overwritten by the ECDIS for any subsequent additions. Confirm that any data already stored on the system is unaffected by any newly imported permits.			
Set up			
Use the data installed for test 7a for DS1 & 2 (assuming that the data loaded as per the expected results) *Test data used* *1) IHO.CRT [Pre-installed]* *2) PERMIT.TXT* *3) V01X01 (Exchange Set - GB255000, GB270000, GB281600, GB281800, GB282000 & GB283000)* *Test Data location* *D:\IHO S-64 [S-63 TDS v1.2]\7 ENC Data Management\Test 7b*			
Action			
Install the permit file from the location above followed by the exchange set at the same location.			
Result			
The permit file must be merged with the previously installed one for the correct data server [DS1 - GB]. The exchange set must install all new cells as well as the updates for the previously installed ones [GB281600 & GB281800]. The expected SENC Status is listed below. *The ENC cells loaded during test 7a for data server 2 [DS2] must still be viewable in the ECDIS to their expected state of correctness. The expected SENC status listed below shows the expected results against 7a [DS2].* *The permit file **only** contains new permits for cells GB255000 & GB270000. The exchange set contains the new cells and the cells from the previous test, 7a [DS1] plus additional updates.* *This test scenario considers how the ECDIS performs when presented with a subset of new additional ENC permits from a specific data provider.* *The system should be up to date as follows:* *after installation of cells from DS1:* *GB255000 (edition # 3 update # 3) new cell should be installed.* *GB270000 (edition # 1 update # 1) new cell should be installed.* *GB281600 (edition # 1 update # 2) updated.* *GB281800 (edition # 1 update # 1) updated.* *GB282000 (edition # 1 update # 0)* *GB283000 (edition # 1 update # 4)* *installation of cells from DS2 unchanged from 7a:* *GB281600 (edition # 1 update # 2)* *GB281800 (edition # 1 update # 1)* *GB282000 (edition # 1 update # 0)* *GB283000 (edition # 1 update # 4)* *GB283100 (edition # 1 update # 3)*			

GB283200 (edition # 1 update # 0) *GB283300 (edition # 1 update # 0)*

2.5.7 c) Test that the system operates correctly in a multiple data provider environment

Test reference	2.5.7 c)	IHO reference	S-63 6
Test description			
Check that ENCs existing within both subscriptions do not cause corruption across service providers. Confirm that both providers information is managed independently without conflict.			
Set up			
IHO certificate/public key installed from previous tests 7a & 7b. No pre-installed permits or ENCs. *Test data used* ***a) Data Server 1 (DS1)*** *IHO.CRT [Pre-installed]* *PERMIT.TXT* *V01X01 (Exchange Set - GB281600, GB281800, GB282000 & GB283000)* *Test Data location* *D:\IHO S-64 [S-63 TDS v1.2]\7 ENC Data Management\Test 7c\DS1* ***b) Data Server 2 (DS2)*** *IHO.CRT [Pre-installed]* *PERMIT.TXT* *V01X01 (Exchange Set - GB281600, GB281800, GB282000, GB283000, GB283100 & GB283200)* *Test Data location* *D:\IHO S-64 [S-63 TDS v1.2]\7 ENC Data Management\Test 7c\DS2*			
Action			
1) Install the ENC permit file from location (a) above. *2) Load the ENC Exchange Set (V01X01) from (a).* *3) Load the ENC Exchange Set (V01X01) from (b).* *4) Install the ENC permit file from location (b)* *5) Load the ENC Exchange Set (V01X01) from (b). This exchange set contains new base cells and updates to previously installed cells. One cell is already installed with no updates.*			
Result			
1. *ENC permits at (a) shall install without error or warning.* 2. *ENC Exchange Set (V01X01) at (a) shall load without error or warning.* 3. *ENC Exchange Set (V01X01) at (b) must **not** load as there are no valid permits for data server 2 [DS2] installed in the ECDIS. A SSE 10 warning must be displayed stating **"SSE 10 – Permits not available for this data provider".*** 4. *ENC permits at (b) shall install without error or warning.* 5. *ENC Exchange Set (V01X01) at (b) shall install the new bases and updates. Warning messages relating to "cells/updates already installed" may be displayed.* *The content of the ECDIS SENC must be the same as that described below* *The system should be up to date as follows:* *after installation of cells from DS1:* *GB281600 (edition # 1 update # 1)* *GB281800 (edition # 1 update # 0)* *GB282000 (edition # 1 update # 0)* *GB283000 (edition # 1 update # 2)* *After installation of cells from DS2:* *GB281600 (edition # 1 update # 2)*			

GB281800 (edition # 1 update # 1) *GB282000 (edition # 1 update # 0)* *GB283000 (edition # 1 update # 4)* *GB283100 (edition # 1 update # 3)* *GB283200 (edition # 1 update # 0)*

2.5.7 d) ECDIS management of cancelled cells

Test reference	2.5.7 d)	IHO reference	S-63 6.4.1.1 & 6.4.1.2
Test description			
To test how the system responds when a cell is cancelled in an S-63 encrypted ENC service. Confirm that the system operates correctly as defined in the S-63 standard.			
Set up			
IHO certificate/public key installed from previous test 7c. No pre-installed permits or ENCs. *Test data used* 1) *IHO.CRT [Pre-installed]* 2) *PERMIT.TXT* 3) *V01X01 (2 Exchange Sets - GB251200/GB255000/GB280200/GB301620)* *Test Data location* *a) D:\IHO S-64 [S-63 TDS v1.2]\7 ENC Data Management\Test 7d* *b) D:\IHO S-64 [S-63 TDS v1.2]\7 ENC Data Management\Test 7d\Base* *c) D:\IHO S-64 [S-63 TDS v1.2]\7 ENC Data Management\Test 7d\Update*			
Action			
Install the ENC permits at location (a) below. Load the base exchange set at (b) and then update using the exchange set at (c). *Attempt to view all imported cells in the ECDIS and determine their status.*			
Result			
The system shall report any cell(s) that have been identified as cancelled at load time. *(Cell GB280200 is cancelled.)* *A message shall be displayed informing the user of the cell name.* *Depending on the method adopted by the OEM for managing cancelled cells one of the following conditions shall be observed:* 1. *The cancelled cell cannot be viewed in the ECDIS* 2. *The cancelled cell can be viewed in the ECDIS with the warning message defined in S-63 and specified below:* *"Cell <name> has been cancelled and may not be up to date. Under no circumstances should it be used for primary navigation".* *Clarification: Systems that remove cells without consulting the user do not have to provide a warning message at load time.* *The system should be up to date as follows:* *after installation of cells from 7d [Base]:* *GB251200 (edition # 1 update # 4)* *GB255000 (edition # 2 update # 2)* *GB280200 (edition # 2 update # 0)* *GB316200 (edition # 2 update # 1)* *After installation of cells from 7d [Update]:* *GB251200 (edition # 1 update # 8)* *GB255000 (edition # 3 update # 0)* *GB280200 (edition # 2 update # 1); cancelled cell (GB280200) should be reported by the system and either removed from the SENC or displayed with the appropriate warning.* *GB316200 (edition # 2 update # 4)*			

2.5.7 e) ECDIS Display of Replacement ENC Cells

Test reference	2.5.7 e)	IHO reference	S-63 6.2.3.3

Test description

To test how the system responds when a cell is cancelled and replaced in an S-63 encrypted ENC service. Confirm that the system operates correctly as defined in the S-63 standard.
This test also makes use of the PARTIAL and FULL PRODUCTS.TXT file.
GB380620 is cancelled and replaced by GB383710 & GB383720
GB380720 is cancelled and replaced by GB389320

Set up

Status as per successful completion of test 2.3.7 d)
1) IHO.CRT [Pre-installed]
2) PERMIT.TXT
3) V01X01 (2 Exchange Sets - GB380620, GB380720, GB40162A, GB40162B & GB40182A)
a) D:\IHO S-64 [S-63 TDS v1.2]\7 ENC Data Management\Test 7e
b) D:\IHO S-64 [S-63 TDS v1.2]\7 ENC Data Management\Test 7e\Base
c) D:\IHO S-64 [S-63 TDS v1.2]\7 ENC Data Management\Test 7e\Update

Action

Install the ENC permits at location (a). Load the base exchange set at (b) and then update using the exchange set at (c).
Attempt to view all imported cells in the ECDIS and determine their status.

Result

The system must report any cell(s) that have been identified as cancelled at load time. A message must be displayed as specified in test 2.3.7 d). If any replacement cells have been encoded in the PRODUCTS.TXT file then this must be presented to the user as defined in S-63 and as follows:
"Cell <name> has been cancelled and has been replaced by cell(s), <name1>; <name2>. Please contact your data supplier to obtain the additional ENC permits".

Test	Cell	Edtn	Updt	Edtn	Updt	Notes
7e [Base]	GB380620	2	0	2	0	All ENC cells installed without error or warning
	GB380720	2	0	2	0	
	GB40162A	8	3	8	3	
	GB40162B	1	1	1	1	
	GB40182A	1	4	1	4	
7e [Update]	GB251200	1	8	1	8	Cells from the previous test 7d (same status)
	GB255000	3	0	3	0	
	GB280200	2	1	2	1	
	GB301620	2	4	2	4	
	GB380620	2	1	2	1	Messages should be displayed as for 7d plus message relating to replaced cells: GB380620 (cancelled) replaced by GB380000 & GB380001. GB380720 (cancelled) replaced by GB290000
	GB380720	2	1	2	1	
	GB40162A	9	0	9	0	
	GB40162B	2	1	2	1	
	GB40182A	1	5	1	5	

2.5.7 f) ECDIS management of ENC re-issued cells

Test reference	2.5.7 f)	IHO reference	S-63 6.2.3
Test description			
To test how the system responds when a cell is published as a re-issue. Confirm that the system operates correctly as defined in the S-63 standard. (The PRODUCTS.TXT file has „Base cell update number" field in each cell record that identifies and flags the update that carries any re-issued cell)			
Set up			
IHO certificate/public key installed from previous test 7e. No pre-installed permits or ENCs. *1) IHO.CRT [Pre-installed]* *2) PERMIT.TXT* *3) Base [Exchange Set – GB303040]* *4) Update [Exchange Set – GB303040 & GB50162D* *a) D:\IHO S-64 [S-63 TDS v1.2]\7 ENC Data Management\Test 7f* *b) D:\IHO S-64 [S-63 TDS v1.2]\7 ENC Data Management\Test 7f\Base* *c) D:\IHO S-64 [S-63 TDS v1.2]\7 ENC Data Management\Test 7f\Update*			
Action			
Install the ENC permits at location (a) below. Load the base exchange set at (b) and then update using the exchange set at (c).			
Result			
The system must load the base exchange set and then the re-issued cells (GB303040 & GB50162D) on the update as though they were an EN application profile, i.e. a new data set or a new edition of a data set. The system must also install the subsequent updates GB303040 [Ed 11 Up10] and GB50162D [Ed 6 Up 6]. *GB50162D is a straight re-issue with no previous history, i.e. new cell. GB303040 is a re-issued cell with history, i.e. base cell already installed in the ECDIS. Both re-issued cells have subsequent updates to test the loading sequence is continuous.* 7f [Base] GB303040 11 9 11 9 Edition 11 of GB303040 installed with updates 1-9. 7f [Update] GB303040 11 10 11 10 GB50162D 6 6 6 6 GB50162A is a straight re-issue with no previous history, i.e. new cell. GB303040 is a re-issued cell with history, i.e. base cell already installed in the ECDIS.			

2.5.7 g) ECDIS management of Base and Update Exchange Sets

Test reference	2.5.7 g)	IHO reference	S-63 6.5.1
Test description			
To confirm the user is informed when there is incompatibility between installed ENCs and the applied update exchange set.			
Set up			
No permits or ENCs installed			

1) IHO.CRT/PUB [Pre-installed from previous tests]
2) PERMIT.TXT
3) BASE 1 WK23_07, BASE 2 WK30_06 & BASE 3 WK27_07
4) UPDATE WK37_07
D:\IHO S-64 [S-63 TDS v1.2]\7 ENC Data Management\Test 7g

Action

Install permits and load the Update and Base media at the location below.

Result

The ENC bases should load without error. However when the update media set is loaded the system should install the band 3 (Coastal) and band 5 (Harbour) ENC updates without error but the system must return the following warning:
"The Update Media is not compatible with currently installed ENCs. Please install „Base 2 issued in week 25/07 and dated 21 June 2007" and then continue with the update process".
[The system will also display continuity errors as a result of non sequential loading when attempting to load and install the updates for GBGB40162A, GBGB40184A, GBGB40186D & GBGB40202A.]

Base media 2 used in this test is dated 20 July 2006 and pre dates the latest Base media 2.

7g
[BASE 1 WK23_07]
GB302840 22 16 22 16
GB303220 4 6 4 6
GB303420 3 9 3 9
GB303460 11 0 11 0

7g
[BASE 2 WK30_06]
GB40162A 9 0 9 0
Cells installed for this base but with the incompatibility warning.
GB40184A 2 3 2 3
GB40186D 1 1 1 1
GB40202A 4 0 4 0

7g
[BASE 3 WK27_07]
GB50162B 10 7 10 7
GB50162C 9 5 9 5
GB50162D 5 2 5 2
GB50182A 2 1 2 1

7g
[UPDATE WK37_07]
GB302840 23 4 23 4 NE installed from WK37/07 Update
GB303220 4 7 4 7
GB303420 3 12 3 12
GB303460 11 1 11 1
GB40162A 9 5 9 0 Cells not updated due to incompatible
GB40184A 3 5 2 3 BASE 2
GB40186D 1 7 1 1
GB40202A 5 2 4 0
GB50162B 11 0 11 0 NE installed from WK37/07 Update
GB50162C - - - - No updates for this cell

GB50162D - - - - No updates for this cell *GB50182A 2 2 2 2* *GB50182A 2 1 2 1*

2.5.7 h) ECDIS management of multiple exchange sets

Test reference	2.5.7 h)	IHO reference	S-63 6.5.1 & Sect 5 Appendix 2
Test description			
ONLY FOR SYSTEMS THAT USE THE LATEST UPDATE EXCHANGE SET TO MANAGE THE IMPORT OF ENCs ACROSS MULTIPLE BASES *This optional test checks a systems ability to use the PERMIT.TXT; PRODUCTS.TXT & STATUS.LST file to manage the efficient loading of ENCs. Confirm the system provides intuitive prompts to the user when installing the ENC update and base media.*			
Set up			
No ENC permits or ENC cells installed. *1) IHO.CRT [Pre-installed]* *2) PERMIT.TXT* *3) Update Exchange Set (UPDATE WK19_07)* *4) Base Exchange sets (BASE 1 WK28_06 & BASE 3 WK32_06)* *D:\IHO S-64 [S-63 TDS v1.2]\7 ENC Data Management [Optional]\Test 7h*			
Action			
Install the permits at the location below then load the "UPDATE WK19_07" exchange set. Load the base exchange sets as prompted by the system. *For this test this should be the following:* *Base 1 dated 06 July 2006* *Base 3 dated 03 August 2006* *Finally re-install the UPDATE WK19_07 and bring the system fully up to date.*			
Result			
The system should read the permit file and the full products listing from the WK19/07 Update. The system should read the product listing to determine where all licensed ENC base [EN] cells are located, then using the STATUS.LST file to prompt users to install the appropriate BASE media. The system should then prompt the user to load the appropriate base media in order. For example, *"Please load BASE media 1 dated 06 July 2006".* *"Please load BASE media 3 dated 03 August 2006".* *When all licensed cells have been loaded from the bases the system should display a message similar to the following example:* *"Please load WK19/07 Update to bring all licensed cells up to date".* *Finally the system may display a message similar to the following example:* *"All licensed cells are installed and up to date to WK19/07".* *The system status should be the same as that described in the "Expected SENC Status" table.* *The permit file for this test only contains permits for Bases 1 and 3. Base 2 has no valid permits and should not be prompted for by the system.* *7h* *[BASE 1 WK28_06]* *GB302840 22 0 22 0* *GB303220 4 1 4 1* *GB303420 3 4 3 4* *GB303460 10 3 10 3* *7h*			

[BASE 2 WK30_06]
GB40162A 9 0
No ENC permits
GB40184A 2 3
GB40186D 1 1
GB40202A 4 0

7h
[BASE 3 WK32_06]
GB50162B 10 3 10 3
GB50162C 9 1 9 1
GB50162D 5 1 5 1
GB50182A 1 5 1 5

7h
[UPDATE WK19_07]
GB302840 22 16 22 16
GB303220 4 6 4 6
GB303420 3 9 3 9
GB303460 11 0 11 0 NE installed from WK19/07 Update
GB40162A 9 3
No ENC permits
GB40184A 3 3
GB40186D 1 6
GB40202A 5 1
GB50162B 10 7 10 7
GB50162C 9 5 9 5
GB50162D 5 2 5 2
GB50182A 2 1 2 1 NE installed from WK19/07 Update

2.5.7 i) ECDIS management of multiple exchange sets and multiple purchases

Test reference	2.5.7 i)	IHO reference	S-63 6.5.1 & Sect 5 Appendix 2
Test description			
ONLY FOR SYSTEMS THAT USE THE LATEST UPDATE EXCHANGE SET TO MANAGE THE IMPORT OF ENCs ACROSS MULTIPLE BASES *This optional test is similar to Test 7h but covers the scenario where the user purchases additional ENC cells.*			
Set up			
No ENC permits or ENC cells installed. *Purchase 1* *1) IHO.CRT [Pre-installed]* *2) PERMIT.TXT* *3) UPDATE WK19_07* *4) Base Exchange set 1* *Purchase 2* *1) IHO.CRT [Pre-installed]* *2) PERMIT.TXT* *3) UPDATE WK37_07* *4) Base Exchange sets (2 & 3)* *a) D:\IHO S-64 [S-63 TDS v1.2]\7 ENC Data Management [Optional]\Test 7i\Purchase 1* *b) D:\IHO S-64 [S-63 TDS v1.2]\7 ENC Data Management [Optional]\Test 7i\Purchase 2*			
Action			

Result
In each instance the system should respond similar to the previous test (7h) and prompt the user to load the appropriate media and install the following ENC cells. *Purchase 1 – The system will prompt for BASE 1 WK28_06 and install four cells [GB302840, GB303220, GB303420 and GB303460].* *Purchase 2 - The system will prompt for BASE 2 WK25_07 [GB40162A & GB40184A] and finally BASE 3 WK27_07 [GB50162D].* *The results should be as specified in the "Expected SENC Status" table. See additional comments below.* *Purchase 2, BASE 1 has no new cells, new editions or updates. If the system maintains an up to date product listing the user should not be prompted to install this base.* *7i – Purchase 1 GB302840 22 0 22 0* *[BASE 1 WK28_06] GB303220 4 1 4 1* *GB303420 3 4 3 4* *GB303460 10 3 10 3* *7i – Purchase 1* *[BASE 2 WK30_06]* *GB40162A 9 0* *No ENC permits* *GB40184A 2 3* *GB40186D 1 1* *GB40202A 4 0* *7i – Purchase 1* *[BASE 3 WK32_06]* *GB50162B 10 3* *No ENC permits* *GB50162C 9 1* *GB50162D 5 1* *GB50182A 1 5 1 5* *7i – Purchase 1* *[UPDATE WK19_07]* *GB302840 22 16 22 16* *GB303220 4 6 4 6* *GB303420 3 9 3 9* *GB303460 11 0 11 0 NE installed from WK19/07 Update* *GB40162A 9 3* *No ENC permits* *GB40184A 3 3* *GB40186D 1 6* *GB40202A 5 1* *GB50162B 10 7* *GB50162C 9 5* *GB50162D 5 2* *GB50182A 2 1 2 1 NE installed from WK19/07 Update* *7i – Purchase 2* *[BASE 1 WK23_07]*

GB302840 22 16 22 16 *There are no new cells, new editions or* *update files on BASE 1* *GB303220 4 6 4 6* *GB303420 3 9 3 9* *GB303460 11 0 11 0* *7i – Purchase 2* *[BASE 2 WK25_07]* *GB40162A 9 3 9 3 New Permit* *GB40184A 3 3 3 3 New Permit* *GB40186D 1 6* *No ENC permits* *GB40202A 5 1* *7i – Purchase 2* *[BASE 3 WK27_07]* *GB50162B 10 7* *GB50162C 9 5* *GB50162D 5 2 5 2 New Permit* *7i – Purchase 2* *[UPDATE WK37_07]* *GB302840 23 4 23 4* *GB303220 4 7 4 7* *GB303420 3 12 3 12* *GB303460 11 1 11 1* *GB40162A 9 5 9 5* *GB40184A 3 5 3 5* *GB40186D 1 7* *No ENC permits* *GB40202A 5 2* *GB50162B 11 0* *GB50162C - - No updates for this cell* *GB50162D - - - - No updates for this cell* *GB50182A 2 2 2 2*

2.5.7 j) ECDIS management of multiple exchange sets

Test reference	2.5.7 j)	IHO reference	S-63 6.5.1 & Sect 5 Appendix 2
Test description			
ONLY FOR SYSTEMS THAT USE THE LATEST UPDATE EXCHANGE SET TO MANAGE THE IMPORT OF ENCs ACROSS MULTIPLE BASES *Confirm the system displays a relevant warning when installing a base media that is newer the latest installed update exchange set.*			
Set up			
No ENC permits or ENC cells installed. *1) IHO.CRT [Pre-installed]* *2) PERMIT.TXT* *3) WK19_07 Update Exchange Set* *4) Base Exchange sets (Bases 1-3) D:\IHO S-64 [S-63 TDS v1.2]\7 ENC Data Management\Test 7j*			
Action			
Install the permits at the location below then load the "UPDATE WK19_07"			

exchange set. Load the base exchange sets as prompted by the system, i.e.
BASE Media 1 dated 06 July 2006
BASE Media 2 dated 20 July 2006
BASE Media 3 dated 03 August 2006 [Not available]
Attempt to load BASE 3 WK24_07 instead of the recommended BASE 3 (unavailable) above.
Install WK19/07 Update to bring all ENC up to date.

Result

The system should read the permit file and the full products listing from the WK19/07 Update. The system should read the product listing to determine where all licenced ENC base [EN] cells are located, then using the STATUS.LST file prompt users to install the appropriate BASE media similar to test 7h. For example, The system should report a warning message when attempting to load BASE 3 WK27_07 similar to the following example:
"This base media is not compatible with the currently installed Update media. Please install "Base media 3 dated 03 August 2006".
The system can load all ENCs (base and updates) from Base 3 but when finally installing the WK19/07 update it would be useful if a message is displayed informing the user of the following:
"A newer update is available not all ENCs may be up to date"

The Base 3 exchange set used in this test is dated 21 July 2007 which is newer than the latest available update exchange set.

7j
[BASE 1 WK28_06]
GB302840 22 0 22 0
GB303220 4 1 4 1
GB303420 3 4 3 4
GB303460 10 3 10 3

7j
[BASE 2 WK30_06]
GB40162A 9 0 9 0
GB40184A 2 3 2 3
GB40186D 1 1 1 1
GB40202A 4 0 4 0

7j
[BASE 3 WK24_07]
GB50162B 11 0 11 0
BASE 3 is newer than the installed WK19/07 Update.
GB50162C 9 5 9 5
GB50162D 5 2 5 2
GB50182A 2 2 2 2

7j
[UPDATE WK19_07]
GB302840 22 16 22 16
GB303220 4 6 4 6
GB303420 3 9 3 9
GB303460 11 0 11 0
GB40162A 9 3 9 3
GB40184A 3 3 3 3
GB40186D 1 6 1 6
GB40202A 5 1 5 1

GB50162B 10 7 11 0 *These ENC Cells are installed from* *WK24/07 BASE 3.* *GB50162C 9 5 9 5* *GB50162D 5 2 5 2* *GB50182A 2 1 2 2*

2.5.8 Data Exchange Media

2.5.8 a) Exchange Set and Media Delivery

Test reference	2.5.8 a)	IHO reference	S-63 7 & S-63 Appendix 2
Test description			
To check that the system can import a single exchange from a CD-ROM or from any other interface or data storage media that may be supplied to the ECDIS for that purpose.			
Set up			
Certificate/Public Key as installed for test 7a. No pre-installed permits or ENCs. *Test data used* *1) IHO.CRT [Pre-installed]* *2) PERMIT.TXT* *3) V01X01 (Exchange Set - GB301620, GB301640 and GB301660)* *Test Data location* *D:\IHO S-64 [S-63 TDS v1.2]\8 Data Exchange Media\Test 8a*			
Action			
1. *Install the permits and certificate/public key stored in the location below.* 2. *Copy the exchange set [formatted as described in section 7 of the standard] from the same location to the following media:* a) *Hard Drive (e.g. C:\)* b) *CD-ROM* c) *DVD* d) *USB Memory Stick* e) *Other [e.g. Bluetooth or other remote means]* 3. *Load the exchange set into the system using those options available to the ECDIS.*			
Result			
All ENCs install correctly without error regardless of media or method. *After installation without errors or warnings the system should be up to date as follows:* *GB316200 (edition # 3 update # 0)* *GB316400 (edition # 4 update # 0)* *GB316600 (edition # 5 update # 0)*			

2.5.8 b) Single Media containing Multiple Exchange Sets

Test reference	2.5.8 b)	IHO reference	S-63 7 & S-63 Appendix 2
Test description			
To check that the system can import a multiple exchange sets from the media defined in test 6a. Confirm that the system imports all test exchange sets without error or omission.			
Set up			
Certificate/Public Key as installed for test 8a. No pre-installed permits or ENCs. *Test data used* *1) IHO.CRT [Pre-installed]*			

2) PERMIT.TXT *3) M01X01 - Media Exchange Set containing the following:* *Base Exchange Set 1 [B1]: GB100001, GB100002 & GB100004* *Base Exchange Set 2 [B2]: GB281600, GB281800, GB282000 & GB283000* *Base Exchange Set 3 [B3]: GB301620, GB301640 & GB301660* *Test Data location* *D:\IHO S-64 [S-63 TDS v1.2]\8 Data Exchange Media\Test 8b*
Action
Install permits and load all exchange sets contained on the media. Uninstall and repeat for all media types.
Result
All three exchange sets and their associated ENC cells shall be loaded into the ECDIS without error or omission. *The system should be up to date as follows:* *After installation of 8b [B1]:* *GB100001 (edition # 3 update # 6)* *GB100002 (edition # 13 update # 5)* *GB100004 (edition # 7 update # 1)* *After installation of 8b [B2]:* *GB281600 (edition # 1 update # 1)* *GB281800 (edition # 1 update # 0)* *GB282000 (edition # 1 update # 0)* *GB283000 (edition # 1 update # 4)* *After installation of 8b [B3]:* *GB301620 (edition # 3 update # 0)* *GB301640 (edition # 4 update # 0)* *GB301660 (edition # 5 update # 0)*

2.5.8 c) Multiple exchange sets across multiple media sets

Test reference	2.5.8 c)	IHO reference	S-63 7 & S-63 Appendix 2
Test description			
To test how the system manages multiple exchanges sets across several media sets. Confirm that the system is intuitive and guides the user through the cell loading process as defined in S-63.			
Set up			
Certificate/Public Key as installed for test 8b. No pre-installed permits or ENCs. *Test data used* *1) IHO.CRT [Pre-installed]* *2) PERMIT.TXT (Valid cell permits for GB100001, GB100002, GB100004, GB281600, GB281800, GB301660, GB40162A & GB61021B)* *3) M01X01 – Update Media set containing various NE & updates for cells below.* *4) M01X02 – Base Media Sets containing the following:* *Base Exchange Set 1 [B1]: GB100001, GB100002 & GB100004* *Base Exchange Set 2 [B2]: GB281600, GB281800, GB282000 & GB283000* *Base Exchange Set 3 [B3]: GB301620, GB301640 & GB301660* *M02X02 - Media Exchange Set containing the following:* *Base Exchange Set 1 [B4]: GB40162A, GB40162B & GB40162C* *Base Exchange Set 1 [B5]: GB58911B, GB58913A, GB58932A & GB58932B* *Base Exchange Set 1 [B6]: GB61011A, GB61021A, GB61021B & GB61032A* *Test Data location* a) *D:\IHO S-64 [S-63 TDS v1.2]\8 Data Exchange Media\Test 8c* b) *D:\IHO S-64 [S-63 TDS v1.2]\8 Data Exchange Media\Test 8c\UPDATE MEDIA* c) *D:\IHO S-64 [S-63 TDS v1.2]\8 Data Exchange Media\Test 8c\BASE MEDIA*			

Action
Install permits from the location at (a) below and then insert the update media set at (b). The system should then guide the user through the rest of the ENC installation process. The base media is held in (c).
Result
The system shall read the MEDIA.TXT file on the update media and prompt the user to install the appropriate media based on installed valid permits. All licenced ENCs and updates shall be installed (see the expected system status below). *Licenced permits are only a subset of ENC cells contained within the base exchange sets across both media.* *The system should be up to date as follows:* *After installation of 8c [B1]:* *GB100001 (edition # 3 update # 6)* *GB100002 (edition # 13 update # 5)* *GB100004 (edition # 7 update # 1)* *After installation of 8c [B2]:* *GB281600 (edition # 1 update # 1)* *GB281800 (edition # 1 update # 0)* *GB282000 (no permit).* *GB283000 (no permit)* *After installation of 8c [B3]:* *GB301620 (no permit)* *GB301640 (no permit)* *GB301660 (edition # 5 update # 0)* *After installation of 8c [B4]:* *GB40162A (edition # 9 update # 3)* *GB40162B (no permit)* *GB40162C (no permit)* *After installation of 8c [B5]:* *GB58911B (no permit)* *GB58913A (no permit)* *GB58932A (no permit)* *GB58932B (no permit)* *After installation of 8c [B6]:* *GB61011A (no permit)* *GB61021A (no permit)* *GB61021B (edition # 1 update # 1)* *GB61032A (no permit)* *After installation of 8c [U1]:* *GB100001 (edition # 3 update # 7)* *GB100002 (edition # 13 update # 7)* *GB100004 (edition # 8 update # 0). New edition is installed from update media.* *GB281600 (edition # 1 update # 2)* *GB281800 (edition # 1 update # 1)* *GB301660 (edition # 5 update # 1)* *GB40162A (edition # 9 update # 5)* *GB61021B (edition # 1 update # 2)*

2.5.8 d) Media validation of encrypted ENC service status

Test reference	2.5.8 d)	IHO reference	S-63 7 & S-63 Appendix 2
Test description			
To confirm that the system performs a check of the update media to establish whether the system has the latest base data installed. Check that the system displays an appropriate warning when identifying a base exchange set that is newer than the installed version.			
Set up			
All data installed from the previous test (8c). *Test data used* *M01X01 (WK48/07 Update Media) & M01X02 (new WK40/07 Base Media)* *Test Data location* *D:\IHO S-64 [S-63 TDS v1.2]\8 Data Exchange Media\Test 8d*			
Action			
1) *Load the UPDATE media from the location below.* 2) *When the warning message is displayed proceed to install available updates.* 3) *Load the correct BASE media as prompted by the ECDIS at the same location.* 4) *Load the UPDATE media again to bring all licenced cells up to date.*			
Result			
1) The system must return a warning stating that that one of the base exchange sets has been re-issued as follows: ***"The Update Media is not compatible with currently installed ENCs. Please load the latest version of 'BASE MEDIA 1 – Week 40/07 - dated 04 October 2007' and continue with the update process".*** *2) When continuing the following errors must be reported:* *Updates '9' cannot be installed for cell* ***GB100002*** *(sequential error reported) [Edition 13, Updates 1 to 8 issued on the new B1].* *Update '2-10' cannot be installed for cell* ***GB100004*** *(sequential error reported) [Edition 8, Update 1-7 issued on the new B1].* ***GB40162A.006*** *must update without error.* *3) Additional updates load from 'Base Exchange Set 1'* *4) All licenced ENC cells are updated without errors as described in the expected SENC status below.* *The system should be up to date as follows:* *After installation of 8d [U1] initial load:* *GB100002 (edition # 13 update # 7). Data set (edition # 13 update # 9).* *GB100004 (edition # 8 update # 0). Data set (edition # 8 update # 10).* *GB40162A (edition # 9 update # 6)* *After installation of 8d [New Media 1of2 – New B1 Exchange Set]:* *GB100001 (edition # 3 update # 7)* *GB100002 (edition # 13 update # 8)* *GB100004 (edition # 8 update # 7)* *After installation of 8d [B2]:* *GB281600 (edition # 1 update # 2)* *GB281800 (edition # 1 update # 1)* *GB282000 (no permit).* *GB283000 (no permit)* *After installation of 8d [B3]:* *GB301620 (no permit)* *GB301640 (no permit)* *GB301660 (edition # 5 update # 1)*			

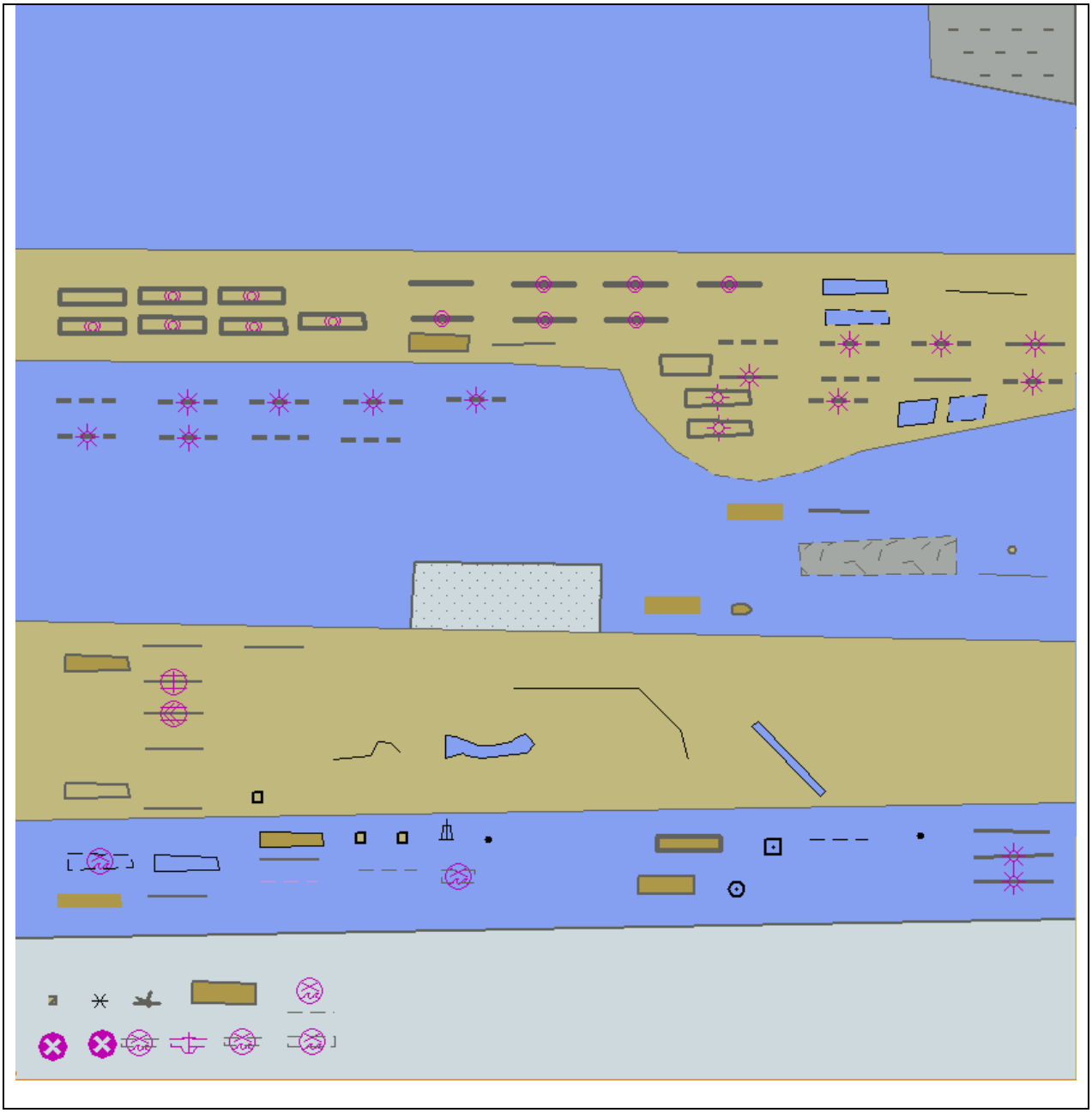
After installation of 8d [U1] final update:
GB100002 (edition # 13 update # 9)
GB100004 (edition # 8 update # 10)
GB281600 (edition # 1 update # 2)
GB281800 (edition # 1 update # 1)
GB301660 (edition # 5 update # 1)
GB40162A (edition # 9 update # 6)
GB61021B (edition # 1 update # 2)

3.0 Chart Display

3.1 Display of ENC data

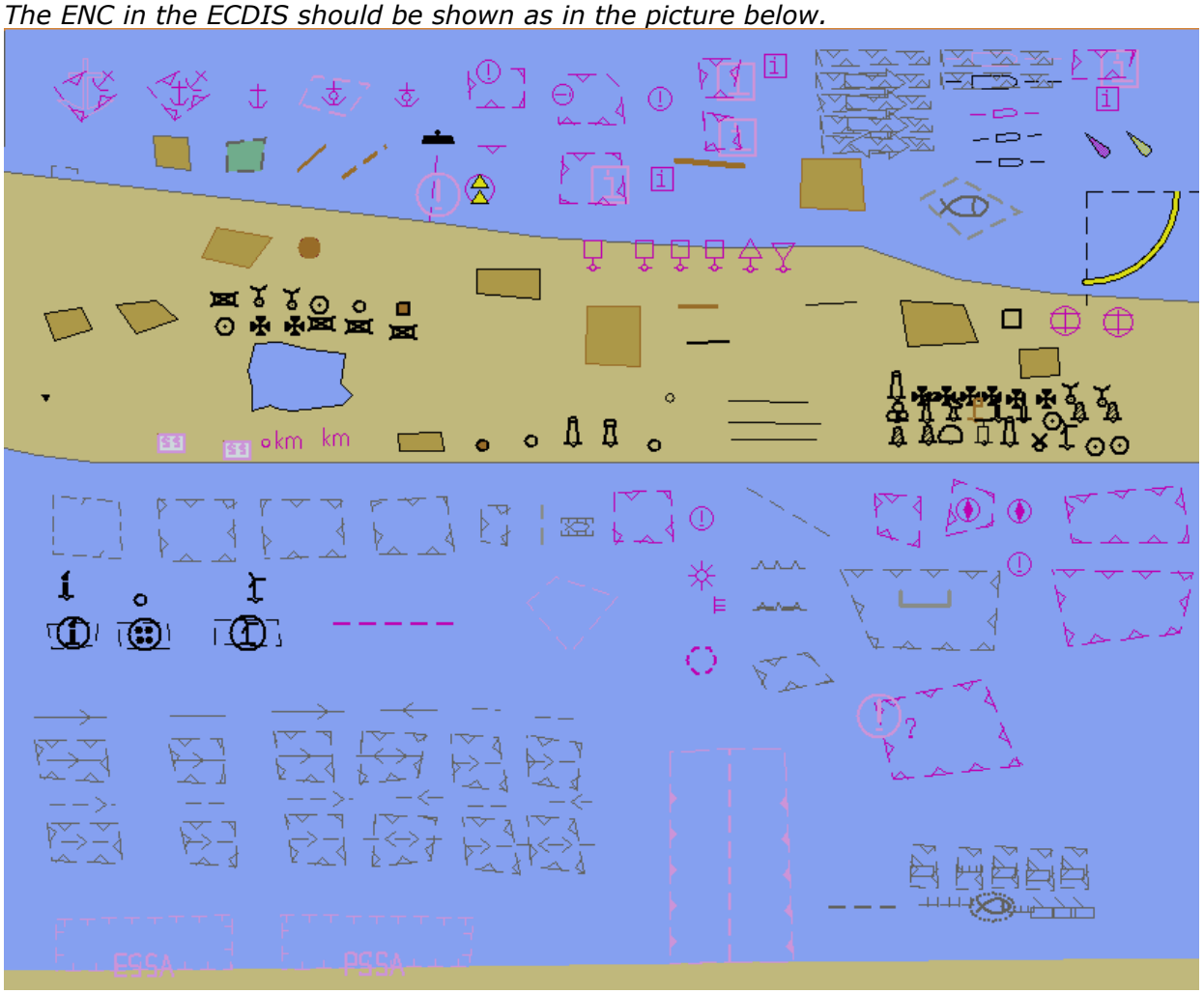
3.1.1 Display base category

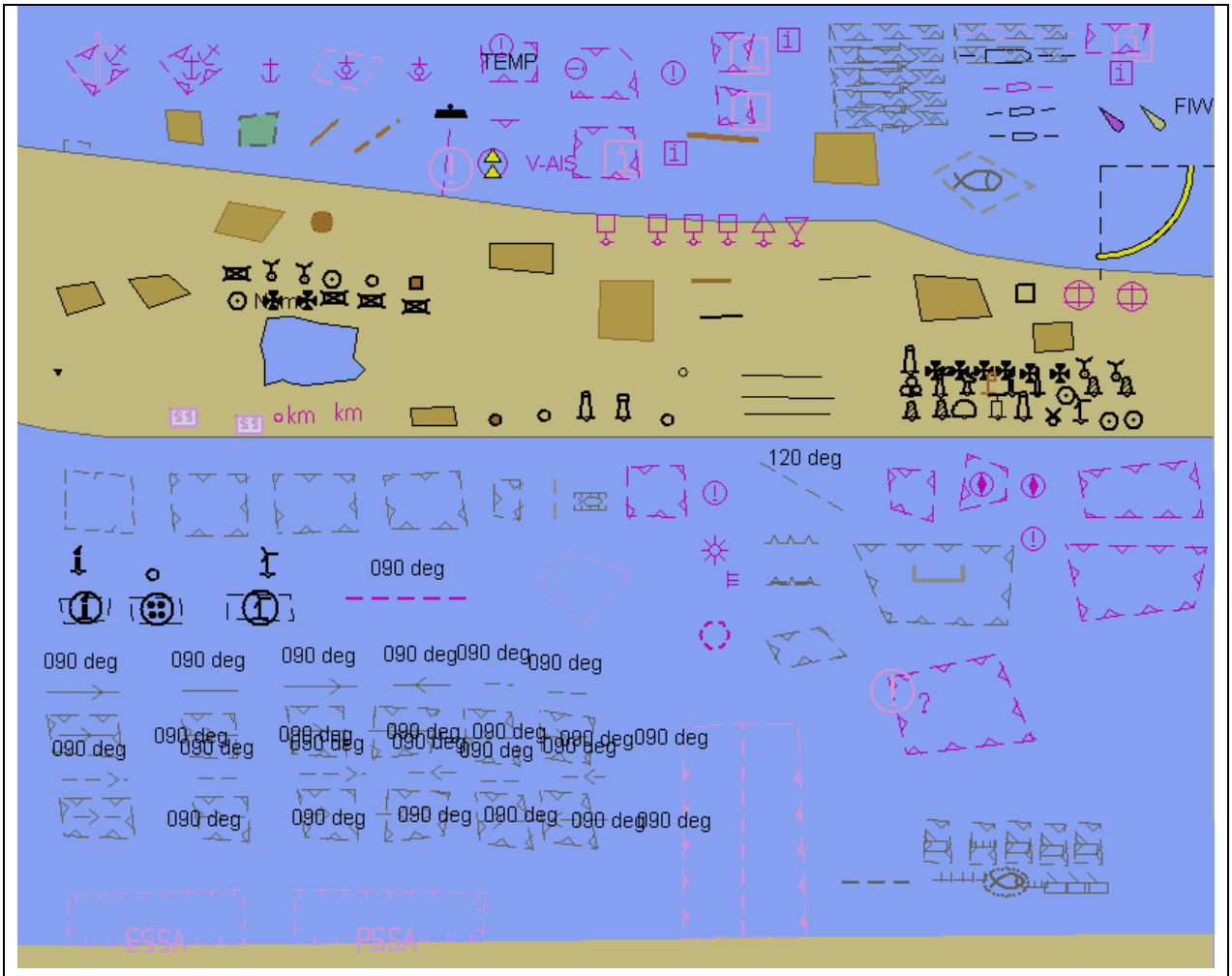
Test reference	3.1.1.	IHO reference	S-52 14.3
Test description			
The purpose of the test is to verify by observation that ECDIS correctly displays all ENC objects included in the IMO Display Base category. The test is performed by loading to ECDIS test S-57 cell and checking display against graphical plots. The test ENC cell "AA5DDBASE.000 contains all ENC objects belonging to Display Base according to the IHO S-52 Presentation Library.			
Set up			
Load cell AA5DBASE.000 from 3.1 ENC Display\Base\ENC_ROOT with the following settings; *Select Viewing group layer Base* *Set the safety contour value to 10 m* *Set the safety depth value to 10 m* *Select Symbolized Boundaries*			
Action			
Check ENC symbols shown in the ECDIS against the graphical plot.			
Result			
The ENC in the ECDIS should be shown like in the picture below.			



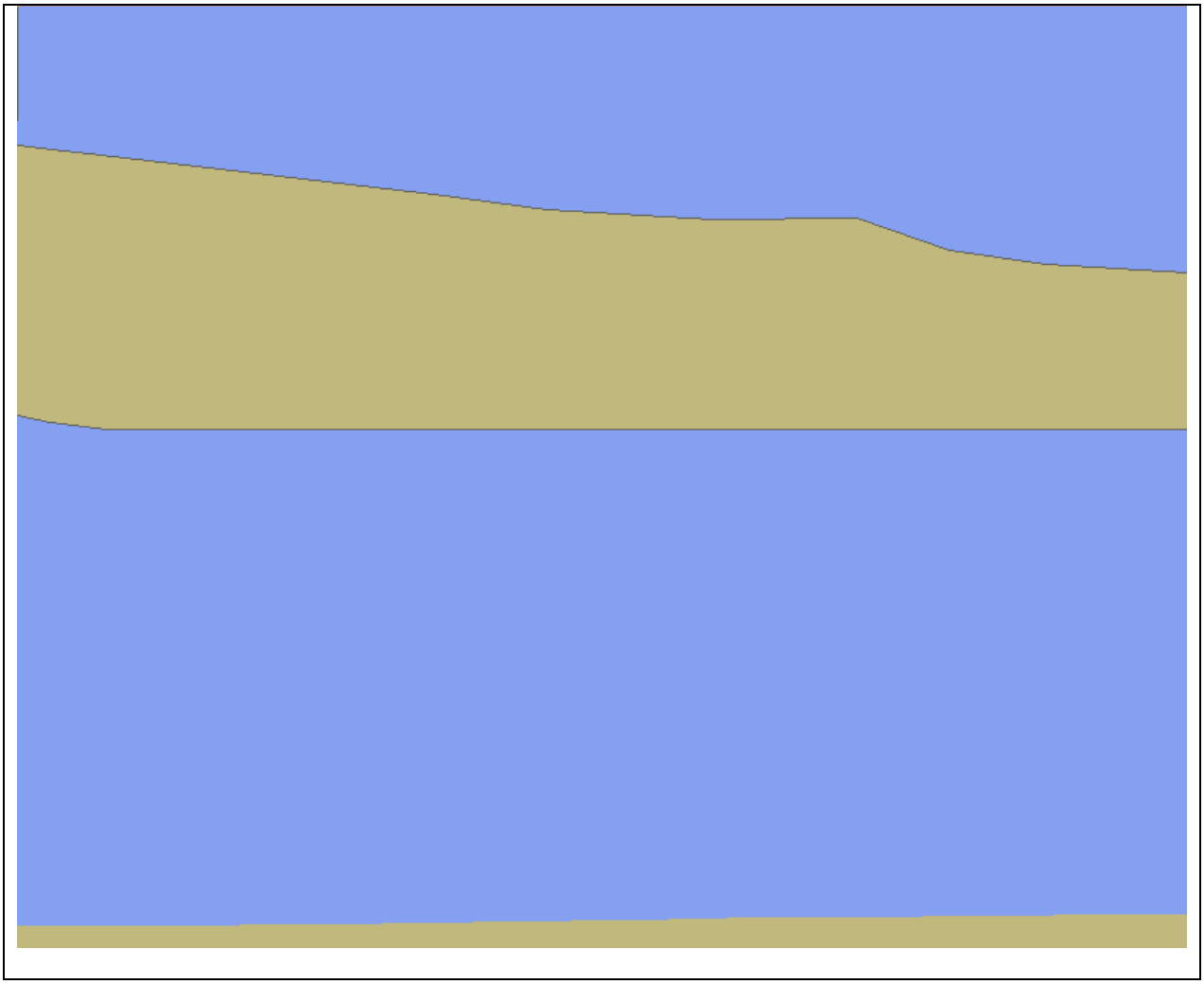
3.1.2 Standard display category

Test reference	3.1.2.	IHO reference	S-52 14.3
Test description			
The purpose of the test is to verify by observation that ECDIS correctly displays all ENC objects included in the IMO Standard Display category. The test is performed by loading to ECDIS test S-57 cell and checking display against graphical plots. *The test ENC cell AA5STNDR.000 contains depth and land areas from Display Base plus all ENC objects belonging to Standard Display according to the IHO S-52 Presentation Library. The objects belonging to Standard Display are to be shown if Standard display is selected in ECDIS HMI and should be disappearing in the Display Base mode*			
Set up			
Load cell AA5STNDR.000 from 3.1 ENC Display\Standard\ENC_ROOT with the following settings; *Select Viewing group layer Standard display*			

Set the safety contour value to 10 m *Set the safety depth value to 10 m* *Select Symbolized Boundaries*
Action
Switch on Standard Display Check ENC symbols shown in ECDIS against graphical plot
Result
Confirm that depth and land areas and safety contour from display base are shown *The ENC in the ECDIS should be shown as in the picture below.* 
Action
Select all Text groups. Check ENC symbols shown in ECDIS against graphical plot
Result
The ENC in the ECDIS should be shown as in the picture below.

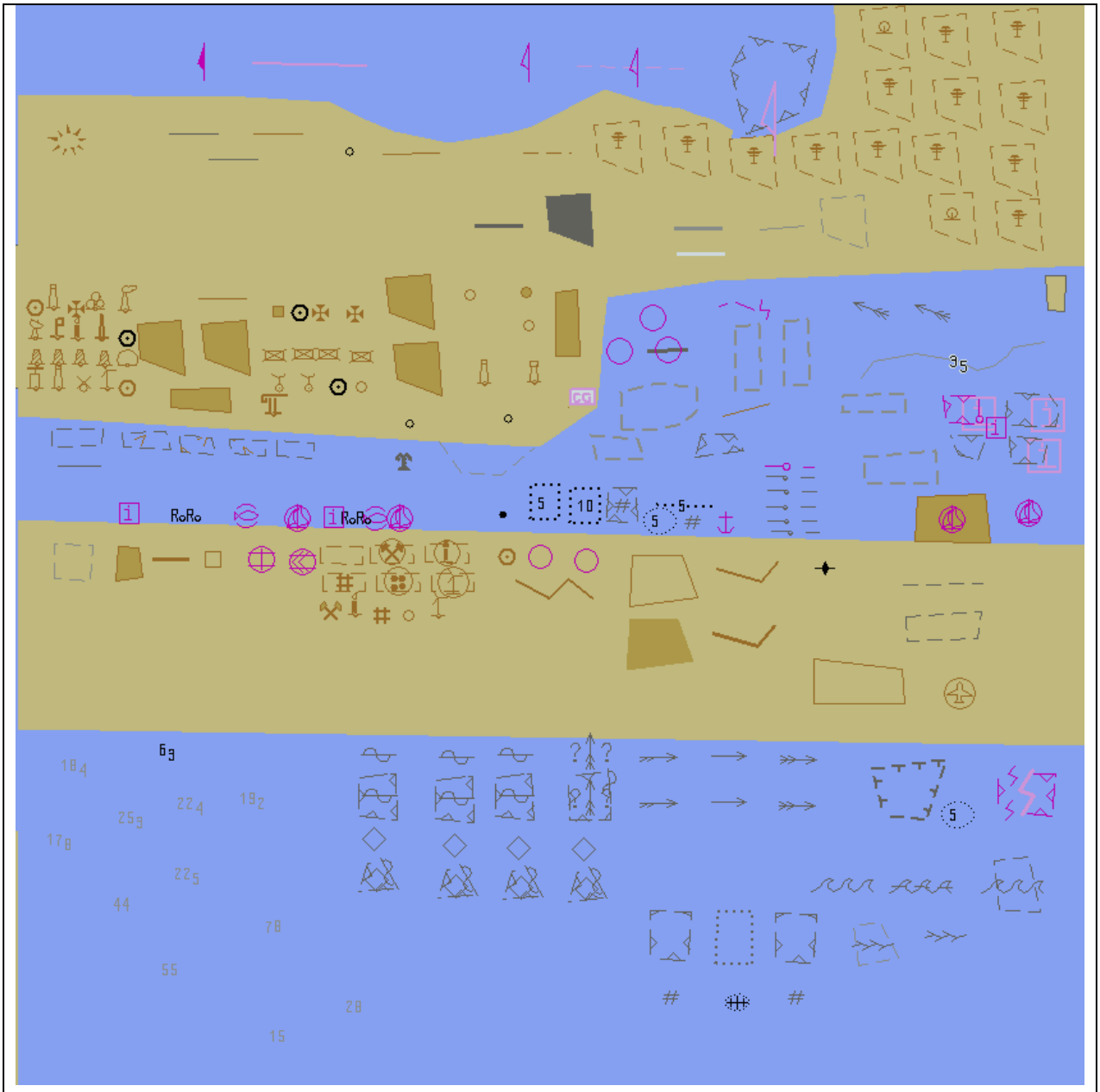


Action
Switch on Display Base. Check ENC symbols shown in ECDIS against graphical plot
Result
The ENC in the ECDIS should be shown like in the picture below.

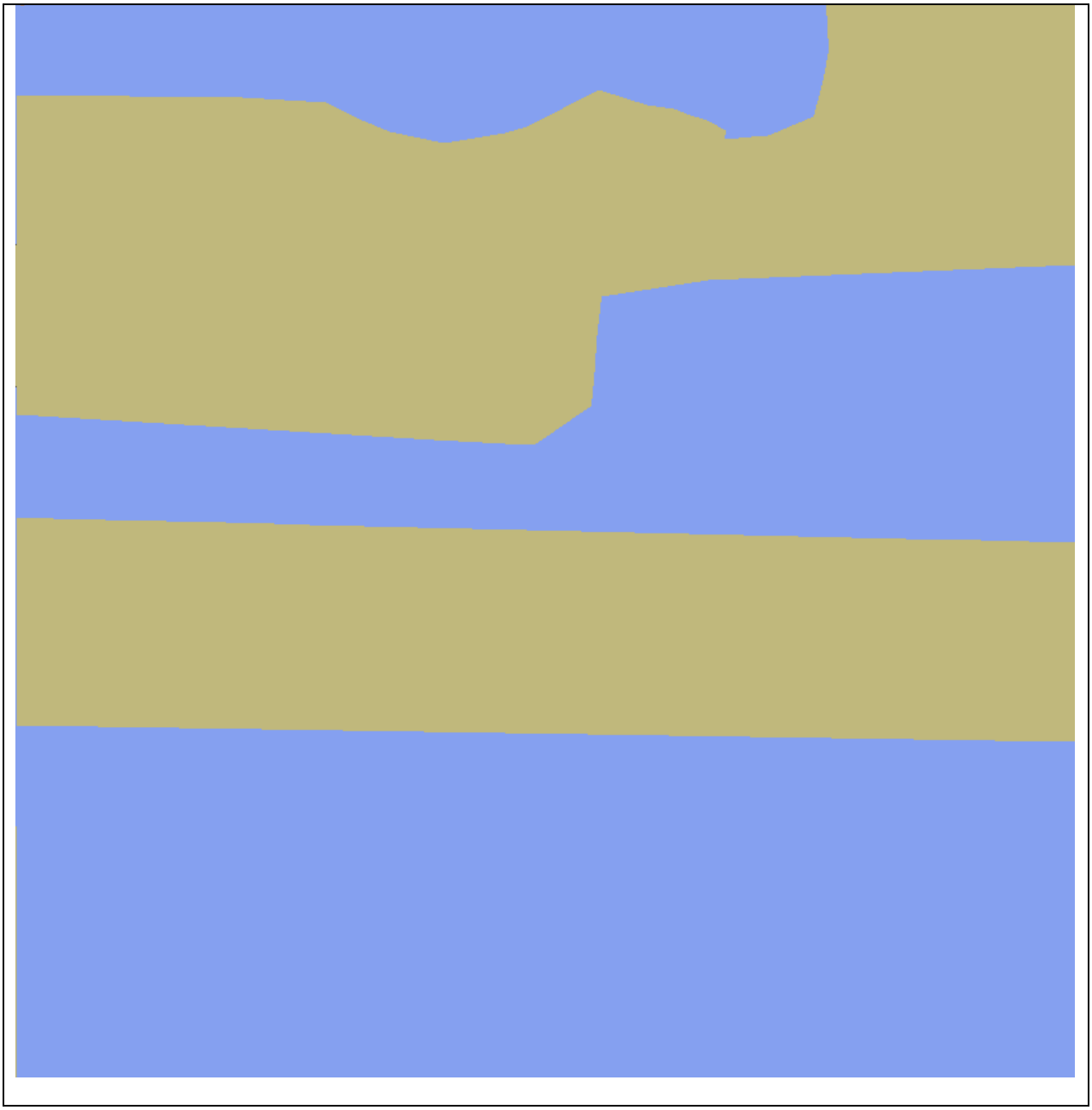


3.1.3 Other Display category

Test reference	3.1.3	IHO reference	S-52 14.3
Test description			
The purpose of the test is to verify by observation that ECDIS correctly displays all ENC objects included in the IMO Other Display category. The test is performed by loading to ECDIS test S-57 cell and checking display against graphical plots. *The test ENC cell AA5OTHER.000 contains depth and land areas from Display Base plus all ENC objects belonging to Other Display according to the IHO S-52 Presentation Library.* *The objects belonging to Other Display are to be shown if Other (or All) display is selected in ECDIS HMI and should be disappearing in the Display Base or Standard Display modes*			
Set up			
Load cell AA5OTHER.000 from 3.1 ENC Display\Other\ENC_ROOT with the following settings; *Select Viewing group layer Other* *Set the safety contour value to 10 m* *Set the safety depth value to 10 m* *Select Symbolized Boundaries*			
Action			
Switch on Other Display Check every ENC symbol shown in ECDIS against graphical plot			
Result			
The objects are shown as presented in the screen plot below			

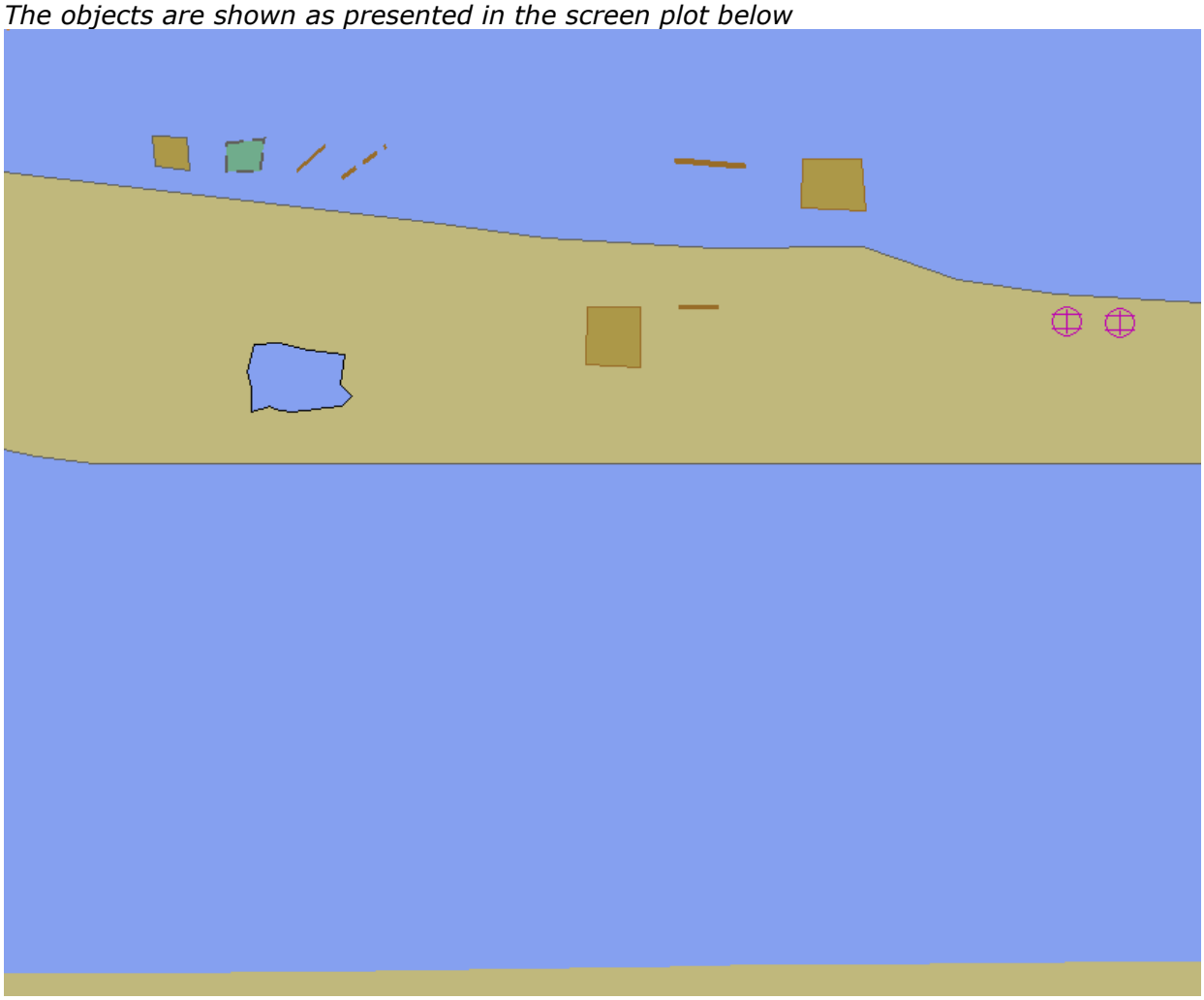


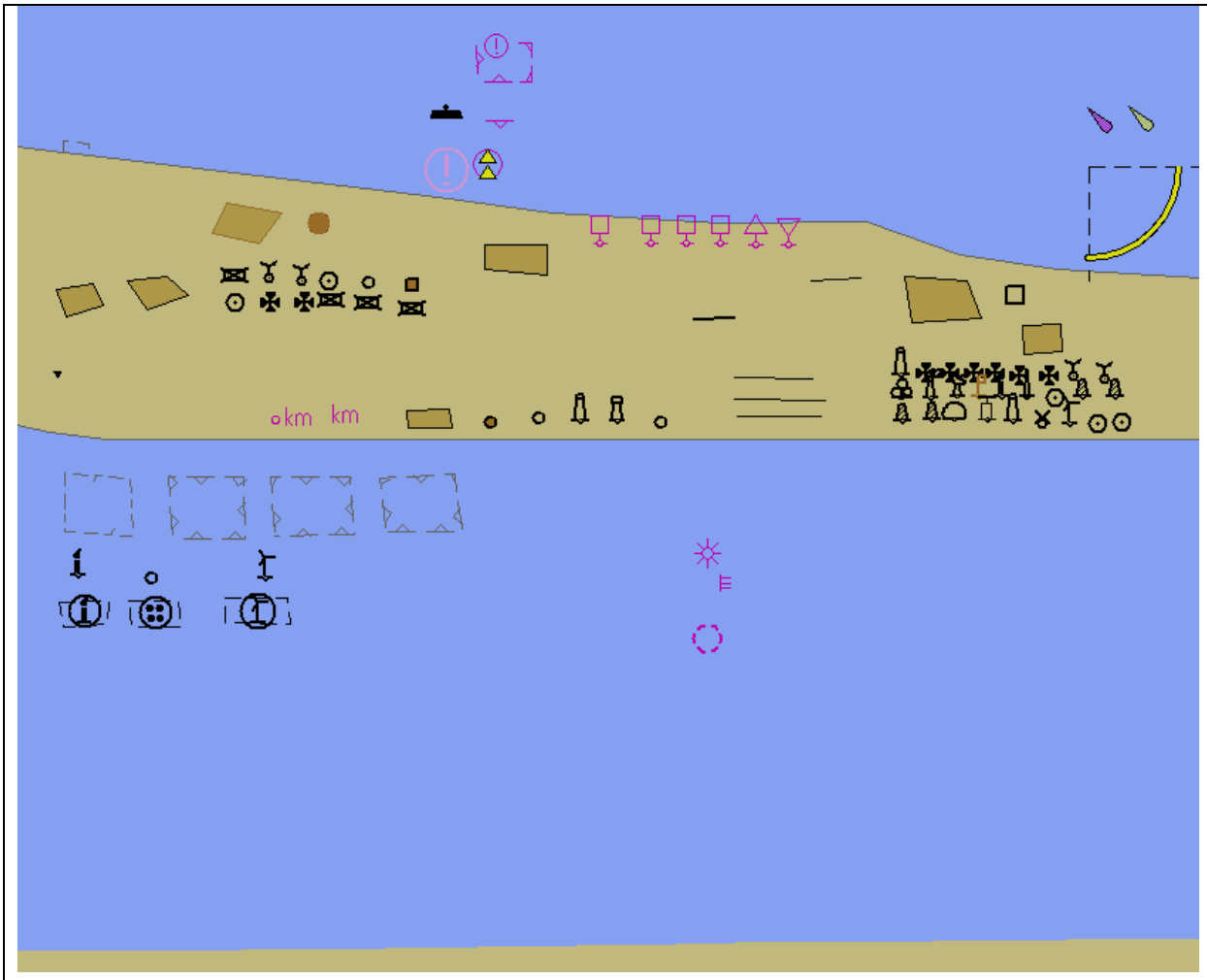
Action
Switch on Display Base. Check ENC display in ECDIS against graphical plot
Result
The objects are shown as presented in the screen plot below



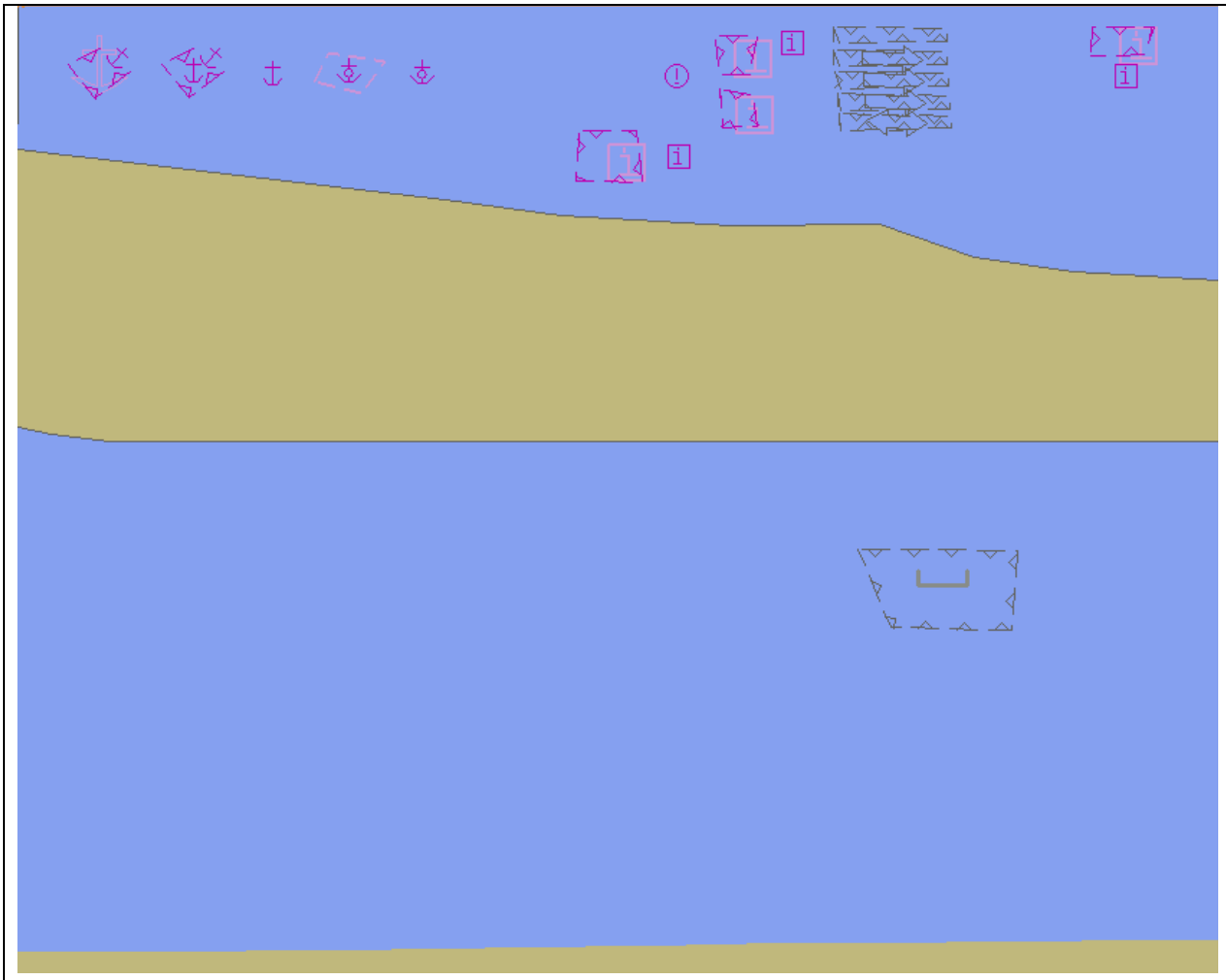
3.1.4 ECDIS Viewing groups names. Standard Display

Test reference	3.1.4.	IHO reference	S-52 14.3
Test description			
The purpose of the test is to verify that ECDIS is able to change ENC display settings by standardized controls. Names of the controls, located under the Standard Display section of ECDIS should switch on and off certain viewing layers and should comply with requirements of IHO S-52 Presentation Library Edition 4.0.			
Set up			
Load cell AA5STNDR.000 from 3.1 ENC Display\Standard\ENC_ROOT with the following settings; *Select Viewing group layer Standard* *Set the safety contour value to 10 m* *Set the safety depth value to 10 m* *Select Symbolized Boundaries*			
Action			

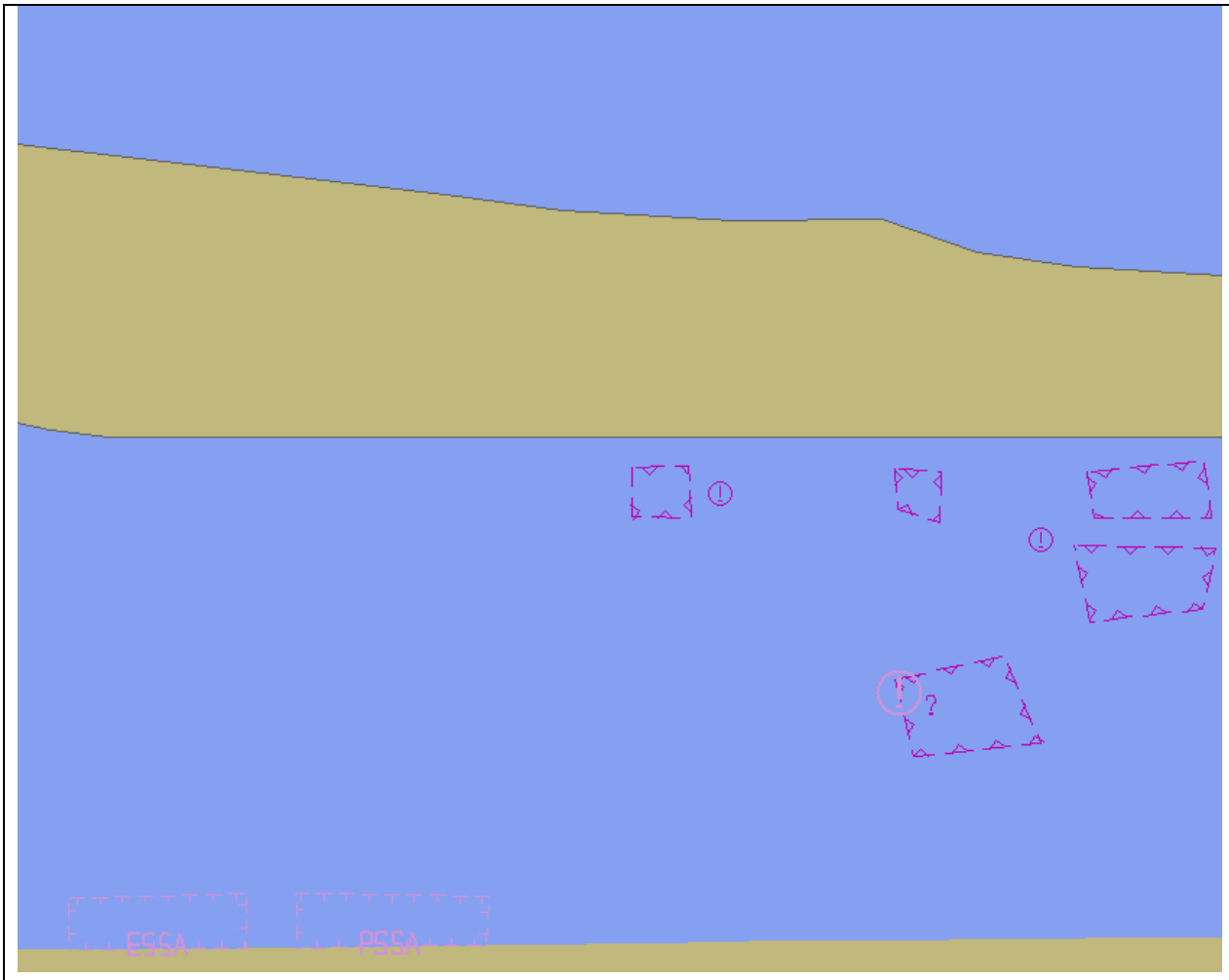
Switch on Standard Display Check that ECDIS HMI contains standardized controls that can switch on and off certain objects from the chart
Result
Confirm that the following controls are available at ECDIS HMI *Drying line* *Buoys, beacons, aids to navigation* *Buoys, beacons, structures* *Lights* *Boundaries and limits* *Prohibited and restricted areas* *Chart scale boundaries* *Cautionary notes* *Ships' routeing systems and ferry routes* *Archipelagic sea lanes*
Action
Switch off all controls and switch on only the "***Drying line***" control. Verify that the objects are displayed correctly as presented in the plot.
Result
The objects are shown as presented in the screen plot below 
Action
Switch off all controls and switch on only the "***Buoys, beacons, aids to navigation***" control. Verify that the objects are displayed correctly as presented in the plot.
Result
The objects are shown as presented in the screen plot below



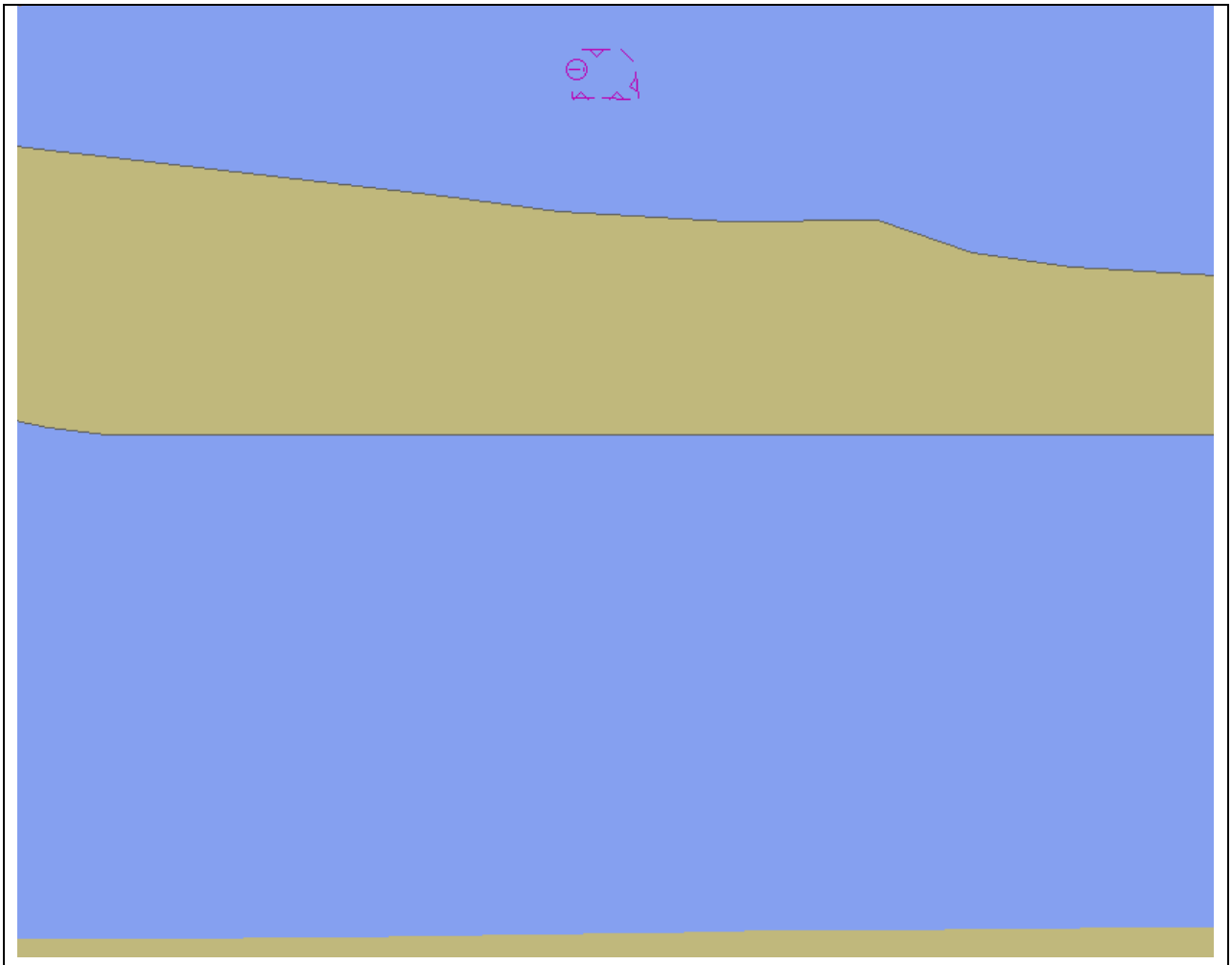
Action
Switch off all controls and switch on only the "***Boundaries and limits***" control. Verify that the objects are displayed correctly as presented in the plot.
Result
The objects are shown as presented in the screen plot below



Action
Switch off all controls and switch on only the "***Prohibited and restricted areas***" control. Verify that the objects are displayed correctly as presented in the plot.
Result
The objects are shown as presented in the screen plot below

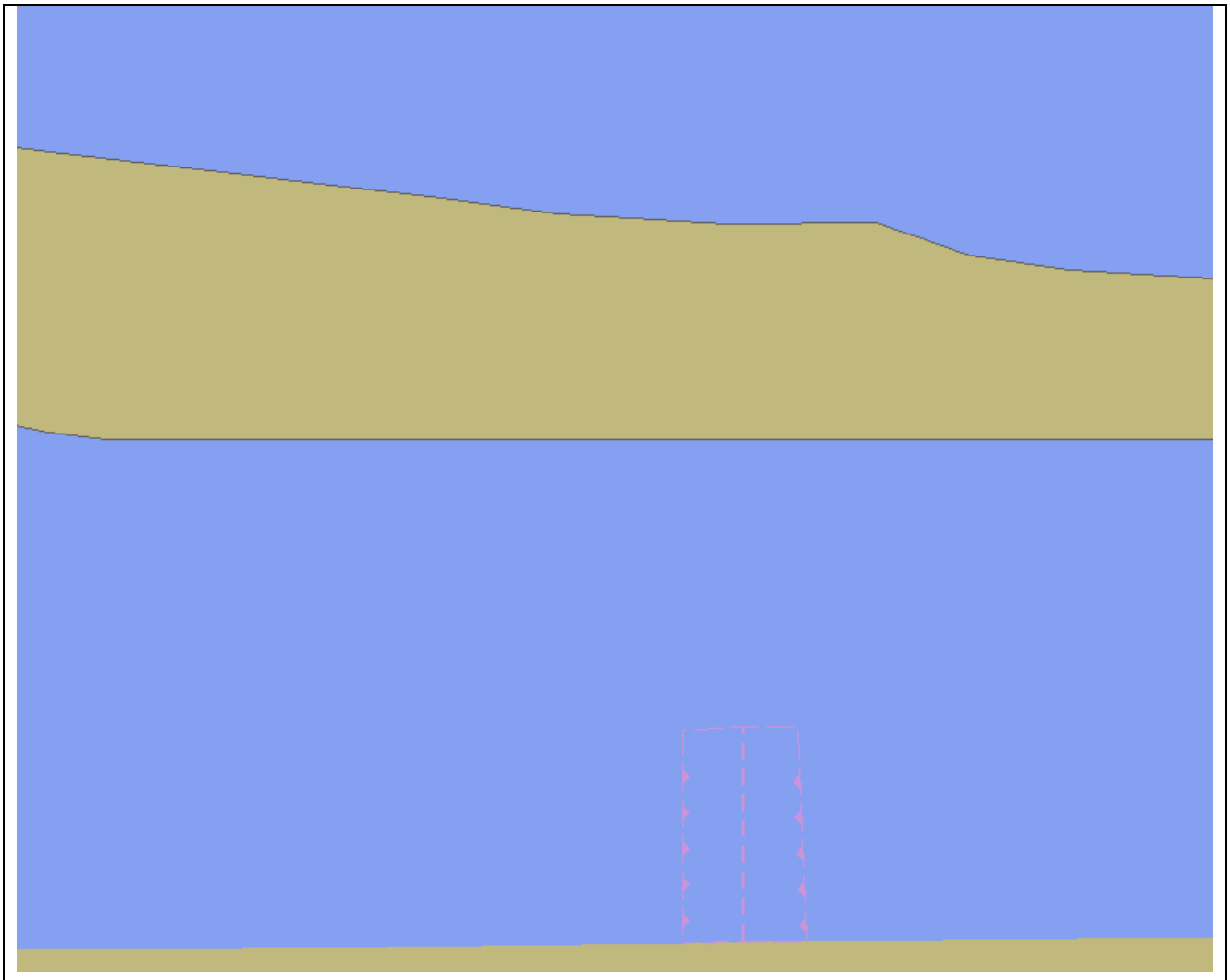


Action
Switch off all controls and switch on only the "***Cautionary notes***" control. Verify that the objects are displayed correctly as presented in the plot.
Result
The objects are shown as presented in the screen plot below

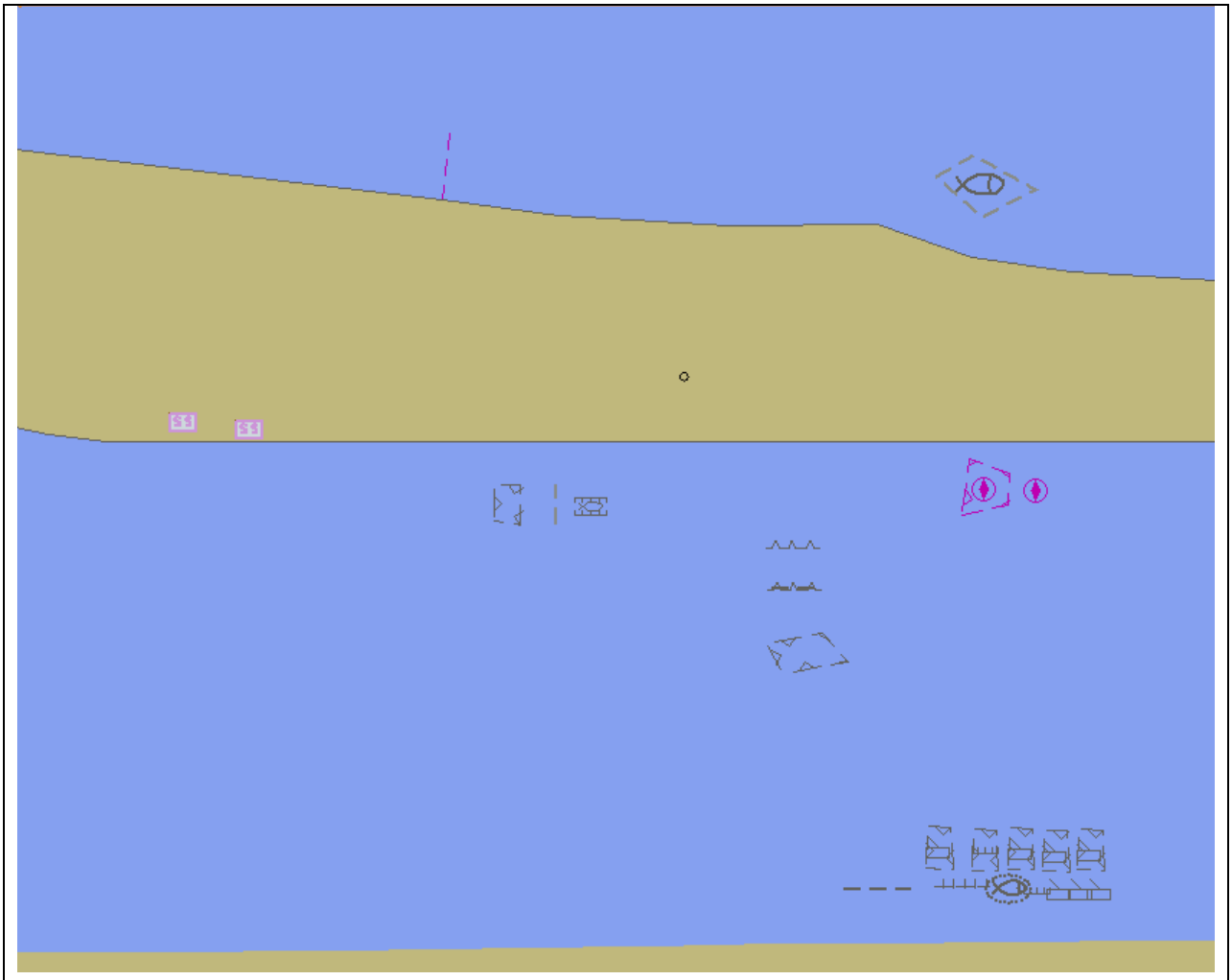


Action
Switch off all controls and switch on only the "***Ships' routeing systems and ferry routes***" control. Verify that the objects are displayed correctly as presented in the plot.
Result
The objects are shown as presented in the screen plot below

Action
Switch off all controls and switch on only the "***Archipelagic sea lanes***" control. Verify that the objects are displayed correctly as presented in the plot.
Result
The objects are shown as presented in the screen plot below



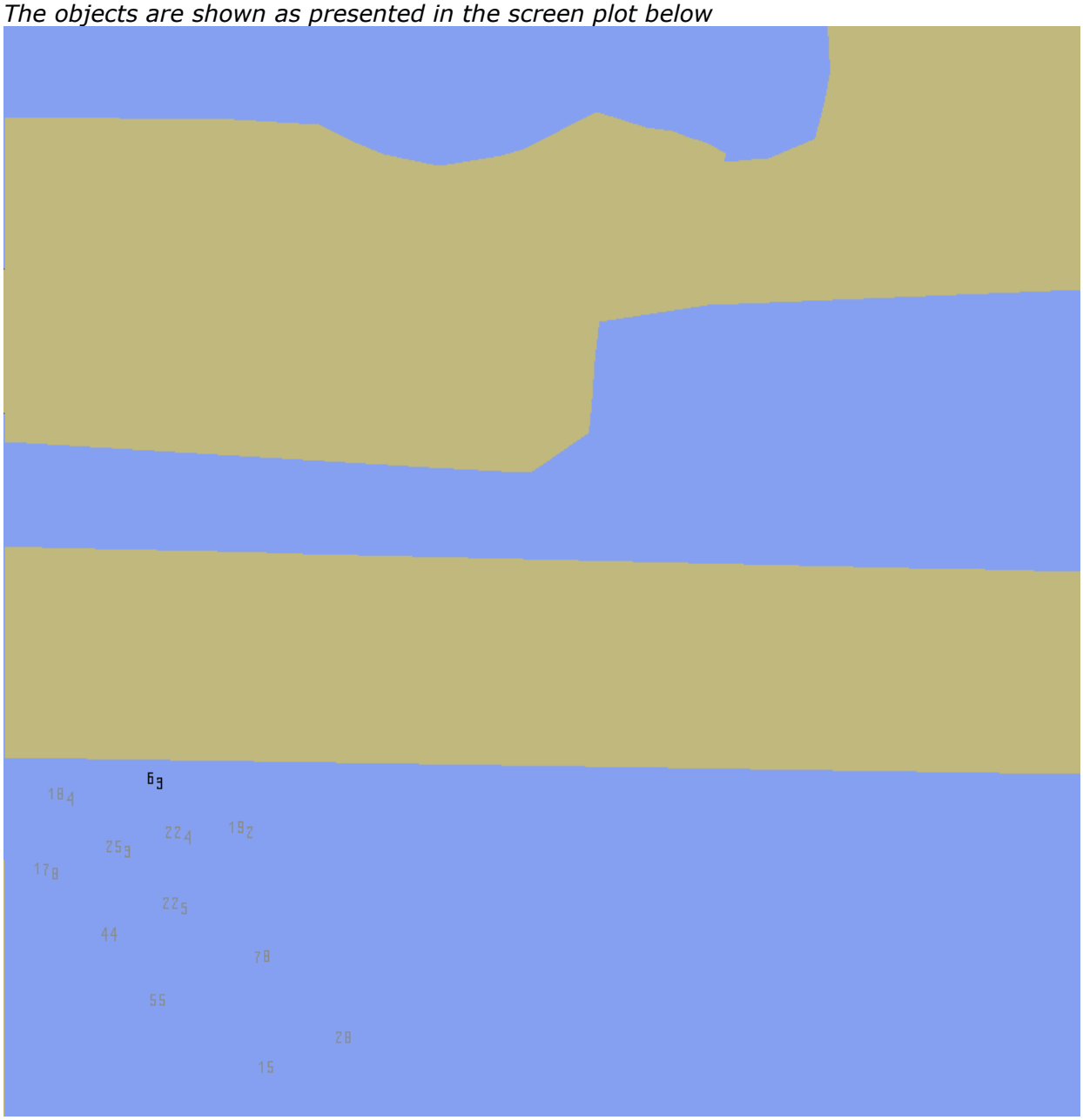
Action
Switch off all controls and switch on only the "***Miscellaneous***" control. Verify that the objects are displayed correctly as presented in the plot.
Result
The objects are shown as presented in the screen plot below



Action
Load all cells from 2.1.1 Power Up\ENC_ROOT *Centre the display on position 32°28'.500S 60° 59.000E and then zoom in to a scale of 1:20,000* Switch off all controls and switch on only the "***Chart scale boundaries***" control. Verify that the objects are displayed correctly as presented in the plot.
Result
The objects are shown as presented in the screen plot below

3.1.5 ECDIS Viewing Layers. Other Display.

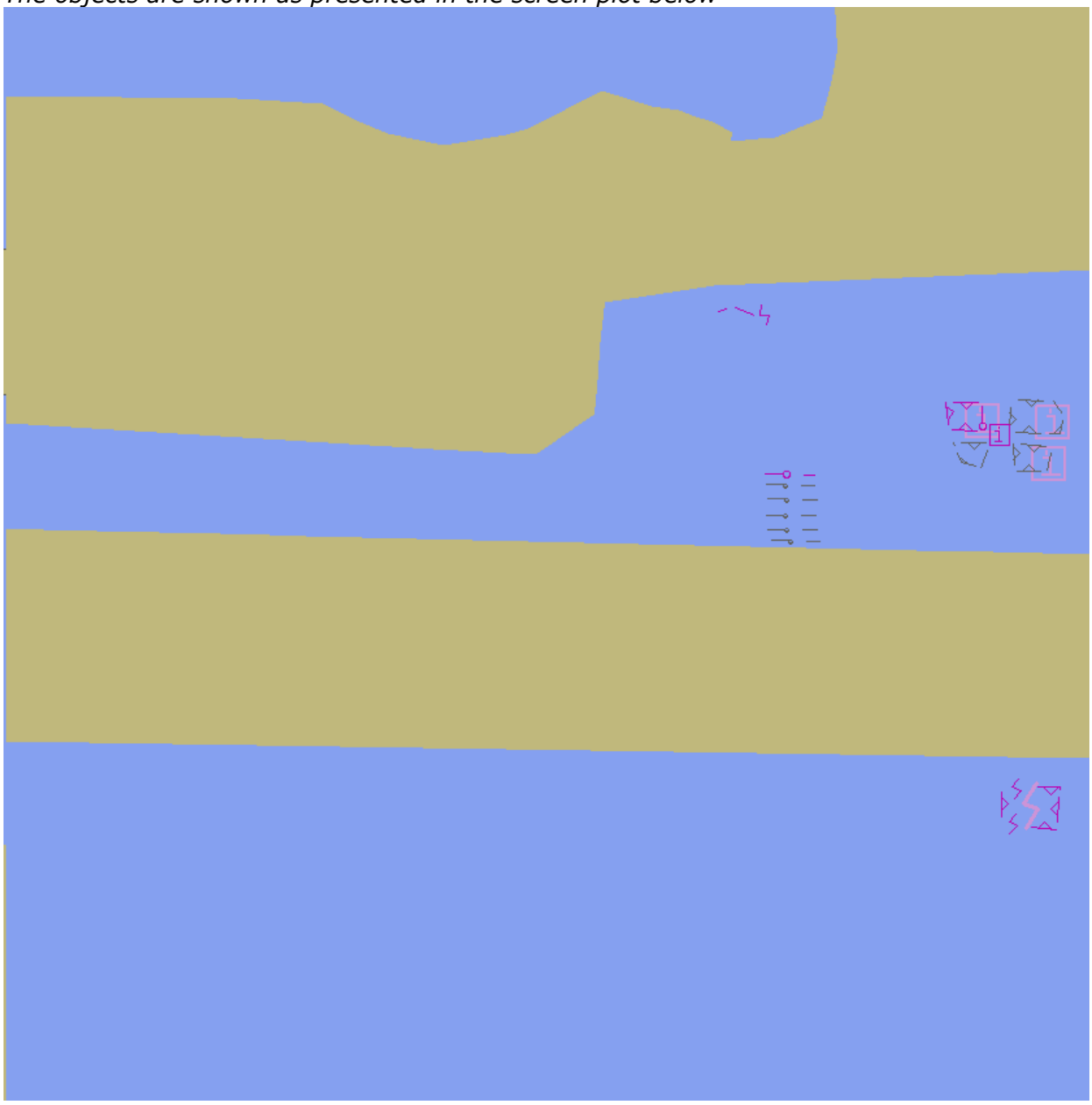
Test reference	3.1.5.	IHO reference	S-52 14.3
Test description			
The purpose of the test is to verify that ECDIS is able to change ENC display settings by standardized controls. Names of the controls, located under the Other Display section of ECDIS should switch on and off certain viewing layers and should comply with requirements of IHO S-52 Presentation Library Edition 4.0.			
Set up			
Load cell AA5OTHER.000 from 3.1 ENC Display\Other\ENC_ROOT with the following settings; *Select Viewing group layer Other* *Set the safety contour value to 10 m* *Set the safety depth value to 10 m* *Select Symbolized Boundaries*			
Action			
Switch on Other Display Check that ECDIS HMI contains standardized controls that can switch on and off certain objects from the chart			

Result
Confirm that the following controls are available at ECDIS HMI under the Other display section *Spot soundings* *Submarine cables and pipelines* *All isolated dangers* *Magnetic variation* *Depth contours* *Seabed* *Tidal* *Miscellaneous*
Action
Switch off all controls and switch on only the "***Spot soundings***" control. Verify that the objects are displayed correctly as presented in the plot.
Result
The objects are shown as presented in the screen plot below 
Action

Switch off all controls and switch on only the "***Submarine cables and pipelines***" control. Verify that the objects are displayed correctly as presented in the plot.

Result

The objects are shown as presented in the screen plot below

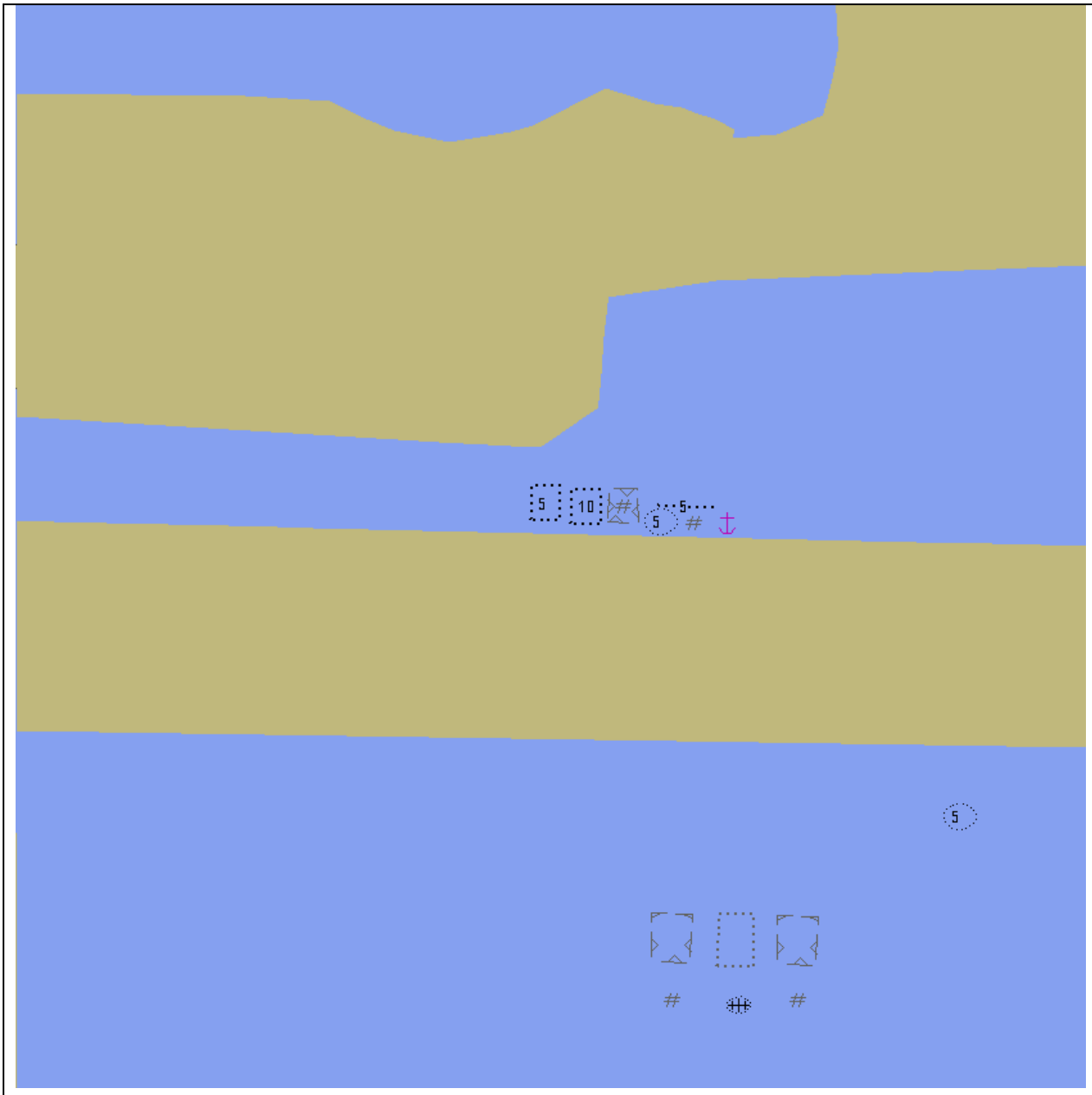


Action

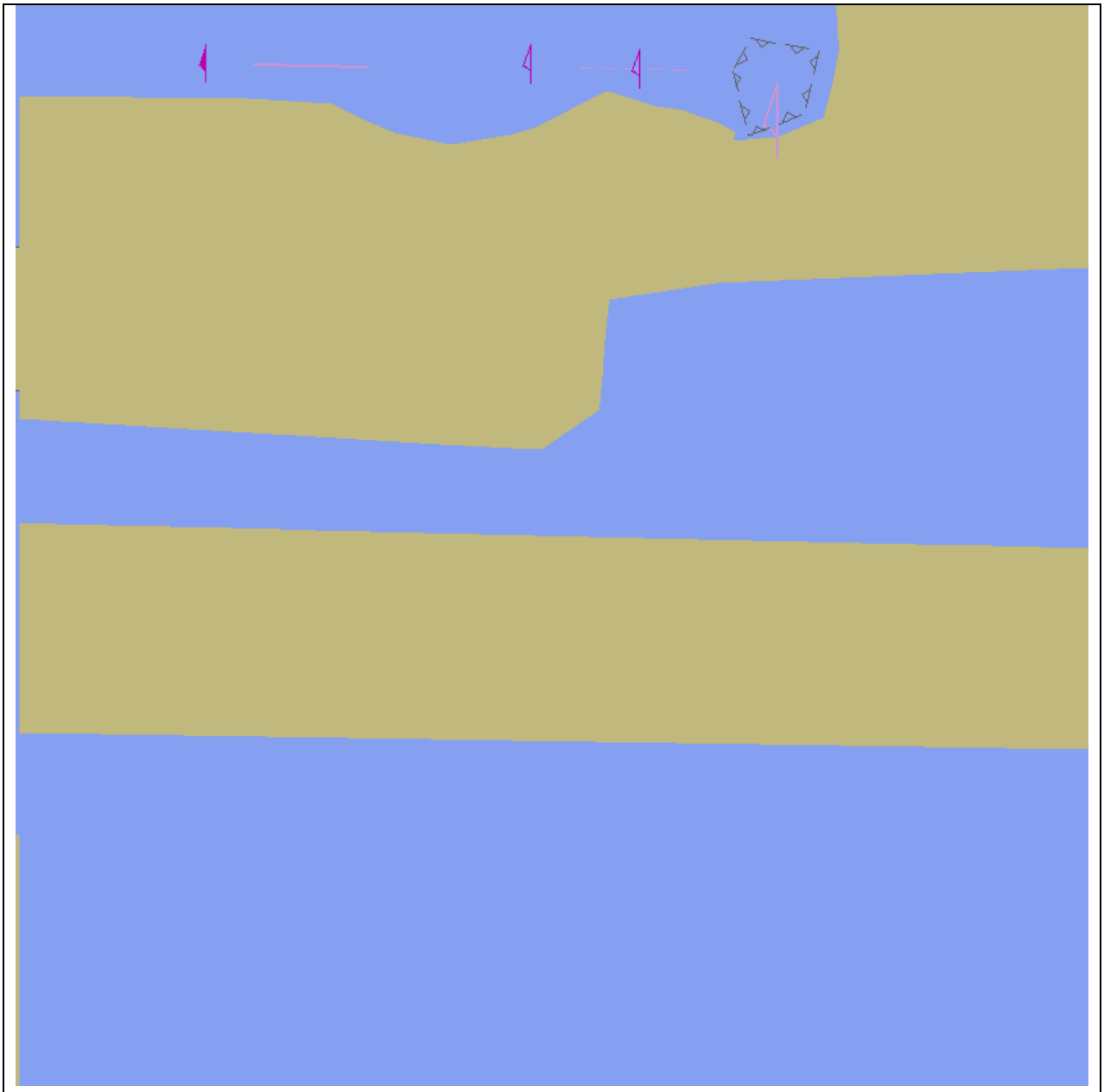
Switch off all controls and switch on only the "***All isolated danger***" control. Verify that the objects are displayed correctly as presented in the plot.

Result

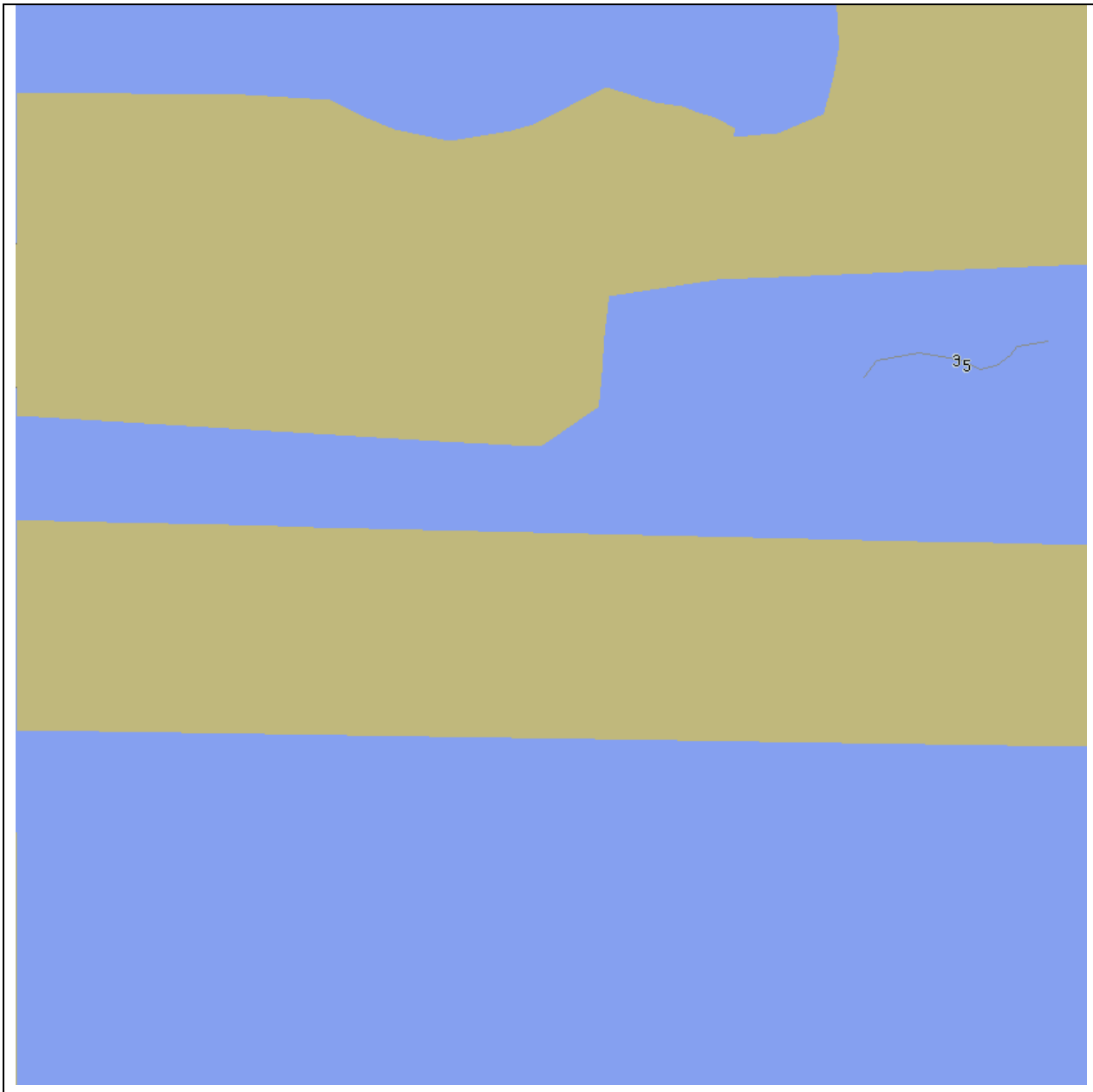
The objects are shown as presented in the screen plot below



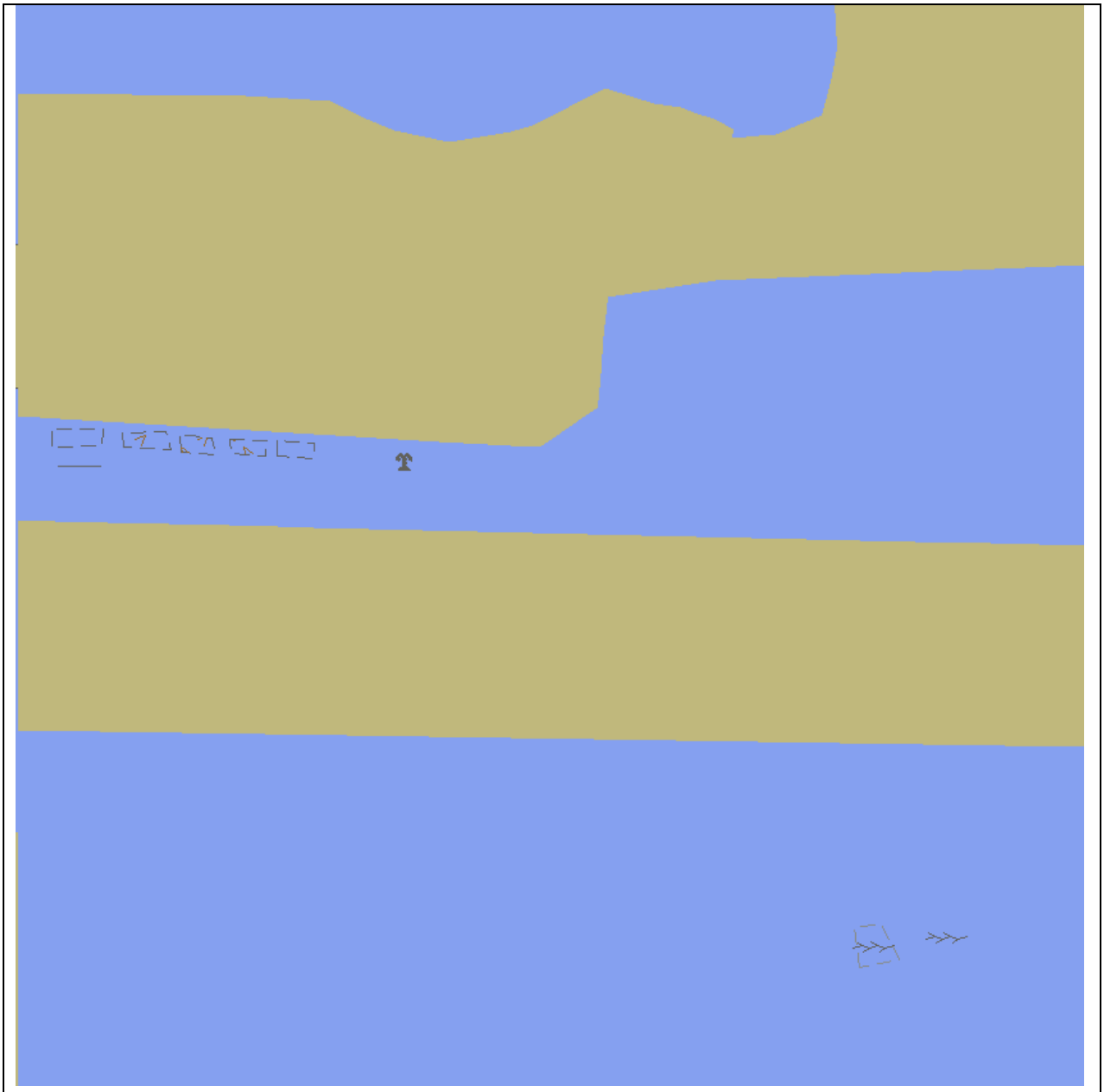
Action
Switch off all controls and switch on only the "***Magnetic variation***" control. Verify that the objects are displayed correctly as presented in the plot.
Result
The objects are shown as presented in the screen plot below



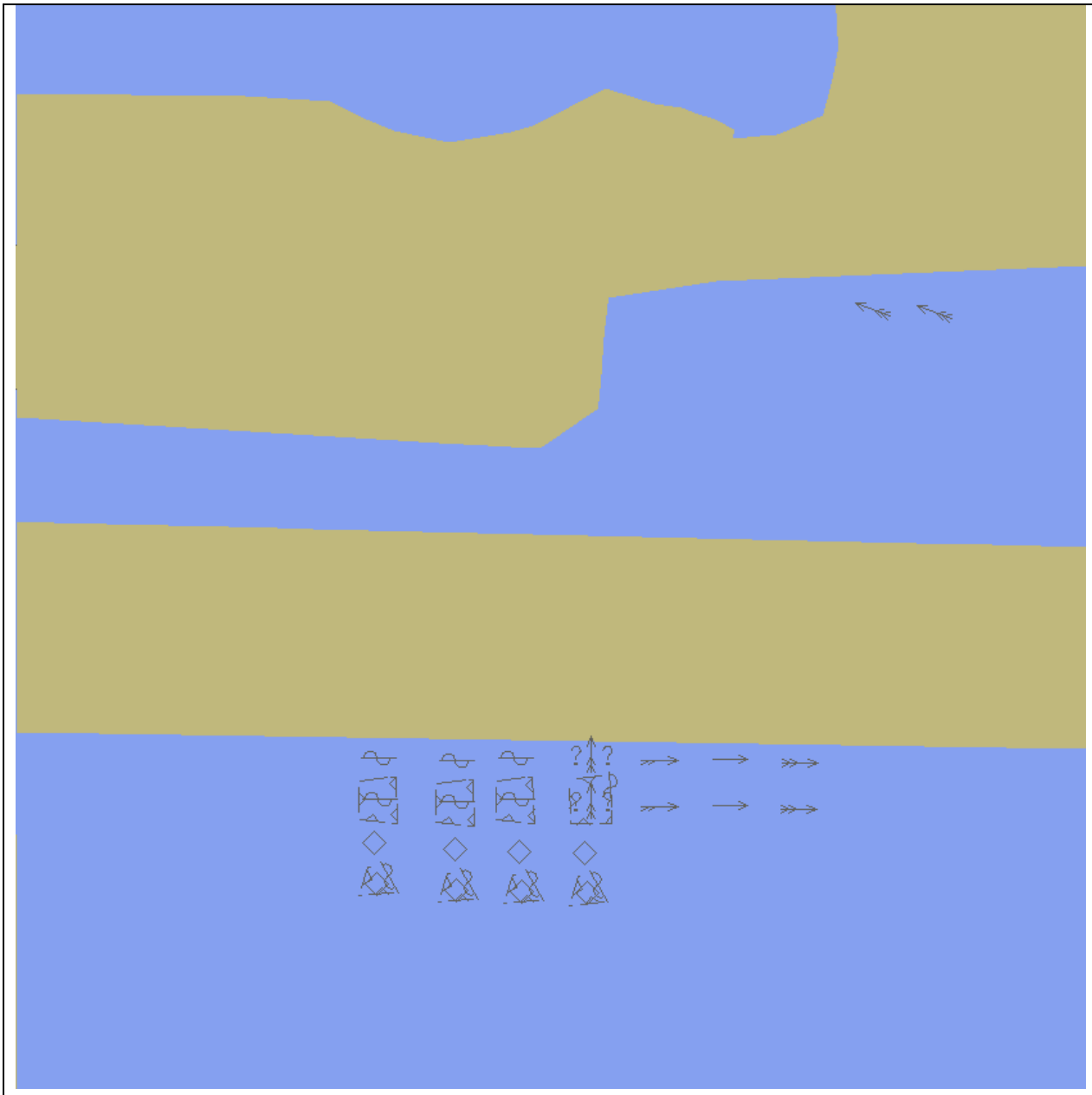
Action
Switch off all controls and switch on only the "***Depth Contours***" control. Verify that the objects are displayed correctly as presented in the plot.
Result
The objects are shown as presented in the screen plot below



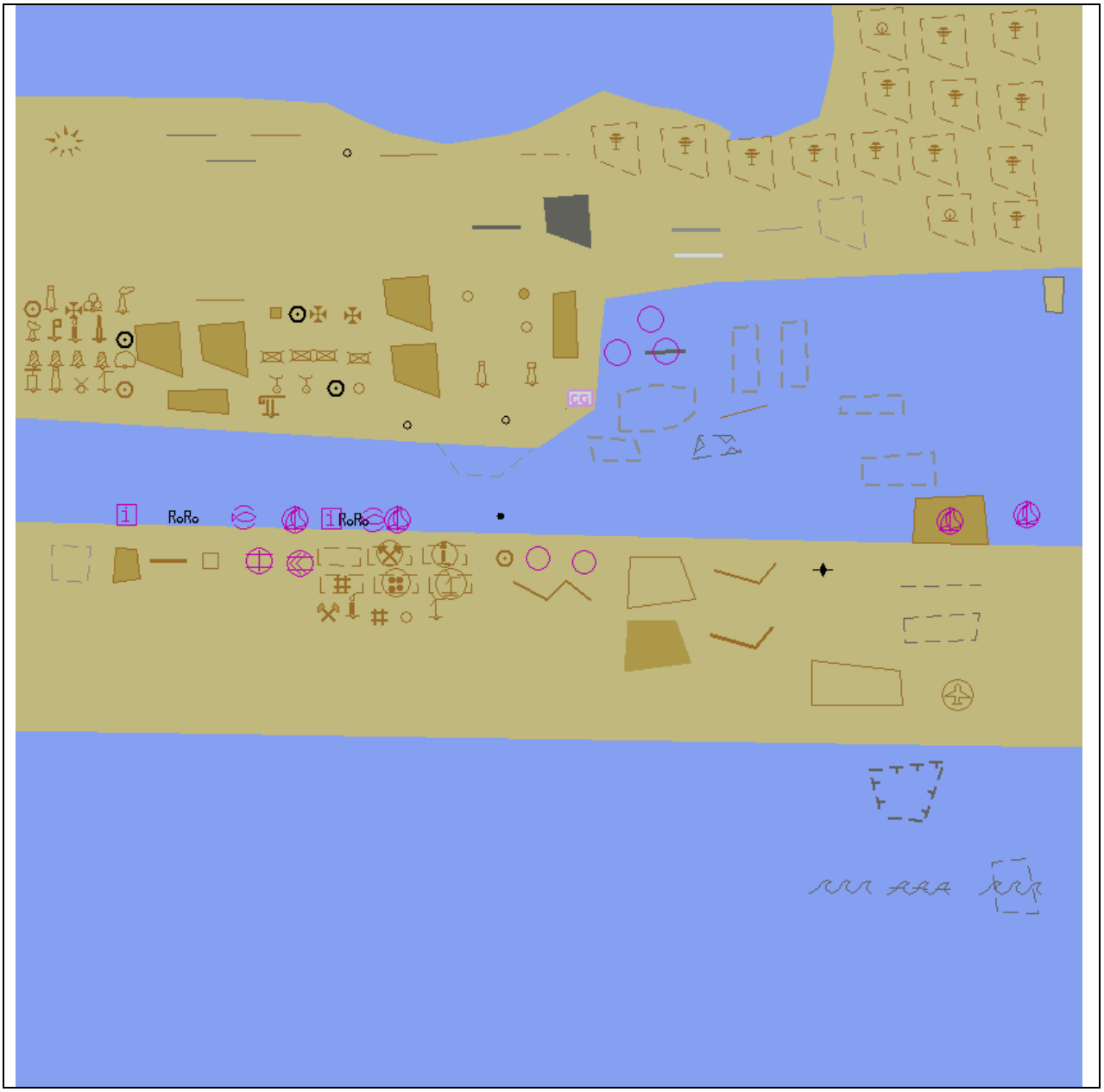
Action
Switch off all controls and switch on only the "***Seabed***" control. Verify that the objects are displayed correctly as presented in the plot.
Result
The objects are shown as presented in the screen plot below



Action
Switch off all controls and switch on only the "***Tidal***" control. Verify that the objects are displayed correctly as presented in the plot.
Result
The objects are shown as presented in the screen plot below

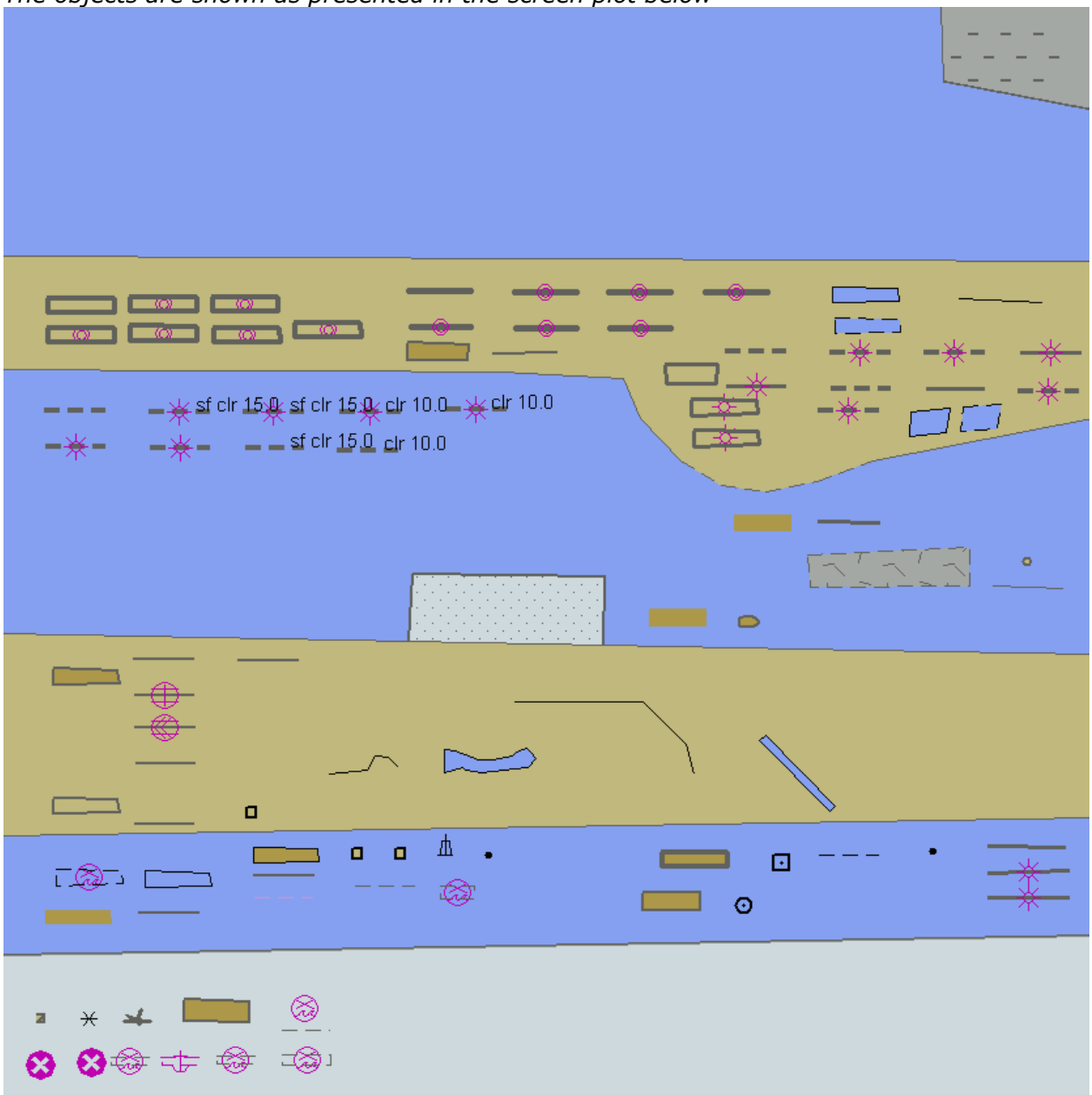


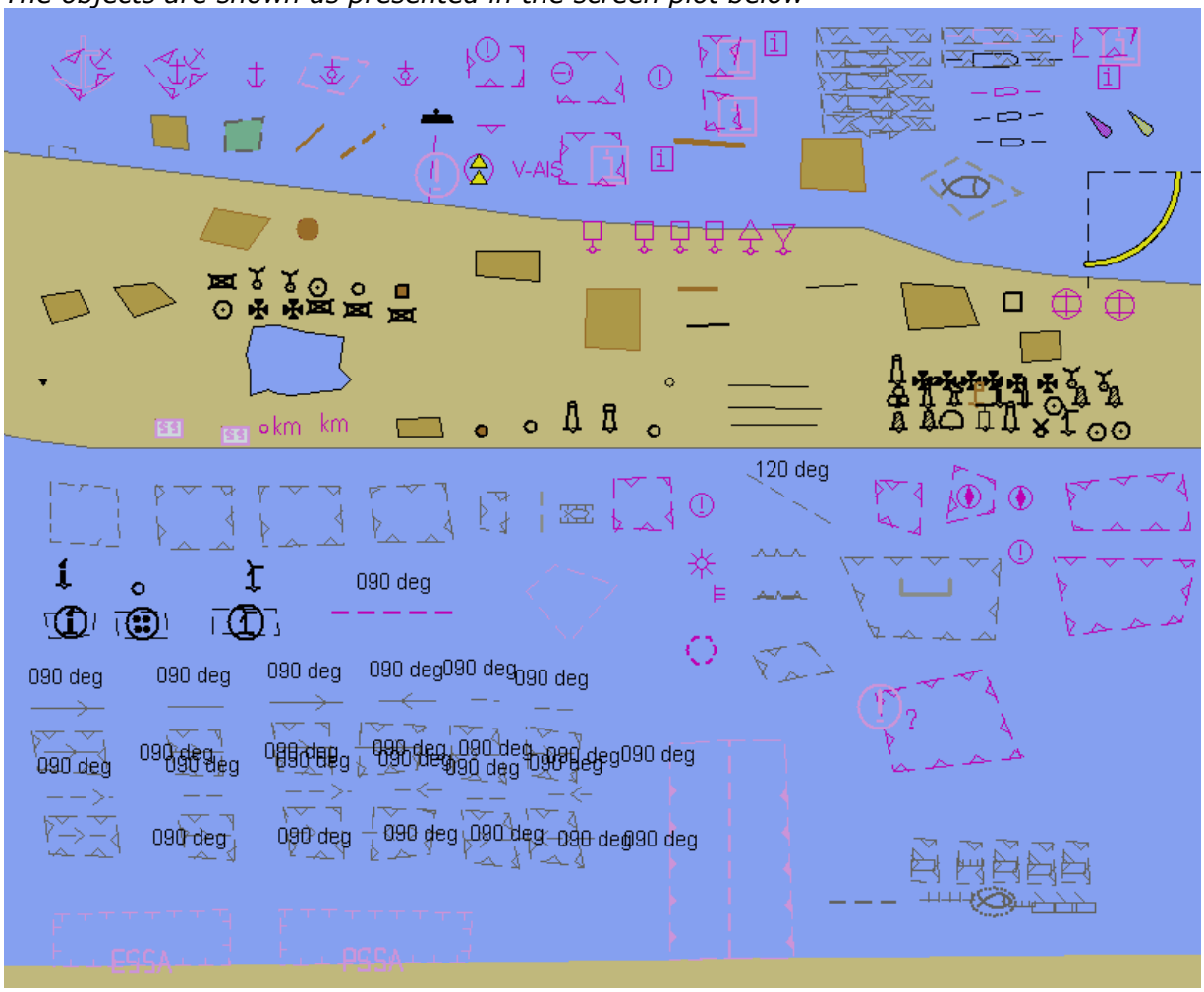
Action
Switch off all controls and switch on only the "***Miscellaneous***" control. Verify that the objects are displayed correctly as presented in the plot.
Result
The objects are shown as presented in the screen plot below

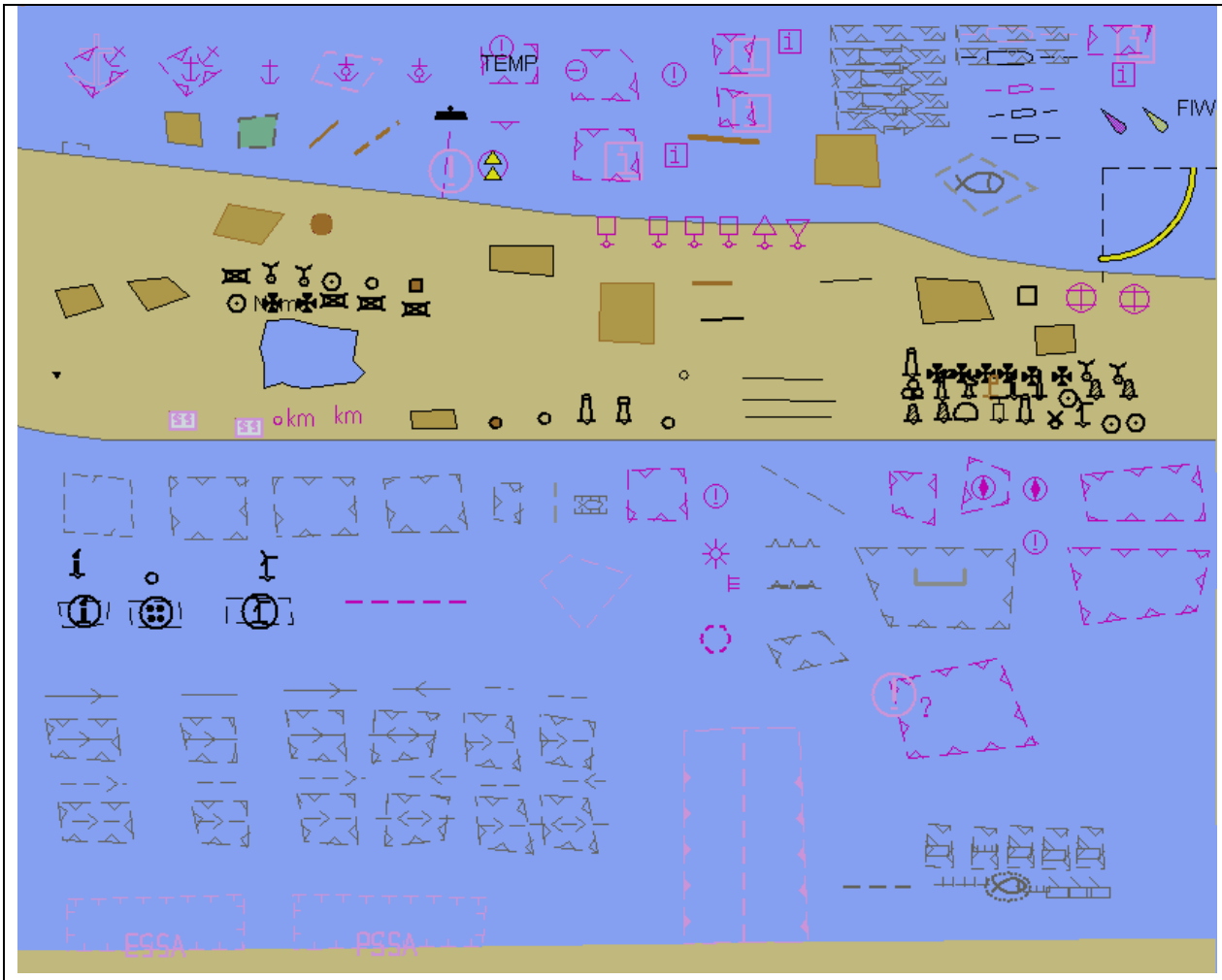


3.1.6 Text Grouping

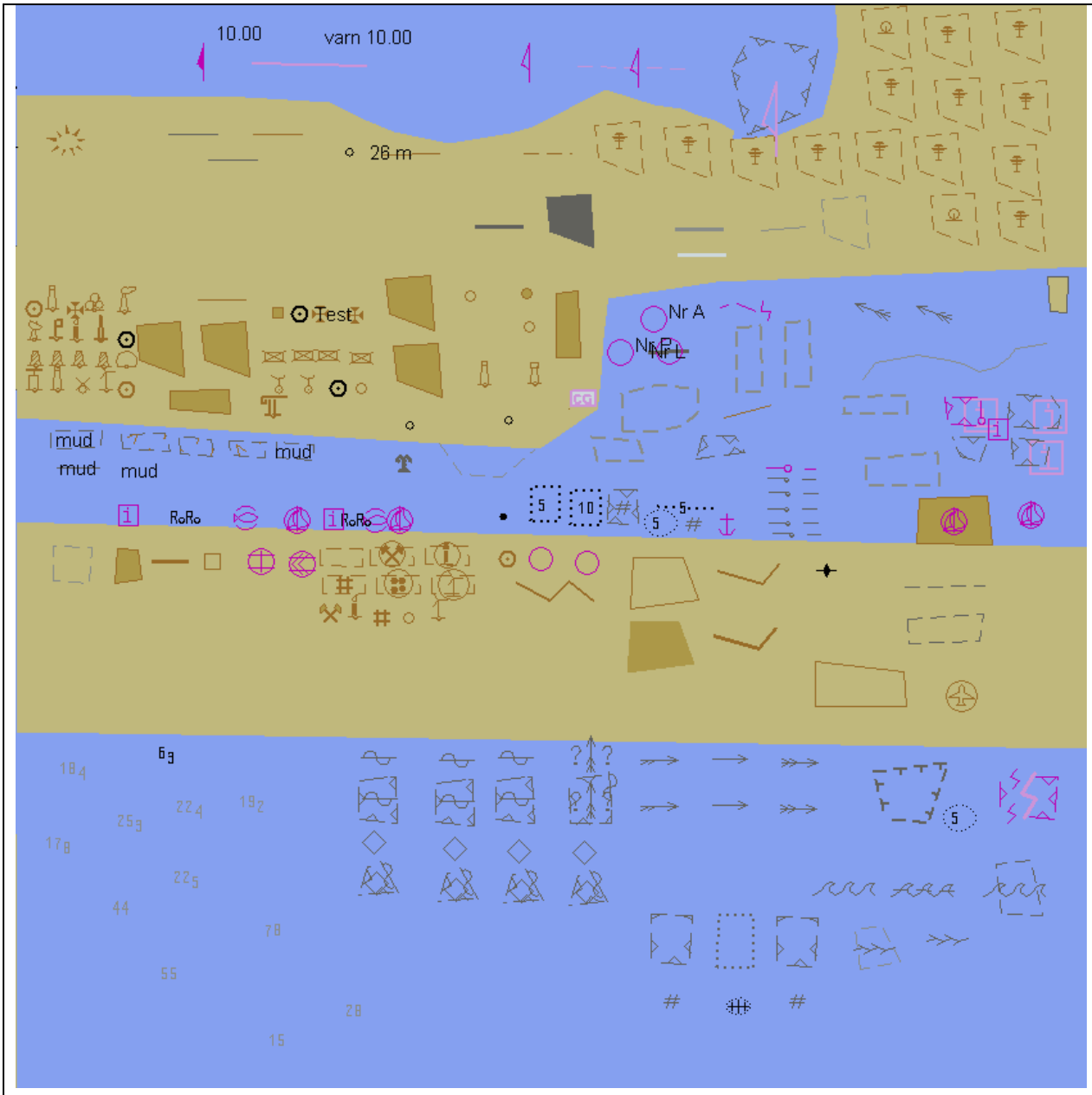
Test reference	3.1.6.	IHO reference	S-52 14.4, 14.5
Test description			
The purpose of the test is to verify that ECDIS is able to change text display settings and display text in accordance with the requirements of IHO S-52 Presentation Library Edition 4.0. Minimum two text display categories should be available in the ECDIS HMI			
Set up			
Load cell AA5DBASE.000, AA5STNDR.000 and AA5OTHER.000 from 3.1 ENC Display with the following settings; *Select Viewing group layer Base* *Set the safety contour value to 10 m* *Set the safety depth value to 10 m* *Select Symbolized Boundaries*			
Action			
Switch on Other Display. Check that ECDIS HMI contains standardized controls that can switch on and off certain objects from the chart			

Result
Confirm that the following controls are available at ECDIS HMI under the Other display section *Important Text* *Other Text* *More text display controls maybe available, however all the additional controls should be subdivision of one of the above controls*
Action
View cell AA5DBASE.000 *Switch off all text group controls and switch on only the "**Important Text**" control. Verify that the objects are displayed correctly as presented in the plot.*
Result
The objects are shown as presented in the screen plot below 
Action
View cell AA5STNDR.000 *Switch off all text group controls and switch on only the "**Important Text**" control. Verify that the objects are displayed correctly as presented in the plot.*

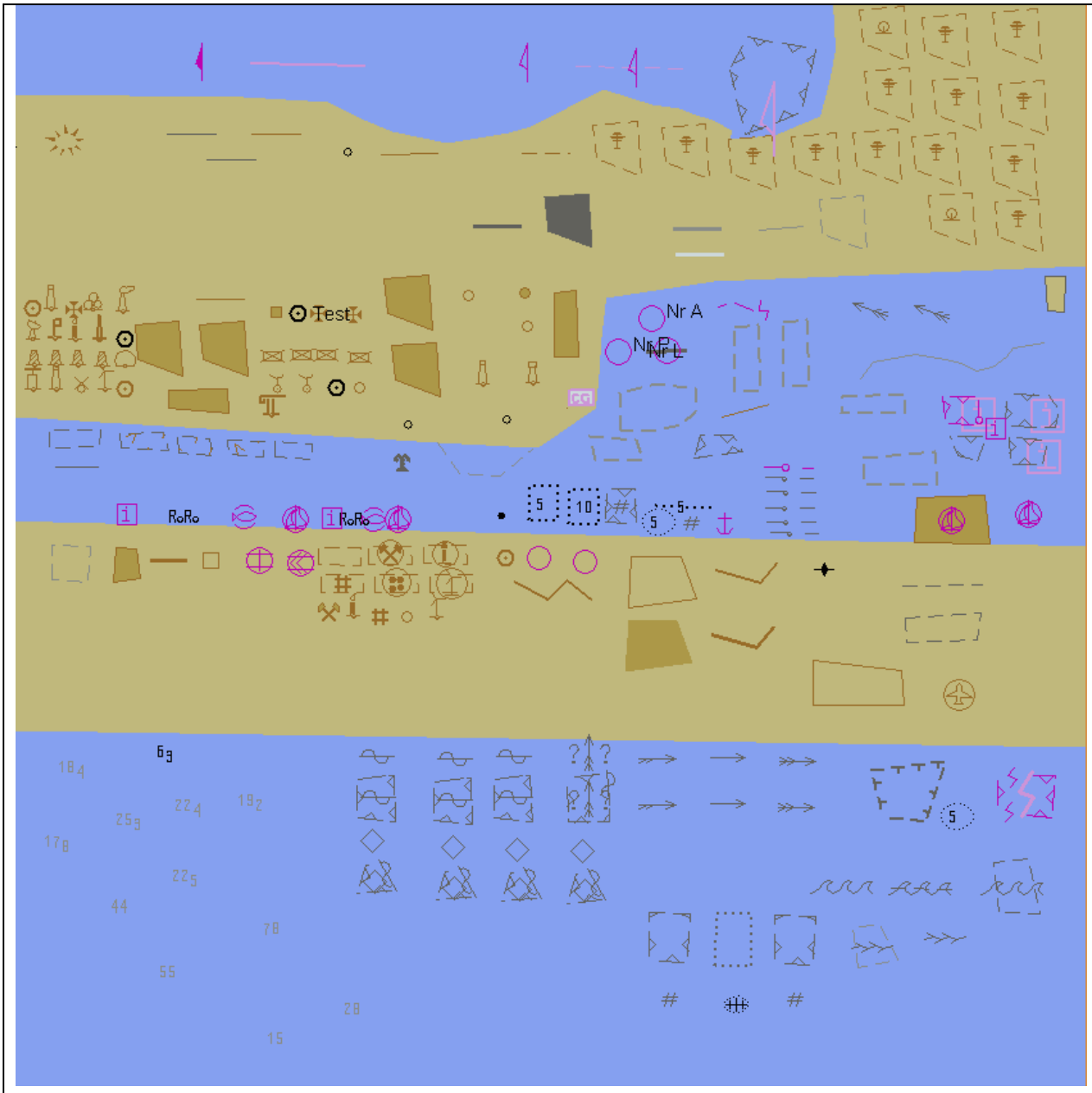
Result
The objects are shown as presented in the screen plot below 
Action
View cell AA5STNDR.000 *Switch off all text group controls and switch on only the "**Other Text**" control. Verify that the objects are displayed correctly as presented in the plot.*
Result
The objects are shown as presented in the screen plot below



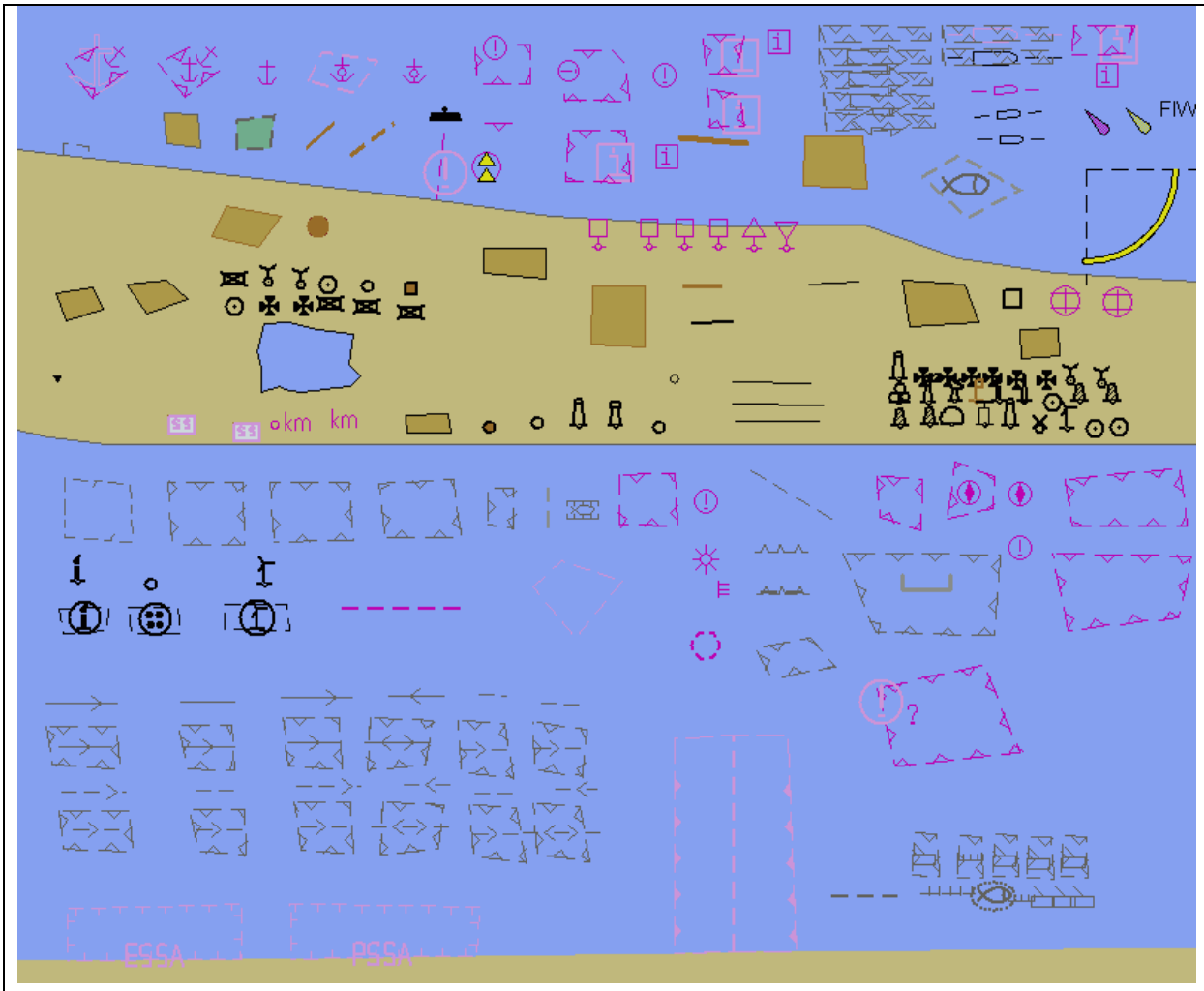
Action
View cell AA5OTHER.000 *Switch off all text group controls and switch on only the "**Other Text**" control. Verify that the objects are displayed correctly as presented in the plot.*
Result
The objects are shown as presented in the screen plot below



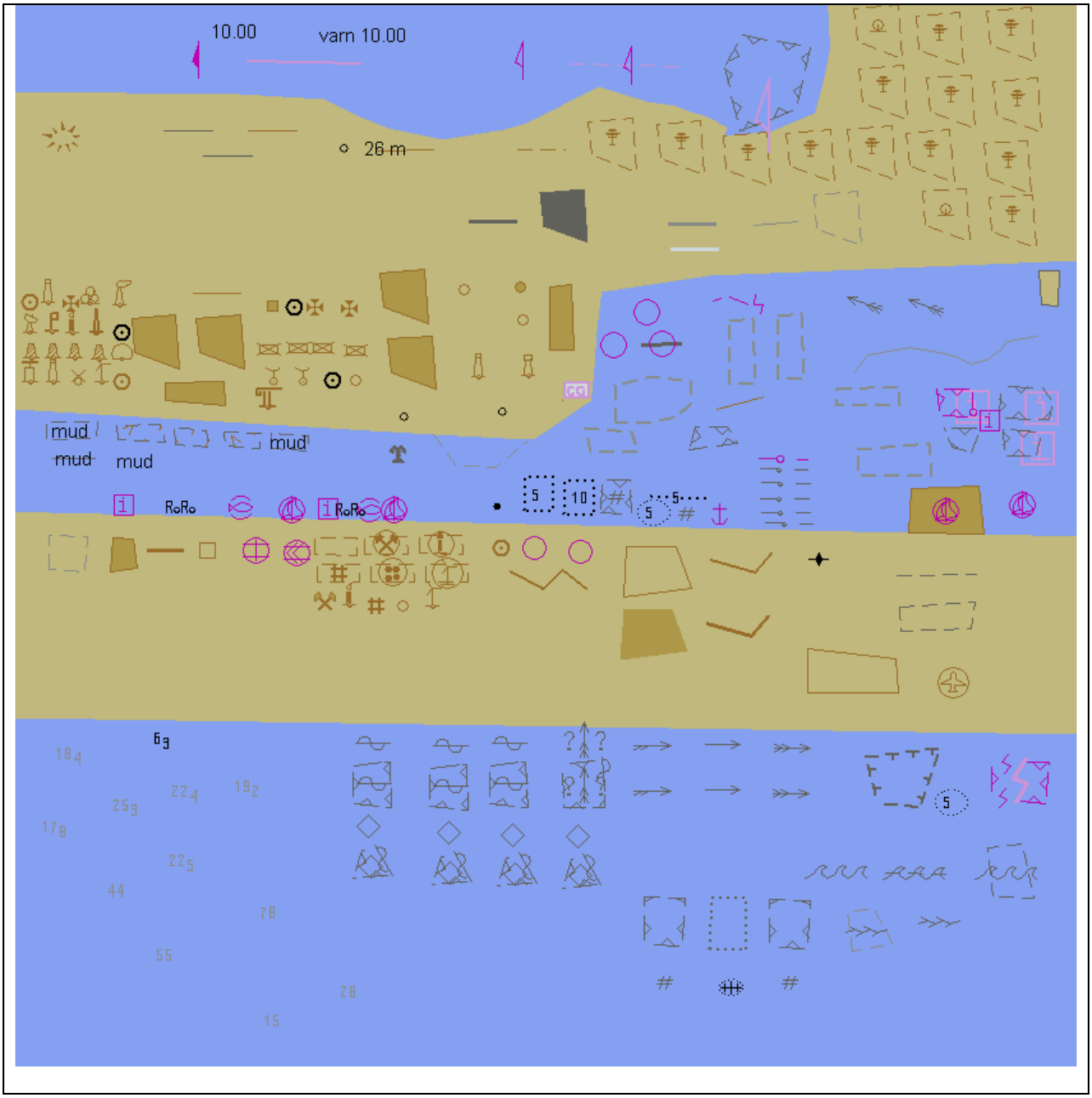
Action
View cell AA5OTHER.000 *Switch off all text group controls and switch on only the "**Names**" control located under the "**Other Text**" control. Verify that the objects are displayed correctly as presented in the plot.*
Result
The objects are shown as presented in the screen plot below



Action
View cell AA5STNDR.000 *Switch off all text group controls and switch on only the "**Light description**" control located under the "**Other Text**" control. Verify that the objects are displayed correctly as presented in the plot.*
Result
The objects are shown as presented in the screen plot below



Action
View cell AA5OTHER.000 *Switch off all text group controls and switch on only the "**All other**" control located under the "**Other Text**" control. Verify that the objects are displayed correctly as presented in the plot.*
Result
The objects are shown as presented in the screen plot below


10.00
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26 m
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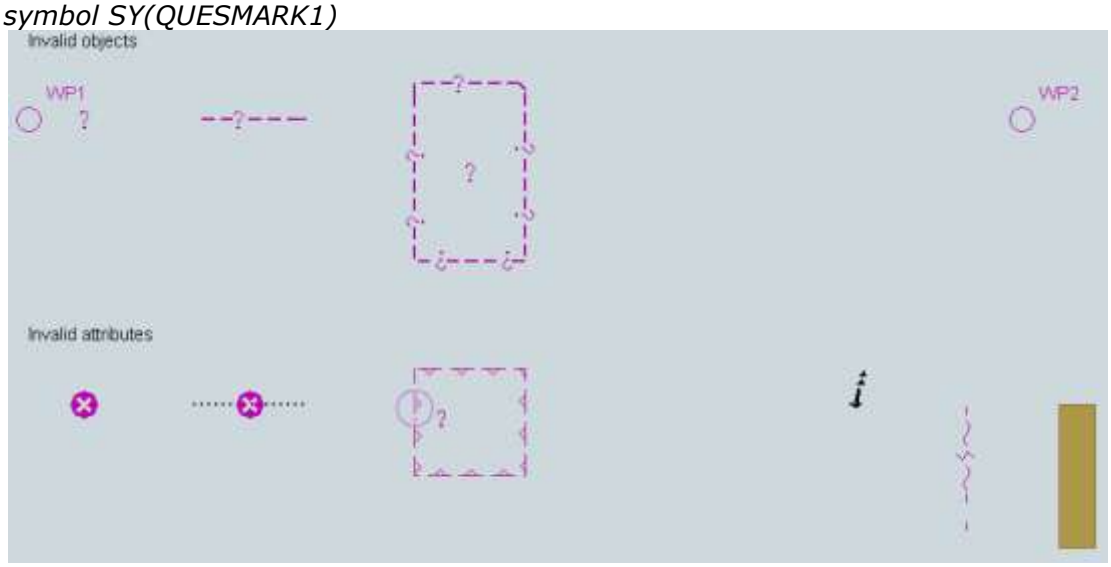
5
10
5
5

3.2 Invalid object

3.2.1 Display of Invalid Objects

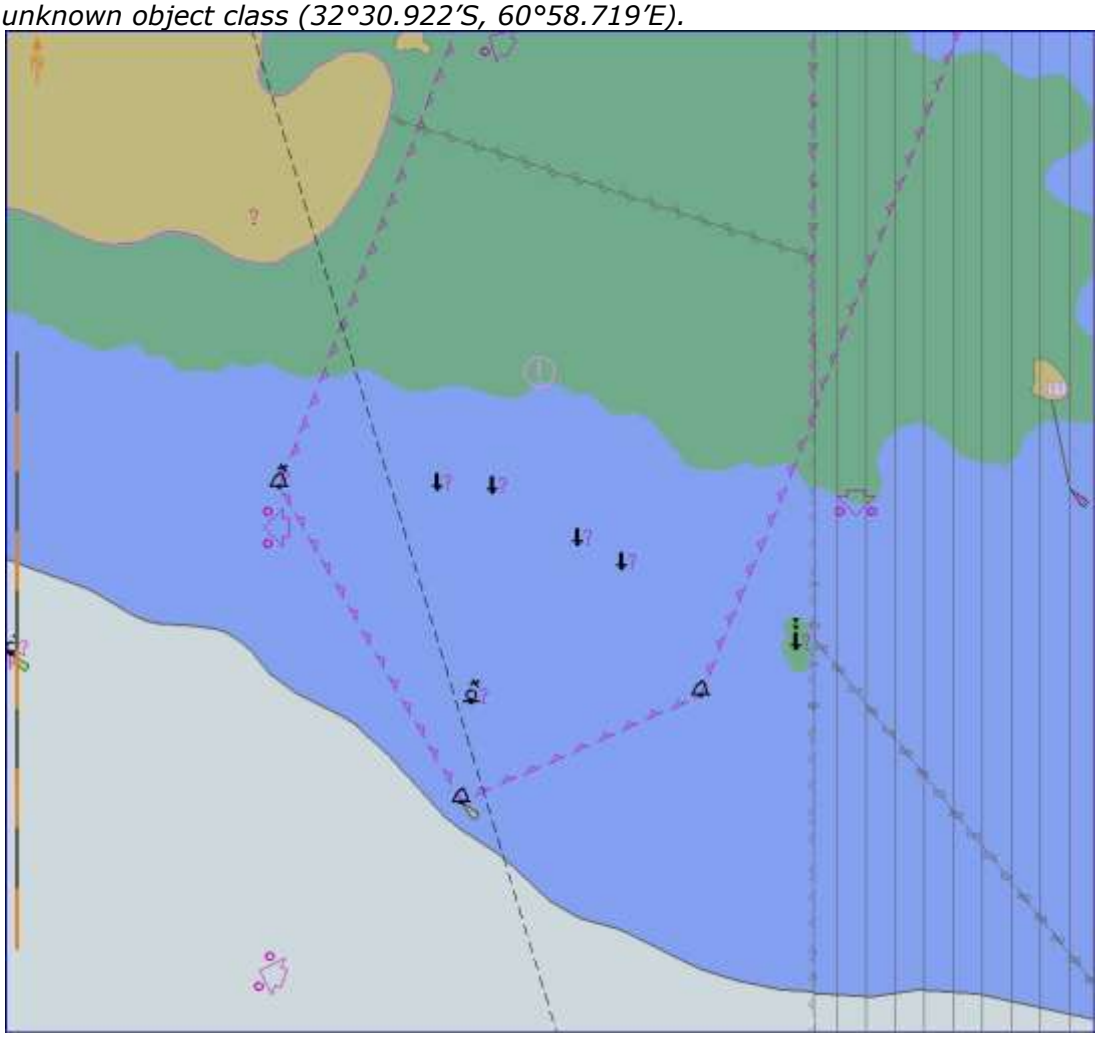
Test reference	3.2.1 a)	IHO reference	S-52 10.3.3.4
Test description			
Display of objects with unknown object class or display of objects for which available or not available attribute(s) cause special presentation.			
Set up			
Load the following cell 3.2 Invalid Object\ENC_ROOT\AA3INVOB.000 *Select Safety Contour = 0 metres* *Select Display Mode as "Other"* *Select Colour Palette as "DAY"* *Select Symbolized Boundaries* *Select Paper chart symbols* *Deselect Highlight info*			
Action			
View chart at scale 1:50 000			
Result			
Confirm that the symbol SY(QUESMRK1) is displayed as below for following cases: *a) unknown object class, point geometry* *b) unknown object class, line geometry* *c) unknown object class, area geometry* *d) known object class for which missing attribute cause presentation of additional symbol SY(QUESMARK1)* 			

Test reference	3.2.1 b)	IHO reference	S-52 10.3.3.4
Test description			
Display of objects with unknown object class or display of objects for which available or not available attribute(s) cause special presentation.			
Set up			
Load the following cell 3.2 Invalid Object\Invalid Base\ENC_ROOT\GB5X01NE.000 *Select Safety Contour = 10 metres* *Select Display Mode as "Standard display"* *Select Colour Palette as "DAY"* *Select Symbolized Boundaries* *Select Paper chart symbols*			
Action			

View chart at scale 1:10 000

Result

Confirm that the symbol SY(QUESMRK1) is displayed as below for five beacon objects and for one buoy object for which missing attribute cause presentation of additional symbol SY(QUESMARK1) (32°31.379'S, 60°59.084'E; 32°31.383'S, 60°59.193'E; 32°31.472'S, 60°59.364'E; 32°31.511'S, 60°59.452'E; 32°31.646'S, 60°59.800'E; 32°31.740'S, 60°59.155'E).
Confirm that the symbol SY(QUESMARK1) is displayed for one object with unknown object class (32°30.922'S, 60°58.719'E).



3.2.2 Invalid Object Pick Report Display

Test reference	3.2.2 a)	IHO reference	S-52 10.8.6
Test description			
Display of pick report information for objects with unknown object class.			
Set up			
As for test 3.2.1 a)			
Action			
1. Select the following objects; *- 39°29.000'N, 104°44.000'W* *- 39°29.000'S, 104°43.000'W* *- 39°28.000'S, 104°41.000'W* *2. Remove pick report information from display.*			
Result			
1a. Pick report associated with chart object is displayed only when object is selected. *1b. First example has 2 attributes (Orientation is 45.0 deg; Information is Wreck).* *1c. Second example has 1 attribute (Information is danger line).* *1d. Third example has 1 attribute (Information is See regulation "Jussland fishing act" paragraph 42).* *2. Pick report associated with chart object is removed from the display.*			

Test reference	3.2.2 b)	IHO reference	S-52 10.8.6
Test description			
Display of pick report information for objects with unknown object class.			
Set up			
As for test 3.2.1 b)			
Action			
1. Select the following object 32°30.924'S, 60°58.719'E *2. Remove pick report information from display.*			
Result			
1a. Pick report associated with chart object is displayed only when object is selected. *1b. This example has no attributes. Only unknown object and its position is available in the pick report.* *2. Pick report associated with chart object is removed from the display.*			

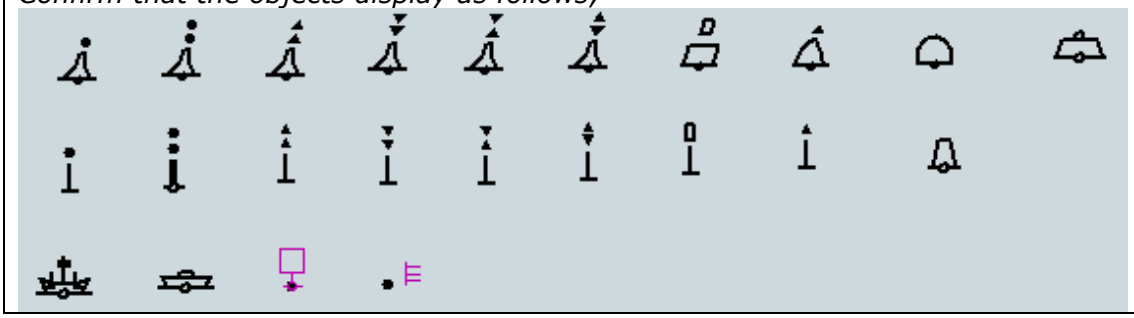
Test reference	3.2.2 c)	IHO reference	S-52 10.8.6
Test description			
Display of pick report information for known objects which has unknown attribute(s).			
Set up			
As for test 3.2.1 a)			
Action			
1. Select the following objects; *- 39°27.000'N, 104°44.000'W* *- 39°27.000'N, 104°43.000'W* *- 39°27.000'N, 104°43.000'W* *2. Remove pick report information from display.*			
Result			
1a. Pick report associated with chart object is displayed only when object is selected.			

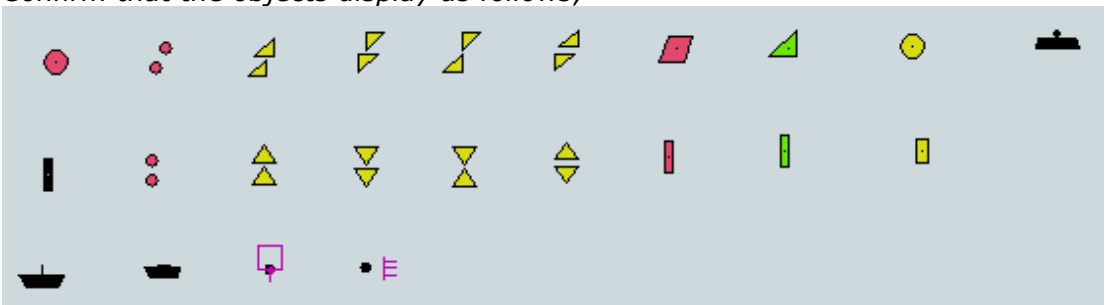
1b. First example is a wreck and it has 1 unknown attribute and 1 known attributes (Water level effect is Covers and uncovers). 1c. Second example is an obstruction and it has 1 unknown attribute and 1 known attribute (Value of sounding has no value). 1d. Third example in a restricted area and it has 1 unknown attribute 2. Pick report associated with chart object is removed from the display.

Test reference	3.2.2 d)	IHO reference	S-52 10.8.6
Test description			
Display of pick report information for known objects for which available or not available attribute(s) cause special presentation.			
Set up			
As for test 3.2.1 b)			
Action			
1. Select the following objects; *- 32°31.737'S, 60°59.153'E* *- 32°31.379'S, 60°59.084'E* *- 32°31.383'S, 60°59.193'E* *- 32°31.472'S, 60°59.364'E* *- 32°31.511'S, 60°59.452'E* *- 32°31.646'S, 60°59.800'E* *2. Remove pick report information from display.*			
Result			
1a. Pick report associated with chart object is displayed only when object is selected. *1b. First example is a buoy and it has 2 known attributes (Category of special purpose mark is target mark; Colour is yellow)* *1c. Second example is a beacon and attribute Beacon shape has no value* *1d. Third example is a beacon and attribute Beacon shape has no value* *1e. Fourth example is a beacon and attribute Beacon shape has no value* *1f. Fifth example is a beacon and attribute Beacon shape has no value* *1g. Sixth example is a beacon and attribute Beacon shape has no value* *2. Pick report associated with chart object is removed from the display.*			

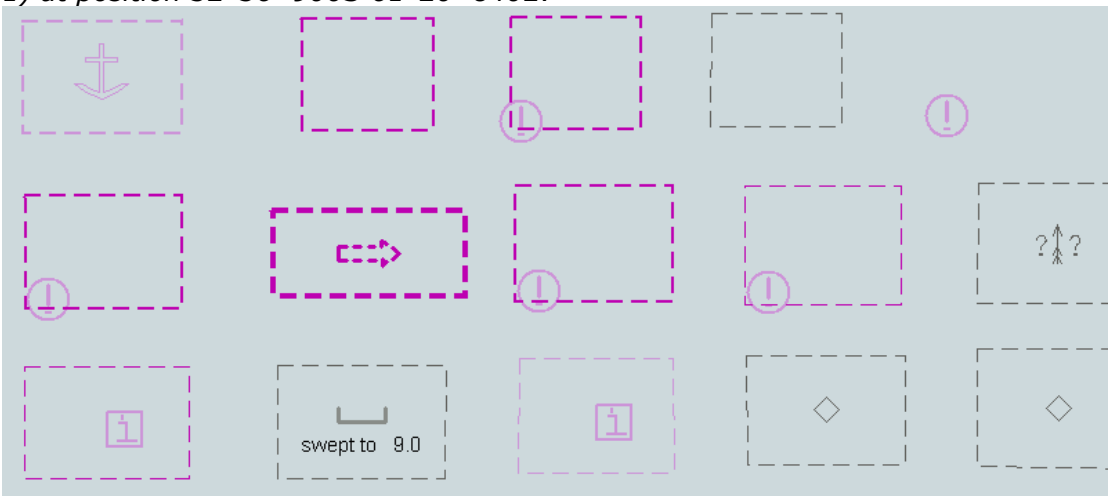
3.3 Independent Mariner Selections

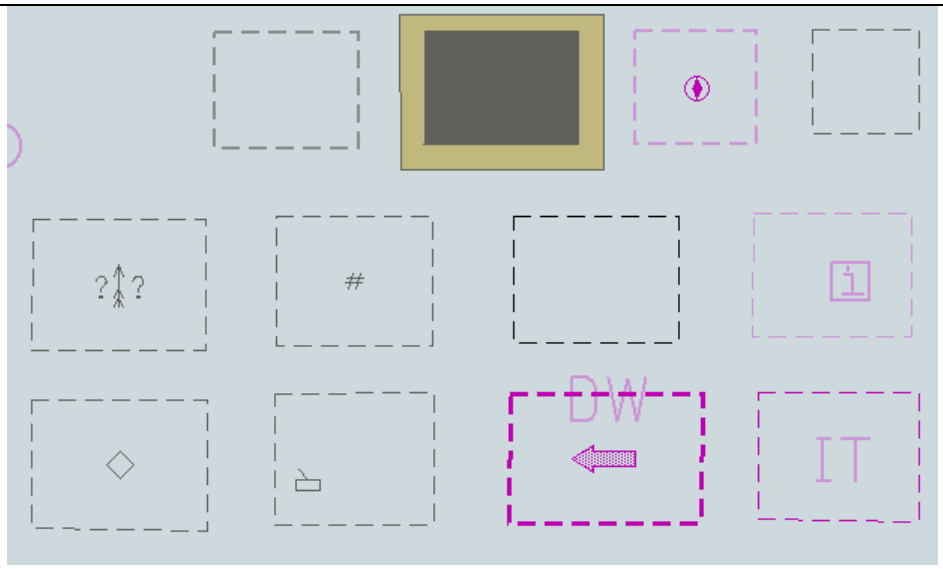
3.3.1 Paper chart and simplified symbols

Test reference	3.3.1 a)	IHO reference	S-52 App B-F
Test description			
Display of objects with paper chart symbols.			
Set up			
Load the following cell 3.3 Settings\ENC_ROOT\GB4X0001.000 with the following settings; *Select Viewing group layer Other* *Select Symbolized Boundaries* *Select Paper chart symbols* *Deselect Accuracy* *Safety Contour = 10 metres* *Safety Depth = 10 metres*			
Action			
View the objects at position 32°37′·280S 61°21′·000E and then zoom in to a scale of 1:10,000.			
Result			
Confirm that the objects display as follows; 			

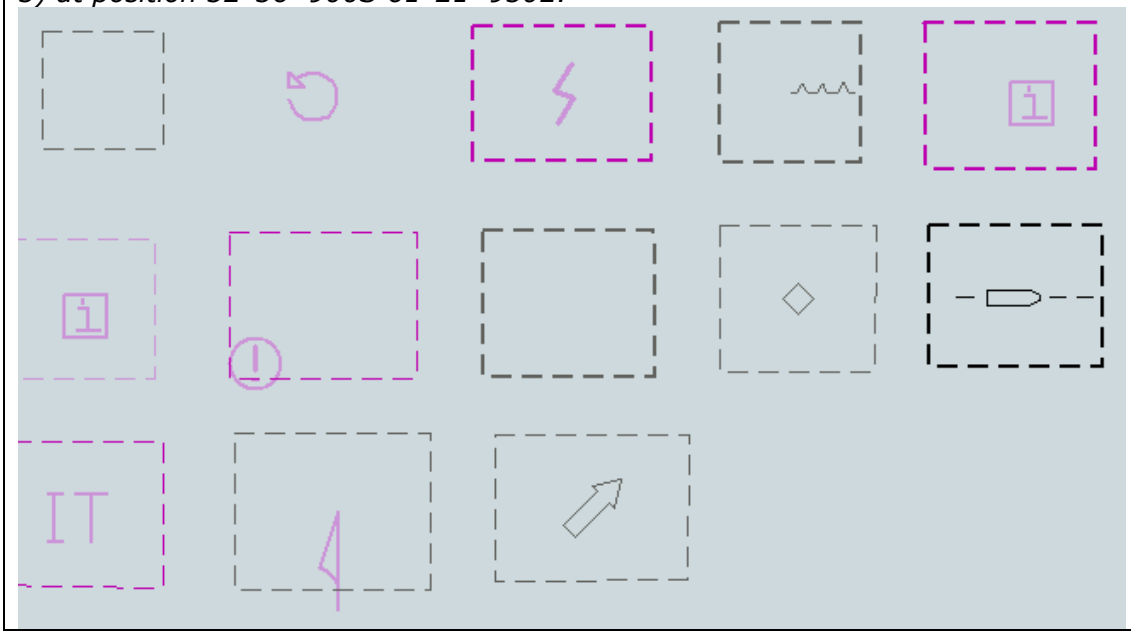
Test reference	3.3.1 b)	IHO reference	S-52 App B-F
Test description			
Display of object with simplified symbols.			
Set up			
As for test 3.3.1 a) and *Select Simplified Symbols*			
Action			
View the objects at position 32°37′·280S 61°21′·000E and then zoom in to a scale of 1:10,000.			
Result			
Confirm that the objects display as follows; 			

3.3.2 Symbolised and plain boundaries

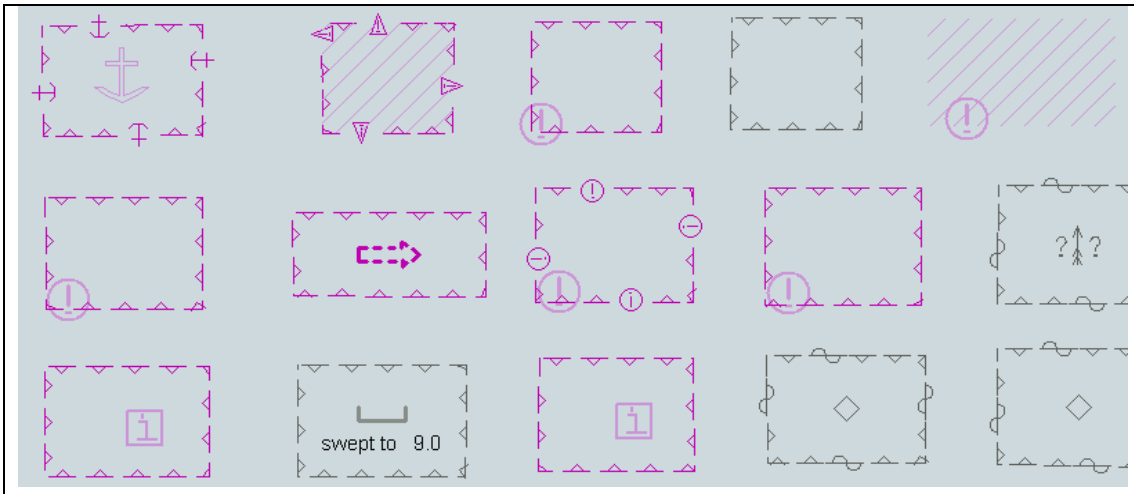
Test reference	3.3.2 a)	IHO reference	S-52 App B-F
Test description			
Display of objects plain boundaries.			
Set up			
Load the following cell 3.3 Settings\ENC_ROOT\GB4X0001.000 with the following settings; *Select Viewing group layer Other* *Deselect Symbolized Boundaries* *Select Paper chart symbols* *Deselect Accuracy* *Deselect Highlight info* *Deselect Highlight document* *Safety Contour = 10 metres* *Safety Depth = 10 metres*			
Action			
Zoom into 1:5 000 and View the objects at position *1) 32°36′·900S 61°20′·840E* *2) 32°36′·900S 61°21′·400E* *3) 32°36′·900S 61°21′·950E*			
Result			
Confirm that the objects display as follows; *1) at position 32°36′·900S 61°20′·840E:*  *2) at position 32°36′·900S 61°21′·400E:*			



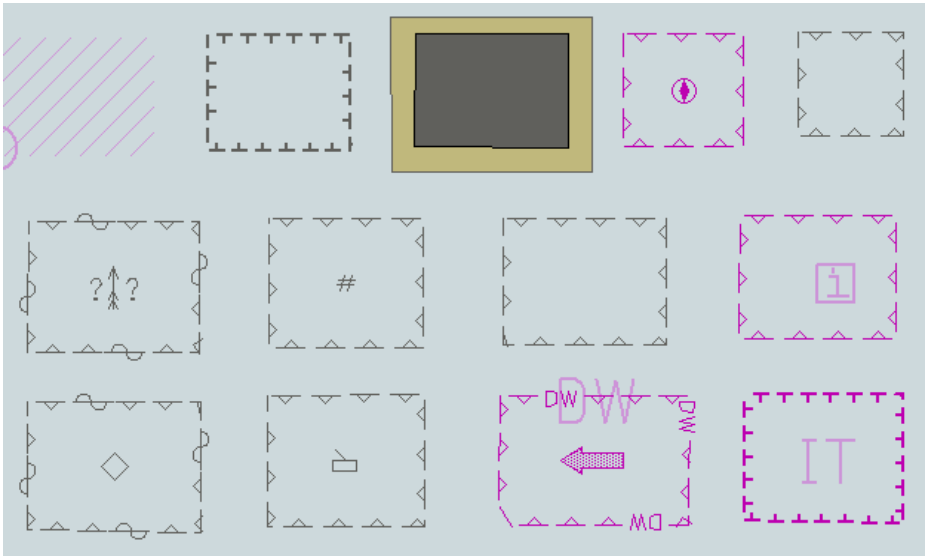
3) at position 32°36′·900S 61°21′·950E:



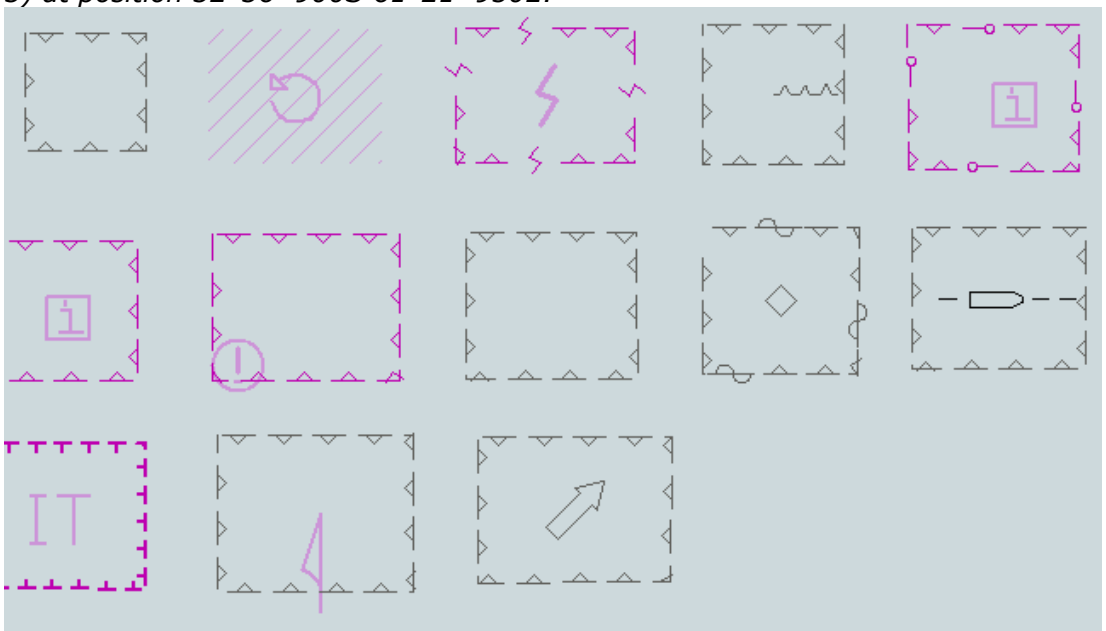
Test reference	3.3.2 b)	IHO reference	S-52 App B-F
Test description			
Display of object with symbolised boundaries.			
Set up			
As for test 3.3.2 a) and *Select Symbolised Boundaries*			
Action			
Zoom into 1:5 000 and View the objects at position *1) 32°36′·900S 61°20′·840E* *2) 32°36′·900S 61°21′·400E* *3) 32°36′·900S 61°21′·950E*			
Result			
Confirm that the objects display as follows; *1) at position 32°36′·900S 61°20′·840E:*			



2) at position 32°36′·900S 61°21′·400E:

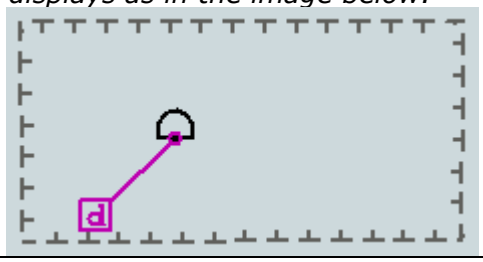


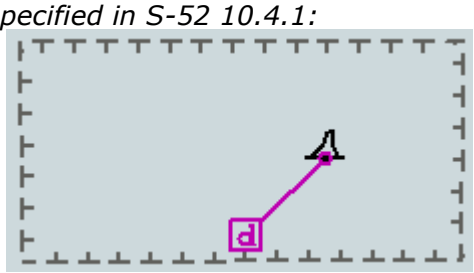
3) at position 32°36′·900S 61°21′·950E:

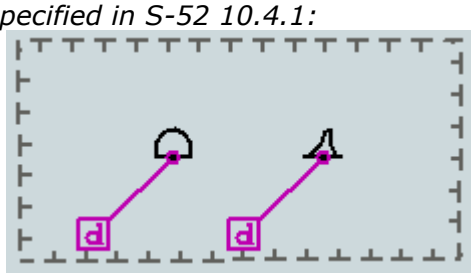


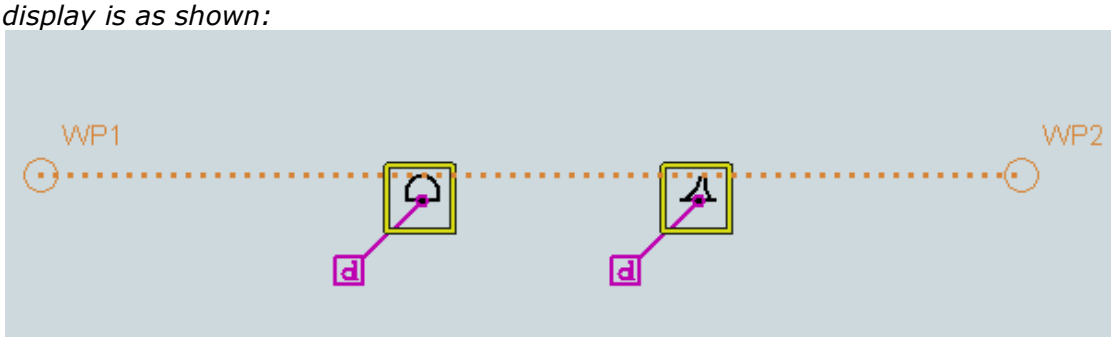
3.3.3 Date Dependent Display and Functionality

3.3.3.1 DATSTA/DATEND on buoys

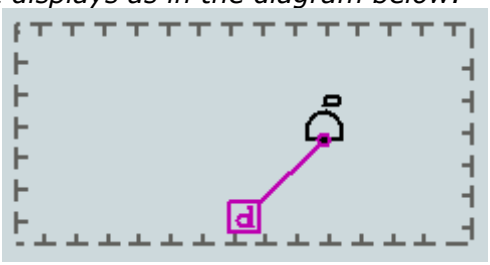
Test reference	3.3.3.1 a)	IHO reference	S-52 10.4.1
Test description			
Display of date dependent objects, current date. (DATSTA and DATEND)			
Set up			
Load the following cell 3.3 Settings\ENC_ROOT\GB4X0001.000 with the following settings; *Select Viewing group layer Other* *Select Symbolized Boundaries* *Select Paper chart symbols* *Deselect Accuracy* *Deselect Highlight info* *Deselect Highlight document* *Safety Contour = 10 metres* *Safety Depth = 10 metres* *Select Highlight date dependent* *Ensure that the viewing date is set to the current date and time (any date after 20131201).*			
Action			
Centre the display on position 32°36′·450S 61°20′·900E and then zoom in to a scale of 1:20,000.			
Result			
Confirm that the object displays as in the image below: 			

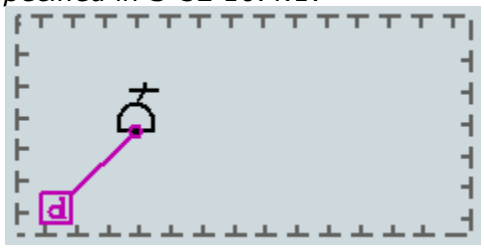
Test reference	3.3.3.1 b)	IHO reference	S-52 10.4.1
Test description			
Display of date dependent objects, set date. (DATSTA and DATEND)			
Set up			
As for test 3.3.3.1 a) *Select Highlight date dependent* *Ensure that the viewing date is set to 18.02.2012*			
Action			
As for test 3.3.3.1 a)			
Result			
Confirm that the object displays as in the image below and that a permanent indication is shown as specified in S-52 10.4.1:  *Note: A permanent indication that the date has been adjusted should be shown as*			

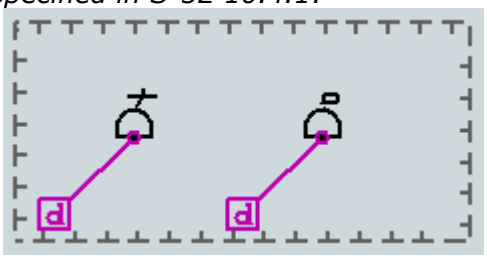
Test reference	3.3.3.1 c)	IHO reference	S-52 10.4.1
Test description			
Display of date dependent objects, date range. (DATSTA and DATEND)			
Set up			
As for test 3.3.3.1 b) *Set the viewing date range as follows;* *Start viewing date= 01.02.2012* *End viewing date= 01.12.2012*			
Action			
As for test 3.3.3.1 a)			
Result			
Confirm that the objects display as in the image below and that a permanent indication is shown as specified in S-52 10.4.1:  *Note: A permanent indication that the date has been adjusted should be shown as specified in S-52 10.4.1.*			
specified in S-52 10.4.1.			

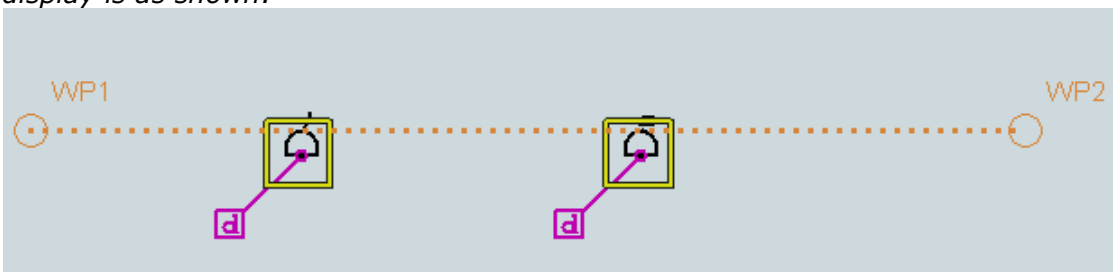
Test reference	3.3.3.1 d)	IHO reference	S-52 10.4.1
Test description			
Route checking of date dependent objects, date range. (DATSTA and DATEND)			
Set up			
As for test 3.3.3.1 c) *Deselect Miscellaneous (Other)* *Select scale 1:10 000*			
Action			
As for test 3.3.3.1 a) *Create a route from 32°36′·425S 61°20′·335E to 32°36′·425S 61°21′·400E with a cross track distance of 0.10NM set for Starboard and for Port.*			
Result			
Check the route and confirm that the following indications are given and the display is as shown:  *Note: A permanent indication that the date has been adjusted should be shown as specified in S-52 10.4.1.*			

3.3.3.2 PERSTA/PEREND on buoys

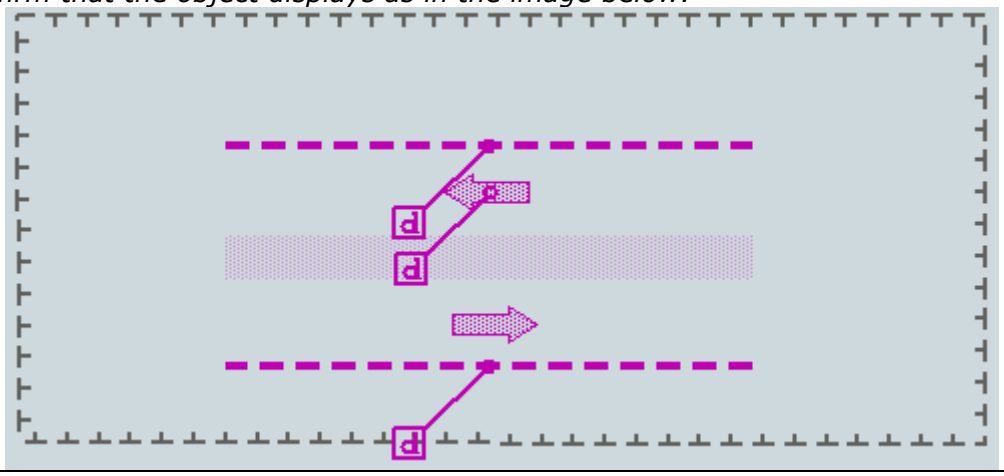
Test reference	3.3.3.2 a)	IHO reference	S-52 10.4.1
Test description			
Display of date dependent objects, current date. (PERSTA and PEREND)			
Set up			
Load the following cell 3.3 Settings\ENC_ROOT\GB4X0001.000 with the following settings; *Select Viewing group layer Other* *Select Symbolized Boundaries* *Select Paper chart symbols* *Deselect Accuracy* *Deselect Highlight info* *Deselect Highlight document* *Safety Contour = 10 metres* *Safety Depth = 10 metres* *Select Highlight date dependent* *Ensure that the viewing date is set to the 01.11.2013*			
Action			
Centre the display on position 32°36′·450S 61°21′·900E and then zoom in to a scale of 1:20,000.			
Result			
Confirm that the object displays as in the diagram below:  *Note: A permanent indication that the date has been adjusted should be shown as specified in S-52 10.4.1.*			

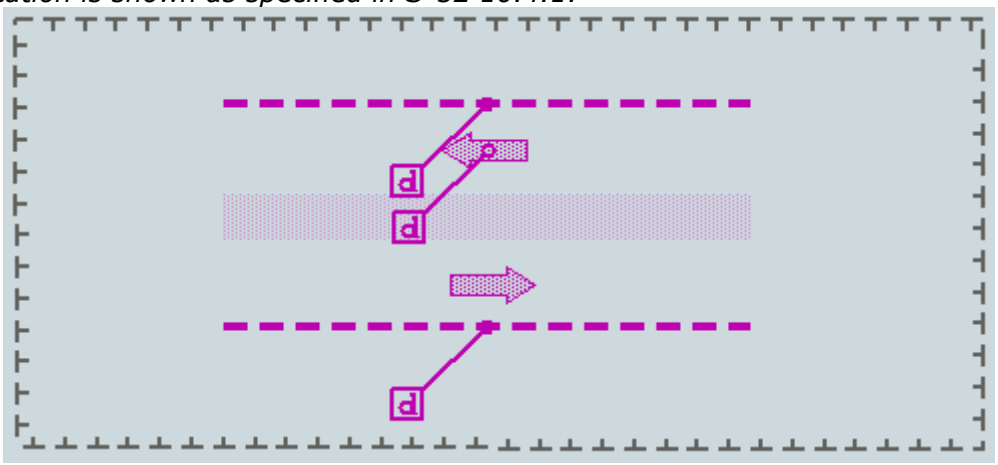
Test reference	3.3.3.2 b)	IHO reference	S-52 10.4.1
Test description			
Display of date dependent objects, set date. (PERSTA and PEREND)			
Set up			
As for test 3.3.3.2 a) *Select Highlight date dependent* *Ensure that viewing date is set to 18.03.2013*			
Action			
As for test 3.3.3.2 a)			
Result			
Confirm that the object displays as in the image below and that a permanent indication is shown as specified in S-52 10.4.1:  *Note: A permanent indication that the date has been adjusted should be shown as specified in S-52 10.4.1.*			

Test reference	3.3.3.2 c)	IHO reference	S-52 10.4.1
Test description			
Display of date dependent objects, date range. (PERSTA and PEREND)			
Set up			
As for test 3.3.3.2 b) *Set the viewing date range as follows;* *Start viewing date= 01.02.2012* *End viewing date= 01.11.2012*			
Action			
As for test 3.3.3.2 a)			
Result			
Confirm that the objects display as in the diagram below and that a permanent indication is shown as specified in S-52 10.4.1:  *Note: A permanent indication that the date has been adjusted should be shown as specified in S-52 10.4.1.*			

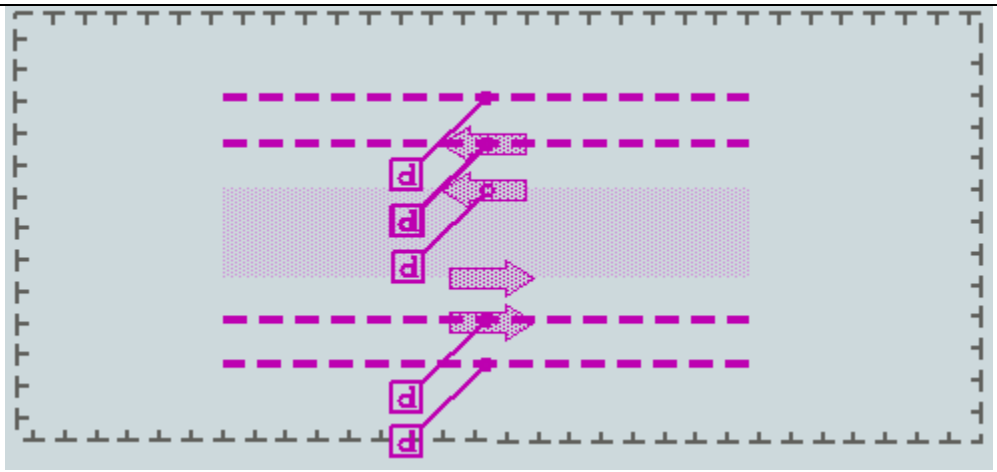
Test reference	3.3.3.2 d)	IHO reference	S-52 10.4.1
Test description			
Route checking of date dependent objects, date range. (PERSTA and PEREND)			
Set up			
As for test 3.3.3.2 c) *Deselect Miscellaneous (Other)* *Select scale 1:10 000*			
Action			
As for test 3.3.3.2 a) *Create a route from 32°36′·425S 61°21′·400E to 32°36′·425S 61°22′·500E with a cross track distance of 0.10NM set for Starboard and for Port.*			
Result			
Check the route and confirm that the following indications are given and the display is as shown:  *Note: A permanent indication that the date has been adjusted should be shown as specified in S-52 10.4.1.*			

3.3.3.3 DATSTA/DATEND on Traffic Separation Schemes (TSS)

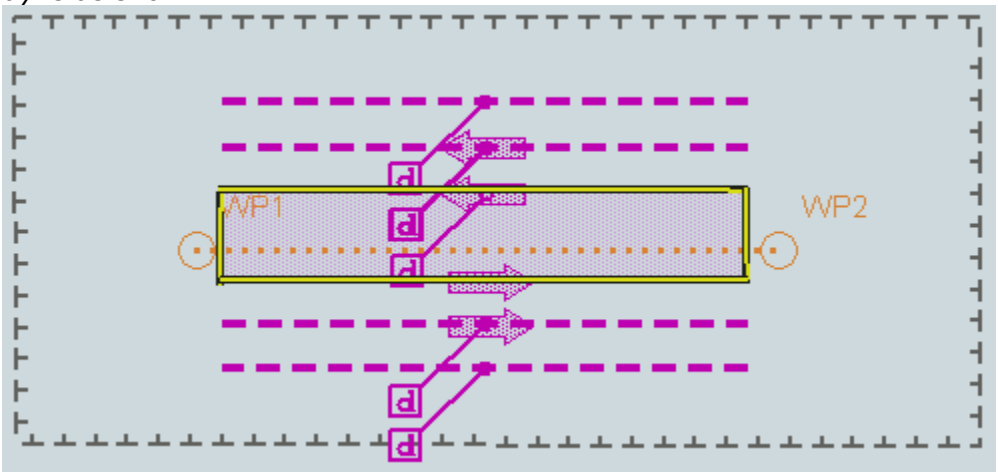
Test reference	3.3.3.3 a)	IHO reference	S-52 10.4.1
Test description			
Display of date dependent objects, current date. (DATSTA and DATEND)			
Set up			
Load the following cell 3.3 Settings\ENC_ROOT\GB4X0001.000 with the following settings; *Select Viewing group layer Other* *Select Symbolized Boundaries* *Select Paper chart symbols* *Deselect Accuracy* *Deselect Highlight info* *Deselect Highlight document* *Safety Contour = 10 metres* *Safety Depth = 10 metres* *Select Highlight date dependent* *Ensure that the viewing date is set to the current date and time (any date after 20131201).*			
Action			
Centre the display on position 32°35′·300S 61°21′·380E and then zoom in to a scale of 1:20,000.			
Result			
Confirm that the object displays as in the image below: 			

Test reference	3.3.3.3 b)	IHO reference	S-52 10.4.1
Test description			
Display of date dependent objects, set date. (DATSTA and DATEND)			
Set up			
As for test 3.3.3.3 a) *Select Highlight date dependent* *Ensure that viewing date is set to 30.11.2013*			
Action			
As for test 3.3.3.3 a)			
Result			
Confirm that the object displays as in the image below and that a permanent indication is shown as specified in S-52 10.4.1:  *Note: A permanent indication that the date has been adjusted should be shown as specified in S-52 10.4.1.*			

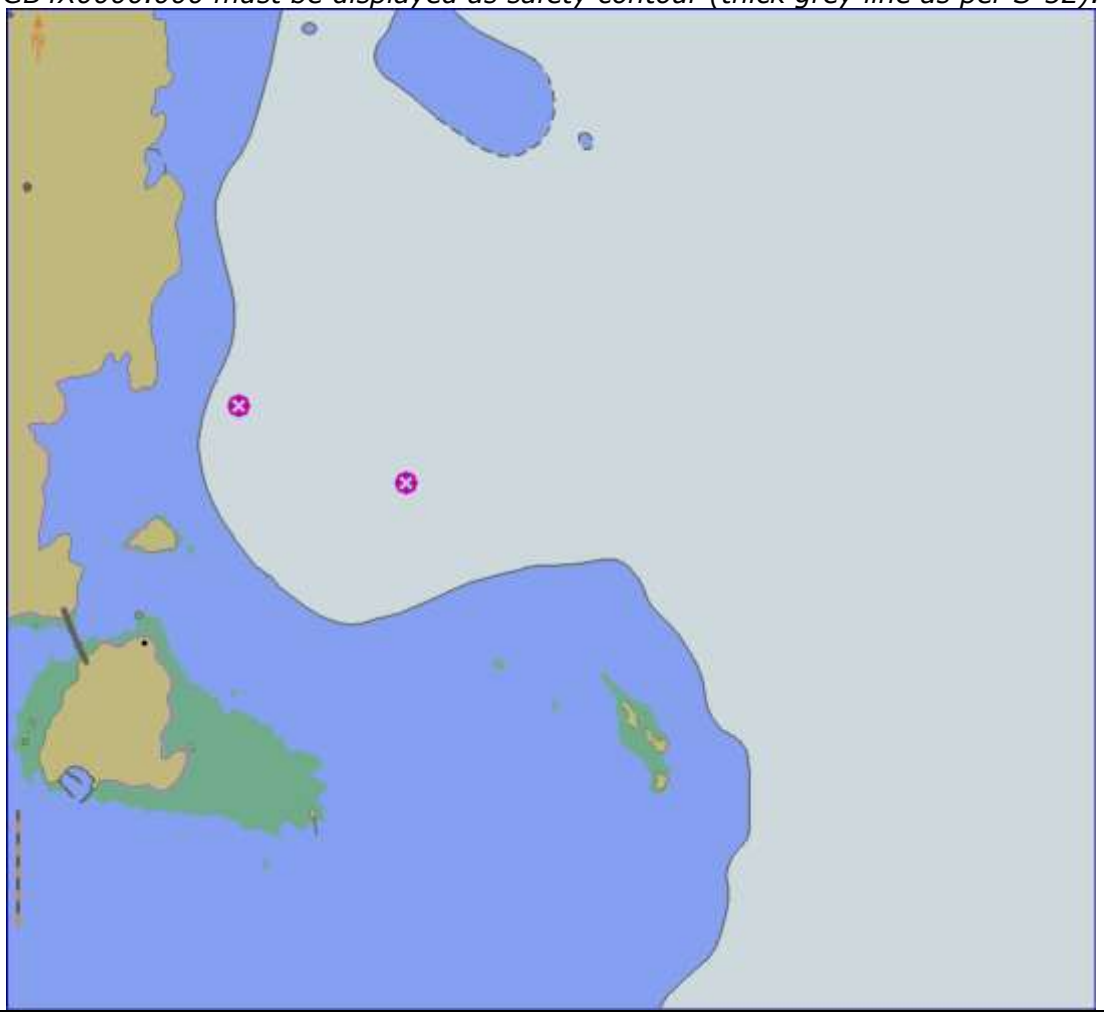
Test reference	3.3.3.3 c)	IHO reference	S-52 10.4.1
Test description			
Display of date dependent objects, date range. (DATSTA and DATEND)			
Set up			
As for test 3.3.3.3 b) *Set the viewing date range as follows;* *Start viewing date= 01.11.2013* *End viewing date= 01.12.2013*			
Action			
As for test 3.3.3.3 a)			
Result			
Confirm that the objects display as in the image below and that a permanent indication is shown as specified in S-52 10.4.1:			

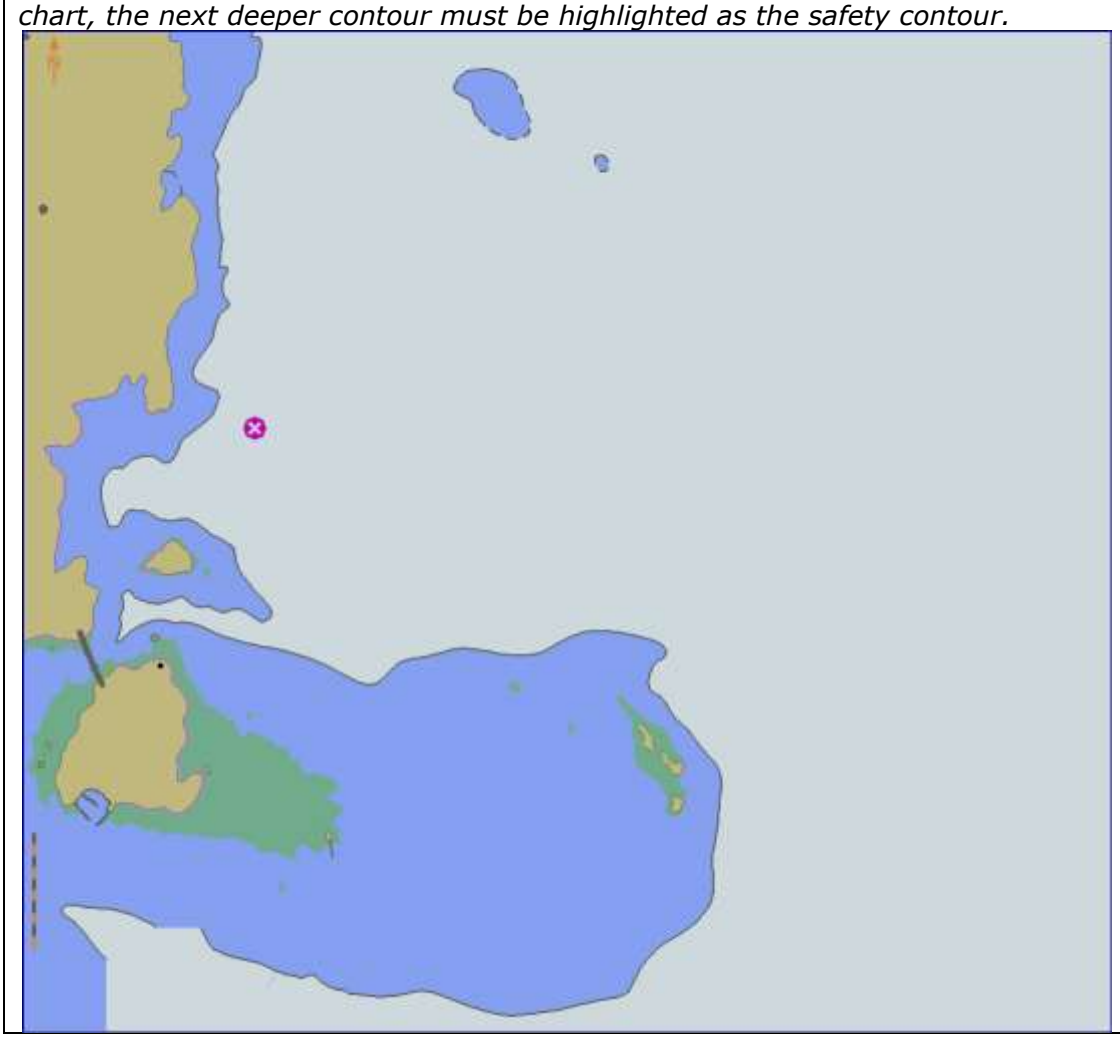


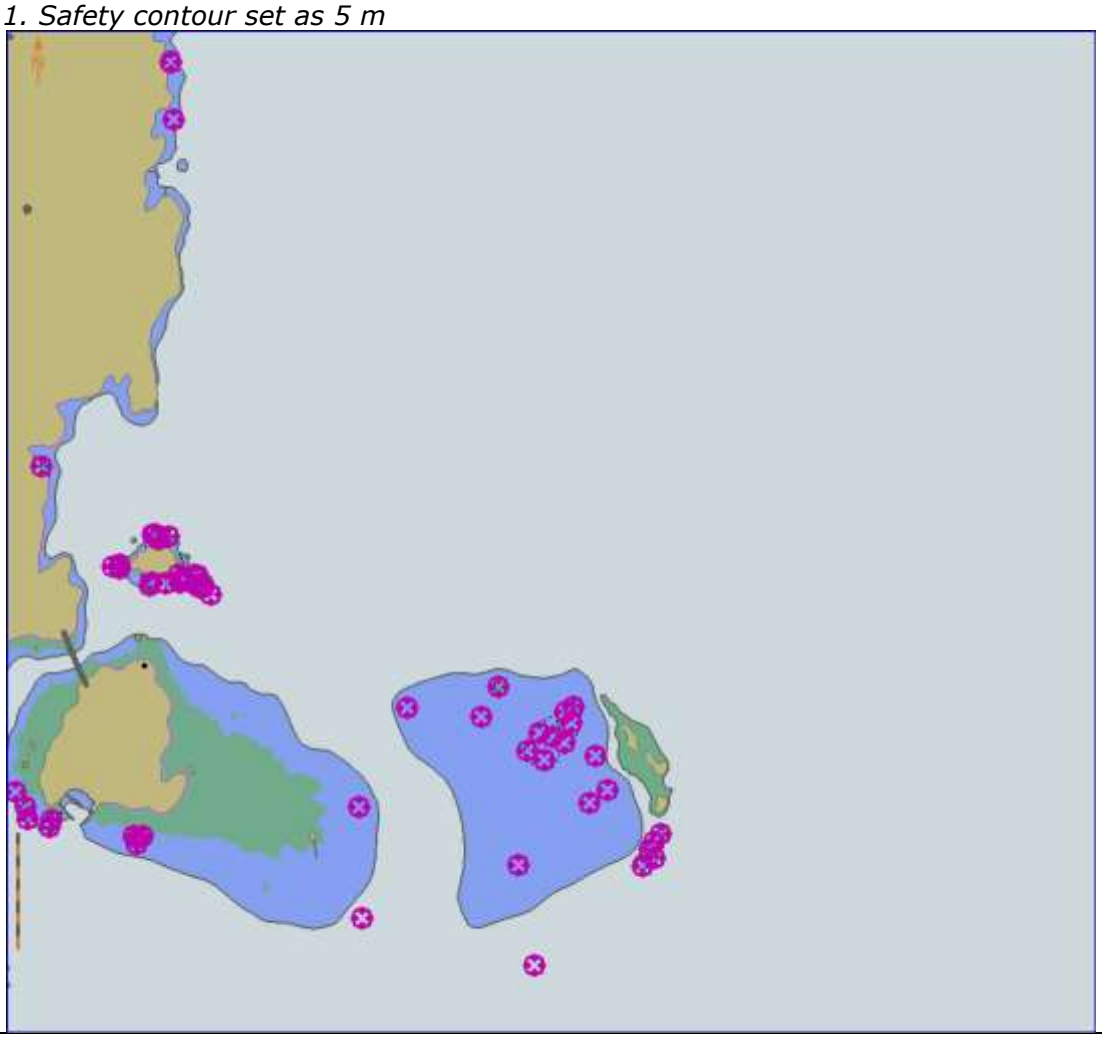
Note: A permanent indication that the date has been adjusted should be shown as specified in S-52 10.4.1.

Test reference	3.3.3.3 d)	IHO reference	S-52 10.4.1
Test description			
Route checking of date dependent objects, date range. (PERSTA and PEREND)			
Set up			
As for test 3.3.3.3 c)			
Action			
As for test 3.3.3.3 a) *Create a route from 32°35′·325S 61°20′·800E to 32°35′·325S 61°21′·960E with a cross track distance of 0.20NM set for Starboard and for Port.*			
Result			
Check the route and confirm that the following indications are given and the display is as shown:  *Note: A permanent indication that the date has been adjusted should be shown as specified in S-52 10.4.1.*			

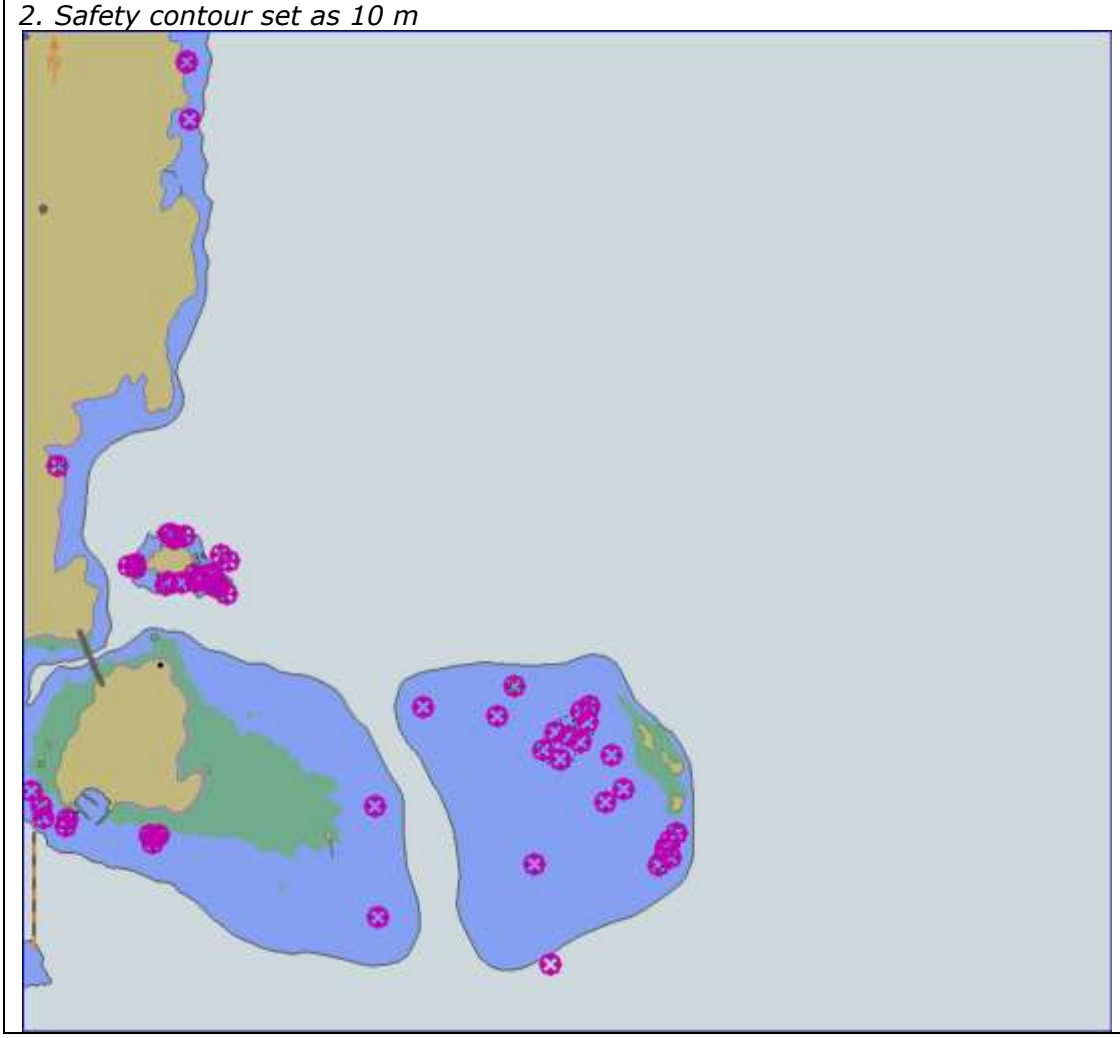
3.3.4 Safety contour

Test reference	3.3.4 a)	IHO reference	S-52 10.6.2 S-52 10.13.2
Test description			
Display of default safety contour			
Set up			
Switch on EUT without setting safety contour value (factory default setting). *Load all cells from 2.1.1 Power Up\ENC_ROOT*			
Action			
Display loaded cell GB4x0000.000 at compilation scale (1:52 000), select Display Base.			
Result			
The safety contour value must be set to 30m and the 30m contour in chart GB4X0000.000 must be displayed as safety contour (thick grey line as per S-52). 			

Test reference	3.3.4 b)	IHO reference	S-52 10.6.2 S-52 10.13.2
Test description			
Display of safety contour			
Set up			
As for test 3.3.4 a)			
Action			
1. Select a safety contour value of 15m. None of the ENCs (with the exception of GB5X01SE.000) have a 15m contour. *2. other values should also be investigated. The harbour charts (i.e. GB5*****.000) contain 0, 2, 5, 10, 20m contours, and the contour intervals on the approach chart (i.e. GB4X0000.000 are 0, 2, 5, 10, 20, 30, 50, 100, 200, 300, and 400m.*			
Result			
1. In cell GB5X01SE.000 the 15m contour and in the other cells the 20m contour must be highlighted as the safety contour. *2. If the selected value of safety contour is not available as a depth contour in the chart, the next deeper contour must be highlighted as the safety contour.* 			

Test reference	3.3.4 c)	IHO reference	S-52 13.2.19 S-52 10.3.4.4 S-52 13.2.24
Test description			
Display of safety contour and isolated dangers within the safe water enclosed by the ship's safety contour.			
Set up			
As for test 3.3.4 a)			
Action			
Select Shallow water dangers for display *1. Set the safety contour value to 5m* *2. Set the safety contour value to 10m.*			
Result			
The safety contour must be emphasised and the isolated dangers within the safe water enclosed by the ships safety contour must be displayed as shown in the screen captures contained in *1. Safety contour set as 5 m* 			

2. Safety contour set as 10 m



Test reference	3.3.4 d)	IHO reference	S-52 13.2.19 S-52 10.3.4.4 S-52 13.2.24 S-52 14.2

Test description

If the equipment under test supports four colour depth shades the following test shall also be performed.
Display of safety contour and isolated dangers within the safe water enclosed by the ship's safety contour using four shades for depth areas.

Set up

As for test 3.3.4 a)

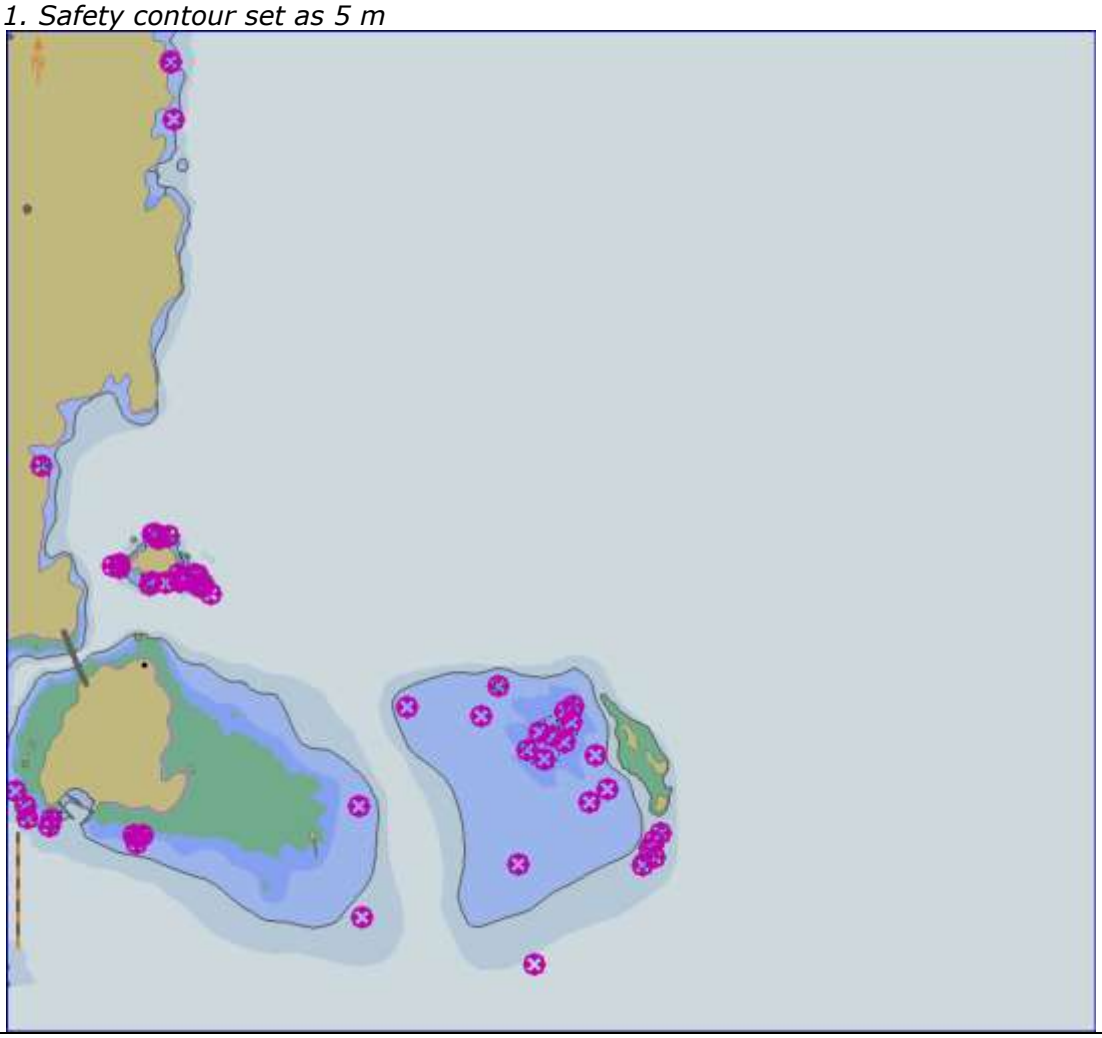
Action

Select Shallow water dangers for display
1. Set the safety contour value to 5m (shallow contour 2m, deep contour 10m,).
2. Set the safety contour value to 10m (shallow contour 5m, deep contour 20m,).

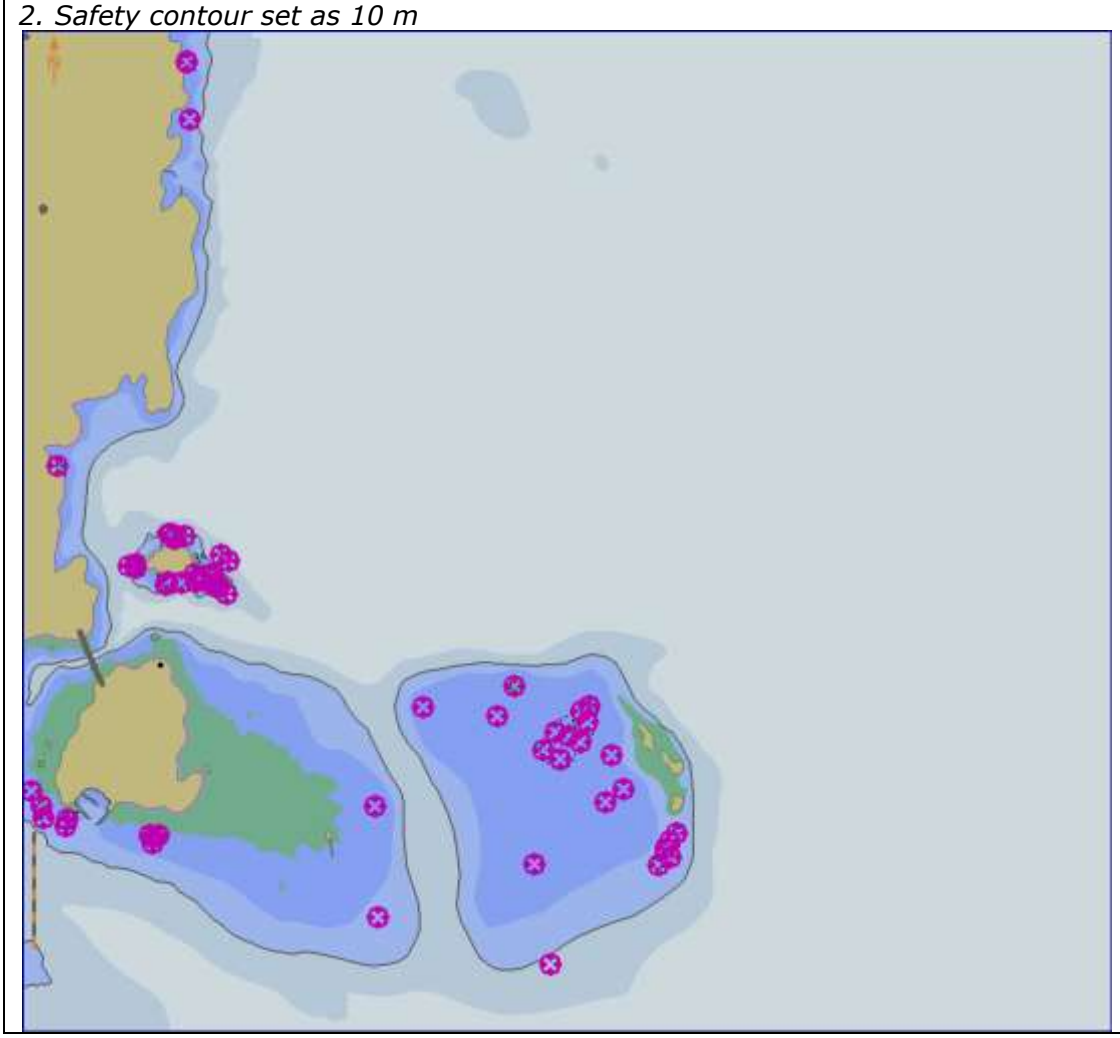
Result

The safety contour must be emphasised and the isolated dangers within the safe water enclosed by the ships safety contour must be displayed as shown in the screen captures contained in

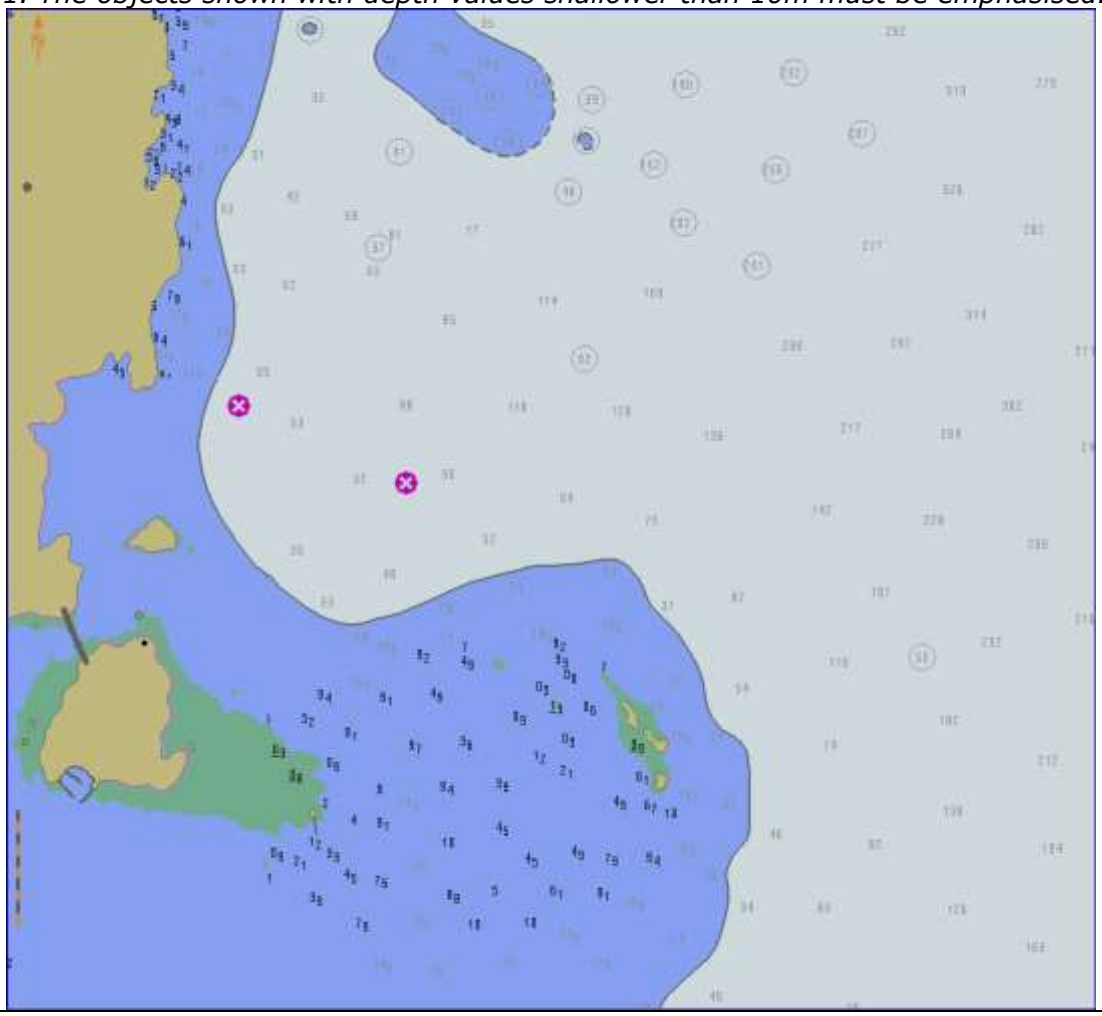
1. Safety contour set as 5 m



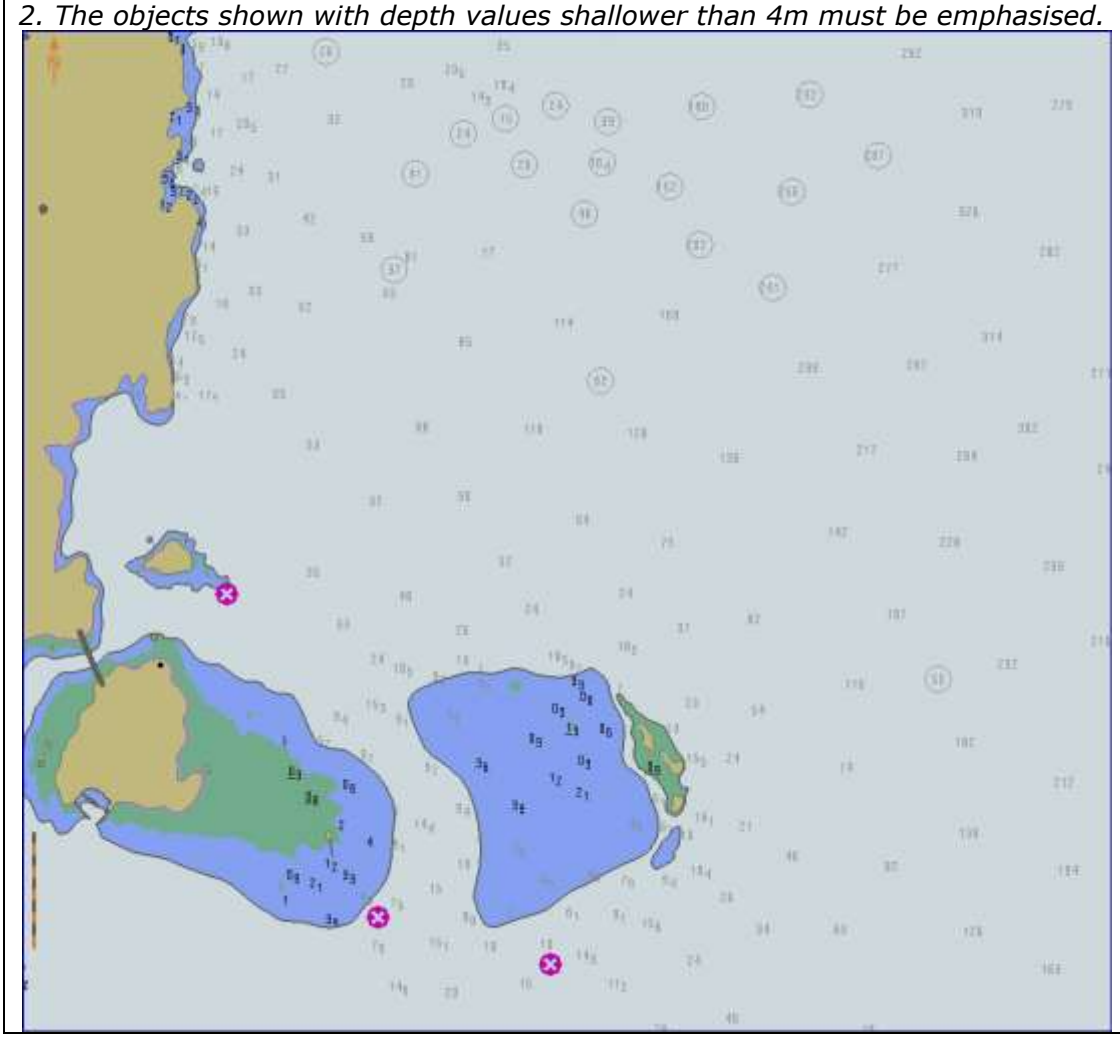
2. Safety contour set as 10 m



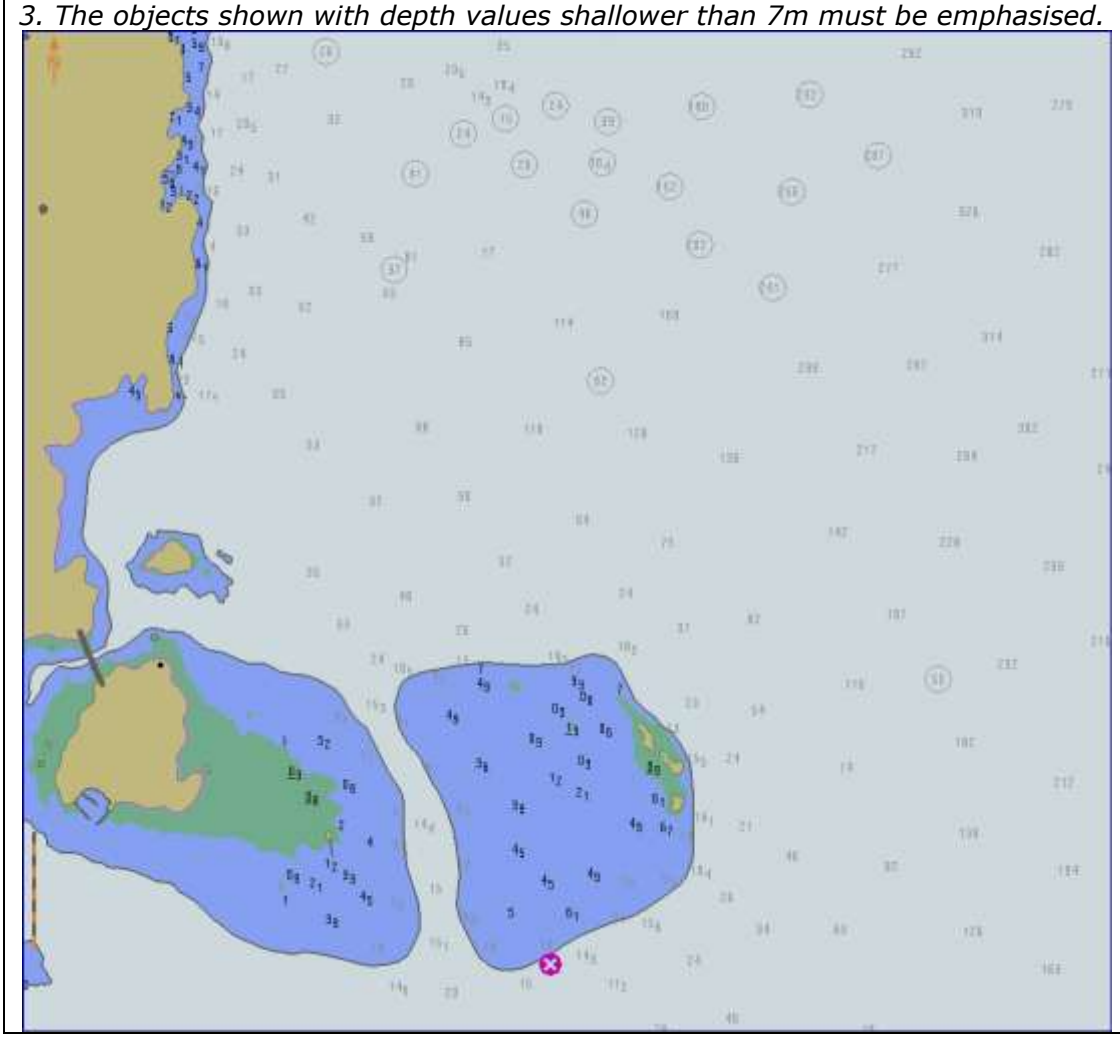
3.3.5 Safety depth

Test reference	3.3.5	IHO reference	S-52 13.2.15
Test description			
Display of objects with respect to value of safety depth			
Set up			
As for test 3.3.4 a) *Display of spot soundings shall be switched on.*			
Action			
1. Set the safety depth value to 10m (safety contour 30m). *2. Set the safety depth value to 4m (safety contour 5m).* *3. Set the safety depth value to 7m (safety contour 10m).* *4. Set the safety depth value to 12m (safety contour 10m).*			
Result			
1. The objects shown with depth values shallower than 10m must be emphasised. 			

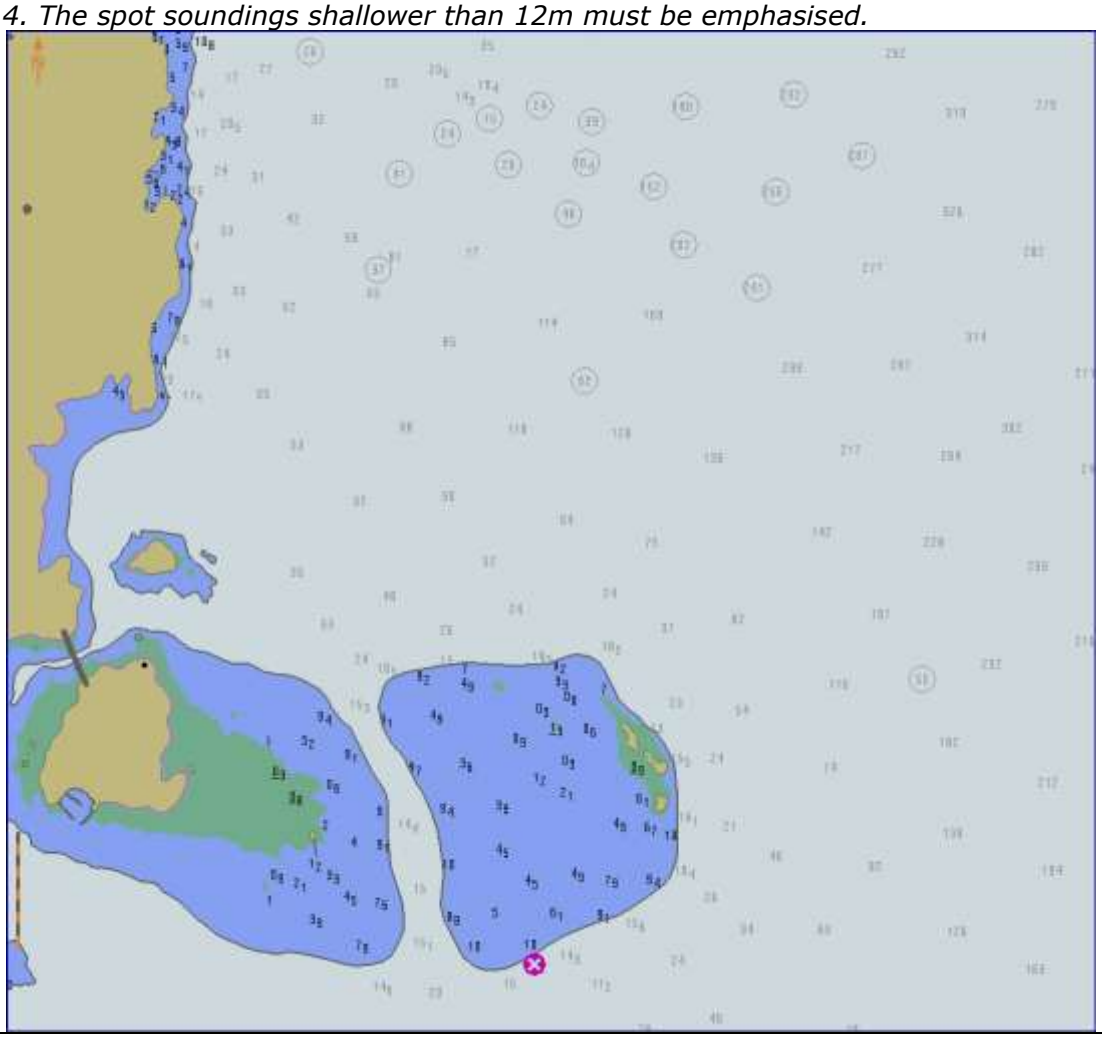
2. The objects shown with depth values shallower than 4m must be emphasised.



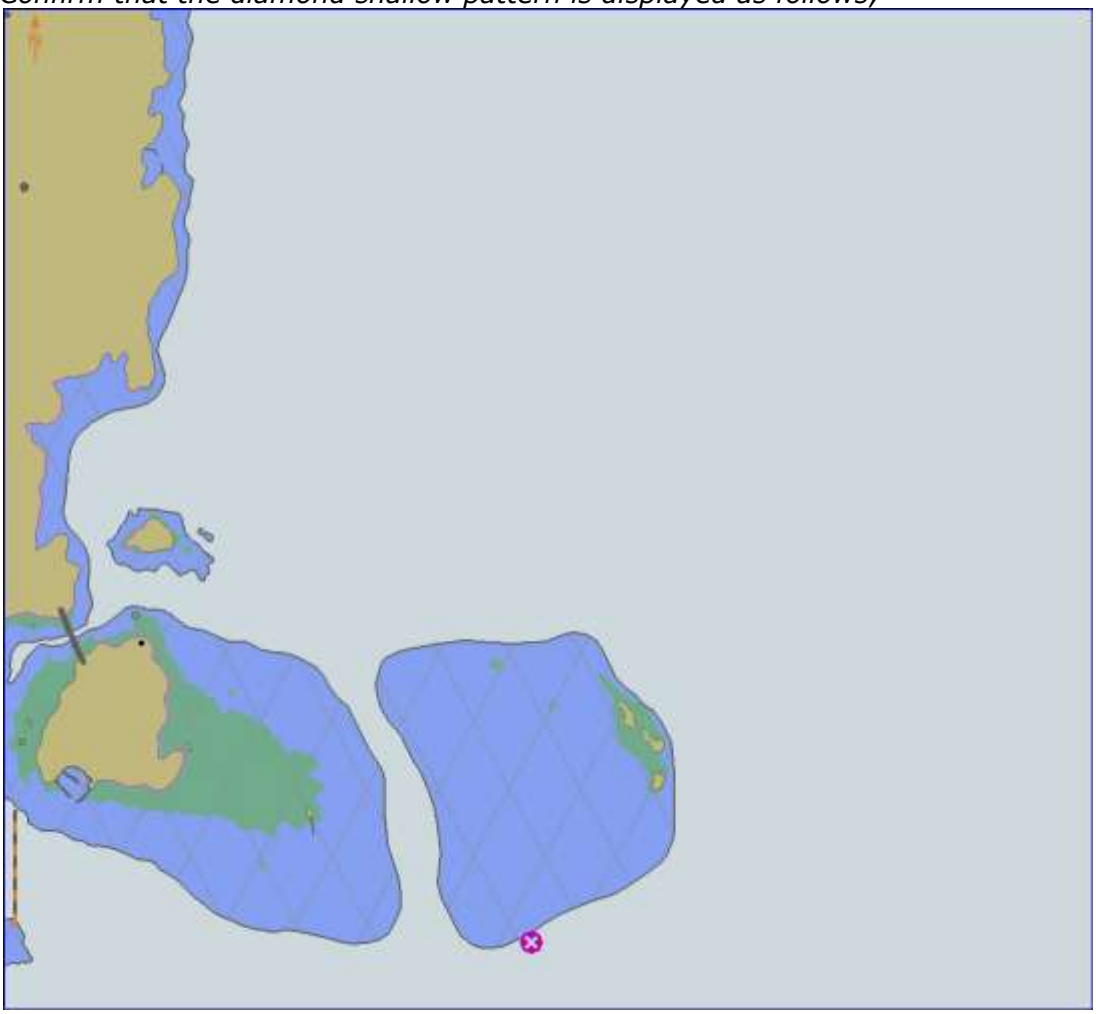
3. The objects shown with depth values shallower than 7m must be emphasised.



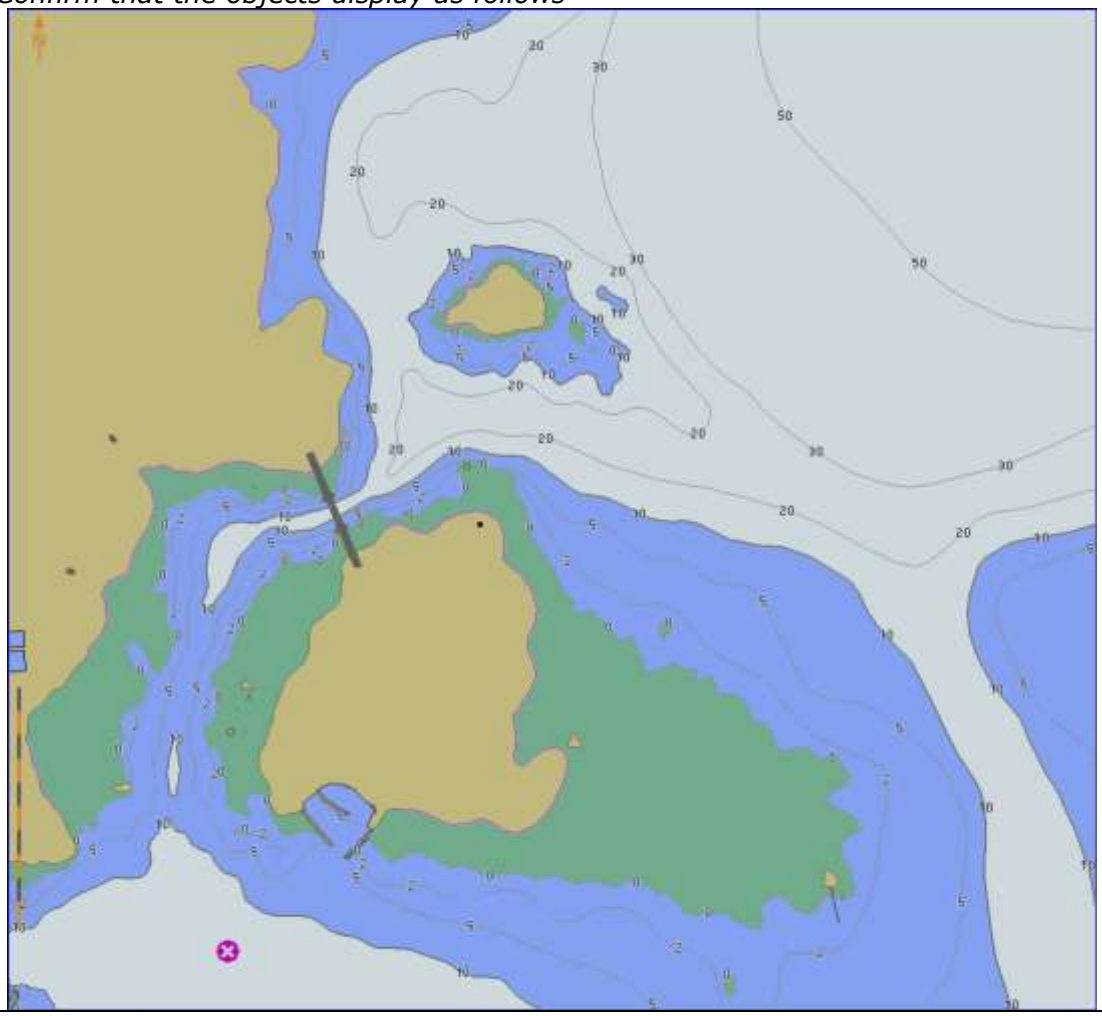
4. The spot soundings shallower than 12m must be emphasised.



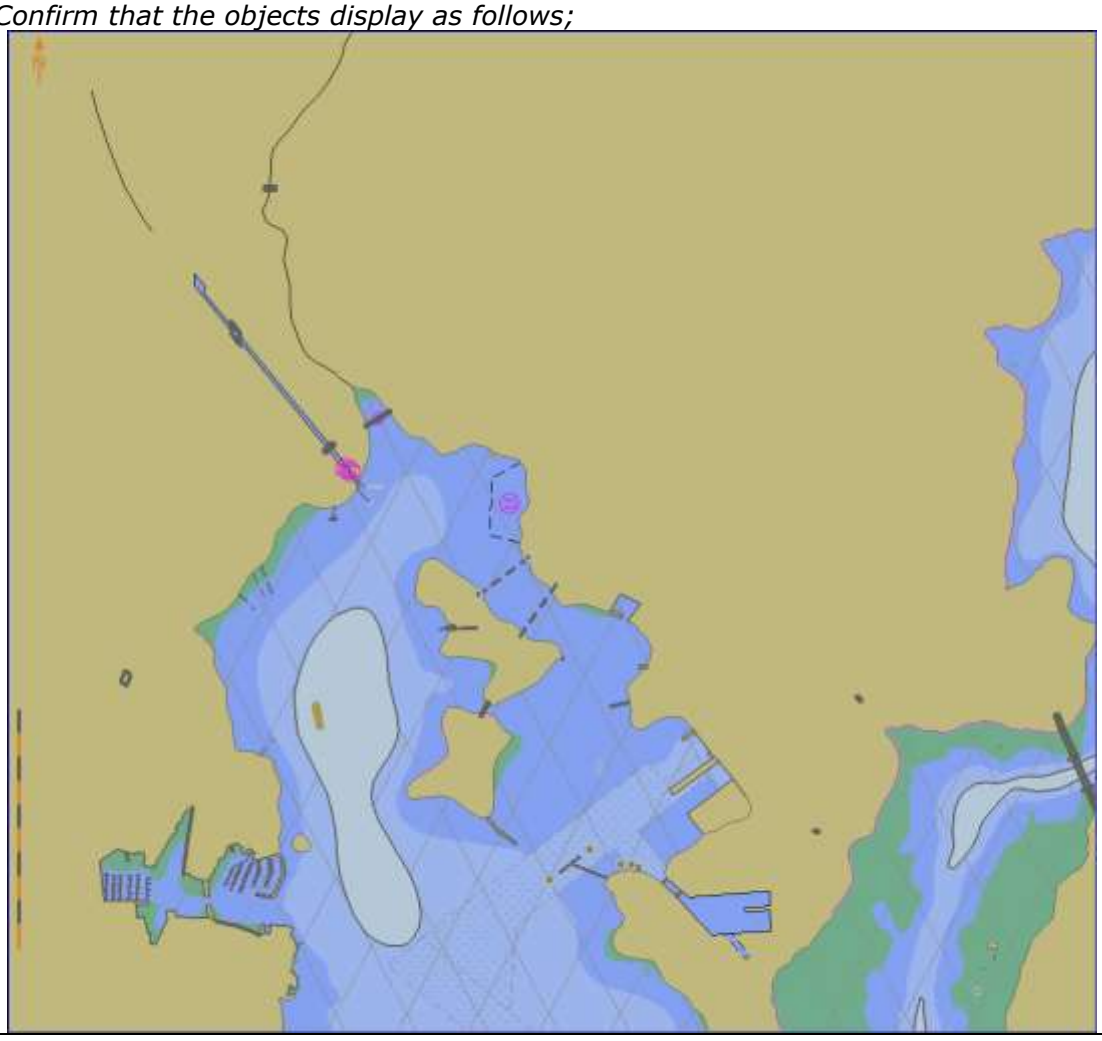
3.3.6 Shallow pattern

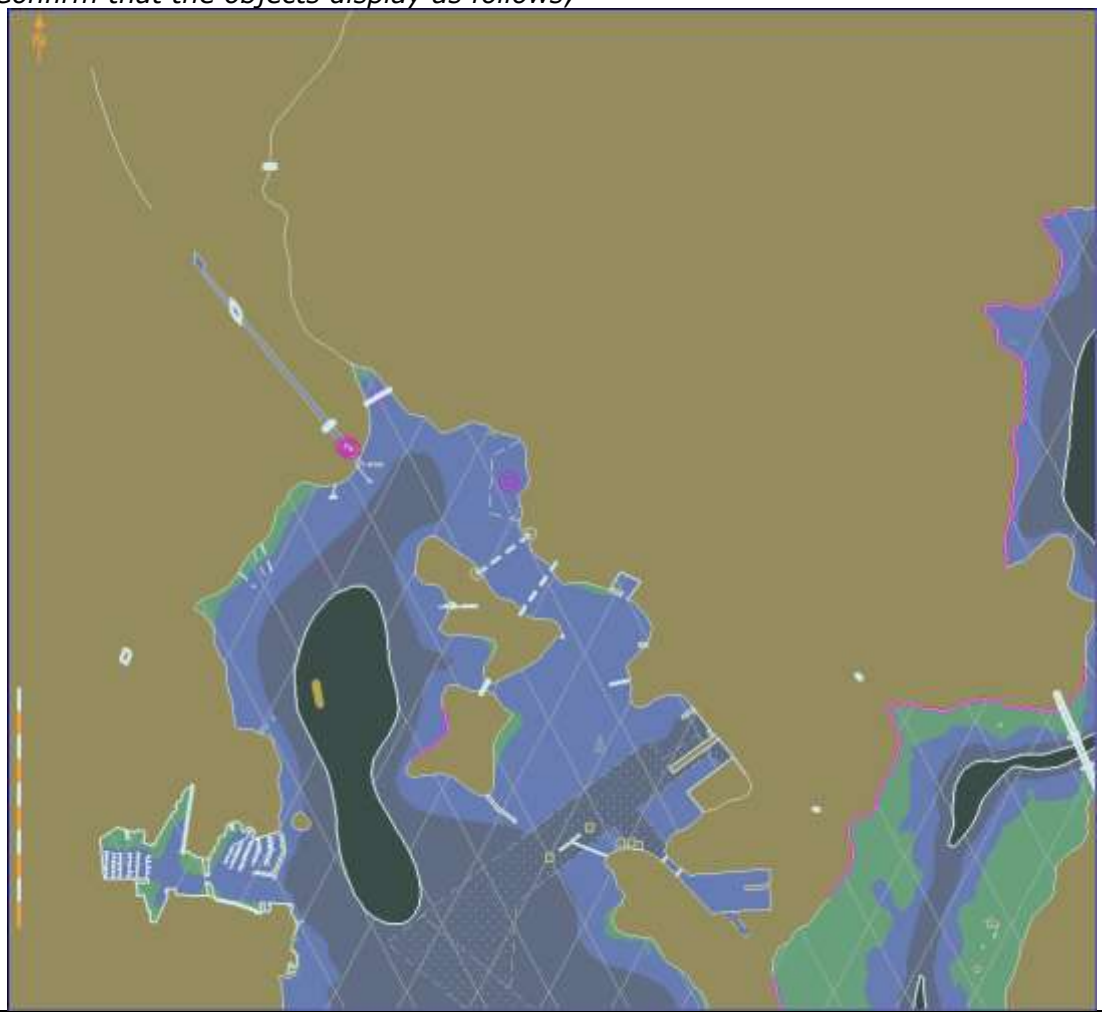
Test reference	3.3.6	IHO reference	S-52 10.5.7 S-52 10.3.4.4
Test description			
Display of shallow pattern.			
Set up			
Load all cells from 2.1.1 Power Up\ENC_ROOT with the following settings; *Safety Contour = 10 metres* *Shallow Pattern = On*			
Action			
Display loaded cell GB4x0000.000 at compilation scale (1:52 000), select Display Base			
Result			
Confirm that the diamond shallow pattern is displayed as follows; 			

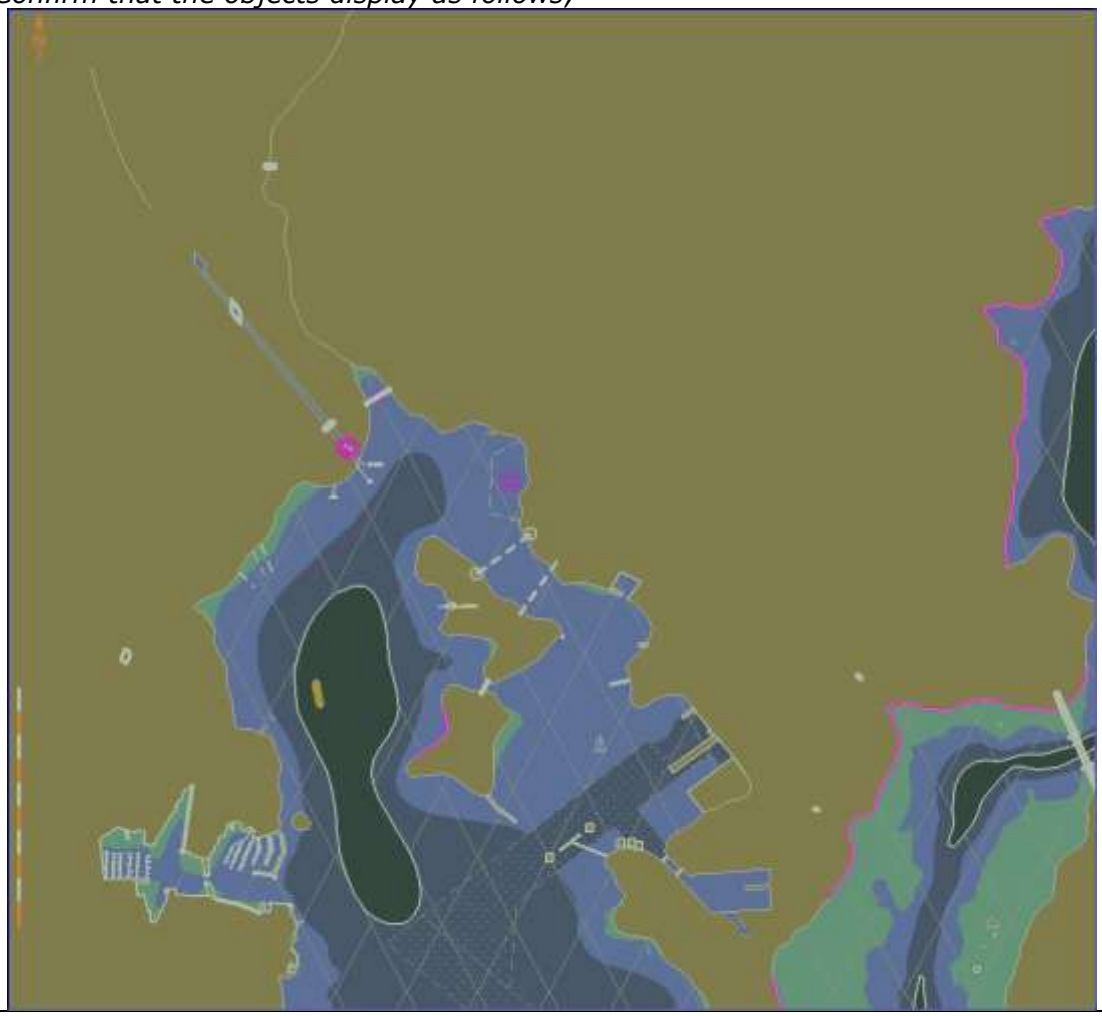
3.3.7 Contour Labels

Test reference	3.3.7	IHO reference	S-52 10.3.4.4
Test description			
Contour labels is an optional mariners' selection. This test shall be performed, if the contour label option is provided.			
Set up			
Load all cells from 2.1.1 Power Up\ENC_ROOT with the following settings; *Select Safety Contour = 10 metres* *Select Display Mode as "DISPLAY BASE"* *Select Colour Palette as "DAY"* *Select Symbolized Boundaries* *Select Paper chart symbols* *Select Other: Depth contours* *Select Contour labels*			
Action			
Display loaded cell GB5X01NE.000 at compilation scale (1:25 000)			
Result			
Confirm that the objects display as follows 			

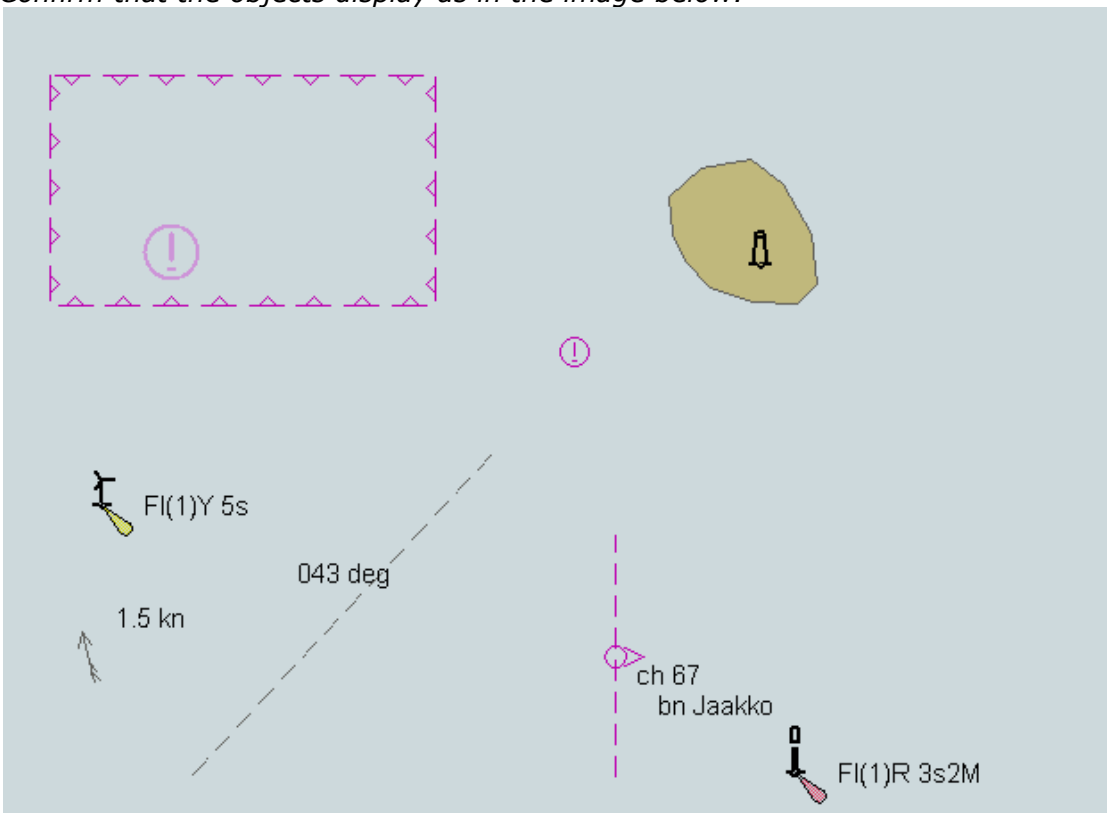
3.3.8 Colour palettes

Test reference	3.3.8 a)	IHO reference	S-52 App A
Test description			
Display of ENC in Day palette			
Set up			
Load all cells from 2.1.1 Power Up\ENC_ROOT with the following settings; *Safety Contour = 10 metres* *Safety Depth = 10 metres* *Shallow contour = 5 m* *Deep contour = 20 m* *Display Mode = "DISPLAY BASE"* *Colour Palette = "DAY"* *Symbolized Boundaries = On* *Depth Shades = 4* *Shallow Pattern = On*			
Action			
Display loaded cell GB5x01NW.000 at compilation scale (1:25 000)			
Result			
Confirm that the objects display as follows; 			

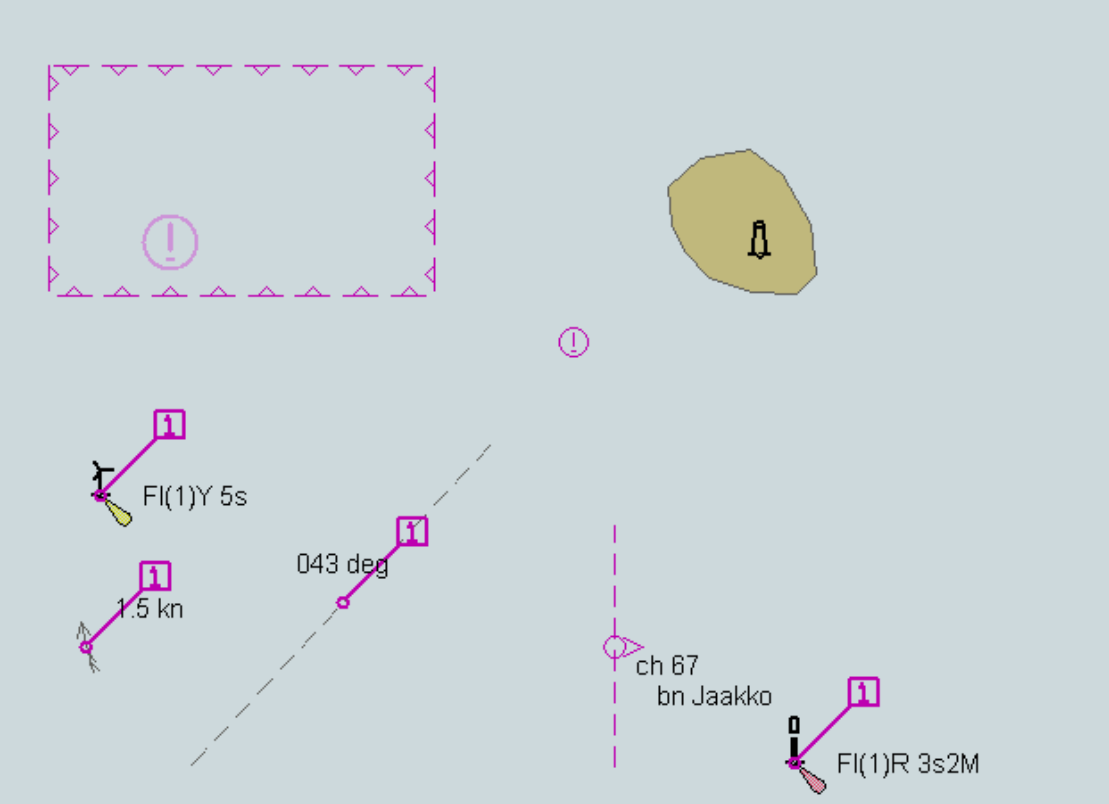
Test reference	3.3.8 b)	IHO reference	S-52 App A
Test description			
Display of ENC in Dusk palette			
Set up			
As for test 3.3.8 a) *Colour Palette = "DUSK"*			
Action			
Display loaded cell GB5x01NW.000 at compilation scale (1:25 000)			
Result			
Confirm that the objects display as follows; 			

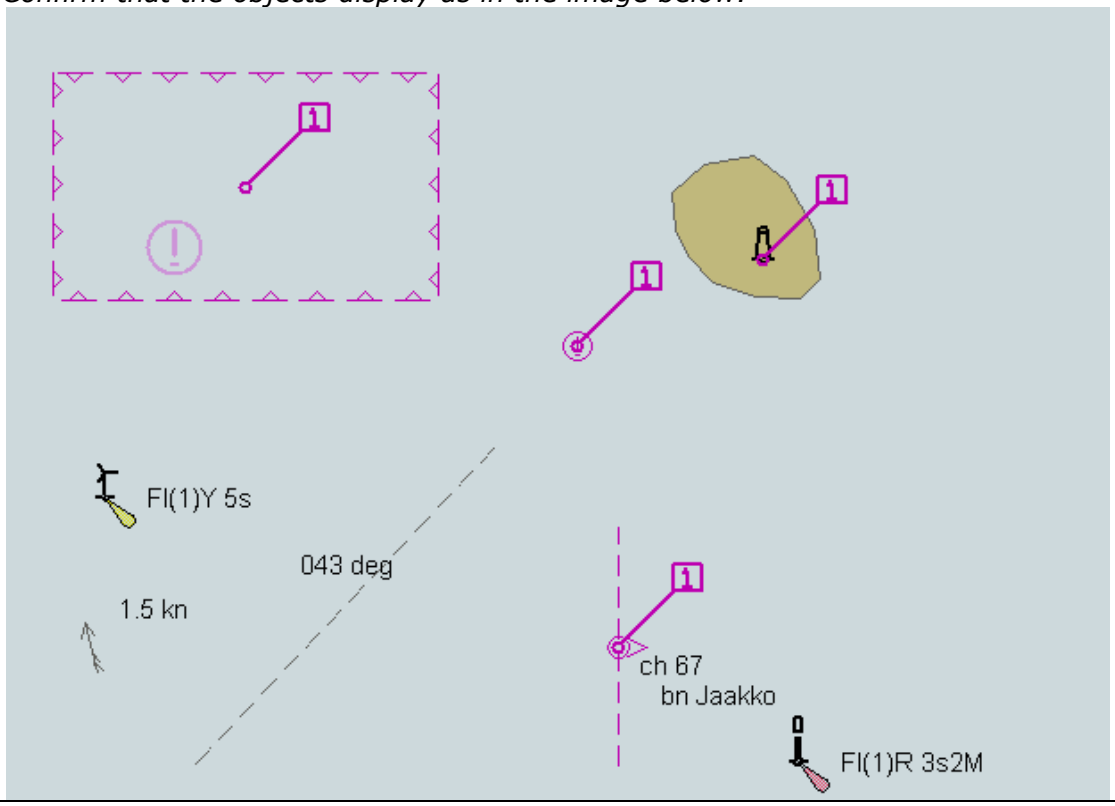
Test reference	3.3.8 c)	IHO reference	S-52 App A
Test description			
Display of ENC in Night palette			
Set up			
As for test 3.3.8 a) *Colour Palette = "NIGHT"*			
Action			
Display loaded cell GB5x01NW.000 at compilation scale (1:25 000)			
Result			
Confirm that the objects display as follows; 			

3.3.9 Display of additional Chart Information Symbol

Test reference	3.3.9 a)	IHO reference	S-52 10.6.1.1
Test description			
Display of additional chart information symbol (INFORM).			
Set up			
Load the following cell 3.3 Settings\ENC_ROOT\GB4X0001.000 with the following settings; *Select Viewing group layer Other* *Select Symbolized Boundaries* *Select Paper chart symbols* *Deselect Accuracy* *Deselect Highlight info* *Deselect Highlight document* *Ensure that the system date is set to the current date and time.*			
Action			
Centre the display on position 32°34'.000S 61° 21.705E and then zoom in to a scale of 1:20,000.			
Result			
Confirm that the objects display as in the image below:  *Note: the display should show all of the objects above without the chart information symbols.*			

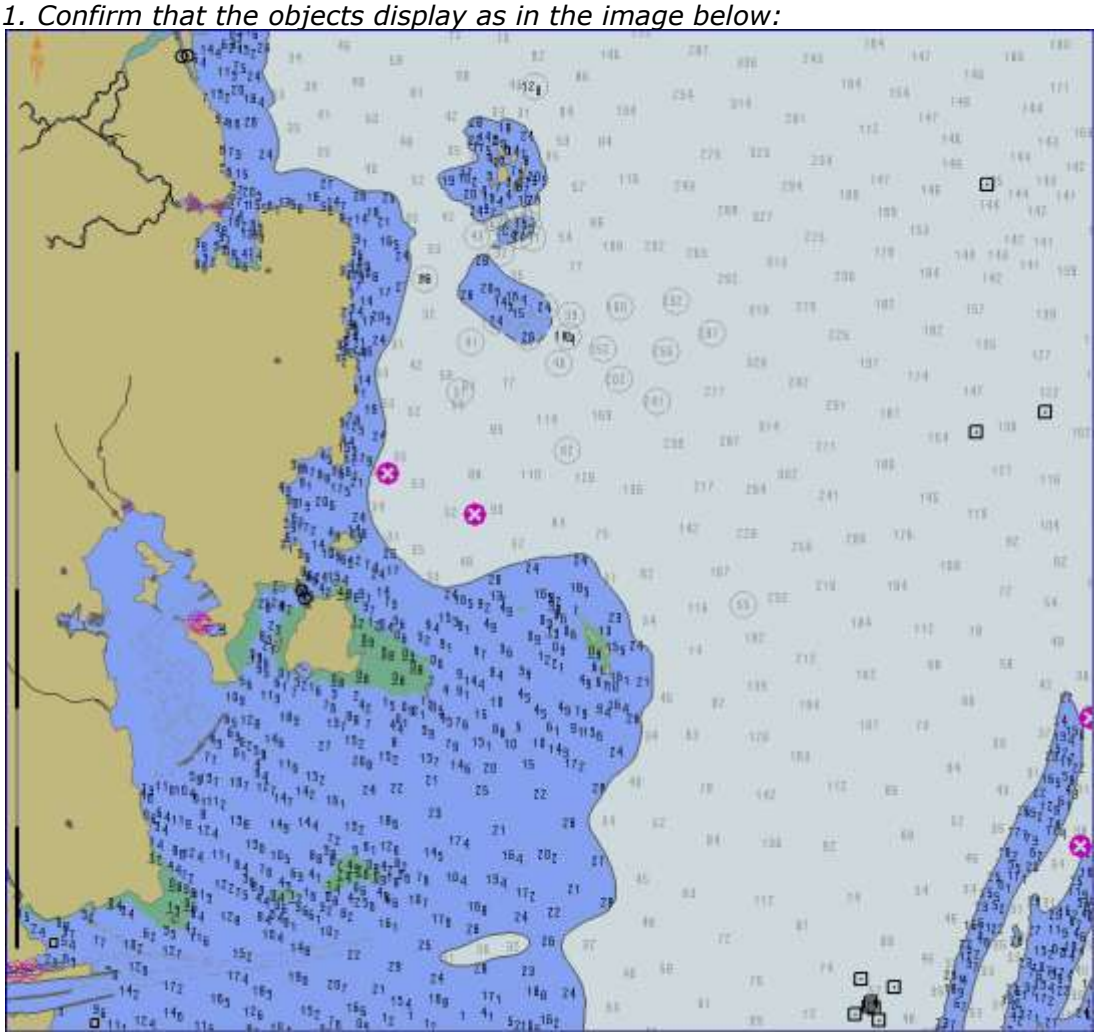
Test reference	3.3.9 b)	IHO reference	S-52 10.6.1.1
Test description			
Display of additional chart information symbol (INFORM).			
Set up			
As for test 3.3.9 a) *Select Highlight info*			
Action			
As for test 3.3.9 a)			
Result			
Confirm that the objects display as in the image below:			

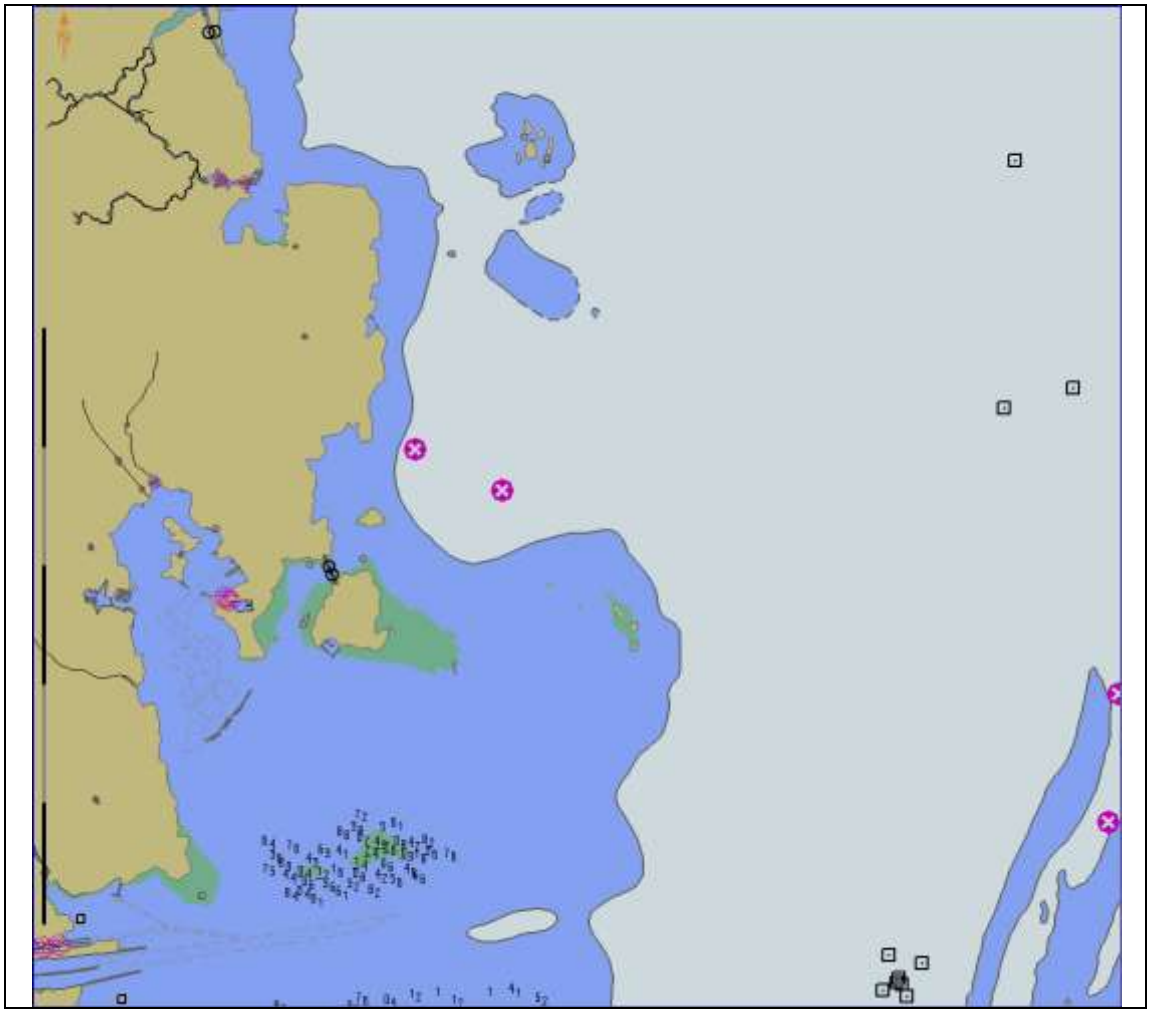


Test reference	3.3.9 c)	IHO reference	S-52 10.6.1.1
Test description			
Display of additional chart information symbol (INFORM).			
Set up			
As for test 3.3.9 a) *Select Highlight document*			
Action			
As for test 3.3.8 a)			
Result			
Confirm that the objects display as in the image below: 			

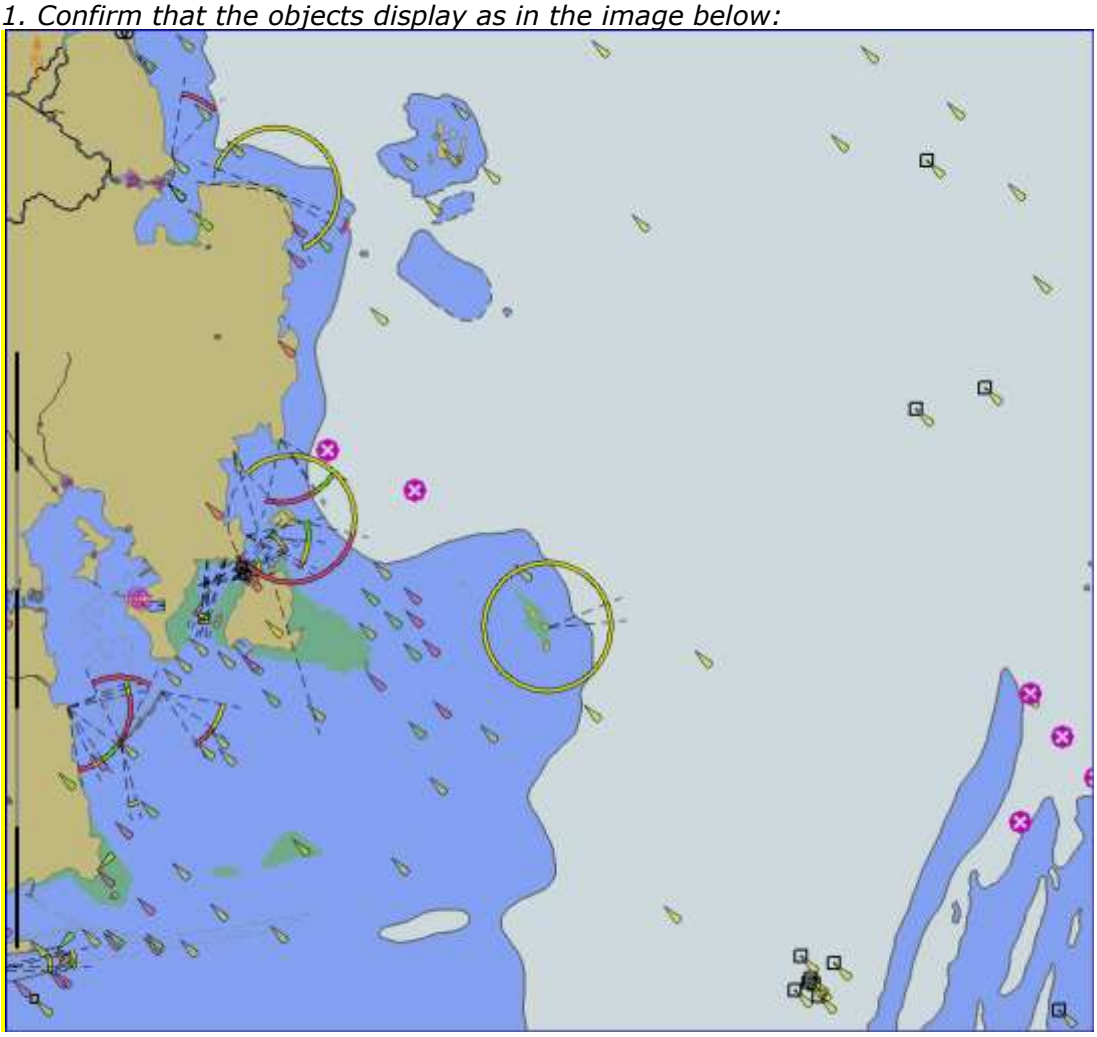
3.3.10 Scale Minimum

Test reference	3.3.10	IHO reference	S-52 10.4.2
Test description			
Disabling Scale Minimum using the Scale min Mariners' Selection			
Set up			
Load the following cell 2.1.1 Power Up\ENC_ROOT\GB4X0000.000 with the following settings; *Select Viewing group layer Display base* *Set the safety contour value to 30 m* *Set the safety depth value to 30 m* *Select Symbolized Boundaries* *Select Paper chart symbols* *Select Spot soundings* *Deselect Accuracy* *Deselect Highlight info* *Deselect Highlight document*			

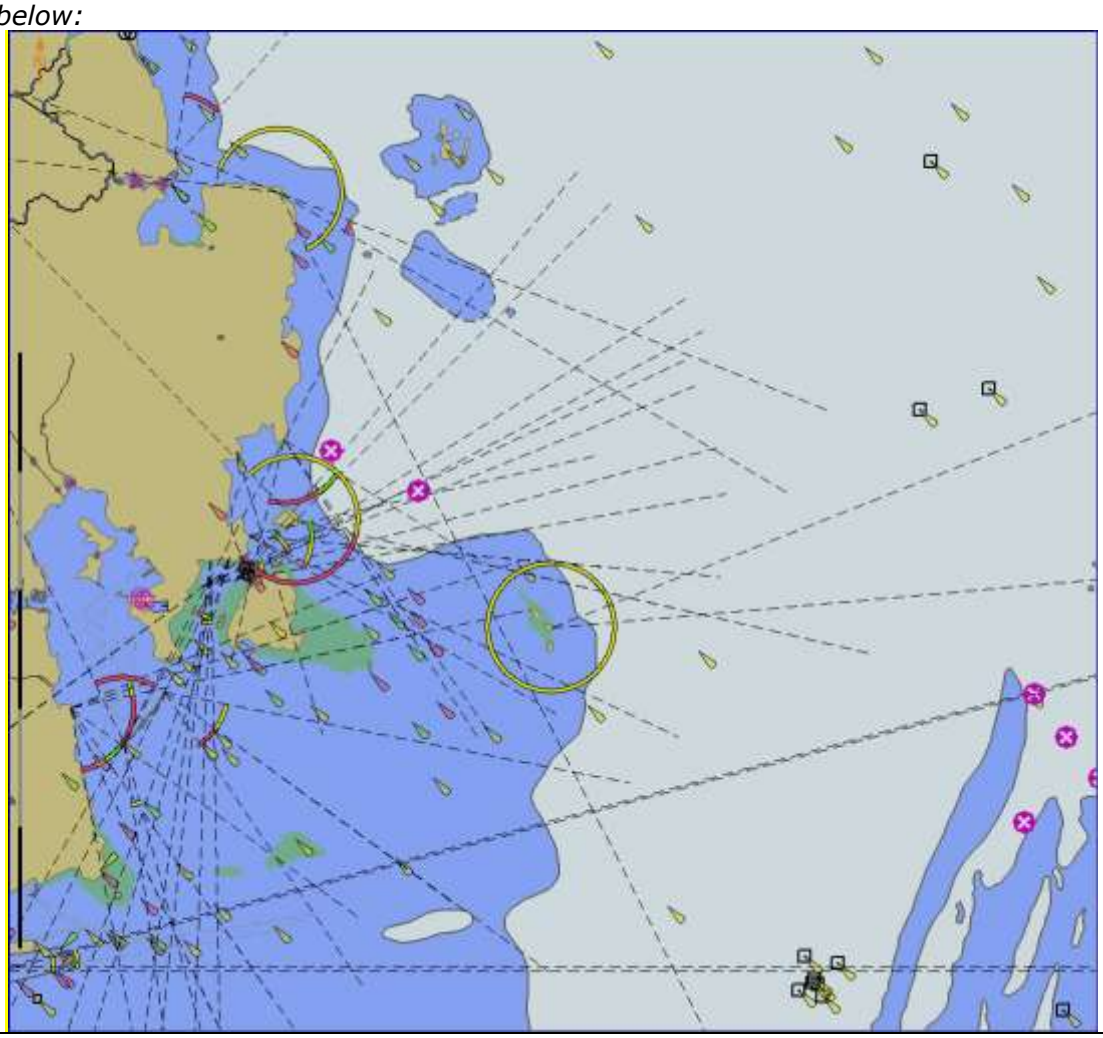
Deselect Scale min
Action
Centre the display on position 32°28′.600S 61° 02.800E and then zoom in to a scale of 1:100,000. *1.Observe the display.* *2.Select Scale min*
Result
1. Confirm that the objects display as in the image below:  *2. After selecting Scale min confirm that the objects display as in the image below:*



3.3.11 Full Light Lines

Test reference	3.3.11	IHO reference	S-52 13.2.7
Test description			
Disabling Full light lines using the Full light lines Mariners' Selection			
Set up			
Load the following cell 2.1.1 Power Up\ENC_ROOT\GB4X0000.000 with the following settings; *Select Viewing group layer Display base* *Set the safety contour value to 30 m* *Set the safety depth value to 30 m* *Select Symbolized Boundaries* *Select Paper chart symbols* *Deselect Accuracy* *Deselect Highlight info* *Deselect Highlight document* *Deselect Full light lines*			
Action			
Centre the display on position 32°29'.000S 61° 04.000E and then zoom in to a scale of 1:100,000. *1. Observe the display.* *2.Select Full light lines*			
Result			
1. Confirm that the objects display as in the image below: 			

2. After selecting Full light lines confirm that the objects display as in the image below:



3.3.12 National Language

Test reference	3.3.12	IHO reference	S-52 10.6.1.2
Test description			
Selecting the display of text in National language.			
Set up			
Load the following cell 3.3 Settings\ENC_ROOT\GB4X0001.000 with the following settings; *Select Viewing group layer Other* *Select Symbolized Boundaries* *Select Paper chart symbols* *Deselect Accuracy* *Deselect Highlight document* *Deselect National language*			
Action			
Centre the display on position 32°34'.700S 61° 22.300E and then zoom in to a scale of 1:10,000. *1. Observe the display.* *2.Select National language*			
Result			
1. Confirm that the objects display as in the image below:  *2. After selecting National language confirm that the objects display as in the image below:*  Note: This object has name in national language (NOBJNM) and information in national language (NINFOM)			

3.4 Non-Official Data

Test reference	3.4 a)	IHO reference	S-52 10.1.7
Test description			
Loading and display of non-official data.			
Set up			
Load the following cell 3.4 Non-Official Data\ENC_ROOT\1B5X01NE.000 *(The producer code of this cell has been changed from GB to 1B and the agency code (AGEN) has been modified from 540 to 65535 as specified in S-57 clauses 4.3.1 and 2.1.)*			
Action			
Visually inspect the cell.			
Result			
Confirm that the cell displays bounded by the LC(NONHODAT) symbol as defined in the presentation library and that an indication to refer to the official chart is provided.			

Cells to support tests 3.4 b) and c) need to be created.

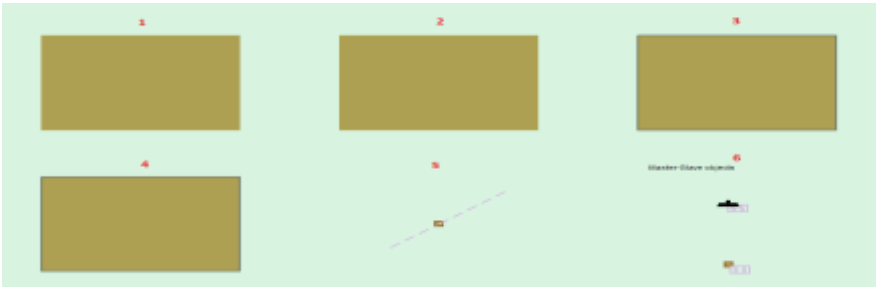
Test reference	3.4 b)	IHO reference	S-52 10.1.7
Test description			
Loading and display of official data.			
Set up			
Load the following cell provided on the IHO website *(The producer code of this cell is the most recently added official agency code)*			
Action			
Visually inspect the cell.			
Result			
Confirm that the cell displays normally the LC(NONHODAT) symbol as defined in the presentation library shall not display and an indication to refer to the official chart shall not be given.			

Test reference	3.4 c)	IHO reference	S-52 10.1.7
Test description			
Loading and display of non-official data.			
Set up			
Load the following cell provided on the IHO website *(The producer code of this cell is the most recently added non-official agency code)*			
Action			
Visually inspect the cell.			
Result			
Confirm that the cell displays with the LC(NONHODAT) symbol as defined in the presentation library and that an indication is provided that the mariner must refer to the official chart.			

3.5 Area of No Data

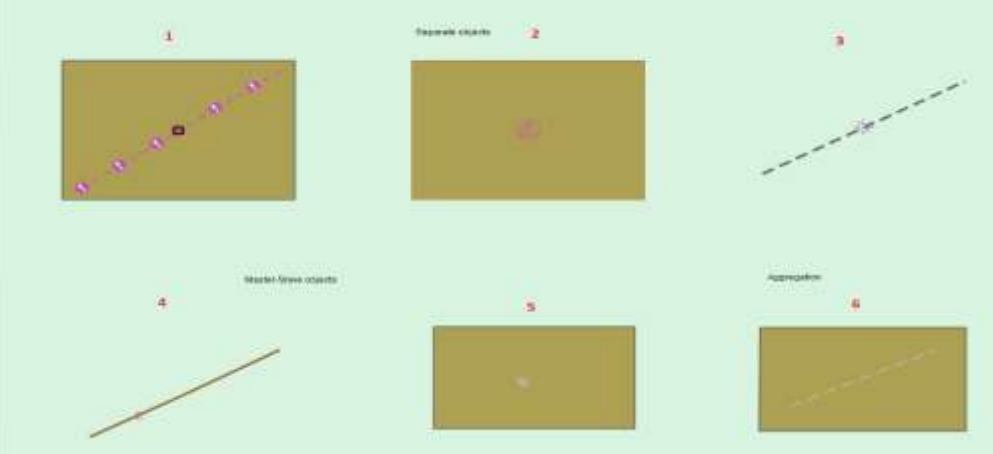
Test reference	3.5	IHO reference	S-52 10.1.8
Test description			
Loading and display of areas of no data.			
Set up			
Load the following cell 2.1.1 Power Up\ENC_ROOT\GB4X0000.000			
Action			
View a display area for which no ENC data is present, the area around the edge of the cell.			
Result			
Confirm that the "no data" area symbolization defined in the presentation library is displayed in the appropriate area.			

3.6 Display priorities

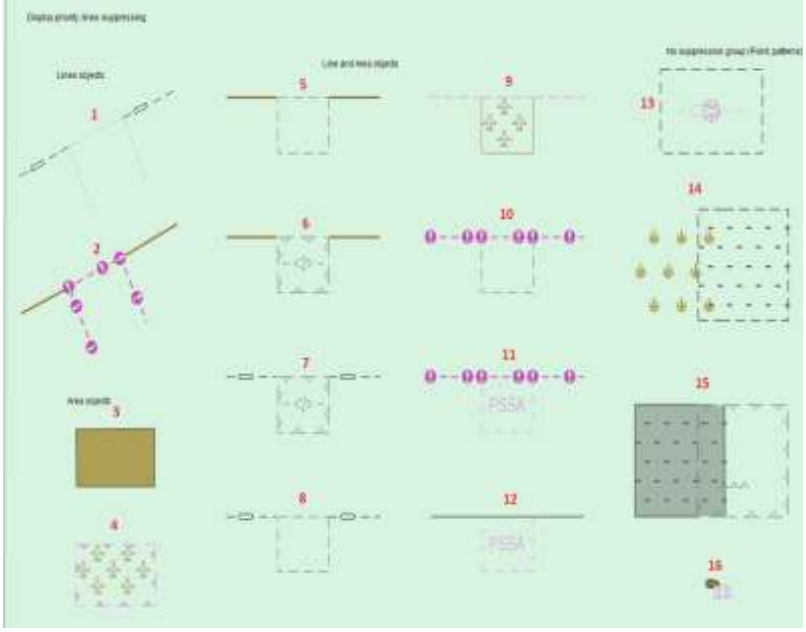
Test reference	3.6.1	IHO reference	S-52 10.3.4.1
Test description			
Different priority and different geometry			
Set up			
Load the following cell 3.6 Display priorities\ENC_ROOT\2J5X0001.000 with the following settings; *Safety Contour = 30 metres* *Display Mode = "OTHER"* *Text display = On* *Shallow pattern = On* *Information indication = On* *Symbolized Boundaries = On* *Simplified Symbols = Off*			
Action			
View the objects at position 32°20'·400S 61°20'·650E scale 1:5000			
Result			
Confirm that items 1-6 display as shown in the graphic below; 			

Test reference	3.6.2	IHO reference	S-52 10.3.4.1
Test description			
Same priority and different geometry			
Set up			
As for test 3.6.1			
Action			
View the objects at position 32°20'·400S 61°21'·900E scale 1:5000			

Result
Confirm that items 1-6 display as shown in the graphic below;

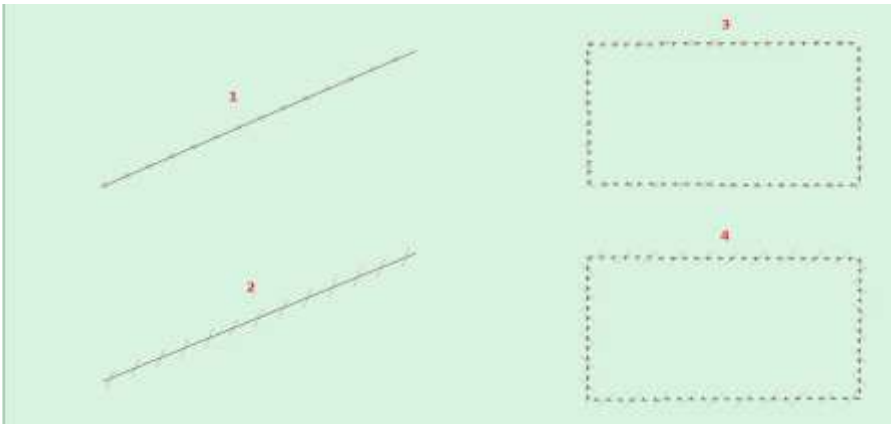


Test reference	3.6.3	IHO reference	S-52 10.3.4.1
Test description			
Line suppression			
Set up			
As for test 3.6.1			
Action			
View the objects at position 32°20′·400S 61°23′·150E scale 1:5000			
Result			
Confirm that items 1-16 display as shown in the graphic below;			

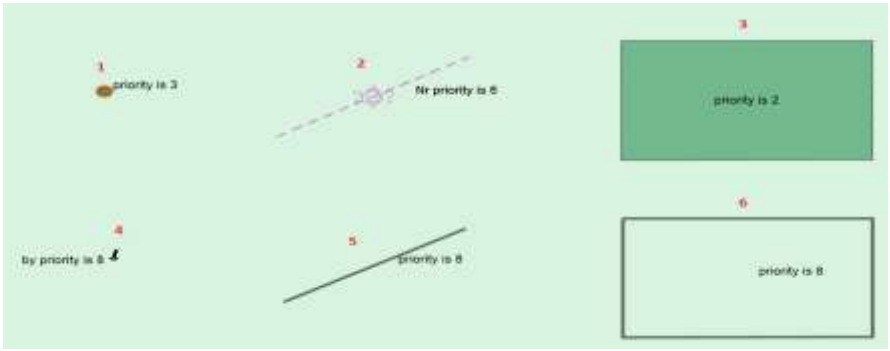


Test reference	3.6.4	IHO reference	S-52 10.3.4.1
Test description			
Manual updates			
Set up			

As for test 3.6.1
Action
View the objects at position 32°21′·100S 61°20′·650E scale 1:5000
Result
Confirm that items 1-4 display as shown in the graphic below;

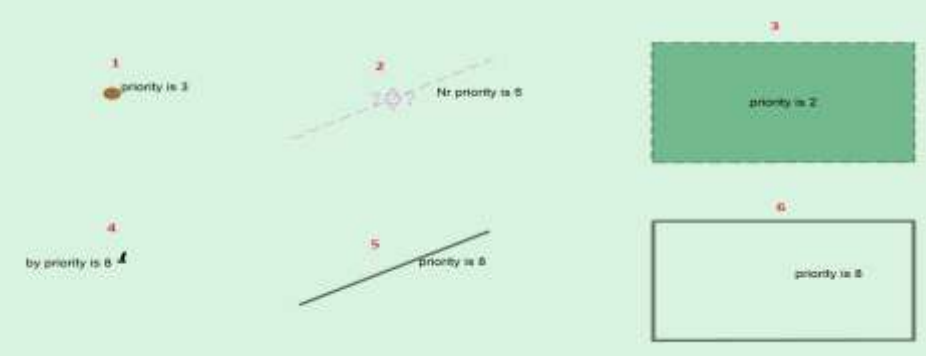


Test reference	3.6.5 a)	IHO reference	S-52 10.3.4.1
Test description			
Text display			
Set up			
As for test 3.6.1			
Action			
View the objects at position 32°21′·100S 61°21′·900E scale 1:5000			
Result			
Confirm that items 1-6 display as shown in the graphic below;			

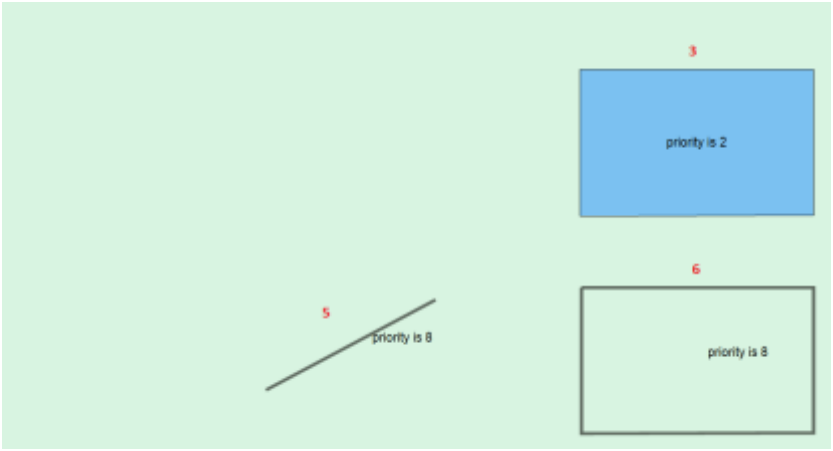


Test reference	3.6.5 b)	IHO reference	S-52 10.3.4.1
Test description			
Text display			
Set up			
As for test 3.6.5 a) except *Display Mode = "STANDARD"*			
Action			
View the objects at position 32°21′·100S 61°21′·900E scale 1:5000			

Result
Confirm that items 1-6 display as shown in the graphic below;

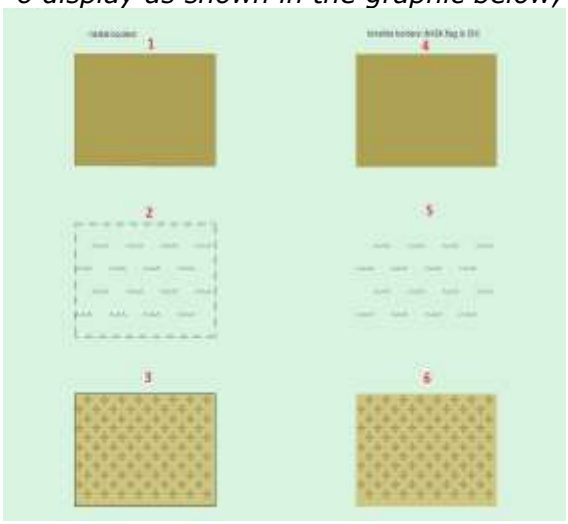


Test reference	3.6.5 c)	IHO reference	S-52 10.3.4.1
Test description			
Text display			
Set up			
As for test 3.6.5 b) except *Display Mode = "BASE"*			
Action			
View the objects at position 32°21′·100S 61°21′·900E scale 1:5000			
Result			
Confirm that items 3,5 and 6 display as shown in the graphic below;			

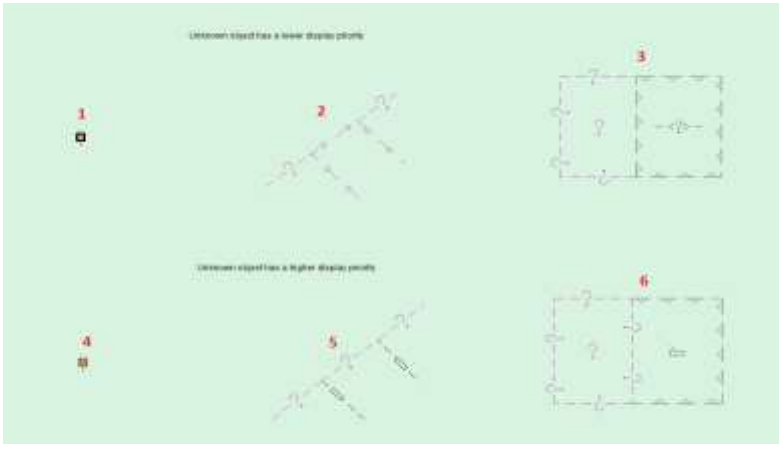


Test reference	3.6.6	IHO reference	S-52 10.3.4.1
Test description			
Display of area borders			
Set up			
As for test 3.6.5 c) except			

Display Mode = "OTHER"
Action
View the objects at position 32°21′·100S 61°23′·150E scale 1:5000
Result
Confirm that items 1-6 display as shown in the graphic below;

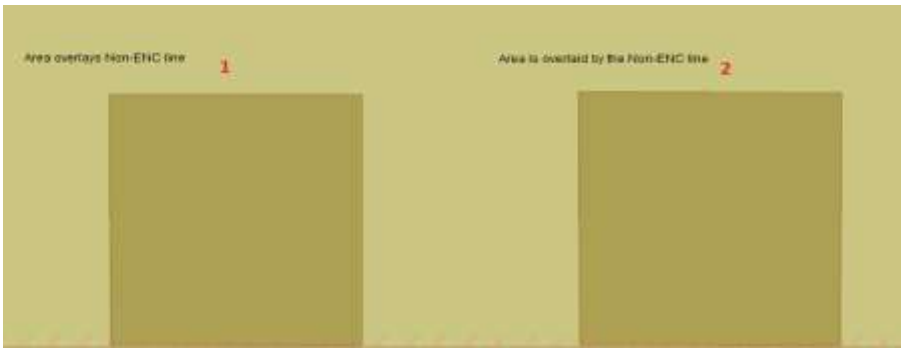


Test reference	3.6.7	IHO reference	S-52 10.3.4.1
Test description			
Display of unknown symbol			
Set up			
As for test 3.6.6			
Action			
View the objects at position 32°21′·850S 61°20′·650E scale 1:5000			
Result			
Confirm that items 1-6 display as shown in the graphic below;			



Test reference	3.6.8.1	IHO reference	S-52 10.3.4.1
Test description			
Unofficial data boundary display			
Set up			
As for test 3.6.6 and in addition;			

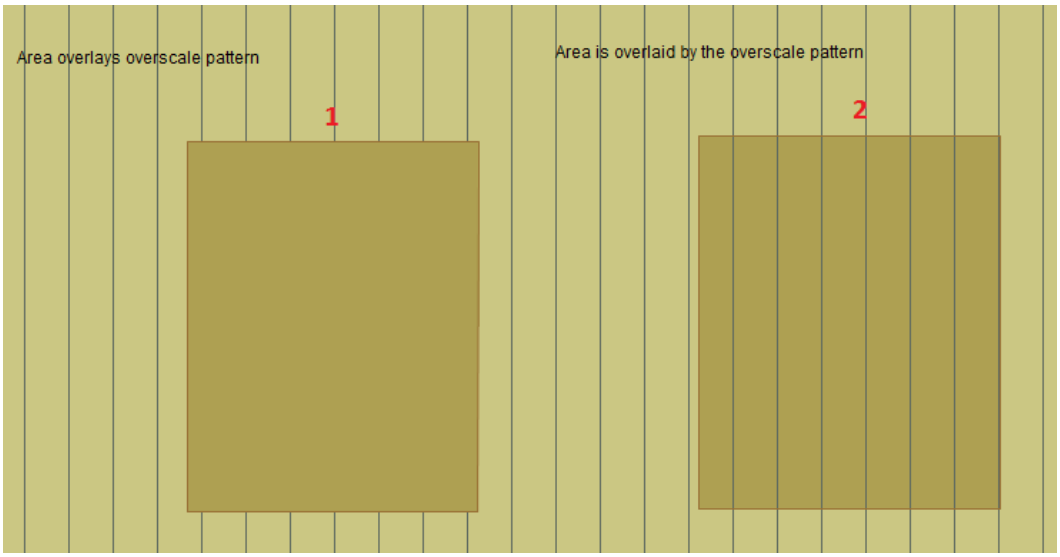
Non-ENC borders = On
Action
View the objects at position 32°22′·450S 61°24′·250E scale 1:5000
Result
Confirm that items 1 and 2 display as shown in the graphic below;



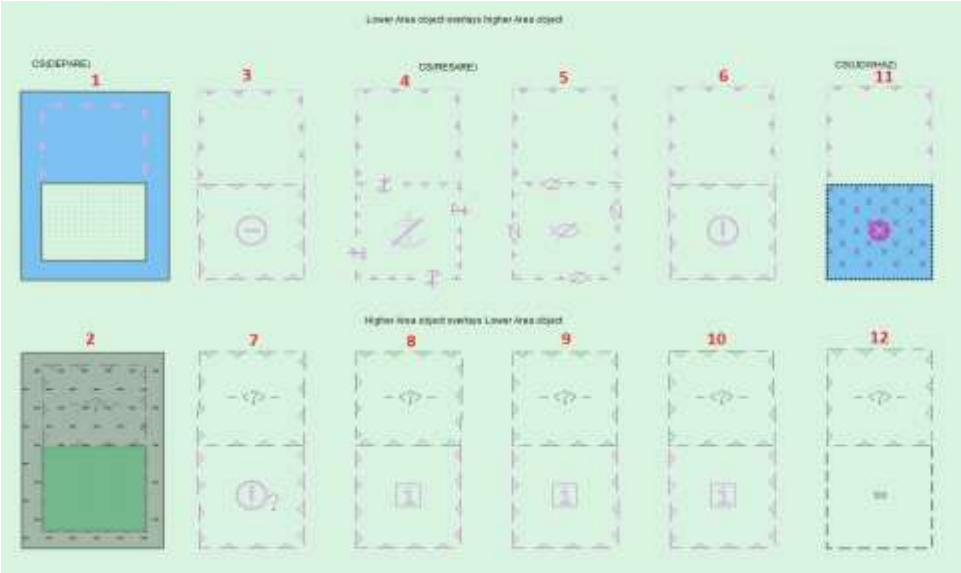
Test reference	3.6.8.2	IHO reference	S-52 10.3.4.1
Test description			
Scale boundary display			
Set up			
As for test 3.6.8.1 and in addition; *Scale borders = On* *Non-ENC borders = Off*			
Action			
View the objects at position 32°22′·450S 61°23′·800E scale 1:5000			
Result			
Confirm that items 1 and 2 display as shown in the graphic below;			

Test reference	3.6.8.3	IHO reference	S-52 10.3.4.1
Test description			
Overscale pattern display			
Set up			
As for test 3.6.8.2 and in addition; *Overscale indication = On*			

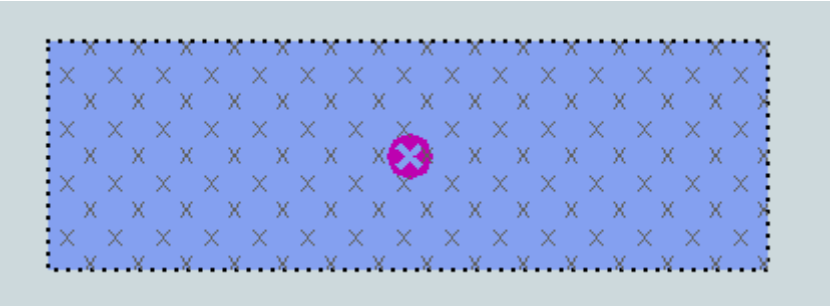
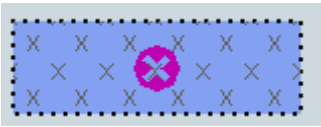
Action
View the objects at position 32°22′·650S 61°23′·800E scale 1:5000
Result
Confirm that items 1 and 2 display as shown in the graphic below;

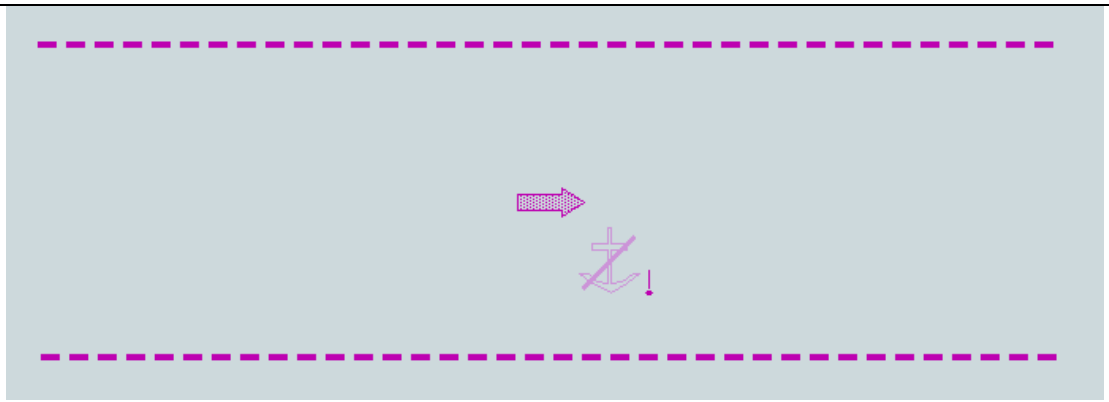


Test reference	3.6.9	IHO reference	S-52 10.3.4.1
Test description			
Display of objects with priority affected by conditional symbology procedures			
Set up			
As for test 3.6.1			
Action			
View the objects at position 32°21′·850S 61°23′·150E scale 1:5000			
Result			
Confirm that items 1- 12 display as shown in the graphic below;			



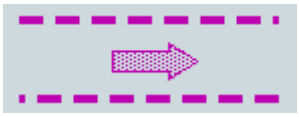
3.6.10 Display of Centred Symbols

Test reference	3.6.10 a)	IHO reference	S-52 8.5.1
Test description			
Display of centred symbol in the centre of an area.			
Set up			
Load the following cell 3.3 Settings\ENC_ROOT\GB4X0001.000 with the following settings; *Select Viewing group layer Other* *Select Symbolized Boundaries* *Select Paper chart symbols* *Deselect Accuracy*			
Action			
Centre the display on position 32°32'.805S 61° 21.290E and then zoom in to a scale of 1:20,000.			
Result			
Confirm that the object displays as in the image below;  *Zoom out to scale 1:50 000 and confirm that the objects now display as follows;* 			
Test reference	3.6.10 b)	IHO reference	S-52 8.5.1
Test description			
Display of centred symbols offset.			
Set up			
As for test 3.6.10 a)			
Action			
Centre the display on position 32°32'.085S 61° 21.415E and then zoom in to a scale of 1:10,000.			
Result			
Confirm that the objects display as in the image below:			



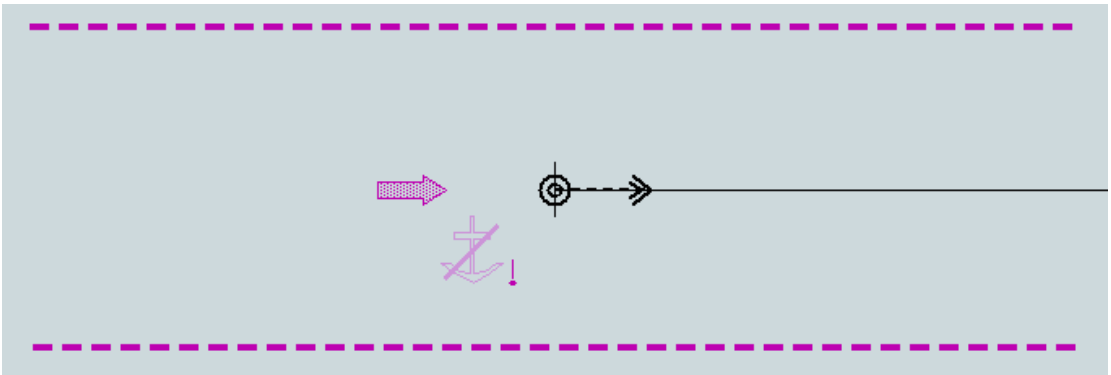
Note: the display should show the centred symbol(s) offset.

Zoom out to scale 50,000 and confirm that the objects now display as follows:

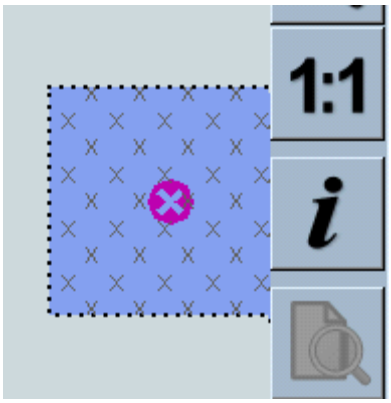


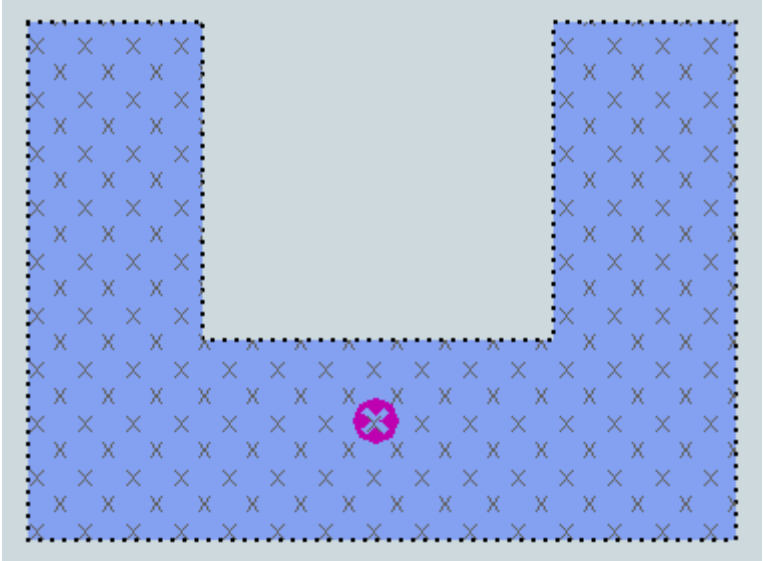
Note: the display should only show the arrow as above without the centred symbol(s) offset.

Test reference	3.6.10 c)	IHO reference	S-52 8.5.1
Test description			
Display of centred symbols which conflict with the own ship symbol.			
Set up			
As for test 3.6.10 a)			
Action			
Centre the display on position 32°32'.085S 61° 21.415E and then zoom in to a scale of 1:10,000. *Simulate own ship on position 32°32'.085S 61° 21.415E*			
Result			
Confirm that the objects display as in the image below:			



Note: the display should show own ship symbol centred with the arrow and restriction symbol(s) offset.

Test reference	3.6.10 d)	IHO reference	S-52 8.5.1
Test description			
Display of centred symbols when area is partially off screen.			
Set up			
As for test 3.6.10 a)			
Action			
Centre the display on position 32°32'.805S 61° 19.170E and then zoom in to a scale of 1:20,000.			
Result			
Confirm that the object displays as in the image below:  *Note: the display should show the centred symbol in the centre of the visible area.*			

Test reference	3.6.10 e)	IHO reference	S-52 8.5.1
Test description			
Display of centred symbols within complex areas.			
Set up			
As for test 3.6.10 a)			
Action			
Centre the display on position 32°30'.970S 61° 21.330E and then zoom in to a scale of 1:20,000.			
Result			
Confirm that the objects display as in the image below:  *Note: the display should show the centred symbol within the OBSTRN area. The display may be different from the example shown above as long as the centred symbol remains within the OBSTRN area.*			

3.7 Scale and navigation purpose

3.7.1 Display of overscale indication

Test reference	3.7.1 a)	IHO reference	S-52 10.1.10.1
Test description			
Display of overscale indication.			
Set up			
Load the cells from 2.1.1 Power Up\ENC_ROOT			
Action			
Zoom in beyond 1:25,000. This is the compilation scale of the harbour usage band cells.			
Result			
Confirm that an overscale indication is provided.			

Test reference	3.7.1 b)	IHO reference	S-52 10.1.10.2
Test description			
Display of overscale pattern.			
Set up			
Load the cells from 2.1.1 Power Up\ENC_ROOT			
Action			
Zoom in beyond 1:XXXXXX. This is the compilation scale of the harbour usage band cells.			
Result			
Confirm that the overscale pattern AP(OVERSC01) is displayed.			

3.7.2 Indication of larger scale data

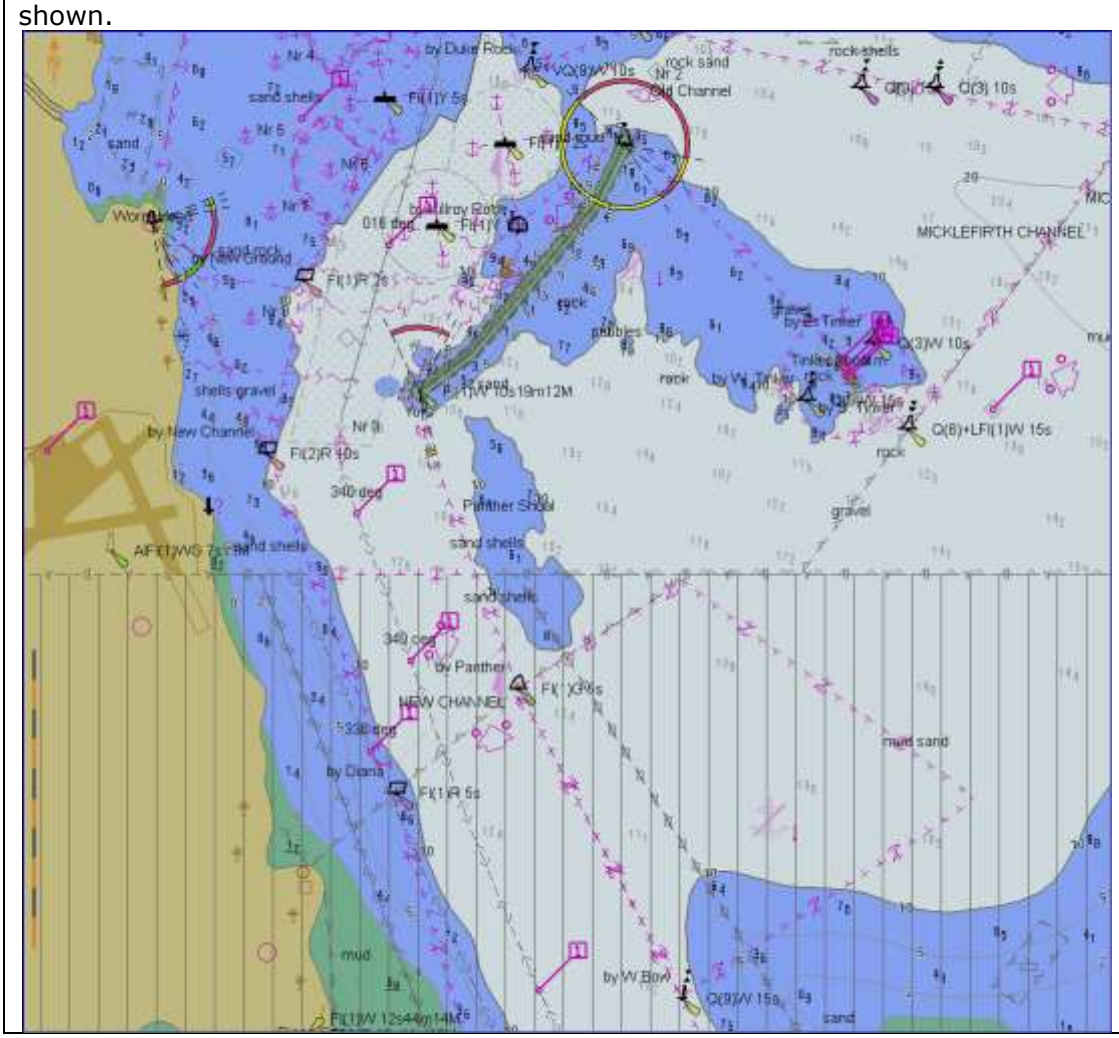
Test reference	3.7.2	IHO reference	S-52 10.1.10.3
Test description			
Indication of better (larger) scale data being available.			
Set up			
Load the following cells; *2.1.1 Power Up\ENC_ROOT\GB4X0000.000* *2.1.1 Power Up\ENC_ROOT\GB5X01NW.000* *Position the own ship at 32°29.668'S, 060°55.864'E with a heading of 234.0 degrees. The will place the ship at the jetty in Micklefirth.*			
Action			
Select the less detailed navigational purpose cell (GB4X0000.000). Observe this cell.			
Result			
Confirm that an indication is provided that more detailed navigational purpose data is available.			

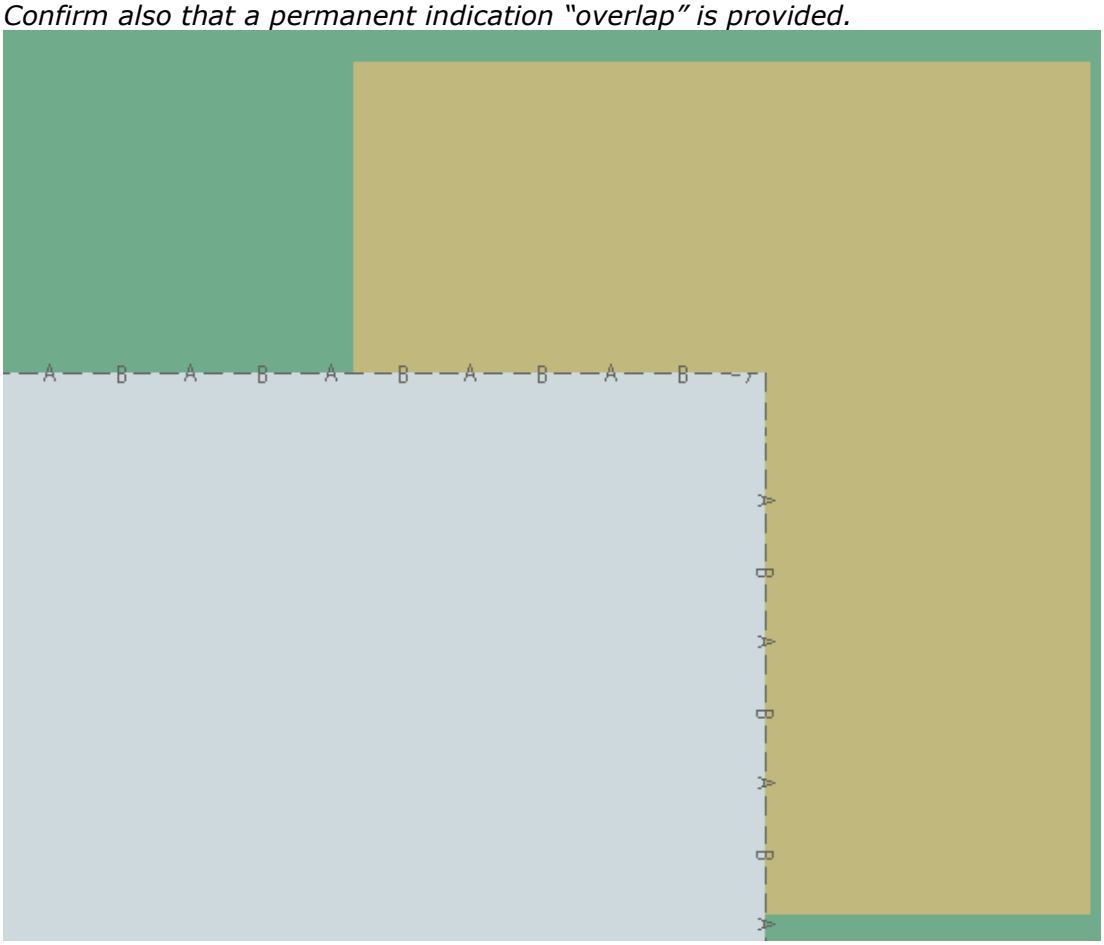
3.7.3 Boundaries between compliation scales

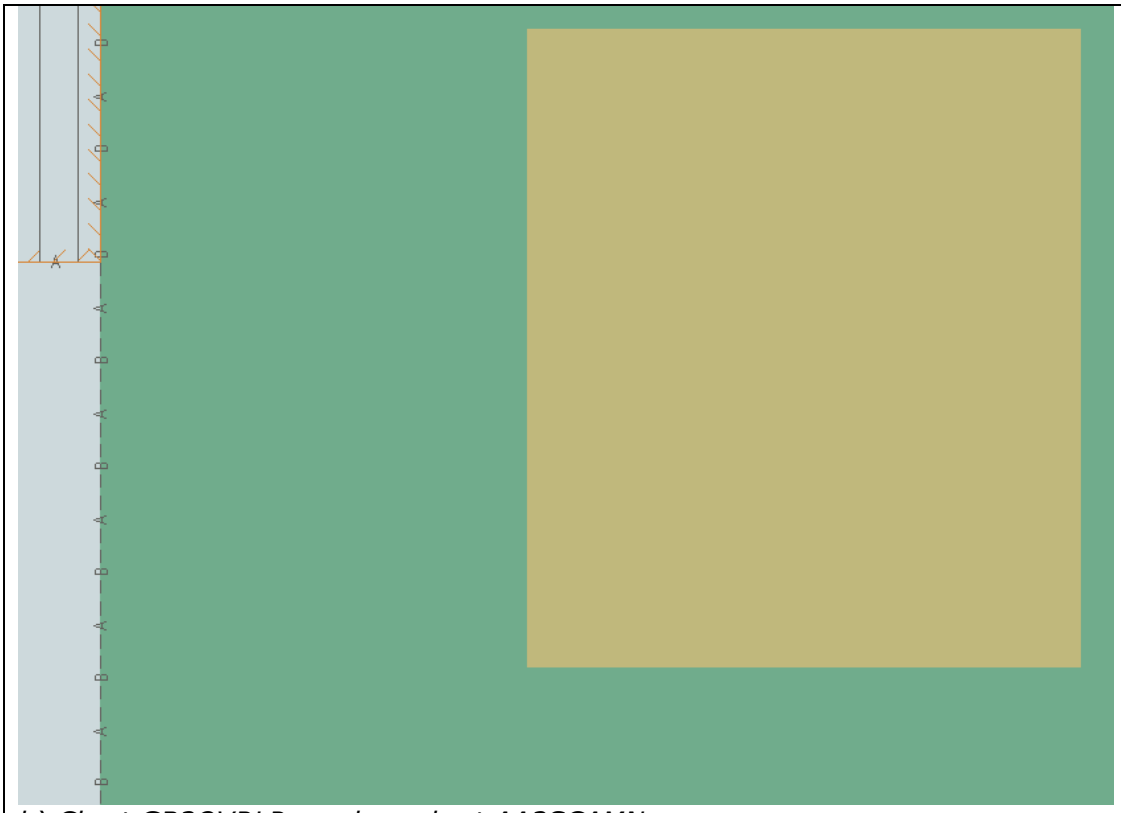
Test reference	3.7.3	IHO reference	S-52 10.1.9.1
Test description			
Boundaries between compilation scales.			
Set up			
Load the following cell; *2.1.1 Power Up\ENC_ROOT\GB4X0000.000*			
Action			
Centre the display on 32°21.010"S, 060°57.920"E and zoom to 1:45,000			

Result
Confirm that either the LS(SOLD,1,CHGRD) or LC(SCLBDY51) is shown for the diagonal limit across the cell. Also confirm that the overscale indication is provided.

3.7.4 Display of data from another navigational purpose

Test reference	3.7.4 a)	IHO reference	
Test description			
Display of data from a smaller scale navigational purpose to completely cover the display.			
Set up			
Load tall cells from 2.1.1 Power Up\ENC_ROOT Select Display mode = Other Select Safety Contour = 10 metres Select Safety Depth = 10 metres Select Symbolized Boundaries Select Paper chart symbols Deselect Accuracy			
Action			
Centre the display at 32°33’·000S 60°56’·000E Select scale 1:20 000 so that harbour detail (buoyage, lights) is shown.			
Result			
Confirm that south of 32°33’141S data from the smaller navigational purpose is shown. 			

Test reference	3.7.4 b)	IHO reference	S-52 10.1.3
Test description			
Display of overlapping data.			
Set up			
Load all cells from 3.7 Overlap\ENC_ROOT *Load all cells from 3.7.7 Scale minimum\ENC_ROOT* *Select Display mode = Other* *Select Safety Contour = 10 metres* *Select Safety Depth = 10 metres* *Select Symbolized Boundaries* *Select Paper chart symbols* *Deselect Accuracy* *Display cell GB3OVRLP at compilation scale (1:90 000)*			
Action			
Centre the display on position 32°23′·000S 60°40′·000E			
Result			
Confirm that only one cell is displayed in a given area. In this case displays as shown in a) or b) are acceptable. *Confirm also that a permanent indication "overlap" is provided.*  a) Chart AA3SCAMN overlaps chart GB3OVRLP			



b) Chart GB3OVRLP overlaps chart AA3SCAMN

".

3.7.5 Display of graphical index

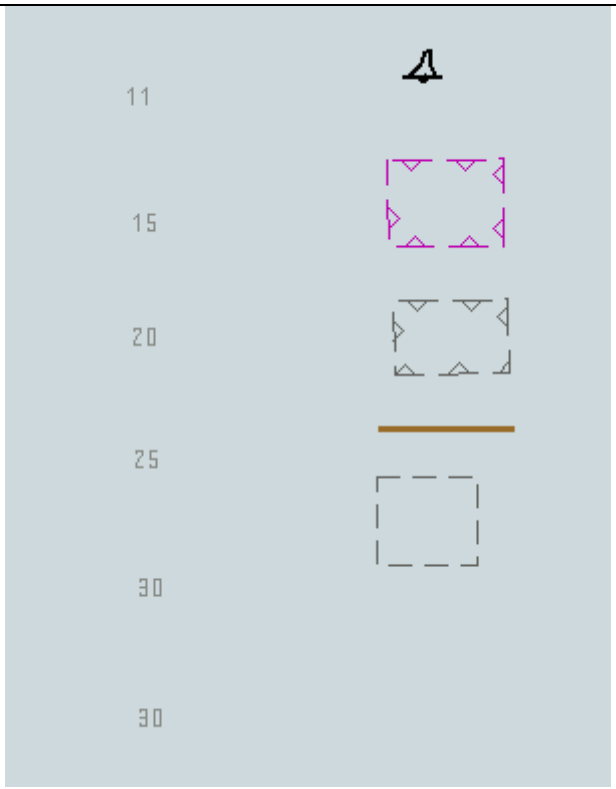
Test reference	3.7.5	IHO reference	S-52 10.1.7
Test description			
Display of graphical index of cell boundaries.			
Set up			
Load the cells from 2.1.1 Power Up\ENC_ROOT			
Action			
Navigate to a graphical index of cell boundaries.			
Result			
Confirm that a graphical index of the cell boundaries is displayed and access to the edition number and date of each cell is available.			

3.7.6 Change of display scale

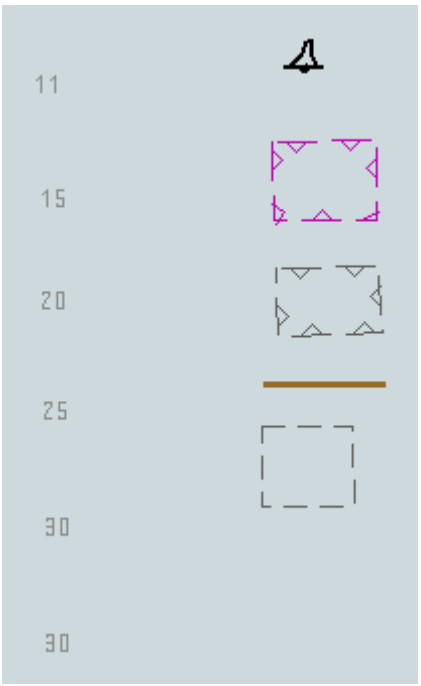
Test reference	3.7.6	IHO reference	-
Test description			
Change of display scale by chart scale values and by increments of displayed range values in nautical miles.			
Set up			
Load the cells from 2.1.1 Power Up\ENC_ROOT			
Action			
Change display scale by chart scale values and by increments of displayed range values in nautical miles.			
Result			
Confirm that the display changes accordingly.			

3.7.7 Impact of SCAMIN on display

Test reference	3.7.7	IHO reference	S-52 10.4.2 S-52 10.3.4.4
Test description			
Impact of SCAMIN values on display of charted objects.			
Set up			
Load the cell AA3SCAMN.000 from 3.7.7 Scale minimum\ENC_ROOT *Select Display mode = Other* *Select Safety Contour = 10 metres* *Select Safety Depth = 10 metres* *Select Symbolized Boundaries* *Select Paper chart symbols* *Deselect Accuracy* *Display cell AA3SCAMN at compilation scale (1:90 000)*			
Action			
1. Centre the display on position 32°24′·000S 60°20′·500E *2. Change scale to 1:100 000* *3. Change scale to 1:200 000* *4. Deselect Scamin*			
Result			
1.All objects shall be shown.			



2. All objects shall be shown



3.The objects with SCAMIN values of 119 000 and 179 999 shall not be shown.

2. All objects shall be shown

3.8 Additional Display Functions

3.8.1 Mariners' objects

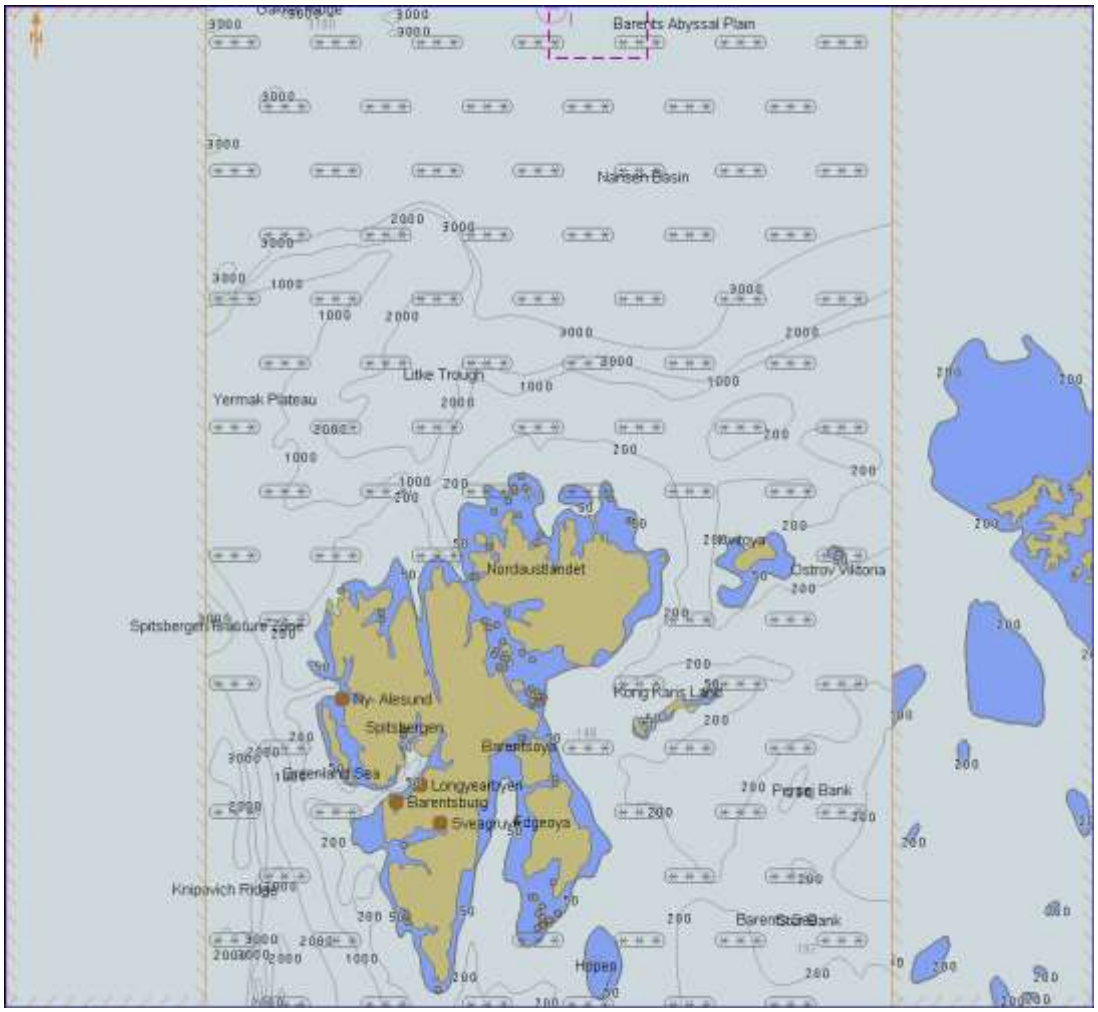
Test reference	3.8.1	IHO reference	S-52 Part II
Test description			
The display of Mariners' Features.			
Set up			
Load the following cell 2.1.1 Power Up\ENC_ROOT\GB4X0000.000			
Action			
1. Create a Mariners' object of type point. *2. Create 10 Mariners' object of type line.* *3. Create a Mariners' object of type area.* *4. Specify a fill style as described in S-52, appendix 2/2.3.1b for the created area object.* *5. Add 25 characters of text on a Mariner's object.*			
Result			
Check that all information added by the mariner (items 1-5) is distinguishable. Check that all of these objects can be added to the SENC. Recall them from the SENC and check that they may be deleted.			

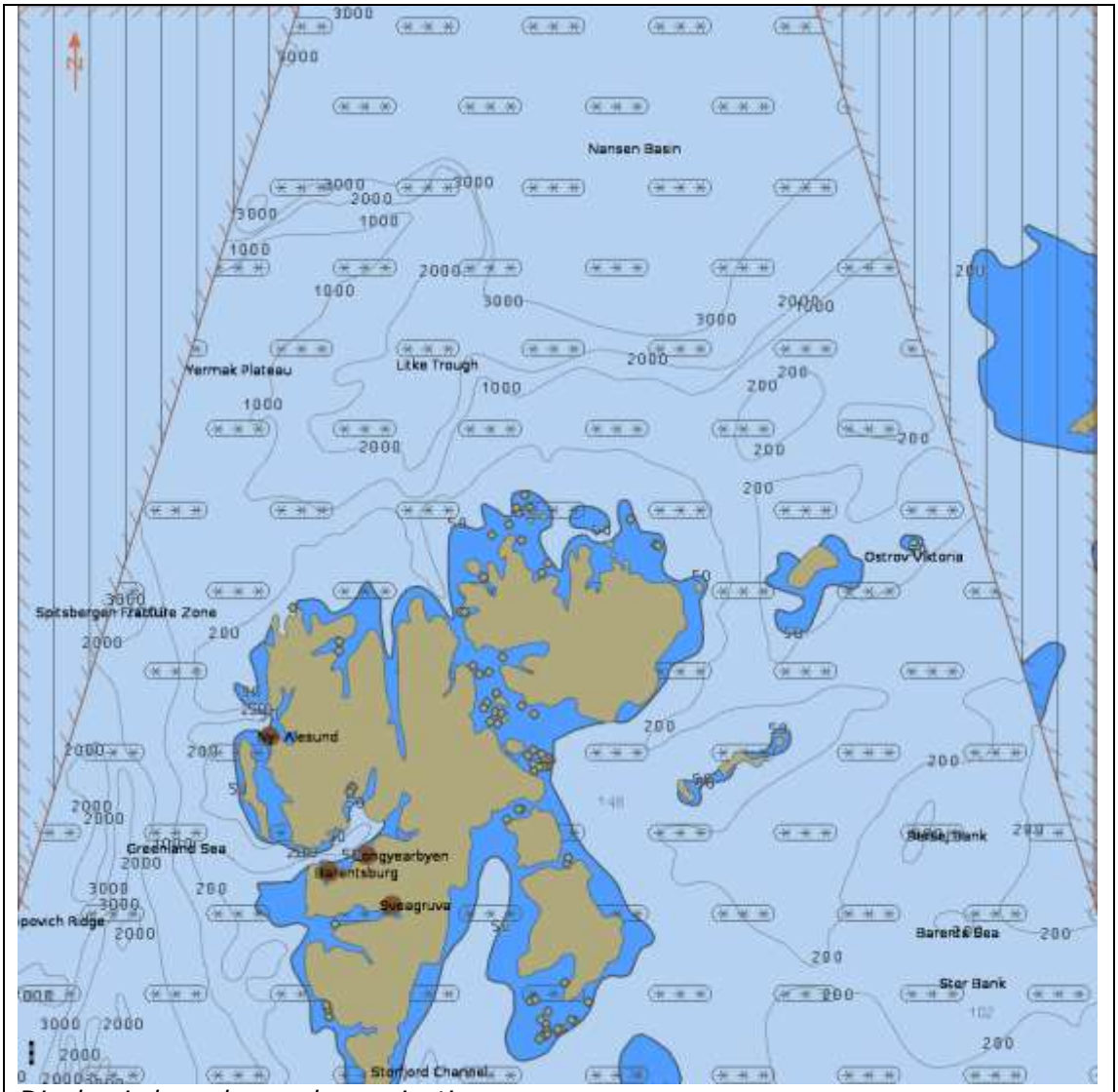
3.8.2 Adjustment of depth information by tidal height

Test reference	3.8.2	IHO reference	-
Test description			
Depth information is not affected by tidal height information.			
Set up			
Load the following cell 2.1.1 Power Up\ENC_ROOT\GB4X0000.000			
Action			
Confirm by analytical evaluation that depth information is not affected by tidal height.			
Result			
Depth information is not affected by tidal height.			

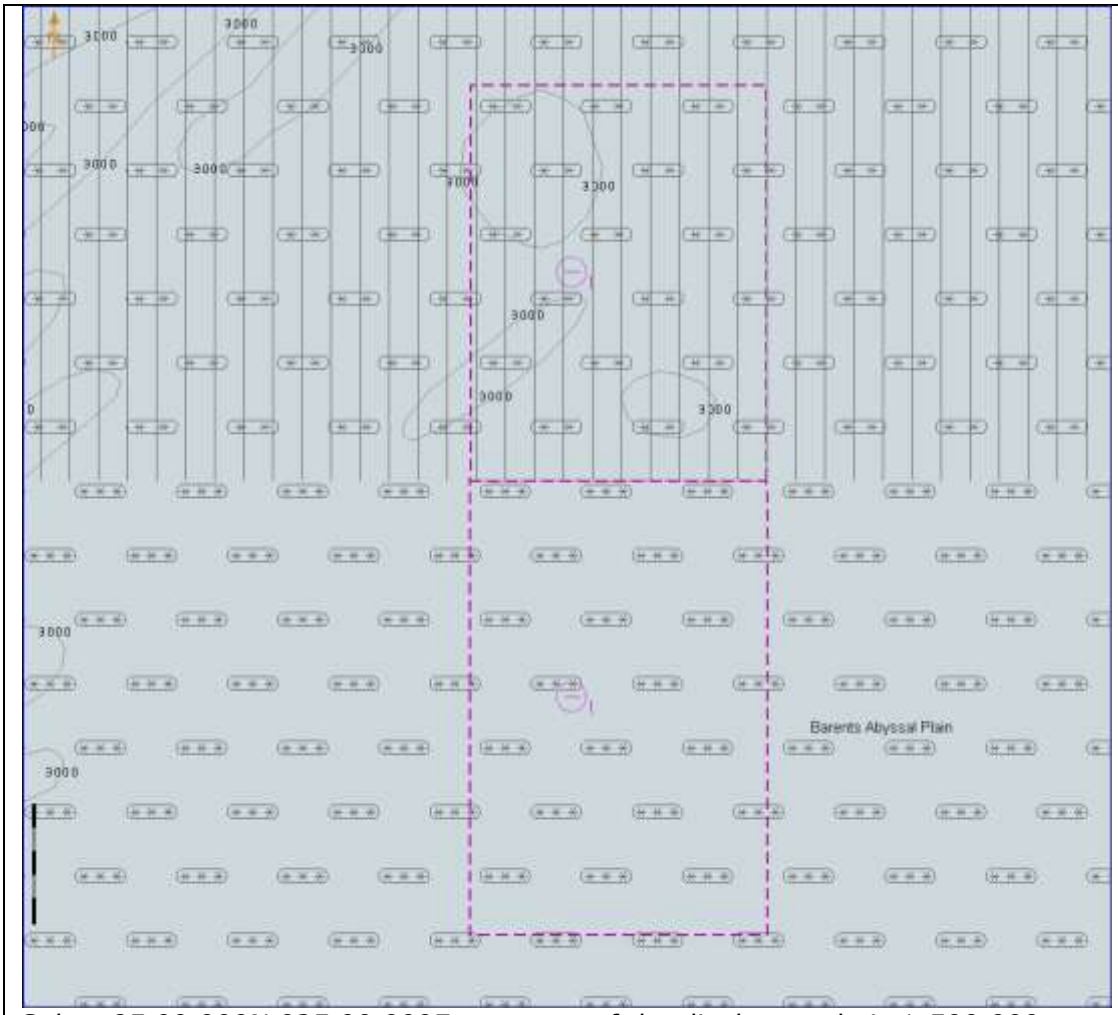
3.9 Display of ENC covering Polar Regions

3.9.1 Display of ENC Data up to 85 degrees

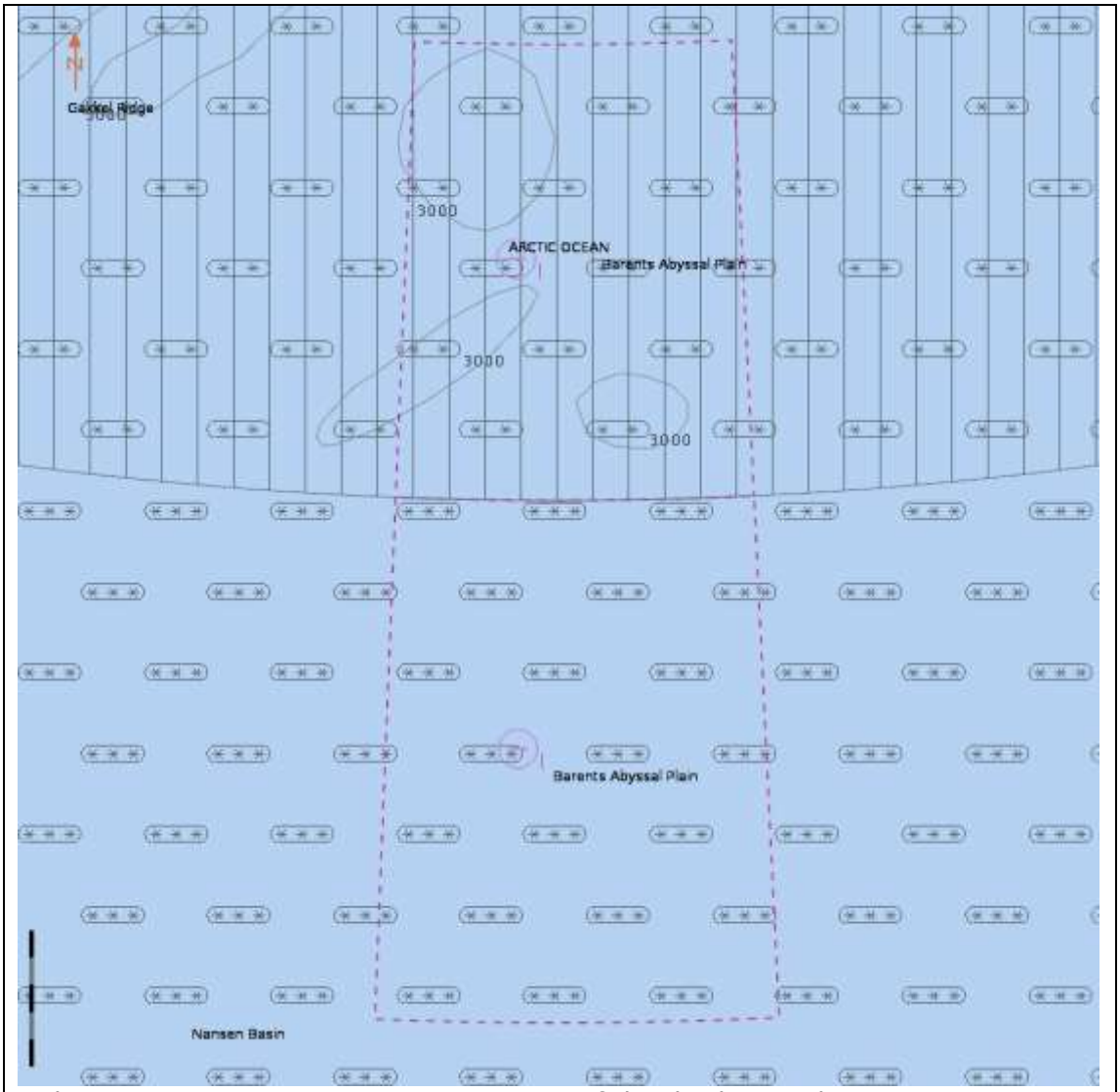
Test reference	3.9.1	IHO reference	S-52 10.1.10.2
Test description			
Display of charts up to 85 degrees.			
Set up			
Load the all cells from 3.9 Polar ENC Data *Select Display mode = Other* *Select Safety Contour = 30 metres* *Select Plain Boundaries* *Select Paper chart symbols*			
Action			
Select chart AA1NPOL3.000 at compilation scale (1:3 000 000) *Check ENC symbols shown in the ECDIS against the graphical plot.*			
Result			
The ENC in the ECDIS should be shown like in the picture below.  *Display is based on Mercator projection*			



Display is based on polar projection



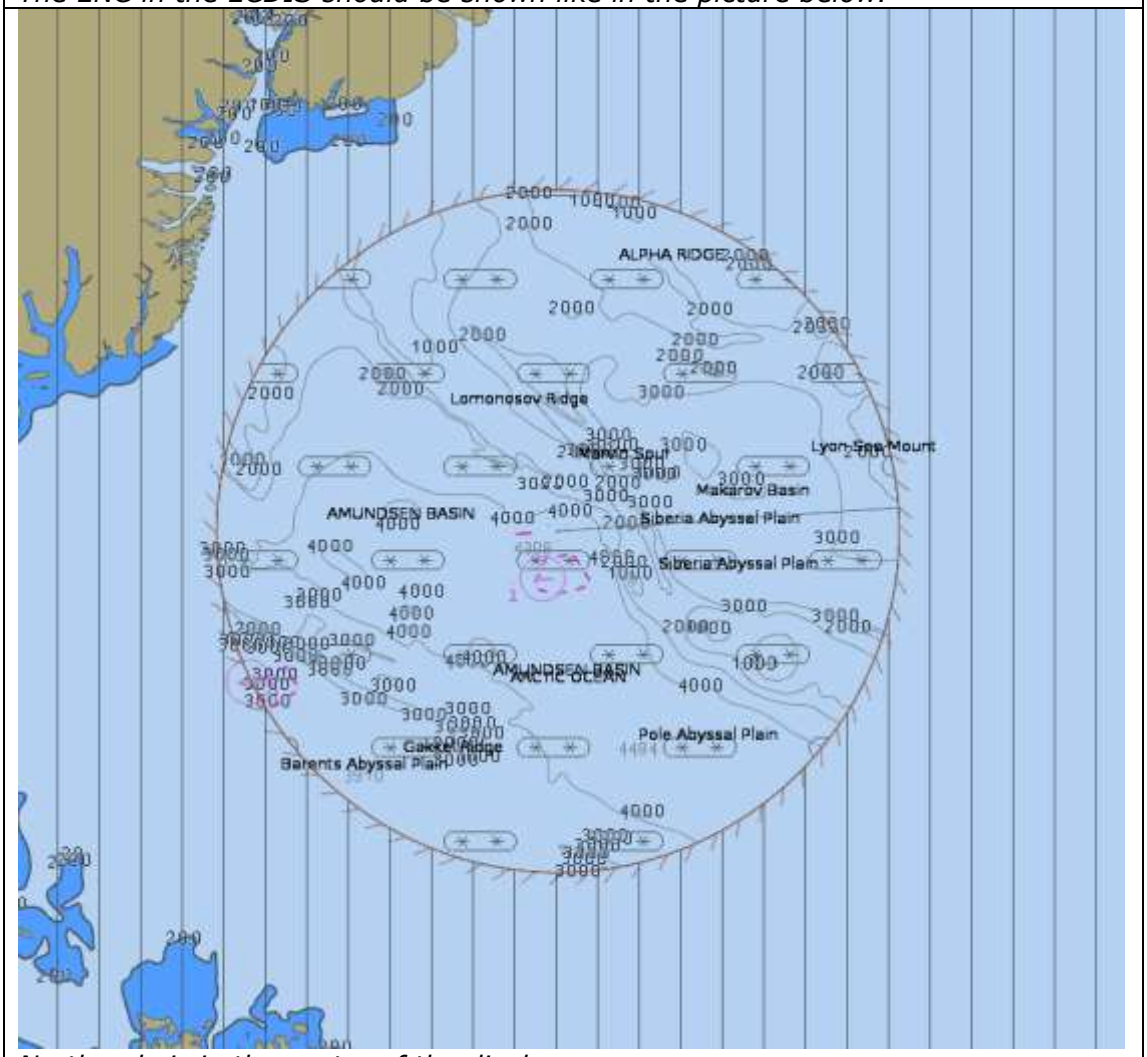
Select 85 00.000N 025 00.000E as centre of the display, scale is 1:500 000
Display is based on polar projection



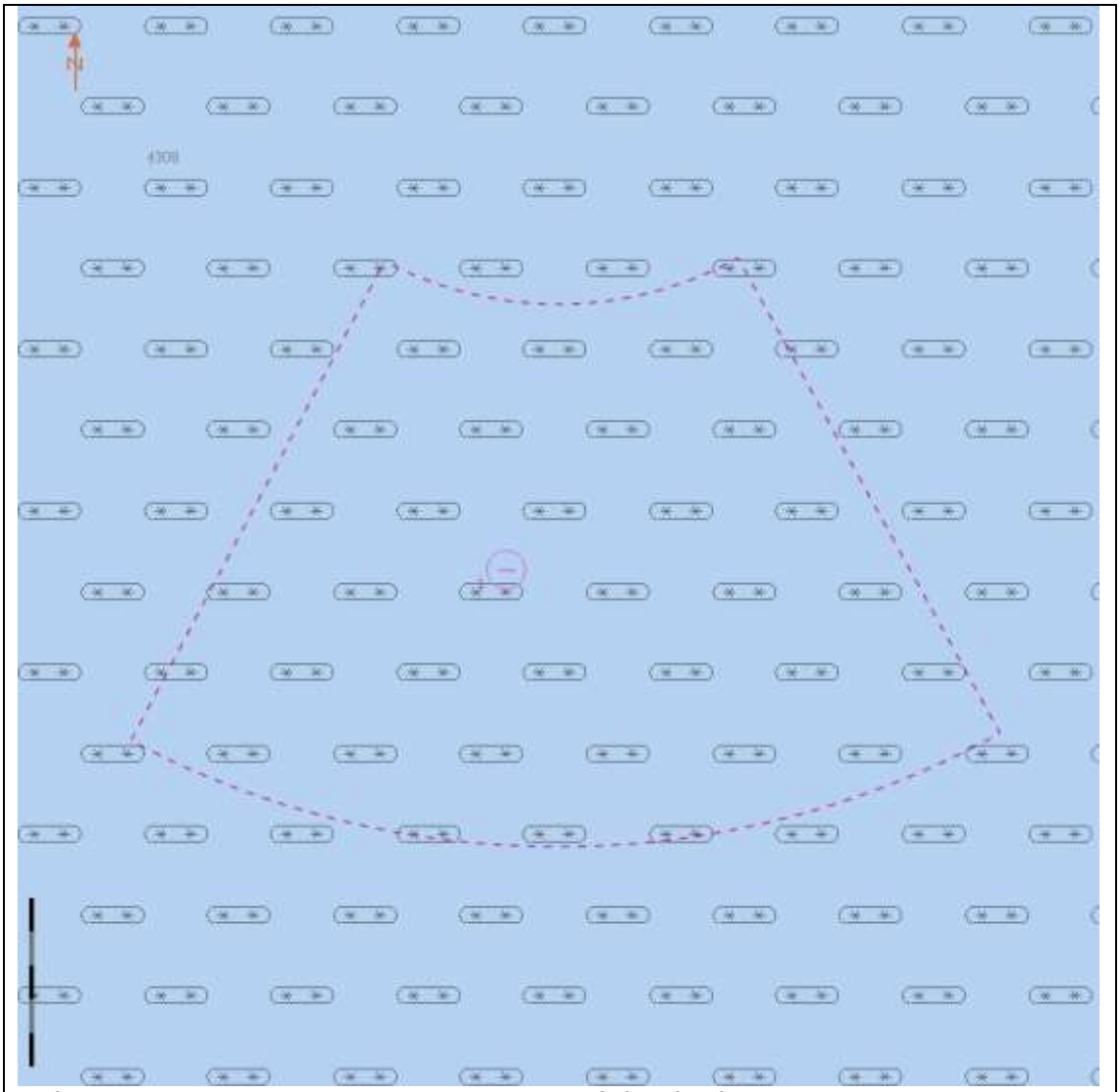
Select 85 00.000N 025 00.000E as centre of the display, scale is 1:500 000
Display is based on polar projection

3.9.2 Display of Data at Extreme High Latitudes

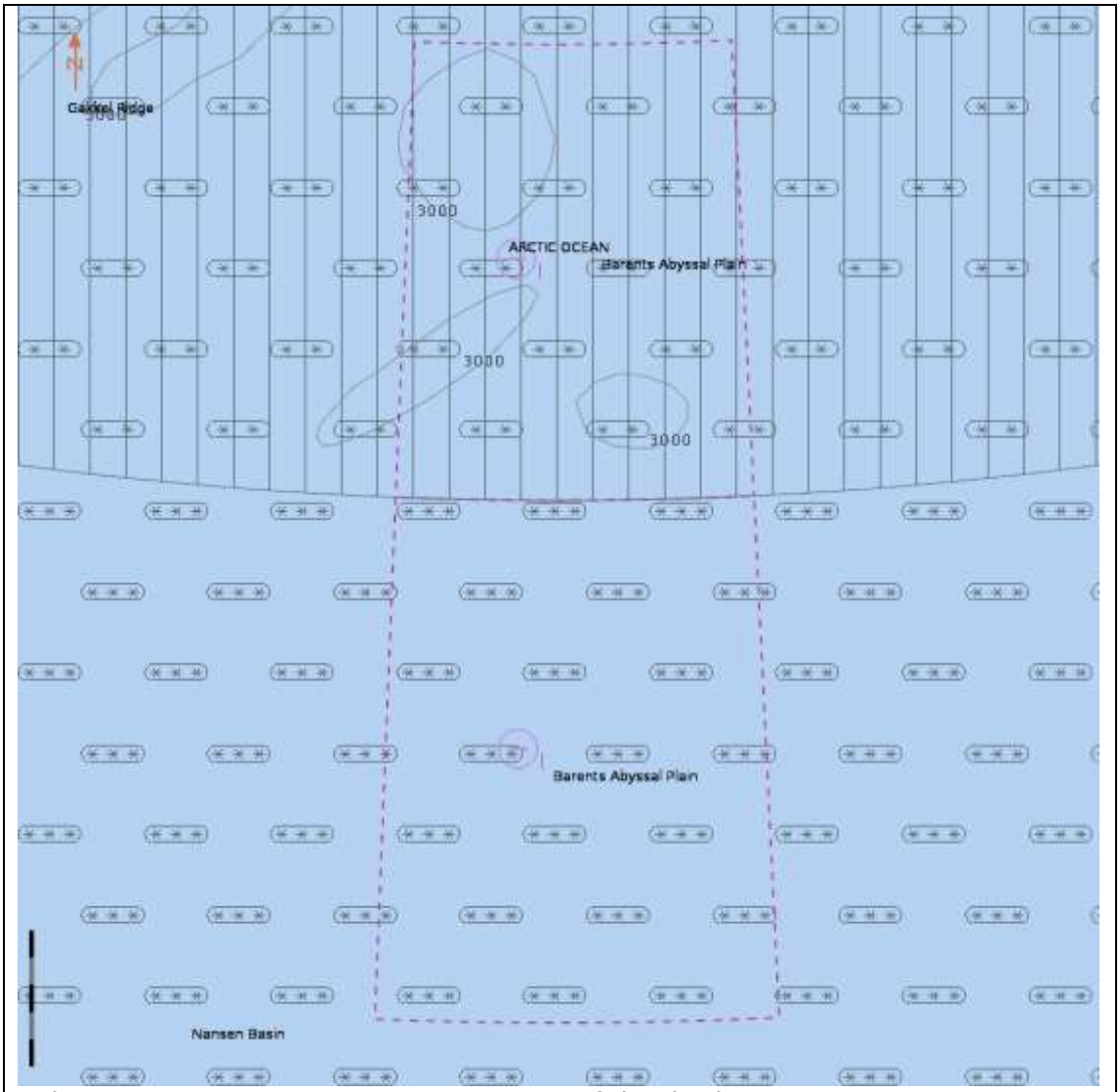
Test reference	3.9.2	IHO reference	S-52 10.1.10.2
Test description			
ONLY TO BE TESTED FOR EQUIPMENT CLAIMING THE CAPABILITY TO DISPLAY ENC DATA AT LATITUDES GREATER THAN 85 DEGREES *Display of charts above 85 degrees.*			
Set up			
Load the all cells from 3.9 Polar ENC Data Polar areas *Select Display mode = Other* *Select Safety Contour = 30 metres* *Select Plain Boundaries* *Select Paper chart symbols*			
Action			
Check ENC symbols shown in the ECDIS against the graphical plot.			
Result			
The ENC in the ECDIS should be shown like in the picture below.			



North pole is in the centre of the display



Select 89 22.000N 090 00.000E as centre of the display



Select 85 00.000N 025 00.000E as centre of the display

4.0 Chart related functions

4.1 Mode and orientation

Test reference	4.1 a)	IHO reference	S-52 10.5.4
Test description			
Display of the north arrow symbol.			
Set up			
Load the following cell 2.1.1 Power Up\ENC_ROOT\GB4X0000.000			
Action			
Observe the display. *If the EUT offers the capability to show other than north-up presentation;* *Change the presentation to non-north up and observe the display.*			
Result			
Confirm that the north arrow symbol is always displayed at the top left corner of the chart area, not overlapping the scale or latitude bar. If the EUT supports changing to non-north up presentations confirm that the symbol realigns to north.			

Test reference	4.1 b)	IHO reference	S-52 2.2.3
Test description			
True motion operation.			
Set up			
As for test 4.1 a)			
Action			
Ensure that true motion is provided. *Reset the display and check that the generation of the neighbouring area takes place automatically at a distance selected by the mariner.*			
Result			
Confirm that true motion operation is provided and that the generation of the neighbouring area takes place automatically at a distance selected by the mariner.			

Test reference	4.1 c)	IHO reference	-
Test description			
Manual adjustment of chart display area and own ship position.			
Set up			
As for test 4.1 a)			
Action			
Manually adjust the chart display area. *Change the position of own ship relative to the edge of the display.*			
Result			
Confirm that it is possible to change manually the chart area and the position of own ship relative to the edge of the display.			

Test reference	4.1 d)	IHO reference	S-52 10.1.8
Test description			
No ENC data available.			
Set up			
As for test 4.1 a) *Ship position as follows; 32°24.53'S 061°19.29'E (within ENC data coverage (M_COVR) where CATCOV=2 (no coverage available).*			
Action			
Observe the display.			

Result
Confirm that a "No ENC available" indication is provided.

Test reference	4.1 e)	IHO reference	S-52 10.1.8
Test description			
No ENC data available.			
Set up			
As for test 4.1 a) *Ship position as follows; 32°27.88'S 061°20.66'E (an area with no ENC)*			
Action			
Observe the display.			
Result			
Confirm that a "No ENC available" indication is provided.			

Test reference	4.1 f)	IHO reference	S-52 [3.1.6]
Test description			
Display in non 'north-up' orientation.			
Set up			
As for test 4.1 a)			
Action			
For each bearing-stabilised orientation other than 'north-up' that may be provided, confirm by analytical evaluation that for turning rates between 0 deg/s and 20 deg/s the displayed chart symbols and text do not re-orient more often than 2 times per second and remain legible if they do not remain fixed.			
Result			
Confirm that the displayed chart symbols and text do not re-orient more often than 2 times per second and remain legible. The symbols and text may remain fixed and in this case will not re-orientate.			

4.2 Display of scale bar

Test reference	4.2	IHO reference	S-52 10.5.1
Test description			
Display of scale bar at appropriate scales.			
Set up			
Load the cells from 2.1.1 Power Up\ENC_ROOT *Set display mode to BASE.*			
Action			
Zoom to a display scale greater than 1:80,000 (such as 1:25,000), observe the display.			
Result			
Confirm that a scale bar is displayed. Also confirm that the scale bar is displayed between 2mm and 4mm from the left side of the chart display area.			

4.3 Display of latitude bar

Test reference	4.3	IHO reference	S-52 10.5.1
Test description			
Display of latitude bar at appropriate scales.			
Set up			
Load the cells from 2.1.1 Power Up\ENC_ROOT *Set display mode to BASE.*			
Action			
Zoom to a display scale less than 1:80,000 (such as 1:300,000), observe the display.			
Result			
Confirm that a latitude bar is displayed. Also confirm that the scale bar is displayed between 2mm and 4mm from the left side of the chart display area.			

4.4 Object information

Test reference	4.4 a)	IHO reference	S-52 [2.3.1e] & 10.8
Test description			
General rules for cursor pick report			
Set up			
As for test 4.3			
Action			
1. Select several objects of *- depth area;* *- restricted area;* *- sea area;* *- depth contour;* *- ferry route;* *- recommended track;* *- buoy (e.g. buoy and light at 32°29.50″S 061°00.46″E);* *- light;* *- wreck.* *2. Observe object information* 3. *Remove object information from display.*			
Result			
1. The following rules shall be applied to the pick report: *a. Full S-57 Object and Attribute names shall be displayed.* *b. Enumerate value names shall be displayed. Enumerate attribute numbers should not be displayed.* *c. There shall not be any padding of attribute values, e.g. a height of 10 metres shall not be padded to 10.000000 metres as this could potentially confuse or mislead the Mariner.* *d. Units of measure shall be included after all attribute values which are weights or measures.* *e. S-57 category "C" feature attributes shall not be displayed unless requested by the user. Attributes in this subset provide administrative information about an object and the data describing it. In most cases it is of no practical use to the Mariner. This information is only relevant to S-57 data transferred between Hydrographic Offices.* *An exception to show the value of SORDAT if it is for the following objects:* *- WRECKS, OBSTRN, UWTROC, and SOUNDG with value QUASOU= 9 and geometry attribute QUAPOS=8;* *- DRGARE with QUASOU=11;* *- SWPARE;*			

- Any object class with attribute CONDTN=1or 3 or 5. *f. Dates shall be given in the form "Day Month Year" DD-MMM-YYYY. (JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC)* *g. The pick report shall only return information about the objects present on the ECDIS display. This means all objects in the viewing layers enabled even if those objects have no resultant display. For example the meta object M_SREL has no display but should be detailed in the pick report.* *h. Cursor enquiry shall extend to the spatial object, which carries accuracy attributes QUAPOS and POSACC. It shall include collection objects which carry additional information for example the OBJNAM of traffic separation systems, navigation lines (NAVLNE, RECTRC, DWRTCL, etc.).* *2. Text associated with chart objects must be removed from the display.*

Test reference	4.4 b)	IHO reference	S-52 10.8.1, 10.8.2 & 10.8.4
Test description			
Pick report descriptions and sorting			
Set up			
As for test 4.4 a)			
Action			
Select several objects as mentioned in 4.4a)			
Result			
1. A plain language explanation of each symbol shall be used as included in the Symbol Library and in the Presentation Library section 17 to provide quick and understandable information which is not always obvious from the object class and attribute information. *2. Attribute values provided in addition to the above explanation shall be connected to their meaning, and the definitions shall also be available.* *3. The object information shall be sorted by the drawing priority of the object as defined in the look-up table for symbolizing. When the drawing priority of objects is equal, the geometric primitive shall be used to order the information (points followed by lines and finally areas).* *4. Check that the content displayed in the pick report is configurable by the user.*			

Test reference	4.4 c)	IHO reference	S-52 10.8.3
Test description			
User defined cursor pick parameters			
Set up			
As for test 4.4 a)			
Action			
1. Configure the cursor pick parameter as available. *2. Select several objects as mentioned in 4.4a)*			
Result			
1. The cursor pick parameters shall be configurable by the user and available for presentation. *2. The content of the pick report shall be presented as configured.*			

Test reference	4.4 d)	IHO reference	S-52 10.8.5

Test description

Hover-over function for object information (optional)
Test shall only be performed if a hover-over function for object information is provided.

Set up

As for test 4.4 a)

Action

1. Configure the hover-over function OFF.
2. Move cursor to one of the following objects and to objects where additional information is available or date dependant objects:

Features	**S-57 Acronym**
Lights	*LIGHTS*
Beacon, cardinal	*BCNCAR*
Beacon, isolated danger	*BCNISD*
Beacon, lateral	*BCNLAT*
Beacon, safe water	*BCNSAW*
Beacon, special purpose/general	*BCNSPP*
Buoy, cardinal	*BOYCAR*
Buoy, installation	*BOYINB*
Buoy, isolated danger	*BOYISD*
Buoy, lateral	*BOYLAT*
Buoy, safe water	*BOYSAW*
Buoy, special purpose/general	*BOYSPP*
Landmarks	*LNDMRK*

3. Configure the hover-over function ON.
4. Move cursor to one of the objects mentioned in 2.
5. Move cursor to any other objects.

Result

1. It shall be possible to switch OFF the hover-over function.
2. There shall be no information of chart objects displayed when hovering over it.
3. It shall be possible to switch OFF the hover-over function.
4. Important information of chart objects shall be displayed when hovering over it.
5. When hovering over other chart objects no information shall be displayed.

Test reference	4.4 e)	IHO reference	S-52 10.8.6

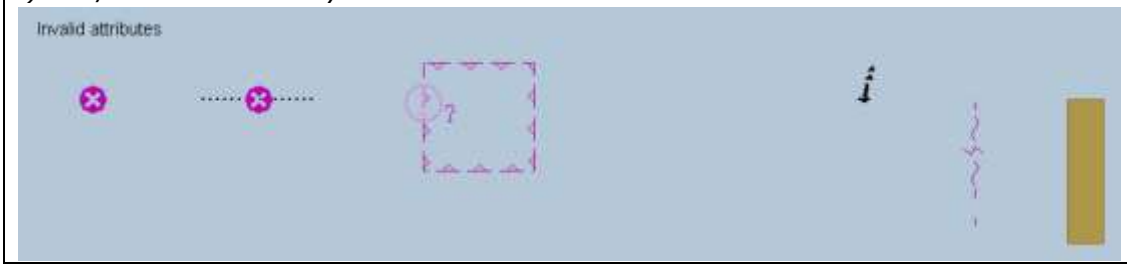
Test description

Presentation of unknown attributes
There is no generic special presentation for unknown attributes. Some presentations may indicate question mark, but that is because something mandatory is missing for the object. The main purpose of this test is to check that ECDIS is able to accept ENC cells which contain unknown attributes. The real use case is when ECDIS is not upgraded for latest IHO standard and therefore the ECDIS does not understand all attributes.

Set up

Load cell AA3INVOB.000 from 3.2 Invalid Object\ENC_ROOT
Select Viewing group layer Other
Set the safety contour value to 0 m
Select Symbolized Boundaries
Select Paper chart symbols
Deselect Highlight info

Action

Select chart objects with unknown attribute for cursor pick report.
Result
Check ENC symbols shown in the ECDIS against the corresponding graphical plot. *Select one by one each of 6 objects for cursor pick report.* *The result of cursor pick shall be* *a) Wreck with attribute Water level effect (covers and uncovers)* *b) Obstruction with attribute Value of sounding (no value)* *c) Restricted area without any attribute* *d) Buoy, cardinal with attributes Buoy shape (spar (spindle)), Category of cardinal mark (north cardinal mark) and Color pattern (horizontal stripes)* *e) Cable, submarine without any attribute* *f) Silo/Tank without any attribute* 

Test reference	4.4 f)	IHO reference	S-52 10.9
Test description			
Display of tidal stream panels			
Set up			
Load all cells from *2.1.1 Power Up\ENC_ROOT*			
Action			
1. Select an example of TS_PAD (tidal stream panel information) *1a. select tidal stream panel information object at 32°31.45‟S 60°56.35‟E for display;* *2. Select an example of TS_PRH (tidal stream prediction by harmonic methods)* *2a. select tidal stream prediction by harmonic methods object at 32°32.57‟S 60° 57.69‟E for display;* *3. Repeat step 1 and 2 for different light conditions (DAY, DUSK, NIGHT).*			
Result			

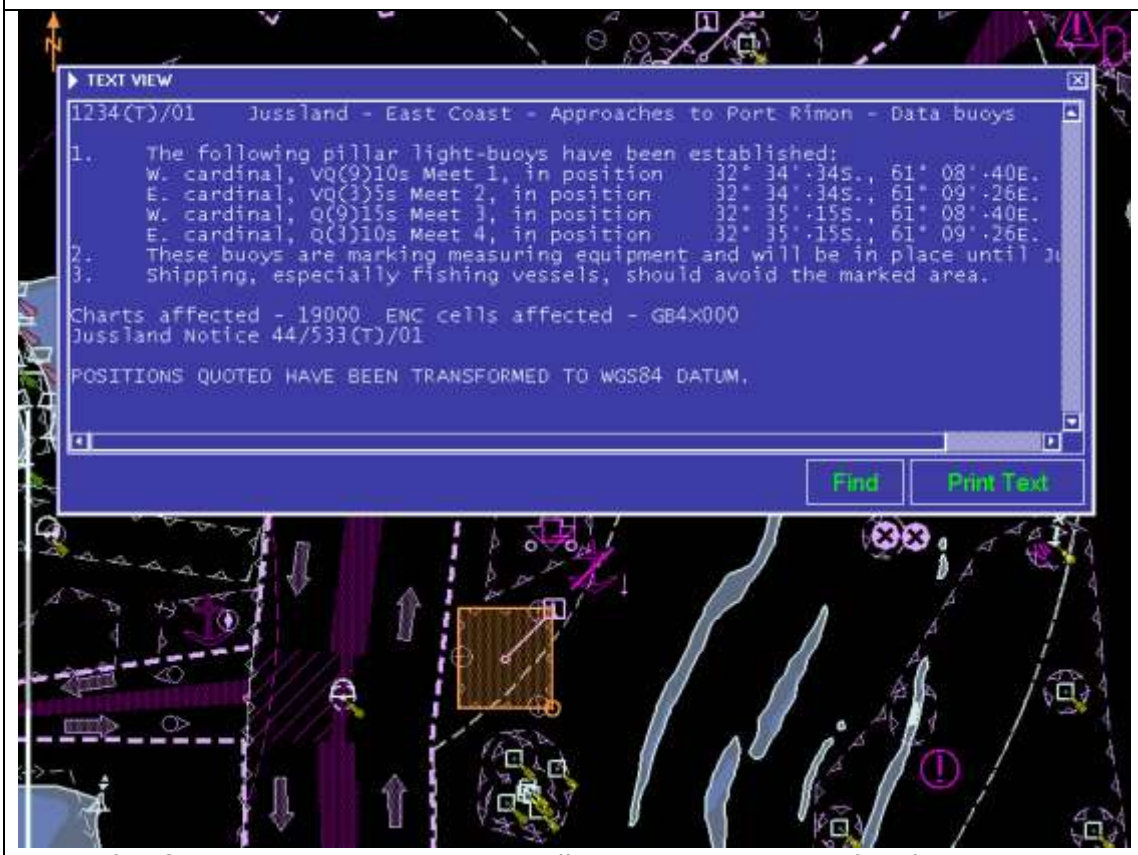
1a. The data must be displayed in a way that it can be easily read and is logically presented, in a format as follows:

Tidal Station: xxxxxxx			
Tidal Station Identifier: yyyyyyyy			
	Hours	*Direction of stream (degrees)*	*Rates at spring tide (knots)*
Before	*-6*	*xxx*	*xxx*
	-5	*xxx*	*xxx*
	-4	*xxx*	*xxx*
	-3	*xxx*	*xxx*
	-2	*xxx*	*xxx*
	-1	*xxx*	*xxx*
HW/LW	*0*	*xxx*	*xxx*
After	*+1*	*xxx*	*xxx*
	+2	*xxx*	*xxx*
	+3	*xxx*	*xxx*
	+4	*xxx*	*xxx*
	+5	*xxx*	*xxx*
	+6	*xxx*	*xxx*

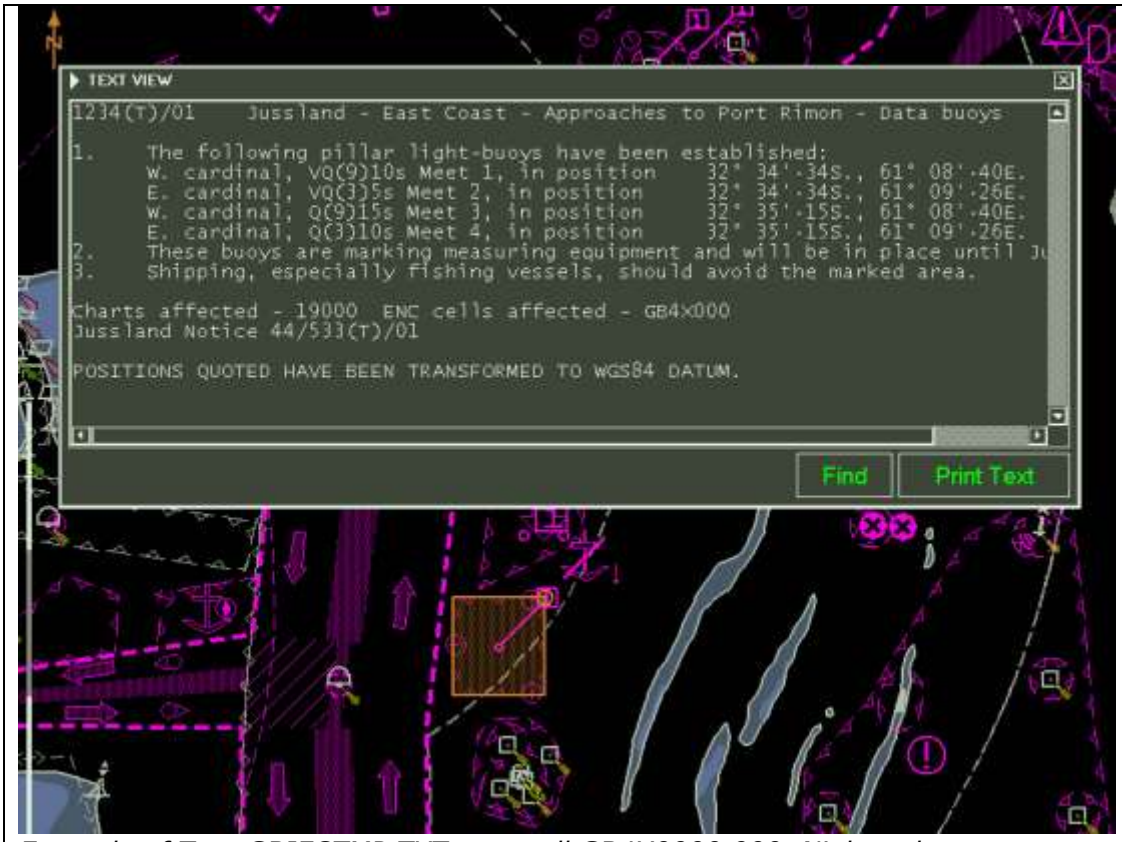
2a. The data must be displayed in a way that it can be easily read and is logically presented, for example by displaying the data as it might appear on a paper chart; 3. The data must be displayed as appropriate for the selected light condition (DAY, DUSK, NIGHT).

Test reference	4.4 g)	IHO reference	S-52 [3.2.3] & 10.6.1.1
Test description			
Display of text description			
Set up			
As for test 4.4 a)			
Action			
1. Select an example of a note encoded using TXTDSC (text description) (e.g. caution area at approximately, 32°34.74′S 061°08.92′E); *2. Repeat step 1 for different light conditions (DAY, DUSK, NIGHT).*			
Result			
1. The note must be displayed within the light level of the current display and that it can be easily read, for example by displaying the note as it might appear on a paper chart (e.g. content of GBIECTMP.TXT file as contained in the directory of loaded ENCs). *2. The note must be displayed as appropriate for the selected light condition (DAY, DUSK, NIGHT).*			

Example of Text GBIECTMP.TXT over cell GB4X0000.000, Day palette

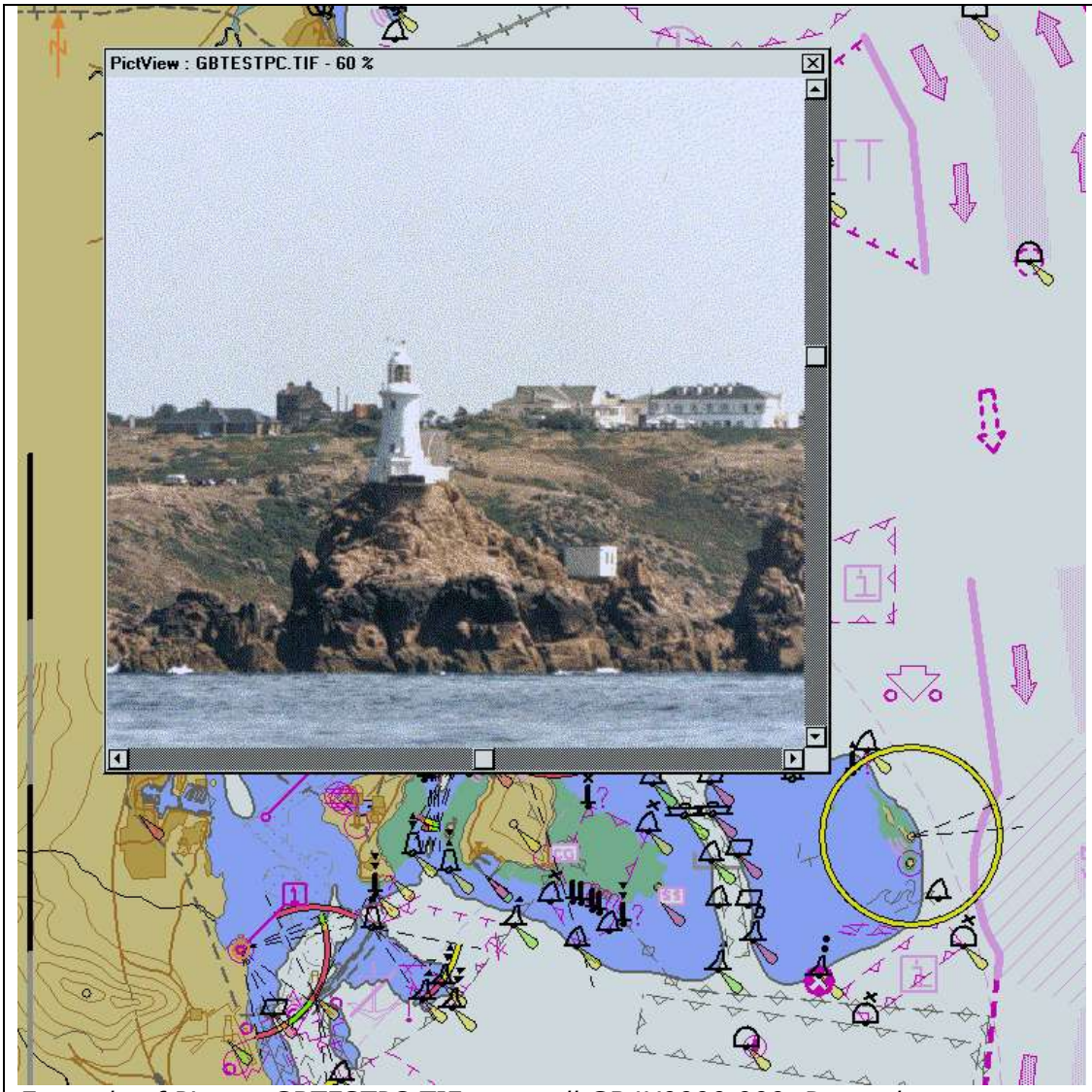


Example of Text GBIECTMP.TXT over cell GB4X0000.000, Dusk palette

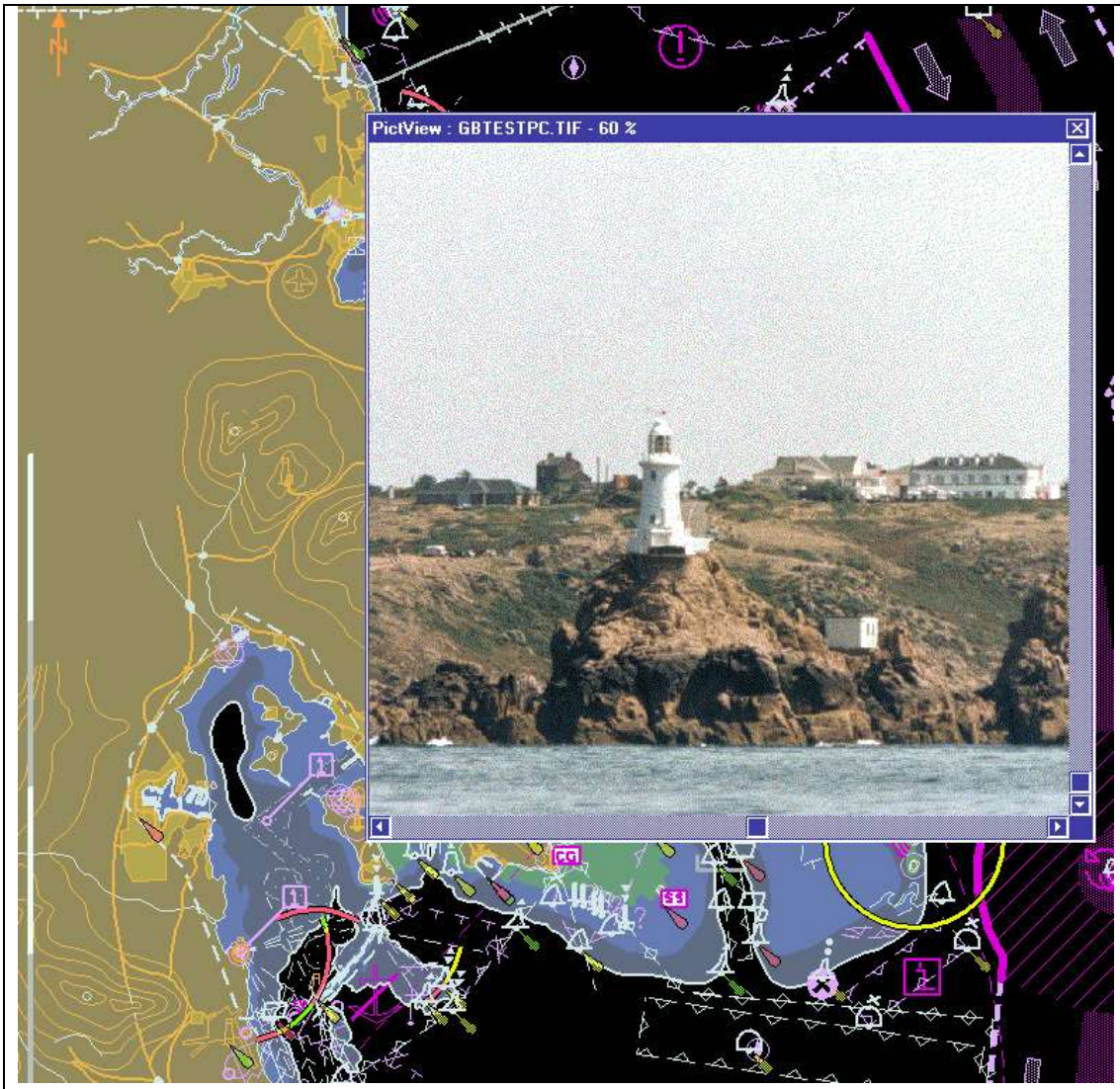


Example of Text GBIECTMP.TXT over cell GB4X0000.000, Night palette

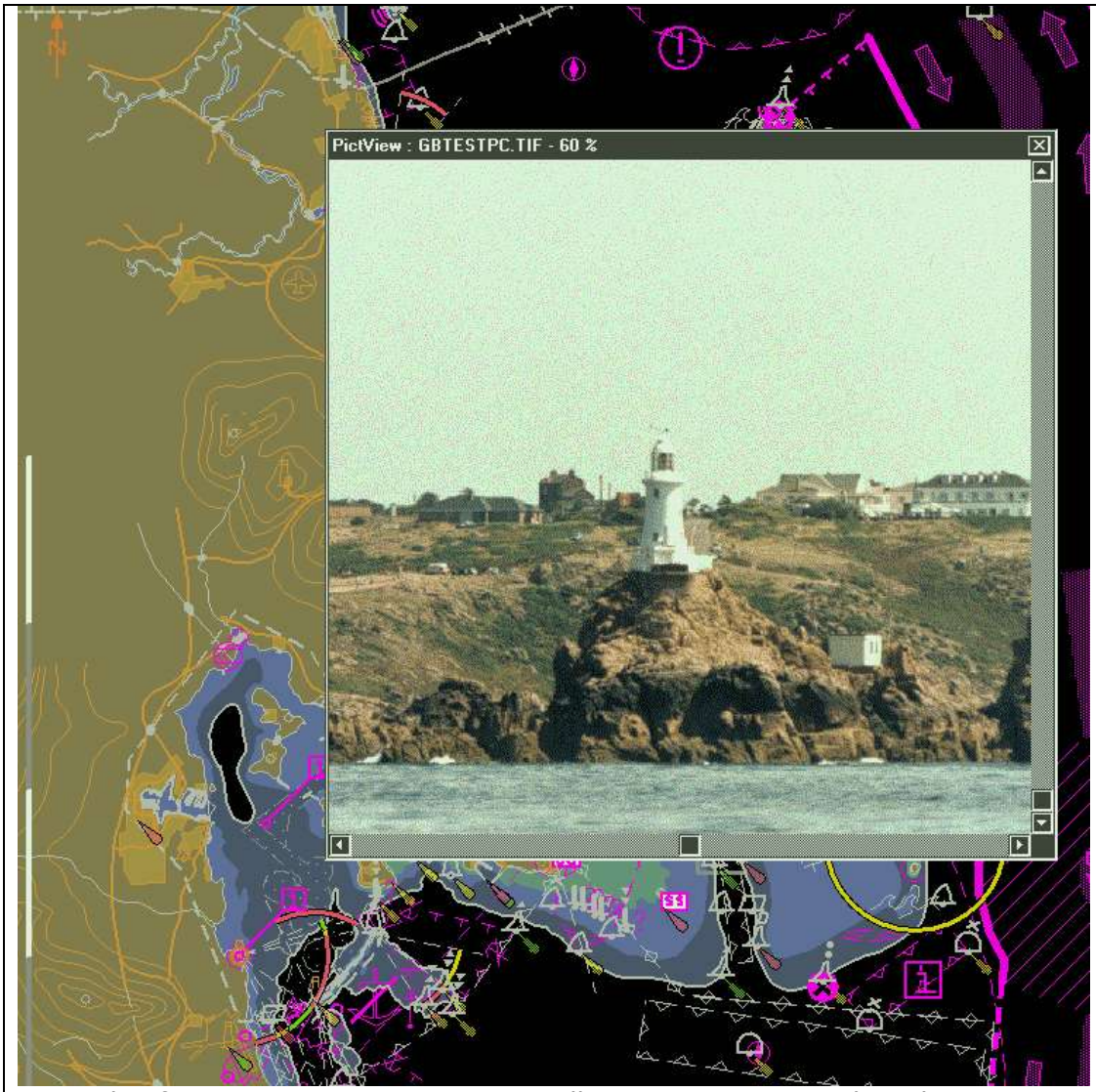
Test reference	4.4 h)	IHO reference	S-52 [3.2.3] & 10.6.1.1
Test description			
Display of picture representation			
Set up			
As for test 4.4 a)			
Action			
1. Select an example of PICREP (picture representation) *1a. select landmark object at 32°31.95‟S 60°54.34‟E and select picture representation for display;* *1b. select area object of 32°30.25‟S 60°54.64‟E with nautical publication (M_NPUB) and select picture representation for display;* *2. Repeat step 1a and b for different light conditions (DAY, DUSK, NIGHT).*			
Result			
1a. The picture GBTESTPC.TIF must be displayed; *1b. The picture GBX4000T.TIF must be displayed;* *2. The pictures must be displayed as appropriate for the selected light condition (DAY, DUSK, NIGHT). It shall not affect the user's night vision.*			



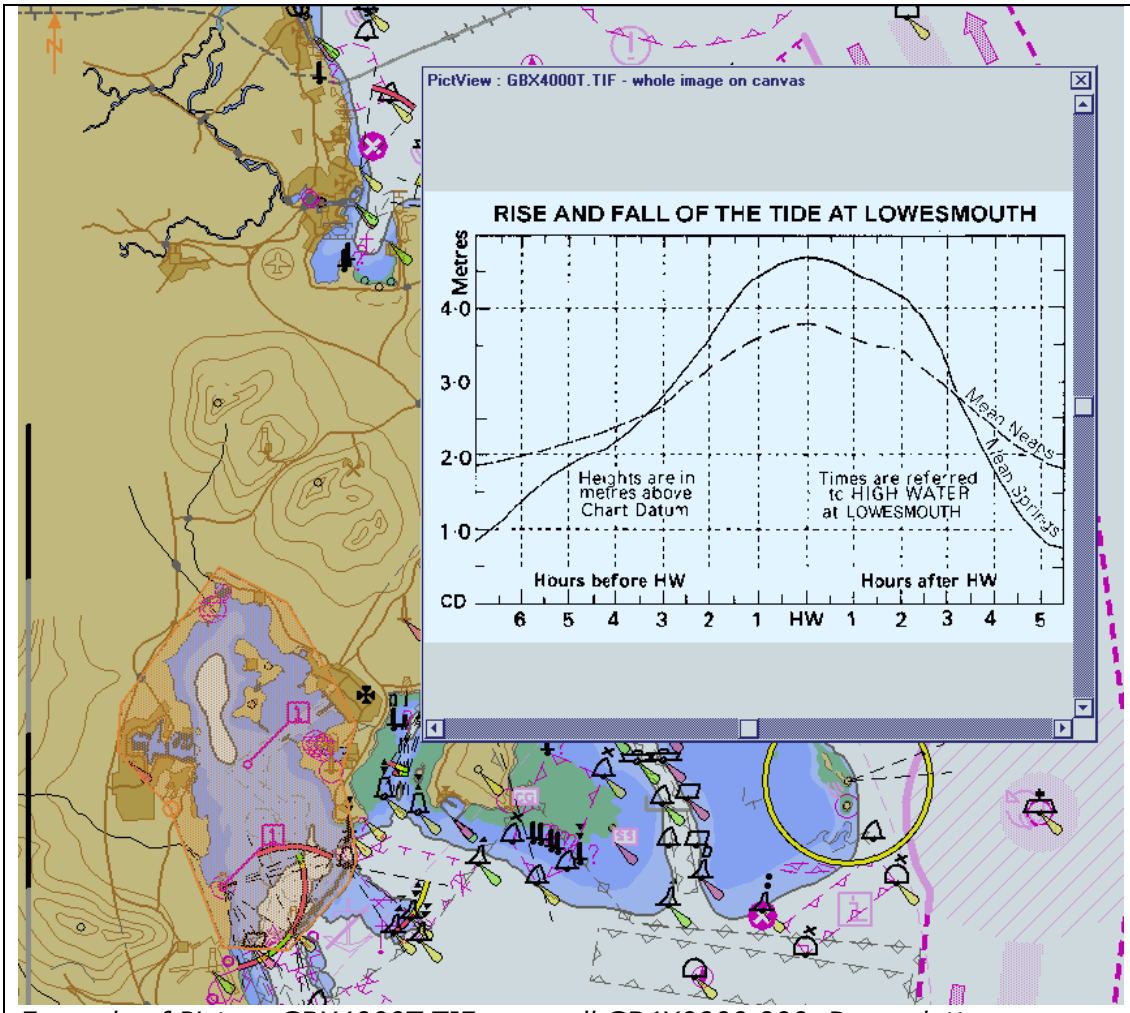
Example of Picture GBTESTPC.TIF over cell GB4X0000.000, Day palette



Example of Picture GBTESTPC.TIF over cell GB4X0000.000, Dusk palette



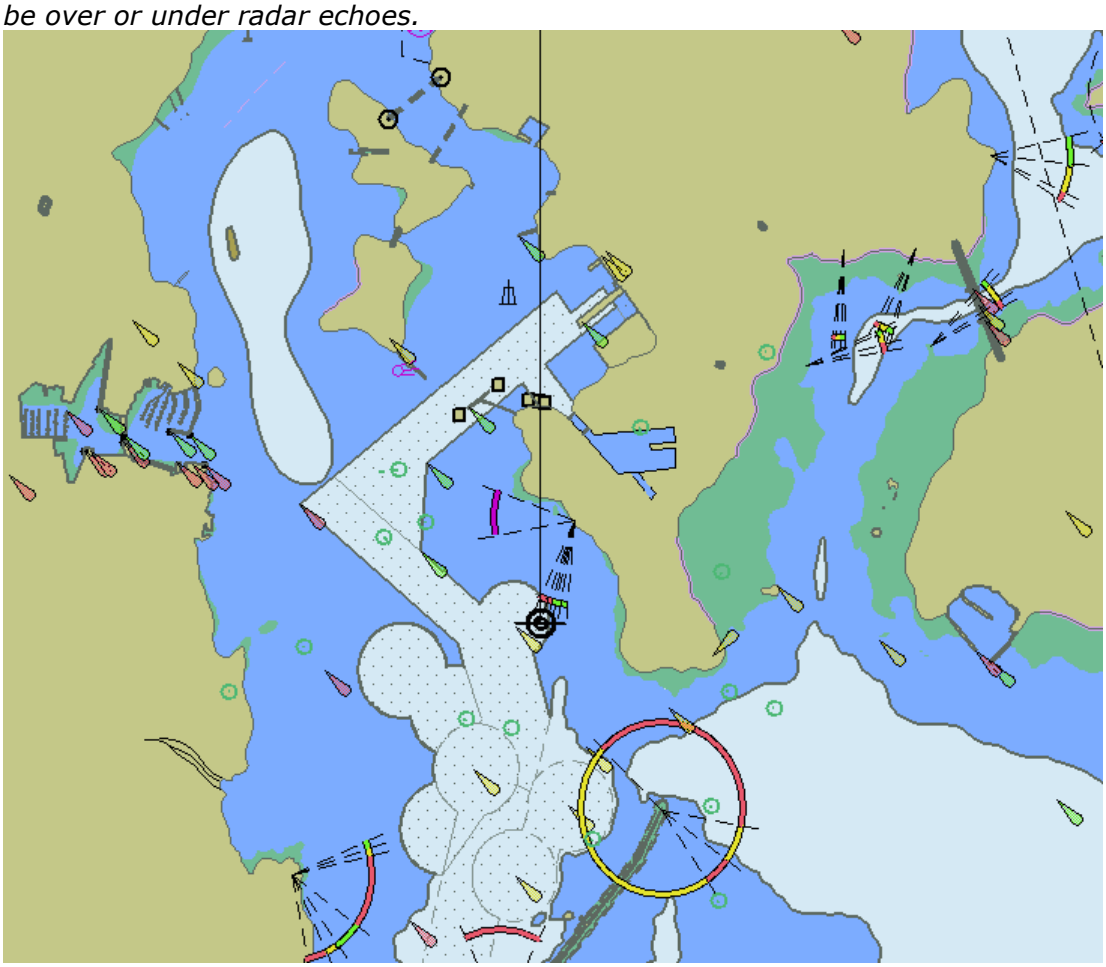
Example of Picture GBTESTPC.TIF over cell GB4X0000.000, Night palette

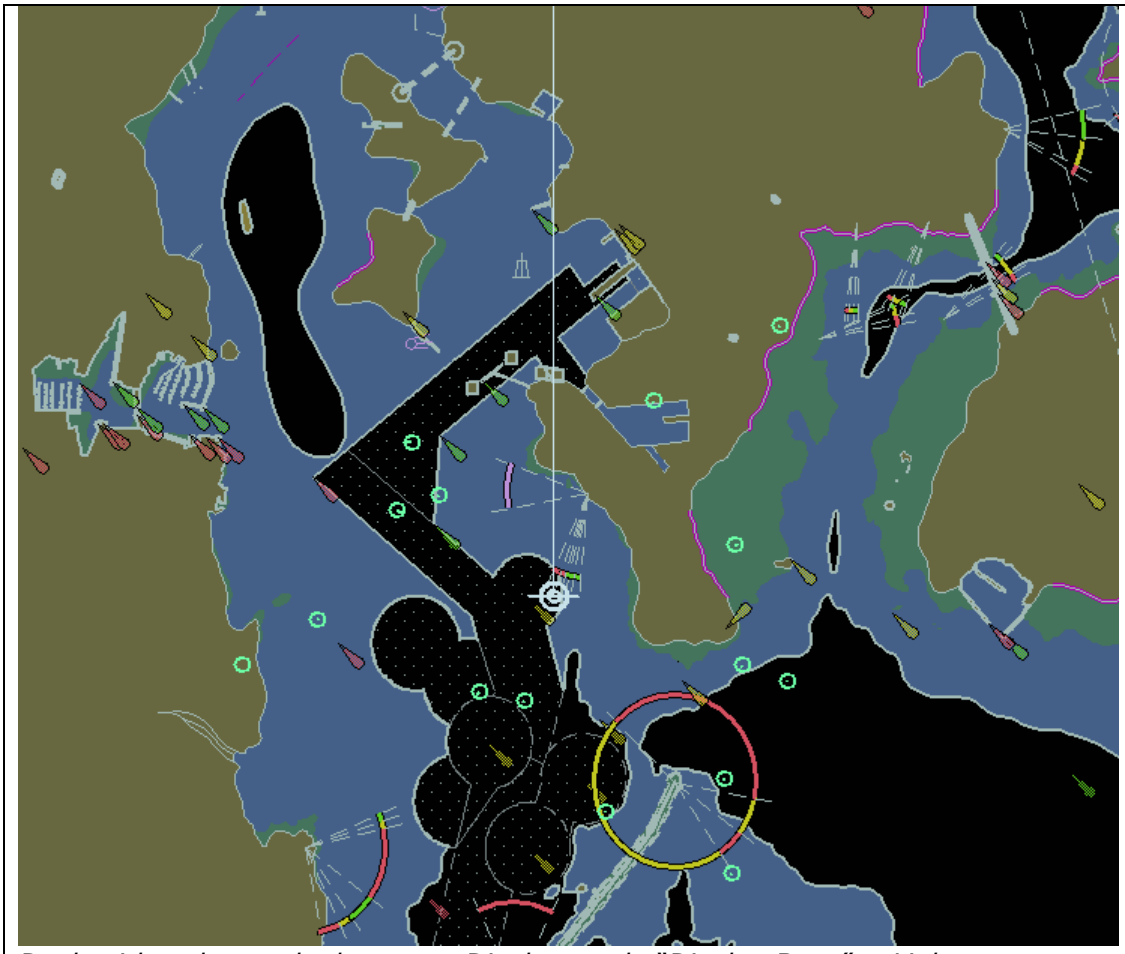


Example of Picture GBX4000T.TIF over cell GB4X0000.000, Day palette

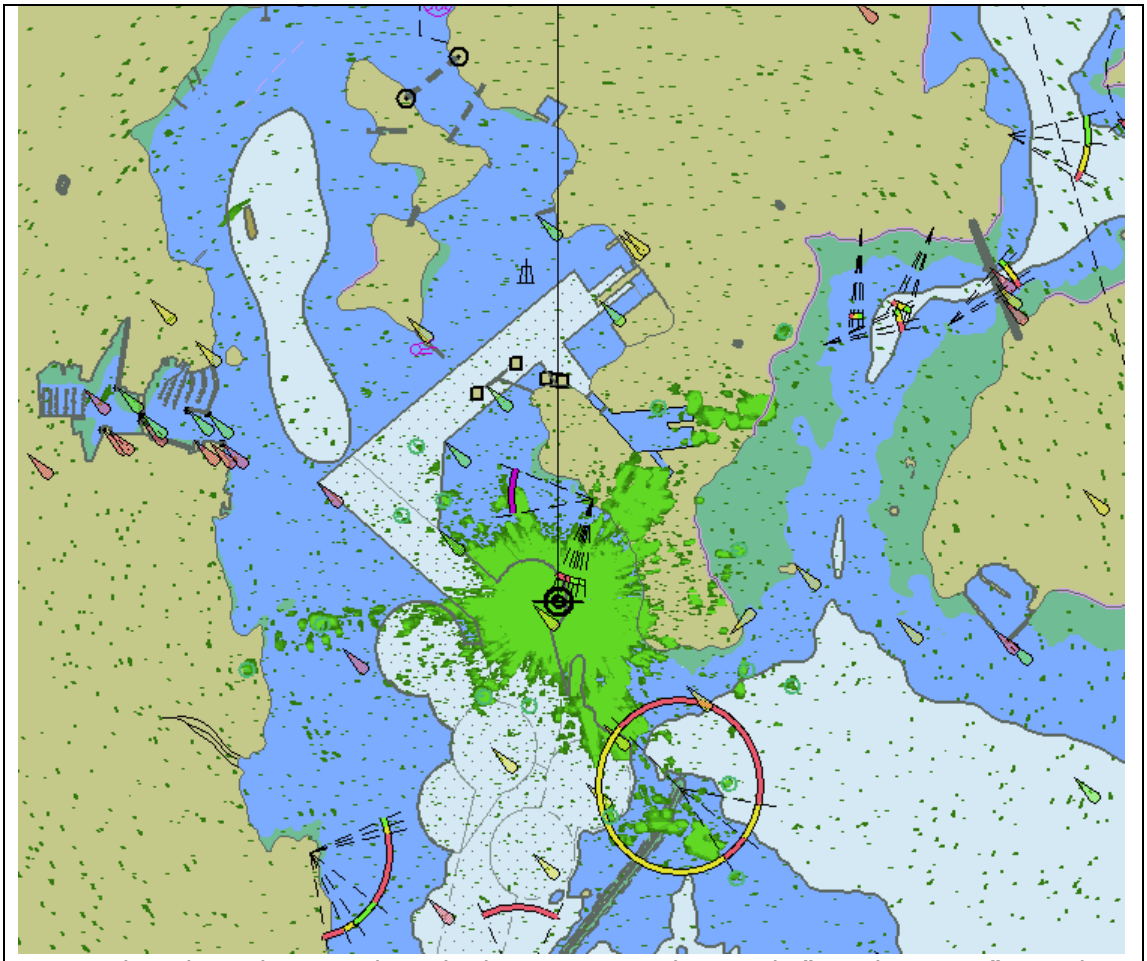
4.5 Radar and Plotting Information

Where the capability for displaying radar, radar tracks or AIS is provided, in addition to the requirements of IEC 62288 for radar displays and presentation of target information, perform the following:

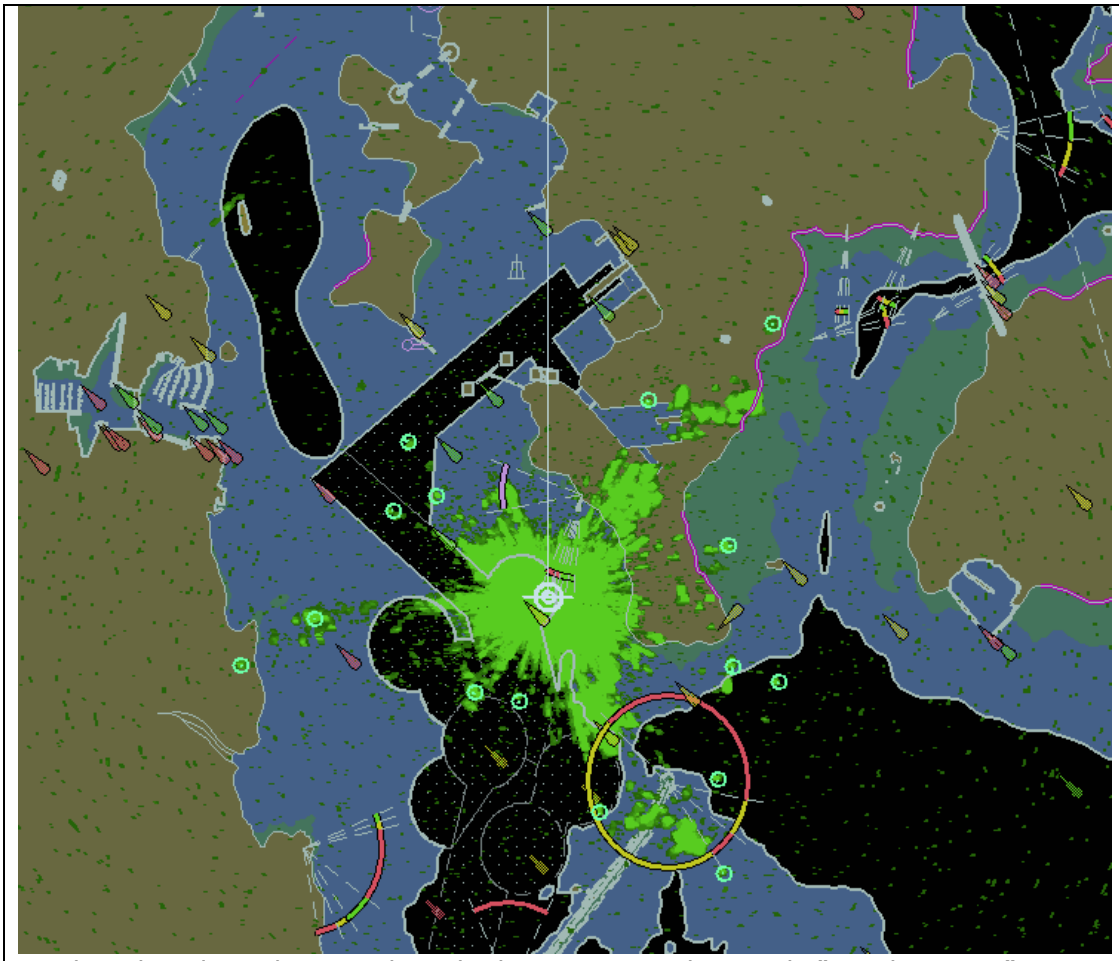
Test reference	4.5 a)	IHO reference	-
Test description			
Display of Radar and AIS overlays with SENC information.			
Set up			
Load the all cells from 2.1.1 Power Up *Display cell GB4X01NE at 3 NM range scale* *Select Safety Contour = 8 metres* *Select Safety Depth = 8 metres* *Select Plain Boundaries* *Select Paper chart symbols*			
Action			
Switch on the following (where available); • *Radar image overlay* • *Radar tracked target information* • *AIS information*			
Result			
Confirm by observation that same SENC object are under or over radar echoes as in the example pictures. Note that some examples contain intentionally a lot of radar echo noise in order to give many examples of the SENC objects which shall be over or under radar echoes.  *Day with radar tracked targets. Display mode "Display Base" + Lights*			



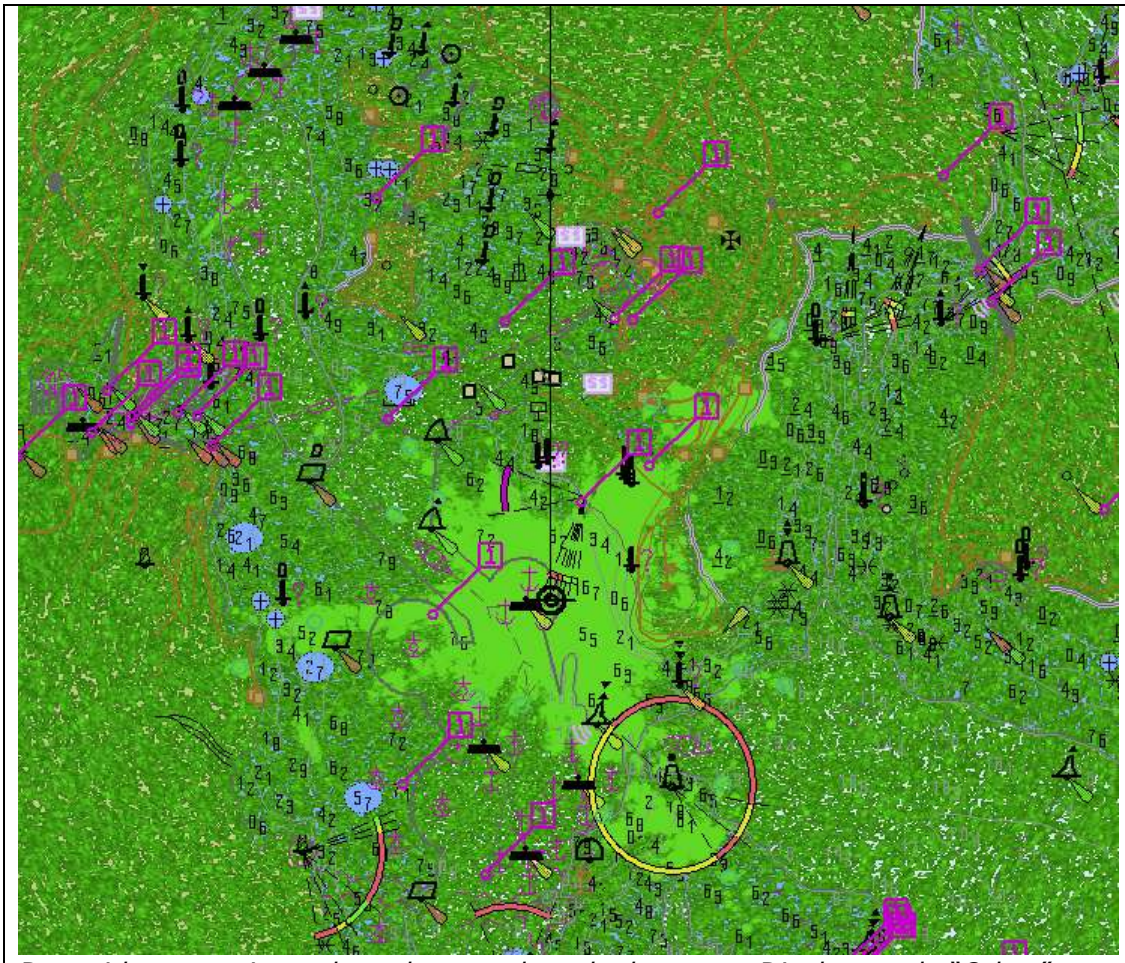
Dusk with radar tracked targets. Display mode "Display Base" + Lights



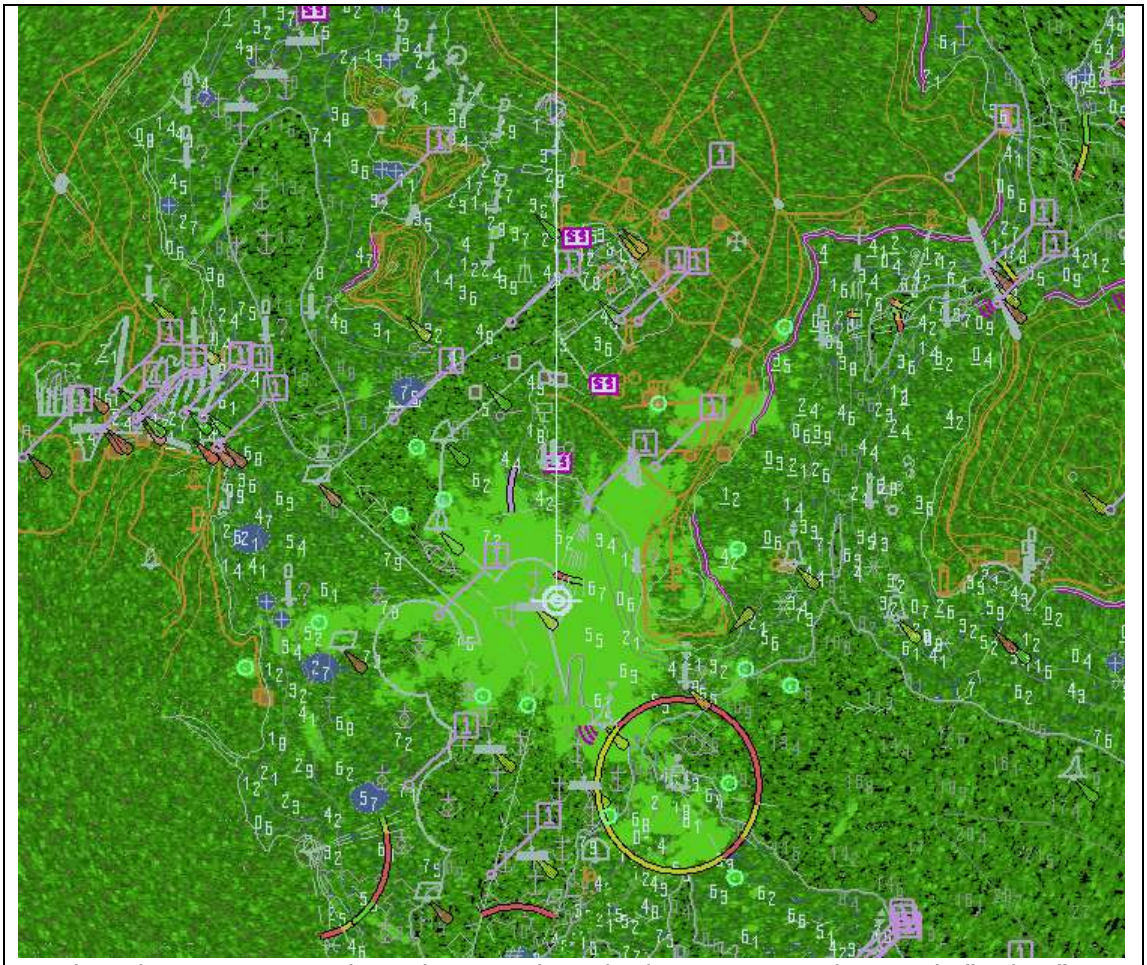
Day with radar echoes and tracked targets. Display mode "Display Base" + Lights



Dusk with radar echoes and tracked targets. Display mode "Display Base" + Lights



Day with very noisy radar echoes and tracked targets. Display mode "Other"
Note: This example clearly shows which SENC features are above radar echoes



Dusk with very noisy radar echoes and tracked targets. Display mode "Other"
Note: This example clearly shows which SENC features are above radar echoes

4.6 Accuracy

In this section calculations are based on the WGS-84 spheroid:

Semi-major axis	6378137.0000m
Semi-minor axis	6356752.3142m
Eccentricity squared	0.00669437999013
Flattening	298.257223563

Conversion of metres (m) to nautical miles (NM) uses
1 NM = 1852 m.

The tests contained within this section shall be executed using the Electronic Bearing Line (EBL) and Variable Range Marker (VRM) tools provided by the ECDIS system.

4.6.1 Geodesic distance and azimuth between geographical positions

Test reference	4.6.1 a)	IHO reference	-
Test description			
True distance and azimuth between two geographical positions a).			
Set up			
Load all cells from; *2.1.1 Power Up\ENC_ROOT*			
Action			
Measure the distance and azimuth between the following two objects; Viking 49/27-B 32 35.224S 61 17.710E Corund Cape Light 32 27.436S 60 58.609E			
Result			
Confirm that the results are as follows; True Distance 33193.554 m / 17.9231 NM Forward Bearing 295.614 degrees Reverse Bearing 115.785 degrees			

Test reference	4.6.1 b)	IHO reference	-
Test description			
True distance and azimuth between two geographical positions b).			
Set up			
As for test 4.6.1a)			
Action			
Measure the distance and azimuth between the following two objects; Viking 49/27-B 32 35.224S 61 17.710E Castlerigg Light 32 23.280S 60 58.496E			
Result			
Confirm that the results are as follows; True Distance 37326.351 m / 20.1546 NM Forward Bearing 306.172 degrees Reverse Bearing 126.344 degrees			

Test reference	4.6.1 c)	IHO reference	-
Test description			
True distance and azimuth between two geographical positions c).			
Set up			
As for test 4.6.1a)			
Action			
Measure the distance and azimuth between the following two objects; Corund Cape Light 32 27.447S 60 58.599E Worm Head Light 32 31.958S 60 54.337E			
Result			
Confirm that the results are as follows; True Distance 10680.859 m / 5.7672 NM Forward Bearing 218.665 degrees Reverse Bearing 38.703 degrees			

4.6.2 Geodesic geographical position from a known position and distance/azimuth

Test reference	4.6.2 a)	IHO reference	-
Test description			
Geographical position from known position and distance/azimuth a).			
Set up			
As for test 4.6.1a)			
Action			
From the following position; Viking 49/27-B 32 35.224S 61 17.710E *Enter a distance and bearing of;* True Distance 33193.554 m / 17.9231 NM Forward Bearing 295.614 degrees			
Result			
Confirm that the end geographical position is; Corund Cape Light 32 27.436S 60 58.609E			

Test reference	4.6.2 b)	IHO reference	-
Test description			
Geographical position from known position and distance/azimuth b).			
Set up			
As for test 4.6.1a)			
Action			
From the following position; Viking 49/27-B 32 35.224S 61 17.710E *Enter a distance and bearing of;* True Distance 37326.351 m / 20.1546 NM Forward Bearing 306.172 degrees			
Result			
Confirm that the end geographical position is; Castlerigg Light 32 23.280S 60 58.496E			

Test reference	4.6.2 c)	IHO reference	-
Test description			
Geographical position from known position and distance/azimuth c).			
Set up			
As for test 4.6.1a)			
Action			
From the following position; Corund Cape Light 32 27.447S 60 58.599E *Enter a distance and bearing of;* True Distance 10680.859 m / 5.7672 NM Forward Bearing 218.665 degrees			
Result			
Confirm that the end geographical position is; Worm Head Light 32 31.958S 60 54.337E			

4.6.3 Rhumb line distance and azimuth between geographical positions

Test reference	4.6.3 a)	IHO reference	-
Test description			
True distance and azimuth between two geographical positions a).			
Set up			
Load all cells from; *2.1.1 Power Up\ENC_ROOT*			
Action			
Measure the distance and azimuth between the following two objects; Viking 49/27-B 32 35.224S 61 17.710E Corund Cape Light 32 27.436S 60 58.609E			
Result			
Confirm that the results are as follows; True Distance 33193.567 m / 17.9231 NM Forward Bearing 295.699 degrees Reverse Bearing 115.699 degrees			

Test reference	4.6.3 b)	IHO reference	-
Test description			
True distance and azimuth between two geographical positions b).			
Set up			
As for test 4.6.1a)			
Action			
Measure the distance and azimuth between the following two objects; Viking 49/27-B 32 35.224S 61 17.710E Castlerigg Light 32 23.280S 60 58.496E			
Result			
Confirm that the results are as follows; True Distance 37326.365 m / 20.1546 NM			

Forward Bearing	306.258 degrees
Reverse Bearing	126.258 degrees

Test reference	4.6.3 c)	IHO reference	-
Test description			
True distance and azimuth between two geographical positions c).			
Set up			
As for test 4.6.1a)			
Action			
Measure the distance and azimuth between the following two objects; Corund Cape Light 32 27.447S 60 58.599E Worm Head Light 32 31.958S 60 54.337E			
Result			
Confirm that the results are as follows; True Distance 10680.859 m / 5.7672 NM Forward Bearing 218.684 degrees Reverse Bearing 38.684 degrees			

4.6.4 Geodesics

Test reference	4.6.4 a)	IHO reference	-
Test description			
Geodesic lines and circle, northern quadrant.			
Set up			
As for test 4.6.1a)			
Action			
Plot positions listed in sets 2-6 of the following document; *4.6 Accuracy – Geodesic*			
Result			
Confirm that the lines drawn pass through or sufficiently close to the listed positions and that the Geodesic circle corresponds to range rings at 2,000,000m intervals.			

Test reference	4.6.4 b)	IHO reference	-
Test description			
Geodesic lines and circle, crossing the equator.			
Set up			
As for test 4.6.1a)			
Action			
Plot positions listed in sets 7-11 of the following document; *4.6 Accuracy – Geodesic*			
Result			
Confirm that the lines drawn pass through or sufficiently close to the listed positions and that the Geodesic circle corresponds to range rings at 2,000,000m intervals.			

Test reference	4.6.4 c)	IHO reference	-
Test description			
Geodesic lines southern quadrant.			
Set up			
As for test 4.6.1a)			
Action			
Plot positions listed in sets 12-16 of the following document; *4.6 Accuracy – Geodesic*			
Result			
Confirm that the lines drawn pass through or sufficiently close to the listed positions and that the Geodesic circle corresponds to range rings at 2,000,000m intervals.			

4.6.5 Rhumb Lines

Test reference	4.6.5 a)	IHO reference	-
Test description			
Rhumb lines, northern quadrant.			
Set up			
As for test 4.6.1a)			
Action			
Plot positions listed in sets 2-5 of the following document; *4.6 Accuracy – Rhumb Lines*			
Result			
Confirm that the lines drawn pass through or sufficiently close to the listed positions.			

Test reference	4.6.5 b)	IHO reference	-
Test description			
Rhumb lines, crossing the equator.			
Set up			
As for test 4.6.1a)			
Action			
Plot positions listed in sets 6-9 of the following document; *4.6 Accuracy - Rhumb Lines*			
Result			
Confirm that the lines drawn pass through or sufficiently close to the listed positions.			

Test reference	4.6.5 c)	IHO reference	-
Test description			
Rhumb lines, southern quadrant.			
Set up			
As for test 4.6.1a)			
Action			
Plot positions listed in sets 12-16 of the following document; *4.6 Accuracy - Rhumb Lines*			
Result			
Confirm that the lines drawn pass through or sufficiently close to the listed positions.			

4.7 Symbols

4.7.1 Symbol Size

Test reference	4.7.1	IHO reference	S-52 [3.1.5]
Test description			
Display of symbols in size shown in the IHO presentation library.			
Set up			
Load one or more cells from *2.1.1 Power Up\ENC_ROOT*			
Action			
Perform zoom-in and zoom-out operations in each display mode.			
Result			
Confirm that the symbols do not decrease in size below that shown in the IHO presentation library.			

4.7.2 Display of ECDIS chart 1 symbols of correct size

Test reference	4.7.2	IHO reference	S-52 16.1
Test description			
Display of the check symbol of the correct size (in mm).			
Set up			
Load the following cell from ECDIS Chart 1 as provided in IHO S-52 Appendix 2); AA5C1AB2.000			
Action			
Observe the CHKSYM01 symbol within the Information about the chart display (A,B) section.			
Result			
Confirm that the height of the CHKSYM01 symbol is not less than 5.0mm and not greater than 5.5mm.			

4.7.3 Size in pixels of the check symbol CHKSYM01

Test reference	4.7.3	IHO reference	S-52 [3.1.5]
Test description			
Display of the check symbol of the correct size (in pixels).			
Set up			
As for test 4.7.1			
Action			
Observe the CHKSYM01 symbol within the Information about the chart display (A,B) section.			
Result			
Confirm that the number of pixels (lines) which comprise the vertical extent of the symbol CHKSYM01 is not less than 16. *This test may be conducted by calculation based on the properties of the equipment under test.*			

4.7.4 Display of text as the correct size

Test reference	4.7.4	IHO reference	S-52 [3.1.5]
Test description			
Display of text within the chart display and pick report.			
Set up			
Load one or more cells from *2.1.1 Power Up\ENC_ROOT*			
Action			
Observe the chart display. *Pick an object and observe the text within the pick report.* *Create a mariners note with text and observe its display.*			
Result			
Confirm that for all text observed the height of upper-case characters is not less than 3.5 mm and not greater than 4.0mm.			

4.7.5 Display redraw

Test reference	4.7.5	IHO reference	S-52 [5.1]
Test description			
Display of text within the chart display and pick report.			
Set up			
Load one or more cells from *2.1.1 Power Up\ENC_ROOT* *Simulate the own ships movement from Micklefirth through the Mickelfirth channel and to the Mickleden TSS roundabout.*			
Action			
Monitor the display at a viewing scale of 1:20,000			
Result			
Confirm that the display redraws in less than 5 seconds for the duration of the own ship movement. *Select the display of the area north of the Lowesmore Oilfield confirm that the display redraws in 5 seconds or informs the user and retains the previous display until ready.*			

4.8 Units and Legend

Test reference	4.8	IHO reference	S-52 [2.3.1f, 2.3.1g], 10.6.2
Test description			
Display units and chart legend.			
Set up			
Load cell GB4X0000.000 from 2.1.1 Power Up\ENC_ROOT			
Action			
Select a position for display applicable chart legend			
Result			
As a minimum the information listed below must be presented clearly (the complete list needs not always to be shown). Examples from the dataset loaded are listed in bold text where appropriate.			

ECDIS Legend	Values
Units for depth	***Metres***
Units for height	***Metres***
Note: *Units for depth and height: although the ENC Product Specification of S-57 does not allow any other than metric depths and heights, these two elements shall be stated for clarity for the Mariner.*	
Scale of display	*Selected by Mariner. (The default display scale is defined by the compilation scale which is coded in the sub-field of the DSPM field or CSCALE attribute value of the M_CSCL object.)* *Compilation scale –* ***52,000***
Data quality indicator	*a. CATZOC attribute of the M_QUAL object for bathymetric data.* *b. POSACC attribute of the M_ACCY object (if available) for non-bathymetric data.*
Note: *Due to the way quality is encoded in the ENC, both values (a. and b.) shall be used.*	
Sounding/vertical datum	*Sounding datum –* ***Lowest astronomical tide*** *Vertical datum –* ***Mean high water springs*** *(VERDAT attributes of individual objects shall not be used for the legend.)*
Horizontal datum	*HDAT subfield of the DPSM field.* ***WGS 84***
Value of safety depth	*Selected by Mariner (default is 30 metres).*
Value of safety contour	*Selected by Mariner (default is 30 metres).*
Note: *If the Mariner has selected a contour that is not available in the ENC and the ECDIS displays a default contour, both the contour selected and the contour displayed shall be quoted.*	
Magnetic variation	*VALMAG, RYRMGV and VALACM of the MAGVAR object. Item shall be displayed as;* *VALMAG RYRMGV (VALACM)* *e.g., 4°15W 1990 (8'E)*
Date and number of latest update affecting chart cells currently in use.	*ISDT and UPDN subfields of the DSID field of the last update cell update file (ER data set) applied.* ***Issue Date - 20010409*** ***Update Number – 0***
Edition number and date of the ENC.	*EDTN and UADT subfields of the DSID field of the last ENC data issue of current ENC of the ENC set.*

	Edition Number – 2 ***ENC Date – 20010409***
Chart projection	*Projection used for the ECDIS display (e.g., oblique azimuthal). This shall be appropriate to the scale and latitude of the data in use.*

In addition the following units shall be indicated:

- *position;*
- *distance;*
- *speed.*

4.9 Other Chart Related Functionality

4.9.1 Presentation Library

Test reference	4.9.1	IHO reference	S-52 4.3
Test description			
Display of presentation library edition number.			
Set up			
N/A			
Action			
Navigate to the appropriate dialog where the presentation library edition number can be found.			
Result			
Presentation library edition number 4.0 must be displayed.			

4.9.2 ECDIS Chart 1

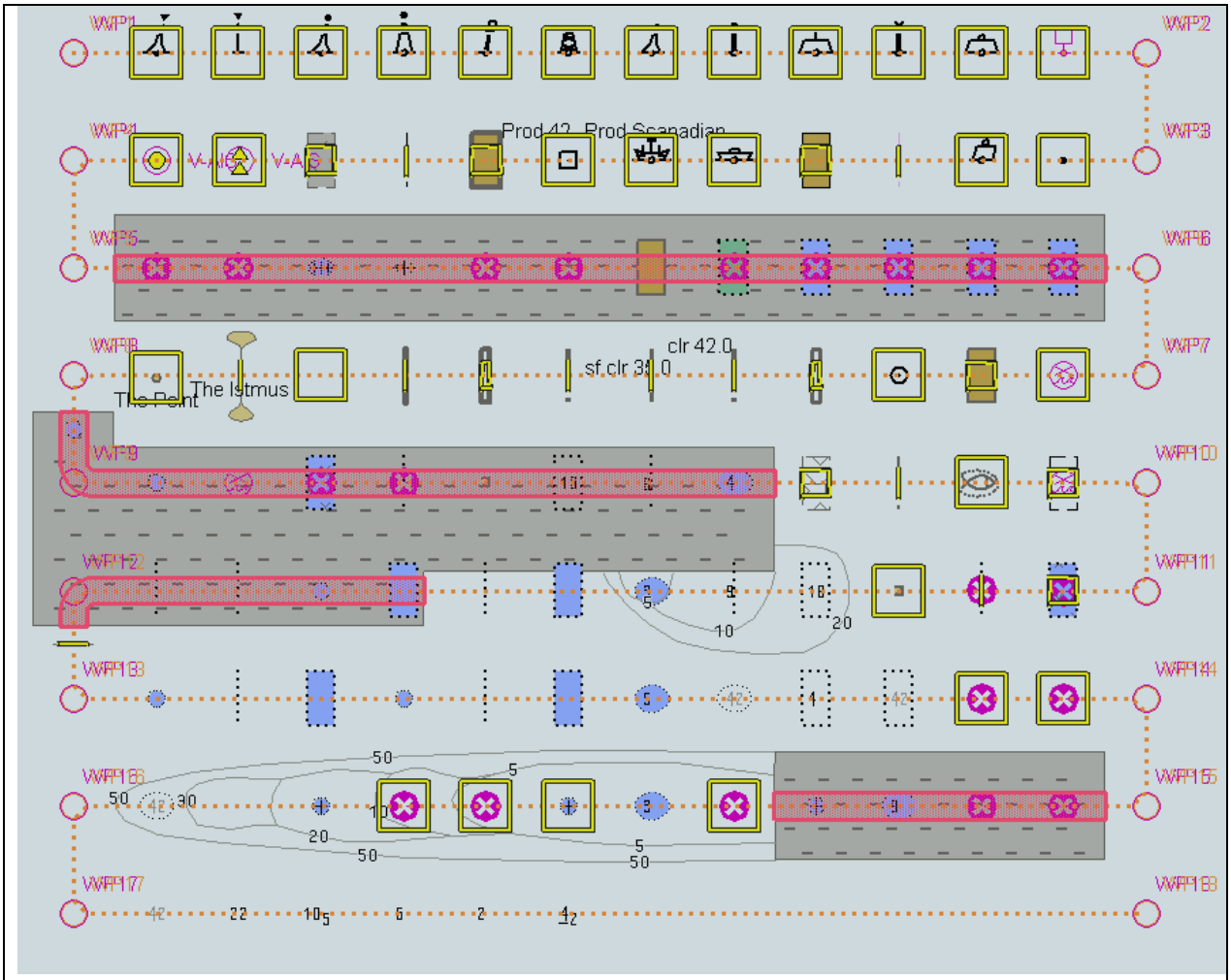
Test reference	4.9.2 a)	IHO reference	S-52 18.2.2
Test description			
Display of ECDIS chart 1.			
Set up			
N/A			
Action			
Navigate to ECDIS chart 1. *Compare the displayed image with the plots provided in S-52 Part 1 Section 16.2.*			
Result			
Confirm that ECDIS chart 1 is displayed. *Confirm that the displayed image is consistent with the plots provided in S-52.*			

Test reference	4.9.2 b)	IHO reference	S-52 18.2.2
Test description			
Interrogation of ECDIS chart 1.			
Set up			
With ECDIS chart 1 displayed.			
Action			
Interrogate 3 symbols by cursor pick.			
Result			
Upon interrogation the description of the symbol as contained in the presentation library is presented.			

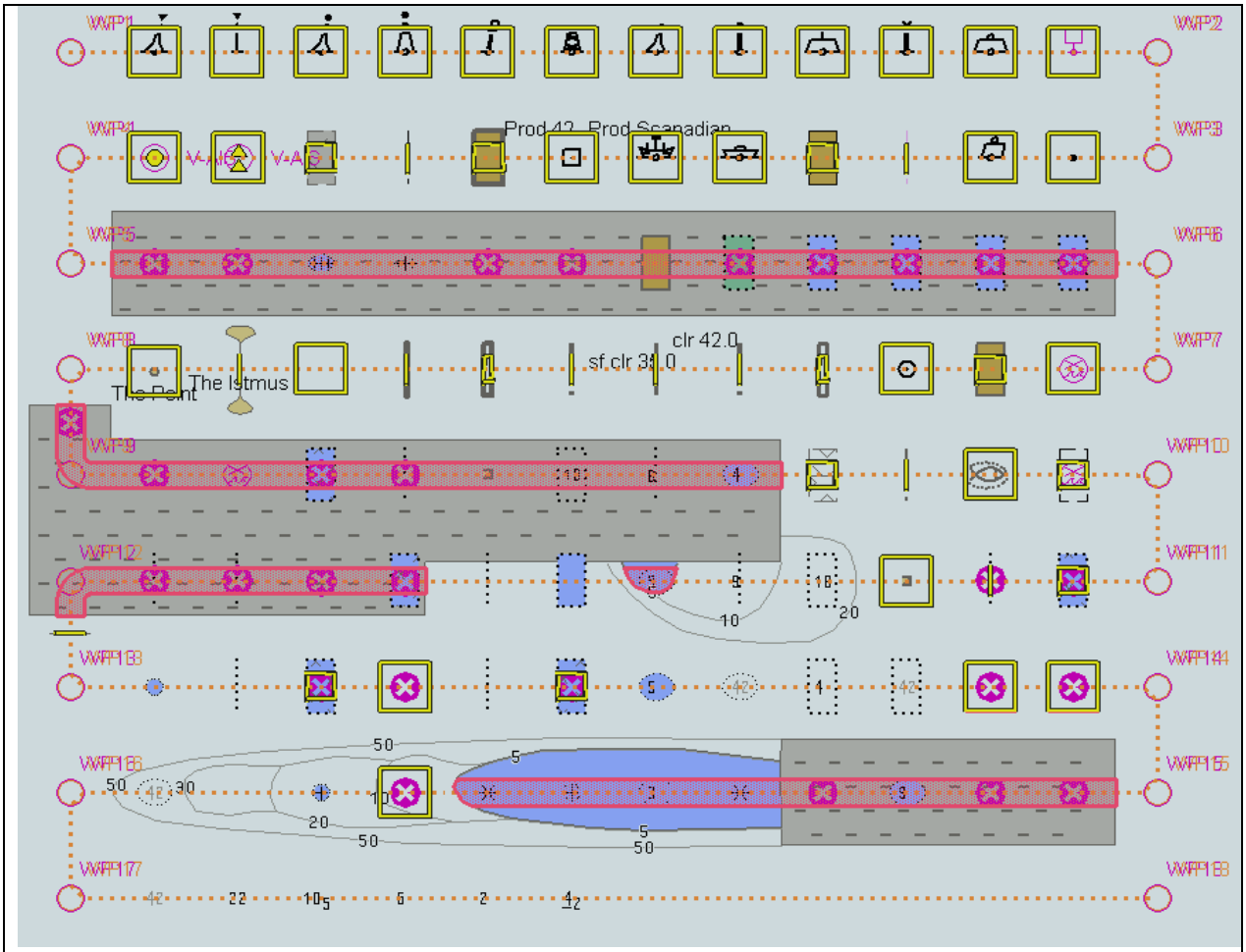
5.0 Detection and Notification of Navigational Hazards

5.1 Detection and Notification of Navigational Hazards - Basic test

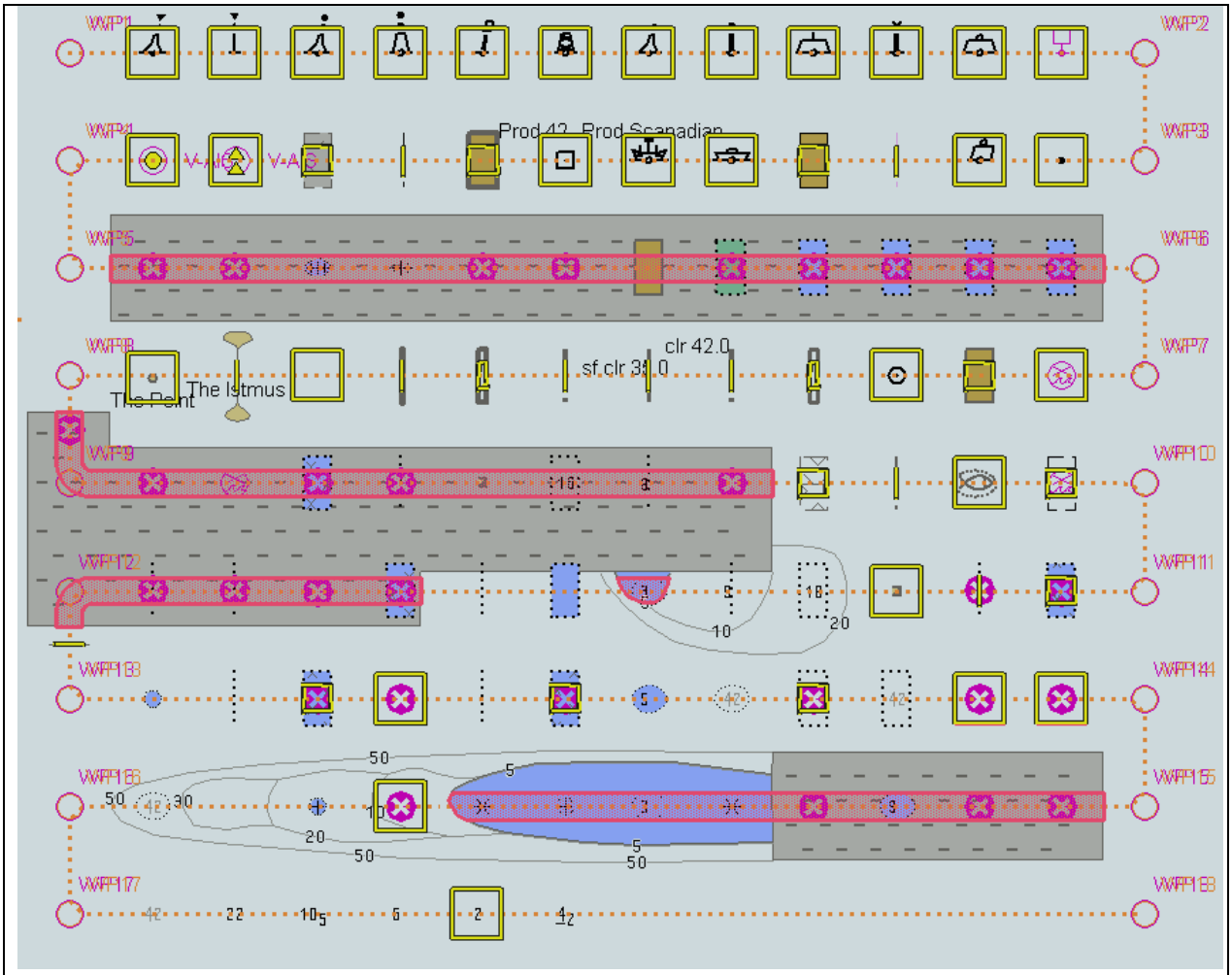
Test reference	5.1	IHO Reference	10.5.9
Test description			
The purpose of this test is to verify by observation that ECDIS provides an appropriate indication when the Mariner plans a route closer than a user-specified distance from any objects satisfying the conditions for this test as listed in section 10.5.9 of IHO S-52 and included in the test cell AA3NAVHZ.000. *This test is performed by loading the test cell AA3NAVHZ.000, manually creating a route connecting all way points between feature objects marked as WP1 through WP18 and checking display against the corresponding graphical plot.*			
Set up			
Load cell AA3NAVHZ.000 from 5.0 Navigational Hazards\ENC_ROOT *Select Viewing group layer Other* *Set the safety contour value to 0 m* *Set the safety depth value to 30 m* *Select Symbolized Boundaries* *Select Paper chart symbols* *Deselect Accuracy* *Deselect Highlight info* *Manually create a route connecting all way points between feature objects marked WP1 through WP18.* *Set user-specified distance for indication navigational hazards as 0.1 NM*			
Action			
Check ENC symbols shown in the ECDIS against the corresponding graphical plot. *Repeat sequentially with a safety contour of 0m, 2m, 5m, 6m, 8m, 10m, 9m, 11m, 16m, 21m, 41m, 42m, 50m, 51m*			
Result			
The ENC in the ECDIS should match the corresponding graphical plot shown below.			



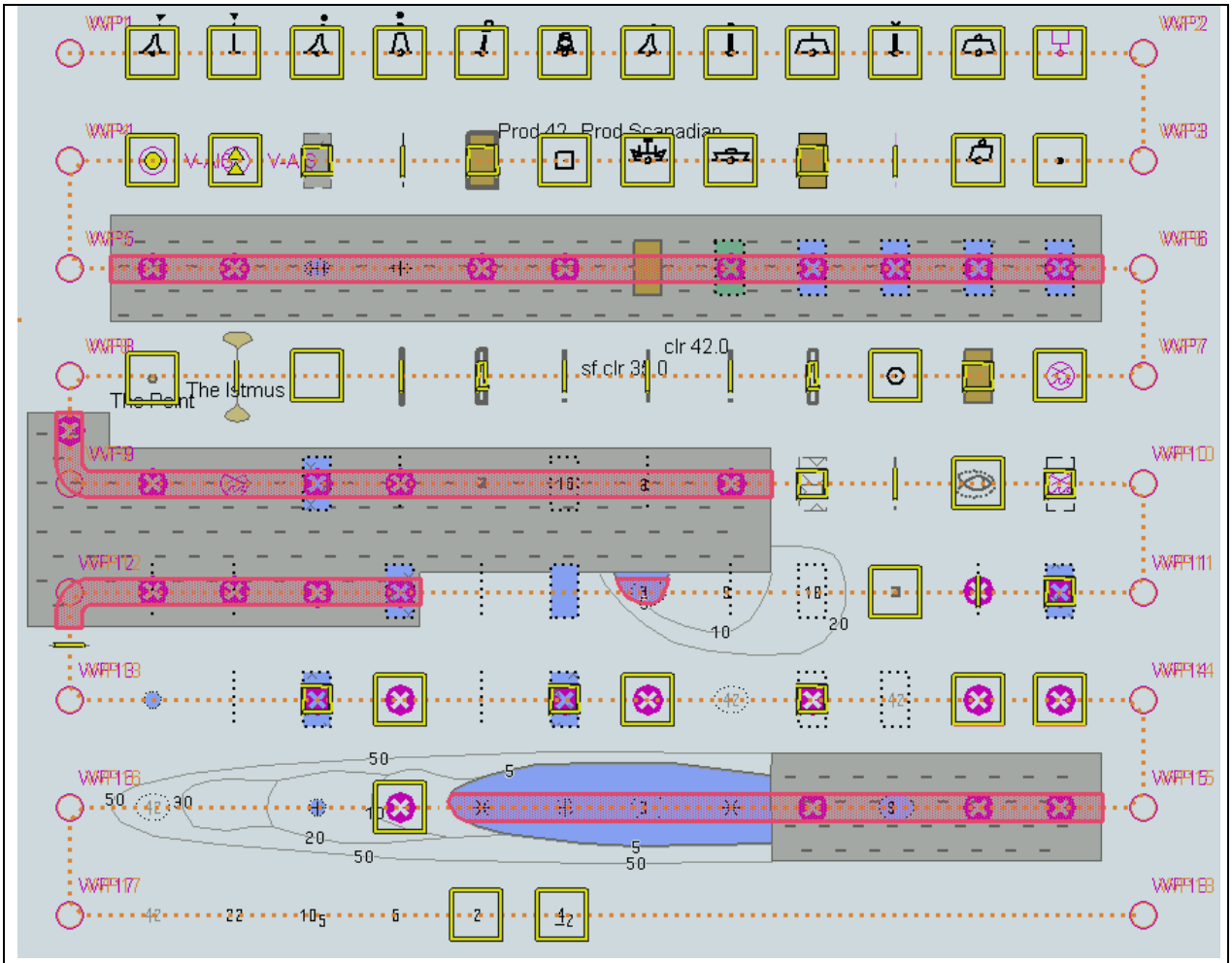
Safety Contour = 0 m



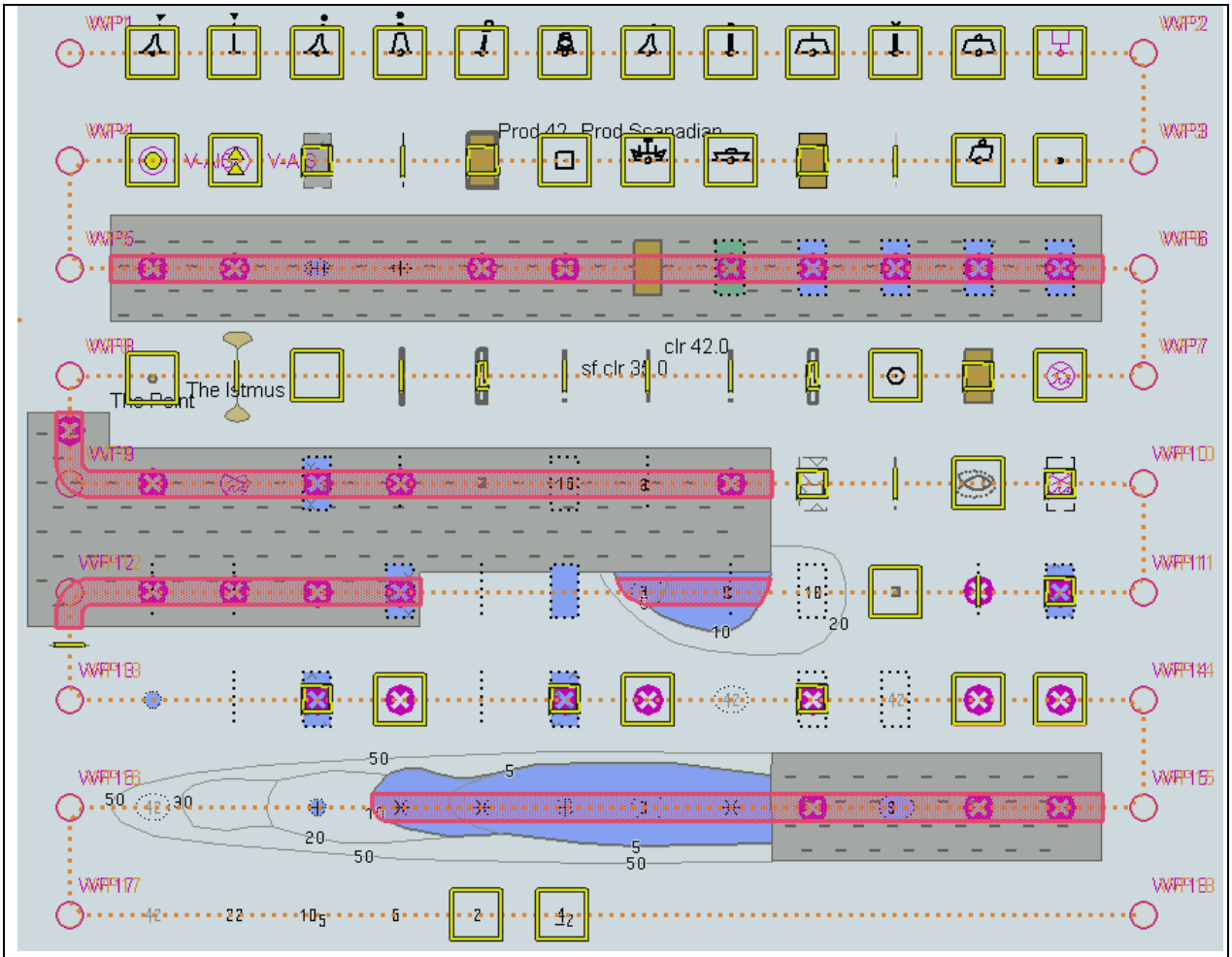
Safety Contour = 2 m



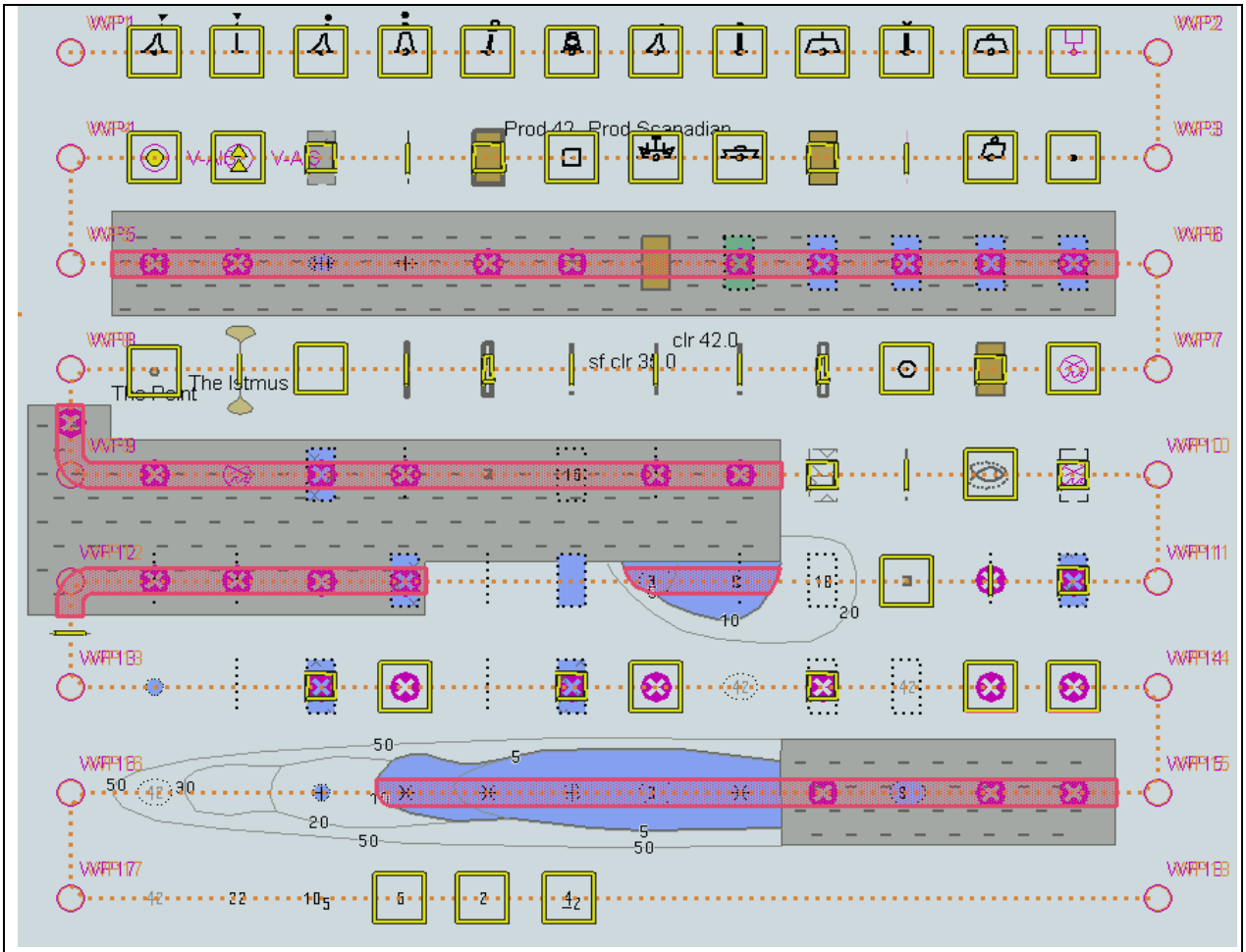
Safety Contour = 4 m



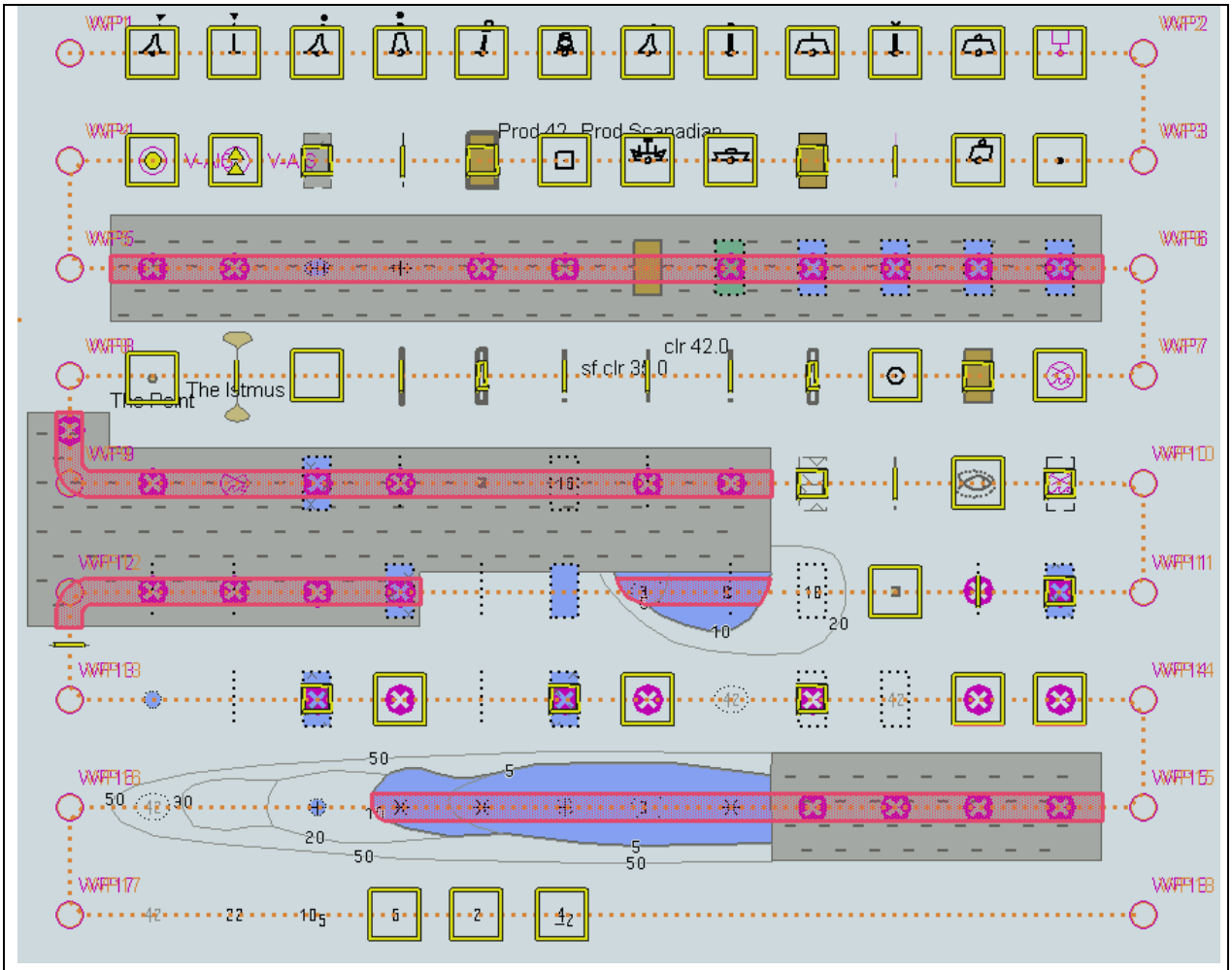
Safety Contour = 5 m



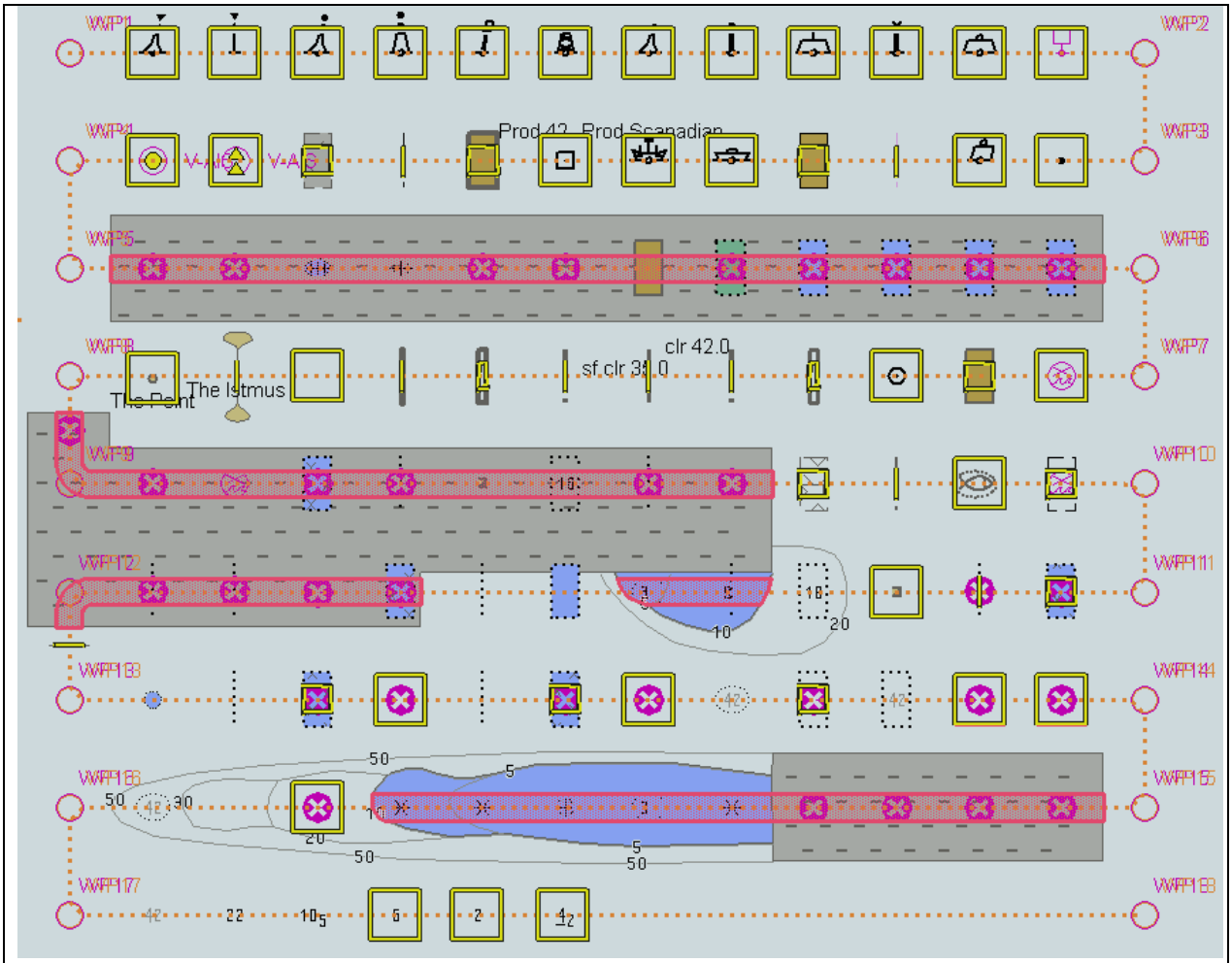
Safety Contour = 6 m



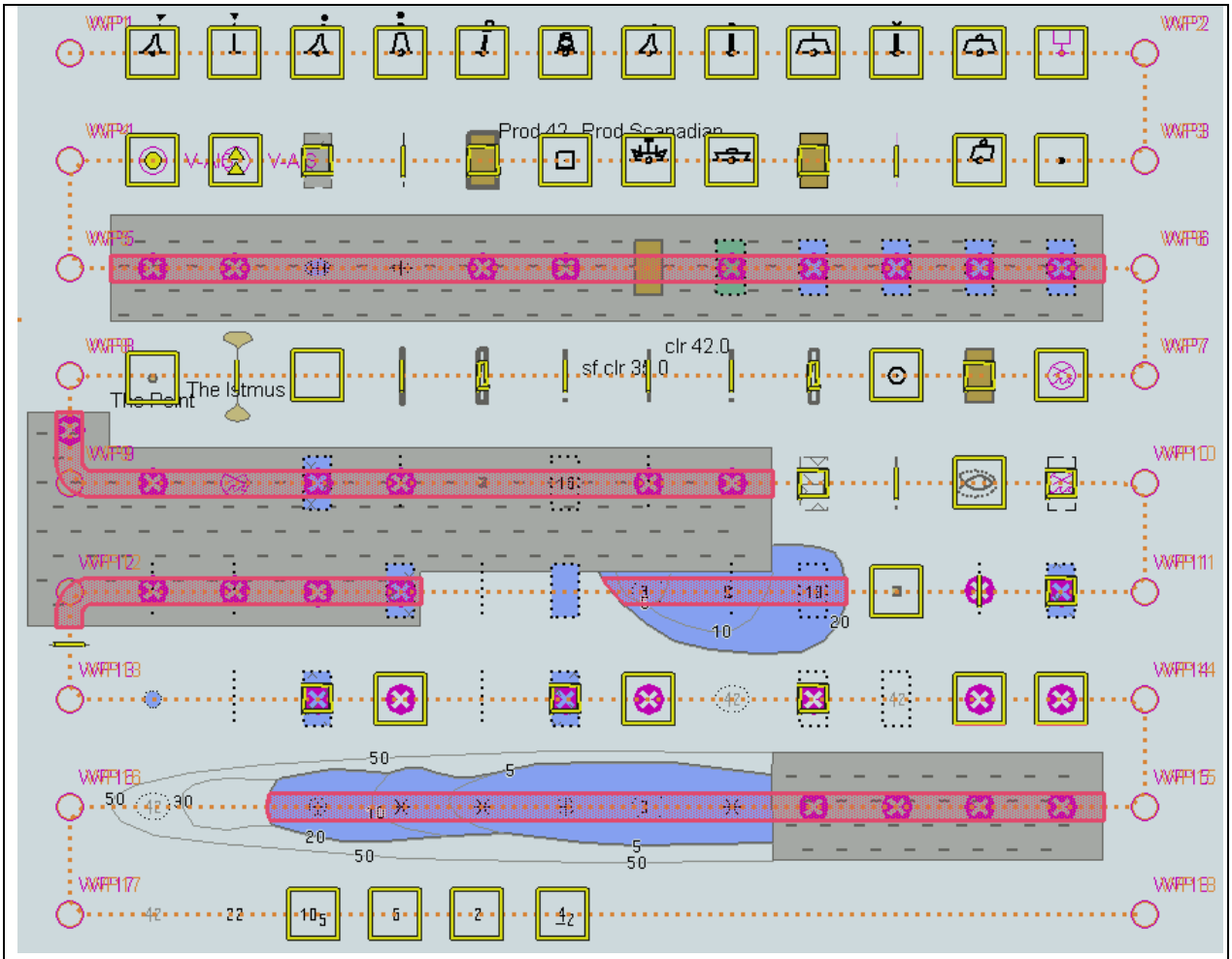
Safety Contour = 8 m



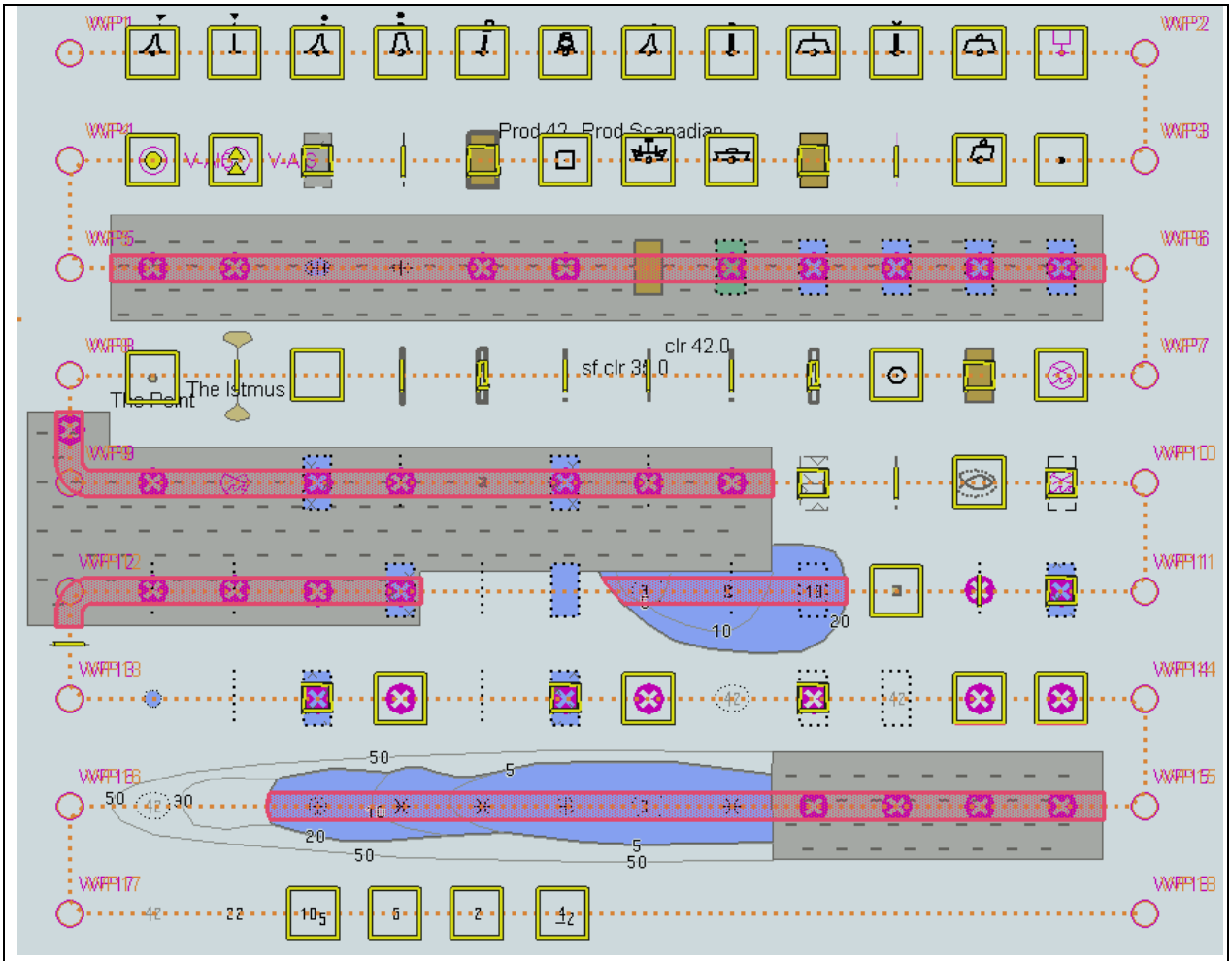
Safety Contour = 9 m



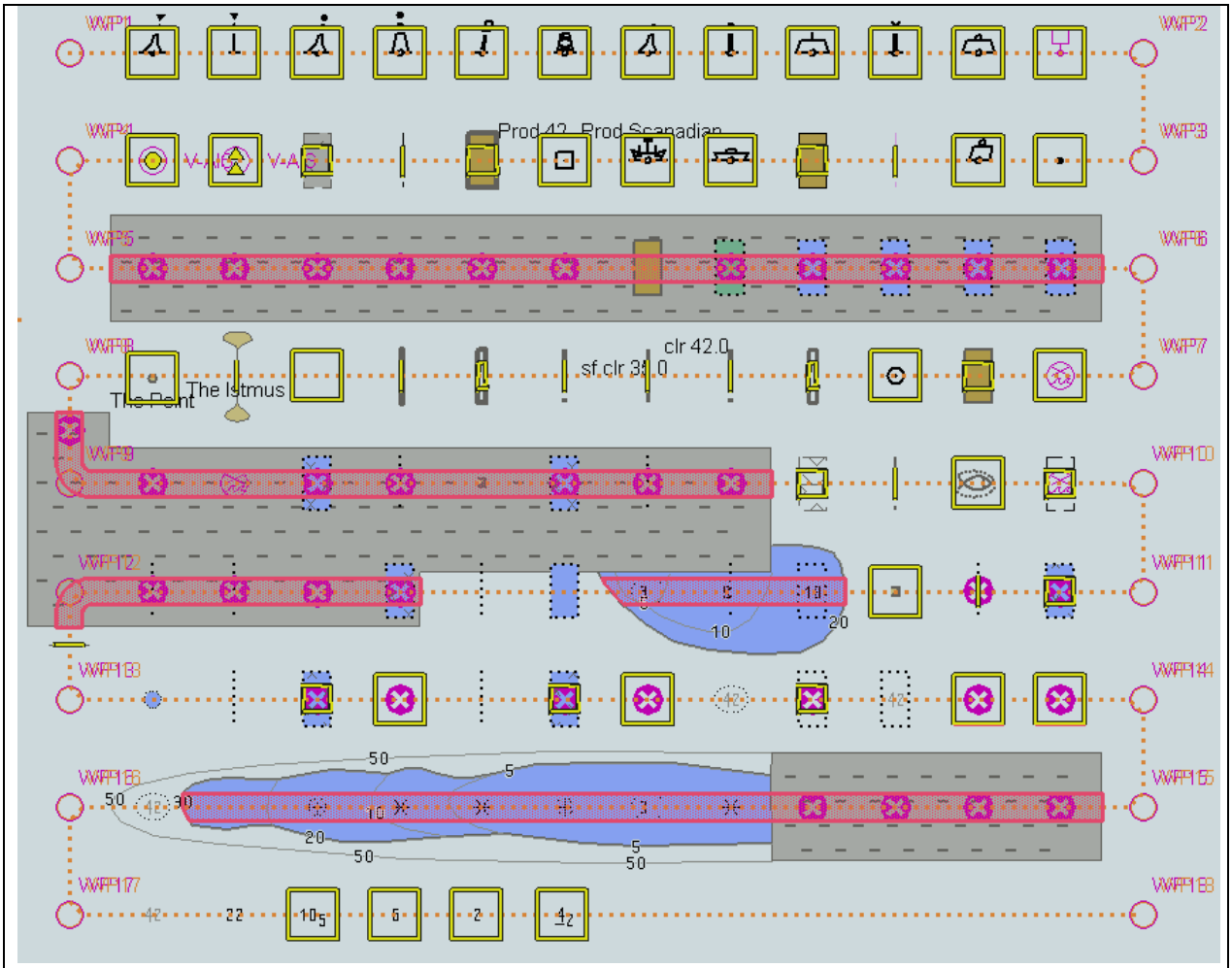
Safety Contour = 10 m



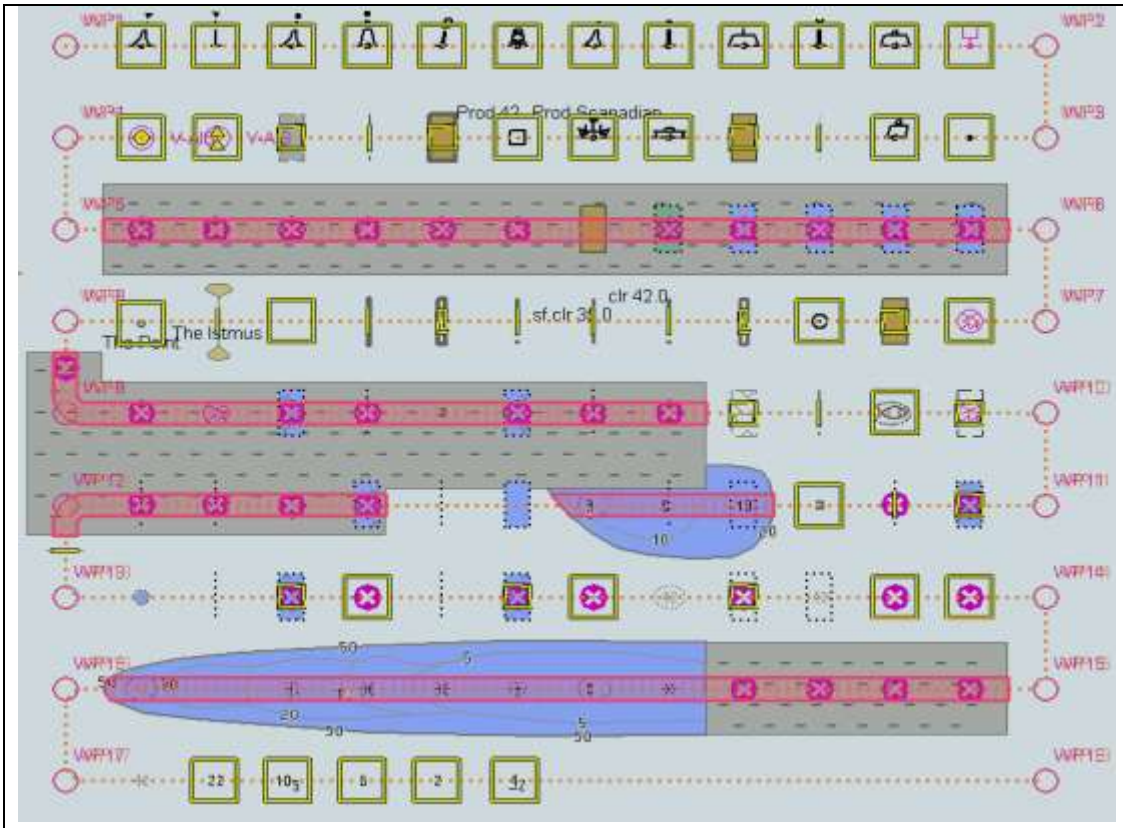
Safety Contour = 11 m



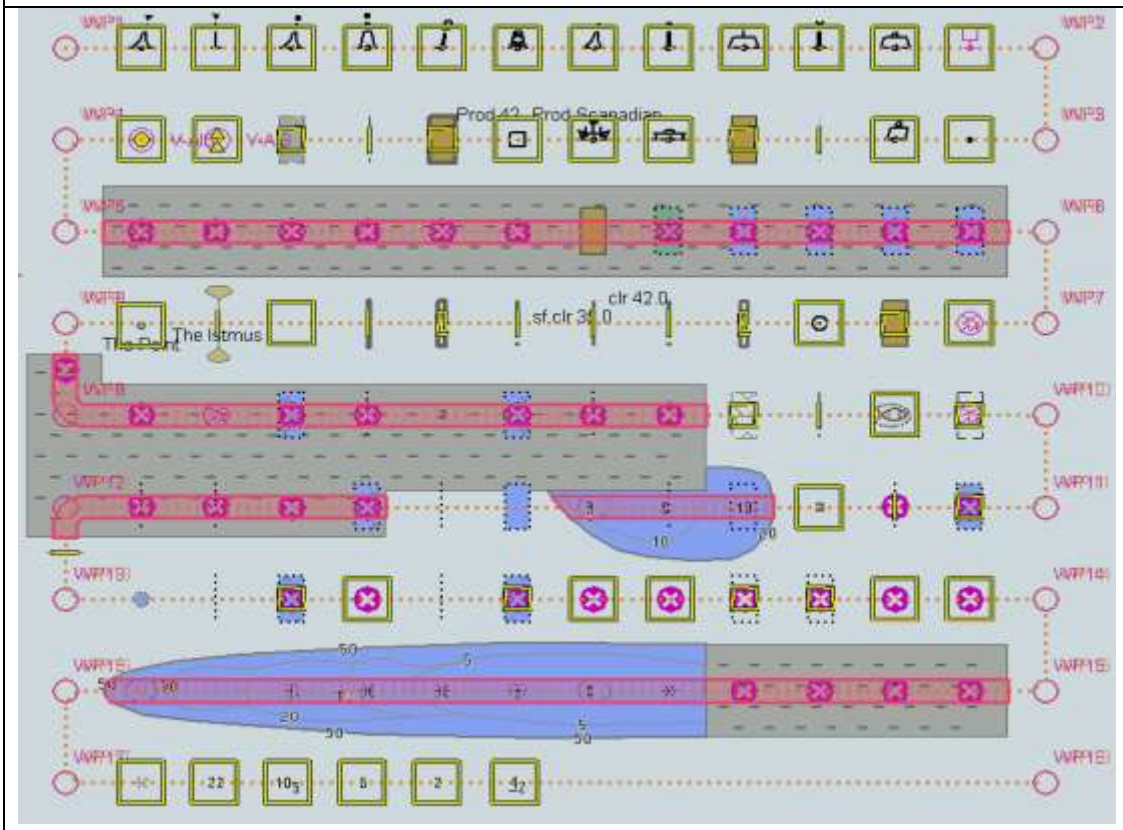
Safety Contour = 16 m



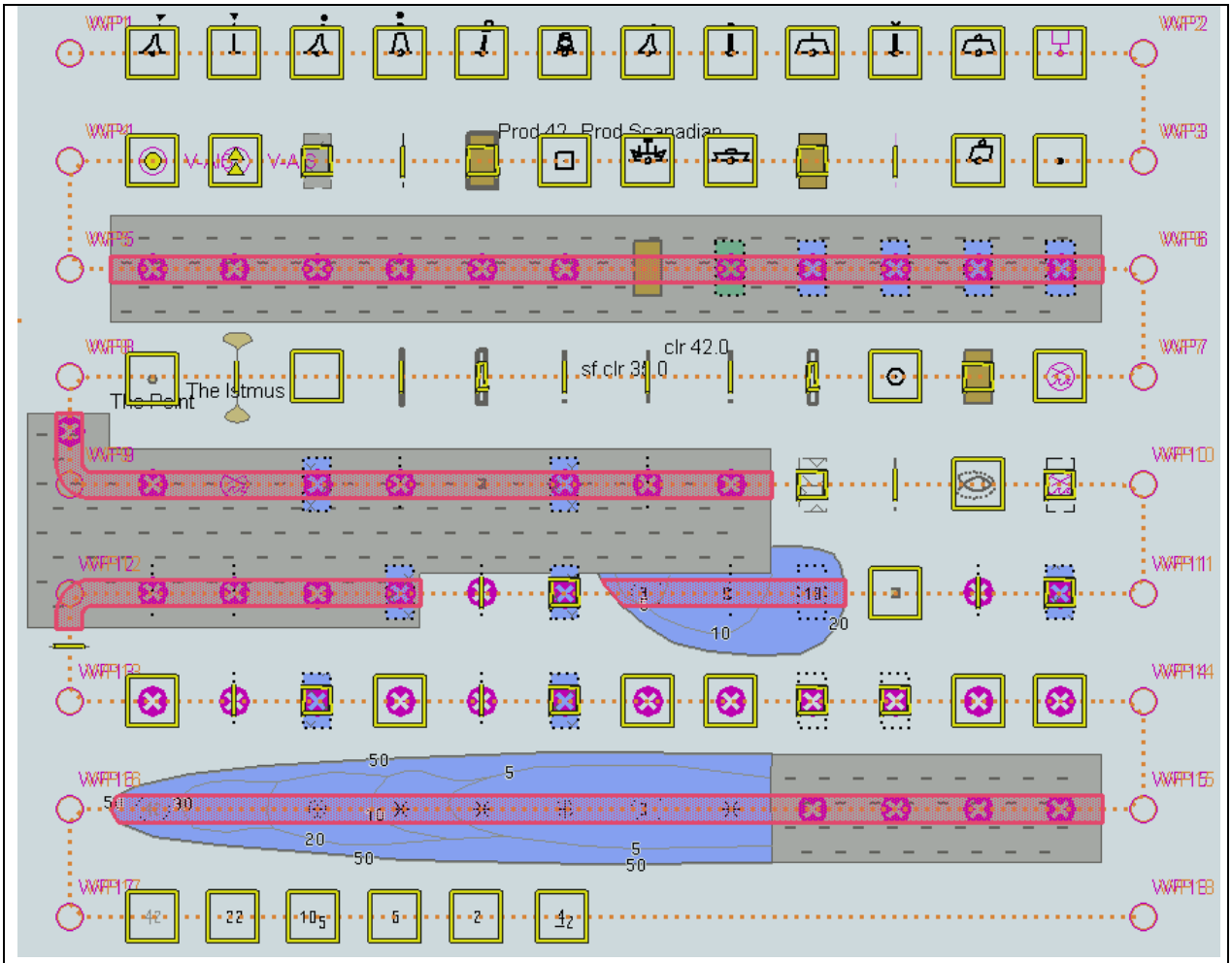
Safety Contour = 21 m



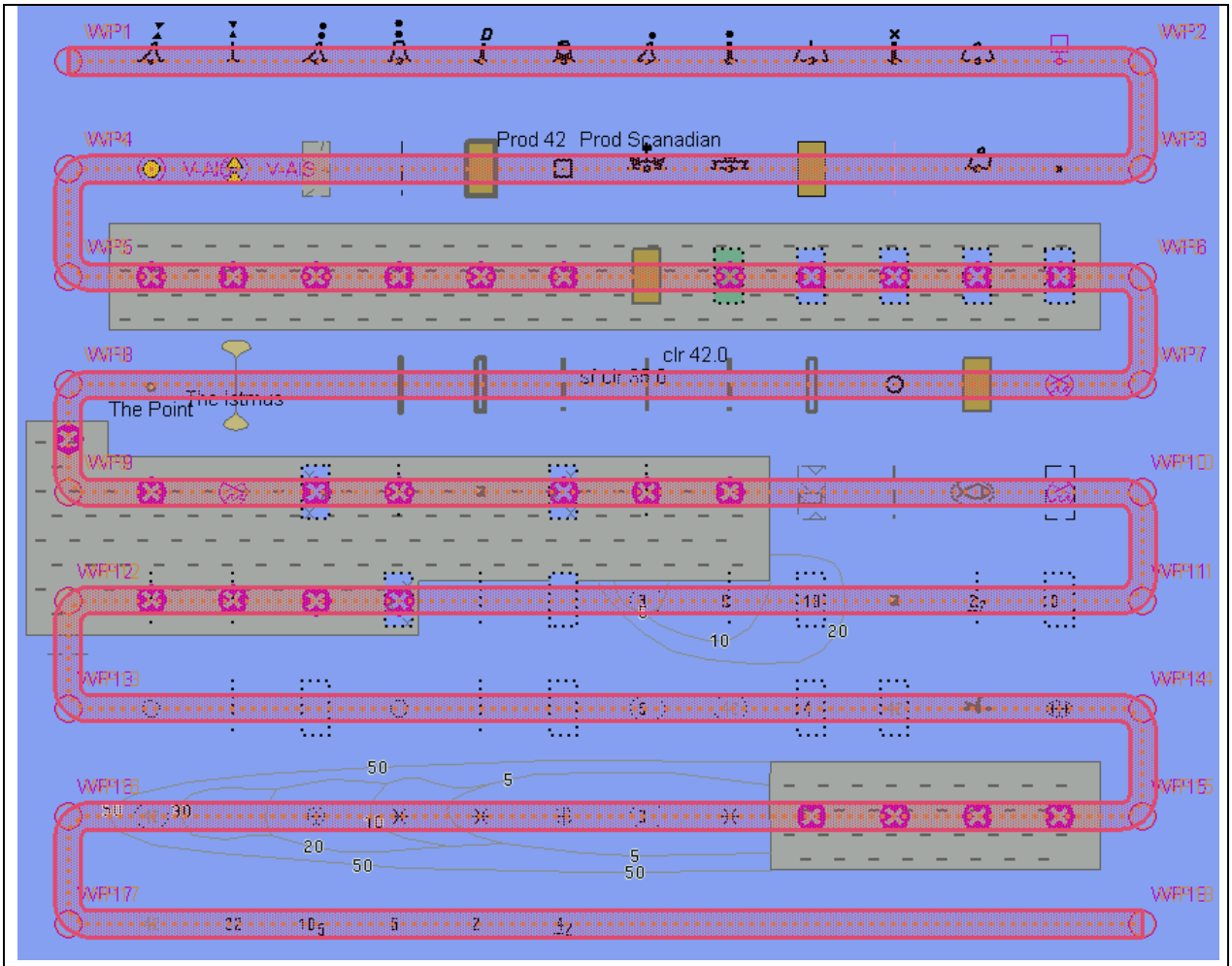
Safety Contour = 31 m



Safety Contour = 42 m

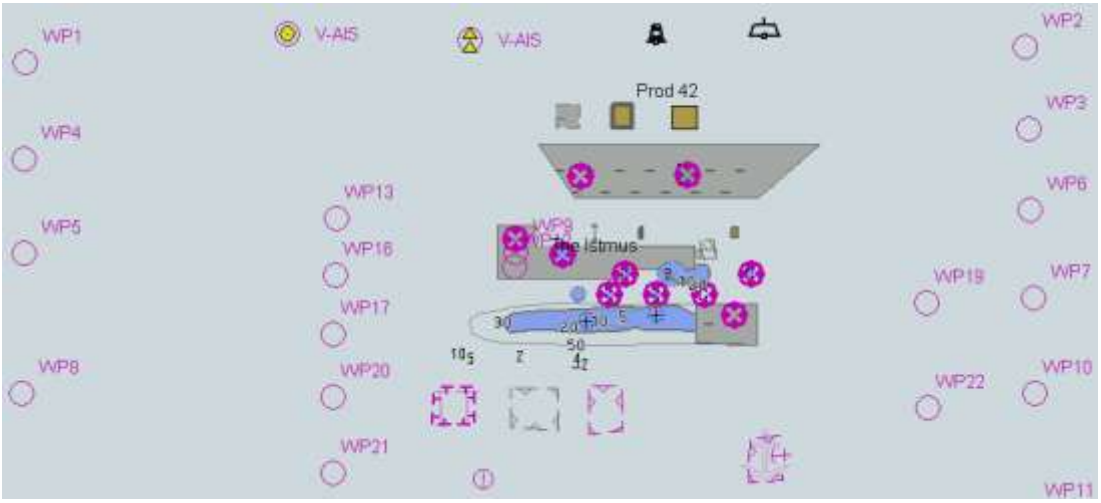


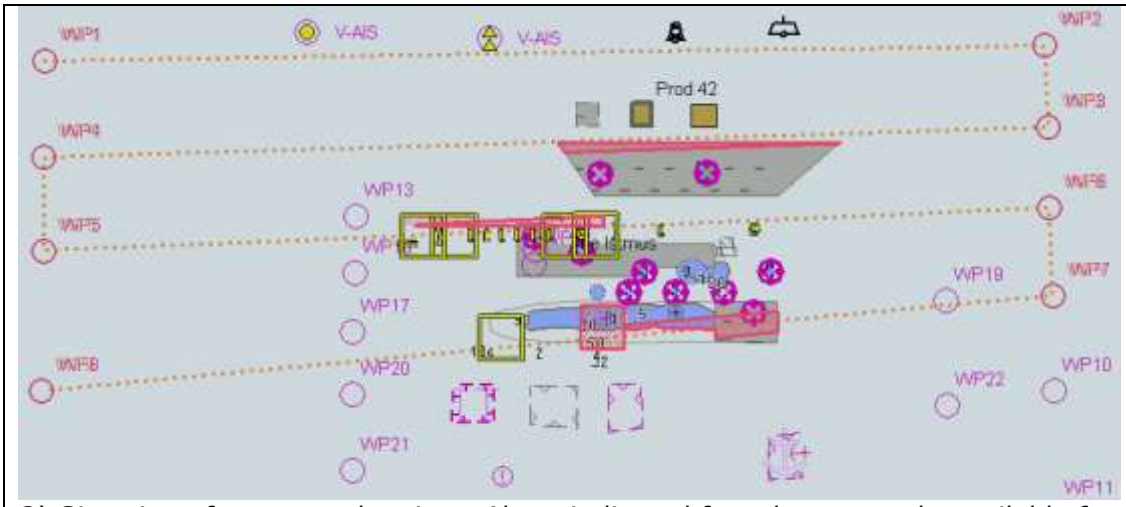
Safety Contour = 50 m



Safety Contour = 51 m

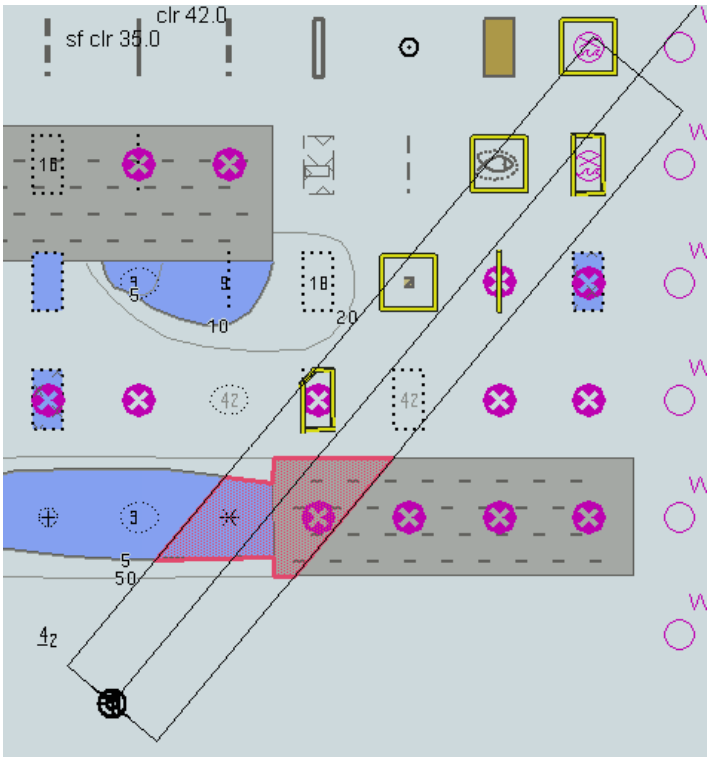
5.2 Detection and Notification of Navigational Hazards - Use of largest scale available

Test reference	5.2	IHO reference	S-52 10.5.9
Test description			
The purpose of this test is to verify by observation that ECDIS uses the largest scale available for detection of navigational hazards. *This test is performed by loading the test cells AA2OVRVU.000 and AA3NAVHZ.000, manually creating a route connecting all way points between feature objects marked as WP1 through WP8 and checking display against the corresponding graphical plot.*			
Set up			
Load cell AA3NAVHZ.000 from 5.0 Navigational Hazards/ENC ROOT *Load cell AA2OVRVU.000 from 5.0 Navigational Hazards/Overview/ENC ROOT* *Select Viewing group layer Other* *Set the safety contour value to 0 m* *Set the safety depth value to 30 m* *Select Symbolized Boundaries* *Select Paper chart symbols* *Deselect Accuracy* *Deselect Highlight info*			
Action			
Select position 39°57′·000N 104°49′·000W at compilation scale (1:350 000) of AA2OVRVU. *1) View chart before route planning* *2) Manually create a route connecting all way points between feature objects marked WP1 through WP8. Set user-specified distance for indication navigational hazards as 0.5 NM. Check ENC symbols shown in the ECDIS against the corresponding graphical plot.*			
Result			
The ENC in the ECDIS should match the corresponding graphical plot shown below.  *1) Situation before route planning. Chart AA2OVRVU displayed as it is-*			

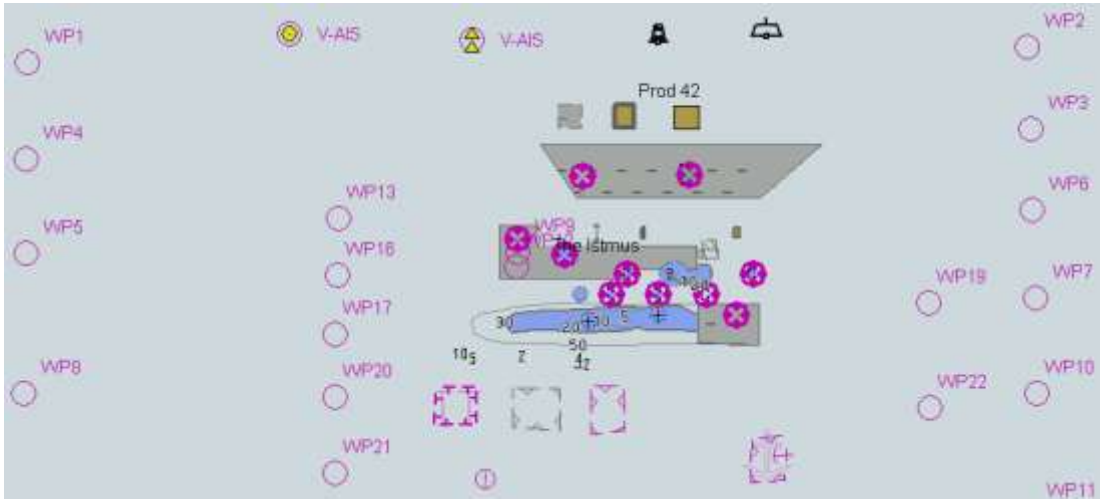


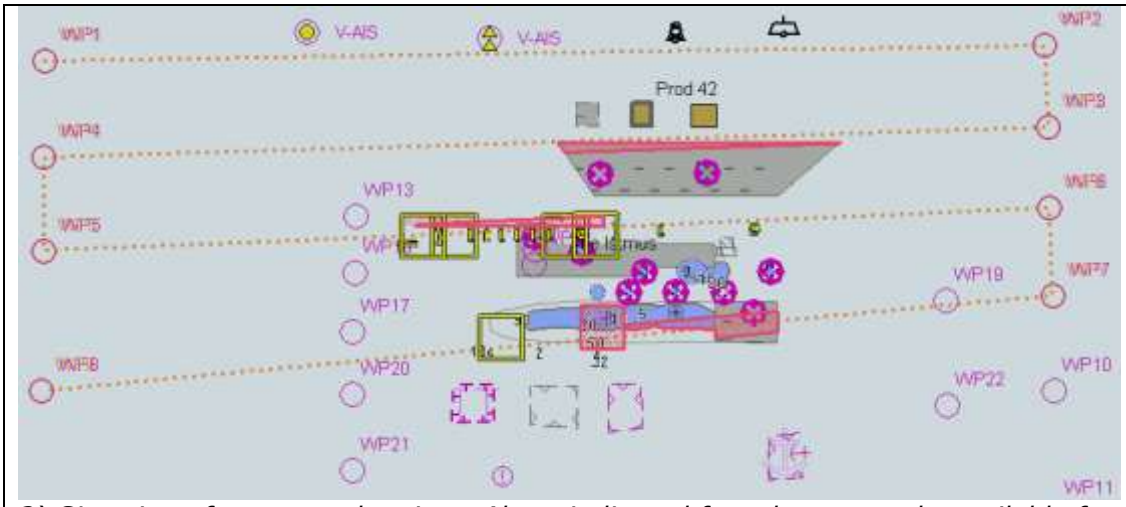
2) Situation after route planning. Alerts indicated from largest scale available for each location

5.3 Detection and Notification of Navigational Hazards - Basic test Monitoring Mode

Test reference	5.3	IHO Reference	S-52 10.5.9
Test description			
The purpose of this test is to verify by observation that ECDIS provides an appropriate indication if, continuing on its present course and speed, over a specified time or distance set by the Mariner, own ship will pass closer than a user-specified distance from any objects satisfying the conditions for this test (as listed in section 10.5.9 of IHO S-52 and included in the test cell AA3NAVHZ.000) that is shallower than the Mariner's safety contour. *This test is performed by loading the test cell AA3NAVHZ.000, sailing with a simulated ship over the test area, setting the and safety contour to the appropriate values (0m, 2m, 5m, 6m, 8m, 9m, 10m, 11m, 16m, 21m, 41m, 42m, 50m, 51m) and checking display against the graphical plots of test 5.1 (Route plan) corresponding to each set of safety contour settings.*			
Set up			
As for test 5.1			
Action			
Check ENC symbols shown in the ECDIS for each safety contour setting against the corresponding graphical plot.			
Result			
The ENC in the ECDIS should match the corresponding graphical plot of test 5.1.  *An example with Safety contour = 10 m.*			

5.4 Detection and Notification of Navigational Hazards - Use of largest scale available Monitoring Mode

Test reference	5.2	IHO reference	S-52 10.5.9
Test description			
The purpose of this test is to verify by observation that ECDIS uses the largest scale available for detection of navigational hazards. *This test is performed by loading the test cells AA2OVRVU.000 and AA3NAVHZ.000, manually creating a route connecting all way points between feature objects marked as WP1 through WP8 and checking display against the corresponding graphical plot.*			
Set up			
Load cell AA3NAVHZ.000 from 5.0 Navigational Hazards/ENC ROOT *Load cell AA2OVRVU.000 from 5.0 Navigational Hazards/Overview/ENC ROOT* *Select Viewing group layer Other* *Set the safety contour value to 0 m* *Set the safety depth value to 30 m* *Select Symbolized Boundaries* *Select Paper chart symbols* *Deselect Accuracy* *Deselect Highlight info*			
Action			
Select position 39°57′·000N 104°49′·000W at compilation scale (1:350 000) of AA2OVRVU. *1) View chart before route planning* *2) Manually create a route connecting all way points between feature objects marked WP1 through WP8. Set user-specified distance for indication navigational hazards as 0.5 NM. Check ENC symbols shown in the ECDIS against the corresponding graphical plot.*			
Result			
The ENC in the ECDIS should match the corresponding graphical plot shown below.  *1) Situation before route planning. Chart AA2OVRVU displayed as it is-*			



2) Situation after route planning. Alerts indicated from largest scale available for each location

6.0 Detection and notification of Areas for which Special Conditions Exist

6.1 Detection of Areas, for which Special Conditions Exist - Basic test

Test reference	6.1	IHO Reference	S-52 10.5.10

Test description

The purpose of this test is to verify by observation that ECDIS provides an appropriate indication when the Mariner plans a route closer than a user-specified distance from the boundary of a prohibited area or a geographic area for which special conditions exist. The objects satisfying the conditions for this test are listed in section 10.5.10 of IHO S-52 and are included in the test cell AA3ARSPC.000.

This test is performed by loading the test cell AA3ARSPC.000, manually creating a route connecting all way points between feature objects marked as WP1 through WP4 and checking display against the corresponding graphical plot.

Set up

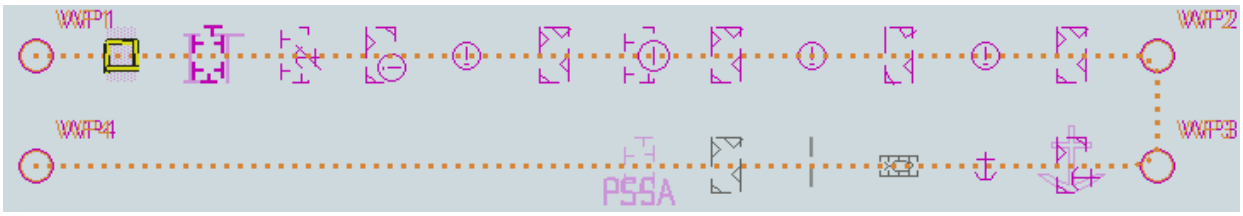
Load cell AA3ARSPC.000 from 6.0 Special Conditions/ENC_ROOT
Select Viewing group layer Other
Set the safety contour value to 0 m
Set the safety depth value to 30 m
Select Symbolized Boundaries
Select Paper chart symbols
Deselect Accuracy
Deselect Highlight info
Manually create a route connecting all way points between feature objects marked WP1 through WP4.
Set user-specified distance for indication of areas with special condition as 0.1 NM

Action

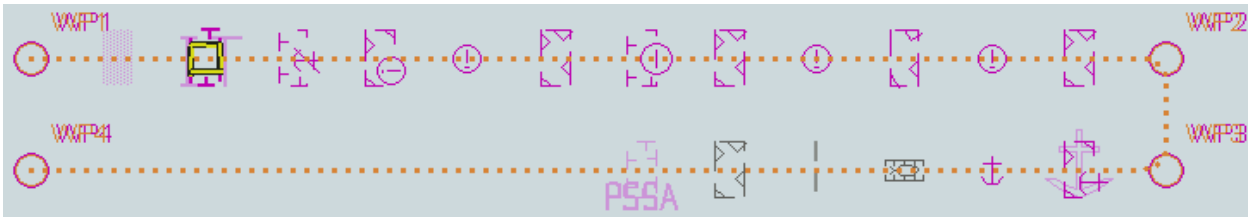
Check ENC symbols shown in the ECDIS against the corresponding graphical plot. selecting one by one each special condition for the test

Result

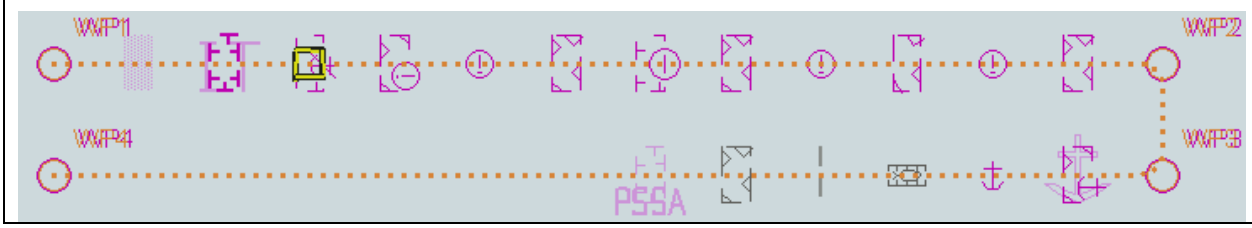
The ENC in the ECDIS should match the corresponding graphical plot shown below.



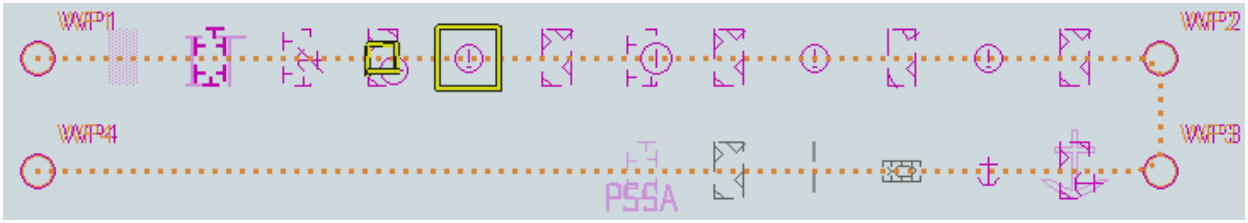
Selected: Traffic separation zone



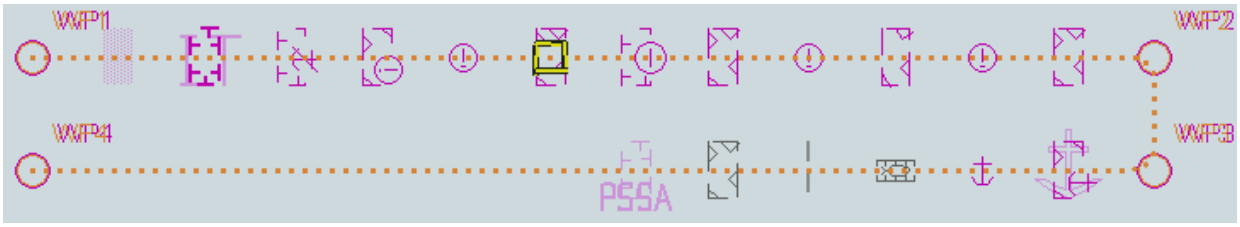
Selected: Inshore traffic zone



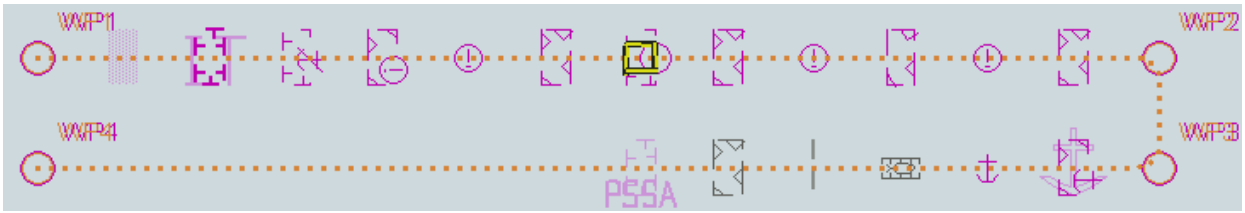
Selected: Restricted area



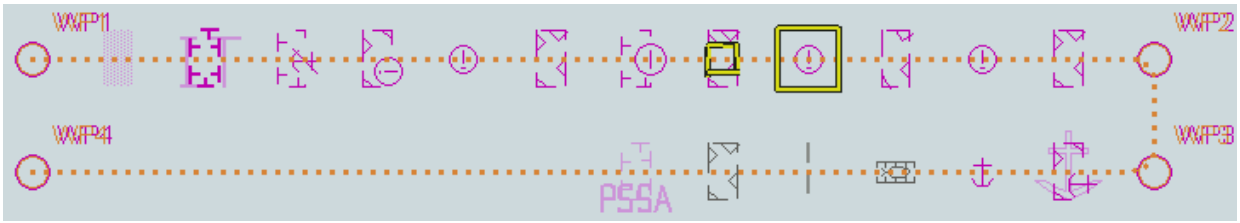
Selected: Caution area



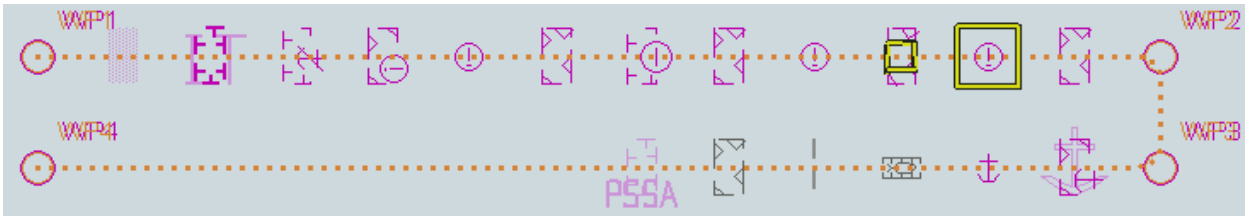
Selected: Offshore production area



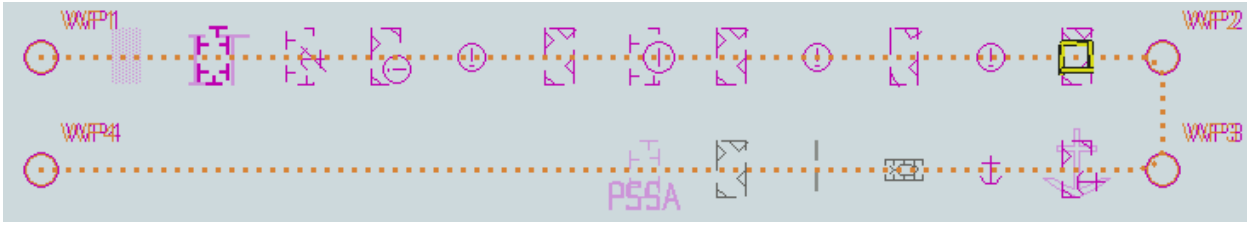
Selected: Area to be avoided



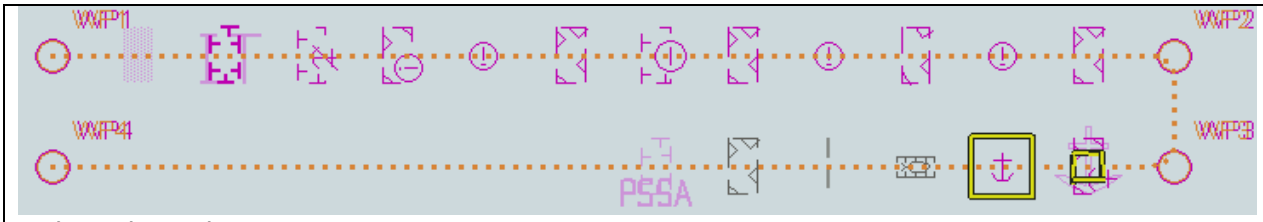
Selected: Military practice area



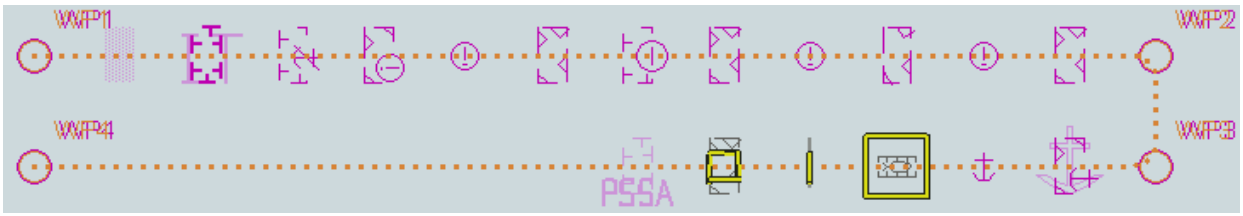
Selected: Seaplane landing area



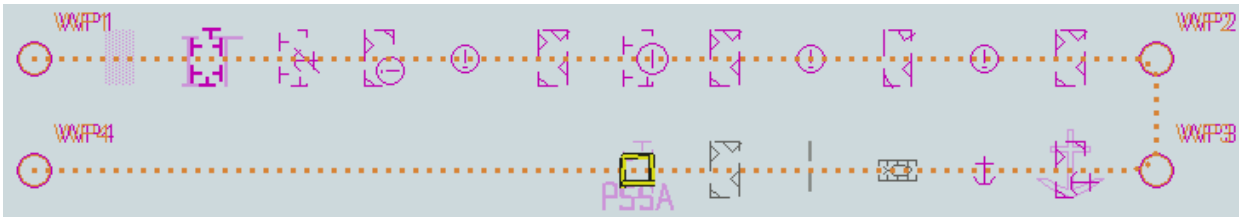
Selected: Submarine transit lane



Selected: Anchorage area



Selected: Marine farm/aquaculture



Selected: PSSA (Particularly Sensitive Sea Area)

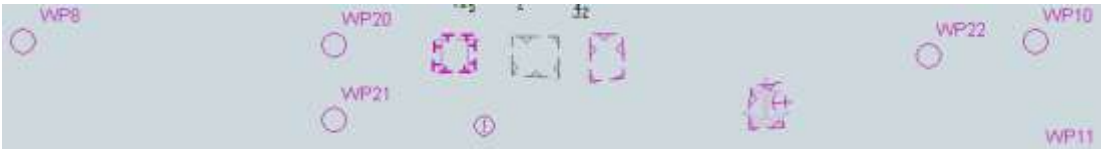
6.2 Detection of Areas, for which Special Conditions Exist Use of largest scale available

Test reference	6.2	IHO reference	S-52 10.5.9
Test description			
The purpose of this test is to verify by observation that ECDIS uses the largest scale available for detection of areas with special condition. *This test is performed by loading the test cells AA2OVRVU.000 and AA3ARSPC.000, manually creating a route connecting way points between feature objects marked as WP20 and WP22 and checking display against the corresponding graphical plot.*			
Set up			
As for test 6.1 in addition load cell 5.0 AA2OVRVU.000 from 5.0 Navigational Hazards/ENC_ROOT *Select Viewing group layer Other* *Set the safety contour value to 0 m* *Set the safety depth value to 30 m* *Select Symbolized Boundaries* *Select Paper chart symbols* *Deselect Accuracy* *Deselect Highlight info*			
Action			

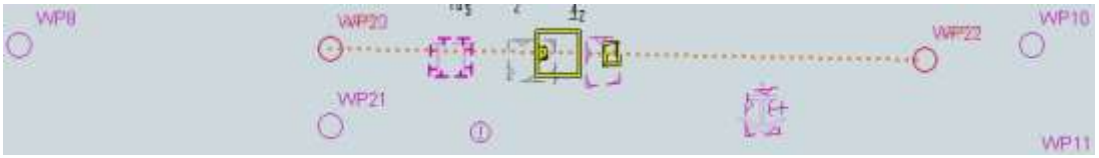
Select position 39°45′·000N 104°49′·000W at compilation scale (1:350 000) of AA2OVRVU.
1) View chart before route planning
2) Manually create a route connecting two way points between feature objects marked WP20 and WP22. Set user-specified distance for indication of areas with special conditions as 0.5 NM. Check ENC symbols shown in the ECDIS against the corresponding graphical plot.

Result

The ENC in the ECDIS should match the corresponding graphical plot shown below.

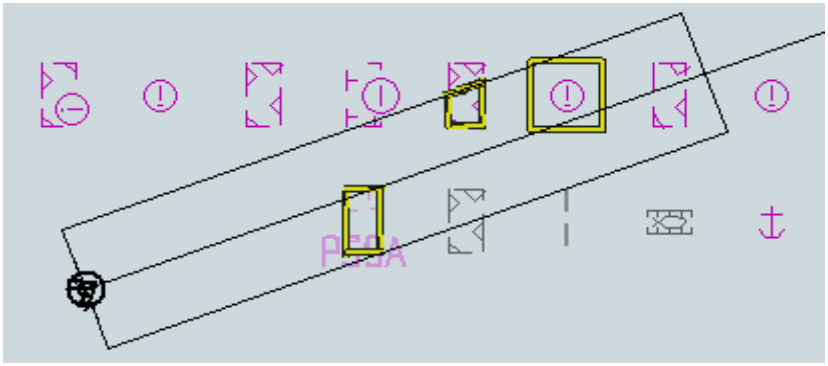


1) Situation before route planning. Chart AA2OVRVU displayed as it is-

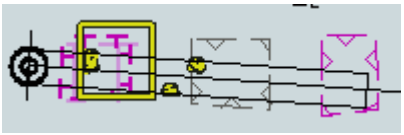


2) Situation after route planning. Alerts indicated from largest scale available for each location. An example with Seaplane landing area and Marine farm/culture area as selected.

6.3 Detection of Areas, for which Special Conditions Exist Monitoring Mode

Test reference	6.3	IHO Reference	S-52 10.5.10
Test description			
The purpose of this test is to verify by observation that ECDIS provides an appropriate alarm or indication, as selected by the Mariner, if, within a specified time set by the Mariner, own ship will cross the boundary of a prohibited area or area for which special conditions exist. The objects satisfying the conditions for this test are listed in section 10.5.10 of IHO S-52 and are included in the test cell AA3ARSPC.000. *This test is performed by loading the test cell AA3ARSPC.000, sailing with a simulated ship over the test area, selecting one by one each special condition for the test and checking display against the graphical plots of test 6.1 (Route plan) corresponding to each set of safety contour settings.*			
Set up			
As for test 6.1			
Action			
Check ENC symbols shown in the ECDIS for each special condition against the corresponding graphical plot.			
Result			
The ENC in the ECDIS should match the corresponding graphical plot of test 6.1.  *An example with PSSA and Military practice area as selected.*			

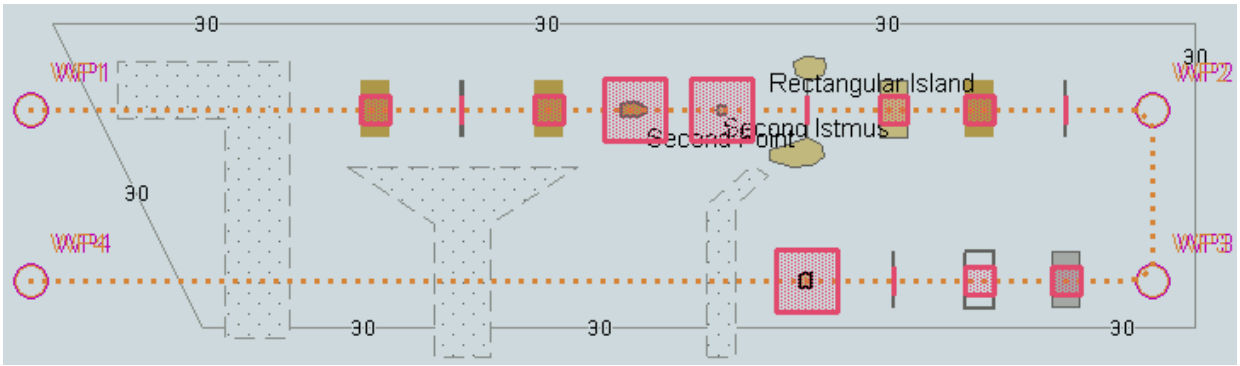
6.4 Detection of Areas, for which Special Conditions Exist Use of largest scale available Monitoring Mode

Test reference	6.4	IHO reference	S-52 10.5.9
Test description			
The purpose of this test is to verify by observation that ECDIS uses the largest scale available for detection of areas with special condition. *This test is performed by loading the test cells AA2OVRVU.000 and AA3ARSPC.000, sailing with a simulated ship over the test area, selecting one by one each special condition for the test and checking display against the graphical plots of tests 6.1 and 6.2 (Route plan) corresponding to each special condition settings.*			
Set up			
As for test 6.2			
Action			
Check ENC symbols shown in the ECDIS for each special condition against the corresponding graphical plot			
Result			
The ENC in the ECDIS should match the corresponding graphical plot of test 6.1 and 6.2.  *An example An example with Seaplane landing area and Marine farm/culture area as selected*			

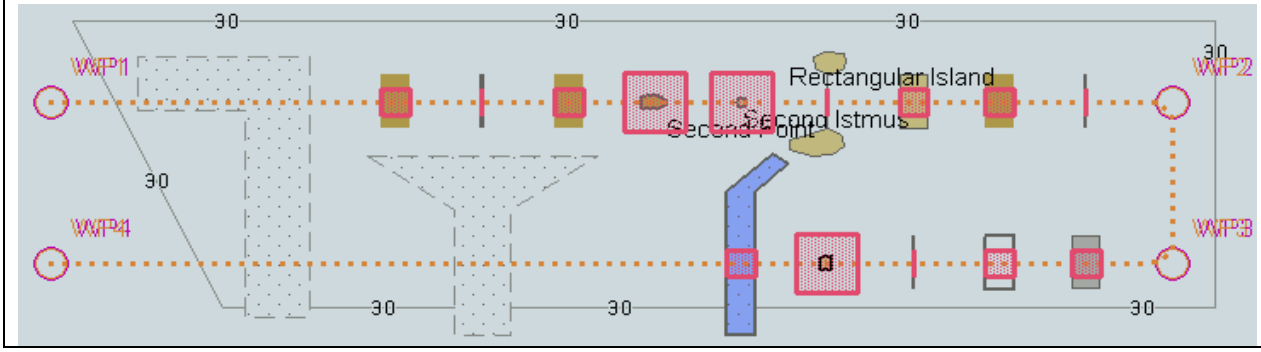
7.0 Detection and Notification of the Safety Contour

7.1 Detection and Notification of the Safety Contour Basic test

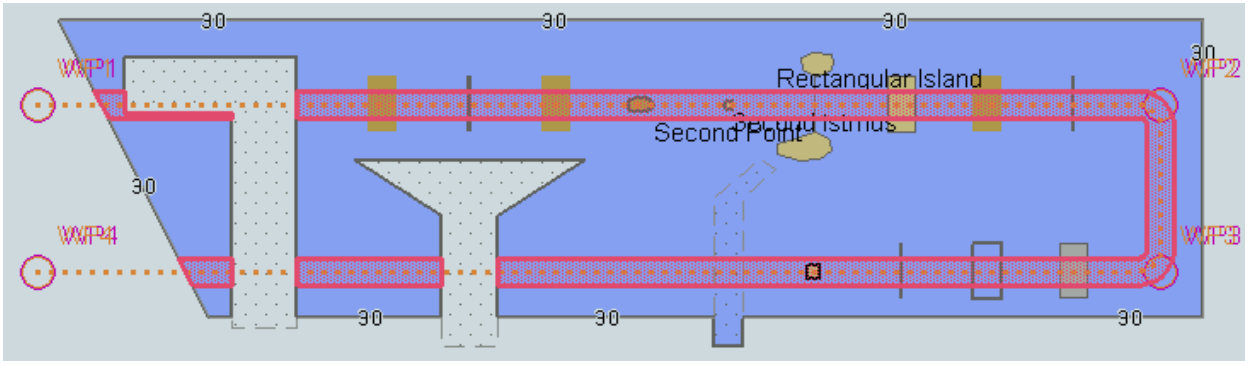
Test reference	7.1	IHO Reference	S-52 10.5.12
Test description			
The purpose of this test is to verify by observation that ECDIS provides an appropriate indication when the Mariner plans a route across an own ship's safety contour. The objects satisfying the conditions for this test are listed in section 10.5.12 of IHO S-52 and are included in the test cell AA3SAFCO.000. *This test is performed by loading the test cell AA3SAFCO.000, manually creating a route connecting all way points between feature objects marked as WP1 through WP4 and checking display against the corresponding graphical plot.*			
Set up			
Load cell AA3SAFCO.000 from 7.0 Safety Contour/ENC_ROOT *Select Viewing group layer Other* *Set the safety contour value to 0 m* *Set the safety depth value to 30 m* *Select Symbolized Boundaries* *Select Paper chart symbols* *Deselect Accuracy* *Deselect Highlight info* *Manually create a route connecting all way points between feature objects marked WP1 through WP4.* *Set user-specified distance for detecting of safety contour as 0.1 NM*			
Action			
Check ENC symbols shown in the ECDIS against the corresponding graphical plot. *Repeat sequentially safety contour for 0m, 6m, 11m, 13m, 43m*			
Result			
The ENC in the ECDIS should match the corresponding graphical plot shown below.			



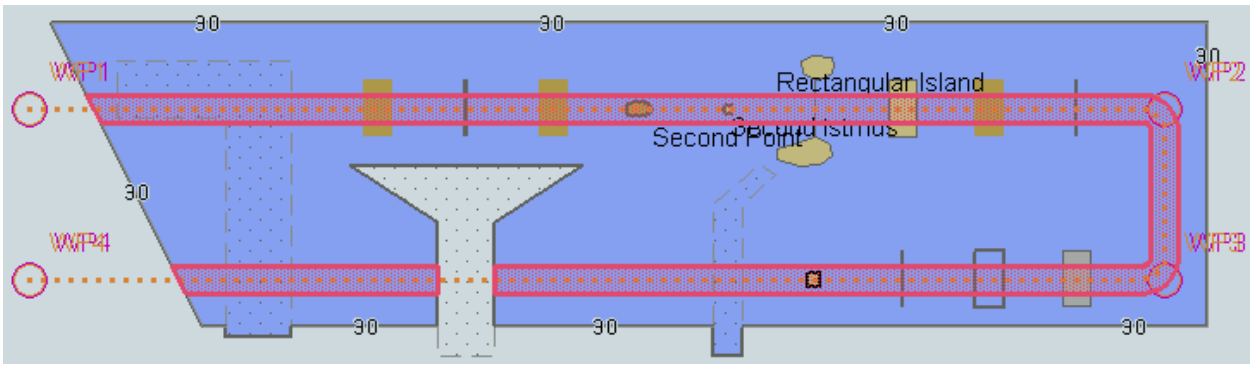
Safety Contour = 0 m



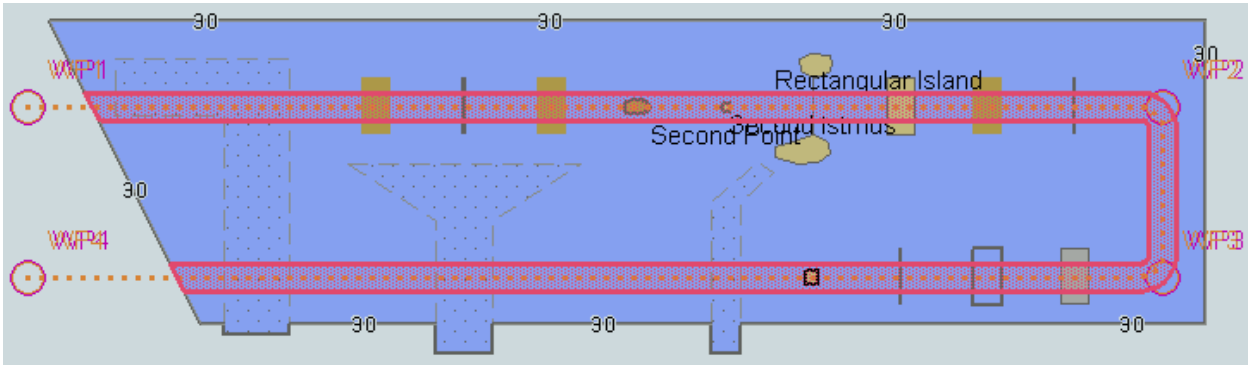
Safety Contour = 6 m



Safety Contour = 11 m

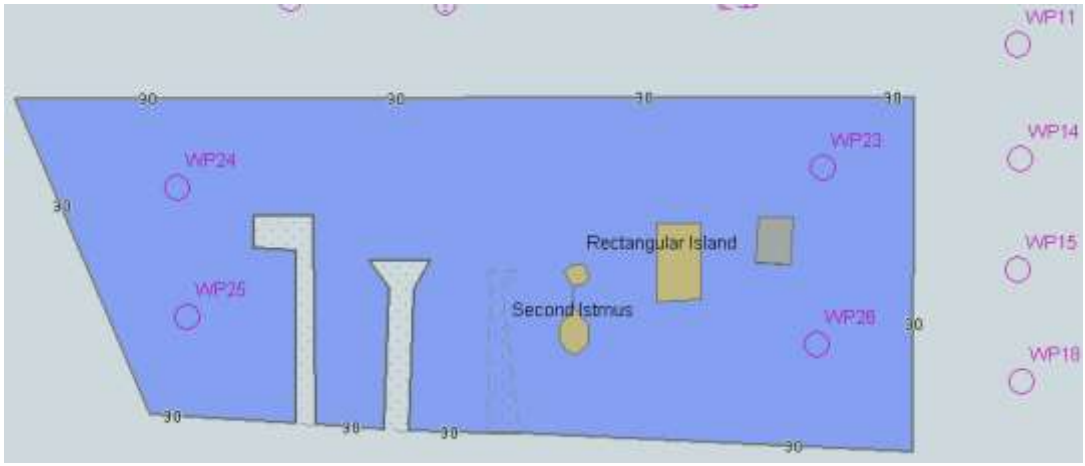


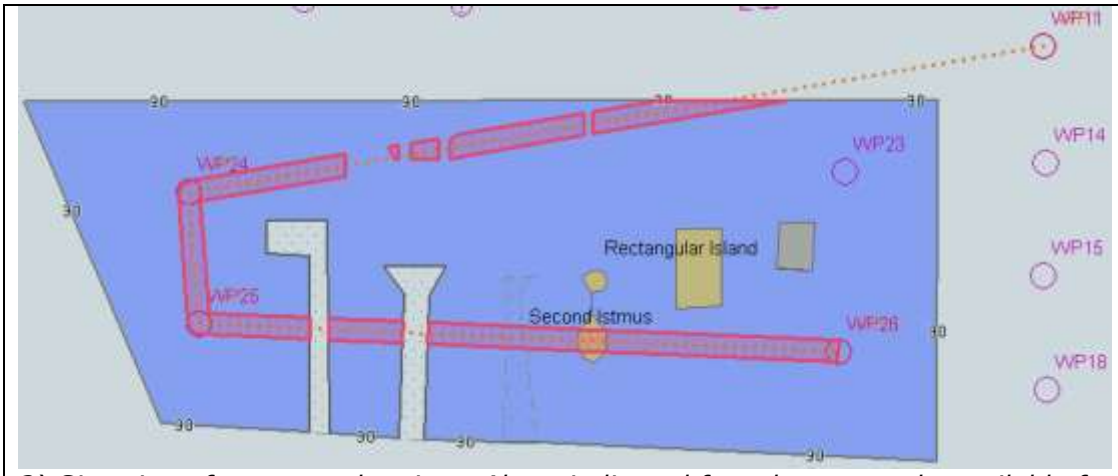
Safety Contour = 13 m



Safety Contour = 43 m

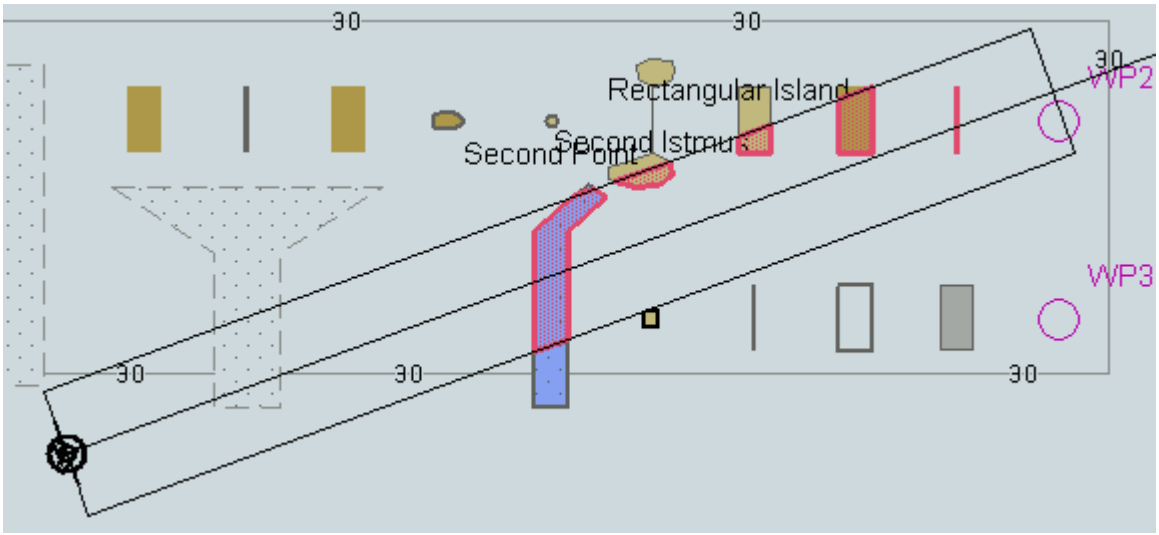
7.2 Detection and Notification of the Safety Contour - Use of largest scale available

Test reference	7.2	IHO reference	S-52 10.5.9
Test description			
The purpose of this test is to verify by observation that ECDIS uses the largest scale available for detection of areas with special condition. *This test is performed by loading the test cells AA2OVRVU.000 and AA3SAFCO.000, manually creating a route connecting way points between feature objects marked as WP11, WP24, WP25 and WP26 and checking display against the corresponding graphical plot.*			
Set up			
As for test 7.1 in addition Load cell AA2OVRVU.000 from 5.0 Navigational Hazards/ENC_ROOT *Select Viewing group layer Other* *Set the safety contour value to 0 m* *Set the safety depth value to 30 m* *Select Symbolized Boundaries* *Select Paper chart symbols* *Deselect Accuracy* *Deselect Highlight info*			
Action			
Select position 39°27′·000N 104°49′·000W at compilation scale (1:350 000) of AA2OVRVU. *1) View chart before route planning* *2) Manually create a route connecting way points between feature objects marked WP11, WP24, WP25 and WP26. Set user-specified distance for indication navigational hazards as 0.5 NM. Check ENC symbols shown in the ECDIS against the corresponding graphical plot.*			
Result			
The ENC in the ECDIS should match the corresponding graphical plot shown below.  *1) Situation before route planning. Chart AA2OVRVU displayed as it is*			

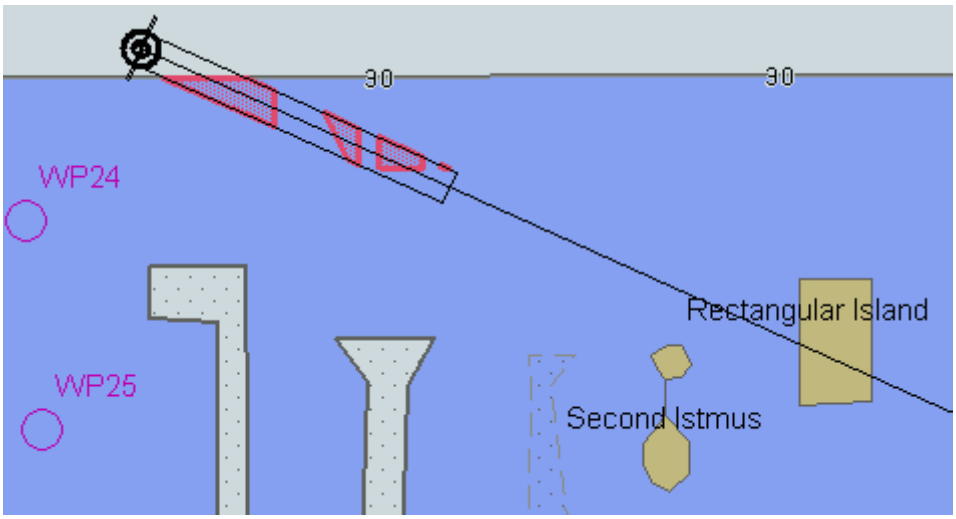


2) Situation after route planning. Alerts indicated from largest scale available for each location. An example with Safety contour = 11 m.

7.3 Detection and Notification of the Safety Contour Basic test Monitoring Mode

Test reference	7.3	IHO Reference	S-52 10.5.12
Test description			
The purpose of this test is to verify by observation that ECDIS provides an appropriate alarm if the ship, within a specified time set by the Mariner, is going to cross own ship's safety contour. The objects satisfying the conditions for this test are listed in section 10.5.12 of IHO S-52 and are included in the test cell AA3SAFCO.000. *This test is performed by loading the test cell AA3SAFCO.000, sailing with a simulated ship over the test area, setting the and safety contour to the appropriate values (0m, 6m, 11m, 13m, 43m) and checking display against the graphical plots of test 7.1 (Route plan) corresponding to each set of safety contour settings.*			
Set up			
As for test 7.1			
Action			
Check ENC symbols shown in the ECDIS for each safety contour setting against the corresponding graphical plot.			
Result			
The ENC in the ECDIS should match the corresponding graphical plot of test 7.1  An example with Safety contour = 6 m.			

7.4 Detection and Notification of the Safety Contour Use of largest scale available Monitoring Mode

Test reference	7.4	IHO reference	S-52 10.5.9
Test description			
The purpose of this test is to verify by observation that ECDIS uses the largest scale available for detection of areas with special condition. *This test is performed by loading the test cells AA2OVRVU.000 and AA3SAFCO.000, sailing with a simulated ship over the test area, setting the and safety contour to the appropriate values (0m, 6m, 11m, 13m, 43m) and checking display against the graphical plots of tests 7.1 and 7.2 (Route plan) corresponding to each set of safety contour settings.*			
Set up			
As for test 7.2			
Action			
Check ENC symbols shown in the ECDIS for each safety contour setting against the corresponding graphical plot.			
Result			
The ENC in the ECDIS should match the corresponding graphical plot of test 7.1 and 7.2.  *An example with Safety contour = 11 m.*			