

IHO Test Datasets for ECDIS

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Instruction Manual for the Use of IHO Test Datasets in ECDIS

IHO



International
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Published by the
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4b quai Antoine 1^{er}
Principauté de Monaco
Tel: (377) 93.10.81.00
Fax: (377) 93.10.81.40
info@iho.int
www.iho.int

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Document History

Changes to this Specification are coordinated by the S-98/S-164 Sub-Group, a Project Team under the IHO S-100 Working Group. New editions will be made available via the IHO website. Maintenance of the Specification shall conform to IHO Resolution 2/2007 (as amended).

Version Number	Date of Issue	Author(s)	Brief Description of Change(s)
1.0.0	01/03/2023	S100WG	Initial Draft
1.1.0	31/03/2023	S100WGTSM9	Updated following feedback from TSM9 meeting.
1.2.0	31/12/2023	J. Pritchard	Updated following new datasets and S-100WG meetings.
1.3.0	14/06/2024	J. Pritchard	Updated with v1.2.0 dataset content, and new form.
1.4.0	04/10/2024	J. Pritchard	Updates following S-98 review and implementation of new settings form.
1.9.0	31/01/2025	J. Pritchard	Updates following latest S-98 revision and reorganisation. Version for HSSC submission and finalisation with test dataset construction.
1.9.1	30/09/2025	J. Pritchard	Updates including global revision of the screenshots and integration of new tests for non-S-101 products.
1.9.2	16/02/2026	J. Pritchard	Updates including addition tests for non ENC products, revision of existing tests and general review (but non exhaustive) of the document content.

1 Introduction

The International Hydrographic Organization (IHO) Test Datasets (TDS) for Electronic Chart and Display Information System (ECDIS) have been produced to fulfil the requirement for data necessary to accomplish all ECDIS testing requirements as outlined in the IEC 61174 standard. The TDS has been published as IHO Publication Number 164 and consists of numerous data sets required for testing as well as this guide, the TDS Instruction Manual. This Instruction Manual 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.

1.1 Acknowledgements

Edition 2.0.0 and its subsequent clarifications have been produced with assistance from many expert contributors and members of the IHO S-100 WG, the ENC Working Group (ENCWG), testbed developers, early S-100 OEM adopters, and associated expert contributors; their input during the drafting and revision process has been invaluable.

1.2 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:

EUT – Equipment Under Test
HMI – Human Machine Interface
TDS – Test Datasets

1.3 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.

1.4 Normative References:

- S-100 *Universal Hydrographic Data Model*, IHO Publication S-100, Edition 5.2.
- S-98 *S-100 ECDIS and Interoperability Specification*, Edition 3.0 .
- IEC 61174 *Maritime navigation and radiocommunication equipment and systems - Electronic chart display and information system (ECDIS) - Operational and performance requirements, methods of testing and required test results*, 2015.
- IEC 63173-2 *Maritime navigation and radiocommunication equipment and systems - Data interfaces - Part 2: Secure communication between ship and shore (SECOM)*, 2022.

1.5 Preface to Edition 2.0.0

IHO S-164 is dependent for some of its content on the existence of comprehensive TDS (which it documents) and systems which have implemented correctly the requirements of IHO S-100 (and allied) standards.

As 2.0 is the initial operational version of S-164 there are few fully developed S-100 systems in place, and some datasets are still under development. Therefore, some of the tests documented may not contain reference screenshots from S-100 implementations – where this is the case screenshots have been noted with “[TBD]” (“to be determined”).

As version 2.0 is refined, and implementation of S-100 matures these gaps will be filled in this manual. Additional tests reflecting the complete functionality specified as mandatory in the operational edition of S-98 may need to be added as refinements and clarifications to this operational edition of S-164. Such refinements will be noted in the clarification number of this document. Tests may be marked with a “To do” planned enhancement where this is the case.

This version of the manual is accompanied by named exchange sets available from the IHO for use in type approval testing. Additions to such exchange sets will also be added as tests are refined as required.

References to both IEC61174 and IHO S-98 are definitive in this operational version of S-164. The scope of S-164 is fully constrained by the requirements set out in S-98. For all test cases, S-98 contains the expected and definitive behaviour.

As portrayal and feature catalogue contents are updated for the relevant product specifications screenshots will be updated with the latest portrayal images and, if necessary, tests for complex portrayal will be enhanced.

With the advent of updated feature and portrayal catalogues, and the finalisation of the ECDIS performance standard for ECDIS, it is finally possible to state the complete “scope” of IHO S-164 as that which implements the requirements laid out in S-98. Where such requirements are optional in S-98, they will be similarly noted in this operational edition of S-164. The complete text of many of the newly introduced tests introduced in this edition will be finalised as the TDS are completed, and as implementations of ECDIS make available the complex functionality contained in the S-100 standards.

1.6 Key Documents Organizations and Relationships

The development and application of the TDS involves several organizations and related specifications (see Figure 1). The TDS was produced by the IHO to allow for the complete testing of ECDIS equipment (hardware and software) in respect of the ECDIS Performance Standard. The ECDIS Performance Standard

is specified by the International Maritime Organization (IMO) in MSC.530(106), 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 these standards must use the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid international standards.

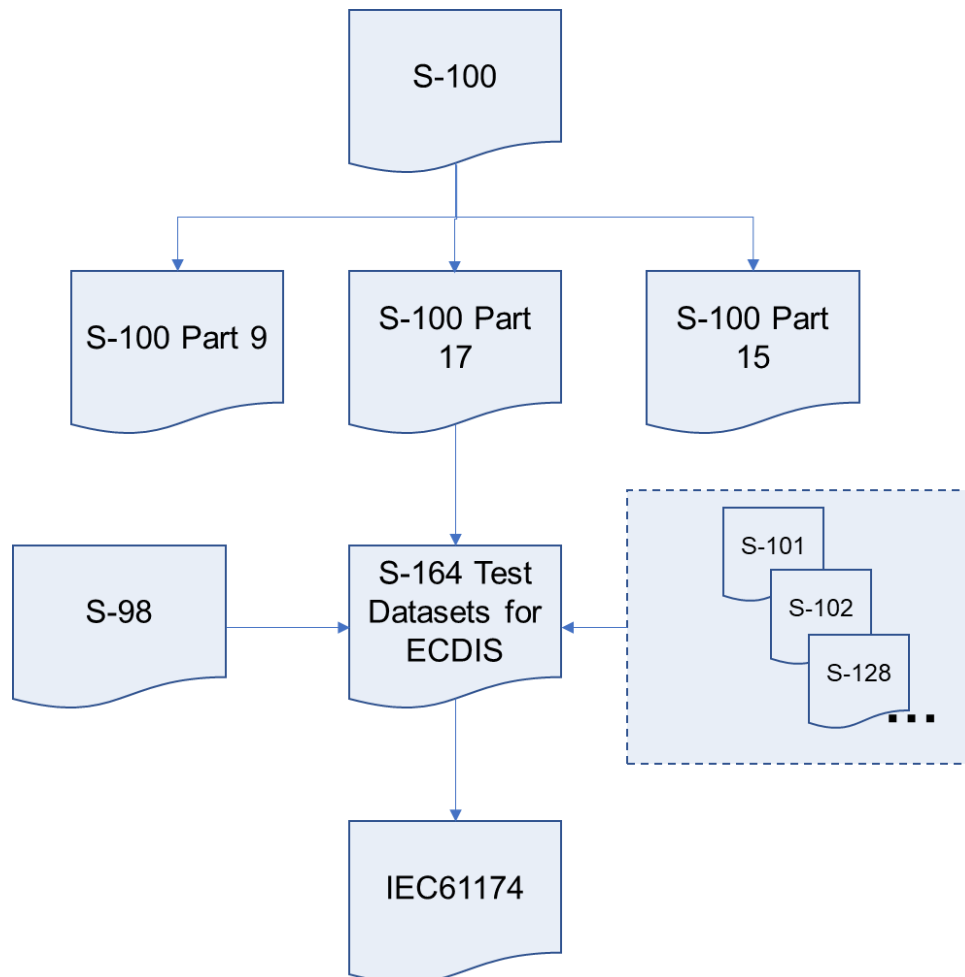


Figure 1 - The TDS and its relationship to other standards.

The S-164 TDS contain both encrypted and unencrypted data. The inclusion of an encrypted dataset, conforming to S-100 Part 15, is so that ECDIS data loading and management operations can be tested under IEC 61174. There are also unencrypted datasets which test visualisation and operational aspects of the ECDIS in respect of its compatibility with S-100 data in various forms. S-164 also now contains datasets which test the dual fuel mode of ECDIS, mixing S-57 and S-101 electronic navigational charts.

1.7 Structure of the Instruction Manual

This document consists of an introduction followed by tests grouped into major sections in a task-based layout. All tests are listed in a common format which is shown in the test template below:

Test Reference	S-164 Test Name	IHO Reference IEC Reference	IHO Standard reference IEC Standard reference
Test Description			
A short description of what the test covers.			
Setup			

The configuration required before performing the test. Generally, starts with reference to another test: “As per end (or possibly “start”) of test xxxxxx (test name)” and mentions exchange sets to be loaded, specific settings to be applied and any other information required.			
Display Mode		Independent Mariner’s Selections (Default = On)	
Displaybase, Standard or Other		Accuracy	
Context Parameters (Default = On)		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown objects	
Radar overlay		Update review	
Plain boundaries		Chart text	
Simplified symbols		Important text	
Full light lines		Other Text	
Ignore scale minimum		Names	
Shallow water dangers		Light description	
Palette		All other chart text	
Day, Dusk or Night			
Viewing Date (or Date Range)		Display	
Start viewing date		Centre	The position at which the display must be centred.
End viewing date		Scale	Dataset viewing scale.
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys, beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships’ routeing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Action			
The action which the test executor must perform after the setup is in place and before checking the expected results.			
Results			
The result which the test executor must observe to complete the test.			

1.8 Screenshots

Screenshots are widely used in this manual to show the expected results of the test on the EUT graphics window. The window of the EUT must have the minimal characteristics as described in S-98 and the applicable ECDIS testing standards – these are not documented here.

1.9 Organization and Coverage of the TDS

The TDS contains a named directory for each section of the Instruction Manual which requires test data. Depending on the test requirement, the named folder contains an S100_ROOT directory containing the files of the exchange set (e.g., CATALOG.XML), plus any required catalogues, updates or other optional/related files, e.g., .TIF, .TXT necessary.

The TDS data for encrypted data, located in section 2.6, contains multiple named exchange sets, each with their own S100_ROOT directory and full test scripts describing how to use the data.

The location (or path) of the exchange sets will be indicated using bold italic notation, e.g., ***Powerup***. Tests are structured so that data is imported from standard S-100 (and S-57 for dual fuel tests) exchange sets only, with no individual datasets requiring import. Datasets themselves are sometimes named individually in the tests for reference where necessary. Exchange sets do not contain all necessary catalogues. These should be pre-loaded from the **Catalogues** exchange set with the exception of tests in Section 2.1 which test the loading of catalogues themselves. Once installed, catalogues should not require re-installation but testers may find it helpful to delete the system database contents between tests.

TDS are arranged in a number of spatially disjoint schemes, with S-57 and S-100 datasets located in close proximity (to facilitate dual fuel testing). Examples of the schemes, and individual dataset names are illustrated in the following diagrams. These show the extent of the S-101 charts comprising the TDS. Other S-100 products are layered on top of these datasets and are integrated with the named exchange sets referenced in each individual test.

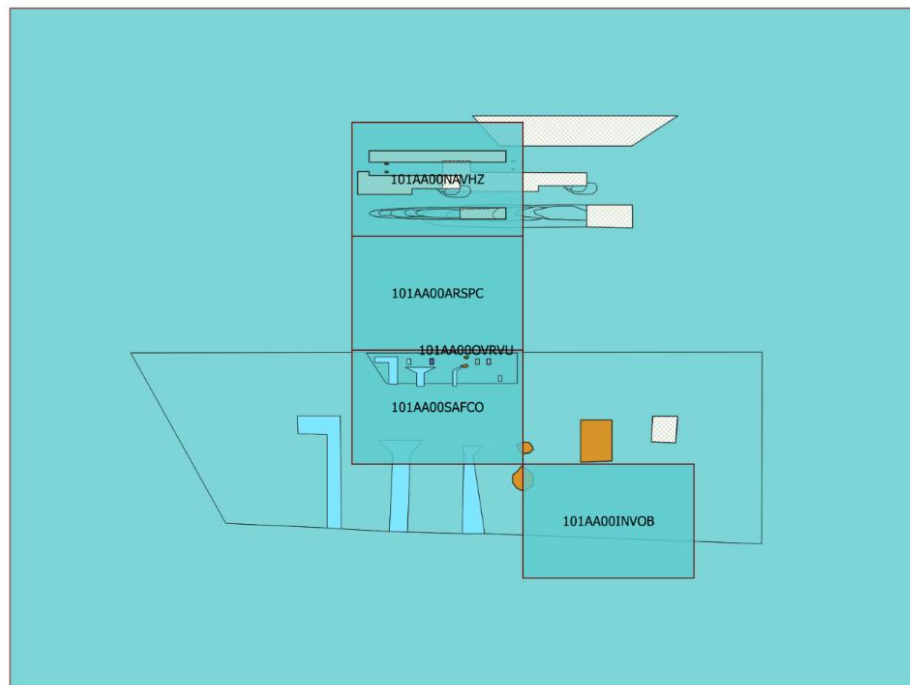


Figure 2 - Data Scheming for Alert and Indication Tests

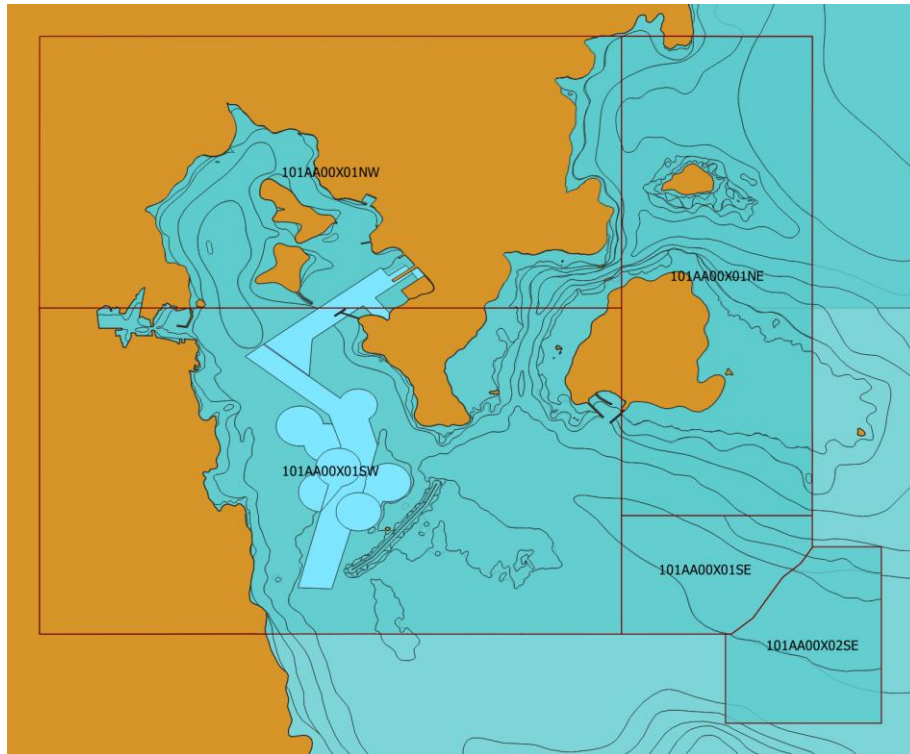


Figure 3 - Cartographic cell overview

1.10 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:

1. *IHO S-98*
2. *IHO S-164 test datasets for ECDIS which includes both encrypted and unencrypted datasets, and updates, together with the associated instruction manual.*

ECDIS Chart 1 and colour differentiation diagrams must also be acquired and installed on the EUT by the manufacturer, prior to the beginning of the tests.

The second item, the IHO TDS, is provided as part of S-164, including the encrypted data and its test scripts. This document is to be considered the “Instruction Manual”. The IHO TDS may be upgraded from time to time to correct residual anomalies and ensure that the results of the tests conform to the description in this Manual.

It is important to ensure that the tests are conducted with the latest version posted on the IHO web site at <http://www.iho.int> > (ENCs & ECDIS). The version number will remain the same as long as the corrections do not impact this document.

[All tests using data assume the system has preloaded the correct catalogues. Aside from Section 1 of this manual, all systems should pre-install the necessary catalogues, contained in exchange set “PowerUpCatalogues” as a pre-requisite. This will ensure the correct portrayal. Section 1 of this manual is concerned with correct behaviour of catalogue installation.]

1.11 Testing of SECOM requirements

S-164 contains tests to satisfy the requirement for unidirectional data transfer using the SECOM standard

(IEC63173-2). This requirement is contained in S-98 and is optional in the current edition of S-98 2.0.0.

Unlike the other tests specified in this manual, the SECOM interfaces are not tested exclusively with test data but are performed by connecting the ECDIS to a conformant SECOM network service and executing the documented test scripts.

The infrastructure for executing SECOM tests is hosted by the IHO and instructions for its use are available from the S-100 ECDIS IHO web page. This manual contains instructions for test procedures and confirmation of correct receipt of the SECOM test data.

For testing of SECOM requirements, refer to Annex A of this document.

2 Catalogue and Dataset Loading and Updating

2.1 Catalogue Loading and System Initialisation

2.1.1 Initial Catalogues

Test Reference	InitialCatalogues	IHO Reference IEC Reference	S-98: 20.1
Test description			
<i>This test ensures the EUT supports the import of initial Feature and Portrayal Catalogues and checks they are persistent in the EUT.</i>			
Setup			
<i>Clear all EUT Catalogue and data contents.</i>			
Action			
<i>Import the catalogues contained in the exchange set InitialCatalogues. [Note: the method by which catalogues are installed is not prescribed by S-164 and may be by any method developed by the OEM]</i>			
Results			
<i>Verify the versions of the S-100 Feature Catalogues and Portrayal Catalogues is correct. The correct information is shown in the following table:</i>			
Catalogue	Product	Version	
Feature Catalogue	S-101	1.9.0	
Portrayal Catalogue	S-101	1.9.0	
Feature Catalogue	S-102	3.0.0	
Portrayal Catalogue	S-102	3.0.0	
Feature Catalogue	S-104	2.0.0	
Feature Catalogue	S-111	1.9.0	
Portrayal Catalogue	S-111	1.9.0	
Feature Catalogue	S-122	2.0.0	
Portrayal Catalogue	S-122	2.0.0	
Feature Catalogue	S-124	1.9.0	
Portrayal Catalogue	S-124	1.9.0	
Feature Catalogue	S-127	2.0.0	
Portrayal Catalogue	S-127	2.0.0	
Feature Catalogue	S-128	2.0.0	
Portrayal Catalogue	S-128	2.0.0	
Feature Catalogue	S-129	2.0.0	
Portrayal Catalogue	S-129	2.0.0	
Feature Catalogue	S-131	2.0.0	
Portrayal Catalogue	S-131	2.0.0	
Feature Catalogue	S-411	2.0.0	
Portrayal Catalogue	S-411	2.0.0	

2.1.2 Out of Catalogue Sequence Dataset

Test Reference	OutOfCatalogueSequence Dataset	IHO Reference IEC Reference	S-98: 20.1 and B-1
Test description			
<i>This test ensures the EUT will detect mismatches between PS versions of installed Catalogues and imported dataset.</i>			
Setup			
<i>As per test Initial Catalogues (exchange set InitialCatalogues loaded).</i>			
Action			
<i>Import the exchange set OutOfCatalogueSequenceDataset.</i>			
Results			
<i>The Dataset installation process shall stop, issuing the user with the error message SSE133 "Version mismatch between 10100AA_X01NE and S-101 Feature Catalogue 1.9.0. Only version 2.0.0 is supported for data of this type (S-101 ENC)".</i>			

2.1.3 Valid Catalogue Update and Data

Test Reference	UpdateCatalogues	IHO Reference IEC Reference	S-98: 20.1 and B-1
Test description			
This test ensures EUT supports the management and update of Feature and Portrayal Catalogues.			
Setup			
As per test Initial Catalogues (exchange set InitialCatalogues loaded).			
Action			
1. Import the following exchange sets: <ul style="list-style-type: none">PowerUpCataloguesUpdatedCatalogueData			
2. Verify the versions of all catalogues installed.			
Results			
1. The exchange sets shall install without any warning messages.			
2. The EUT shall allow at least the following catalogue versions to be listed:			
Catalogue	Product	Version	
Feature Catalogue	S-101	2.0.0	
Portrayal Catalogue	S-101	2.0.0	
Feature Catalogue	S-101	2.5.0	
Portrayal Catalogue	S-101	2.5.0	
Feature Catalogue	S-101	2.6.0	
Portrayal Catalogue	S-101	2.6.0	
Feature Catalogue	S-101	2.7.0	
Portrayal Catalogue	S-101	2.7.0	
Feature Catalogue	S-101	2.8.0	
Portrayal Catalogue	S-101	2.8.0	
Feature Catalogue	S-111	2.0.0	
Portrayal Catalogue	S-111	2.0.0	
Feature Catalogue	S-124	2.0.0	
Portrayal Catalogue	S-124	2.0.0	

2.1.4 Multiple Revision Portrayal

Test Reference	MultipleRevisions	IHO Reference	S-98: 20.1 and B-1
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		IEC Reference	
Test Description			
<i>This test ensures EUT supports the correct display of datasets based on different versions of a Product Specification (S-101).</i>			
Loaded Data			
Exchange Set Name			
MultipleRevisions			
Display Mode		Independent Mariner's Selections	
Other		Accuracy	On
Context Parameters		Contour label	Off
Safety contour	10	Highlight date dependent	On
Safety depth	8	Highlight document	Off
Deep contour	30	Highlight info	On
Shallow contour	2	Shallow pattern	Off
Four shades	Off	Unknown objects	Off
Radar overlay	Off	Update review	Off
Plain boundaries	Off	Text Groups	
Simplified symbols	Off	Chart text	On
Full light lines	Off	Important text	On
Ignore scale minimum	Off	Other Text	
Shallow water dangers	Off	Names	On
Palette		Light description	On
Day		All other chart text	On
Date Dependent Objects		Display	
Start Date	N/A	Centre	42°30.00'S 61°45.00"E
End Date	N/A	Scale	1:24 000
Viewing Groups			
Standard Display		Other	
Drying lines	On	Spot soundings	On
Buoys, Beacons, aids to navigation	On	Submarine cables and pipelines	On
Buoys, beacons, structures	On	All isolated dangers	On
Lights	On	Magnetic variation	On
Boundaries and limits	On	Depth contours	On
Prohibited and restricted areas	On	Seabed	On
Chart scale boundaries	On	Tidal	On
Cautionary notes	On	Miscellaneous (Other)	On
Ships' routing systems and ferry routes	On		
Archipelagic sea lanes	On		
Miscellaneous (Standard)	On		
Chart (Standard)	On		
Alert Highlights (Standard)	On		
Setup			
<i>As per UpdateCatalogue</i>			
Action			
<ol style="list-style-type: none"> 1. Import exchange set MultipleRevisions; 2. Verify installation of the datasets 10100AASPLIT01, 10100AASPLIT02, 10100AASPLIT03 and 10100AASPLIT04 and the versions of the Feature Catalogues and Portrayal Catalogues for each of the datasets; 3. Navigate to the position indicated at viewing scale 1: 24 000 and verify the symbols used for each of the shown landmarks. These are specific to the different revisions of the portrayal catalogues; 4. Verify the existence of the "Alternative Landmarks" context parameter (defined in portrayal catalogue 2.7.0). 			
Results			

1. The exchange set shall install without any warning messages.
2. The information in the System Database shall show the presence of the datasets and their associated Catalogue versions as follows:

Dataset	Feature Catalogue	Associated Portrayal Catalogue
10100AASPLIT01	2.5.0	2.5.0
10100AASPLIT02	2.6.0	2.6.0
10100AASPLIT03	2.7.0	2.7.0
10100AASPLIT04	2.8.0	2.8.0

3. At the defined position the following image shall be observed:



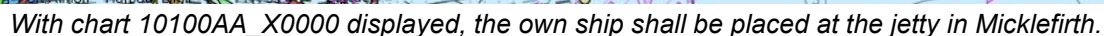
4. The EUT shall show context parameter (defined in portrayal catalogue 2.7.0) – “**Alternative Landmarks**”.

2.2 Dataset Loading

2.2.1 Preparation and Initial Power Up

Test Reference	InitialPowerUp	IHO Reference IEC Reference	S-98: 6.1.1 61174: 4.4.1
Test Description			
<i>This test ensures EUT supports the import of initial datasets and indication of own ship stationary position.</i>			
Loaded Data			
Exchange Set Name			
<u>InitialPowerUp</u>			
Display Mode		Independent Mariner's Selections	
Other		Accuracy	On
Context Parameters		Contour label	Off
Safety contour	10	Highlight date dependent	On
Safety depth	8	Highlight document	Off
Deep Contour	30	Highlight info	On
Shallow contour	2	Shallow pattern	Off

Four shades	Off	Unknown objects	Off
Radar overlay	Off	Update review	Off
Plain boundaries	Off	Text Groups	
Simplified symbols	Off	Chart text	On
Full light lines	Off	Important text	On
Ignore scale minimum	Off	Other Text	On
Shallow water dangers	Off	Names	On
Palette		Light description	On
Day		All other chart text	On
Date Dependent Objects		Display	
Start Date	N/A	Centre	32°29.66'S 60°55.86'E
End Date	N/A	Scale	1:60 000
		Orientation	
Viewing Groups			
Standard Display		Other	
Drying lines	On	Spot soundings	On
Buoys. Beacons, aids to navigation	On	Submarine cables and pipelines	On
Buoys, beacons, structures	On	All isolated dangers	On
Lights	On	Magnetic variation	On
Boundaries and limits	On	Depth contours	On
Prohibited and restricted areas	On	Seabed	On
Chart scale boundaries	On	Tidal	On
Cautionary notes	On	Miscellaneous (Other)	On
Ships' routing systems and ferry routes	On		
Archipelagic sea lanes	On		
Miscellaneous (Standard)	On		
Chart (Standard)	On		
Alert Highlights (Standard)	On		
Setup			
<i>As per Initial Catalogues.</i>			
Action			
1. Import the exchange set InitialPowerUp . 2. Set ship position at 32°29.66'S, 060°55.86'E with heading=234.00; Set the viewing scale to 1:60 000; Centre the display on position 32°32.00'S, 060°59.50'E.			
Results			
1. The exchange sets shall install without any warning messages. 2. At the defined position the following image shall be observed:			



Action

- ## Results

Edition 2.0.0



The prison bars shall be displayed out of 10100AA_X01NW.000 coverage.

2.2.2 Number and date in System Database

Test Reference	PowerUp	IHO Reference IEC Reference	S-98: 6.1.1 61174: 4.4.1	
Test description				
This test ensures EUT supports the import of initial datasets and confirmation of information in System Database.				
Setup				
As per <i>InitialPowerUp</i> .				
Action				
1. Import the exchange set <i>PowerUp</i> . 2. Check information about the datasets in the System Database.				
Results				
1. The exchange sets shall install without any warning messages. 2. The information in the System Database shall be identical to the below table:				
ENC	Edition (EDTN)	Update number (UPDN)	Update Application Date (UADT)	Issue Date (ISDT)
10100AA_X0000.000	7	0	N/A	22 Apr 2018
10100AA_X01NE.000	5	0	N/A	22 Apr 2018
10100AA_X01NW.000	3	0	N/A	22 Apr 2018
101AA00_X01SE.000	3	0	N/A	22 Apr 2018
101AA00_X01SW.000	3	0	N/A	22 Apr 2018
101AA00_X02SE.000	4	0	N/A	22 Apr 2018

2.2.3 Load additional dataset and check System Database

Test Reference	AdditionalCell	IHO Reference IEC Reference	61174: 4.4.1	
Test description				
<i>This test ensures EUT supports import of additional cell and confirmation of its addition to the System Database.</i>				
Setup				
<i>As for test PowerUp.</i>				
Action				
<i>1. Import the exchange set Settings.</i> <i>2. Check that in the System Database the details of the dataset have been added.</i>				
Results				
<i>1. The exchange sets shall install without any warning messages.</i> <i>2. The information in the System Database shall reflect the cell loaded and the coverage shall have changed accordingly;</i>				
ENC	Edition (EDTN)	Update number (UPDN)	Update Application Date (UADT)	Issue Date (ISDT)
10100AA_X0001.000	4	0	N/A	22 Apr 2022

2.2.4 Remove dataset and check the System Database

Test Reference	RemoveCell	IHO Reference IEC Reference	S-98: 6.1.1 61174: 4.4.1
Test description			
This test ensures EUT supports removing a cell and confirmation of its removal from the System Database.			
Setup			
As on completion of test AdditionalCell .			
Action			
Remove the following cell: 10100AA_X0001.000 and check that in the System Database the details of the cell have been removed.			
Results			
The information in the System Database shall reflect the cell removed and the chart coverage shall have changed accordingly.			

2.3 Automatic updates of Unencrypted ENCs

2.3.1 Loading sequential updates

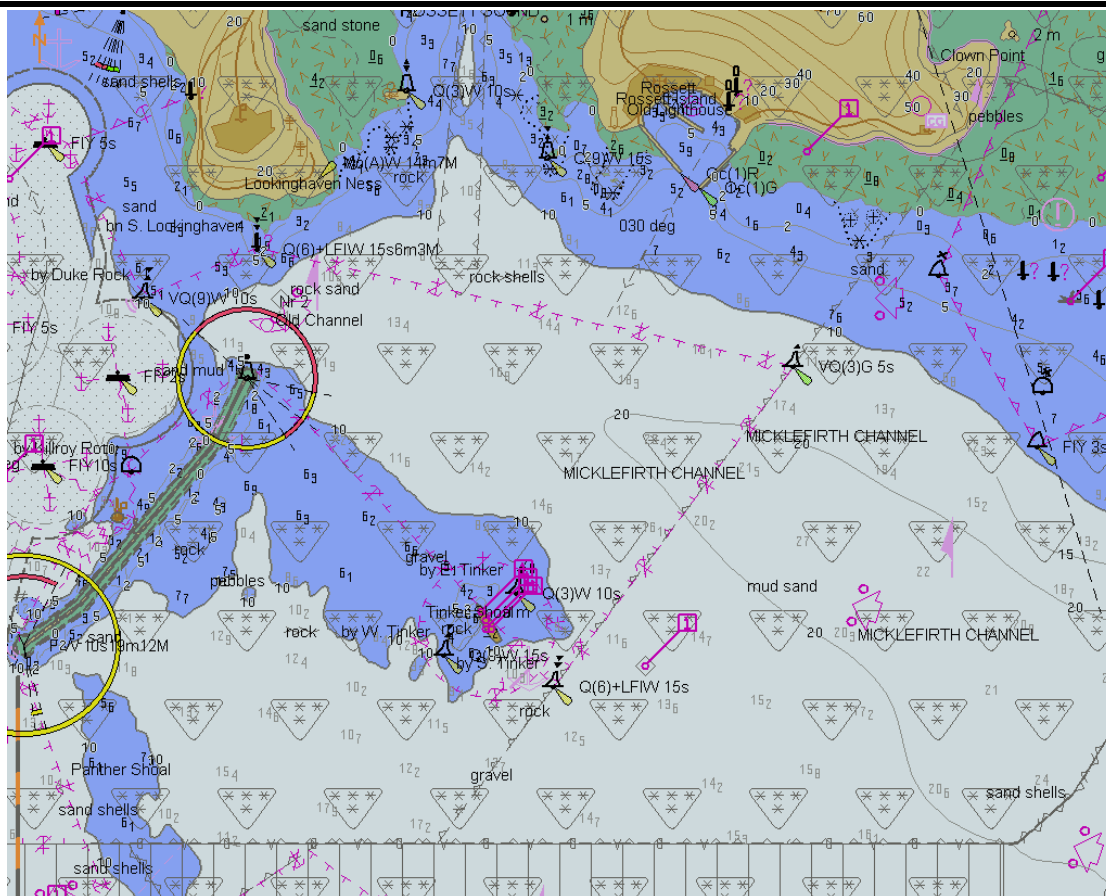
Test Reference	SequentialUpdates	IHO Reference IEC Reference	S-98: 20.4.3 61174: 4.4.2
Test Description			
This test will ensure the EUT supports the import of sequential updates and their review.			
Loaded Data			
Exchange Set Name			
PowerUp			
SequentialUpdate1 to 5 (contains datasets for Updates 1 to 5)			
Display Mode		Independent Mariner's Selections	
Displaybase		Accuracy	On
Context Parameters		Contour label	Off
Safety contour	8	Highlight date dependent	On

Safety depth	8	Highlight document	On
Deep Contour	N/A	Highlight info	On
Shallow contour	N/A	Shallow pattern	Off
Four shades	Off	Unknown objects	Off
Radar overlay	Off	Update review	Off
Plain boundaries	Off	Text Groups	
Simplified symbols	Off	Chart text	On
Full light lines	Off	Important text	On
Ignore scale minimum	Off	Other Text	On
Shallow water dangers	Off	Names	On
Palette		Light description	On
Day		All other chart text	On
Date Dependent Objects		Display	
Start Date	N/A	Centre	32°31.80'S, 60°57.50'E
End Date	N/A	Scale	1:20 000
		Orientation	
Viewing Groups			
Standard Display		Other	
Drying lines	On	Spot soundings	On
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	On
Buoys, beacons, structures	On	All isolated dangers	On
Lights	On	Magnetic variation	On
Boundaries and limits	On	Depth contours	On
Prohibited and restricted areas	On	Seabed	On
Chart scale boundaries	On	Tidal	On
Cautionary notes	On	Miscellaneous (Other)	On
Ships' routeing systems and ferry routes	On		
Archipelagic sea lanes	On		
Miscellaneous (Standard)			
Chart (Standard)	On		
Alert Highlights (Standard)	Off		
Setup			
As per PowerUp (exchange set PowerUp loaded).			
Action			
<ol style="list-style-type: none"> 1. Import exchange sets SequentialUpdate1 to 5. 2. Apply the following 5 updates one by one and check the plots after each successfully applied update to create the same results as the S-164 plots. <ul style="list-style-type: none"> • Apply Update .001 Update review date range: 1st May 2011 – 21st May 2011 <ul style="list-style-type: none"> • Apply Update .002 Update review date range: 1st Dec 2014 – 1st Mar 2015 <ul style="list-style-type: none"> • Apply Update .003 Update review date range: 1st Sep 2015 – 14th Sep 2015 <ul style="list-style-type: none"> • Apply Update .004 Update review date range: 15th Sep 2015 – 30th Sep 2015 <ul style="list-style-type: none"> • Apply Update .005 Update review date range: 1st Oct 2015 – 14th Oct 2015 3. Review of updates shall be performed after the update process is completed and the updates have been applied. Review the updates by selecting the given date range and confirm that display is as available in the corresponding screen plot. 			
Results			
<ol style="list-style-type: none"> 1. The exchange sets shall install without any warning messages. 2. The update process shall install all updates (up to update no. 005) and indicate it in an 			

appropriate summary report which shall contain the following information:

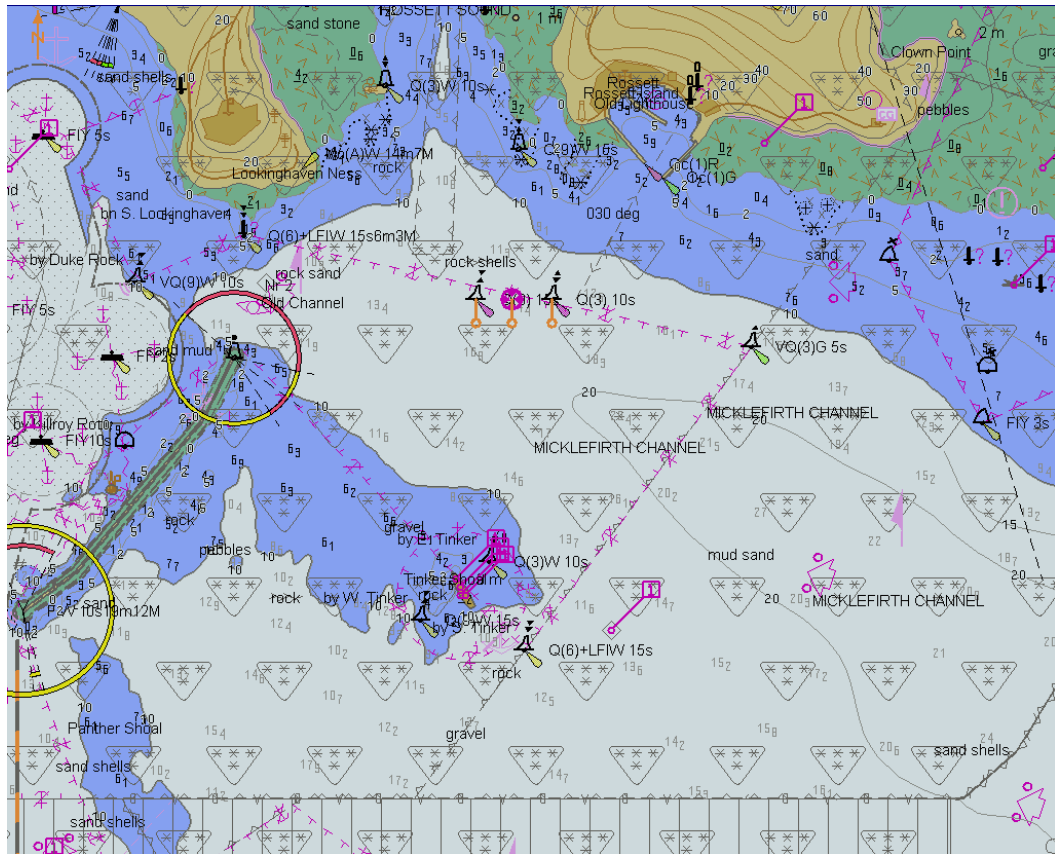
- identification of issuing authority;
- update numbers of the update files;
- identifiers of datasets affected;
- edition number and reference date of involved datasets;
- number of updates in the affected datasets.

Note: Manufacturers can use their own algorithms for calculating the position of centred symbols.



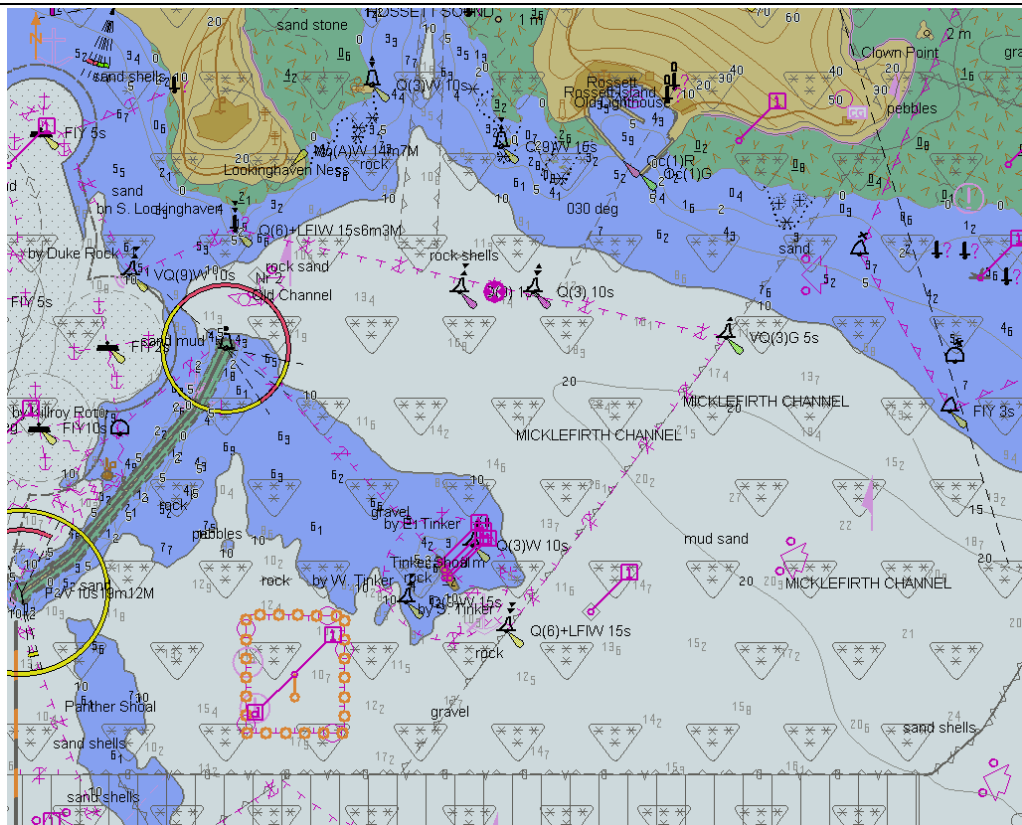
TBD

Before loading of updates, displayed scale 1:20 000



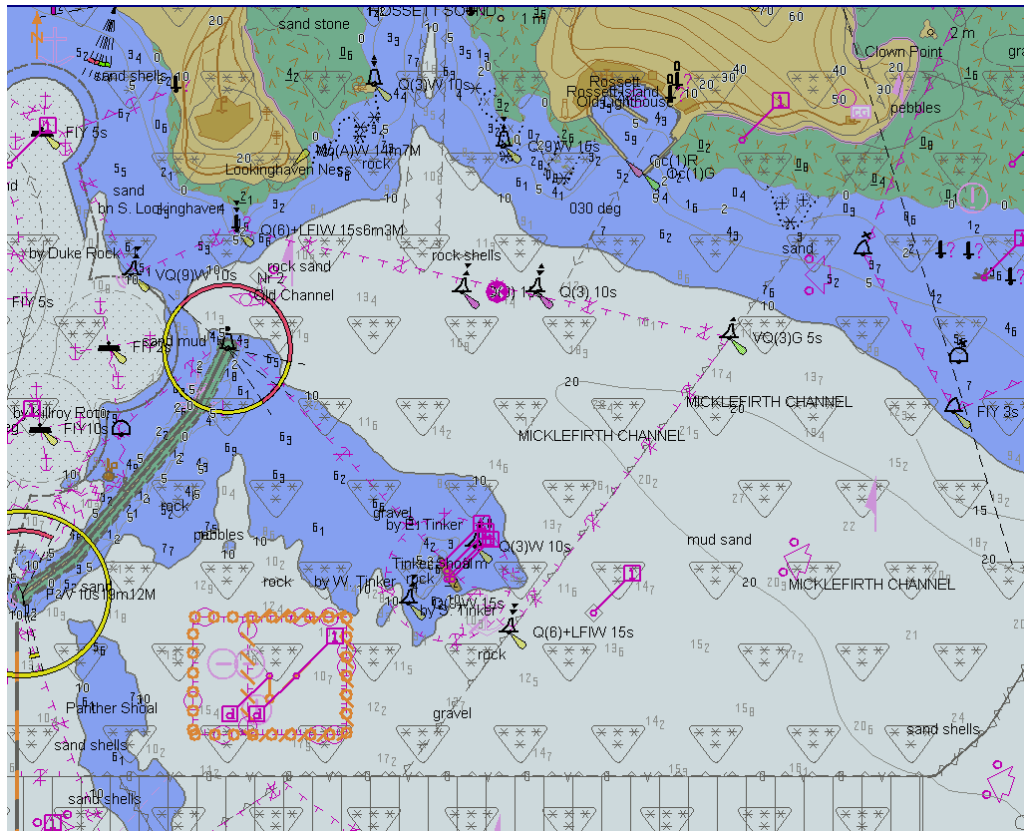
TBD

After loading of 101AA00X01SW.001, displayed scale 1:20 000, date range include 9th May 2011



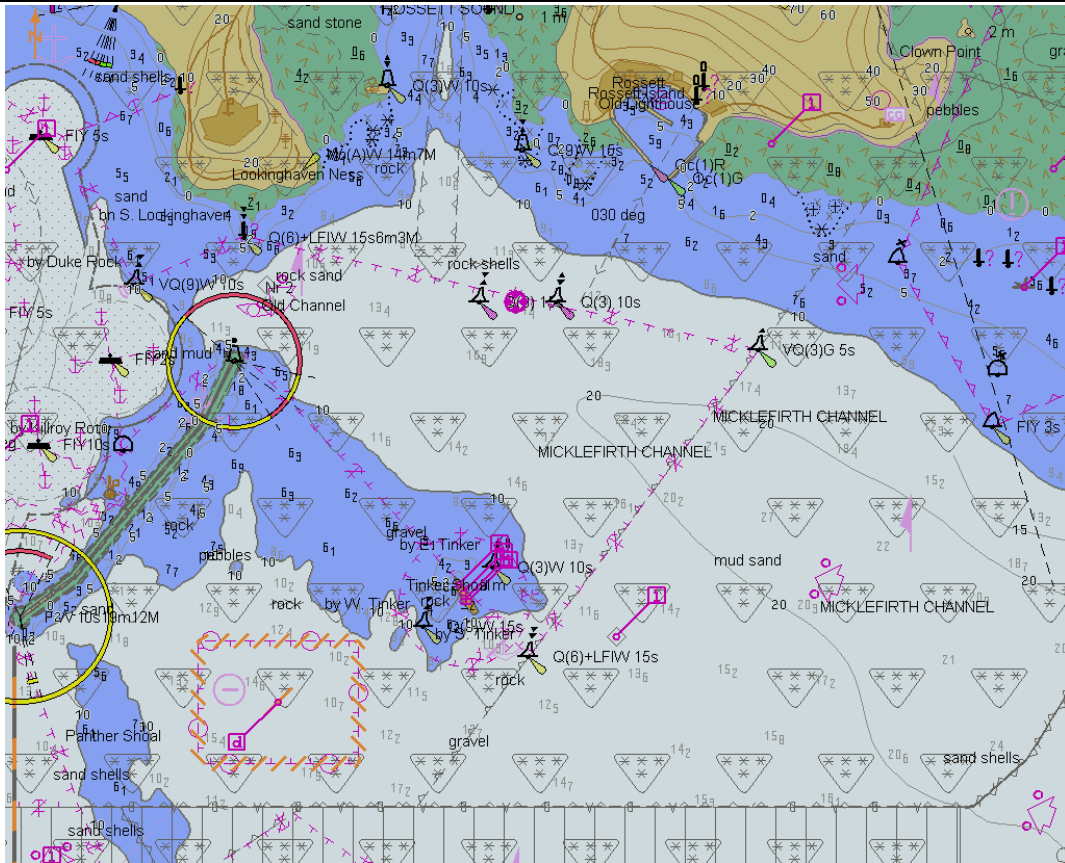
TBD

After loading of 101AA00X01SW.002, displayed scale 1:20 000, date range 1st Jan 2015-21st Feb 2015



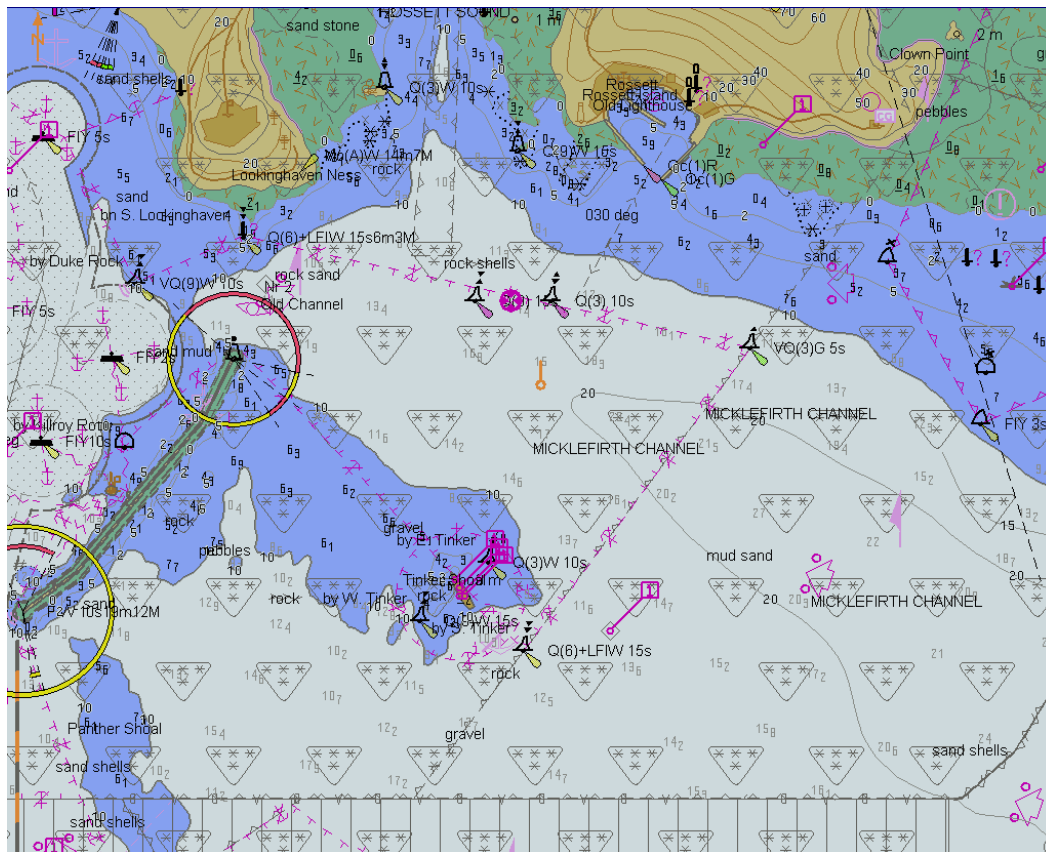
TBD

After loading of 101AA00X01SW.003, displayed scale 1:20 000, date range include 8th Sep 2015



TBD

After loading of 101AA00X01SW.004, displayed scale 1:20 000, date range include 22nd Sep 2015



TBD

After loading of 101AA00X01SW.005, displayed scale 1:20 000, date range include 6th Oct 2015

2.3.2 Loading update in an invalid sequence

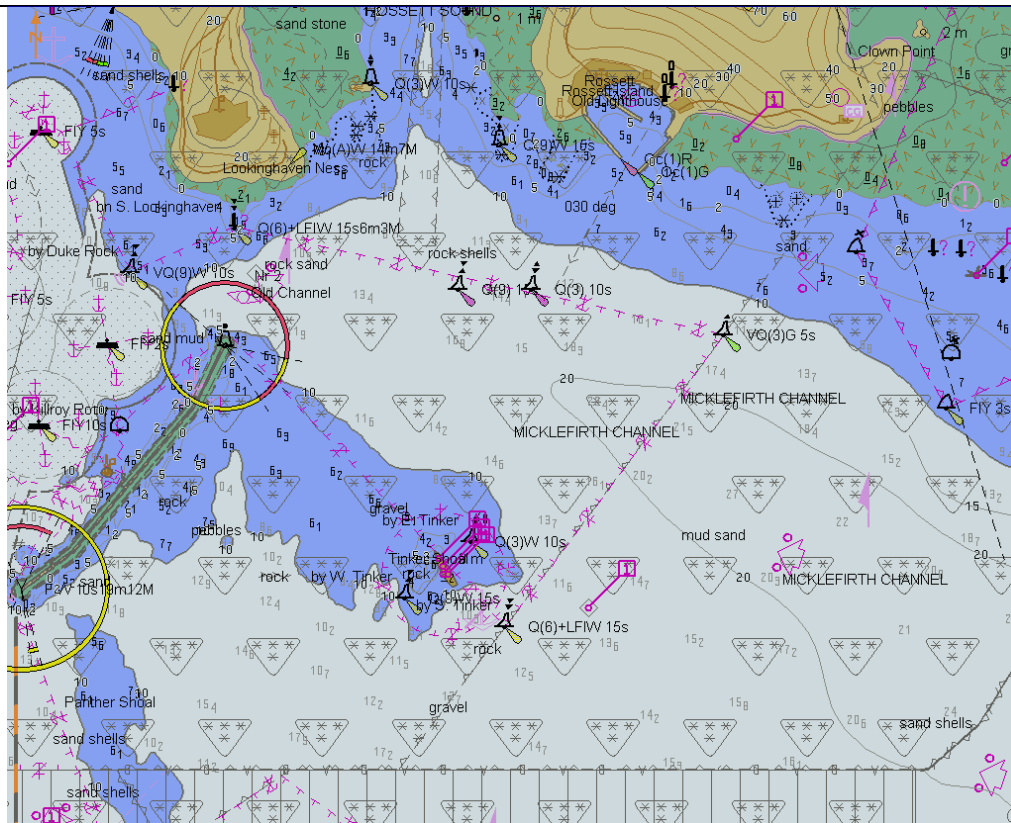
Test Reference	InvalidSequence	IHO Reference IEC Reference	S-98: 20.4.3 61174: 4.4.2
Test description			
This test will ensure the EUT will reject the import of an update file which is not in the expected sequence.			
Setup			
As per PowerUp . (PowerUp exchange set loaded, but all previously loaded Update datasets must be removed from the System Database.			
Action			
Import the following five update exchange sets: InvalidSequence00x with x=1,2,3			
Results			
The update process shall install the updates up to update no. 2 and reject the installation of updates no. 4 with a permanent indication, "Non sequential update, previous update(s) missing try reloading from the base media. If the problem persists contact your data supplier (message SSE123)"			

2.3.3 Loading update of newer edition

Test Reference	NewerEditionUpdate	IHO Reference IEC Reference	61174: 6.8.16.1
Test Description			
This test will ensure the EUT supports the import, display and update review process of an update file of a newer edition than base dataset installed			
Loaded Data			
Exchange Set Name			

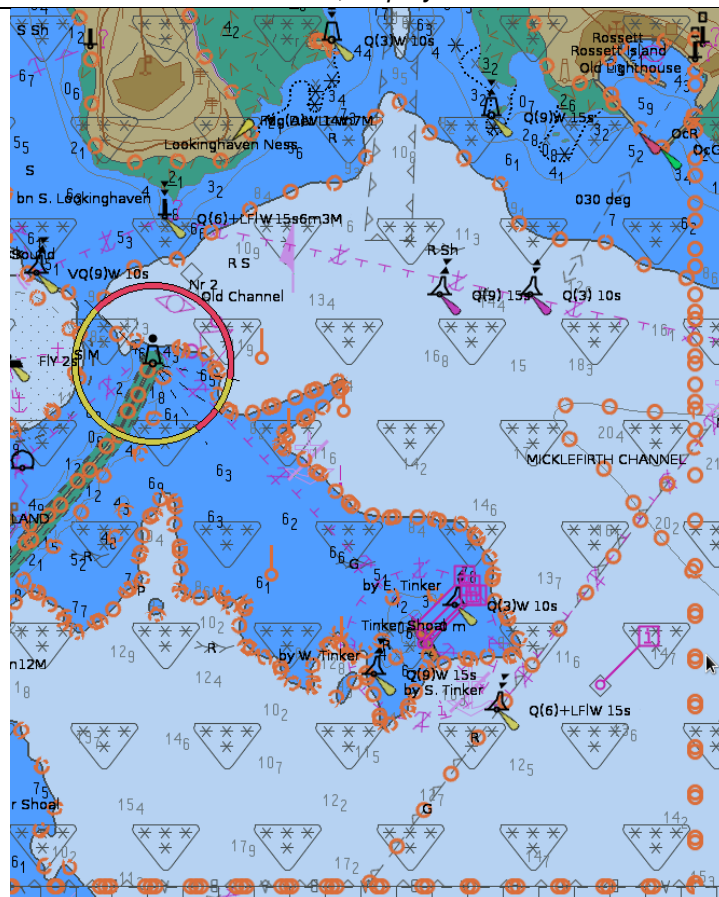
NewUpdate			
GoodBaseCell			
Display Mode		Independent Mariner's Selections	
Other		Accuracy	On
Context Parameters		Contour label	Off
Safety contour	8	Highlight date dependent	On
Safety depth	8	Highlight document	Off
Deep Contour	N/A	Highlight info	On
Shallow contour	N/A	Shallow pattern	Off
Four shades	Off	Unknown objects	Off
Radar overlay	Off	Update review	Off
Plain boundaries	Off	Text Groups	On
Simplified symbols	Off	Chart text	On
Full light lines	Off	Important text	On
Ignore scale minimum	Off	Other Text	On
Shallow water dangers	Off	Names	On
Palette		Light description	On
Day		All other chart text	On
Date Dependent Objects		Display	
Start Date	N/A	Centre	32°31.80'S, 60°57.50'E
End Date	N/A	Scale	1:20 000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines	On	Spot soundings	On
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	On
Buoys, beacons, structures	On	All isolated dangers	On
Lights	On	Magnetic variation	On
Boundaries and limits	On	Depth contours	On
Prohibited and restricted areas	On	Seabed	On
Chart scale boundaries	On	Tidal	On
Cautionary notes	On	Miscellaneous (Other)	On
Ships' routing systems and ferry routes	On		
Archipelagic sea lanes	On		
Miscellaneous (Standard)	On		
Chart (Standard)			
Alert Highlights (Standard)			
Setup			
As per PowerUp (dataset 101AA00X01SW.000 (edition 3) loaded.			
Action			
1. Import the following update exchange set: NewUpdate , contains 101AA00X01SW.001 (update 1 of edition 4) 2. Display installed chart. 3. Import exchange sets: GoodBaseCells 101AA00X01SW.000 (edition 4) NewUpdate 101AA00X01SW.001 (edition 4) 4. Display installed chart.			
Results			
1. The update process shall refuse to install the update and inform the user that chart data of a newer edition are available. 2. A permanent indication "Chart information not up to date" shall be 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. The EUT shall install Base Cell and Update without any warning or error.
4. The “Chart information not up to date” message no longer displayed.



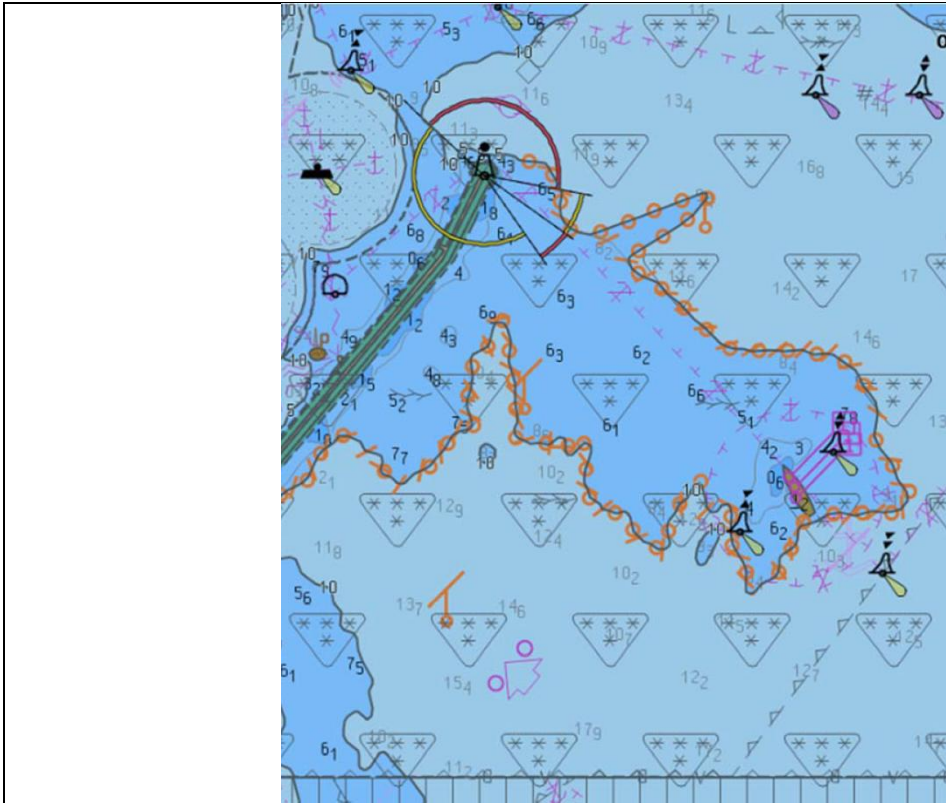
TBD

After loading of 101AA00X01SW.000 4th edition, displayed scale 1:20 000



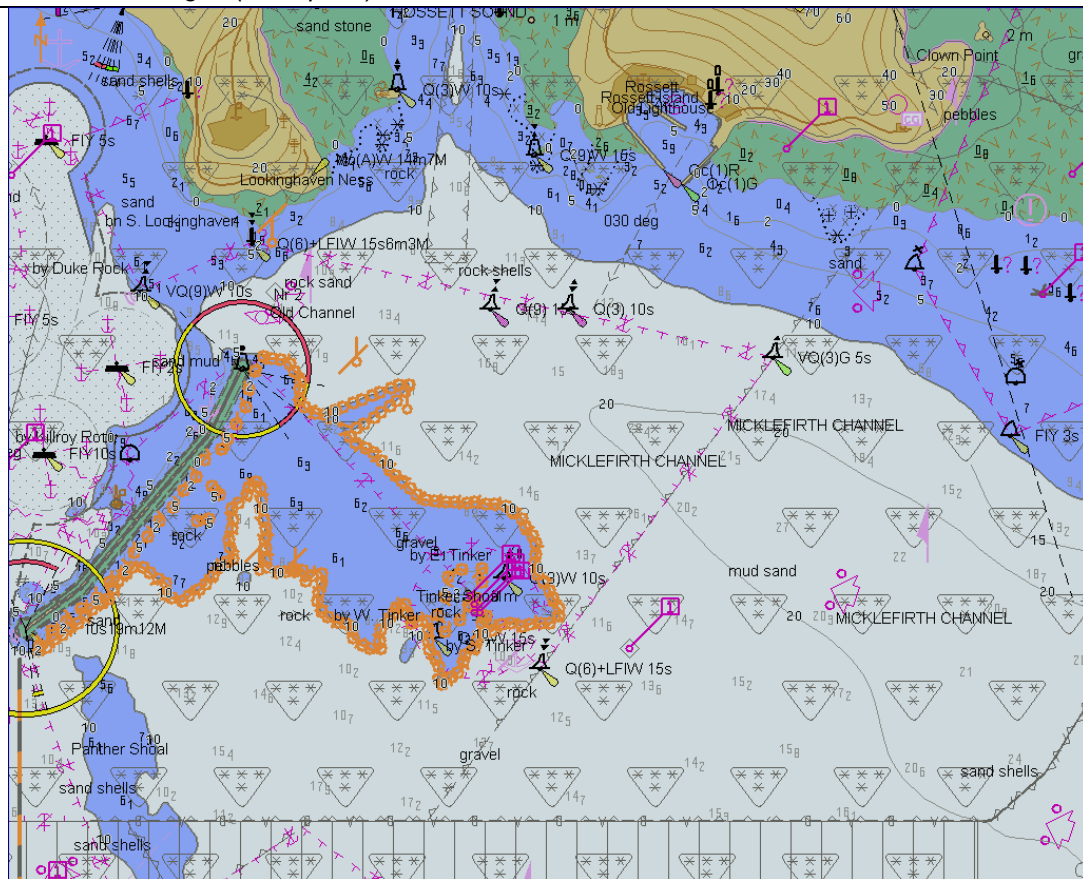
TBD

After loading of 101AA00X01SW.001 4th edition, displayed scale 1:20 000, all features and their geometries being subject to this update review are highlighted.



TBD

After loading of 101AA00X01SW.001 4th edition, displayed scale 1:20 000, update review highlight filtered for real changes (example 1).



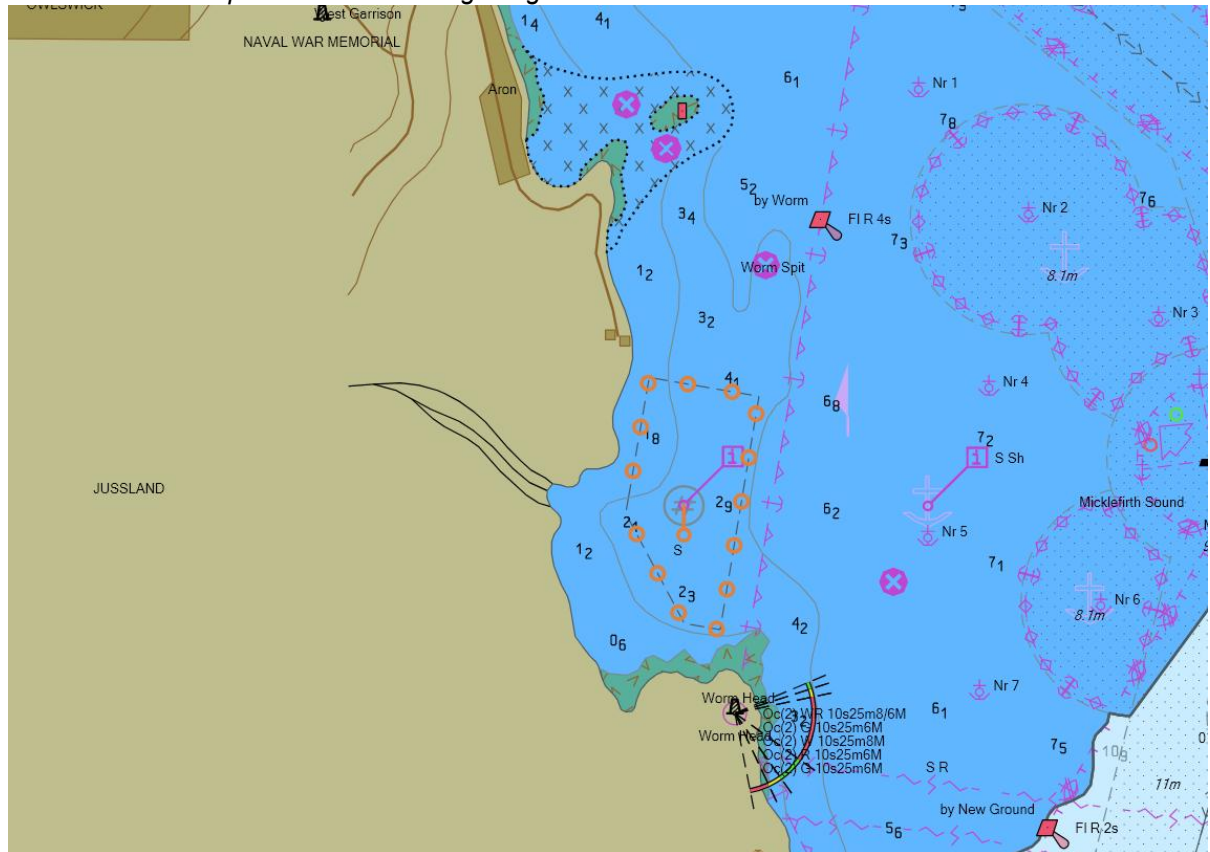
TBD

After loading of 101AA00X01SW.001 4th edition, displayed scale 1:20 000, update review highlight filtered for real changes (example 2).

2.3.4 Update Information

Test Reference	UpdateInformation		IHO Reference IEC Reference	S-98 20.4.3 IEC 61174/ 4.4.2
Test Description				
This test ensures EUT supports the import and display of S-101 metadata feature Update Information.				
Loaded Data				
Exchange Set Name				
UpdateInformation				
Display Mode		Independent Mariner's Selections		
Other		Accuracy		Off
Context Parameters		Contour label		Off
Safety contour	10 m	Highlight date dependent		Off
Safety depth	8 m	Highlight document		Off
Deep Contour	30 m	Highlight info		On
Shallow contour	2 m	Shallow pattern		Off
Four shades	Off	Unknown objects		Off
Radar overlay	Off	Update review		On
Plain boundaries	Off	Text Groups		
Simplified symbols	On	Chart Text		On
Full light lines	Off	Important text		On
Ignore scale minimum	On	Other Text		
Shallow water dangers	On	Names		On
Palette		Light description		On
Day		All other chart text		On
Date Dependent Objects		Display		
Start Date		Centre	32°31.61'S, 60°54.24'E	
End Date		Scale	1: 12 000	
Viewing Groups (On / Off)				
Standard Display		Other		
Drying lines	On	Spot soundings		On
Buoys. Beacons, aids to navigation	On	Submarine cables and pipelines		On
Buoys, beacons, structures	On	All isolated dangers		On
Lights	On	Magnetic variation		On
Boundaries and limits	On	Depth contours		On
Prohibited and restricted areas	On	Seabed		On
Chart scale boundaries	On	Tidal		On
Cautionary notes	On	Miscellaneous (Other)		On
Ships' routing systems and ferry routes	On			
Archipelagic sea lanes	On			
Miscellaneous (Standard)	On			
Chart (Standard)	On			
Alert Highlights (Standard)	Off			
Setup				
As per PowerUp				
Action				
1. Observe dataset 10100AA_X01SW.000 at indicted position and scale and verify Foul Ground feature is highlighted; 2. Cursor pick highlighted Foul Ground area feature and verify information contained in the Update Information feature.				
Results				

1. At the defined position the following image shall be observed:



2. Cursor pick shall show the following information:

- Update Type = Insert
- Update Number = 0
- Information Text = "Foul Ground is new for this edition of the ENC"

2.3.5 Importing update of older edition

Test Reference	OlderEditionUpdate	IHO Reference IEC Reference	S-98: 20.4.3 61174: 4.4.2
Test description			
<i>This test ensures EUT will reject the import of an update file of an older edition than base dataset installed.</i>			
Setup			
<i>As per Updated Catalogue Data (all datasets must be removed from the System Database; only catalogue files must be present).</i>			
Action			
1. Import the following exchange set: GoodBaseCell (dataset 10100AA_X01SW.000 (edition 4)); 2. Import the following exchange set: OldUpdate (dataset 10100AA_X01SW.001 (edition 3))			
Results			
1. The exchange set GoodbaseCell shall install without any warning message. 2. 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, for example "Incorrect Edition Number 1 [of update]: expecting 2".			

2.3.6 Importing a re-issue and an update of a dataset

Test Reference	RelssueAndUpdate	IHO Reference IEC Reference	S-98: 20.5 61174: 4.4.2
Test Description			

This test ensures EUT supports import and display of a re-issue of an unencrypted ENC dataset and a subsequent update.

Loaded Data			
Exchange Set Name			
Reissue			
ReissueUpdate			
Display Mode		Independent Mariner's Selections	
Other		Accuracy	On
Context Parameters		Contour label	Off
Safety contour	10	Highlight date dependent	On
Safety depth	8	Highlight document	Off
Deep Contour	30	Highlight info	On
Shallow contour	2	Shallow pattern	Off
Four shades	Off	Unknown objects	Off
Radar overlay	Off	Update review	Off
Plain boundaries	Off	Text Groups	
Simplified symbols	Off	Chart text	On
Full light lines	Off	Important text	On
Ignore scale minimum	Off	Other Text	
Shallow water dangers	Off	Names	On
Palette		Light description	On
Day		All other chart text	On
Date Dependent Objects		Display	
Start Date	N/A	Centre	32°31.80'S, 60°57.50'E
End Date	N/A	Scale	1:20 000
		Orientation	
Viewing Groups			
Standard Display		Other	
Drying lines	On	Spot soundings	On
Buoys. Beacons, aids to navigation	On	Submarine cables and pipelines	On
Buoys, beacons, structures	On	All isolated dangers	On
Lights	On	Magnetic variation	On
Boundaries and limits	On	Depth contours	On
Prohibited and restricted areas	On	Seabed	On
Chart scale boundaries	On	Tidal	On
Cautionary notes	On	Miscellaneous (Other)	On
Ships' routing systems and ferry routes	On		
Archipelagic sea lanes	On		
Miscellaneous (Standard)	On		
Chart (Standard)	On		
Alert Highlights (Standard)	On		
Setup			
<i>As per UpdateCatalogues</i>			
Action			
Display dataset 10100AA_X01SW.000 (Edition 3); 1. Import exchange set Reissue ; 2. Display dataset 10100AA_X01SW.000 (Reissue of Edition 3, update 5); 3. Import exchange set ReissueUpdate ; 4. Display dataset 10100AA_X01SW.000 with update 6 applied).			
Results			
1. After loading of 101AA00X01SW.000 3rd edition, displayed scale 1:20 000 Screenshot TBD			

2. The exchange set Reissue shall install without any warning messages.
Screenshot TBD
3. After loading of 101AA00X01SW.000 (Reissue of Edition 3, update 5) displayed scale 1:20 000.
4. The exchange set ReissueUpdate shall install without any warning messages.
5. After loading of 101AA00X01SW.000 (Reissue of Edition 3, update 6) displayed scale 1:20 000.
Screenshot TBD

2.3.7 Rejection of automatic update

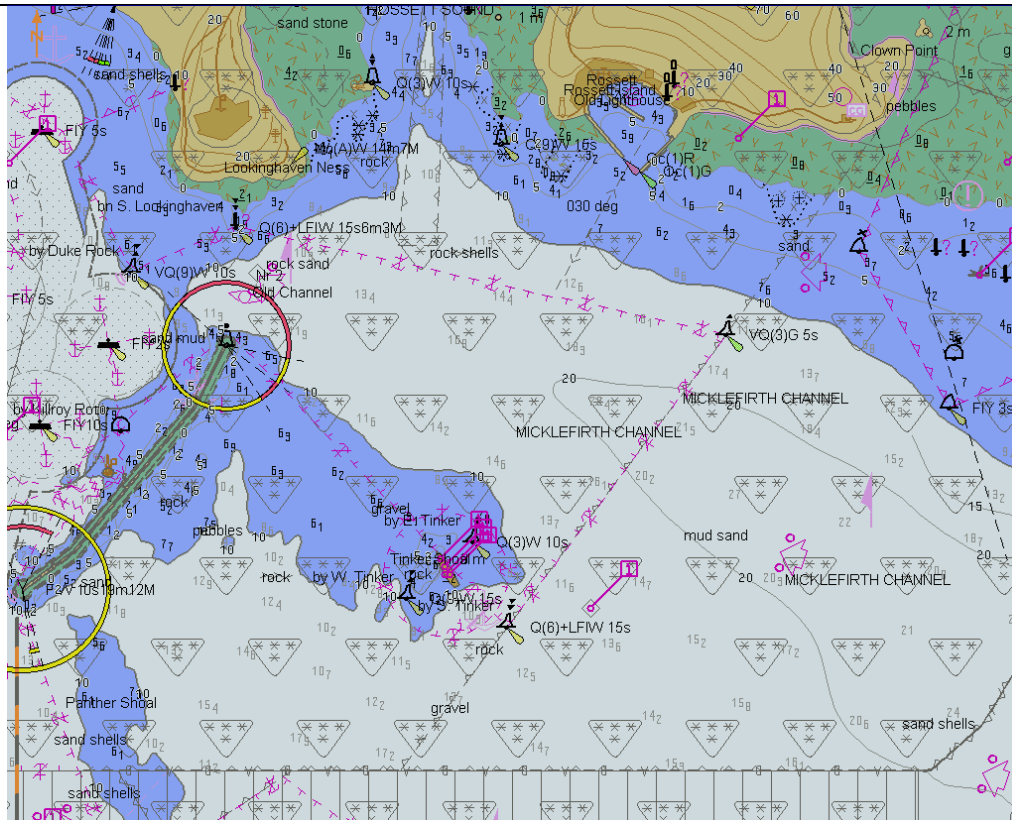
Test Reference	UpdateRejection	IHO Reference	S-98: 20.4.3
		IEC Reference	61174: 4.4.2
Test Description			
This test ensures EUT supports the manual rejection of an automatic update.			
Loaded Data			
Exchange Set Name			
PreReissue			
SequentialUpdate1			
Display Mode		Independent Mariner's Selections	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown objects	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60 000
		Orientation	
Viewing Groups			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Setup			

As per Update Catalogues**Action**

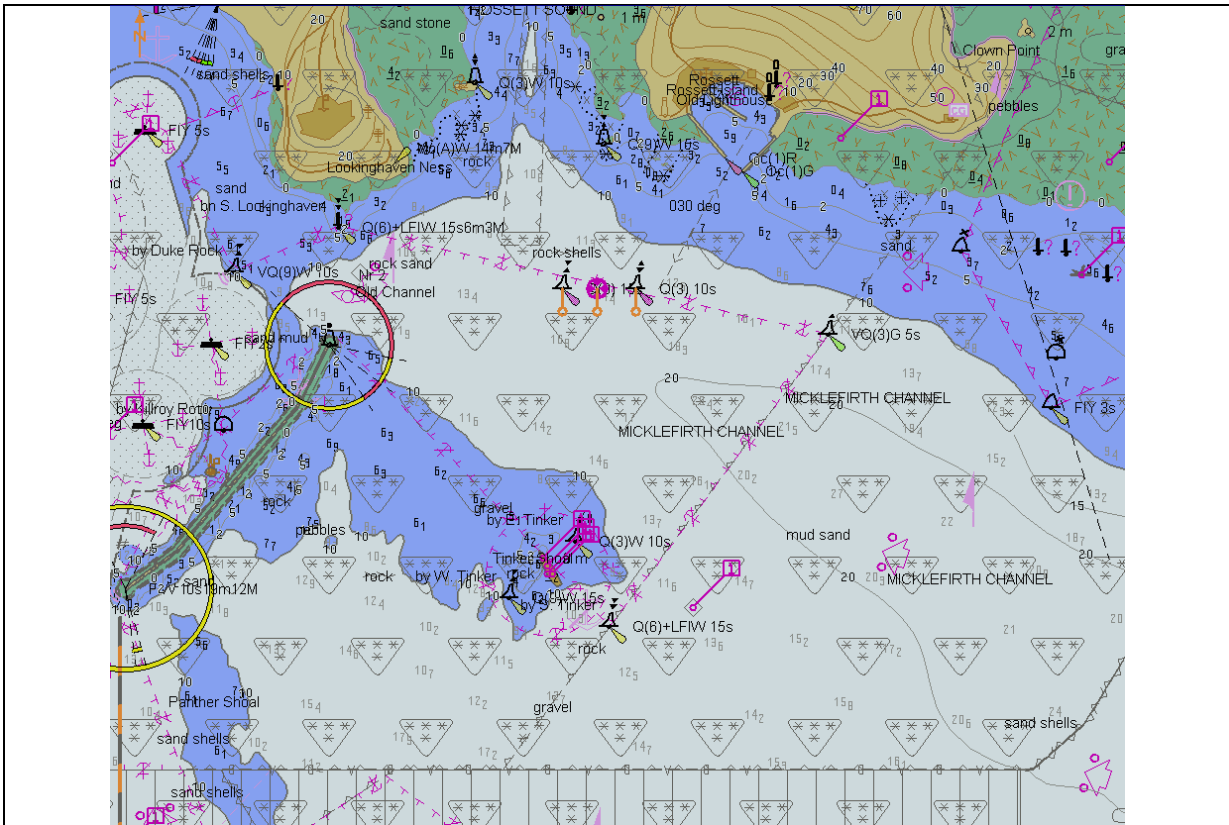
1. Import Exchange Set **PreReissue** and display the dataset at indicated centered position and scale;
2. Import Exchange Set **SequentialUpdate1**;
3. Manually annotate the features of the update as rejected using the deletion available in the manual update method.

Results

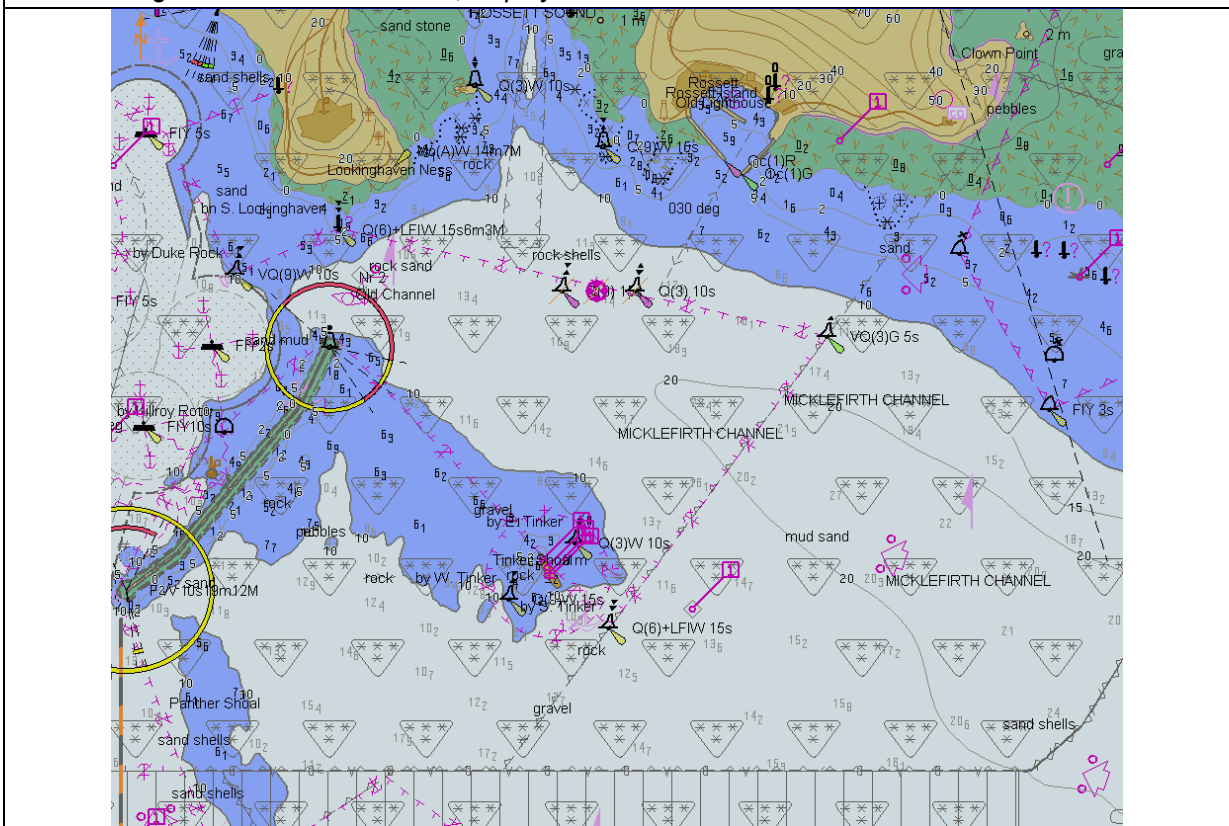
The features from the update shall remain in display as annotated by the deletion mark of the manual update method.

**TBD**

Before loading of update, displayed scale 1:20 000



After loading of 101AA00X01SW.001, displayed scale 1:20 000



After update 1 has been manually annotated as rejected by the Mariner, displayed scale 1:20 000

2.4 Manual Updates

2.4.1 Creation of a Manual Update

Test Reference	ManualUpdateCreation	IHO Reference IEC Reference	S-98: 20.4.4 IEC: 61174/ 6.8.17
Test Description			
Manual updates.			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown objects	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date	N/A	Centre	
End Date	N/A	Scale	1:60 000
		Orientation	
Viewing Groups			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Setup			
Load the exchange set PowerUp			
<ul style="list-style-type: none"> - Select Display Category Standard - Set the Safety contour value to 8 m - Set the Safety depth value to 8 m - Select Symbolized Boundaries - Select Simplified symbols = false 			

<ul style="list-style-type: none"> - Select Highlight date dependent - Select Spot soundings
Action
<p>These descriptions potentially need editing as they are the original updates. They will need to be updated to the feature model included in S-98.</p> <p>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:</p> <ul style="list-style-type: none"> a. Insert a dangerous wreck near: 32 31.5S, 60 57.3E; b. Insert East Cardinal buoys including topmarks near: 32 31.5S, 60 57.46E; c. Insert West Cardinal buoy including topmark near: 32 31.5S, 60 57.16E; d. Insert a prohibited entry area between Panther and Tinker Shoals timed to come into force at 20220220; e. Insert a cautionary area in the same location being in force from date of issue to 20220220; 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. <p>2. Set viewing date before 20220220. Display chart cell with manual updates.</p> <p>3. Set viewing date after 20220220. Display chart cell with manual updates.</p> <p>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:</p> <ul style="list-style-type: none"> 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. <p>5. Set viewing date before 20220220. Display chart cell with manual updates.</p> <p>6. Set viewing date after 20220220. Display chart cell with manual updates.</p> <p>7. Review manual updates.</p> <p>8. Retrieve textual description from record.</p> <p>9. Remove all manual updates from display and review them (system time and date may need to be adjusted for verification).</p>
Results
<p>[The table from previous editions has been deleted (it will be referred to when creating the screenshots for the operational S-164 TDS Manual. The portrayal of manual updates has changed completely and so these screenshots will need to be completely revised)]</p>

2.4.2 Manual Update - Dates

Test Reference	ManualUpdatesDates	IHO Reference IEC Reference	S-98 20.4.4 61174: 6.8.17
Test Description			
<p>Test Manual Updates work with the date settings on the ECDIS.</p> <ul style="list-style-type: none"> - Identified by S-98 stakeholders. - Behaviour should be as specified in S-98 and allow users to create appropriate manual updates which behave correctly as the target date on the ECDIS is configured. - There are tests in the previous test but they should be re-located here and made exhaustive. 			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	

Shallow contour		Shallow pattern	
Four shades		Unknown objects	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60 000
		Orientation	
Viewing Groups			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Setup			
Action			
Results			

2.4.3 Manual Update - retrieval

Test Reference	ManualUpdatesRetrieval	IHO Reference IEC reference	S-98: 20.4.4 61174: 6.8.17
Test Description			
<i>Test retrieval of manual updates.</i>			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	

Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown objects	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date	N/A	Centre	
End Date	N/A	Scale	1:60 000
		Orientation	
Viewing Groups			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routeing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Setup			
Action			
Results			

2.4.4 Manual Update - Alerts and indications

Test Reference	ManualUpdatesAlerts	IHO Reference IEC Reference	S-98: 20.4.4 61174: 6.8.17
Test Description			
<ul style="list-style-type: none"> - Test that manual updates are able to interact with alerts and indications. - This should exhaustively test that manual updates which are required for creation of alerts/indications work correctly. This should be done by locating them in order, creating them according to the instructions and then running a route over the manual updates to observe the alerts/indications. - Suggest using the area where the existing navhaz test are located for this test. 			
Loaded Data			

Exchange Set Name					
Display Mode			Independent Mariner's Selections		
Other			Accuracy		
Context Parameters			Contour label		
Safety contour			Highlight date dependent		
Safety depth			Highlight document		
Deep Contour			Highlight info		
Shallow contour			Shallow pattern		
Four shades			Unknown objects		
Radar overlay			Update review		
Plain boundaries			Text Groups		
Simplified symbols			Chart Text		
Full light lines			Important text		
Ignore scale minimum			Other Text		
Shallow water dangers			Names		
Palette			Light description		
Day			All other chart text		
Date Dependent Objects			Display		
Start Date	N/A		Centre		
End Date	N/A		Scale	1:60 000	
			Orientation		
Viewing Groups					
Standard Display			Other		
Drying lines			Spot soundings		
Buoys. Beacons, aids to navigation			Submarine cables and pipelines		
Buoys, beacons, structures			All isolated dangers		
Lights			Magnetic variation		
Boundaries and limits			Depth contours		
Prohibited and restricted areas			Seabed		
Chart scale boundaries			Tidal		
Cautionary notes			Miscellaneous (Other)		
Ships' routeing systems and ferry routes					
Archipelagic sea lanes					
Miscellaneous (Standard)					
Chart (Standard)					
Alert Highlights (Standard)					
Setup					
Action					
Results					

2.5 Loading, Updating and Authentication of datasets

2.5.1 Organization of encrypted datasets

The tests for loading encrypted data are stored in the folder "Part15". The test exchange sets are named and

referred to in the tests by the exchange set name. Where permits, certificates or other elements are needed they are provided in the root folder of the exchange set.

This section also includes tests of how the ECDIS performs data management functions for update, cancel/replace and reissued datasets and supplementary files.

[notes for finalization of encrypted data tests: the S-101 test datasets are planned for use with these tests. These are AA / IHO datasets which will be given their own data producer certificates. The test descriptions will therefore change all the dataset names, but the details of the tests will remain the same. Additionally, depending on S-98 reviews and updates some of the SSE codes and messages may change]

Default test data parameters

The S-100 Part 15 data permits that accompany any encrypted TDS have been generated for the User Permit specified below. To carry out the tests described in this document manufacturers will have to create systems compatible with the following manufacturer information and hardware ID (HW_ID) – these are taken from S-100 Edition 5.2.1 Part 15.

Manufacturer ID: (M_ID)	=	859868
Manufacturer Key: (M_KEY)	=	4D5A79677065774A7343705272664F72
Hardware ID: (HW_ID)	=	40384B45B54596201114FE9904220101
USERPERMIT	=	AD1DAD797C966EC9F6A55B66ED98281599B3C7B1859868

This is the official manufacturer information issued for and by the Scheme Administrator (IHO secretariat) and is provided expressly for the purpose of producing encrypted ENC test data. This data is provided specifically for the following purposes:

- OEM Type approval against the S-164 Test Data for Encrypted ENCs (this document).
- OEM and Data Server self-certification of their systems against S-100 Part 15.
- OEM Type approval against the S-64 Test Data for Encrypted ENCs (this document).
- OEM and Data Server self-certification of their systems against the S-63 Data Protection Scheme.

Test Certificate and Public Key

The TDS IHO Scheme Administrator Certificate (IHO.CRT) should be used in the test data unless a different certificate or public key file is specified in the test description.

2.5.2 ENC Licensing – Permit Management

2.5.2.a. Check permit string availability

Test Reference	InvalidPermit	IHO Reference IEC reference	S-98: B-3
Test description			
Test how the system performs when loading a non-compliant permit file. Verify that the ECDIS returns the correct error message.			
Setup			
No pre-installed permits. Test data used: 1) PERMIT.XML file (empty file) 2) TEXT.XML file (wrong name) Test data location: InvalidPermitFile			
Action			
1) Attempt to load a PERMIT.XML file with no cell permits listed. 2) Attempt to load a non-compliant text file.			
Results			
Security Scheme Error (SSE 111) and accompanying description is displayed in the system at permit installation. i.e., SSE 111 – Cell permit not found			

2.5.2.b. ENC cell permit string incorrect format

Test Reference	IncorrectPermitFormat	IHO Reference IEC Reference	S-98: B-3
Test description			
ENC Licensing – Permit Management. ENC cell permit string incorrect format. Test how the system performs when loading a PERMIT.XML file with an incorrectly formatted permit string. Verify that the ECDIS returns the correct error message.			
Setup			
No pre-installed permits or ENCs in the System Database. Test data used: 1) PERMIT.XML 2) b) S100_ROOT (Exchange Set – 101AA0027M5, 101AA002GTBT plus updates) Test data location:			
Action			
Load the permit file (PERMIT.XML) and then the exchange set (S100_ROOT) from the location above.			
Results			
Security Scheme Error (SSE 112) and accompanying description is displayed in the system at permit installation. That is, 101AA0027M5 , “ SSE 112 – Cell permit format is incorrect ” 101AA002GTBT, valid to 31st Dec 2018 installed OK. (This message is only intended as indication of what should be displayed when a valid permit is installed.) Only 101AA002GTBT (edition #13 update # 5) and updates should be loaded into the System Database. The permit string for 101AA0027M5 is the wrong length [The cell name has the permit string for 101AA002GTBT is the correct length and is valid.			

2.5.2.c. Validate permit checksum

Test Reference	InvalidPermitChecksum	IHO Reference IEC Reference	S-98: B-3
Test description			
<p><i>ENC Licensing – Permit Management Validate permit CRC:</i> <i>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.</i></p>			
Setup			
<p><i>No pre-installed permits.</i> <i>Test data used:</i> <i>PERMIT.XML</i> <i>Test data location:</i></p> <ul style="list-style-type: none"> - ENCLicensingC1 - ENCLicensingC2 			
Action			
<p><i>Attempt to load the PERMIT.XML file from locations (a) and (b) above into the ECDIS.</i></p>			
Results			
<p><i>The system reports a CRC failure on 101AA0027M5 accompanied by the appropriate error message as follows:</i> “SSE 113 – Cell Permit is invalid (checksum is incorrect)” <i>In both cases the permit for 101AA002GTBT imports without any error or warning.</i></p> <ol style="list-style-type: none"> 1) <i>Cell 101AA0027M5 has had its permit CRC changed from 760CD6BA8AAEF1A0 to 760CD6BA8AAEE1A0.</i> 2) <i>Cell 101AA0027M5 has had the encrypted cell keys 1 & 2 altered slightly.</i> 3) <i>Cell 101AA002GTBT has a valid permit (CRC value for both tests).</i> 			

2.5.2.d. Missing PERMIT.XML signature

Test Reference	MissingPermitSignature	IHO Reference IEC Reference	S-98: B-3
Test description			
<p><i>This test checks that permits cannot be loaded from a PERMIT.XML without a valid PERMIT.SIG permit signature file also present.</i></p>			
Setup			
<p><i>No pre-installed permits.</i> <i>Test data used:</i> <i>PERMIT.XML</i> <i>Test data location:</i></p> <ul style="list-style-type: none"> - ENCLicensingH 			
Action			
<p><i>Import PERMIT.XML.</i></p>			
Results			
<p><i>Verify the EUT fails to import the permits contained in PERMIT.XML and a suitable error message is issued.</i></p>			

2.5.2.e. Multiple Permits

Test Reference	MultiplePermits	IHO Reference IEC Reference	S-98: B-3
Test description			
<i>This test checks that multiple permits contained in a single permit file can be correctly managed by the ECDIS.</i>			
Setup			
Load the PERMIT.XML from the location MultiplePermits			
Action			
<i>Import PERMIT.XML.</i>			
Results			
Verify the ECDIS selects the correct permit from the available permits contained in PERMIT.XML			

2.5.2.f. Invalid PERMIT.XML signature (contained in PERMIT.SIG)

Test Reference	InvalidPermitSignature	IHO Reference IEC Reference	S-98: B-3
Test description			
<i>This test checks that permits cannot be loaded from a PERMIT.XML with an invalid PERMIT.SIG permit signature.</i>			
Setup			
<i>No pre-installed permits.</i> <i>Test data used:</i> <i>PERMIT.XML</i> <i>Test data location:</i> - ENCLicensingI			
Action			
<i>Load PERMIT.XML.</i>			
Results			
<i>Verify the ECDIS fails to load the permits contained in PERMIT.XML and a suitable error message is issued.</i>			

2.5.2.g. Check remaining permit expiry period

Test Reference	ExpiringPermit	IHO Reference IEC Reference	S-98: B-3
Test description			
<i>Test how the system performs when loading permits that expire within the next 30 days. Verify that the ECDIS returns the correct warning message.</i>			
Setup			
No pre-installed permits. Test data used: PERMIT.XML The expiry date set in this test permit is 20251231 (31st December 2025). Test data location: - ENCLicencingD			
Action			
Set the computer Date/Time properties to 3rd Dec 2025 Install the PERMIT.XML file:			
Results			
The system must return an SSE 120 warning message as follows: “SSE 120 – Subscription service will expire in less than 30 days. Please contact your data supplier to renew the subscription licence.”			

2.5.2.h. Incorrect User Permit in PERMIT.XML

Test Reference	InvalidPermitSignature	IHO Reference IEC Reference	S-98: B-3
Test description			
<i>This test checks that permits cannot be loaded from a PERMIT.XML with the wrong user permit contained.</i>			
Setup			
No pre-installed permits. Test data used: PERMIT.XML Test data location: - ENCLicencingJ			
Action			
Load PERMIT.XML.			
Results			
Verify the ECDIS fails to load the permits contained in PERMIT.XML with the following message: “SSE 121 – Permits may be for another system or new permits may be required, please contact your data supplier to obtain a new licence.”			

2.5.2.i. Check for expired permits

Test Reference	ExpiredPermits	IHO Reference IEC Reference	S-98: B-3
Test description			
<i>Test how the system performs when installing permits which have expired. Verify that the ECDIS returns the correct warning message.</i>			
Setup			
<i>No pre-installed permits. Test data used: PERMIT.XML The expiry date set in this test permit is 20251231 (31st December 2025). Test data location: - ENCLicensingE</i>			
Action			
<i>Load the PERMIT.XML file. [Note The expiry dates for these permits are set to 31st Dec 2025. Set the computer Date/Time to 1st Jan 2026 and install the PERMIT.XML file]</i>			
Results			
<i>The system must report the correct SSE 115 warning message as follows: “SSE 115 – 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 documented in S-98 Appendix B.</i>			

2.5.2.j. Permit installation and reporting

Test Reference	PermitInstallation	IHO Reference IEC reference	S-98: 15-7.4
Test description			
<i>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.</i>			
Setup			
<i>No pre-installed permits. Test data used: PERMIT.XML Test data location: - ENCLicensingF The expiry dates for these permits are set to 31st Dec 2028. Set the computer Date/Time prior to 1st Dec 2028 and install the PERMIT.XML file.</i>			
Action			
<i>Load the file PERMIT.XML in the location stated above.</i>			
Results			
<i>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 are provided for this test created using the IHO manufacturer hardware ID and M_KEY.)</i>			

2.5.2.k. Management of permits from multiple data servers.

Test Reference	MultipleDataServers	IHO Reference IEC reference	S-98: B-3
Test description			
<i>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.</i>			
Setup			
<p>No pre-installed permits.</p> <p>Test data used:</p> <p>PERMIT.XML</p> <p>Test data location:</p> <ul style="list-style-type: none"> - ENCLicencingG1 - ENCLicencingG2 <p>There are two ENC cells common to both PERMIT.XML files. These common permits have been created using different encryption keys.</p>			
Action			
<p>Load the PERMIT.XML file at the test data location (a) above.</p> <p>Load the PERMIT.XML file at the test data location (b) above.</p>			
Results			
<i>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. (There are two ENC cells common to both PERMIT.XML files. These common permits have been created using different encryption keys.)</i>			

2.5.2.l. Management of installed permits

Test Reference	PermitManagement	IHO Reference IEC Reference	S-98: 15-7.4
Test description			
<i>Test whether the system enables user to manage their permit holdings. Confirm that users have the ability to selectively remove permits from the system.</i>			
Setup			
<p>Use the pre-installed permits from the previous test MultipleDataServers (2.5.2g).</p> <p>Test data used:</p> <p>PERMIT.XML files loaded in the previous test.</p> <p>Two permit files have been supplied with this test from two different Data Servers (DS). These have been designated GB and PM.</p>			
Action			
<i>Attempt to remove one of the installed sets of permits from the system leaving the other one intact.</i>			
Results			
<i>The user must be able to delete permits from the system. Suitable warnings/confirmations must be given.</i>			

2.5.2.m. Change and update installed certificate

Test Reference	InstallSACertificate	IHO Reference IEC Reference	S-98: B-3
Test description			
<i>Confirm that the system can import a new certificate/public key and return a report informing the user of the fact. Validate the supplied exchange set against the SA certificate.</i>			
Setup			
<p>Use the pre-installed information and data from the previous test.</p> <p>Test data used:</p> <ol style="list-style-type: none"> 1) IHO.CRT 2) PERMIT.XML 3) S100_ROOT (Exchange Set) <p>Test data location:</p> <ul style="list-style-type: none"> - Authentication1B 			
Action			
<ol style="list-style-type: none"> 1. Install the new IHO.CRT file as the new SA certificate Install the exchange set from the location above. 			
Results			
<ol style="list-style-type: none"> 1) The new certificate or public key file should load without error or warning, i.e., no SSE 126 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. <p>ENC cell 101AA003555D (Edition #7, Update #1) installed without error or warning; ENC cell 101AA003LRFD (Edition #3, Update #2) installed without error or warning.</p>			

2.5.2.n. No pre-installed certificate/public key on the system

Test Reference	MissingSACertificate	IHO Reference IEC reference	S-98: B-3
Test description			
<i>Test how the system performs when there is no pre-installed certificate. Confirm that the correct SSE 105 error message is displayed and that the system does not progress to the decompress/decrypt stage.</i>			
Setup			
<p>No pre-installed certificate, permits or ENC data.</p> <p>Test data used:</p> <ol style="list-style-type: none"> 1) PERMIT.XML 2) S100_ROOT (Exchange Set) <p>Test data location:</p> <ul style="list-style-type: none"> - Authentication1C 			

Action
<i>Install the exchange set stored in the location above.</i>
Results
<p><i>The system must report an SSE 105 error message similar to the one below.</i></p> <p>“SSE 105 – SA Digital Certificate file is not available. A valid certificate can be obtained from the IHO website or your data supplier.”</p> <p><i>The system must abort at this point and not continue to install ENC.</i></p> <p><i>ENC cell 101AA0027M5 (Edition #3, Update #6) not installed. “SSE 105” Error Message;</i></p> <p><i>ENC cell 101AA002GTBT (Edition #13, Update #5) not installed. “SSE 105” Error Message.</i></p>

2.5.2.o. Check SA Certificate Expiry Date

Test Reference	CertificateExpiry	IHO Reference IEC Reference	S-98: B-3
Test description			
<p><i>Test how the system performs if the SA certificate (IHO.CRT) has expired. To confirm that the correct SSE 122 error message is displayed and that the system does not progress to the decompress/decrypt stage.</i></p>			
Setup			
<p><i>No pre-installed certificate, permits or ENC data.</i></p> <p><i>Test data used:</i></p> <p><i>IHO.CRT PERMIT.XML PERMIT.SIG</i></p> <p><i>S100_ROOT (Exchange Set)</i></p> <p><i>Test data location:</i></p> <p style="padding-left: 40px;">Authentication1DExpired</p> <p style="padding-left: 40px;">Authentication1DCurrent</p> <p><i>The IHO.CRT (Expired) certificate expired on 31st December 2014</i></p> <p><i>The IHO.CRT (Current) certificate expires on 29th August 2033</i></p>			
Action			
<p><i>There are two folders one contains an expired certificate and an exchange set, the other a current certificate and an exchange set.</i></p> <p><i>The system date should be set to a date between the expiry dates for (a) and (b) above.</i></p> <p><i>1) Install the SA certificate at location (a) above then attempt to load the exchange set.</i></p> <p><i>2) Then install the SA certificate at location (b) above then attempt to load the exchange set (this test should result in the certificate & ExSet loading correctly).</i></p>			

Results
<p>1) When installing the expired certificate, the system must report an SSE 122 error message similar to the one below. “SSE 122 – 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 105 message stating that no valid certificate is installed in the ECDIS.</p> <p>2) When installing the current certificate this should install OK and load the ExSet without error or warning.</p> <p>Current ENC cell 101AA0027M5 (Edition #3, Update #6) installed without errors and warnings. ENC cell 101AA002GTBT (Edition #13, Update #5) installed without errors and warnings.</p> <p>Expired ENC cell 101AA0027M5 (Edition #3, Update #1) not installed. “SSE 122 & 105” Error Messages. ENC cell 101AA002GTBT (Edition #12, Update #7) not installed. “SSE 122 & 105” Error Messages.</p>

2.6 Dataset Authentication

2.6.1 Missing Catalogue Signature

Test Reference	MissingCatalogueSignature	IHO Reference IEC Reference	S-98: B-3
Test description			
<i>This test checks that exchange sets with an invalid catalogue signature file cannot be loaded.</i>			
Setup			
<p>No pre-installed permits. Test data used: CATALOG.XML Test data location: - Authentication3A The exchange set is missing the CATALOG.SIGN catalogue signature file.</p>			
Action			
Load exchange set MissingCatalogueSignature .			
Results			
Verify the EUT fails to install the exchange set contents and outputs a suitable error message.			

2.6.2 Invalid Catalogue Signature

Test Reference	InvalidCatalogueSignature	IHO Reference IEC Reference	S-98: B-3
Test description			
<i>This test checks that exchange sets with an invalid catalogue signature file cannot be loaded.</i>			
Setup			
<p>No pre-installed permits. Test data used: CATALOG.XML CAT.SIG Test data location: - Authentication3B The signature contained in CATALOG.SIGN is invalid.</p>			
Action			
Load exchange set InvalidCatalogueSignature .			
Results			
Verify the ECDIS fails to install the exchange set contents and outputs a suitable error message.			

2.6.3 Authentication against a non-SA certificate

Test Reference	NonSASignedData	IHO Reference IEC reference	S-98: B-3
Test description			
<i>Test that the system will correctly reject data which is authenticated against a certificate which is not the Scheme Administrator.</i>			
Setup			
<p>No pre-installed certificate/public key, permits or ENC data. Test data used: 1) S100_ROOT (Exchange Set – 101AA_TBD_52, 101AA_TBD_53, 101AA_TBD_54) Test data location: - Authentication2B This test uses an exchange set where the data server certificate is self-signed (not by the SA).</p>			
Action			
Install certificate and exchange set stored in the location above.			
Results			
<p>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. An error message must be displayed as follows: “SSE 126 – ENC is not authenticated by the IHO acting as the SA”</p> <p>This test should prevent the exchange set from being loaded.</p>			

2.6.4 Authentication via a domain coordinator

Test Reference	AuthenticationDomainCoordinator	IHO Reference IEC Reference	S-98: B-3
Test description			
<i>S-100 Part 15 allows for domain coordinators and a chain of certification between the data server certificate and the SA. This test verifies the ECDIS is able to correctly import data which is authenticated by the SA via one or more domain coordinators.</i>			
Setup			
<p>No pre-installed certificate, permits or ENC data.</p> <p>Test data used:</p> <p>1) PERMIT.XML</p> <p>3) S100_ROOT (Exchange Set – 101AA_TBD_52, 101AA_TBD_53, 101AA_TBD_54)</p> <p>Test data location:</p> <ul style="list-style-type: none"> - AuthenticationDomainControllers 			
Action			
<i>Install the IHO.CRT file, PERMIT.XML and ENC exchange set from the location described.</i>			
Results			
<i>Verify the ECDIS correctly installs all cells.</i>			

2.6.5 ENC signature validation

Test Reference	InvalidDatasetSignature	IHO Reference IEC Reference	
Test description			
<i>Test how the system responds when validating an incorrectly signed dataset. Confirm that the correct SSE 109 message is displayed.</i>			
Setup			
<p>No pre-installed certificate/public key, permits or ENC data.</p> <p>Test data used:</p> <p>1) IHO.CRT</p> <p>2) S100_ROOT (Exchange Set)</p> <p>Test data location:</p> <ul style="list-style-type: none"> - Authentication2C <p>The digital signature for 101AA00EJ8PM.000 is in the correct format but the signature is invalid. The digital signature for 101AA00EP00S.000 is in the correct format and is valid.</p>			
Action			
<i>Install the SA IHO.CRT file, PERMIT.XML and ENC exchange set from the location described below.</i>			

2.6.6 Check authentication is continuous and complete

Test Reference	ContinuousAuthentication	IHO Reference IEC Reference	
Test description			
<i>Tests that the system authenticates all signature files individually and continuously without hanging at an error. Check that the SSE 109 and SSE 124 messages are reported correctly.</i>			
Setup			
<i>Use data installed from the previous test (with 101AA00EJ8PM & 101AA00FD2Z already installed). Test data used: 1) S100_ROOT (Exchange Set)</i>			
<i>Test data location: - Authentication2E</i>			
<i>101AA00HAOUR.000 (invalid signature) 101AA00I9FJ3.001 (Incorrect signature format)</i>			
Action			
<i>Load the exchange set from the location above.</i>			
Results			
<i>The system must authenticate each ENC signature continuously in turn. It must report the following errors at the end of the process: "101AA00HAOUR.000 – SSE 109 – ENC Signature is invalid." "101AA00I9FJ3.001 – SSE 124 – ENC Signature format is incorrect."</i>			
<i>The system must load all ENC data files with authenticated digital signatures but not those that do not. Some systems may report an SSE 109 (ENC Signature is invalid) error for both 101AA00HAOUR.000 & 101AA00I9FJ3.001. This is acceptable as the expected outcome is the same, i.e. the data file is rejected.</i>			
<i>Note: 101AA00I9FJ3.002 should also return a sequential update error as it was not possible to install 101AA00I9FJ3.001.</i>			
<i>e.g ENC cell 101AA00EJ8PM (Edition #3, Update #0) installed without error or warning ENC cell 101AA00EP00S (Edition #4, Update #0) installed without error or warning ENC cell 101AA00FD2Z (Edition #5, Update #0) installed without error or warning ENC cell 101AA00HAOUR (Edition #3, Update #0) is not installed. Error message SSE109 ENC cell 101AA00HC6FD (Edition #8, Update #1) installed without error or warning ENC cell 101AA00I9FJ3 (Edition #3, Update #2) Base cell is installed without error or warning. Update #1 is not installed. Error message SSE 124</i>			

2.6.7 Single exchange set with datasets signed by multiple data servers

Test Reference	MultipleDataServers	IHO Reference IEC Reference	S-98: B-3
Test description			
To test how the system performs when an exchange set contains digital signatures from multiple data servers. That is, datasets signed with different data server private keys and containing different SA signed data server certificates.			
Setup			
No pre-installed certificates, permits or ENC.s.			
Test data used:			
1) IHO.CRT			
2) S100_ROOT (Exchange Set)			
Test data location:			
- Authentication2F			
ENC Signatures		ENC Signatures	
Signed by Data Server 1 (DS1)		Signed by Data Server 2 (DS2)	
DS1"s SA signed certificate		DS2"s SA signed certificate	
101AA00EJ8PM.000, 101AA00EP00S.000,		101AA00HC6FD.001	
101AA00FD2Z.000, 101AA00HAOUR.000,		101AA00I9FJ3.000,001 & 002	
101AA00HC6FD.000		101AA00J9D5.000 & 001	
Action			
Install the certificate, permits and exchange set from the location above.			
Results			
The seven cells and accompanying updates must authenticate, decrypt and import to the ECDIS without any error or warning messages.			
ENC cell 101AA00EJ8PM (Edition #3, Update #0) installed without error or warning			
ENC cell 101AA00EP00S (Edition #4, Update #0) installed without error or warning			
ENC cell 101AA00FD2Z (Edition #5, Update #0) installed without error or warning			
ENC cell 101AA00HAOUR (Edition #3, Update #0) installed without error or warning			
ENC cell 101AA00HC6FD (Edition #8, Update #1) installed without error or warning			
ENC cell 101AA00I9FJ3 (Edition #3, Update #2) installed without error or warning			
ENC cell 101AA00J9D5 (Edition #4, Update #1) installed without error or warning			

2.6.8 Missing Certificate

Test Reference	MissingCertificate	IHO Reference IEC Reference	S-98: B-3
Test description			
<i>This test checks that exchange sets containing signatures but missing a data server certificate may not be loaded.</i>			
Setup			
<p>No pre-installed permits. Test data used: CATALOG.XML CATALOG.SIGN Test data location: - Authentication3C</p> <p><i>This exchange set contains data signed by two data servers (as in MultipleDataServers) but DS2's SA signed data server certificate is missing.</i></p>			
Action			
<i>Install the certificate, permits and exchange set from the location above.</i>			
Results			
<p><i>The four cells signed by DS1 must authenticate, decrypt and import to the ECDIS without any error or warning messages. The cells and updates from DS2 must not be loaded and a suitable error message given.</i></p> <p>ENC cell 101AA00EJ8PM (Edition #3, Update #0) installed without error or warning ENC cell 101AA00EP00S (Edition #4, Update #0) installed without error or warning ENC cell 101AA00FD2Z (Edition #5, Update #0) installed without error or warning ENC cell 101AA00HAOUR (Edition #3, Update #0) installed without error or warning ENC cell 101AA00HC6FD (Edition #8, Update #1) not installed ENC cell 101AA00I9FJ3 (Edition #3, Update #2) not installed ENC cell 101AA00J9D5 (Edition #4, Update #1) not installed</p>			

2.6.9 ENC Decryption

2.6.9.a. Install ENCs when pre-installed permits have expired

Test Reference	ExpiredPermits	IHO Reference IEC Reference	S-98: B-3
Test description			
<i>To test how the system performs when importing new ENCs where the previously installed permits have expired.</i>			
Setup			
<p>Only the PERMIT.XML and IHO.CRT files installed from the location below.</p> <p>Test data used:</p> <ol style="list-style-type: none"> 1) IHO.CRT 2) PERMIT.XML 3) S100_ROOT (Exchange Set - 101AA_TBD_52 & 101AA_TBD_53) <p>Test data location:</p> <ul style="list-style-type: none"> - DecryptionA 			
Action			
<p>Install the exchange set from the location above.</p> <p>Note: The computer clock must be to 1st Jan 2023.</p>			
Results			
<p>The system must display the SSE 115 warning when importing the exchange set as follows:</p> <p>“SSE 115 – Subscription service has expired. Please contact your data supplier to renew the subscription licence”, (list affected cells)</p> <p>The system must display the following SSE 125 warning when viewing cells with expired permits:</p> <p>“SSE 125 – The ENC permit for this cell has expired. This cell may be out of date and MUST NOT be used for NAVIGATION”.</p> <p>(Permits for this test are set to expire on 31st Dec 2022.)</p> <p>101AA_TBD_52 (edition # 1 update # 1) should be installed.</p> <p>101AA_TBD_53 (edition # 1 update # 1) should be installed.</p>			

2.6.9.b. Permit expiry within 30 days

Test Reference	ExpiringPermits	IHO Reference IEC Reference	S-98: B-3
Test description			
<i>To test how the system performs when importing new ENC's where the installed permits expire within 30 days.</i>			
Setup			
<p>No ENC data installed but with PERMIT.XML and IHO.CRT installed for previous test (2.5.6a).</p> <p>Test data used:</p> <ol style="list-style-type: none"> 1) IHO.CRT (already installed) 2) PERMIT.XML (already installed) 3) S100_ROOT (Exchange Set - 101AA_TBD_52 & 101AA_TBD_53) <p>Test data location:</p> <ul style="list-style-type: none"> - EncryptionB 			
Action			
<p>Set the computer clock between 1st Dec 2022 and 31st Dec 2022.</p> <p>Install the exchange set from the location above.</p>			
Results			
<p>The system must import the exchange set but display the appropriate SSE 120 warning message as follows (Permits in this test are set to expire on 31st Dec 2022):</p> <p>“SSE 120 – Subscription service will expire in less than 30 days. Please contact your data supplier to renew the subscription licence.”</p> <p>101AA_TBD_52 (edition # 1 update # 1) should be installed (with “SSE 120”).</p> <p>101AA_TBD_53 (edition # 1 update # 1) should be installed (with “SSE 120”).</p>			

2.6.9.c. Incorrect cell keys encrypted in the ENC permits

Test Reference	IncorrectCellKeys	IHO Reference IEC 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 121 error message is displayed. 2) Test that the system does not permanently halt for a single/multiple failures. 3) Test that the system reports the number of successful/unsuccessful imports.			
Setup			
No pre-installed permits or ENCs. Certificate from previous tests, 2.5.6a and 2.5.6b. Test data used: 1) IHO.CRT (Pre-installed) 2) PERMIT.XML 3) S100_ROOT (Exchange Set - 101AA00XGEH, 101AA00XHTX, 101AA00XPE6, 101AA00XUIH, 101AA00YY4T, 101AA00Z85F & 101AA_TBD_51) Test data location: - EncryptionC			
Action			
Install the permits and load the exchange set from the location above.			
Results			
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 121 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: - 101AA00XPE6 & 101AA00XUIH.) The system must not halt at an error but continue on to the next ENC. The system must report on successful/unsuccessful imports. 101AA00XGEH (edition # 1 update # 0) should be installed (without error or warning). 101AA00XHTX (edition # 2 update # 1) should be installed (without error or warning). 101AA00XPE6 (edition # 1 update # 1) should not be installed (with “SSE 121”). 101AA00XUIH (edition # 1 update # 0) should not be installed (with “SSE 121”). 101AA00YY4T (edition # 1 update # 0) should be installed (without error or warning). 101AA00Z85F (edition # 1 update # 0) should be installed (without error or warning). 101AA_TBD_51 (edition # 1 update # 0) should be installed (without error or warning).			

2.6.9.d. Validate ENC data integrity

Test Reference	DataIntegrity	IHO Reference IEC Reference	S-98: B-3
Test description			
Confirm that the system correctly validates decrypted ENC's and checks the integrity of each ENC data file. Confirm that the system reports the correct SSE 116 error message when the digital signature is incorrect or does not agree with the value contained in the corresponding CATALOG.XML record for the dataset. Also determine whether the system correctly reports the SSE 123 (sequential update error).			
Setup			
IHO.CRT from previous test (2.5.6c) but no pre-installed permits or ENC's. Test data used: 1) IHO.CRT (Pre-installed) 3) S100_ROOT (Exchange Set – 101AA00P860, 101AA00PTU4K, 101AA00QYVK & 101AA00R5ZR) Test data location: - EncryptionD			
Action			
Install the ENC cell permits and exchange set from the location above.			
Results			
1) The system must validate the digital signature of each dataset 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 116 – Dataset <Dataset Name> Signature is incorrect. Contact your 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 123 – Non sequential update, previous update(s) missing try reloading from the base media. If the problem persists contact your data supplier” . (101AA00PTU4K.000 – digital signature altered manually in CATALOG.XML file 101AA00R5ZR.003 – ENC data intentionally corrupted.) 101AA00P860 (edition # 9 update # 3) should be installed (without error or warning). 101AA00PTU4K (edition # 2 update # 1) should not be installed (with “SSE 116” followed by “SSE 123”). 101AA00QYVK (edition # 1 update # 1) should be installed (without error or warning). 101AA00R5ZR (edition # 1 update # 5) should be installed with only two updates (edition # 1 update # 2) (with “SSE 116” followed by “SSE 123”).			

2.7 Dataset Management

2.7.1 Encrypted ENC's supplied by different Data Servers

Test Reference	DataManagement	IHO Reference IEC Reference	S-98: B-3
Test description			
<i>To test how the system performs when loading datasets from two different data servers who have their own unique SA signed certificates and encrypt using their own unique encryption keys.</i>			
Setup			
<i>IHO.CRT from previous test but no pre-installed permits or ENC's.</i>			
a) Data Server 1 (DS1) Test data used: 1) IHO.CRT [Pre-installed] 2) PERMIT.XML 3) S100_ROOT (Exchange Set - 101AA008GJO, 101AA008M4D, 101AA008RXF0 & 101AA009SKHX) Test data location: - DataManagementA1			
b) Data Server 2 (DS2) Test data used: 4) IHO.CRT [Pre-installed] 5) PERMIT.XML 6) S100_ROOT (Exchange Set - 101AA009SKHX, 101AA00B5MV, 101AA00D1AZO & 101AA00E356) Test data location: - DataManagementA2			
Action			
<i>Install the permits and exchange set for Data Server 1 (DS1), then install the permits and exchange set for DS2 from locations above.</i>			
Results			
<i>Both exchange sets authenticate against the same installed SA certificate and contain the correct data server certificate. The DSs' permits must be stored independently and decrypt the relevant exchange sets when loaded.</i> <i>(In this test both Data Servers (DS) have ENC cell 101AA009SKHX common to both. DS1 has 101AA009SKHX.000 – 002 and DS2 has 101AA009SKHX.000 – 004.</i> <i>This test scenario considers how the ECDIS performs when a user obtains ENC's from two independent data providers.)</i> <i>The system should be up to date as follows:</i> <i>after installation of cells from DS1 (a):</i> 101AA008GJO (edition # 1 update # 1) 101AA008M4D (edition # 1 update # 0) 101AA008RXF0 (edition # 1 update # 0) 101AA009SKHX (edition # 1 update # 2) <i>after installation of cells from DS2 (b):</i> 101AA008GJO (edition # 1 update # 1) 101AA008M4D (edition # 1 update # 0) 101AA008RXF0 (edition # 1 update # 0) 101AA009SKHX (edition # 1 update # 4) 101AA00B5MV (edition # 1 update # 3) 101AA00D1AZO (edition # 1 update # 0) 101AA00E356 (edition # 1 update # 0)			

2.7.2 Loading additional dataset permits and cells from a different data provider

Test Reference	AdditionalPermits	IHO Reference IEC Reference	S-98: B-3
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.			
Setup			
Use the data installed for test 2.5.7a for DS1 & 2 (assuming that the data loaded as per the expected results) Test data used: 1) IHO.CRT [Pre-installed] 2) PERMIT.XML 3) S100_ROOT (Exchange Set - 101AA006EC2, 101AA006TF9N, 101AA008GJO, 101AA008M4D, 101AA008RXF0 & 101AA009SKHX) Test data location: - DataManagementB			
Action			
Install the permit file from the location above followed by the exchange set at the same location.			
Results			
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 [101AA008GJO & 101AA008M4D]. The expected Status within the ECDIS is listed below. The ENC cells loaded during test 2.5.7a for data server 2 [DS2] must still be viewable in the ECDIS to their expected state of correctness. The expected SYSTEM DATABASE status listed below shows the expected results against 2.5.7a [DS2]. The permit file only contains new permits for cells 101AA006EC2 & 101AA006TF9N. The exchange set contains the new cells and the cells from the previous test, DataManagementA 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: 101AA006EC2 (edition # 3 update # 3) new cell should be installed. 101AA006TF9N (edition # 1 update # 1) new cell should be installed. 101AA008GJO (edition # 1 update # 2) updated. 101AA008M4D (edition # 1 update # 1) updated. 101AA008RXF0 (edition # 1 update # 0) 101AA009SKHX (edition # 1 update # 4) installation of cells from DS2 unchanged from 2.5.7a: 101AA008GJO (edition # 1 update # 2) 101AA008M4D (edition # 1 update # 1) 101AA008RXF0 (edition # 1 update # 0) 101AA009SKHX (edition # 1 update # 4) 101AA00B5MV (edition # 1 update # 3) 101AA00D1AZO (edition # 1 update # 0) 101AA00E356 (edition # 1 update # 0)			

2.7.3 Test that the system operates correctly in a multiple data provider environment

Test Reference	ProviderChange	IHO Reference IEC Reference	S-98: B-3
Test description			
Check that ENC's existing within both subscriptions do not cause corruption across service providers. Confirm that both providers information is managed independently without conflict.			
Setup			
IHO certificat installed from previous tests 2.5.7a & 2.5.7b. No pre-installed permits or ENC's.			
<p>a) Data Server 1 (DS1)</p> <p>Test data used:</p> <p style="padding-left: 40px;">IHO.CRT [Pre-installed] PERMIT.XML</p> <p style="padding-left: 40px;">S100_ROOT (Exchange Set - 101AA008GJO, 101AA008M4D, 101AA008RXF0 & 101AA009SKHX)</p> <p>Test data location:</p> <ul style="list-style-type: none"> - DataManagementC1 <p>b) Data Server 2 (DS2)</p> <p>Test data used:</p> <p style="padding-left: 40px;">IHO.CRT [Pre-installed] PERMIT.XML</p> <p style="padding-left: 40px;">S100_ROOT (Exchange Set - 101AA008GJO, 101AA008M4D, 101AA008RXF0, 101AA009SKHX, 101AA00B5MV & 101AA00D1AZO)</p> <p>Test data location:</p> <ul style="list-style-type: none"> - DataManagementC2 <p style="text-align: center;">2</p>			
Action			
<ol style="list-style-type: none"> 1) Install the PERMIT.XML from location (a) above. 2) Load the Exchange Set (S100_ROOT) from (a). 3) Load the Exchange Set (S100_ROOT) from (b). 4) Install the PERMIT.XML from location (b). 5) Load the Exchange Set (S100_ROOT) from (b). This exchange set contains new base datasets and updates to previously installed cells. One cell is already installed with no updates. This test scenario considers how the ECDIS performs when the user changes from one data provider to another. 			
Results			

1. *Permits at (a) shall install without error or warning.*
2. *Exchange Set (S100_ROOT) at (a) shall load without error or warning.*
3. *Exchange Set (S100_ROOT) at (b) must **not** load as there are no valid permits for data server 2 [DS2] installed in the ECDIS. A SSE 110 warning must be displayed stating “**SSE 110 – Permits not available for this data provider**”.*
4. *Permits at (b) shall install without error or warning.*
5. *Exchange Set (S100_ROOT) 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 SYSTEM DATABASE must be the same as that described below.

The system should be up to date as follows:

after installation of cells from DS1:

*101AA008GJO (edition # 1 update # 1)
101AA008M4D (edition # 1 update # 0)
101AA008RXF0 (edition # 1 update # 0)
101AA009SKHX (edition # 1 update # 2)*

After installation of cells from DS2:

*101AA008GJO (edition # 1 update # 2)
101AA008M4D (edition # 1 update # 1)
101AA008RXF0 (edition # 1 update # 0)
101AA009SKHX (edition # 1 update # 4)
101AA00B5MV (edition # 1 update # 3)
101AA00D1AZO (edition # 1 update # 0)*

2.8 ECDIS management of data services.

2.8.1 ECDIS management of cancelled cells

Test Reference	CancelledDatasets	IHO Reference IEC Reference	
Test description			
<i>This test ensures EUT responds correctly when a dataset is cancelled.</i>			
Setup			
<p><i>IHO certificate/public key installed from previous test ProviderChange. No pre-installed permits or ENC's.</i></p> <p><i>Test data used:</i></p> <ol style="list-style-type: none"> <i>1) IHO.CRT [Pre-installed]</i> <i>2) PERMIT.XML</i> <i>3) S100_ROOT (2 Exchange Sets - 101AA00572C 101AA006EC2, 101AA007I3I, 101AA00EJ8PM)</i> <p><i>Test data location:</i></p> <ul style="list-style-type: none"> <i>- DataManagementCancelBase</i> <i>- DataManagementCancelUpdate</i> 			
Action			
<ol style="list-style-type: none"> <i>1. Install the ENC permits.</i> <i>2. Load the exchange set DataManagementCancelBase</i> <i>3. Update using the exchange set DataManagementCancelUpdate</i> <i>4. Attempt to view all imported cells in the ECDIS and determine their status.</i> 			
Results			
<p><i>The system shall report any cell(s) that have been identified as cancelled at load time.</i></p> <p><i>(Cell 101GB00280200 is cancelled.)</i></p> <p><i>A message shall be displayed informing the user of the cell name.</i></p> <p><i>Depending on the method adopted by the OEM for managing cancelled cells one of the following conditions shall be observed:</i></p> <ol style="list-style-type: none"> <i>1. The cancelled cell cannot be viewed in the ECDIS</i> <i>2. The cancelled cell can be viewed in the ECDIS with the warning message defined in S-63 and specified below:</i> <p><i>"Cell <name> has been cancelled and may not be up to date. Under no circumstances should it be used for primary navigation".</i></p> <p><i>Clarification: Systems that remove cells without consulting the user do not have to provide a warning message at load time.</i></p> <p><i>The system should be up to date as follows: after installation of cells from 2.5.7d [Base]:</i></p> <p><i>101AA00572C (edition # 1 update # 4)</i></p> <p><i>101AA006EC2 (edition # 2 update # 2)</i></p> <p><i>101AA007I3I (edition # 2 update # 0)</i></p> <p><i>101AA00EJ8PM (edition # 2 update # 1)</i></p> <p><i>After installation of cells from 2.5.7d [Update]:</i></p> <p><i>101AA00572C (edition # 1 update # 8)</i></p> <p><i>101AA006EC2 (edition # 3 update # 0)</i></p> <p><i>101AA007I3I cancelled cell (101AA007I3I) should be reported by the system and either removed from the system database or displayed with the appropriate warning.</i></p> <p><i>101AA00EJ8PM (edition # 2 update # 4)</i></p>			

ECDIS Display of Replacement ENC Cells	Test Reference	CancelReplace	IHO Reference IEC Reference			
Test description						
To test how the system responds when a cell is cancelled and replaced in a service.						
101AA00MTG2 is cancelled and replaced by 101AA00NYPC & 101AA00NYWT [Fileless Cancel] 101AA00NF2KE is cancelled and replaced by 101AA00P46I [by Cancellation Update]						
Setup						
Status as per successful completion of test 2.5.7 d) Test data used: 1) IHO.CRT [Pre-installed] 2) PERMIT.XML 3) S100_ROOT (2 Exchange Sets - 101AA00MTG2, 101AA00NF2KE, 101AA00P860, 101AA00PTU4K & 101AA00RACV) Test data location: - DataManagementCancelReplaceBase - DataManagementCancelReplaceUpdate						
Action						
Install the ENC permits. Load the exchange set DataManagementCancelReplaceBase then update using the exchange set DataManagementCancelReplaceUpdate.						
Attempt to view all imported cells in the ECDIS and determine their status.						
Results						
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 2.5.7 d). Replacement cells must be presented to the user as follows: "Cell <name> has been cancelled and has been replaced by cell(s), <name1>; <name2>."						
Test	Cell Name	Exchange Set Content		Expected SYSTEM DATABASE Content		Notes
		Edition N°	Update N°	Edition N°	Update N°	
Base	101AA00MTG2	2	0	2	0	All ENC cells installed without error or warning
	101AA00NF2KE	2	0	2	0	
	101AA00P860	8	3	8	3	
	101AA00PTU4K	1	1	1	1	
	101AA00RACV	1	4	1	4	
Update	101AA00572C	1	8	1	8	Cells from the previous test (same status)
	101AA006EC2	3	0	3	0	
	101AA007I3I	2	1	2	1	
	101AA00EJ8PM	2	4	2	4	
	101AA00MTG2	2	1	cancelled		Messages should be displayed as for previous test
	101AA00NF2KE	2	1	cancelled		
	101AA00P860	9	0	9	0	
	101AA00PTU4K	2	1	2	1	

		101AA00RACV	1	5	1	5	plus message relating to replaced cells: 101AA00MTG2 is cancelled and replaced by 101AA00NYPC & 101AA00NYWT 101AA00NF2KE is cancelled and replaced by 101AA00P46I	
--	--	-------------	---	---	---	---	---	--

2.8.2 ECDIS management of ENC re-issued datasets

Test Reference	Reissues	IHO Reference IEC Reference				
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)						
Setup						
IHO certificate/public key installed from previous test No pre-installed permits or ENC's. Test data used: 1) IHO.CRT [Pre-installed] 2) PERMIT.XML 3) Base [Exchange Set – 101AA00L75N] 4) Update [Exchange Set – 101AA00L75N & 101AA00WOV3] Test data location: - DataManagementF1 - DataManagementF2						
Action						
Install the ENC permits. Load the exchange set DataManagementF1 then update using the exchange set DataManagementF2 .						
Results						
The system must load the base exchange set and then the re-issued cells. (101AA00L75N & 101AA00WOV3) on the update as though they were a new data set or a new edition of a data set. The system must also install the subsequent updates 101AA00L75N [Ed 11 Up10] and 101AA00WOV3 [Ed 6 Up 6]. 101AA00WOV3 is a re-issue with no previous history, i.e., new cell. 101AA00L75N 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.						
Test	Cell Name	Exchange Set Content		Expected SYSTEM DATABASE Content		Comments
		Edition N°	Update N°	Edition N°	Update N°	
2.5.7f [Base]	101AA00L75N	11	9	11	9	Edition 11 of 101AA00L75N installed with updates 1-9
2.5.7f [Update]	101AA00L75N	11	10	11	10	101AA00WOV3 is straight re-issue with no previous history, i.e. new cell. 101AA00L75N is a re-issued cell with history, i.e. base cell already installed in the ECDIS.
	101AA00WOV3	6	6	6	6	

2.8.3 ECDIS management of Exchange Sets

Test Reference	ECDISManagement	IHO Reference	IEC Reference			
Test description						
To confirm the user is informed when there is incompatibility between installed ENC's and an applied update exchange set.						
Setup						
No permits or ENC's installed Test data used: 1) IHO.CRT [Pre-installed from previous tests] 2) PERMIT.XML 3) Exchange Sets DataManagementG1, DataManagementG2, DataManagementG3 4) Update exchange set DataManagementG4 Test data location: - DataManagementG1, DataManagementG2, DataManagementG3, DataManagementG4						
7g						
Action						
Install permits and load the exchange sets listed.						
Results						
DataManagementG1, DataManagementG2 and DataManagementG3 should load without error. However, when loading DataManagementG4 the system should install some ENC updates without error but the system must return an appropriate error message that the exchange set is incompatible with existing installed data. Note: Systems must appropriately manage the import of data from different Data Servers and store information of installed data. When loading new data systems should check that the S-128 revision information is compatible with that which is already installed and report any inconsistencies. Users should only be prompted to install licenced datasets [The system will also display continuity errors as a result of non sequential loading when attempting to load and install the updates for 101AA00P860, 101AA00RY93F, 101AA00S8YN & 101AA00101AA00SA35K.]						
DataManagementG4 used in this test is dated 20 July 2016 and pre dates DataManagementG3						
Test	Cell Name	Exchange Set Content		Expected ECDIS Content		Comments
		Edition N°	Update N°	Edition N°	Update N°	
DataManagementG1	101AA00JQS3A	22	16	22	16	
	101AA00LR0Z	4	6	4	6	
	101AA00LXFQ0	3	9	3	9	
	101AA00LXJSN	11	0	11	0	
DataManagementG2	101AA00P860	9	0	9	0	Cells installed for this exchange set but with the incompatibility warning
	101AA00RY93F	2	3	2	3	
	101AA00S8YN	1	1	1	1	
	101AA00SA35K	4	0	4	0	
DataManagementG3	101AA00SH6I7	10	7	10	7	
	101AA00TJHYR	9	5	9	5	
	101AA00WOV3	5	2	5	2	
	101AA00X8SFR	2	1	2	1	
DataManagementG4	101AA00JQS3A	23	4	23	4	NE installed from WK37/07 DataManagementG4
	101AA00LR0Z	4	7	4	7	
	101AA00LXFQ0	3	12	3	12	
	101AA00LXJSN	11	1	11	1	

	101AA00P860	9	5	9	0	Cells not updated due to incompatible S-128
	101AA00RY93F	3	5	2	3	
	101AA00S8YN	1	7	1	1	Cell not updated due to non-sequential update
	101AA00SA35K	5	2	4	0	Cell not updated due to incompatible S-128
	101AA00SH6I7	11	0	11	0	NE installed from DataManagementG4
	101AA00TJHYR					No updates for this cell
	101AA00WOV3					No updates for this cell
	101AA00X8SFR	2	2	2	2	

2.8.4 Update of Supplementary Files

Test Reference	SupplementaryFiles	IHO Reference IEC Reference	S-98: Appendix C
Test description			
<i>This test ensures the EUT supports the update of dataset support files.</i>			
Setup			
<p>No pre-installed permits or ENC's.</p> <p>Test data used:</p> <ol style="list-style-type: none"> 1) IHO.CRT [Pre-installed] 2) PERMIT.XML 3) Base DataManagementSF1 4) UpdateDataManagementSF2 <p>Test data location:</p> <ul style="list-style-type: none"> - DataManagementSF1 - DataManagementSF2 			
Action			
<i>Install permits and load the exchange sets listed.</i>			
Results			
<ol style="list-style-type: none"> 1. Select the note encoded using TXTDSC (text description) (Caution area at 32°34.74'S - 061°08.92'E); 2. The content of the note should be as follows: <p>[Updated note content]</p> <p><i>This note content is updated via a direct replacement in the Update exchange set, without an explicit update to the ENC dataset.</i></p>			

2.8.5 Fileless Cancellation

Test Reference	Fileless Cancellation	IHO Reference IEC Reference	S-98: 21.2
Test description			
<i>Test that the ECDIS correctly processes fileless cancellation.</i>			
Setup			
<p>No pre-installed permits or ENC's.</p> <p>Test data used:</p> <ol style="list-style-type: none"> 1) IHO.CRT [Pre-installed] 2) Base DataManagement1 3) Update FilelessCancellation1 			
Action			
<ol style="list-style-type: none"> 1. Install Exchange Set DataManagement1 2. Inspect the system to ensure installation of 102AA00WOV3 and 102AA00X8SFR 3. Install FilelessCancellation1 			
Results			
<ol style="list-style-type: none"> 1. Ensure that 102AA00WOV3 is cancelled (successful processing of a fileless cancellation) 2. Ensure 102AA00X8SFR is not cancelled due to incorrect formatting of the dataset discovery metadata 			

2.9 ECDIS Update Status Report

2.9.1 ENC Update Status Report

Test Reference	UpdateStatusReportENC	IHO Reference IEC Reference	S-98: Appendix C
Test description			
<i>Confirm that the ECDIS is capable of executing the ENC Update status report as documented in S-98, Appendix C.</i>			
Setup			
<p>Load the exchange set PowerUp.</p> <p>Set system time to 10th February 2019.</p>			
Action			
<p>Ensure ECDIS has data installed. Locate and execute the Update Status Report and inspect output. If ECDIS also supports route filtering of the Status Report then construct a route intersecting with the cells loaded and run the Status Report with the route filtered option.</p>			
Results			
<p>Verify that the update Status Report can be filtered to display only Electronic Navigational Charts (S-101).</p> <p>The ECDIS should report the status of all ENC's loaded in accordance with S-98 XXX-XXX. It should use the issue date of the latest delivered S-128 dataset as the reference date and should display its reference date as 9th February 2019.</p> <p>The datasets should show in the report as "up to date". Then reset the system time to a 1st April 2019 – rerun the report, all the datasets should show as "not up to date".</p>			

2.9.2 ENP Update Status Report

Test Reference	UpdateStatusReportENP	IHO Reference IEC Reference	S-98: Appendix C
Test description			
<i>Confirm that the ECDIS is capable of executing the ENP Update status report as documented in S-98, Appendix C.</i>			
Setup			
<i>As for UpdateStatusReportENC.</i>			
Action			
<i>Ensure ECDIS has data installed. Locate and execute the Update Status Report and inspect output. Select ENP Update Status report.</i>			
<i>If ECDIS also supports route filtering of the Status Report then construct a route intersecting with the cells loaded and run the Status Report with the route filtered option.</i>			
Results			
<i>Verify that the update Status Report can be filtered to display only Electronic Navigational Publications with the following products shown</i>			
<ul style="list-style-type: none"> - S-124 - S-129 			
<i>The ECDIS should report the status of the ENP datasets loaded in accordance with S-98, Appendix C. It should use the issue date of the latest delivered S-128 dataset as the reference date and should display its reference date as 9th February 2019.</i>			
<i>The datasets should show in the report as “up to date”. Then reset the system time to a 1st April 2019 – rerun the report, all the datasets should show as “not up to date”.</i>			

2.9.3 Missing Revision information.

Test Reference	MissingRevisionInformation	IHO Reference	S-98, Appendix C
Test description			
<i>This test checks that the ECDIS correctly marks datasets as unknown when no revision information is available).</i>			
Setup			
<i>Load the exchange set MissingRevisionInformation. This exchange set contains no revision information.</i>			
Action			
<i>Ensure ECDIS has data installed. Locate and execute the Update Status Report and inspect output.</i>			
Results			
<i>Verify that all cells are marked as “Unknown” in accordance with S-98 Appendix C.</i>			

2.9.4 Multiple Revision Information

Test Reference	MultipleRevisionInformation	IHO Reference	S-98, Appendix C
Test description			
<i>This test checks that the ECDIS is able to merge multiple sources of revision information (encoded in the S-128 datasets) together.</i>			
Setup			
<p>Load the following exchange sets:</p> <ul style="list-style-type: none"> - MultipleRevisionInformation1 - MultipleRevisionInformation2 <p>These exchange sets contain multiple S-128 revision information. The ECDIS must merge the revision information together to give the user a harmonised view of their data holdings. A single S-124 dataset is common to both services and the revision information shows it has been updated but is not contained in the delivered exchange set.</p> <p>Data server is the producer code of the S-128, multiple data servers = multiple reports.</p>			
Action			
<i>Ensure ECDIS has data installed. Locate and execute the Update Status Report and inspect output.</i>			
Results			
<i>Verify that all S-101 datasets are marked as “up to date” in the ENC up to date status report. The ENP Up to date Status report should show S-124 dataset 124AA00X01NE.GML marked as “not up to date”.</i>			

2.9.5 Product Independence

Test Reference	RevisionInformation	IHO Reference	S-98, Appendix C
Test description			
<p>TODO:</p> <p><i>Latest updates in S-98 will place new test requirements for update status report.</i></p> <ul style="list-style-type: none"> • <i>Product independence. Delivery of one product only should not invalidate other products. The reference to use is S-104 / S-101, so a delivery of S-104 only should not invalidate S-101</i> • <i>Also, check data producer is valid. Under S-98 the data producer is the producer code of the S-128 dataset.</i> <ul style="list-style-type: none"> • <i>Scenario is S-104 revision independent of S-101.</i> • 			
Setup			
Action			
Results			

Test Reference	RevisionUpdate	IHO Reference	S-98, Appendix C
Test description			
<ul style="list-style-type: none"> • <i>Check it is possible to update revision information using GML updates as stated in S-98</i> • <i>Simple S-128 update, new/modified objects added.</i> • <i>This should also check for filenames of GML update files (to be added to S-98)</i> 			
Setup			
Action			
Results			

2.9.6 Adequate and Complete Tests

Test Reference	RevisionCompleteness	IHO Reference	S-98, Appendix C
Test description			
TODO: <ul style="list-style-type: none"> • <i>Check that S-124 in-force bulletins can be replicated by inspecting an S-124 only S-128 dataset and identifying gaps (in S-128, not on ECDIS, on ECDIS cancelled/not present in S-128)</i> 			
Setup			
Action			
Results			

2.10 Loading and update of non-ENC S-100 datasets.

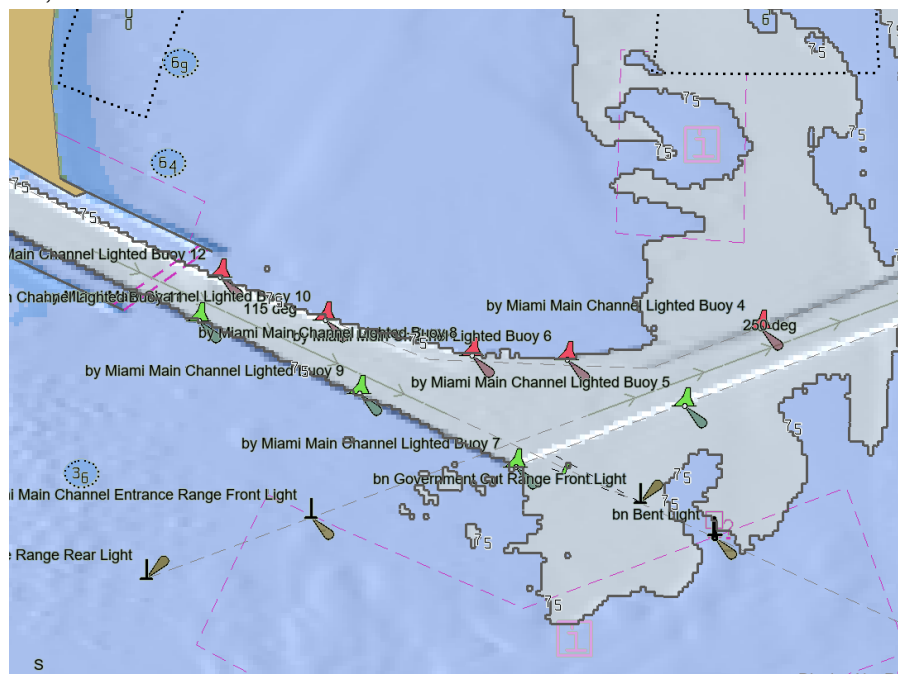
2.10.1 Bathymetric Surface Datasets (S-102)

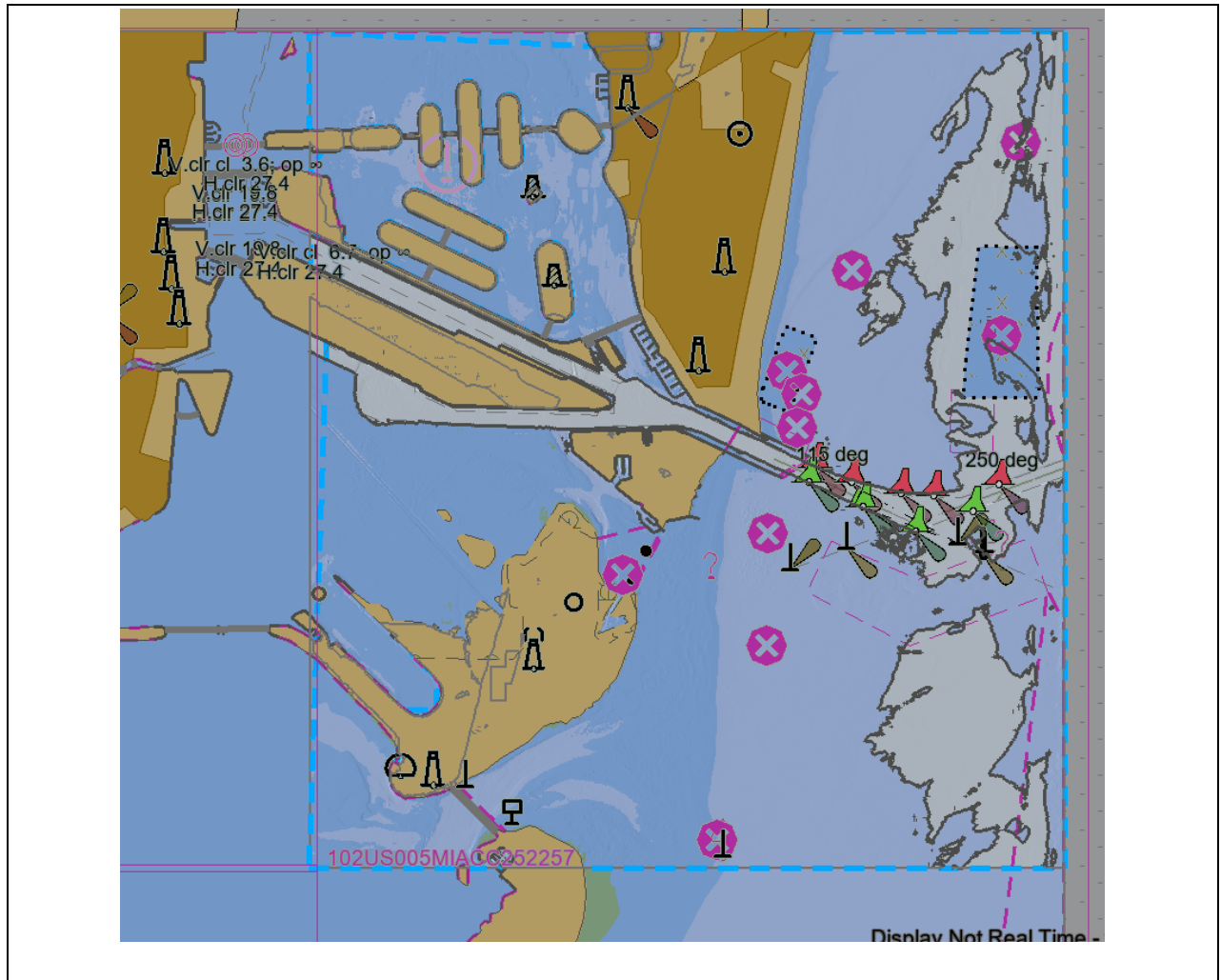
Test Reference	S-102	IHO Reference	S-98 6.1 S-98 13
Test description			
<p>Tests of S-101 ENC and S-102 loading and portrayal:</p> <p>TODO: Add tests for correctly disallowing interoperability based on producer codes [S-98 8.1.1/Appendix D-1]</p> <p>TODO: S-102 should only be displayed according to scale values in CATALOG.XML [S-98]</p>			
Setup			
<i>As per test Initial Catalogues (exchange set InitialCatalogues loaded).</i>			
Action			
<i>Ensure enhanced Safety Contour is enabled and Water Level Adjustment is disabled.</i>			
Results			

1. Navigate to the specified position
2. Turn on Enhanced Safety Contour
3. Ensure the blue border appears as shown in the following image denoting the limit of the area for which enhanced safety contour is available.



1. **[Show new safety contour]** Set safety contour value to 7.5m
2. Ensure display shows the enhanced safety contour constructed from the S-102 data, at position XXX.XXX, YYY.XXX






2.10.2 Water Levels (S-104)

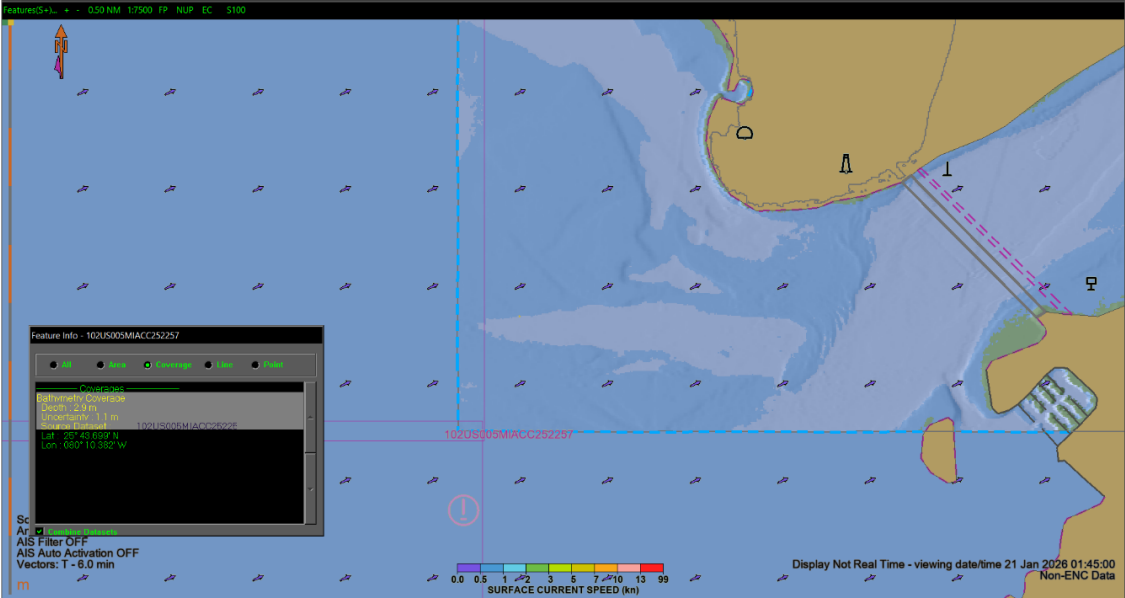
Test Reference	Water Level Adjustment S-104	IHO Reference	S-98 Appendix D-2
Test Description			
TODO: Water Level permission for producer codes [S-98 8.1.1 / Appendix D1] TODO: More detailed tests for vertical clearance adjustment			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	On
Safety Contour	10	Highlight date dependent	
Safety Depth	8	Highlight document	
Deep Contour	30	Highlight info	
Shallow Contour	5	Shallow Pattern	
Four Shades	On	Unknown	On
Radar Overlay		Update Review	
Plain Boundaries	Off	Text Groups	On

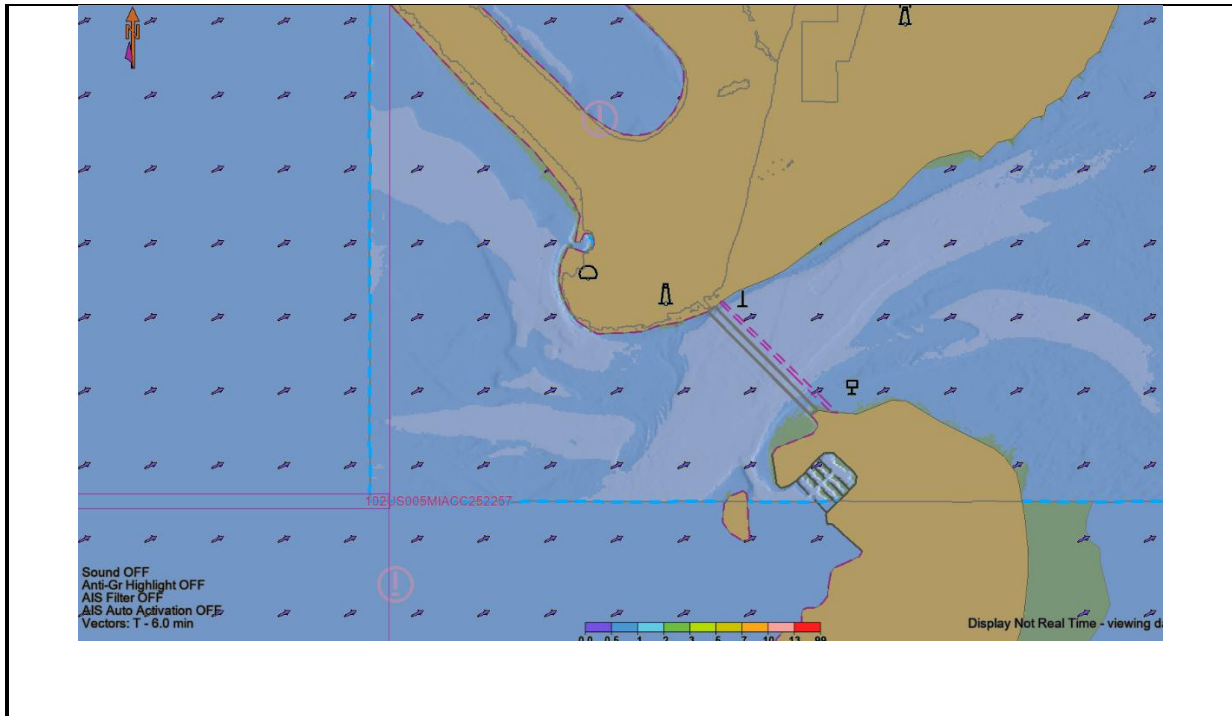
Simplified Symbols	Off	Chart Text	
		Important text	
Full Light Lines			
Ignore scale minimum		Other Text	
Shallow Water Dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:8000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys, Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			
Setup			
<ol style="list-style-type: none"> 1. As per test Initial Catalogues (exchange set InitialCatalogues loaded). 2. Ensure enhanced Safety Contour and Water Level Adjustment is disabled. 3. Load exchange set EnhancedSafetyContour 4. Load exchange set WaterLevelAdjustment 			
Source Dataset 10100AA164US4FL2, 102US004FL2A125227			
Action			
<ol style="list-style-type: none"> 1. Switch on Enhanced Safety Contour and Water Level Adjustment 2. Ensure the blue border is displayed showing the limit where water level adjustment is applied. 3. Navigate to the position XXX.XXX YYY.YYY 4. Query 0.6m sounding at position XXX.XXX YYY.YYY 5. Ensure an adjusted value of sounding is available = 0.9m 6. Ensure an unadjusted value is also available = 0.6m 7. Switch off Enhanced Safety Contour and WLA 8. Ensure the Sounding value available in the pick report is 0.6m 			

Results

Action
<ol style="list-style-type: none"> 1. Turn on Enhanced Safety Contour and Water Level Adjustment 2. Turn on Uncertainty – if the ECDIS supports separate horizontal and vertical uncertainty, switch on Vertical Uncertainty 3. Query the 0.6m sounding at position XXX.XXX YYY.YYY 4. Ensure the vertical uncertainty value of 0.1m is taken into account giving an adjusted value of 0.8m
Results
tbd
Action
<ol style="list-style-type: none"> 1. Switch off Enhanced Safety contour, Water Level Adjustment and Uncertainty 2. Load exchange set WLAOverlap 3. Switch on Water Level Adjustment 4. Navigate to position XXX.XXX YYY.YYY 5. Ensure an indication of “Overlap” is shown on the display and the user is prompted to choose which datasets to use as the source for Water Level Adjustment
Results

2.10.3 Tidal Streams (S-111)

Test Reference	S-111	IHO Reference	S-98 6.1 S-98 13
Test Description			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	On
Safety Contour	10	Highlight date dependent	
Safety Depth	8	Highlight document	
Deep Contour	30	Highlight info	
Shallow Contour	5	Shallow Pattern	
Four Shades	On	Unknown	On
Radar Overlay		Update Review	
Plain Boundaries	Off	Text Groups	On
Simplified Symbols	Off	Chart Text	
		Important text	
Full Light Lines			
Ignore scale minimum		Other Text	
Shallow Water Dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:8 000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys, Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			

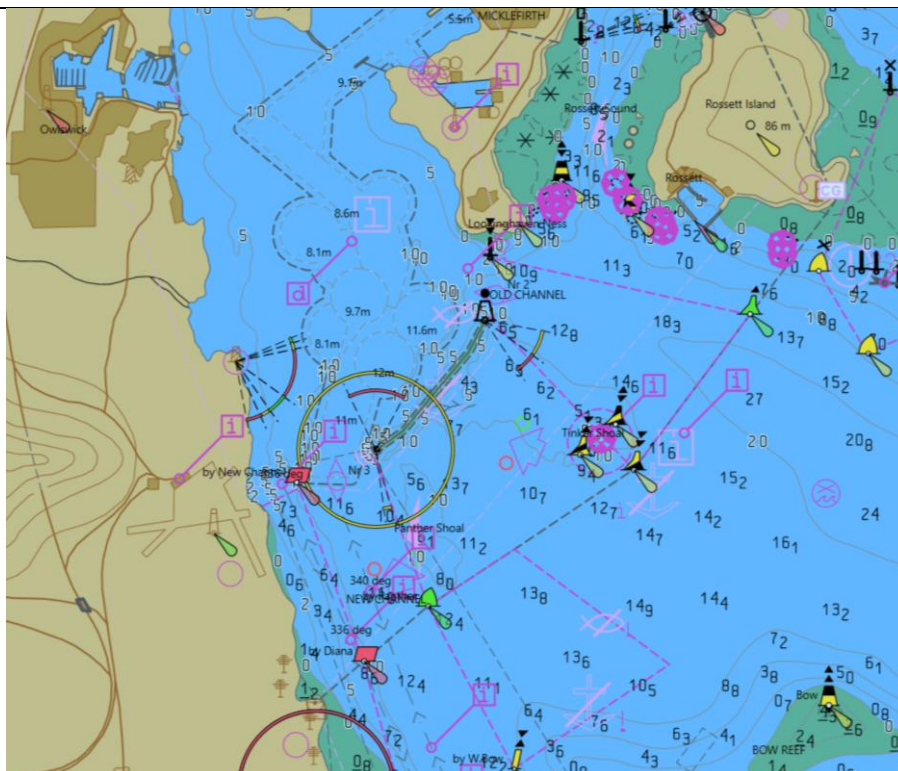
Chart (Standard)			
Alert Highlights (Standard)			
Additional			
Setup			
<ol style="list-style-type: none"> As per test Initial Catalogues (exchange set InitialCatalogues loaded). Zoom to display scale of 1:8 000 Switch on portrayal of S-111 Tidal Streams Ensure the display shows the S-111 arrows, as shown 			
Action			
Results			
			
Action			
<ol style="list-style-type: none"> Zoom to Display Scale 1: 20 000 or smaller 			
Results			
<ol style="list-style-type: none"> Ensure the S-111 portrayal remains at a constant density, showing that the portrayal of the S-111 data has been “thinned” to reduce clutter on screen. 			



2.10.4 Marine Protected Areas (S-122)

Test Reference	Marine Protected Areas.	IHO Reference	S-98 6.1.1
Test Description			
Ensure the ECDIS is capable of displaying the mandatory overlays of S-122 TODO: S-122 (and others) should only display within scale range of MSVS			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	On
Safety Contour	10	Highlight date dependent	
Safety Depth	8	Highlight document	
Deep Contour	30	Highlight info	
Shallow Contour	5	Shallow Pattern	Off
Four Shades	On	Unknown	
Radar Overlay		Update Review	
Plain Boundaries	Off	Text Groups	On
Simplified Symbols	Off	Chart Text	
		Important text	
Full Light Lines			
Ignore scale minimum		Other Text	
Shallow Water Dangers		Names	
Palette		Light description	
Day		All other chart text	

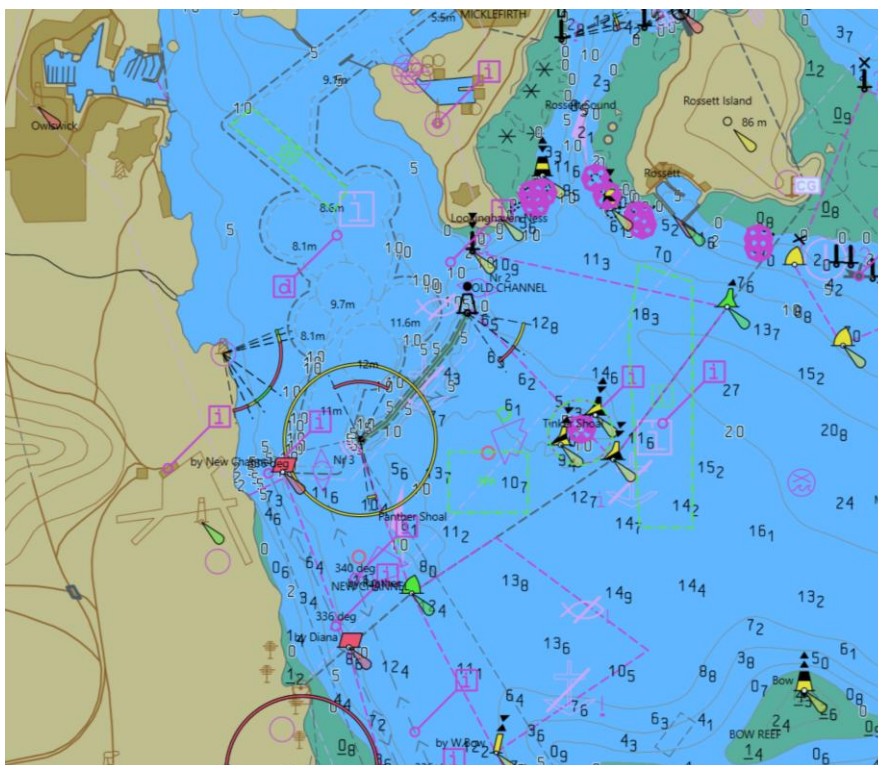
Date Dependent Objects		Display	
Start Date		Centre	32.5465S,60.9387E
End Date		Scale	1:45,000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			
Setup			
<ol style="list-style-type: none"> 1. Load the Exchange set PowerUp 2. Load the Exchange set Overlays 3. Switch off all overlays 4. Navigate to the documented position and MSVS 			
Action			
5. Observe the Display			
Results			



Action

6. Switch on S-129 Under Keel Management Areas

Results



Action

7. Query the display at position 32.5465S,60.9387E

Results

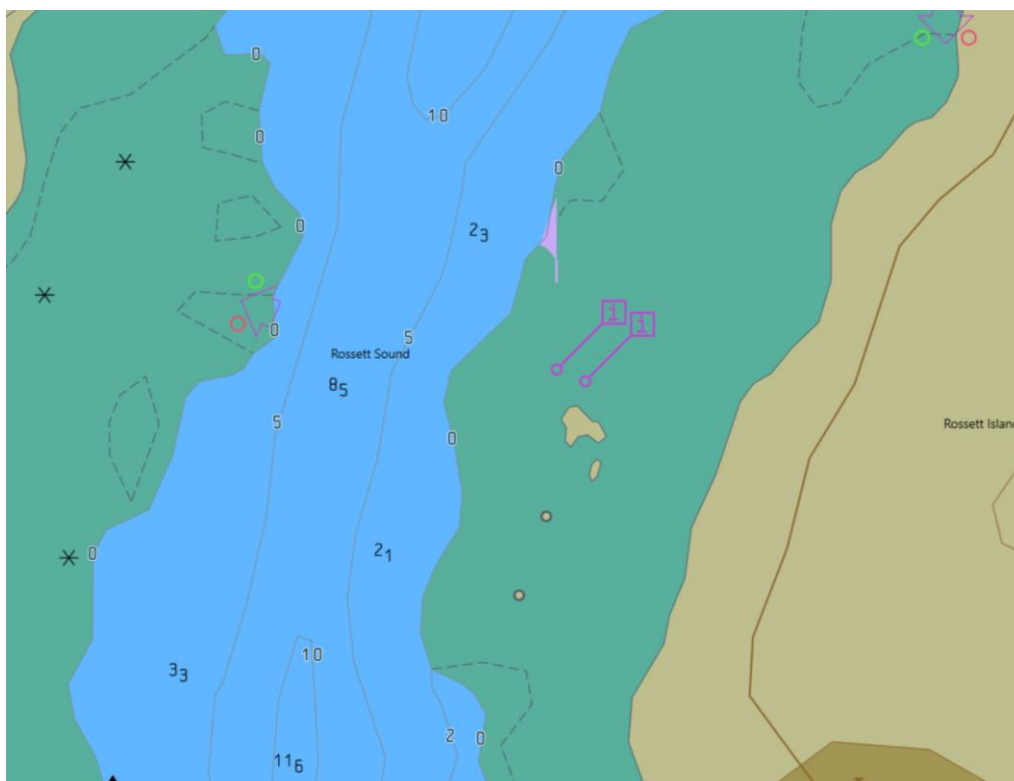
8. Verify that the S-122 feature "Marine Protected Area" has details as follows:
 - *Category Of Marine Protected Area = IUCN IV*

2.10.5 Navigational Warnings (S-124)

Test Reference	Navigational Warnings		IHO Reference IEC Reference	S-98 11.12.1 S-98 11.2.2
Test Description				
This test ensures the EUT is capable of displaying the mandatory overlays of S-124.				
Loaded Data				
Exchange Set Name				
Display Mode		Independent Mariner's Selections		
Other		Accuracy		
Context Parameters		Contour label		On
Safety Contour	10	Highlight date dependent		
Safety Depth	8	Highlight document		
Deep Contour	30	Highlight info		
Shallow Contour	5	Shallow Pattern		Off
Four Shades	On	Unknown		
Radar Overlay		Update Review		
Plain Boundaries	Off	Text Groups		On
Simplified Symbols	Off	Chart Text		
		Important text		
Full Light Lines				
Ignore scale minimum		Other Text		
Shallow Water Dangers		Names		
Palette		Light description		
Day		All other chart text		
Viewing Date or Range		Display		
Start viewing date		Centre	32.5059S,60.9557E	
End viewing date		Scale	1:8,000	
Viewing Groups				
Standard Display		Other		
Drying lines		Spot soundings		
Buoys. Beacons, aids to navigation		Submarine cables and pipelines		
Buoys, beacons, structures		All isolated dangers		
Lights		Magnetic variation		
Boundaries and limits		Depth contours		
Prohibited and restricted areas		Seabed		
Chart scale boundaries		Tidal		
Cautionary notes		Miscellaneous (Other)		
Ships' routing systems and ferry routes				
Archipelagic sea lanes				
Miscellaneous (Standard)				
Chart (Standard)				
Alert Highlights (Standard)				
Setup				
1. Load the Exchange set PowerUp 2. Load the Exchange set Overlays 3. Switch off all overlays 4. Navigate to the documented position and MSVS				
Action				

5. Observe the Display

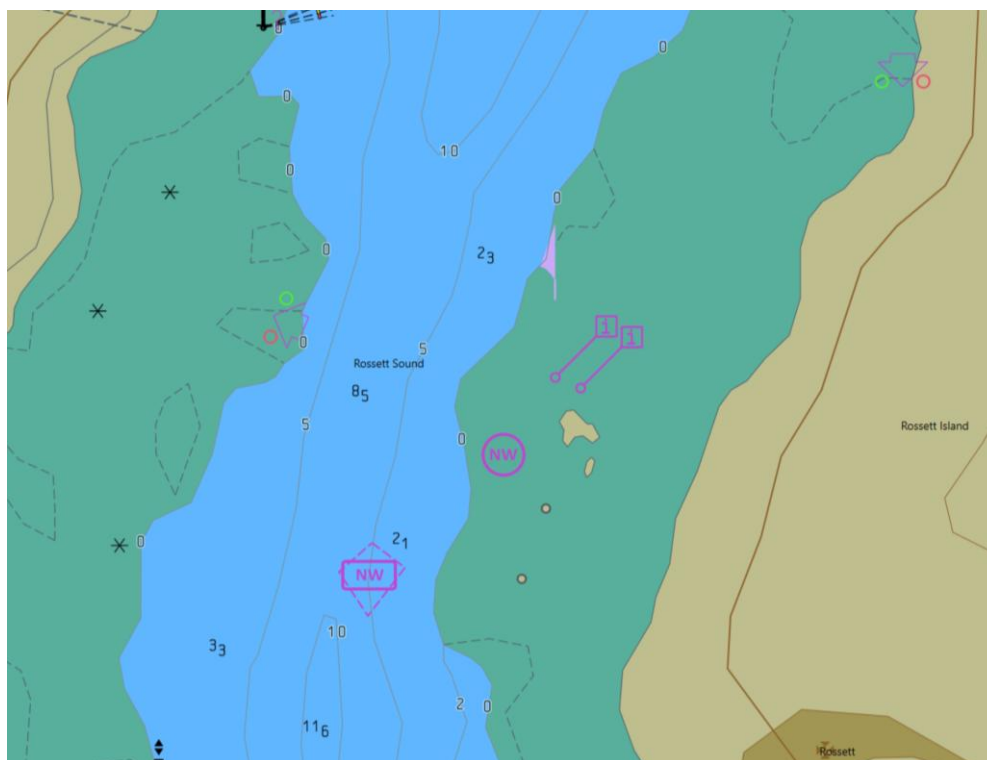
Results



Action

6. Switch on S-124 Navigational Warnings

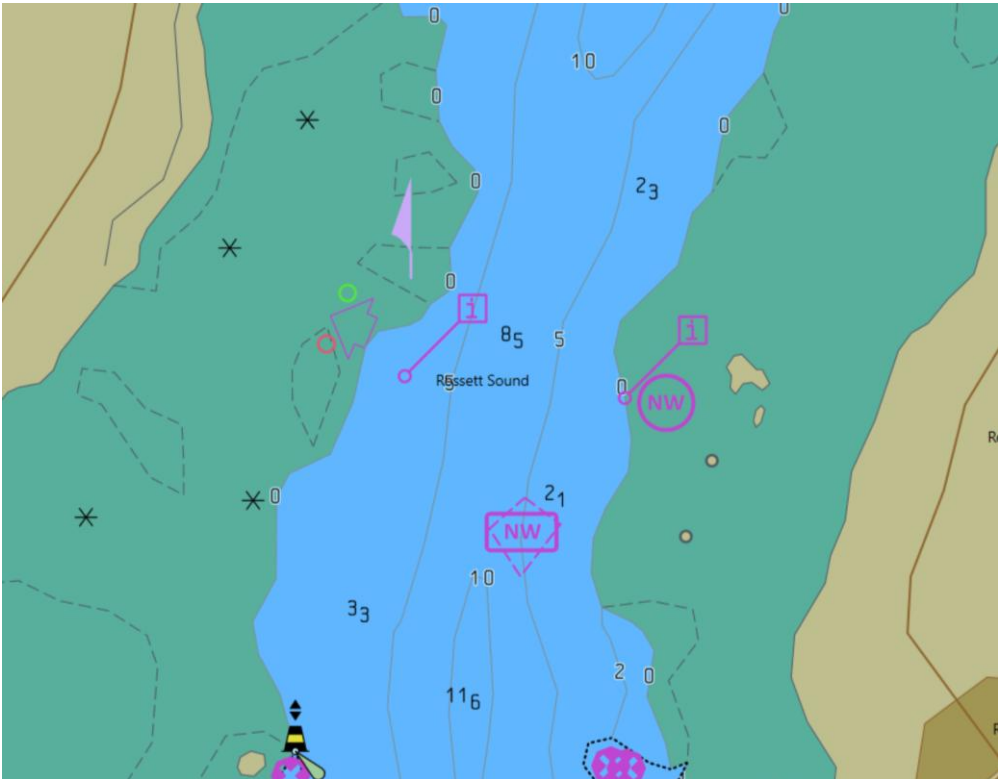
Results



Action

1. Query the display at position 32.5069S,60.9551E

Results
<p>2. Verify that the Navigational Warning selected has details as follows:</p> <ul style="list-style-type: none"> • <i>Name of Series:</i> NAVAREA 43 • <i>Warning Number</i> 2025/36 • <i>Warning Type:</i> Local Navigational Warning • <i>Navwarning Type General:</i> Special Operations
Action
<p>Provision of dedicated S-124 user interface</p> <p>Load exchange set S124NAVARNSelection</p>
Results
<p>Check that a dedicated user interface is provided to allow users to interact with NAVWARN messages:</p> <ol style="list-style-type: none"> 1. Confirm that classification of individual messages is possible 2. Confirm that classification ensures an uncluttered screen 3. Confirm that the classification functionality enables manual filtering of the display of NAVWARN messages 4. Confirm that the manual filtering of the display of NAVWARN messages includes the following criteria: <ol style="list-style-type: none"> a. Warning type b. Producer c. Series d. Navigation warning topic (<i>navwarnTypeGeneral</i>) e. Date range f. Valid time

Test Reference	S-124 Detail 2	IHO Reference	S-98 11.12.1
Test description			
<p>Lat -32.507020 Lon = 60.950072 Scale = 12k</p> <p>(Other)</p> <p>Pick the circular NW as shown and observe in the pick report the following details:</p> <p><i>Name of Series: NAVAREA 43</i> <i>Warning Number 2025/36</i> <i>Warning Type: Local Navigational Warning</i> <i>Navwarning Type General: Special Operations</i></p>			
			
Action			
Results			

On-demand listing of S-124 NavWARN messages:

1. Confirm that an on-demand listing of all S-124 NAVWARN messages is provided. Confirm the on-demand listing allows sorting according to:
 - a. Installed date and time
 - b. Issue date and time (*publicationTime*)
 - c. Warning type
 - d. Producer, series and message classification
2. Confirm the on-demand listing includes means for viewing an abbreviated view of any NAVWARNPart *warningInformation* attributes consisting of a minimum of the Issue Date (*publicationTime*), warning type (*navwarnTypeGeneral*) and the first 64 characters of the *warningInformation* attributes.
3. Confirm it is possible to view the most recent message and the full list of past messages

Action**Message cancellation.**

Load exchange set *S124MessageManagement*

Results

Confirm that the two messages [2025/36] and [2025/37] are no longer displayed, but are still listed, and marked as “cancelled” in the on-demand listing

Action**New NAVWARN indications**

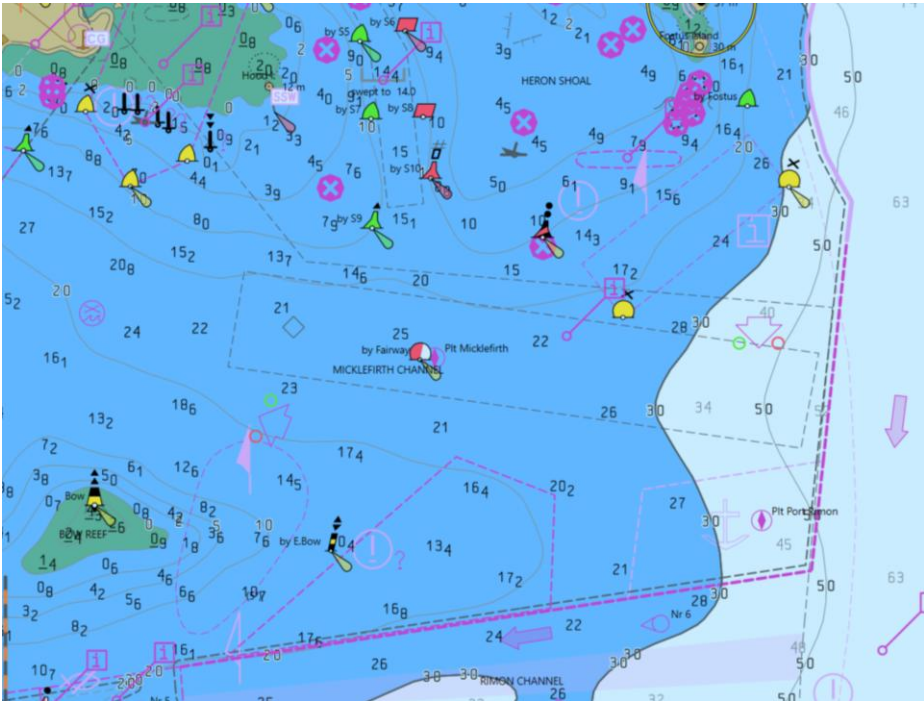
Load exchange set *S124NewNAVWARN* (containing *NewNAVWARN1* and *NewNAVWARN2*)

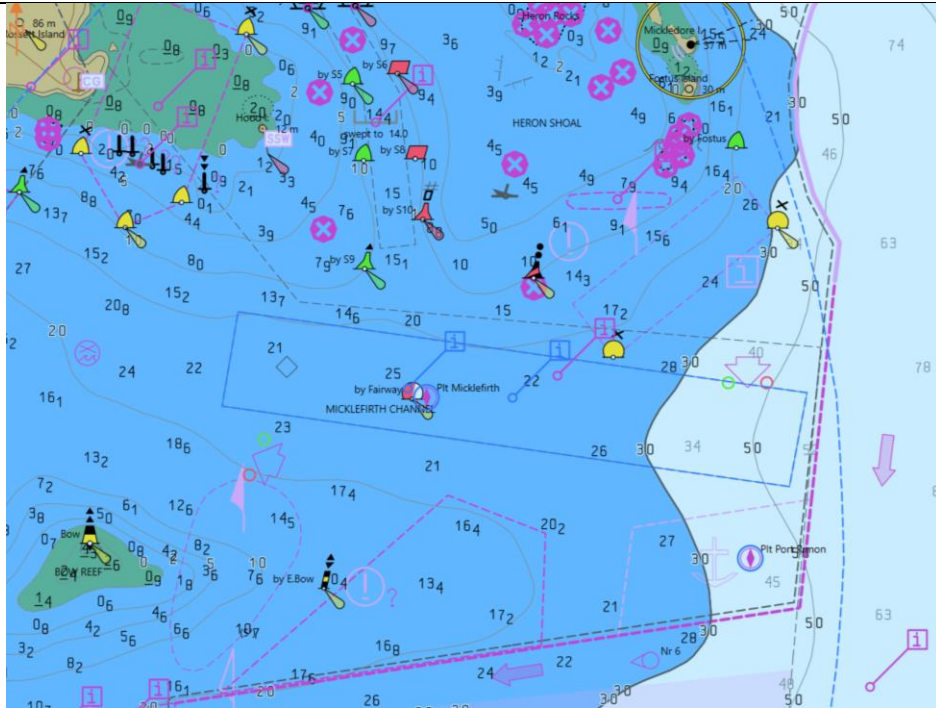
Results

1. Confirm an indication is provided to show the new NAVWARN message has been loaded.
2. Confirm the indication disappears when NAVWARN *NewNAVWARN1* is displayed
3. Set the system clock to +24 hours from current time
4. Confirm the indication disappears for *NewNAVWARN2*

2.10.6 Marine traffic Management (S-127)

Test Reference	Marine Traffic Management.	IHO Reference	S-98 6.1.1
Test Description			
Ensure the ECDIS is capable of displaying the mandatory overlays of S-127			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	On
Safety Contour	10	Highlight date dependent	
Safety Depth	8	Highlight document	
Deep Contour	30	Highlight info	
Shallow Contour	5	Shallow Pattern	Off
Four Shades	On	Unknown	
Radar Overlay		Update Review	
Plain Boundaries	Off	Text Groups	On
Simplified Symbols	Off	Chart Text	
		Important text	
Full Light Lines			
Ignore scale minimum		Other Text	
Shallow Water Dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	32.5521S,61.0432E
End Date		Scale	1:45,000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			

Alert Highlights (Standard)		
Additional		
Setup		
<ol style="list-style-type: none"> 1. Load the Exchange set PowerUp 2. Load the Exchange set Overlays 3. Switch off all overlays 4. Navigate to the documented position and MSVS 		
Action		
5. Observe the Display		
Results		
		
Action		
6. Switch on S-129 Under Keel Management Areas		
Results		



Action

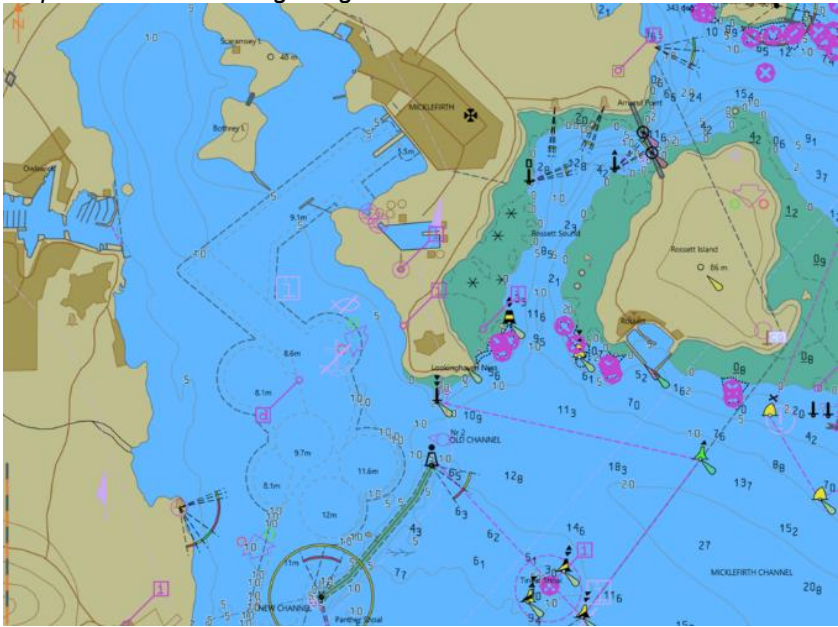
1. Query the display at position 32.5521S,61.0432E

Results

2. Verify that the S-127 feature "Routing Measure" has details as follows:
 - *Category Of Routing Measure* = **Fairway system**

2.10.7 Under Keel Clearance Management Areas (S-129)

Test Reference	UnderKeelClearance	IHO Reference	S-98 6.1.1
		IEC Reference	
Test Description			
This test ensures the EUT is capable of displaying the mandatory overlays of S-129.			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour	10 m	Highlight date dependent	
Safety depth	8 m	Highlight document	
Deep contour	30 m	Highlight info	
Shallow contour	5 m	Shallow Pattern	
Four shades	Off	Unknown	
Radar overlay	Off	Update Review	
Plain boundaries	Off	Text Groups	
Simplified symbols	Off	Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	

Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:30000
Viewing Groups			
Standard Display		Other	
Drying lines	On	Spot soundings	On
Buoys, Beacons, aids to navigation	On	Submarine cables and pipelines	On
Buoys, beacons, structures	On	All isolated dangers	On
Lights	On	Magnetic variation	On
Boundaries and limits	On	Depth contours	On
Prohibited and restricted areas	On	Seabed	On
Chart scale boundaries	On	Tidal	On
Cautionary notes	On	Miscellaneous (Other)	Off
Ships' routing systems and ferry routes	On		
Archipelagic sea lanes	On		
Miscellaneous (Standard)	Off		
Chart (Standard)	Off		
Alert Highlights (Standard)	Off		
Setup			
As per PowerUp .			
Action			
<ol style="list-style-type: none"> 1. Import exchange set Overlay-S129; 2. Switch off all overlays and observe the display at indicated scale and position. 			
Results			
<ol style="list-style-type: none"> 1. The exchange set shall install without any warning message; 2. At the defined position the following image shall be observed: 			
			
Action			
Switch on S-129 Under Keel Management Areas			
Results			
At the defined position the following image shall be observed:			



Action

Query the display at position 32.5078S,60.9123E

Results

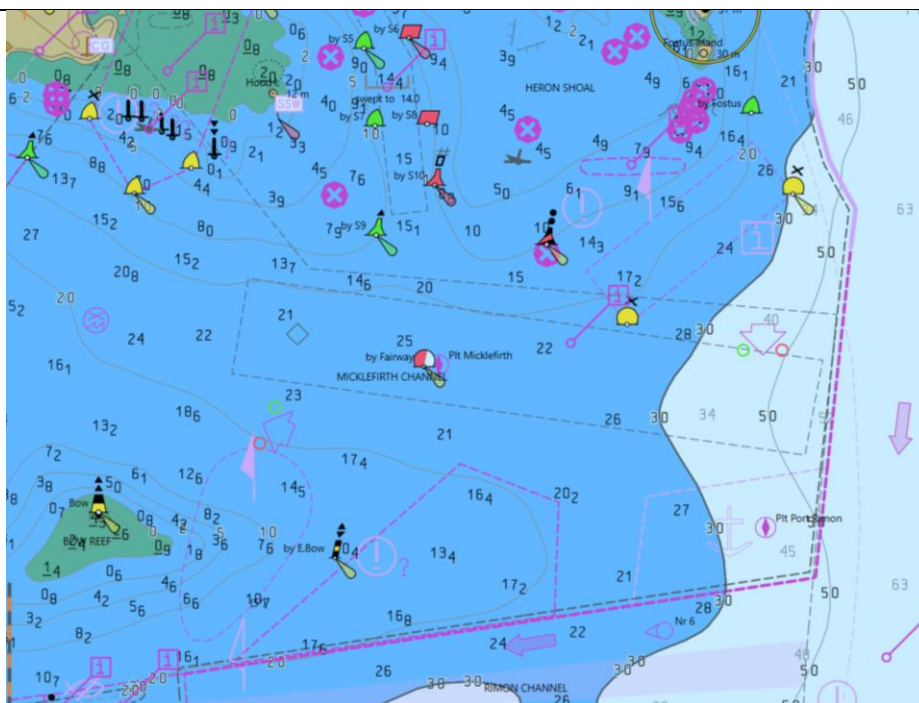
The Under Keel Clearance Control Point must have details as follows:

- Name: CP02
- Expected Passing Time: 2025-10-30T01:30:00Z
- Expected Passing Speed: 10
- Distance Above UKC Limit: 1.0

2.10.8 Marine Harbour Infrastructure (S-131)

Test Reference	Marine Harbour Infrastructure.	IHO Reference	S-98 6.1.1
Test Description			
Ensure the ECDIS is capable of displaying the mandatory overlays of S-131 TODO: Portrayal of S-131 has been updated for 2.0.0			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	On
Safety Contour	10	Highlight date dependent	
Safety Depth	8	Highlight document	
Deep Contour	30	Highlight info	
Shallow Contour	5	Shallow Pattern	Off
Four Shades	On	Unknown	
Radar Overlay		Update Review	
Plain Boundaries	Off	Text Groups	On
Simplified Symbols	Off	Chart Text	

Full Light Lines		Important text	
Ignore scale minimum		Other Text	
Shallow Water Dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	32.494S,60.9314E
End Date		Scale	1:45,000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys, Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			
Setup			
<ol style="list-style-type: none"> 1. Load the Exchange set PowerUp 2. Load the Exchange set Overlays 3. Switch off all overlays 4. Navigate to the documented position and MSVS 			
Action			
5. Observe the Display			
Results			



6. Switch on S-129 Under Keel Management Areas

3. Query the display at position 32.494S,60.9314E

4. Verify that the S-131 feature “Berth” has details as follows:

- *Available Berthing Length = 56.3m*

3 Chart Display

3.1 Dataset Selection and Loading

3.1.1 Dataset Selection

Test Reference	Dataset Selection	IHO Reference	S-98 Appendix E
Test description			
<p>TODO:</p> <ul style="list-style-type: none"> Algorithm tests. Should test for correct selection of datasets from a group at given scales. Test what happens when an overlap exists (between min/opt according to S-98) Scale band boundary test(s) to check that optimum is selected instead of minimum as per MONG when MSVS is at minimum/optimum of overlapping cells. If there are user prompts in the event of overlaps inspection of these should be added here. This test should also test that non ENC datasets are only displayed between the optimum/maximum values set in the catalogue (new requirement in S-98). This should also include the overlapping cases. This is further checked in the non-ENC tests. 			

3.1.2 Dataset Rendering

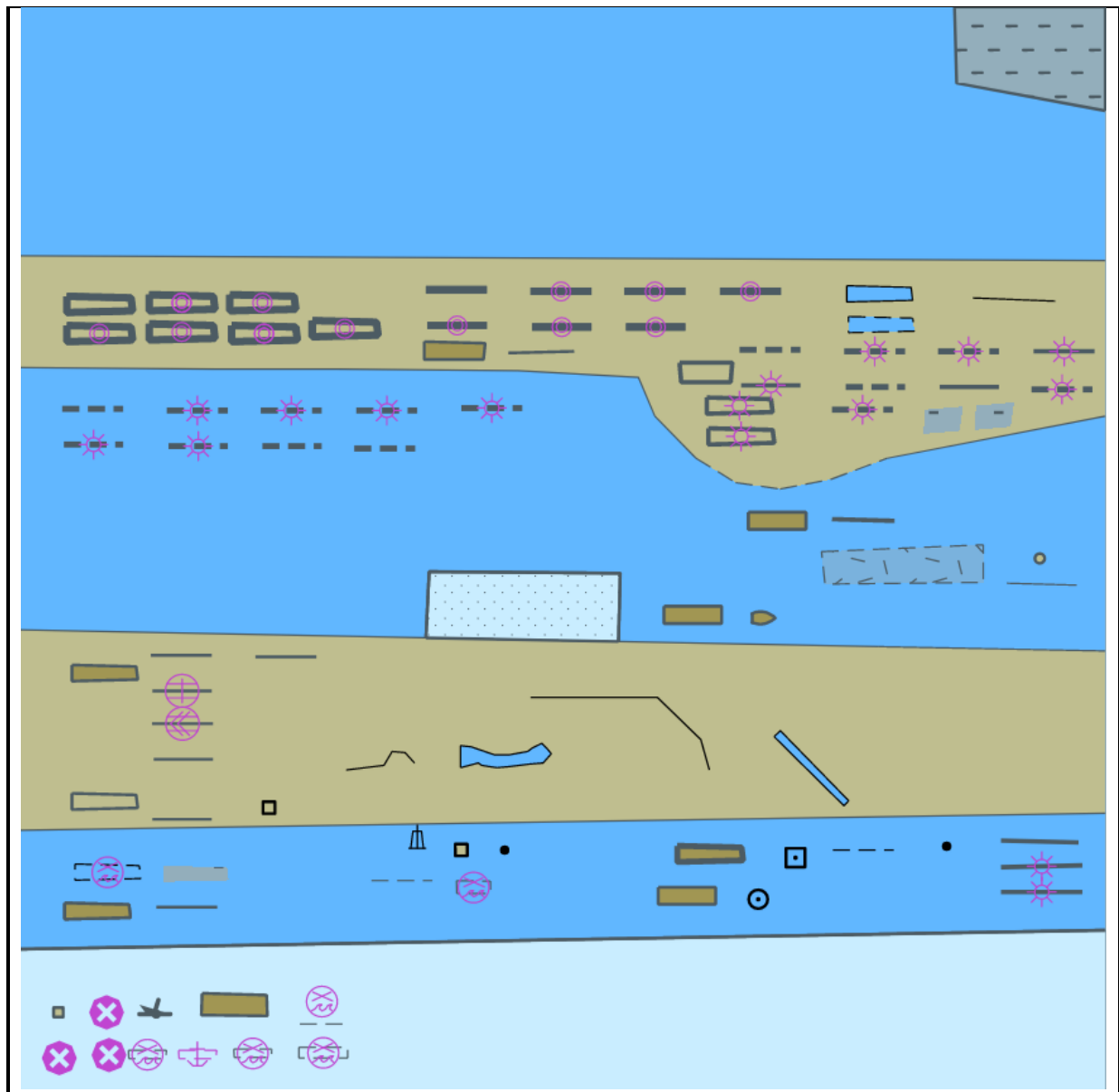
Test Reference	DatasetRendering	IHO Reference	S-98 Appendix E
Test description			
<p>TODO: Test for correct rendering according to the MONG algorithm,</p> <ul style="list-style-type: none"> Test for correct rendering Features which extend beyond the dataset boundary in datasets. Test for truncation of text and features on the boundaries of cells. Text across boundaries. 			

3.2 Display of ENC data

3.2.1 Display Base category

Test Reference	DisplayBase	IHO Reference	S-98 6.1.1; S-100 Part 9; S-101 Portrayal.
		IEC Reference	
Test Description			
This test ensures the EUT correctly displays all S-101 ENC features included in the IMO Display Base category. The test ENC dataset 10100AA_DBASE.000 contains all ENC features belonging to Display Base according to the S-101 Portrayal Catalogue.			
Loaded Data			
Exchange Set Name			
DisplayBase			
Display Mode		Independent Mariner's Selections	
Displaybase		Accuracy	Off
Context Parameters		Contour label	Off
Safety contour	10	Highlight date dependent	Off

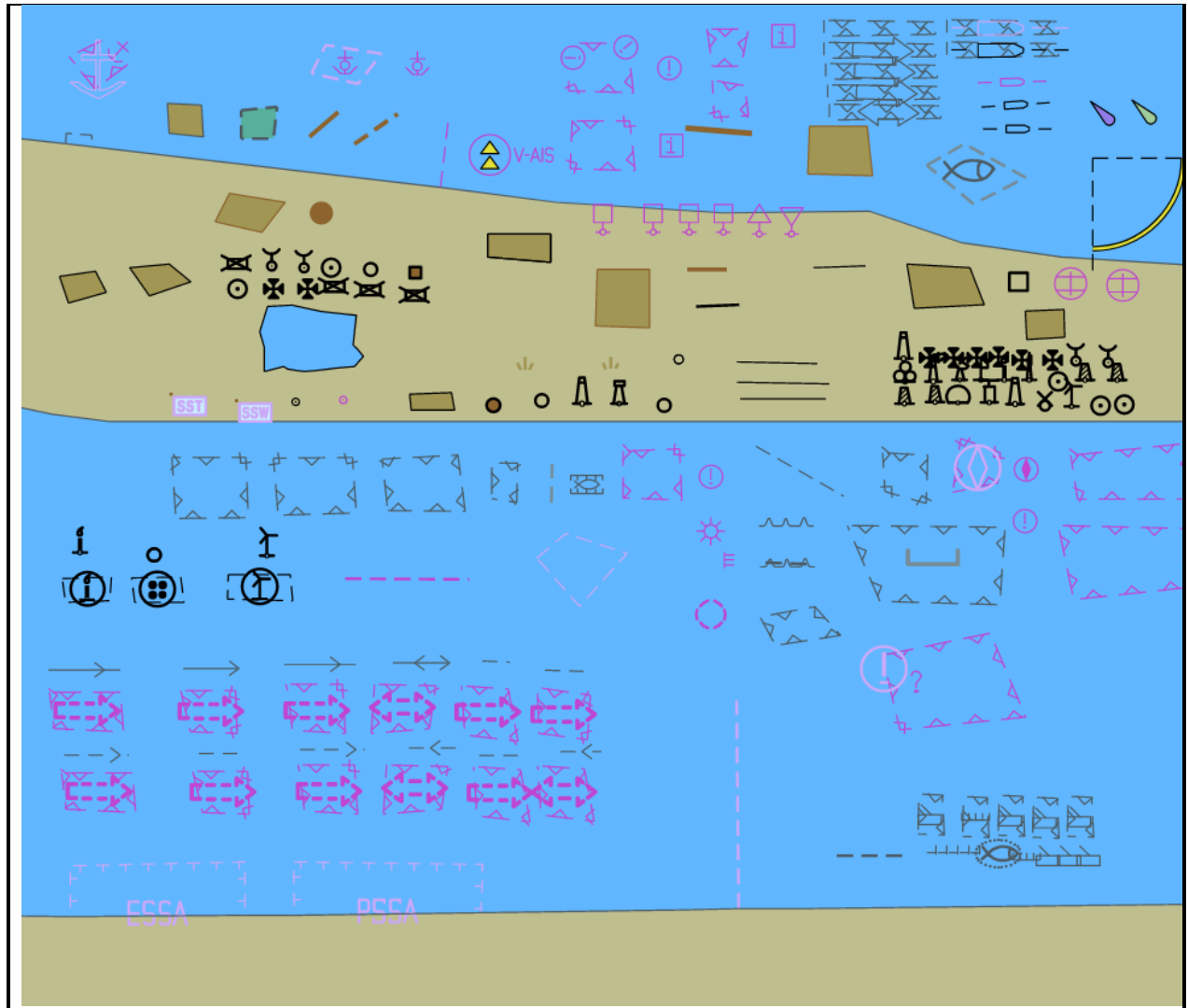
Safety depth	10	Highlight document	Off
Deep contour	30	Highlight info	Off
Shallow contour	2	Shallow pattern	Off
Four shades	Off	Unknown objects	Off
Radar overlay	Off	Update review	Off
Plain boundaries	Off	Text Groups	
Simplified symbols	Off	Chart text	On
Full light lines	Off	Important text	Off
Ignore scale minimum	Off	Other Text	
Shallow water dangers	Off	Names	Off
Palette		Light description	Off
Day		All other chart text	Off
Date Dependent Objects		Display	
Start date		Centre	10°05.00'N, 9°55.00'E
End date		Scale	1:80 000
		Orientation	
Viewing Groups			
Standard Display		Other	
Drying lines	Off	Spot soundings	Off
Buoys. Beacons, aids to navigation	Off	Submarine cables and pipelines	Off
Buoys, beacons, structures	Off	All isolated dangers	Off
Lights	Off	Magnetic variation	Off
Boundaries and limits	Off	Depth contours	Off
Prohibited and restricted areas	Off	Seabed	Off
Chart scale boundaries	Off	Tidal	Off
Cautionary notes	Off	Miscellaneous (Other)	Off
Ships' routeing systems and ferry routes	Off		
Archipelagic sea lanes	Off		
Miscellaneous (Standard)	Off		
Chart (Standard)	Off		
Alert highlights (Standard)	Off		
Setup			
<i>As per UpdateCatalogues (S-101 Feature and Portrayal Catalogues loaded, but all datasets removed from the System Database)</i>			
Action			
1. Import exchange set DisplayBase (Dataset 10100AA_DBASE.000).			
2. Check the symbols shown in the EUT against the graphical plot.			
Results			
1. The exchange set shall install without any warning messages.			
2. At the defined position the following image shall be observed			



3.2.2 Display Standard category

Test Reference	DisplayStandard	IHO Reference	S-98 6.1.1 S-100 Part 9 S-101 Portrayal	
		IEC Reference		
Test Description				
<i>This test ensures the EUT correctly displays all S-101 ENC features included in the IMO Standard Display category. The test ENC dataset 10100AA_STNDR.000 contains depth and land areas from Display Base plus all S-101 ENC features belonging to Standard Display according to the S-101 Portrayal Catalogue. The features belonging to Standard Display are to be shown if Standard Display is selected in EUT HMI and should disappear in the Display Base mode.</i>				
Loaded Data				
Exchange Set Name				
DisplayStandard				
Display Mode		Independent Mariner's Selections		
Standard		Accuracy		Off
Context Parameters		Contour label		Off
Safety contour	10 m	Highlight date dependent		Off
Safety depth	10 m	Highlight document		Off

Deep contour	30 m	Highlight info	Off
Shallow contour	2 m	Shallow pattern	Off
Four shades	Off	Unknown objects	Off
Radar overlay	Off	Update review	
Plain boundaries	Off	Text Groups	
Simplified symbols	Off	Chart text	Off
Full light lines	Off	Important text	Off
Ignore scale minimum	Off	Other Text	
Shallow water dangers	Off	Names	Off
Palette		Light description	Off
Day		All other chart text	Off
Date Dependent Objects		Display	
Start Date		Centre	10°05.00'N, 9°55.00'E
End Date		Scale	1:70 000
		Orientation	
Viewing Groups			
Standard Display		Other	
Drying lines	On	Spot soundings	Off
Buoys, Beacons, aids to navigation	On	Submarine cables and pipelines	Off
Buoys, beacons, structures	On	All isolated dangers	Off
Lights	On	Magnetic variation	Off
Boundaries and limits	On	Depth contours	Off
Prohibited and restricted areas	On	Seabed	Off
Chart scale boundaries	On	Tidal	Off
Cautionary notes	On	Miscellaneous (Other)	Off
Ships' routing systems and ferry routes	On		
Archipelagic sea lanes	On		
Miscellaneous (Standard)	On		
Chart (Standard)	On		
Alert Highlights (Standard)	On		
Setup			
<i>As per UpdateCatalogues (S-101 Feature and Portrayal Catalogues loaded, but all datasets removed from the System Database).</i>			
Action			
1. Import the exchange set DisplayStandard (Dataset 10100AA_STNDR.000).			
2. Check the symbols shown in the EUT against the graphical plot.			
Results			
1. The exchange set shall install without any warning messages.			
2. At the defined position the following image shall be observed. Confirm that depth and land areas from Display Base are shown.			

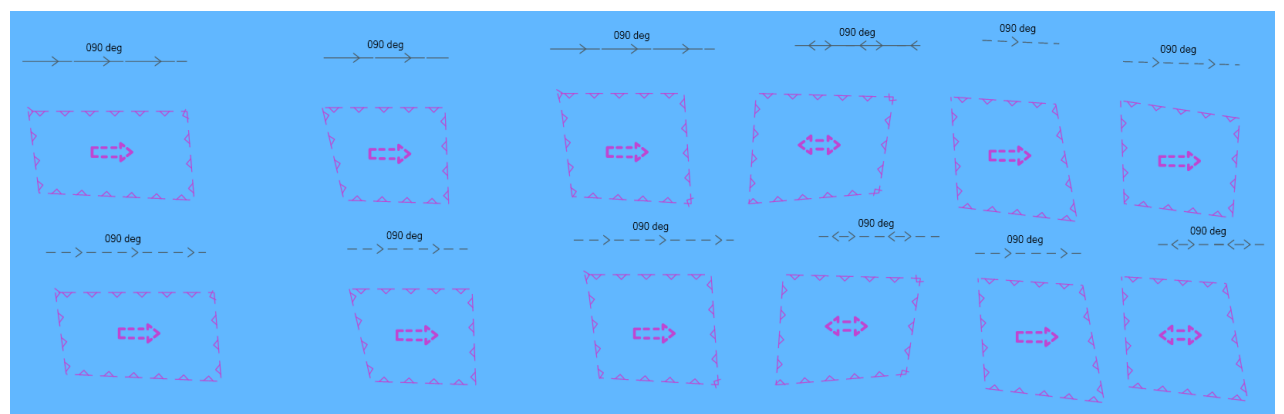
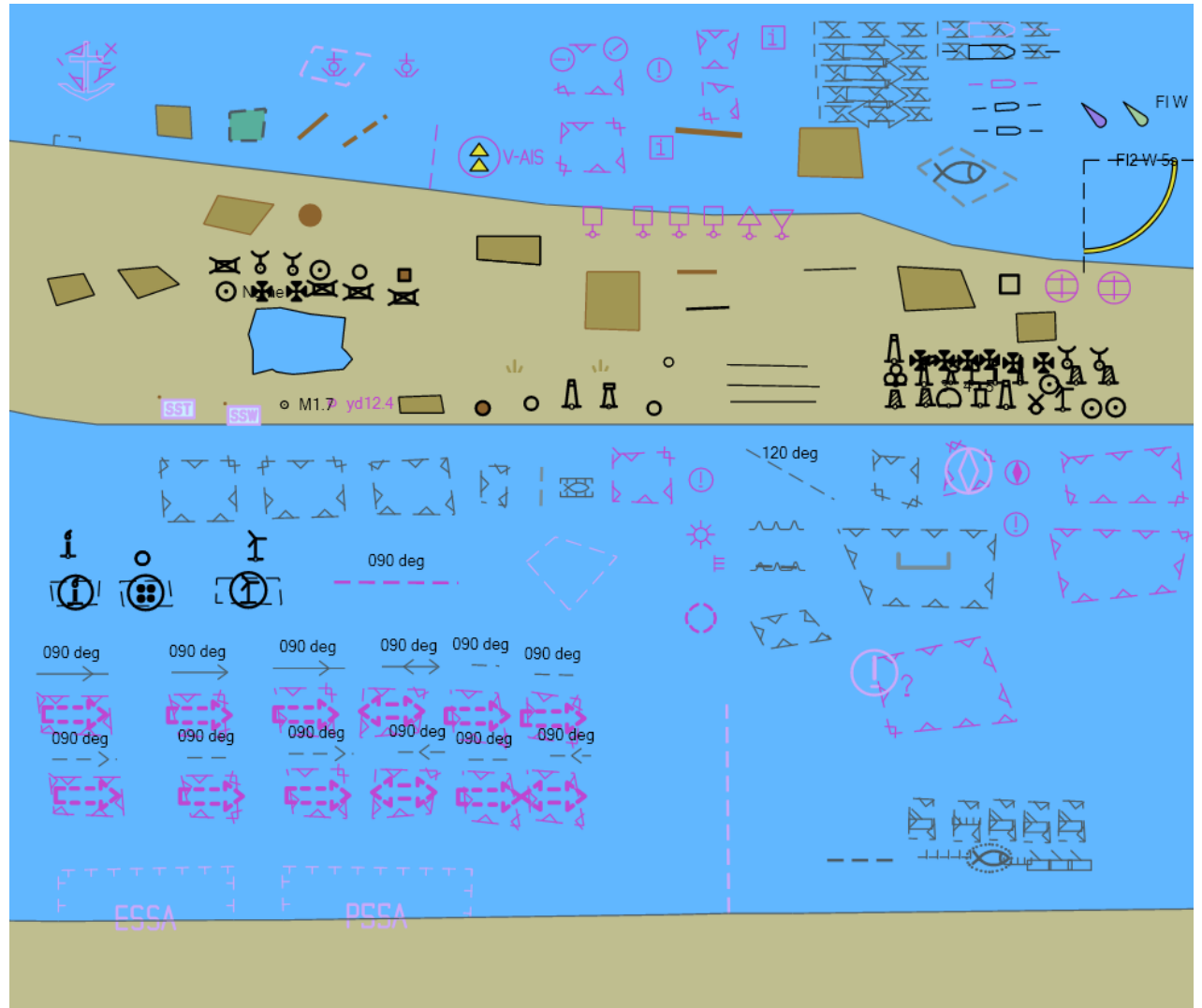


Action

Select all text groups. Check the symbols shown in the EUT against the graphical plot.

Results

The ENC in the EUT should be shown as in the picture below.



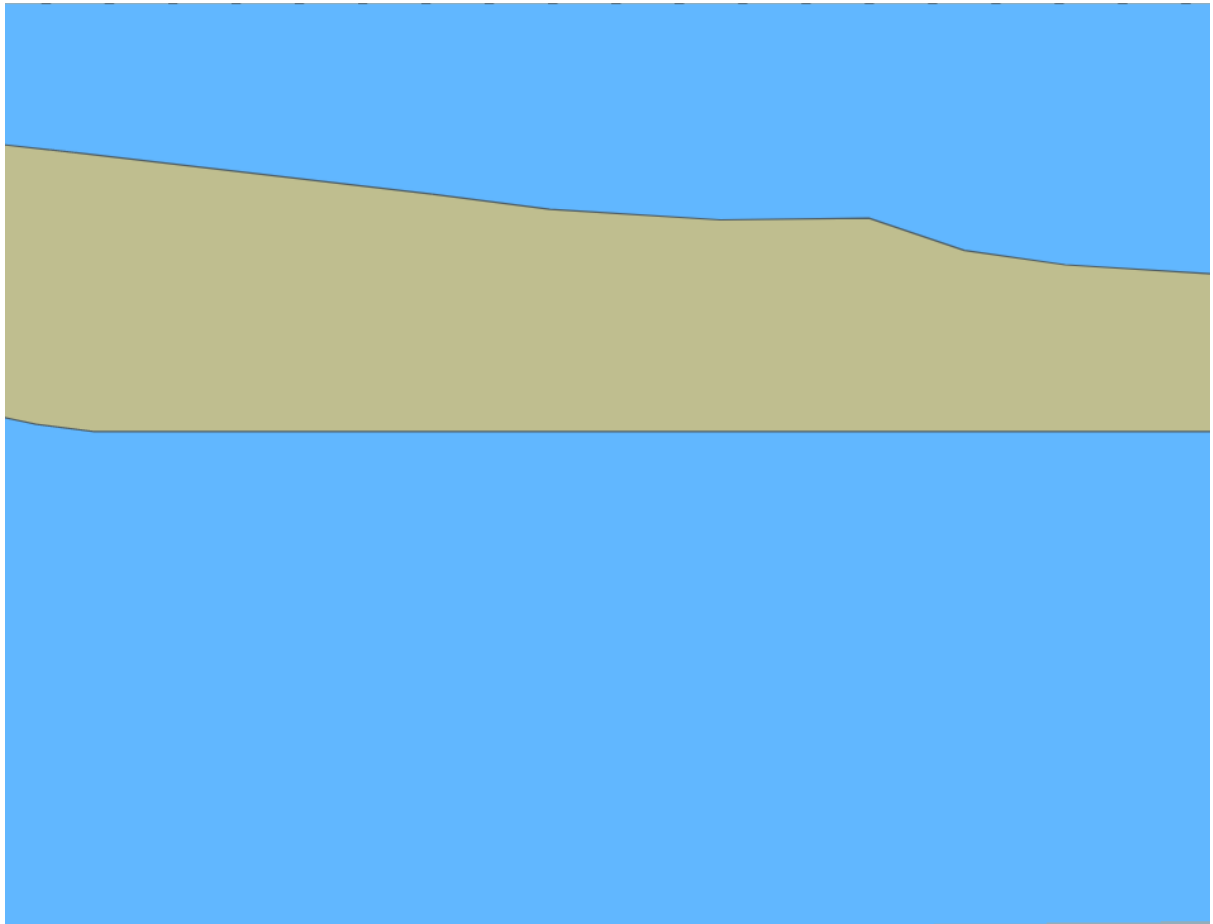
South-West part of above chart at scale 1:20 000

Action

Switch on Display Base and display the dataset at scale 1:70 000. Check ENC symbols shown in ECDIS against graphical plot.

Results

The ENC in the ECDIS should be shown as in the picture below



3.2.3 Display Other category

Test Reference	DisplayOther	IHO Reference	S-98 6.1.1 S-100 Part 9 S-101 Portrayal
IEC Reference			
Test Description			
<p>This test ensures the EUT correctly displays all S-101 ENC features included in the IMO Other Display category. The test ENC dataset 10100AA_OTHER.000 contains depth and land areas from Display Base plus all ENC features belonging to Other Display according to the S-101 portrayal catalogue. The features belonging to Other Display are to be shown if Other (or All) display is selected in EUT HMI and should disappear in the Display Base or Standard Display Categories.</p>			
Loaded Data			
Exchange Set Name			
DisplayOther			
Display Mode		Independent Mariner's Selections	
Other		Accuracy	Off
Context Parameters		Contour label	Off
Safety contour	10 m	Highlight date dependent	Off
Safety depth	10 m	Highlight document	Off
Deep Contour	30 m	Highlight info	Off
Shallow contour	2 m	Shallow pattern	Off
Four shades	Off	Unknown	Off
Radar overlay	Off	Update review	Off
Plain boundaries	Off	Text Groups	
Simplified symbols	Off	Chart Text	Off
Full light lines	Off	Important text	Off
Ignore scale minimum	Off	Other Text	
Shallow water dangers	Off	Names	Off
Palette		Light description	Off
Day		All other chart text	Off
Date Dependent Objects		Display	
Start Date	N/A	Centre	10°05.00'N, 9°55.00'E
End Date	N/A	Scale	1:60 000
		Orientation	
Viewing Groups			
Standard Display		Other	
Drying lines	On	Spot soundings	Off
Buoys. Beacons, aids to navigation	On	Submarine cables and pipelines	Off
Buoys, beacons, structures	On	All isolated dangers	Off
Lights	On	Magnetic variation	Off
Boundaries and limits	On	Depth contours	Off
Prohibited and restricted areas	On	Seabed	Off
Chart scale boundaries	On	Tidal	Off
Cautionary notes	On	Miscellaneous (Other)	Off
Ships' routing systems and ferry routes	On		
Archipelagic sea lanes	On		
Miscellaneous (Standard)	On		
Chart (Standard)	On		
Alert Highlights (Standard)	On		
Setup			
As per UpdateCatalogues (S-101 Feature and Portrayal Catalogues loaded, but all datasets removed from the System Database)..			

Action

1. Import the exchange set **DisplayOther** (dataset 10100AA_OTHER.000).
2. Check every ENC symbol shown in ECDIS against graphical plot.

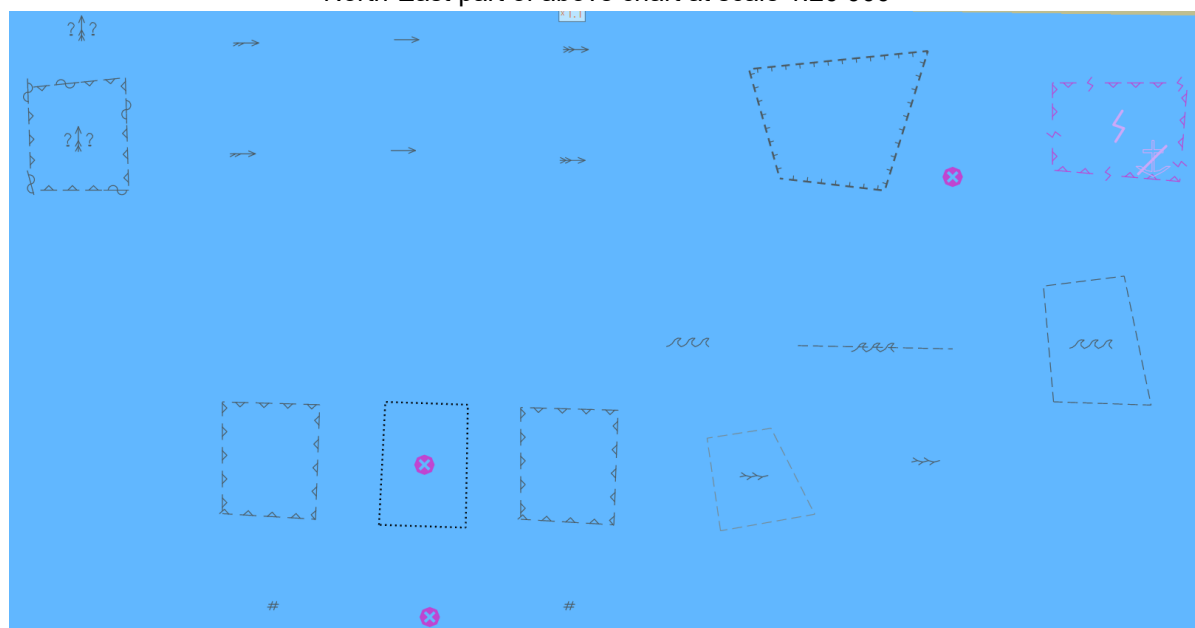
Results

The features are shown as presented in the screen plot below (Scale 1:70 000)





North-East part of above chart at scale 1:20 000



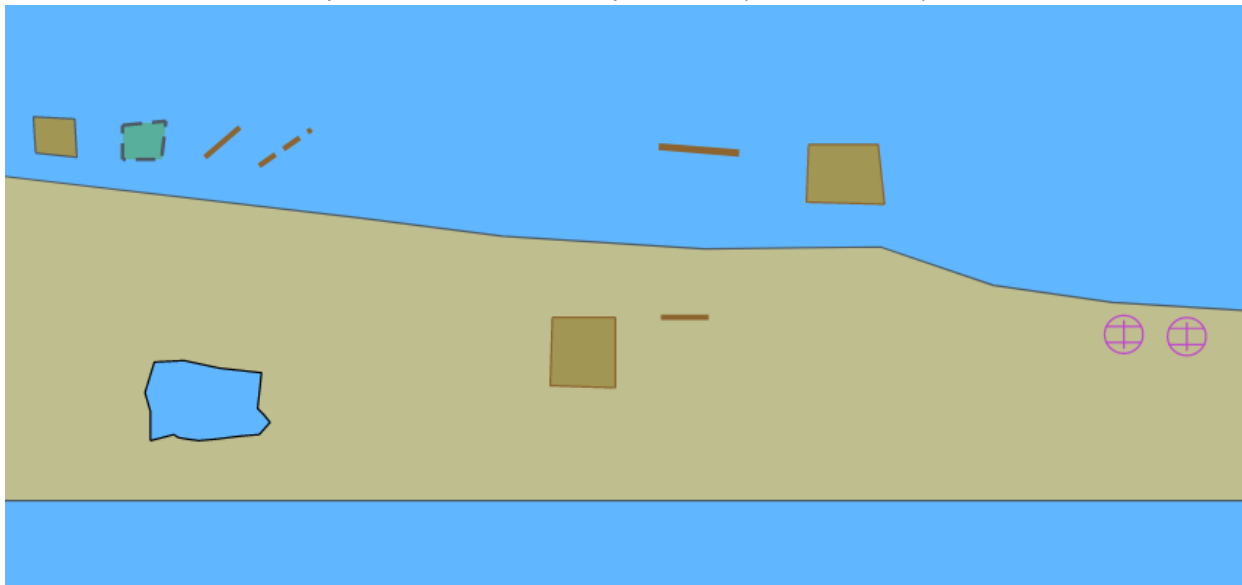
South-East part of above chart at scale 1:20 000, with Shallow water dangers **On**.

Action
Switch on Display Base. Check ENC display in ECDIS against graphical plot
Results
<p>The ENC in the ECDIS should be shown as in the picture below.</p> 

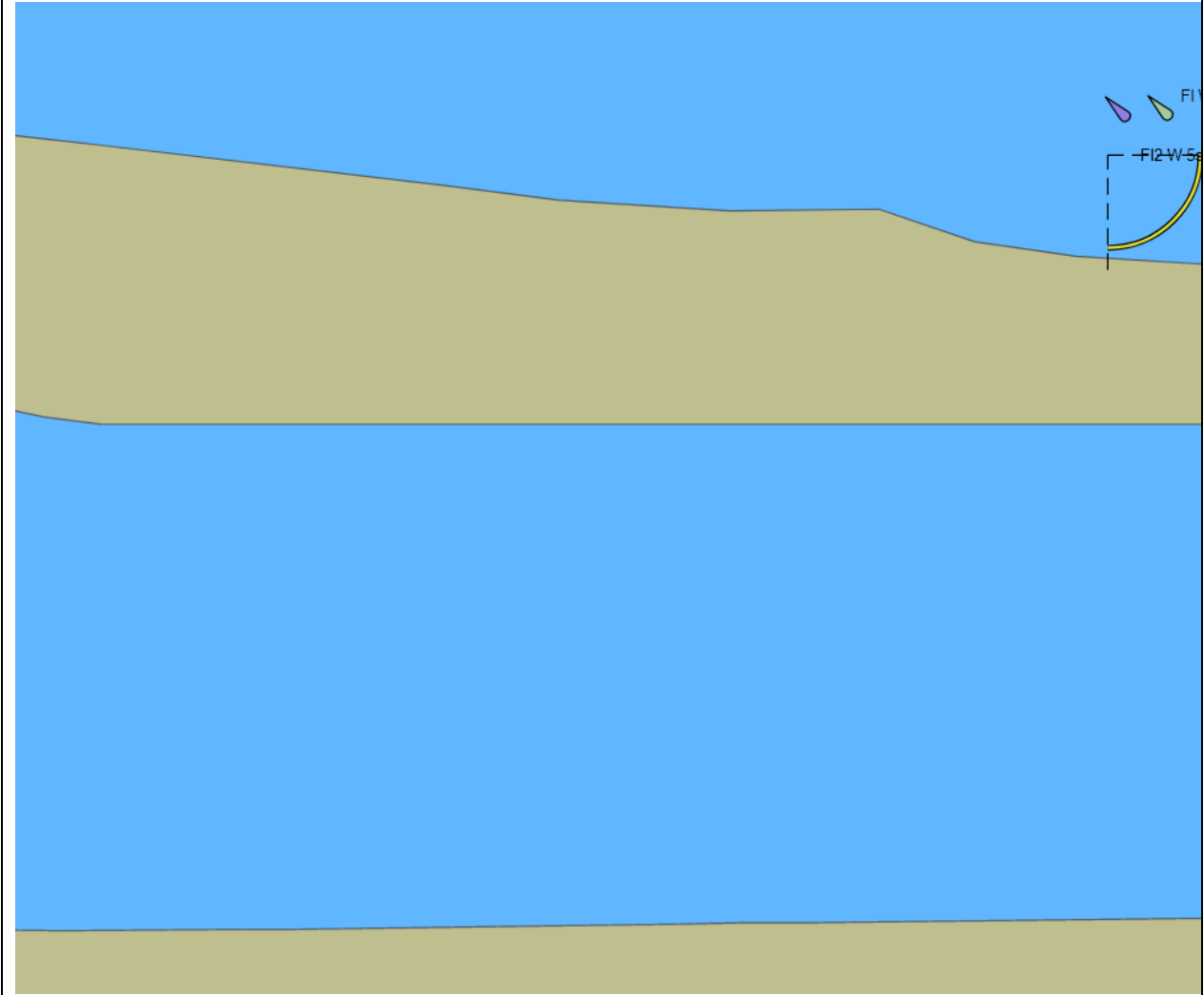
3.2.4 ECDIS Viewing groups names. Standard Display

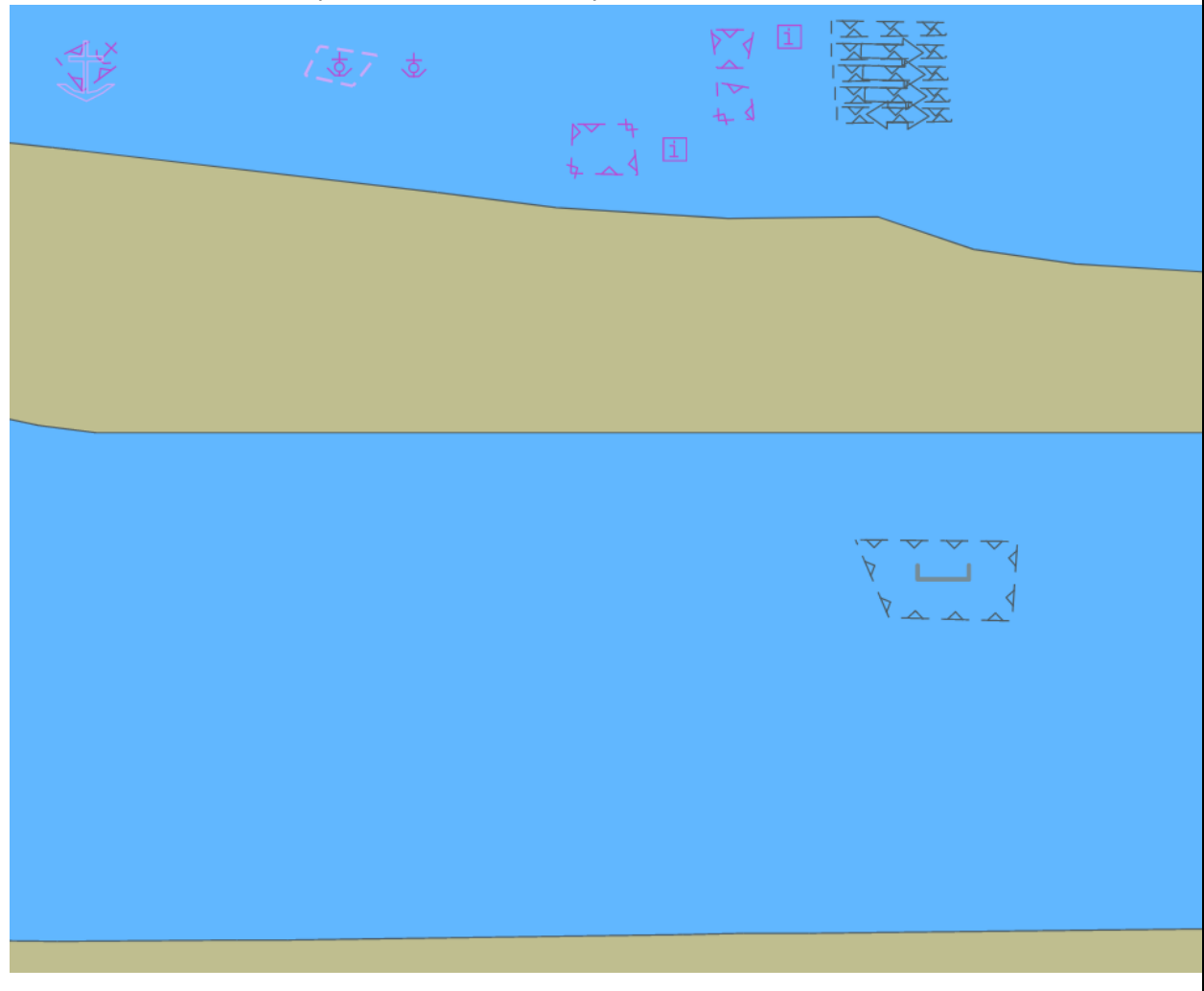
Test Reference	ViewingGroupsStandard	IHO Reference	S-98 6.1.1 S-100 Part 9 S-101 Portrayal
Test Description			
<p>The purpose of the test is to verify that ECDIS is able to change S-101 display settings using standardized controls.</p> <p>Names of the controls, located under the Standard Display section of ECDIS should switch On and Off certain viewing layers and should comply with the content of the S-101 Portrayal Catalogue.</p>			
Loaded Data			
Exchange Set Name			
DisplayStandard			
Display Mode		Independent Mariner's Selections	
Standard		Accuracy	Off
Context Parameters		Contour label	Off
Safety contour	10 m	Highlight date dependent	Off
Safety depth	10 m	Highlight document	Off
Deep Contour	30 m	Highlight info	Off
Shallow contour	2 m	Shallow pattern	Off
Four shades	Off	Unknown	Off
Radar overlay	Off	Update review	Off
Plain boundaries	Off	Text Groups	
Simplified symbols	Off	Chart Text	Off
Full light lines	Off	Important text	Off
Ignore scale minimum	Off	Other Text	
Shallow water dangers	Off	Names	Off
Palette		Light description	Off
Day		All other chart text	Off
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:70 000
		Orientation	
Viewing Groups			
Standard Display		Other	
Drying lines	On	Spot soundings	Off
Buoys. Beacons, aids to navigation	On	Submarine cables and pipelines	Off
Buoys, beacons, structures	On	All isolated dangers	Off
Lights	On	Magnetic variation	Off
Boundaries and limits	On	Depth contours	Off
Prohibited and restricted areas	On	Seabed	Off
Chart scale boundaries		Tidal	Off
Cautionary notes	On	Miscellaneous (Other)	Off
Ships' routing systems and ferry routes	On		
Archipelagic sea lanes	On		
Miscellaneous (Standard)	On		
Chart (Standard)			
Alert Highlights (Standard)			
Setup			
As per UpdateCatalogues (S-101 Feature and Portrayal Catalogues loaded, but all datasets removed from the System Database).			
Action			
<ol style="list-style-type: none"> 1. Import the exchange set DisplayStandard 2. Check that EUT HMI contains standardized controls that can switch On and Off certain features 			

<i>from the chart.</i>
Results
<i>Confirm that the following controls are available at ECDIS HMI</i> <i>Drying line</i> <i>Buoys, beacons, aids to navigation</i> <i> Buoys, beacons, structures</i> <i> Lights</i> <i>Boundaries and limits</i> <i>Prohibited and restricted areas</i> <i>Chart scale boundaries</i> <i>Cautionary notes</i> <i>Ships' routing systems and ferry routes</i> <i>Archipelagic sea lanes</i> <i>Miscellaneous</i>

Action
Switch off all controls and switch “On” only the “Drying line” control. Verify that the features are displayed correctly as presented in the plot.
Results
The features are shown as presented in the screen plot below (scale 1:70 000)


Action
Switch off all controls and switch on only the “Buoys, beacons, aids to navigation” control. Verify that the features are displayed correctly as presented in the plot.
Results
The features are shown as presented in the screen plot below

Action
Switch off all controls and switch on only the “ Lights ” control. Verify that the features are displayed correctly as presented in the plot.
Results
The features are shown as presented in the screen plot below


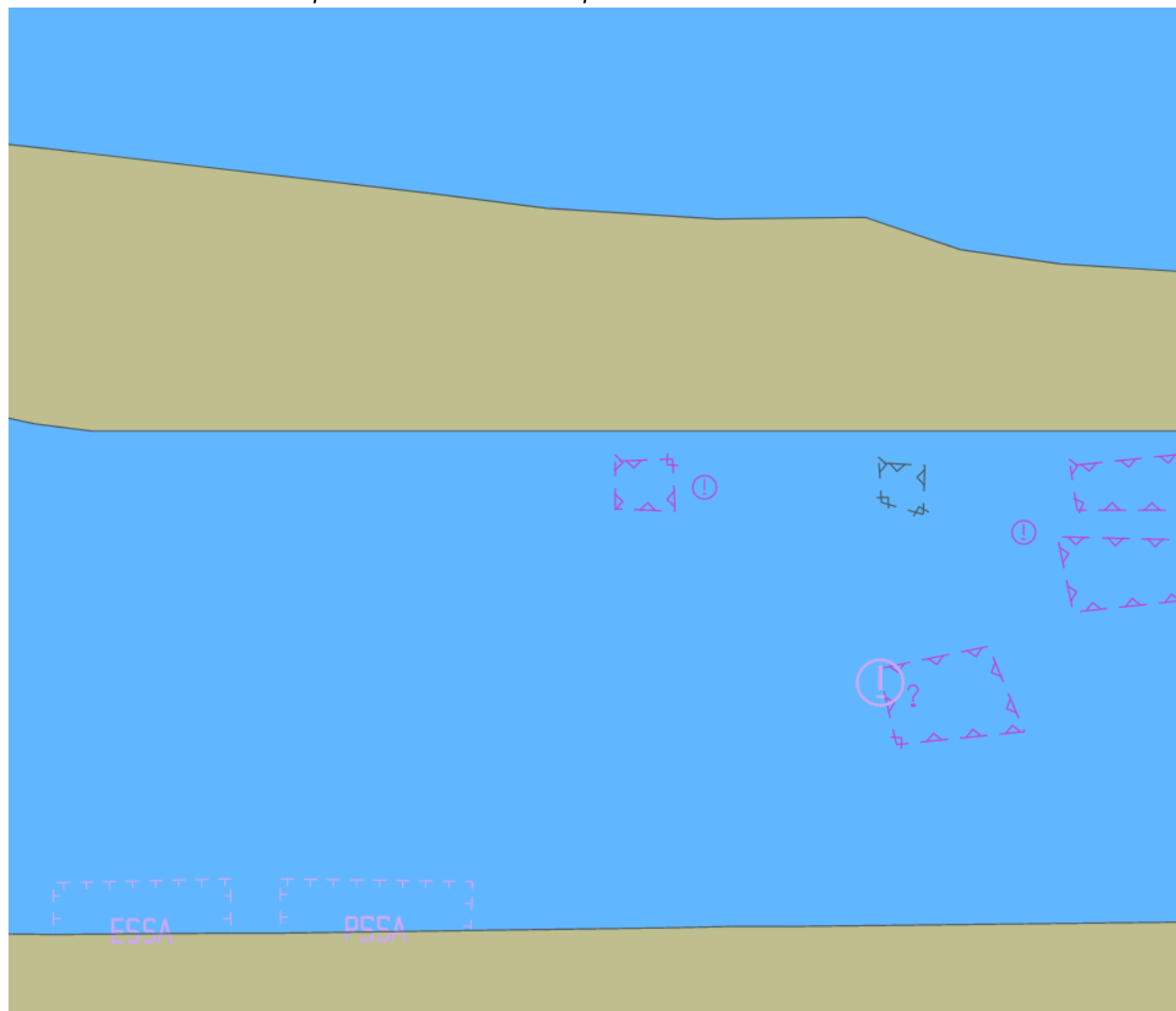
Action
Switch off all controls and switch on only the “Boundaries and limits” control. Verify that the features are displayed correctly as presented in the plot.
Results
The features are shown as presented in the screen plot below


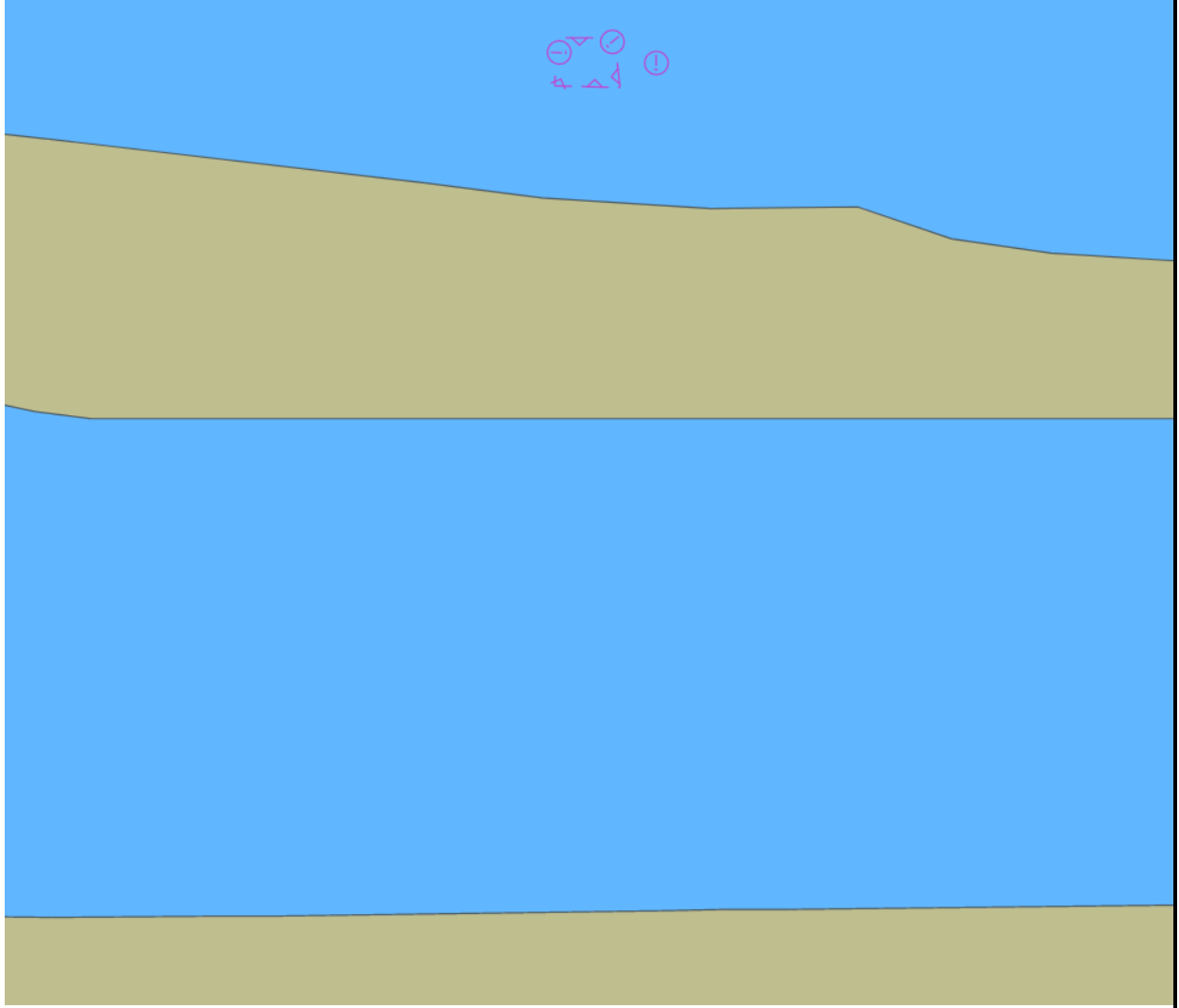
Action

Switch off all controls and switch on only the “**Prohibited and restricted areas**” control.
Verify that the features are displayed correctly as presented in the plot.

Results

The features are shown as presented in the screen plot below



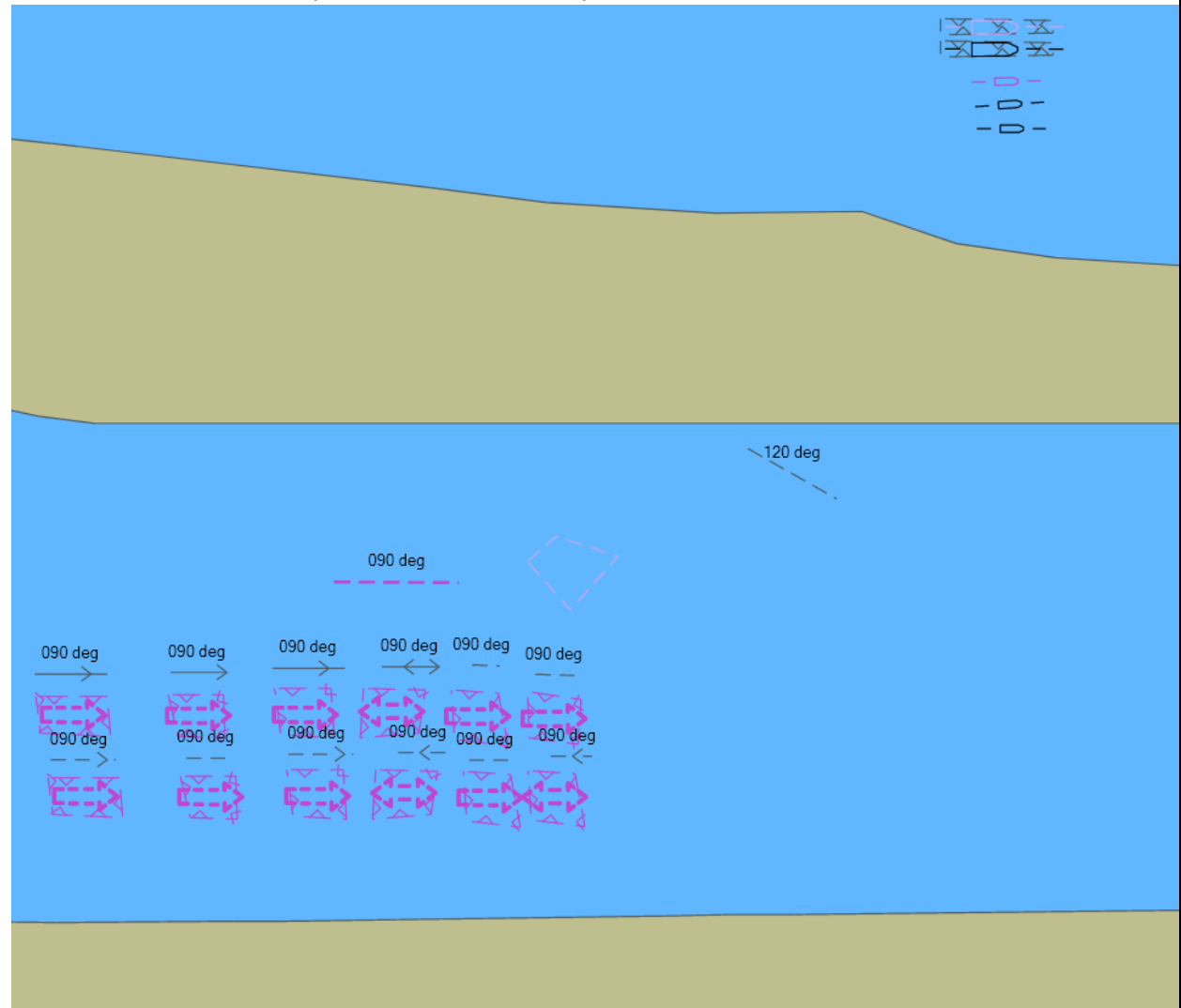
Action
Switch off all controls and switch on only the “ Cautionary notes ” control. Verify that the features are displayed correctly as presented in the plot.
Results
The features are shown as presented in the screen plot below


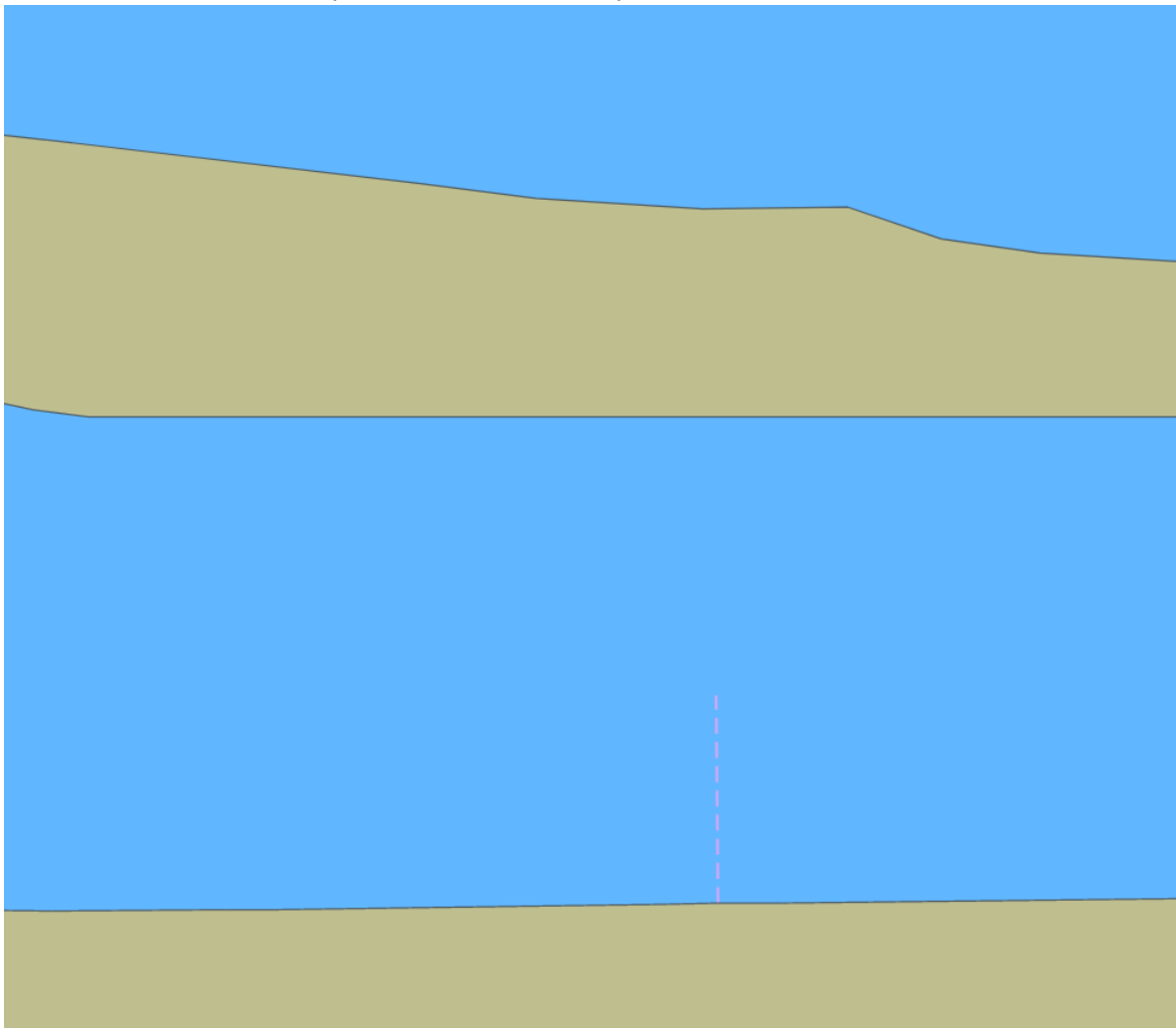
Action

Switch off all controls and switch on only the “***Ships’ routeing systems and ferry routes***” control. Verify that the features are displayed correctly as presented in the plot.

Results

The features 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 features are displayed correctly as presented in the plot.
Results
<p>The Features are shown as presented in the screen plot below</p> 

Action
Switch off all controls and switch on only the “ Miscellaneous ” control. Verify that the features are displayed correctly as presented in the plot.

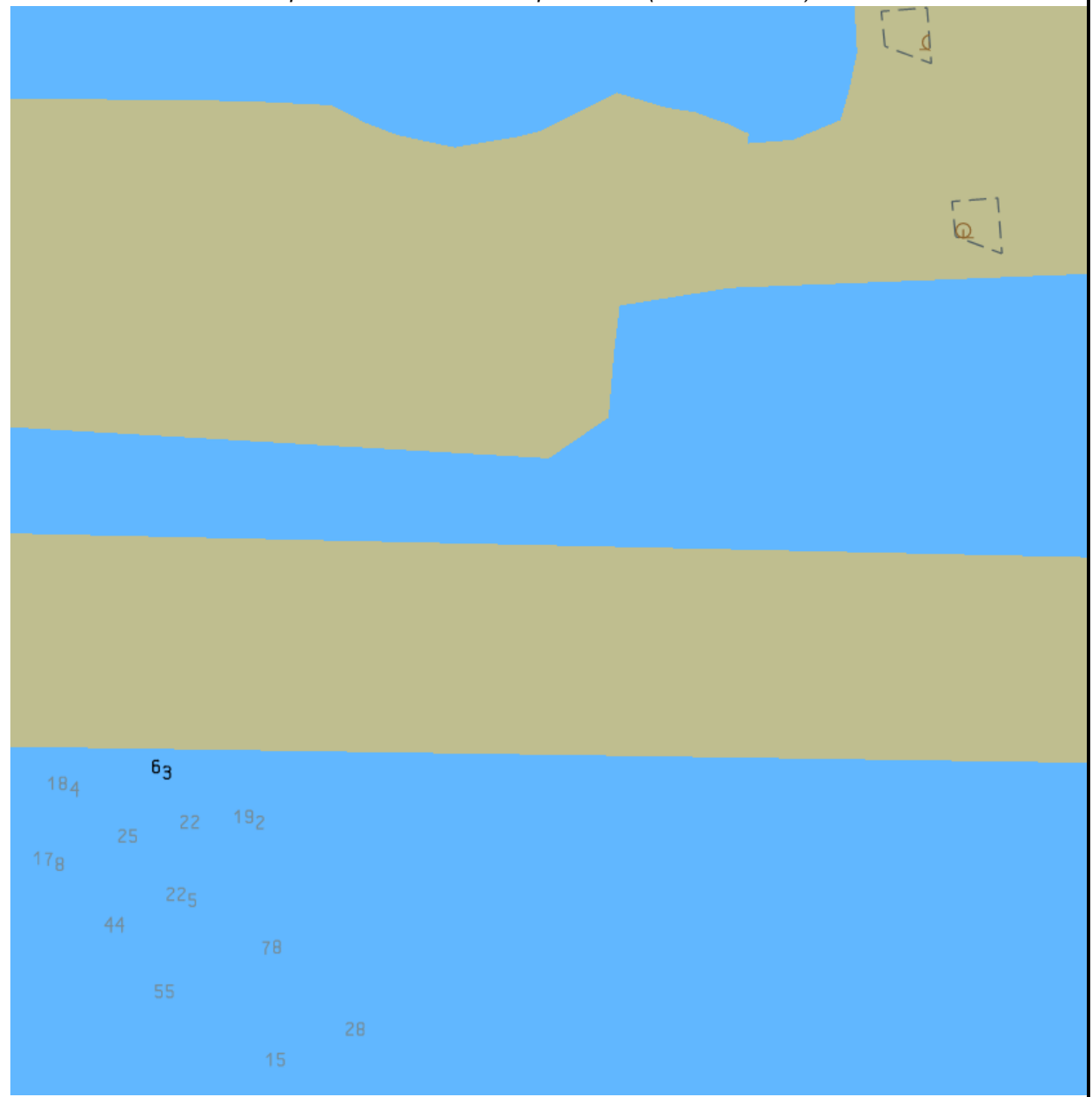
Results
The features are shown as presented in the screen plot below

3.2.5 ECDIS Viewing Layers. Other Display

Test Reference	ViewingGroupsOther	IHO Reference	S-98 6.1.1 S-100 Part 9 S-101 Portrayal
Test Description			
The purpose of the test is to verify that EUT is able to change ENC display settings using 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 the S-101 Portrayal Catalogue.			
Loaded Data			
Exchange Set Name			
DisplayOther			
Display Mode		Independent Mariner's Selections	
Other		Accuracy	Off
Context Parameters		Contour label	Off
Safety contour	10 m	Highlight date dependent	Off

Safety depth	10 m	Highlight document	Off
Deep Contour	30 m	Highlight info	Off
Shallow contour	2 m	Shallow pattern	Off
Four shades	Off	Unknown	Off
Radar overlay	Off	Update review	Off
Plain boundaries	Off	Text Groups	
Simplified symbols	Off	Chart Text	Off
Full light lines	Off	Important text	Off
Ignore scale minimum	Off	Other Text	
Shallow water dangers	Off	Names	Off
Palette		Light description	Off
Day		All other chart text	Off
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:70 000
		Orientation	
Viewing Groups			
Standard Display		Other	
Drying lines		Spot soundings	On
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	On
Buoys, beacons, structures		All isolated dangers	On
Lights		Magnetic variation	On
Boundaries and limits		Depth contours	On
Prohibited and restricted areas		Seabed	On
Chart scale boundaries		Tidal	On
Cautionary notes		Miscellaneous (Other)	On
Ships' routeing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Setup			
<i>As per UpdateCatalogues (S-101 Feature and Portrayal Catalogues loaded, but all datasets removed from the System Database).</i>			
Action			
<p><i>Import the exchange set DisplayOther (dataset 10100AA_OTHER.000) with the following settings provided.</i></p> <p><i>Switch on Other Display Check that ECDIS HMI contains standardized controls that can switch on and off certain features from the chart.</i></p>			
Results			
<p><i>Confirm that the following controls are available at ECDIS HMI under the Other Display section</i></p> <p><i>Spot soundings</i></p> <p><i>Submarine cables and pipelines</i></p> <p><i>All isolated dangers</i></p> <p><i>Magnetic variation</i></p> <p><i>Depth contours</i></p> <p><i>Seabed</i></p> <p><i>Tidal</i></p> <p><i>Miscellaneous (Other)</i></p>			
Action			
<p><i>Switch off all controls and switch on only the "Spot soundings" control.</i></p> <p><i>Verify that the features are displayed correctly as presented in the plot.</i></p>			
Results			

The features are shown as presented in the screen plot below (scale 1:60 000)



Action
Switch off all controls and switch on only the “ Submarine cables and pipelines ” control. Verify that the features are displayed correctly as presented in the plot.
Results
The features are shown as presented in the screen plot below



Action

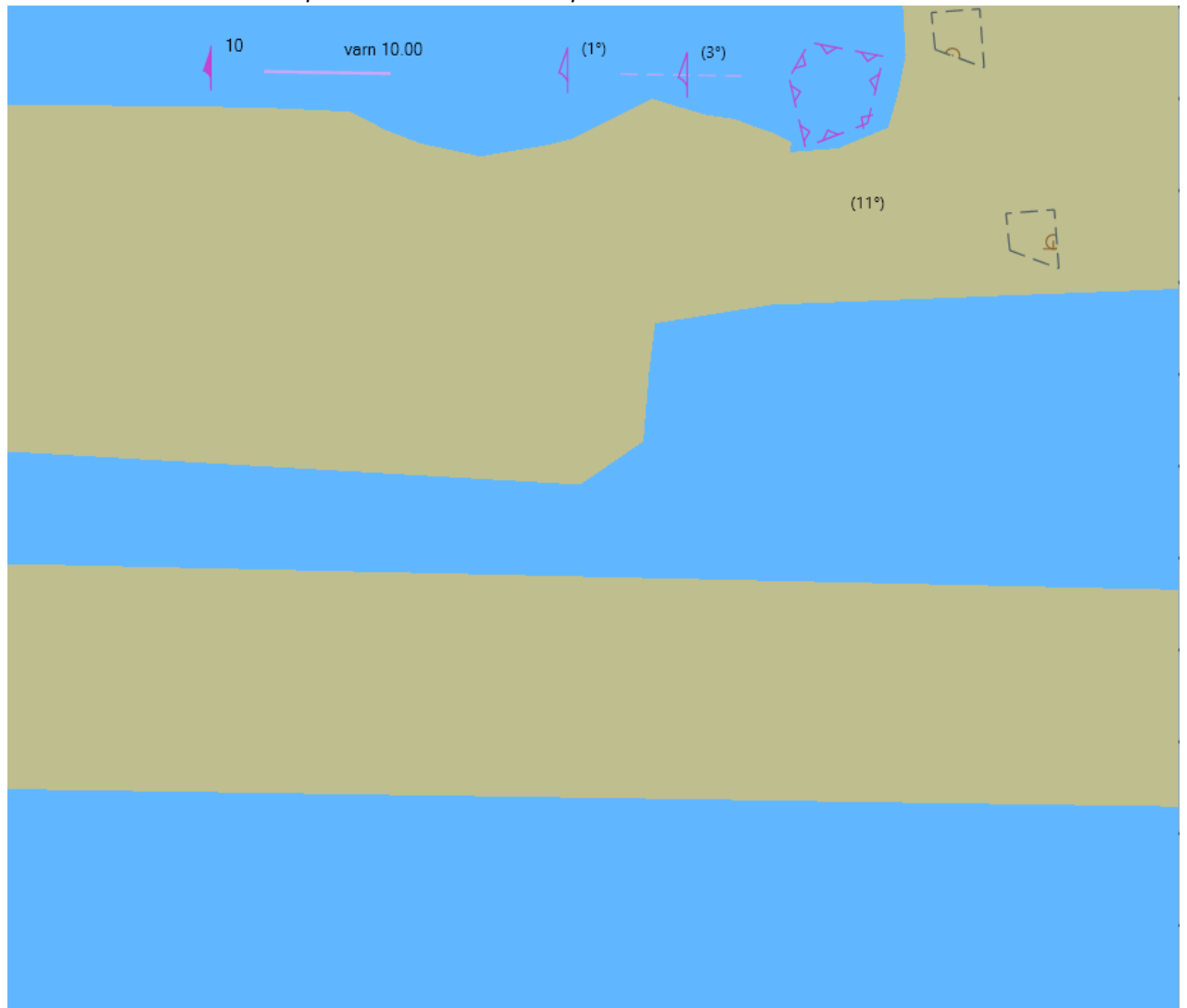
Switch off all controls and switch on only the “**All isolated danger**” control.
Verify that the features are displayed correctly as presented in the plot.

Results

The features 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 features are displayed correctly as presented in the plot.
Results
The features are shown as presented in the screen plot below

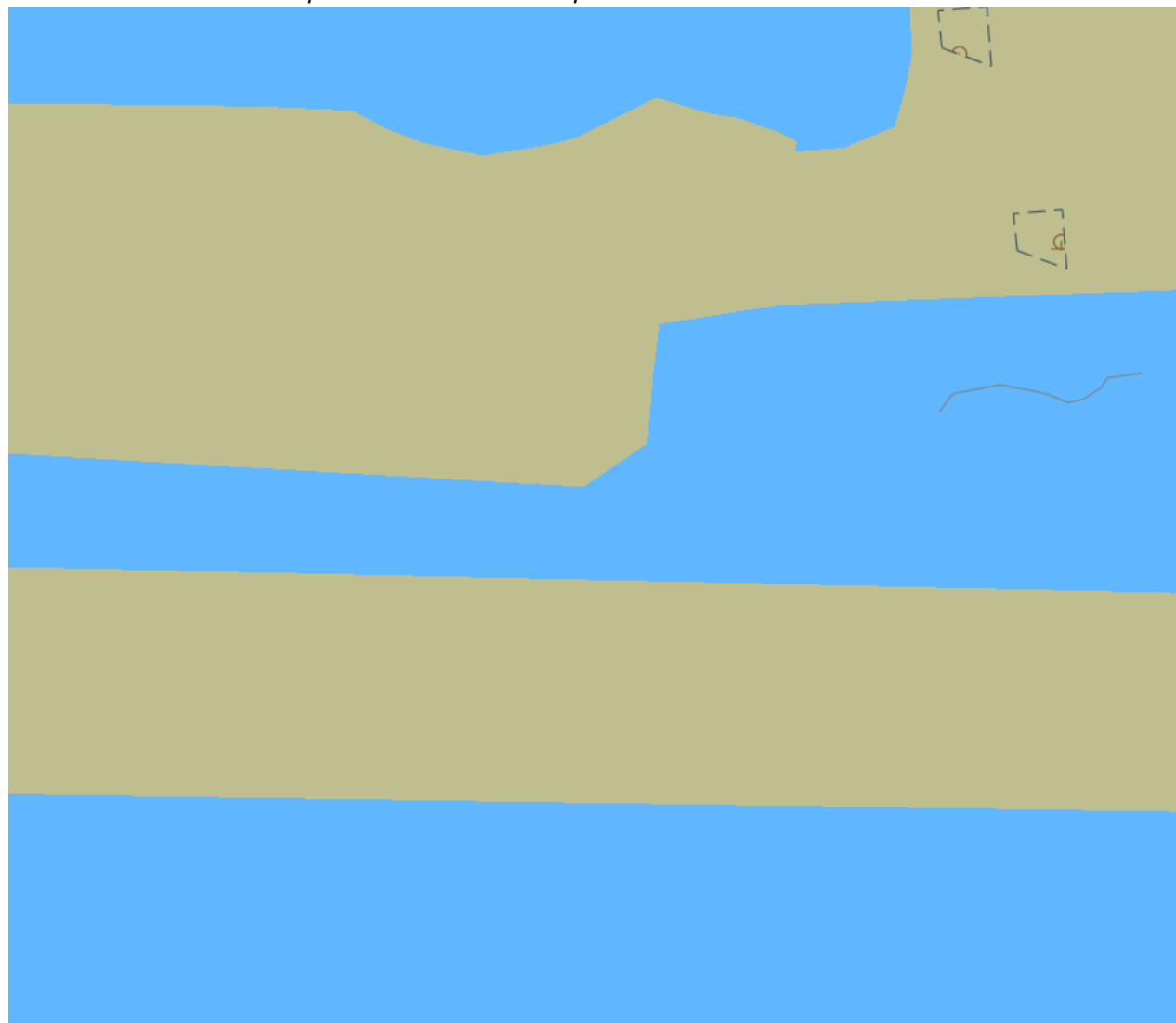


Action


Switch off all controls and switch on only the “**Depth Contours**” control.
If provided, select optional Contour label.
Verify that the features are displayed correctly as presented in the plot.

Results

The features are shown as presented in the screen plot below



Action
Switch off all controls and switch on only the “ Seabed ” control. Verify that the features are displayed correctly as presented in the plot.
Results
The features are shown as presented in the screen plot below



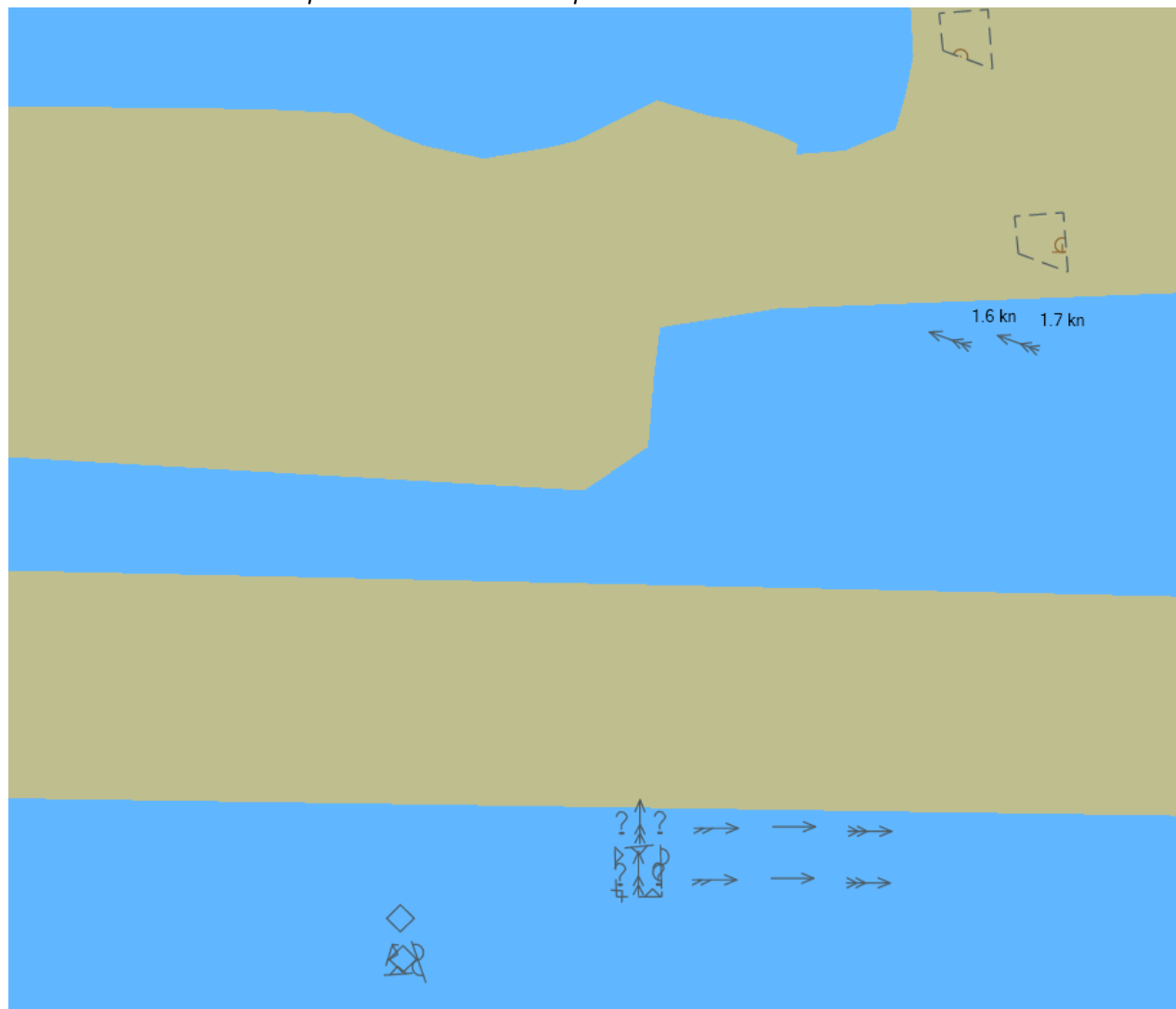
Action

Switch off all controls and switch on only the “**Tidal**” control.

Verify that the features are displayed correctly as presented in the plot.

Results

The features are shown as presented in the screen plot below



Action
<p>Switch off all controls and switch on only the “Miscellaneous” control. Verify that the features are displayed correctly as presented in the plot.</p>
Results
<p>The features are shown as presented in the screen plot below</p> 

3.2.6 Text Grouping

Test Reference	TextGrouping	IHO Reference	S-98 6.1.1 S-100 Part 9 S-101 Portrayal
IEC Reference			
Test Description			
<i>The purpose of the test is to verify that EUT is able to change text display settings and display text in accordance with the S-101 Portrayal Catalogue. Minimum two text display categories should be available in the EUT HMI.</i>			
Loaded Data			
Exchange Set Name			
DisplayOther			
Display Mode		Independent Mariner's Selections	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour	10 m	Highlight date dependent	
Safety depth	10 m	Highlight document	
Deep Contour	30 m	Highlight info	
Shallow contour	2 m	Shallow pattern	
Four shades	Off	Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	On
Ignore scale minimum		Other Text	On
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date	N/A	Centre	
End Date	N/A	Scale	1:60 000
		Orientation	
Viewing Groups			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routeing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Setup			
<i>As per UpdateCatalogues (S-101 Feature and Portrayal Catalogues loaded, but all datasets removed from the System Database).</i>			
Action			
<i>Import the exchange sets DisplayBase, DisplayStandard and DisplayOther;</i>			

Check that EUT HMI contains standardized controls that can switch on and off certain features from the chart.

Results

Confirm that the following controls are available at EUT HMI under the Other Display section:

- Important Text
- Other Text

More text display controls may be available; however, all the additional controls should be subdivisions of one of the above controls.

Action

View dataset 10100AA_DBASE.000

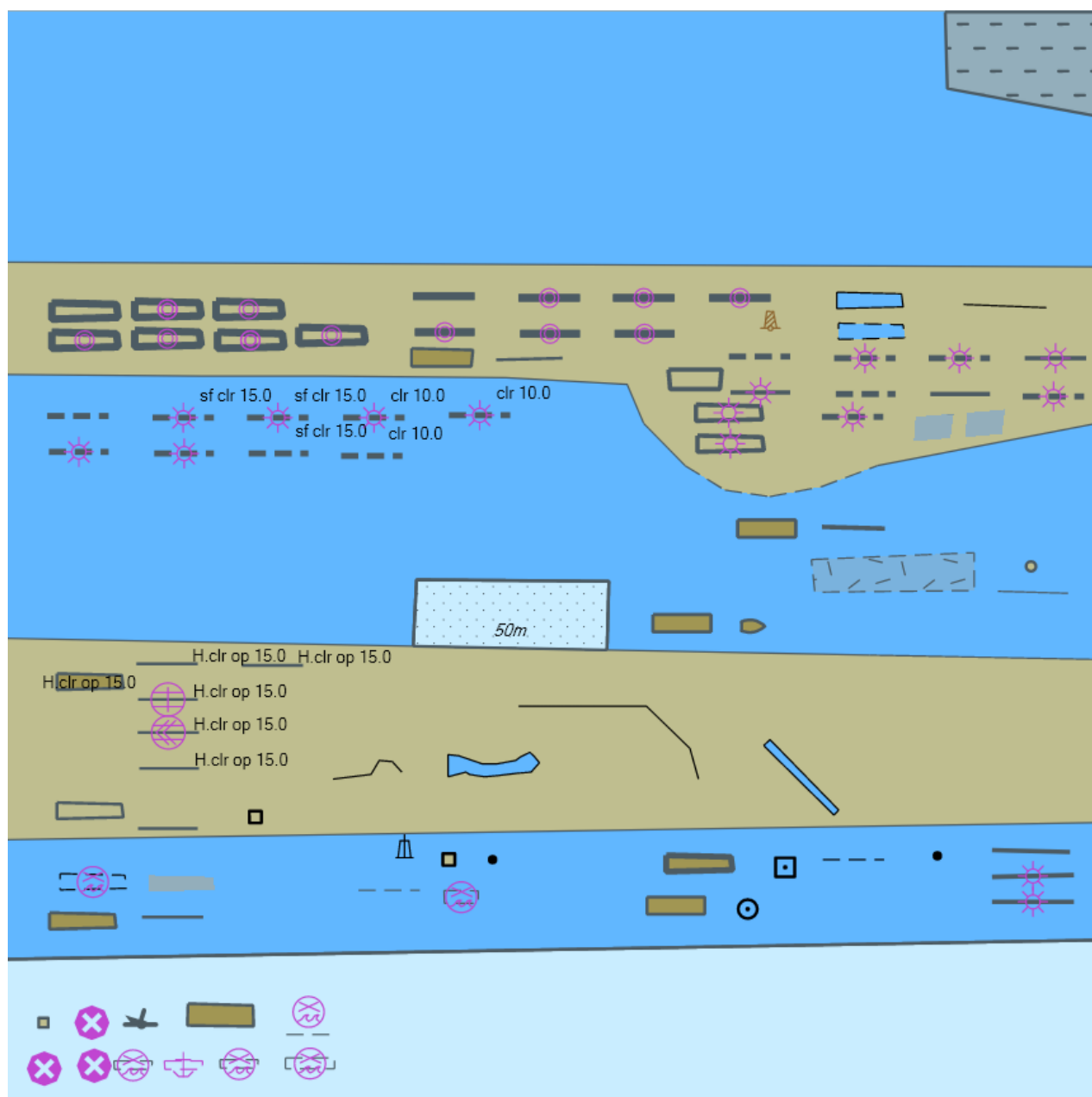
Select Display Category Display Base

Switch off all text group controls and switch on only the “**Important Text**” control.

Verify that the features are displayed correctly as presented in the plot.

Results

The features are shown as presented in the screen plot below (scale 1:60 000)



Action

View dataset 10100AA_STNDR.000

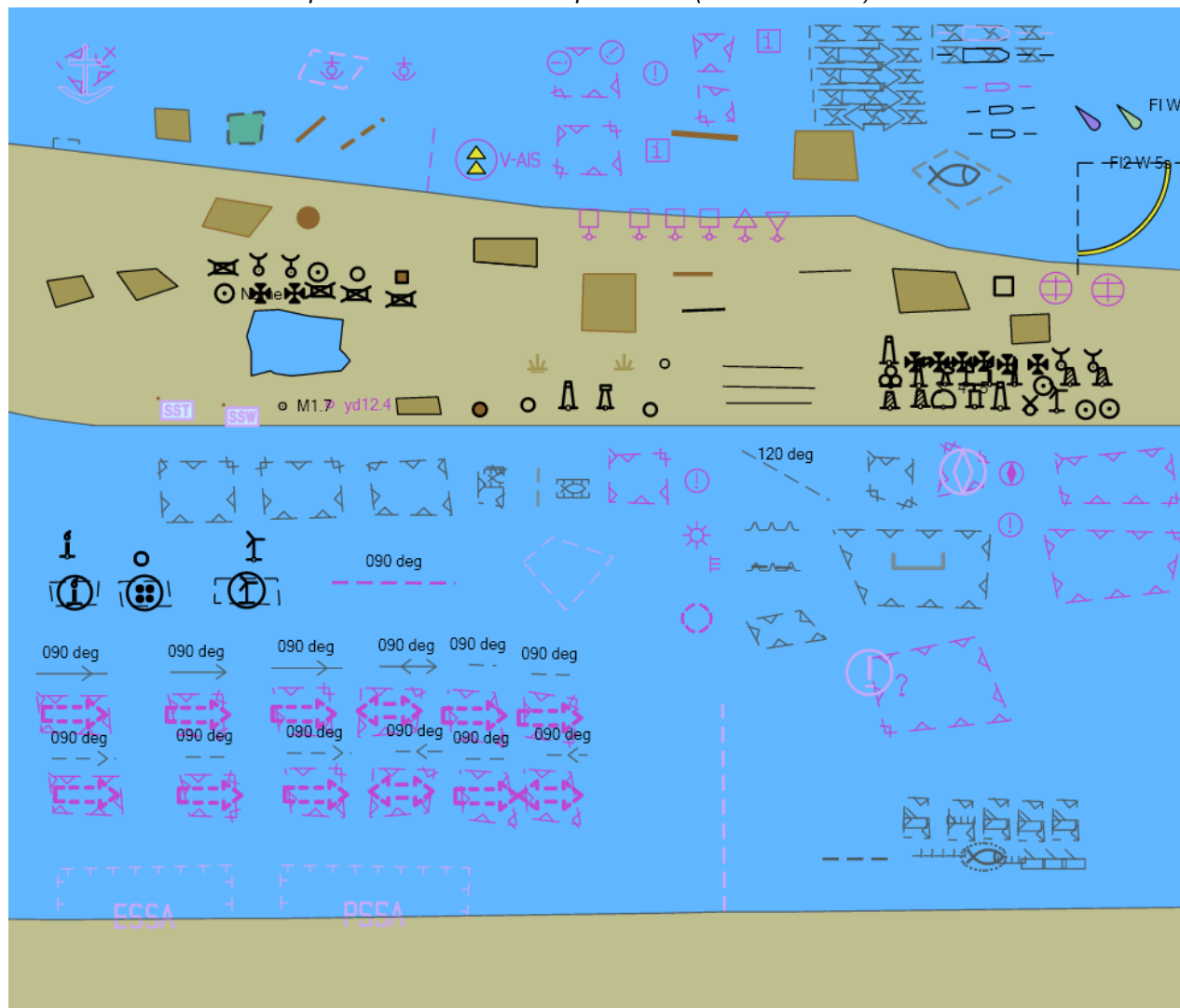
Select Display Category Standard

Switch off all text group controls and switch on only the “**Important Text**” control.

Verify that the features are displayed correctly as presented in the plot.

Results

The features are shown as presented in the screen plot below (scale 1:70 000)



Action

View dataset 10100AA_STNDR.000

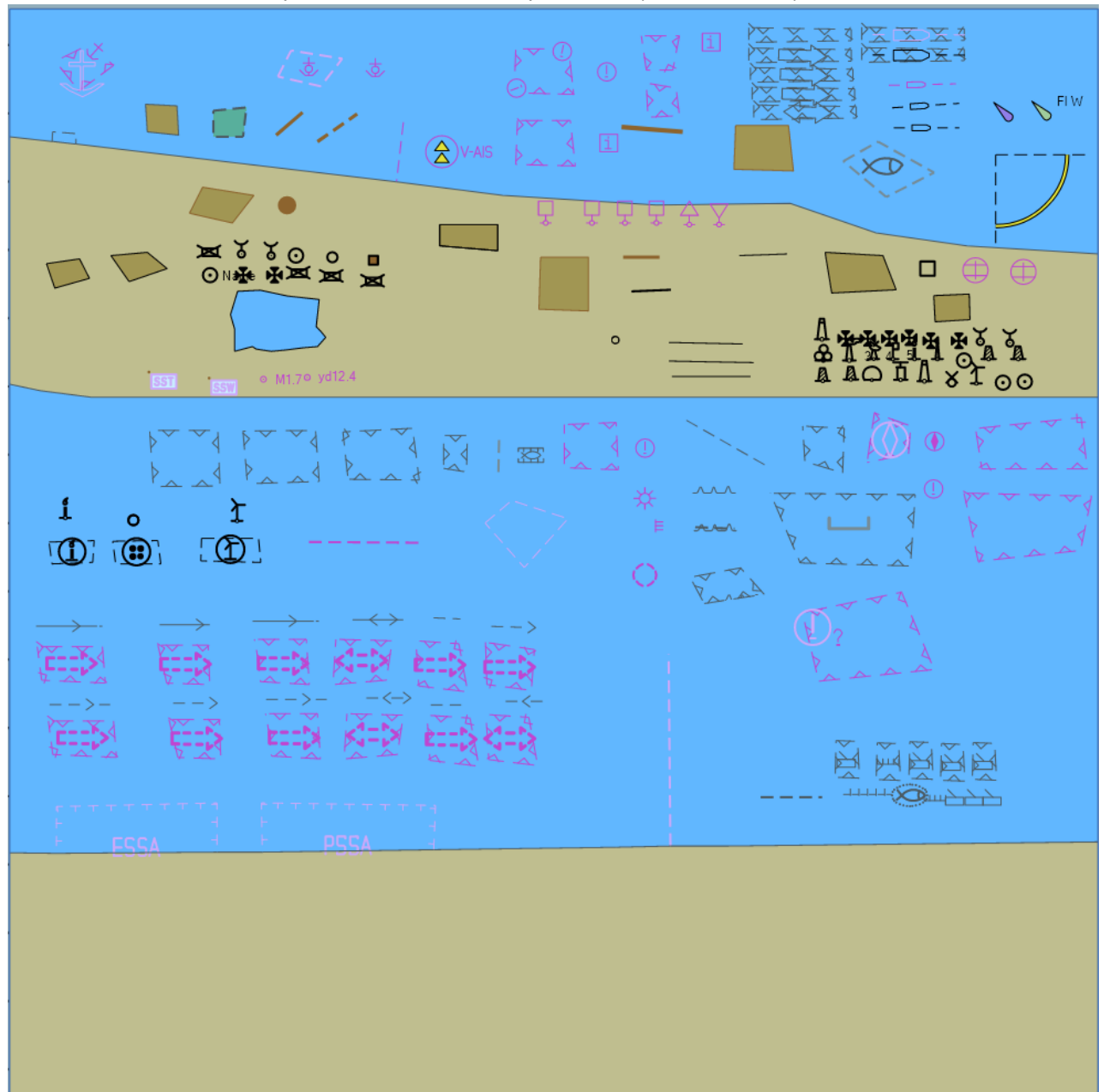
Select Display Category Other

Switch off all text group controls and switch on only the “**Other Text**” control.

Verify that the features are displayed correctly as presented in the plot.

Results

The features are shown as presented in the screen plot below (scale 1:60,000)



Action

View dataset 10100AA_OTHER.000

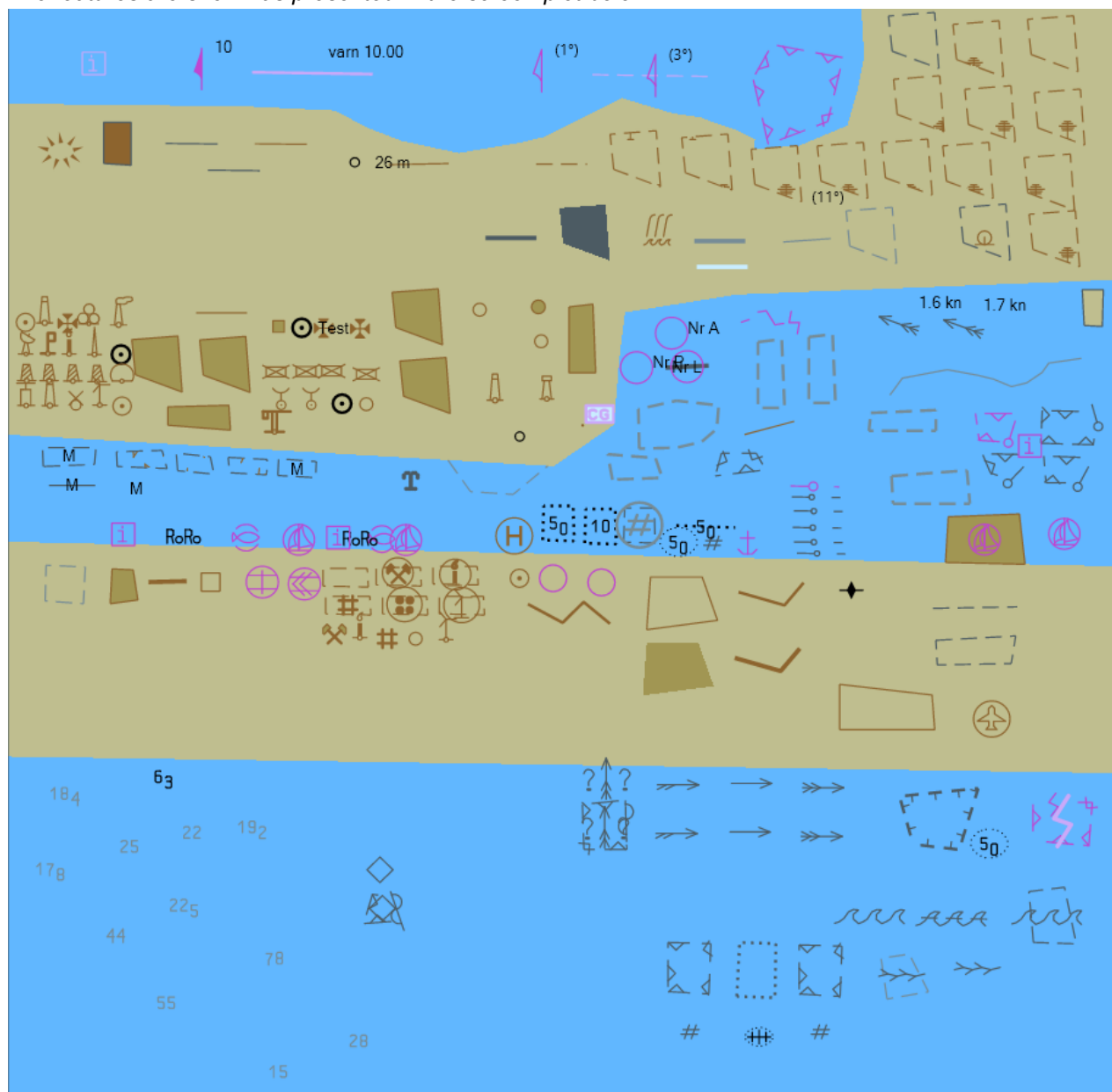
Select Display Category Other

Switch off all text group controls and switch on only the “**Other Text**” control.

Verify that the features are displayed correctly as presented in the plot.

Results

The features are shown as presented in the screen plot below



Action
<p>View dataset 10100AA_OTHER.000</p> <p>Select Display Category Other</p> <p>Switch off all text group controls and switch on only the “Names” control located under the “Other Text” control. Verify that the features are displayed correctly as presented in the plot.</p>
Results
<p>The features are shown as presented in the screen plot below</p> 

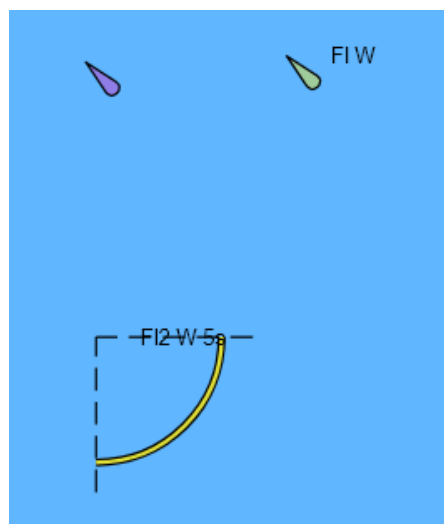
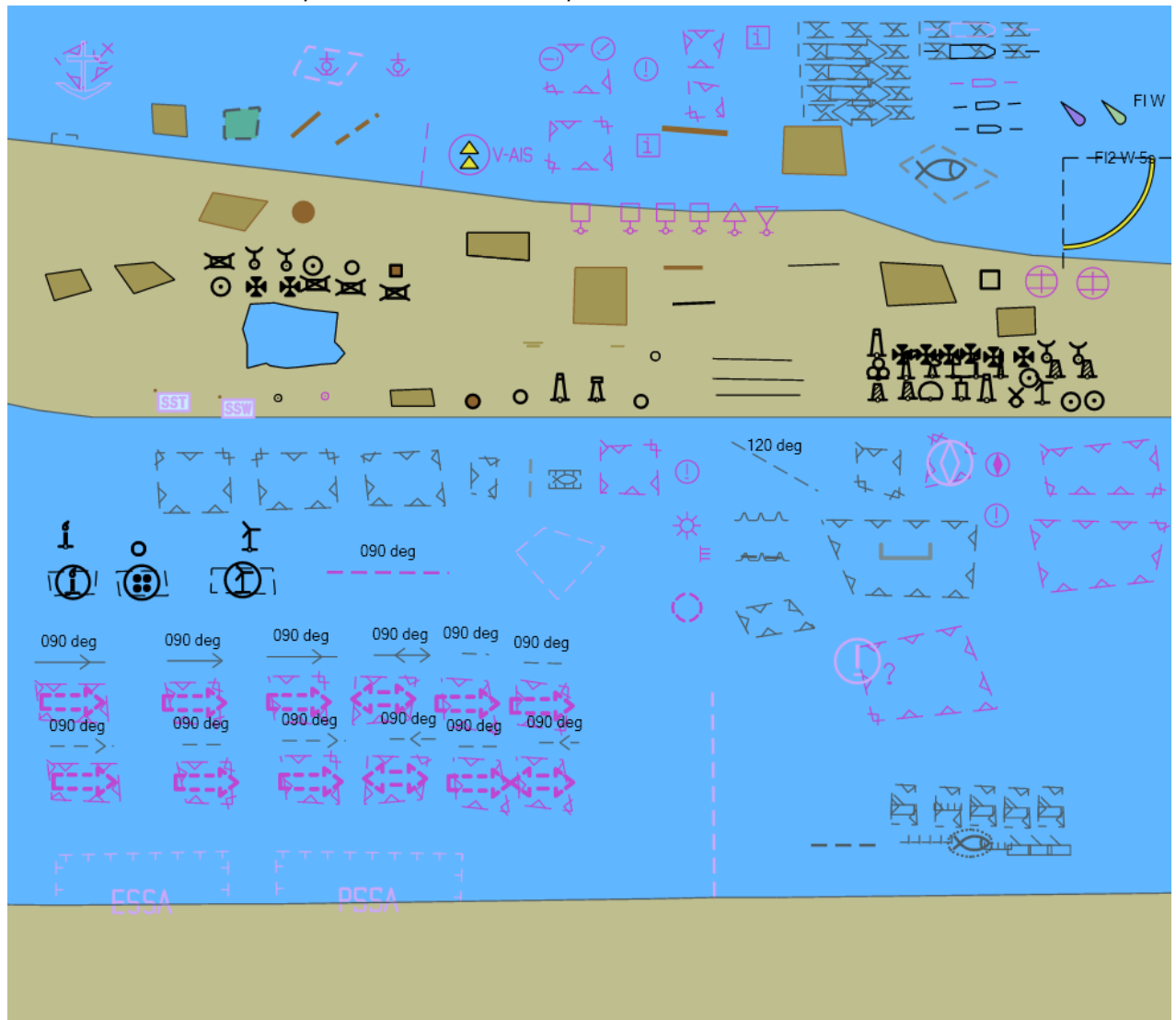
Action

View dataset 10100AA_STNDR.000

Switch off all text group controls and switch on only the “**Light description**” control located under the “**Other Text**” control. Verify that the features are displayed correctly as presented in the plot.

Results

The features are shown as presented in the screen plot below



North_East part of above dataset at scale 1:20 000

Action
View dataset 10100AA_OTHER.000 Switch off all text group controls and switch on only the “All other” control located under the “Other Text” control. Verify that the features are displayed correctly as presented in the plot.
Results
The features are shown as presented in the screen plot below


3.3 Invalid Features

3.3.1 Display of Invalid Features

Test Reference	InvalidFeaturesA	IHO Reference	S-98 6.1.1 S-100 Part 9 S-101 Portrayal
Test Description			
This test ensures EUT supports the display of features with unrecognised feature class or the display of features for which available or not available attribute(s) causes special presentation.			
Loaded Data			
Exchange Set Name			

InvalidFeatures			
Display Mode		Independent Mariner's Selections	
Other		Accuracy	Off
Context Parameters		Contour label	Off
Safety contour	0 m	Highlight date dependent	Off
Safety depth	0 m	Highlight document	Off
Deep Contour	30 m	Highlight info	Off
Shallow contour	0 m	Shallow pattern	Off
Four shades	Off	Unknown	Off
Radar overlay	Off	Update review	Off
Plain boundaries	Off	Text Groups	
Simplified symbols	Off	Chart Text	Off
Full light lines	Off	Important text	Off
Ignore scale minimum	Off	Other Text	
Shallow water dangers	Off	Names	Off
Palette		Light description	Off
Day		All other chart text	Off
Date Dependent Objects		Display	
Start Date	N/A	Centre	
End Date	N/A	Scale	1:50000
		Orientation	
Viewing Groups			
Standard Display		Other	
Drying lines	Off	Spot soundings	On
Buoys. Beacons, aids to navigation	On	Submarine cables and pipelines	On
Buoys, beacons, structures	On	All isolated dangers	On
Lights	On	Magnetic variation	Off
Boundaries and limits	On	Depth contours	Off
Prohibited and restricted areas	On	Seabed	Off
Chart scale boundaries	Off	Tidal	Off
Cautionary notes	On	Miscellaneous (Other)	Off
Ships' routing systems and ferry routes	Off		
Archipelagic sea lanes	Off		
Miscellaneous (Standard)	Off		
Chart (Standard)	Off		
Alert Highlights (Standard)	Off		
Setup			
<i>As per UpdateCatalogues (S-101 Feature and Portrayal Catalogues loaded, but all datasets removed from the System Database).</i>			
Action			
<i>Import the exchange set InvalidFeatures (dataset 10100AA_INVFE.000);</i>			
Results			
<p><i>Confirm that the symbol SY(QUESMRK1) is displayed as below for following cases:</i></p> <p><i>a) unknown feature class, point geometry</i></p> <p><i>b) unknown feature class, line geometry</i></p> <p><i>c) unknown feature class, area geometry</i></p> <p><i>d) known feature class for which missing attribute causes presentation of additional symbol SY(QUESMRK1)</i></p>			

Test Reference	InvalidFeaturesB	IHO Reference	S-98 6.1.1 S-100 Part 9 S-101 Portrayal
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		IEC Reference		
Test Description				
Display of features with unrecognised feature class or display of features for which available or not available attribute(s) causes special presentation.				
Loaded Data				
Exchange Set Name				
InvalidFeatures				
Display Mode			Independent Mariner's Selections (Default=On)	
Standard			Accuracy	
Context Parameters			Contour label	
Safety contour	0 m		Highlight date dependent	
Safety depth	0 m		Highlight document	
Deep Contour	30 m		Highlight info	
Shallow contour	0 m		Shallow pattern	
Four shades	Off		Unknown	
Radar overlay	Off		Update review	
Plain boundaries	Off		Text Groups	
Simplified symbols	Off		Chart Text	
Full light lines	Off		Important text	
Ignore scale minimum	Off		Other Text	
Shallow water dangers	Off		Names	
Palette			Light description	
Day			All other chart text	
Date Dependent Objects			Display	
Start Date			Centre	
End Date			Scale	1:10000
			Orientation	
Viewing Groups				
Standard Display			Other	
Drying lines			Spot soundings	
Buoys. Beacons, aids to navigation			Submarine cables and pipelines	
Buoys, beacons, structures			All isolated dangers	
Lights			Magnetic variation	
Boundaries and limits			Depth contours	
Prohibited and restricted areas			Seabed	
Chart scale boundaries			Tidal	
Cautionary notes			Miscellaneous (Other)	
Ships' routing systems and ferry routes				
Archipelagic sea lanes				
Miscellaneous (Standard)				
Chart (Standard)				
Alert Highlights (Standard)				
Additional				
Setup				
Load the following exchange sets				
- InvalidFeatures (10100AA_X01NE.000)				
- PowerUp (10100AA_X0000.000)				

Action
<i>View dataset at scale 1:10 000</i>
Results
<i>Confirm that all features display as shown in the following screenshot</i>

3.3.2 Invalid Features Pick Report Display

Test Reference	InvalidFeaturesPickA	IHO Reference	S-98 6.1.1 S-100 Part 9 S-101 Portrayal
Test description			
<i>This test ensures the EUT display pick report information for features with unknown feature class.</i>			
Setup			
<i>As for test InvalidFeaturesA</i>			
Action			
<ol style="list-style-type: none"> Select the following features: <ol style="list-style-type: none"> 39° 29.000' N 104° 44.000' W 39° 29.000' N 104° 42.500' W 39° 29.000' N 104° 40.500' W Remove pick report information from display. 			
Results			
<ol style="list-style-type: none"> Pick report associated with chart feature is displayed only when feature is selected. <ol style="list-style-type: none"> First example has 2 attributes (Orientation is 45.0 deg; Information is Wreck). Second example has 1 attribute (Information is danger line). Third example has 1 attribute (Information is See regulation "Jussland fishing act" paragraph 42). Pick report associated with chart feature is removed from the display. 			

Test Reference	InvalidFeaturesPickB	IHO Reference	S-98 6.1.1 S-100 Part 9 S-101 Portrayal
Test description			
<i>Display of pick report information for features with unknown feature class.</i>			
Setup			
<i>As for InvalidFeaturesB.</i>			
Action			
<ol style="list-style-type: none"> Select the following feature 32°30.924'S, 60°58.719'E Remove pick report information from display. 			
Results			
<ol style="list-style-type: none"> Pick report associated with chart feature is displayed only when feature is selected. This example has no attributes. Only unknown feature and its position is available in the pick report. <ol style="list-style-type: none"> Pick report associated with chart feature is removed from the display. 			


Test Reference	InvalidFeaturesPickC	IHO Reference	S-98 6.1.1 S-100 Part 9 S-101 Portrayal
Test description			
<i>Display of pick report information for known features which have unknown attribute(s).</i>			
Setup			
<i>As for InvalidFeaturesA.</i>			
Action			
1. Select the following features: - 39° 27.000' N 104° 44.000' W - 39° 27.000' N 104° 42.500' W - 39° 27.000' N 104° 40.500' W 2. Remove pick report information from display.			
Results			
1a. Pick report associated with chart feature is displayed only when feature 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 is a restricted area and it has 1 unknown attribute 2. Pick report associated with chart feature is removed from the display.			

Test Reference	InvalidFeaturesPickD 3.2.2 d)	IHO Reference	S-98 6.1.1 S-100 Part 9 S-101 Portrayal
Test description			
<i>Display of pick report information for known features for which available or not available attribute(s) cause special presentation.</i>			
Setup			
<i>As for InvalidFeaturesB.</i>			
Action			
1. Select the following features: - 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.			
Results			
1a. Pick report associated with chart feature is displayed only when feature 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 feature is removed from the display.			

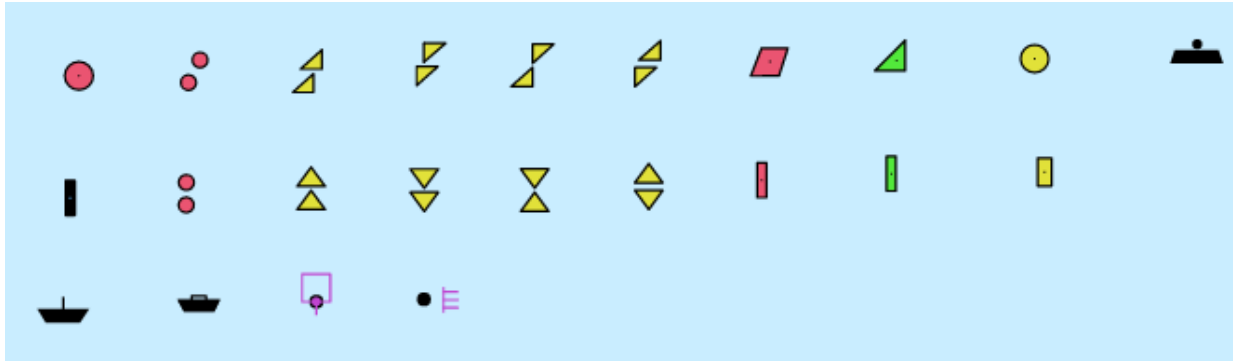
3.4 Independent Mariner Selections

3.4.1 Portrayal of simplified point symbols

Test Reference	SimplifiedSymbolsFalse	IHO Reference	S-98 6.1.1 S-100 Part 9 S-101 Portrayal
Test Description			
<i>This test ensures EUT supports the display of features with simplified symbols turned off.</i>			
Setup			
Exchange Set Name			
Settings			
Display Mode		Independent Mariner's Selections	
Standard		Accuracy	Off
Context Parameters		Contour label	Off
Safety contour	10 m	Highlight date dependent	Off
Safety depth	10 m	Highlight document	Off
Deep Contour	30 m	Highlight info	Off
Shallow contour	2 m	Shallow pattern	Off
Four shades	Off	Unknown	Off
Radar overlay	Off	Update review	Off
Plain boundaries	Off	Text Groups	
Simplified symbols	Off	Chart Text	Off
Full light lines	Off	Important text	Off
Ignore scale minimum	On	Other Text	
Shallow water dangers	Off	Names	Off
Palette		Light description	Off
Day		All other chart text	Off
Date Dependent Objects		Display	
Start Date		Centre	32° 37.280' S 61° 21 .000' E
End Date		Scale	1:10000
		Orientation	
Viewing Groups			
Standard Display		Other	
Drying lines	Off	Spot soundings	Off
Buoys. Beacons, aids to navigation	On	Submarine cables and pipelines	Off
Buoys, beacons, structures	On	All isolated dangers	Off
Lights	On	Magnetic variation	Off
Boundaries and limits	Off	Depth contours	Off
Prohibited and restricted areas	Off	Seabed	Off
Chart scale boundaries	Off	Tidal	Off
Cautionary notes	Off	Miscellaneous (Other)	Off
Ships' routing systems and ferry routes	Off		
Archipelagic sea lanes	Off		
Miscellaneous (Standard)	Off		
Chart (Standard)	Off		
Alert Highlights (Standard)	Off		
Setup			
<i>As per UpdateCatalogues.</i>			

Action
<p>Import the exchange set Settings.</p> <p>View the features at scale and position indicated.</p>
Results
<p>Confirm that the features display as follows:</p> 

Test Reference	SimplifiedSymbolsTrue	IHO Reference	S-98 6.1.1 S-100 Part 9 S-101 Portrayal
Test Description			
This test ensures EUT supports the display of features with simplified symbols.			
Setup			
Exchange Set Name			
Settings			
Display Mode		Independent Mariner's Selections	
Other		Accuracy	Off
Context Parameters		Contour label	Off
Safety contour	10 m	Highlight date dependent	Off
Safety depth	10 m	Highlight document	Off
Deep Contour	30 m	Highlight info	Off
Shallow contour	2 m	Shallow pattern	Off
Four shades	Off	Unknown	Off
Radar overlay	Off	Update review	Off
Plain boundaries	Off	Text Groups	
Simplified symbols	Off	Chart Text	Off
Full light lines	Off	Important text	Off
Ignore scale minimum	On	Other Text	
Shallow water dangers	Off	Names	Off
Palette		Light description	Off
Day		All other chart text	Off
Date Dependent Objects		Display	
Start Date		Centre	32° 37.280' S 61° 21 .000' E
End Date		Scale	1:10000
		Orientation	
Viewing Groups			
Standard Display		Other	
Drying lines	Off	Spot soundings	Off
Buoys. Beacons, aids to navigation	On	Submarine cables and pipelines	Off

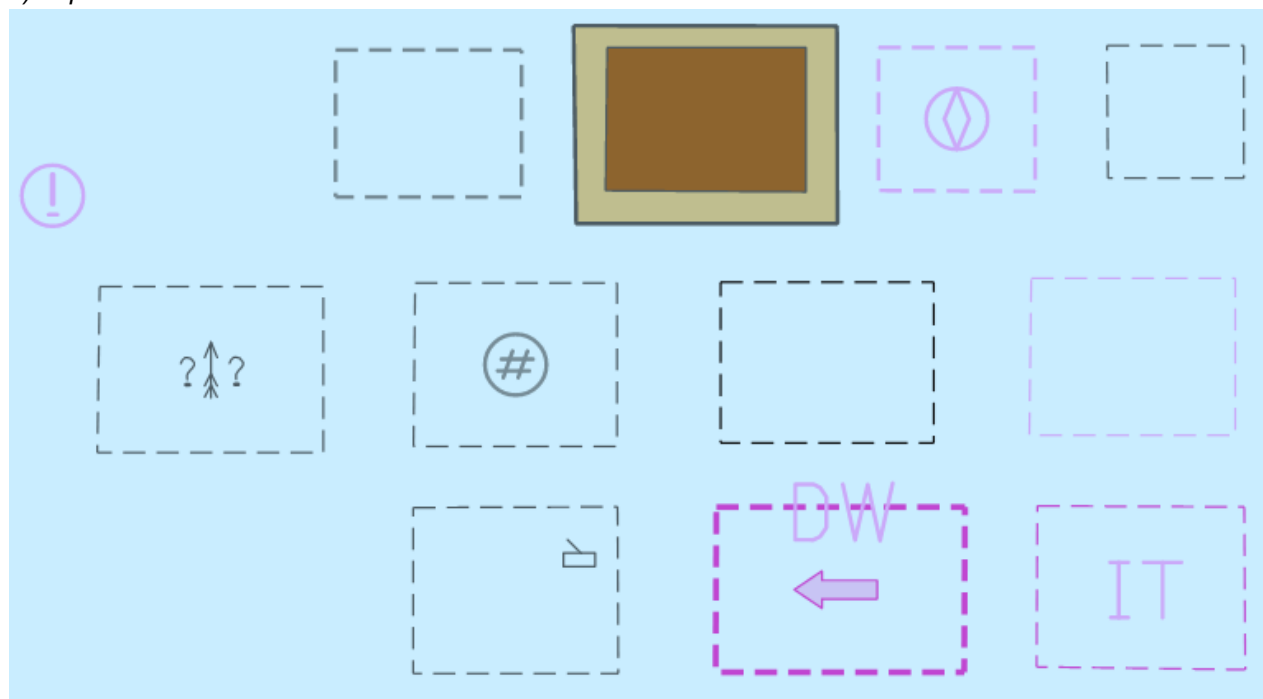
Buoys, beacons, structures	On	All isolated dangers	Off
Lights	On	Magnetic variation	Off
Boundaries and limits	Off	Depth contours	Off
Prohibited and restricted areas	Off	Seabed	Off
Chart scale boundaries	Off	Tidal	Off
Cautionary notes	Off	Miscellaneous (Other)	Off
Ships' routing systems and ferry routes	Off		
Archipelagic sea lanes	Off		
Miscellaneous (Standard)	Off		
Chart (Standard)	Off		
Alert Highlights (Standard)	Off		
Setup			
<i>As for test SimplifiedSymbolsFalse.</i>			
Action			
<i>Select Simplified symbols = true</i>			
<i>View the features at scale and position indicated.</i>			
Results			
<i>Confirm that the features display as follows:</i>			
			

3.4.2 Symbolized and plain boundaries

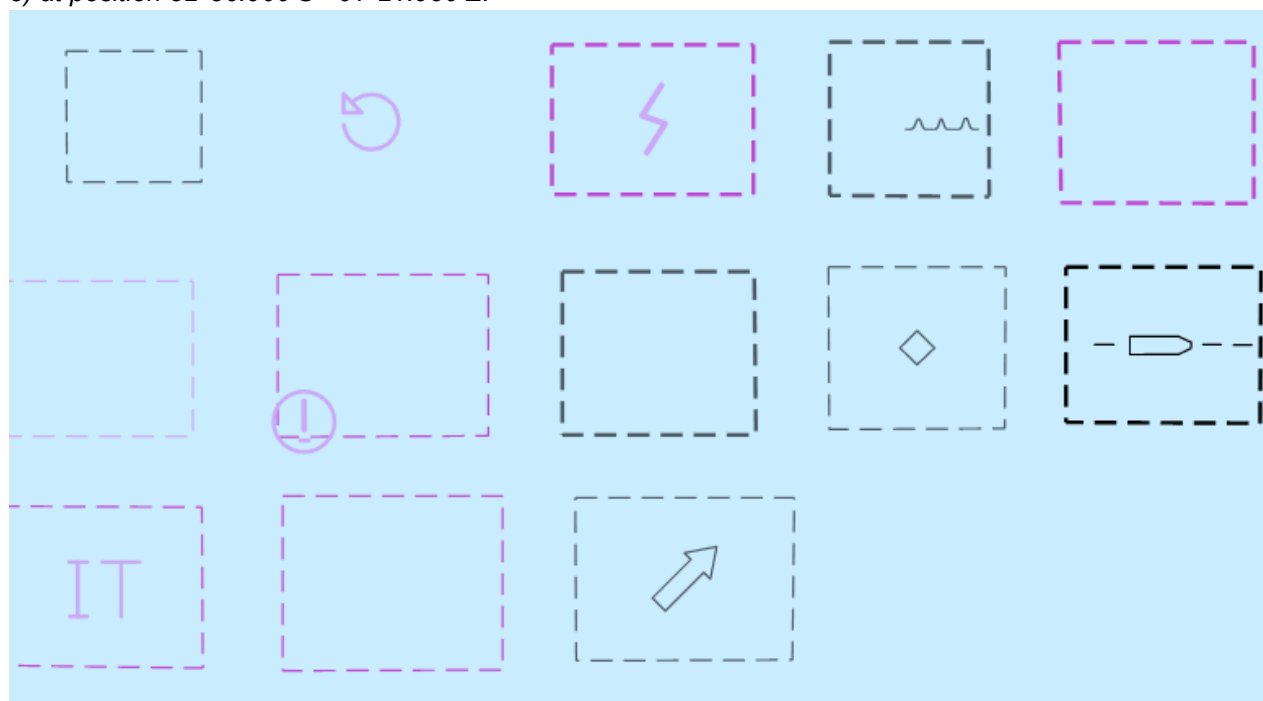
Test Reference	PlainBoundaries	IHO Reference	S-98 6.1.1 S-100 Part 9 S-101 Portrayal
Test Description			
<i>Display of features with plain boundaries.</i>			
Setup			
Exchange Set Name			
Settings			
Display Mode		Independent Mariner's Selections	
Other		Accuracy	Off
Context Parameters		Contour label	Off
Safety contour	10 m	Highlight date dependent	Off
Safety depth	10 m	Highlight document	Off
Deep Contour	30 m	Highlight info	Off
Shallow contour	2 m	Shallow pattern	Off
Four shades	Off	Unknown	Off
Radar overlay	Off	Update review	Off
Plain boundaries	On	Text Groups	
Simplified symbols	Off	Chart Text	Off
Full light lines	Off	Important text	Off
Ignore scale minimum	On	Other Text	
Shallow water dangers	Off	Names	Off

Palette		Light description		Off
Day		All other chart text		On
Date Dependent Objects		Display		
Start Date		Centre		
End Date		Scale	1:10000	
		Orientation		
Viewing Groups				
Standard Display		Other		
Drying lines	Off	Spot soundings	On	
Buoys. Beacons, aids to navigation	On	Submarine cables and pipelines	On	
Buoys, beacons, structures	On	All isolated dangers	On	
Lights	Off	Magnetic variation	On	
Boundaries and limits	On	Depth contours	On	
Prohibited and restricted areas	On	Seabed	On	
Chart scale boundaries	Off	Tidal	On	
Cautionary notes	On	Miscellaneous (Other)	On	
Ships' routing systems and ferry routes	Off			
Archipelagic sea lanes	Off			
Miscellaneous (Standard)	On			
Chart (Standard)	Off			
Alert Highlights (Standard)	Off			
Setup				
As per SimplifiesSymbolsTrue.				
Action				
Zoom into 1:5 000 and view the features at position				
1) 32°36.900'S 61°20.840'E				
2) 32°36.900'S 61°21.400'E				
3) 32°36.900'S 61°21.950'E				
Results				
Confirm that the features display as follows:				
1) at position 32°36.900'S 61°20.840'E:				

2) at position 32°36.900'S 61°21.400'E:



3) at position 32°36.900'S 61°21.950'E:



Test Reference	Symbolised boundaries	IHO Reference	S-98 6.1.1 S-100 Part 9 S-101 Portrayal
Test Description			
<i>Display of features with symbolised boundaries</i>			
Setup			
Exchange Set Name			
Settings			
Display Mode		Independent Mariner's Selections (Default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour	10 m	Highlight date dependent	
Safety depth	10 m	Highlight document	
Deep Contour	30 m	Highlight info	
Shallow contour	2 m	Shallow pattern	
Four shades	Off	Unknown	
Radar overlay	Off	Update review	
Plain boundaries	Off	Text Groups	
Simplified symbols	Off	Chart Text	On
Full light lines	Off	Important text	
Ignore scale minimum	On	Other Text	On
Shallow water dangers	Off	Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:10000
		Orientation	
Viewing Groups			
Standard Display		Other	
Drying lines	Off	Spot soundings	
Buoys, Beacons, aids to navigation	On	Submarine cables and pipelines	
Buoys, beacons, structures	On	All isolated dangers	
Lights	Off	Magnetic variation	
Boundaries and limits	On	Depth contours	
Prohibited and restricted areas	On	Seabed	
Chart scale boundaries	Off	Tidal	
Cautionary notes	On	Miscellaneous (Other)	
Ships' routing systems and ferry routes	Off		
Archipelagic sea lanes	Off		
Miscellaneous (Standard)	On		
Chart (Standard)	Off		
Alert Highlights (Standard)	Off		
Additional			
Setup			

As for test *PlainBoundaries***Action****Select Symbolised Boundaries**

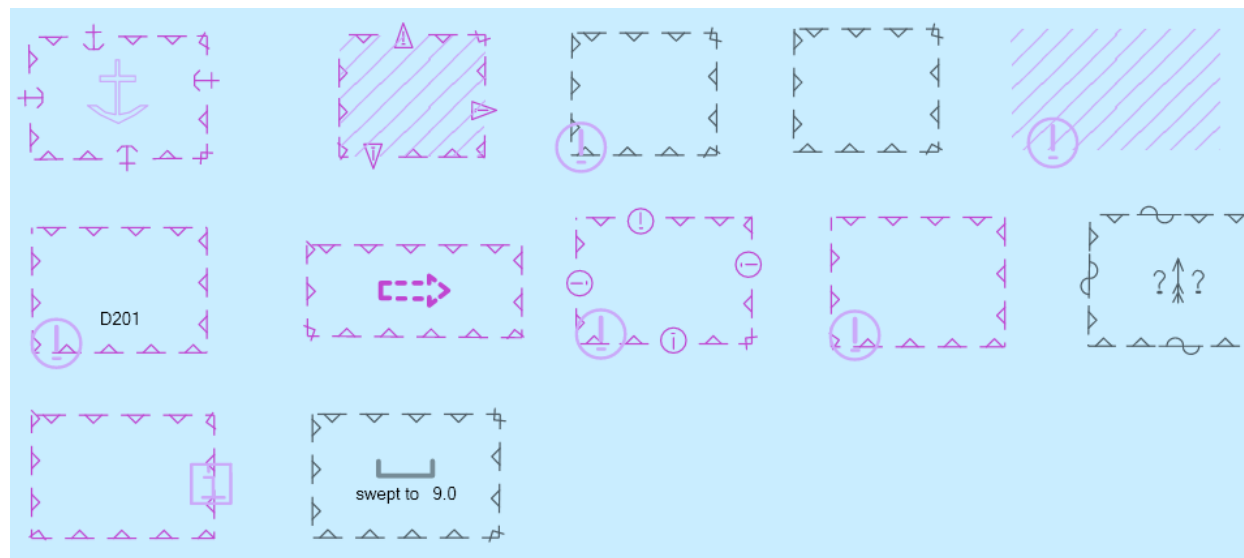
Zoom into 1:5 000 and view the features at position:

- 1) 32°36.900'S 61°20.840'E
- 2) 32°36.900'S 61°21.400'E
- 3) 32°36.900'S 61°21.950'E

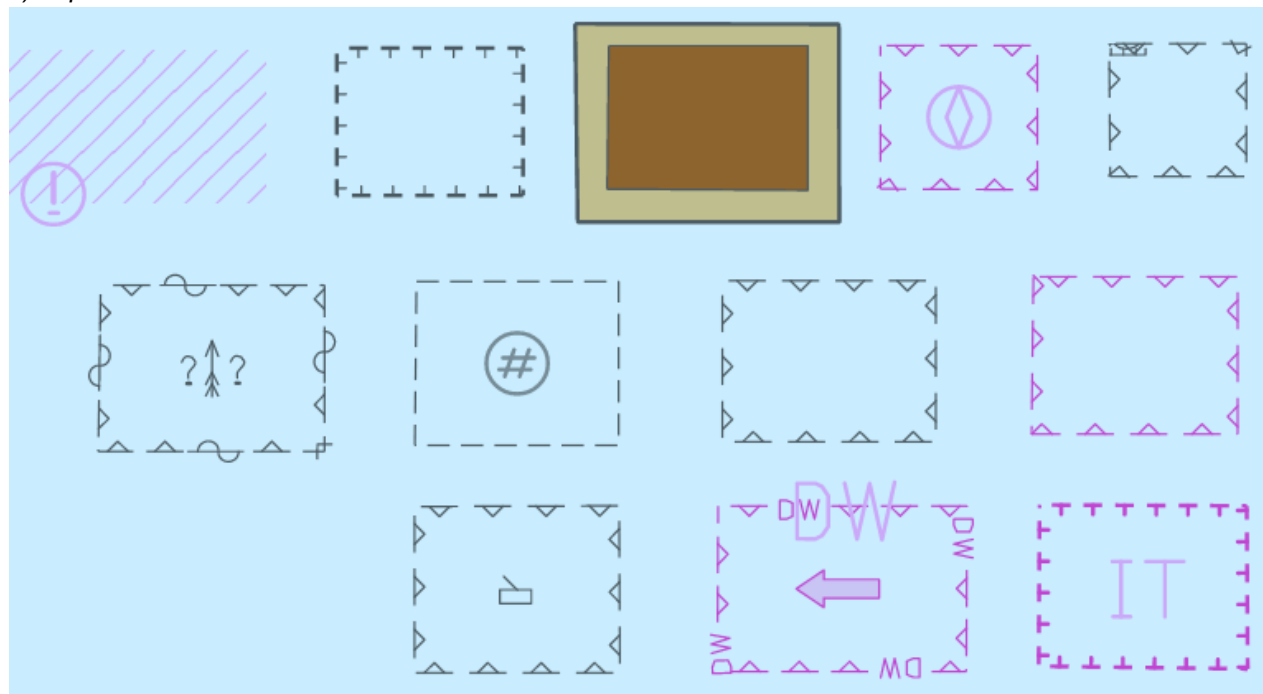
Results

Confirm that the features display as follows:

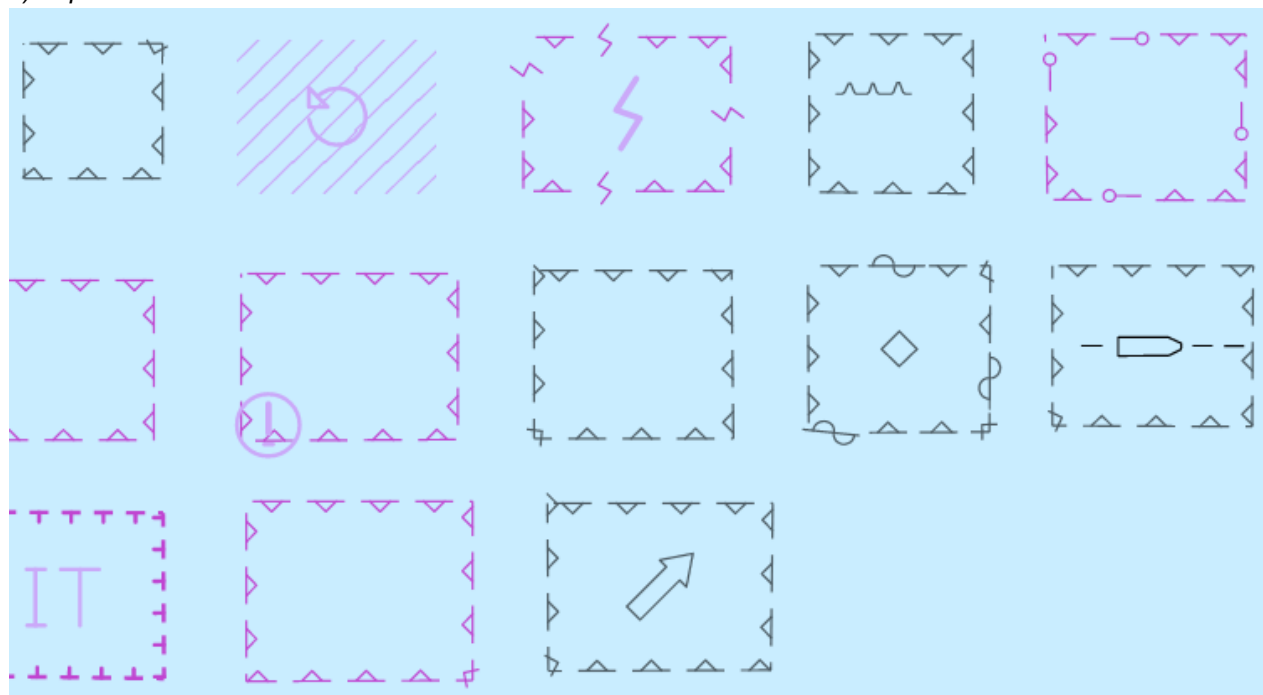
- 1) at position 32°36.900'S 61°20.840'E:



2) at position 32°36.900'S 61°21.400'E:



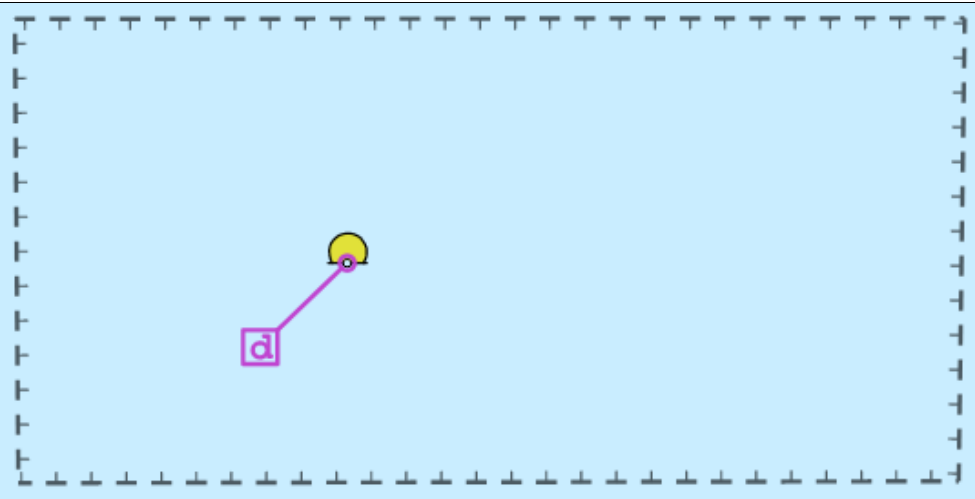
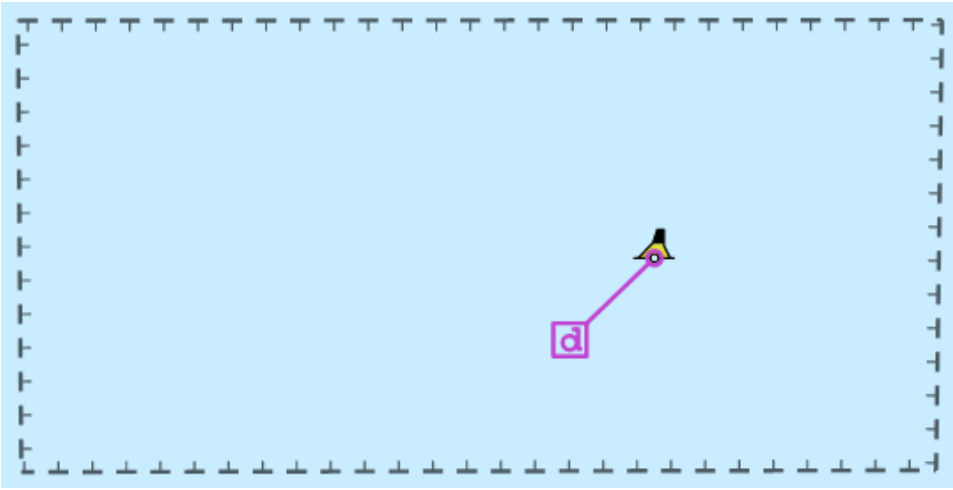
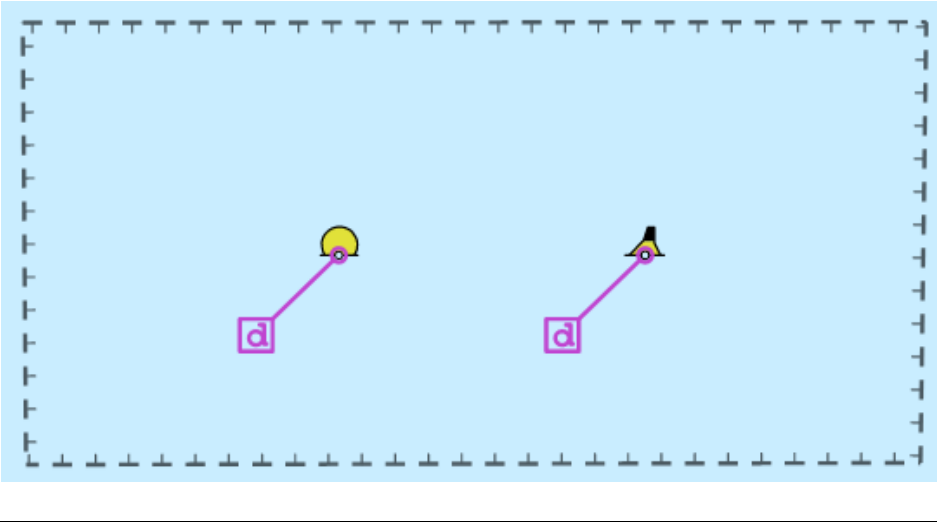
3) at position 32°36.900'S 61°21.950'E:



3.5 Date Dependent Display and Functionality

3.5.1 Fixed Date Range

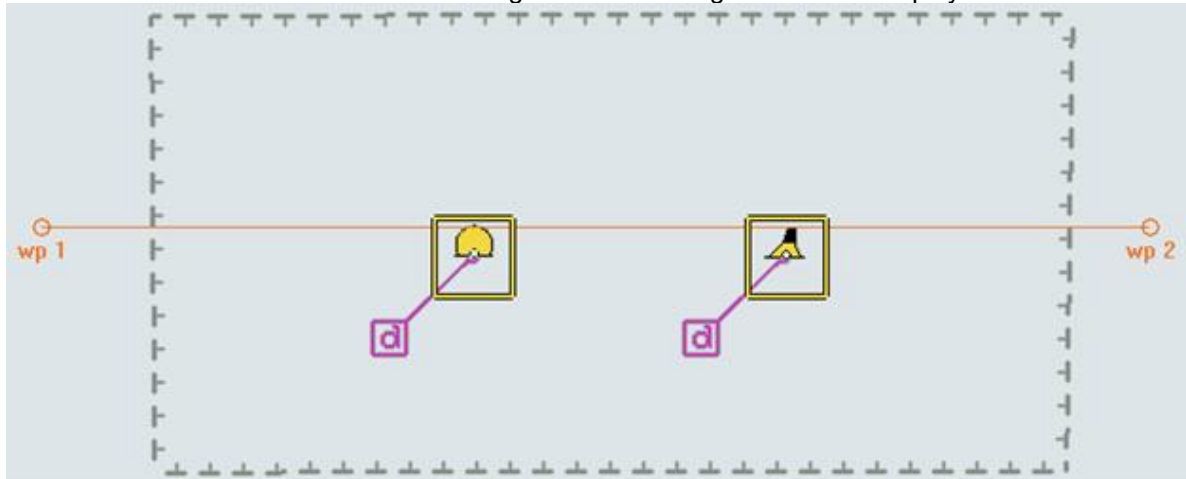
Test Reference	FixedDateRange	IHO Reference IEC Reference	S-98 12.8.1
Test Description			
<i>This test ensures EUT supports the display of date dependent features encoded with a fixed start or end date, or a fixed date range.</i>			
Setup			
Exchange Set Name			
Settings			
Display Mode		Independent Mariner's Selections	
Other		Accuracy	Off
Context Parameters		Contour label	Off
Safety contour	10 m	Highlight date dependent	On
Safety depth	10 m	Highlight document	Off
Deep Contour	30 m	Highlight info	Off
Shallow contour	2 m	Shallow pattern	Off
Four shades	Off	Unknown	Off
Radar overlay	Off	Update review	Off
Plain boundaries	Off	Text Groups	
Simplified symbols	Off	Chart Text	Off
Full light lines	Off	Important text	Off
Ignore scale minimum	On	Other Text	
Shallow water dangers	Off	Names	Off
Palette		Light description	Off
Day		All other chart text	Off
Viewing Date or Range		Display	
Start viewing date	N/A	Centre	32°36.45'S 61°20.90'E
End viewing date	N/A	Scale	1:10 000
Viewing Groups			
Standard Display		Other	
Drying lines	Off	Spot soundings	Off
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	Off
Buoys, beacons, structures	On	All isolated dangers	Off
Lights	Off	Magnetic variation	Off
Boundaries and limits	Off	Depth contours	Off
Prohibited and restricted areas	Off	Seabed	Off
Chart scale boundaries	Off	Tidal	Off
Cautionary notes	Off	Miscellaneous (Other)	On
Ships' routing systems and ferry routes	Off		
Archipelagic sea lanes	Off		
Miscellaneous (Standard)	Off		
Chart (Standard)	Off		
Alert Highlights (Standard)	Off		
Setup			
<i>As per test SimplifiedSymbolsFalse (Settings exchange set loaded).</i>			
Action			
<i>Observe the dataset at indicated scale and position.</i>			
Results			
<i>Confirm that the feature displays as in the image below:</i>			


Action
Set the viewing date to 18.02.2013.
Result
Confirm that the feature displays as in the image below and that a permanent indication is shown as specified in S-98 12.8.2: "Display Not Real Time".

Action
Set the start viewing date to 01.02.2012 and the end viewing date to 01.12.2012.
Result
Confirm that the feature displays as in the image below and that a permanent indication is shown as specified in S-98 12.8.2: "Display Not Real Time".

Action

Create a route from 32°36.425'S 61°20.335'E to 32°36.425'S 61°21.400'E 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:



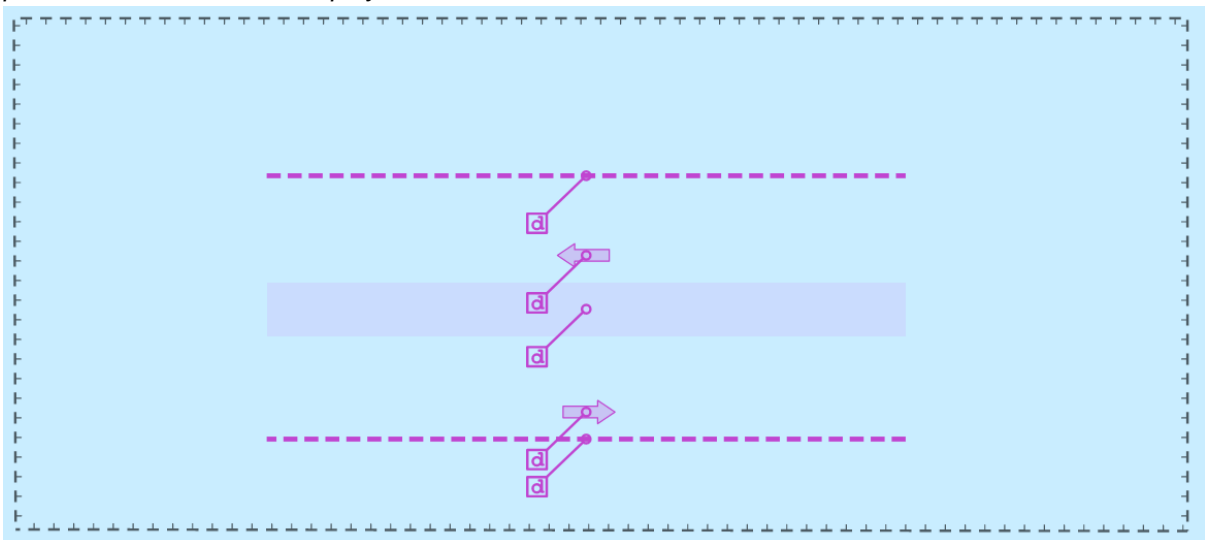
Note: A permanent indication that the date has been adjusted should be shown as specified in S-98.

Action

Set the viewing date to the current date and centre the display on position 32°35.30'S 61°21.38'E.

Result

Confirm that the feature displays as in the image below and that a permanent indication is shown as specified in S-98 12.8.2: "Display Not Real Time".



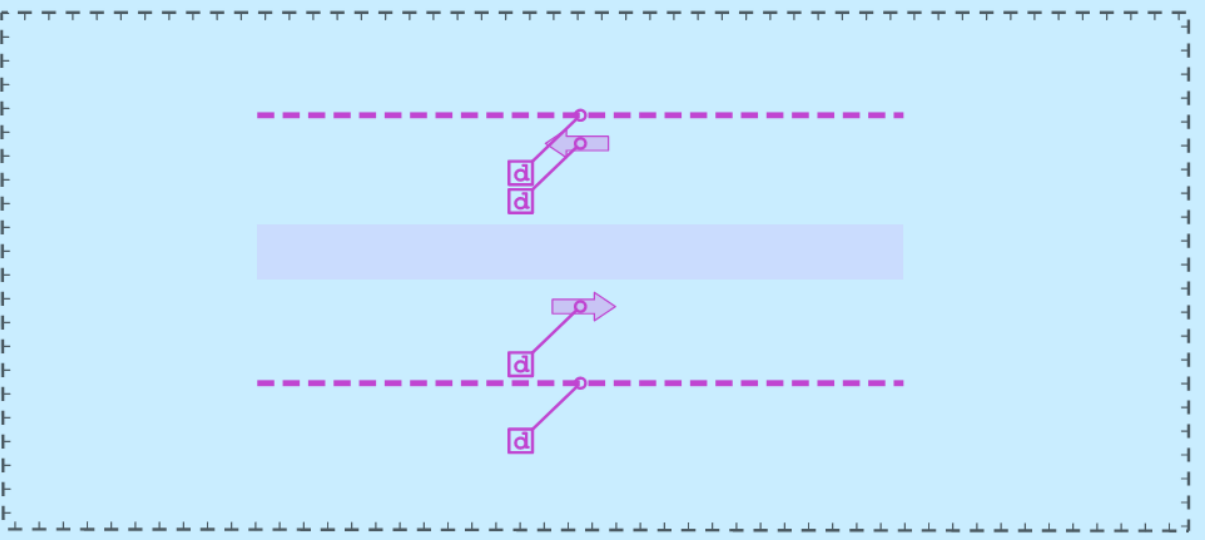
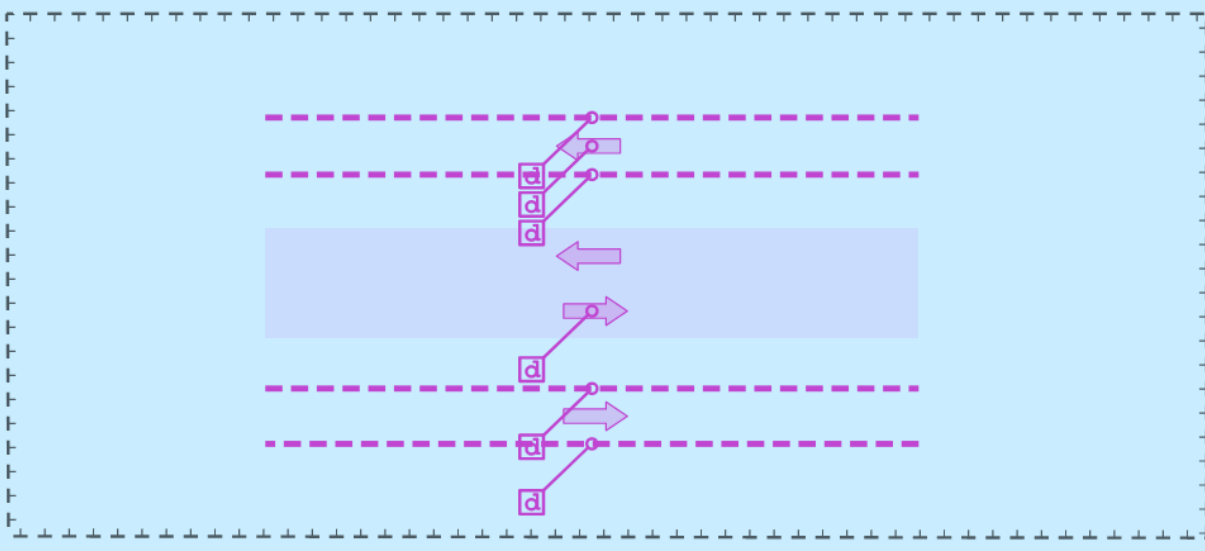
Note: A permanent indication that the date has been adjusted should be shown as specified in S-98.

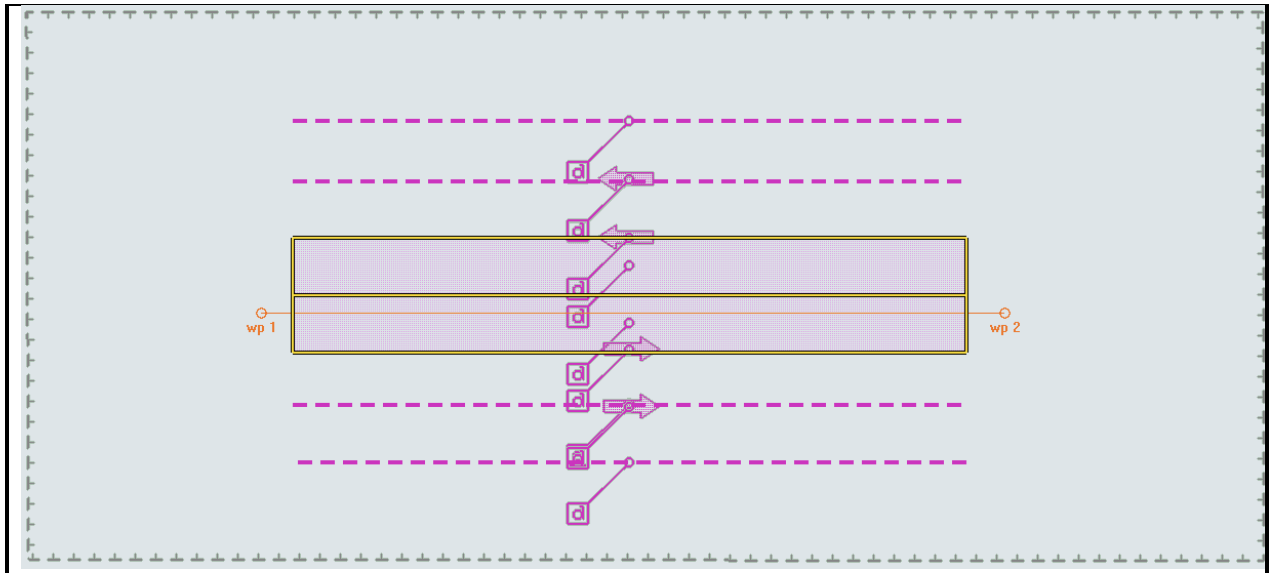
Action

Set the viewing Date to 30.11.2013.

Result

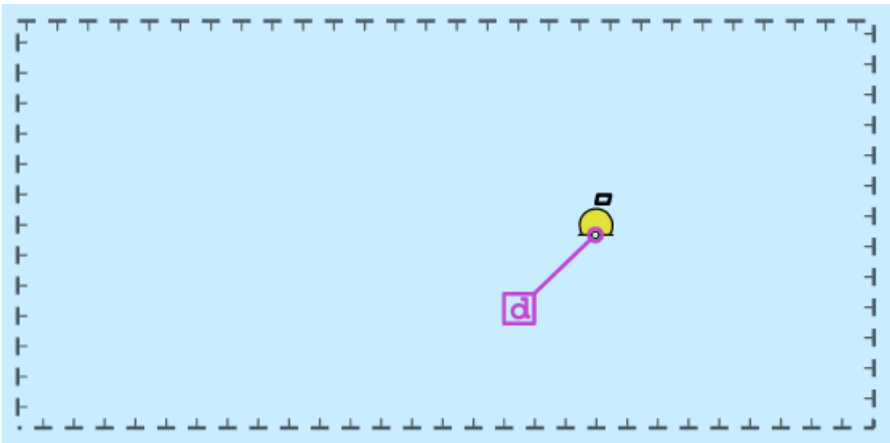
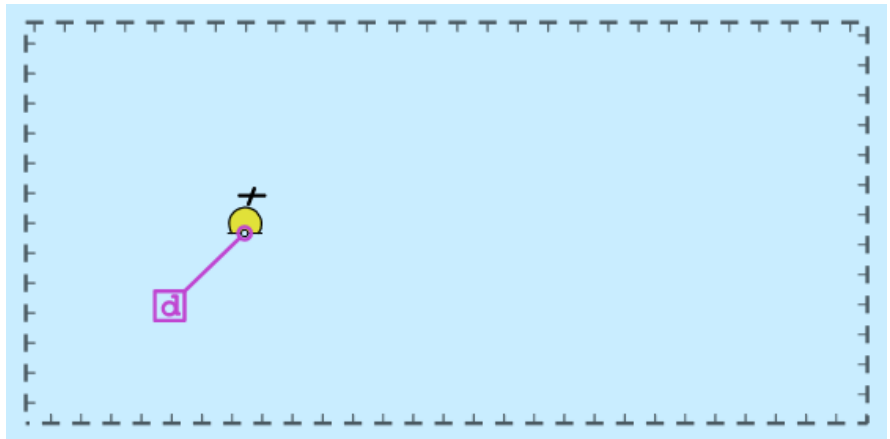
Confirm that the feature displays as in the image below and that a permanent indication is shown as specified in S-98 12.8.2: "Display Not Real Time".

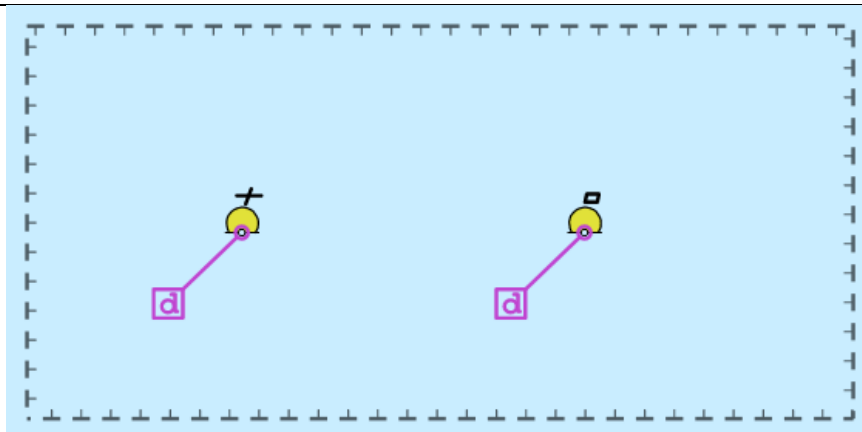

Action
Set the Start viewing date to 01.11.2013 and the End viewing date to 01.12.2013.
Result
Confirm that the feature displays as in the image below and that a permanent indication is shown as specified in S-98 12.8.2: "Display Not Real Time".

Action
Create a route from 32°35.325'S 61°20.800'E to 32°35.325'S 61°21.960'E with a cross track distance of 0.20NM set for Starboard and for Port.
Result
Confirm that the feature displays as in the image below and that a permanent indication is shown as specified in S-98 12.8.2: "Display Not Real Time".



3.5.2 Periodic Date Range

Test Reference	PeriodicDateRange	IHO Reference IEC Reference	S-98 12.8.1
Test Description			
<i>This test ensures EUT supports the display of features encoded with a periodic date range dependency.</i>			
Setup			
Exchange Set Name			
DisplayOther			
Display Mode		Independent Mariner's Selections (Default=On)	
Other		Accuracy	Off
Context Parameters		Contour label	Off
Safety contour	10 m	Highlight date dependent	On
Safety depth	10 m	Highlight document	Off
Deep Contour	30 m	Highlight info	Off
Shallow contour	2 m	Shallow pattern	Off
Four shades	Off	Unknown	Off
Radar overlay	Off	Update review	Off
Plain boundaries	Off	Text Groups	
Simplified symbols	Off	Chart Text	Off
Full light lines	Off	Important text	Off
Ignore scale minimum	On	Other Text	
Shallow water dangers	Off	Names	Off
Palette		Light description	Off
Day		All other chart text	Off
Viewing Date or Range		Display	
Viewing date	01.11.2013	Centre	32°36.450'S 61°21.900'E
		Scale	1:10 000
Viewing Groups			
Standard Display		Other	
Drying lines	Off	Spot soundings	Off
Buoys. Beacons, aids to navigation	Off	Submarine cables and pipelines	Off
Buoys, beacons, structures	On	All isolated dangers	Off
Lights	Off	Magnetic variation	Off
Boundaries and limits	Off	Depth contours	Off

Prohibited and restricted areas	Off	Seabed	Off
Chart scale boundaries	Off	Tidal	Off
Cautionary notes	Off	Miscellaneous (Other)	On
Ships' routing systems and ferry routes	Off		
Archipelagic sea lanes	Off		
Miscellaneous (Standard)	Off		
Chart (Standard)	Off		
Alert Highlights (Standard)	Off		
Setup			
<i>As for test FixedDateRange.</i>			
Action			
<i>Observe the dataset at indicated scale and position.</i>			
Results			
<p>Confirm that the feature displays as in the diagram below:</p>  <p><i>Note: A permanent indication that the date has been adjusted should be shown as specified in S-98 XXX-XXX.</i></p>			
Action			
<p><i>Set the viewing date to 18.03.2013.</i></p> <p><i>Observe the dataset at indicated scale and position.</i></p>			
Results			
<p>Confirm that the feature displays as in the diagram below</p>  <p><i>Note: A permanent indication that the date has been adjusted should be shown as specified in S-98 XXX-XXXX</i></p>			
Action			
<p><i>Set the start viewing date to 01.02.2022 and the end viewing date to 14.11.2022.</i></p> <p><i>Observe the dataset at indicated scale and position.</i></p>			
Results			
<p>Confirm that the feature displays as in the diagram below:</p>			



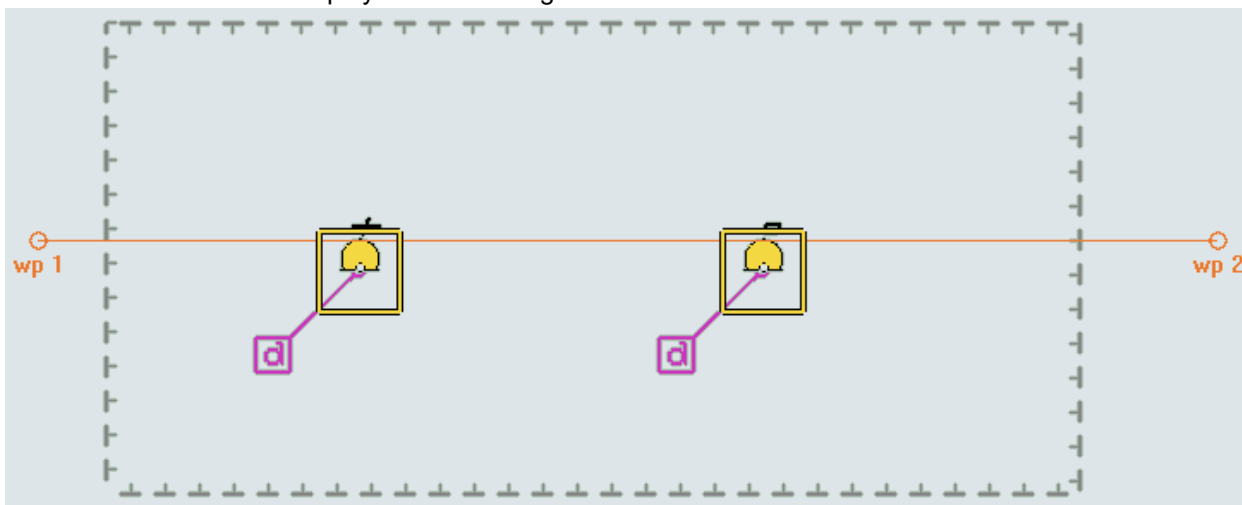
Note: A permanent indication that the date has been adjusted should be shown as specified in S-98 XXX-XXXX

Action

Create a route from $32^{\circ}36.425'S$ $61^{\circ}21.400'E$ to $32^{\circ}36.425'S$ $61^{\circ}22.500'E$ with a cross track distance of 0.10NM set for Starboard and for Port.
Observe the dataset at indicated scale and position.

Results

Confirm that the feature displays as in the diagram below:



Note: A permanent indication that the date has been adjusted should be shown as specified in S-98 XXX-XXXX

3.5.3 Safety contour

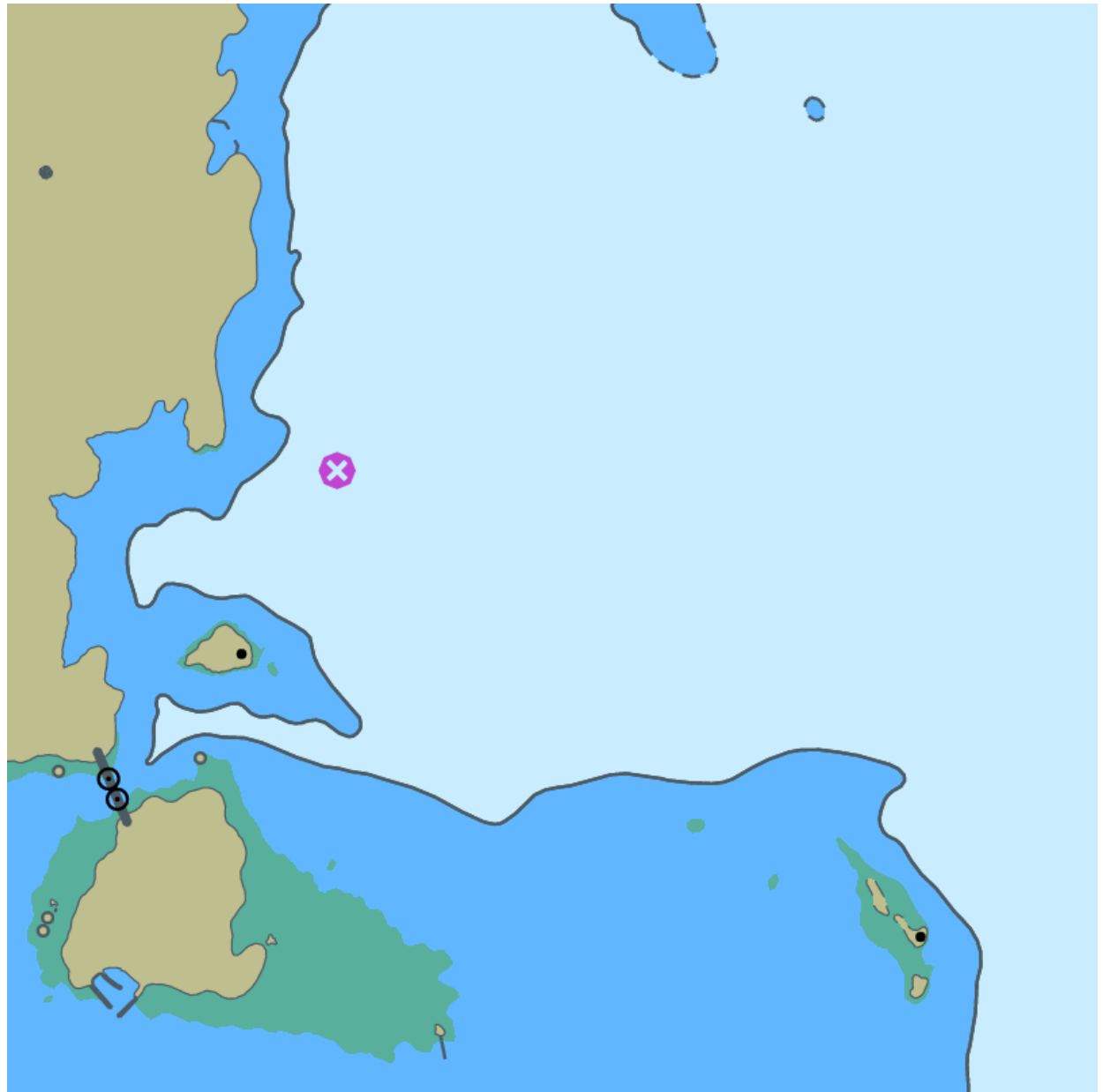
3.6

Test Reference	SafetyContourDisplay		IHO Reference IEC Reference	S-98 12.6.1
Test Description				
This test ensures EUT supports the display of default safety contour.				
Exchange Set Name				
InitialPowerUp				
Display Mode		Independent Mariner's Selections		
Displaybase		Accuracy	Off	
Context Parameters		Contour label	Off	
Safety contour	N/A	Highlight date dependent	Off	
Safety depth	N/A	Highlight document	Off	
Deep Contour	N/A	Highlight info	Off	
Shallow contour	N/A	Shallow pattern	Off	
Four shades	Off	Unknown	Off	
Radar overlay	Off	Update review	Off	
Plain boundaries	Off	Text Groups		
Simplified symbols	Off	Chart Text	Off	
Full light lines	Off	Important text	Off	
Ignore scale minimum	Off	Other Text		
Shallow water dangers	On	Off		
Palette		Light description	Off	
Day		All other chart text	Off	
Viewing Date or Range		Display		
Start viewing date	N/A	Centre	32°28.00'S 61°00.00'E	
End viewing date	N/A	Scale	1:60 000	
Viewing Groups				
Standard Display		Other		
Drying lines	Off	Spot soundings	Off	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	Off	
Buoys, beacons, structures	Off	All isolated dangers	On	
Lights	Off	Magnetic variation	Off	
Boundaries and limits	Off	Depth contours	Off	
Prohibited and restricted areas	Off	Seabed	Off	
Chart scale boundaries	Off	Tidal	Off	
Cautionary notes	Off	Miscellaneous (Other)	Off	
Ships' routeing systems and ferry routes	Off			
Archipelagic sea lanes	Off			
Miscellaneous (Standard)	Off			
Chart (Standard)	Off			
Alert Highlights (Standard)	Off			
Setup				
As per InitialPowerUp test.				
Action				
Ensures the EUT is set without Safety contour value (factory default setting); Load all datasets from the exchange set InitialPowerUp; Display dataset 10100AA_X0000.000 at indicated scale and centred position.				
Results				

Select Safety contour value to 15 m (the ENC has no 15 m Depth Contour);
Load all datasets from the exchange set **InitialPowerUp**;
Display dataset 10100AA X0000.000 at indicated scale and centred position.

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The 20m contour must be highlighted as the safety contour.

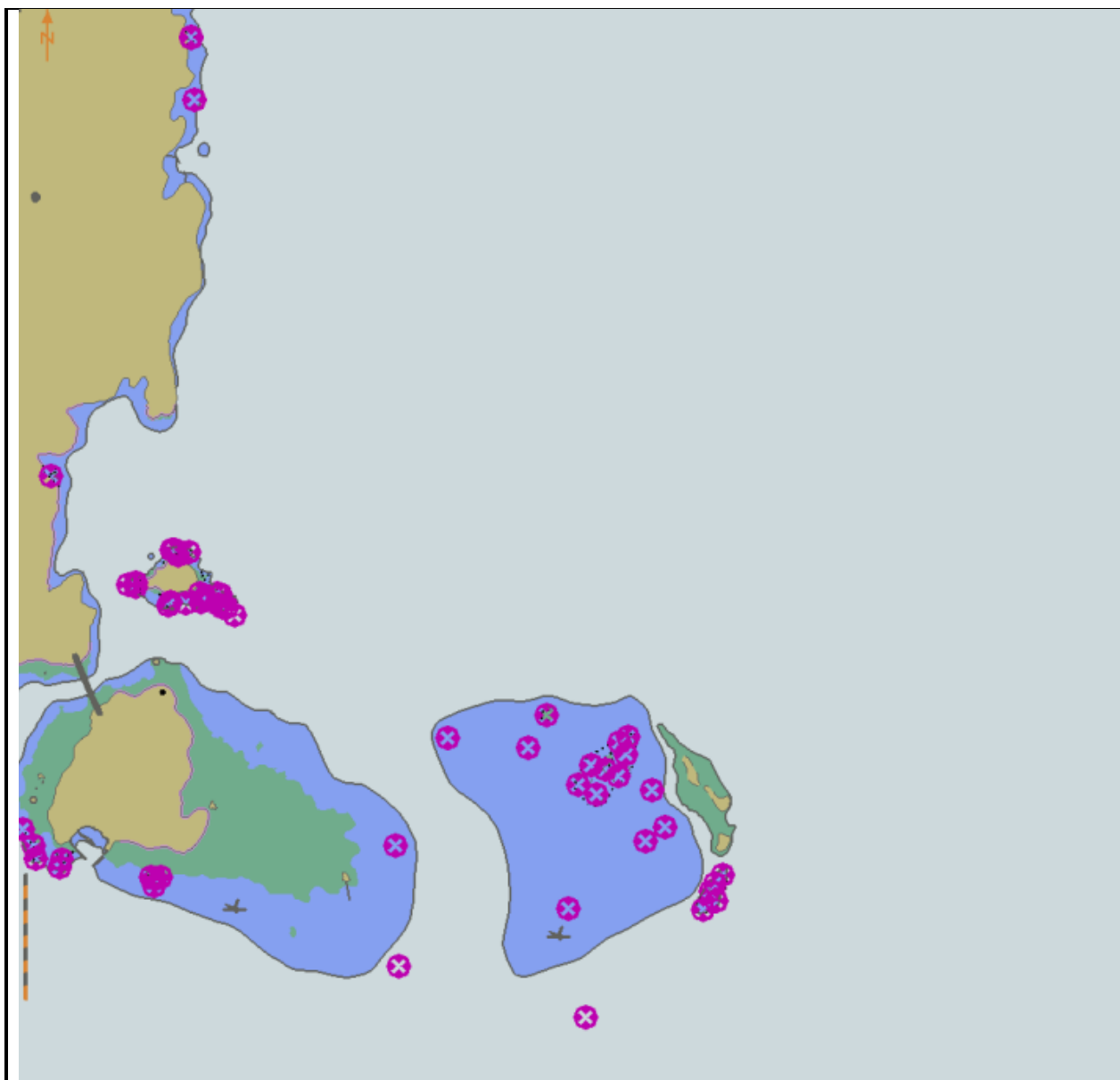


Action

Select Safety contour value to 5 m.

Results

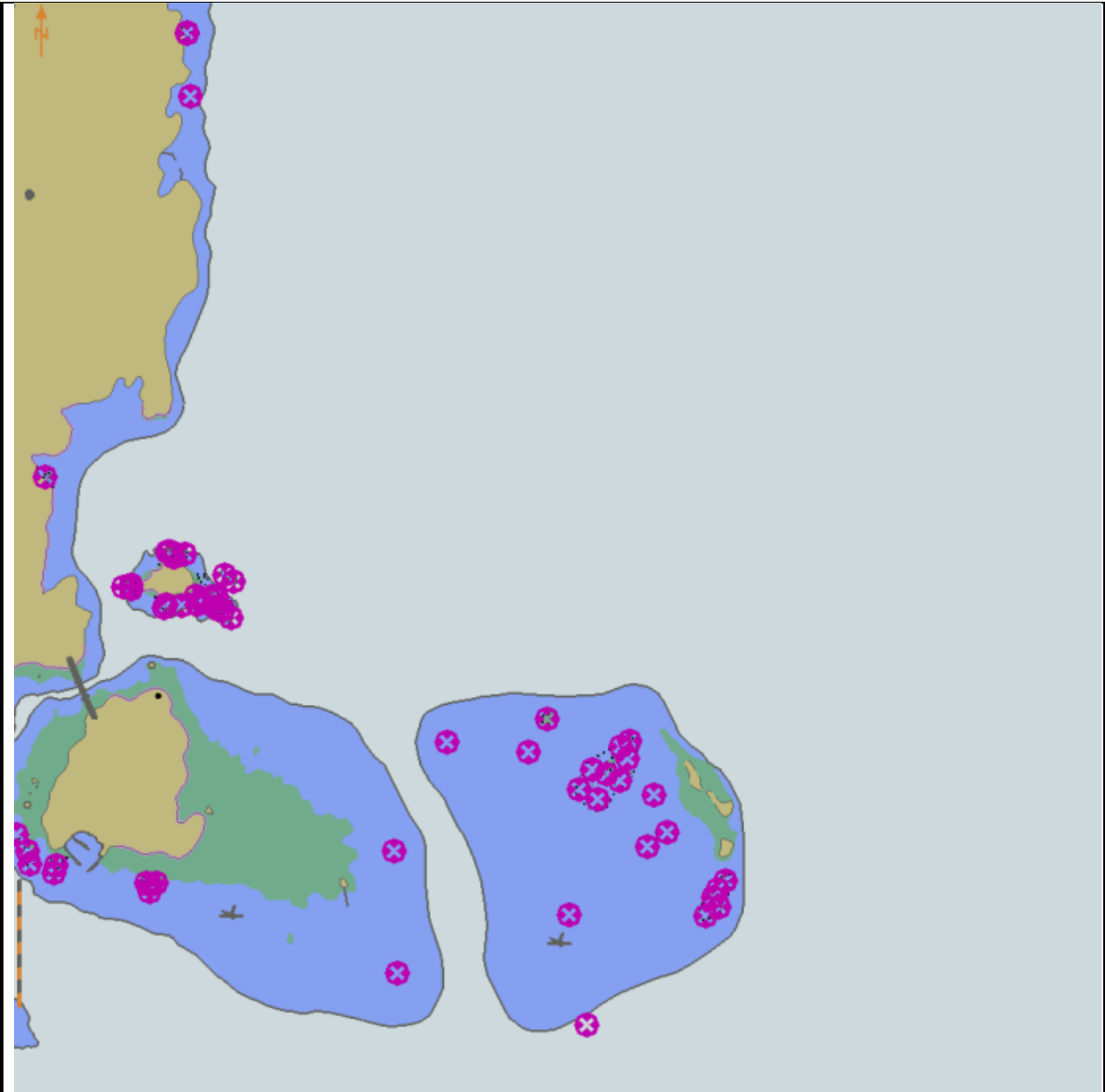
The Safety Contour must be emphasised and the isolated dangers within the unsafe water enclosed by the ship's Safety Contour must be displayed as shown in the image below.

**Action**

Select Safety contour value to 10 m.

Results

The Safety Contour must be emphasised and the isolated dangers within the unsafe water enclosed by the ship's Safety Contour must be displayed as shown in the image below.



Test Description

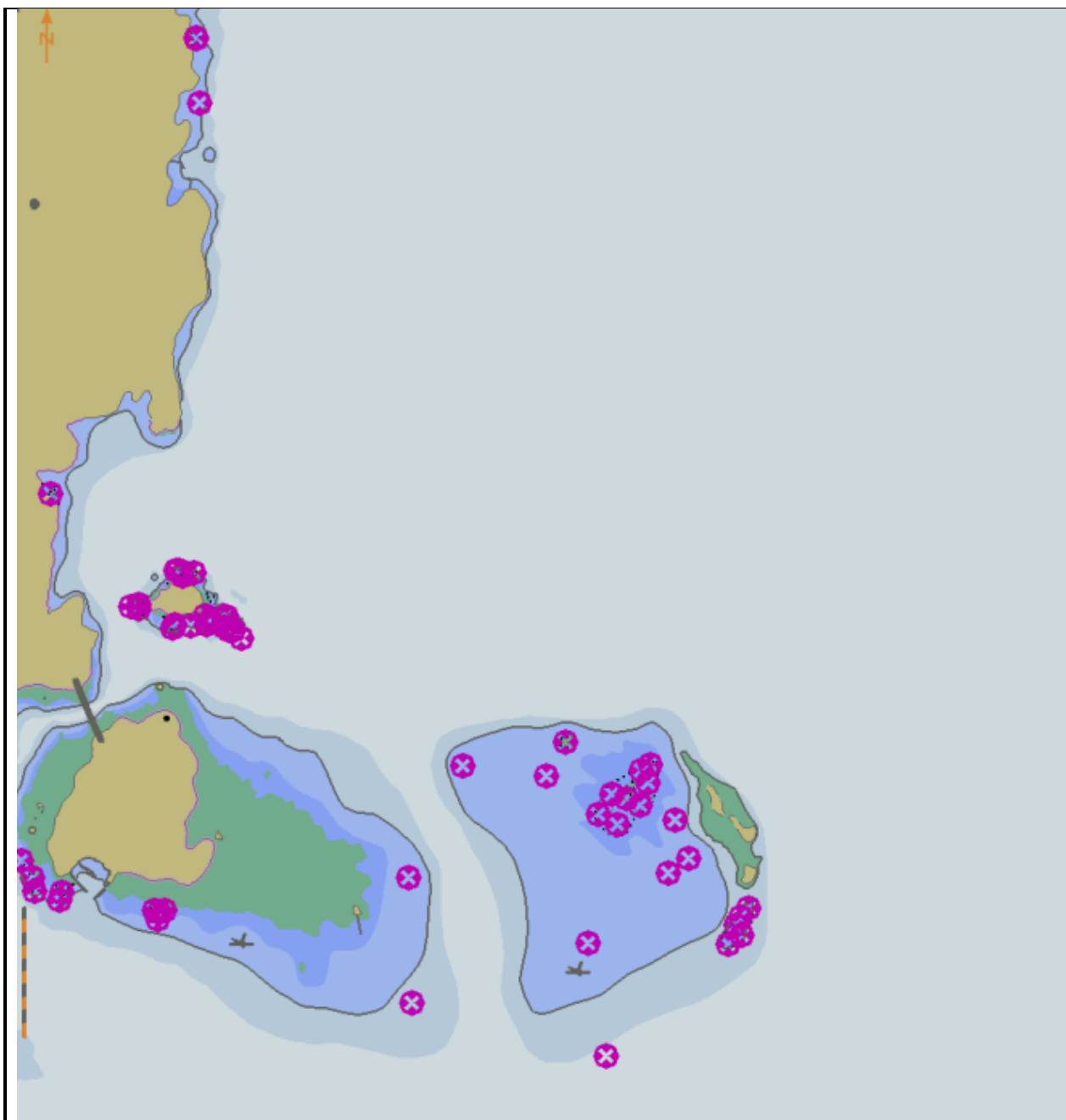
This test ensures the EUT display the Safety Contour and isolated dangers within the safe water enclosed by the ship's Safety Contour using four shades for depth areas.

Action

Select Safety contour value to 5 m.

Results

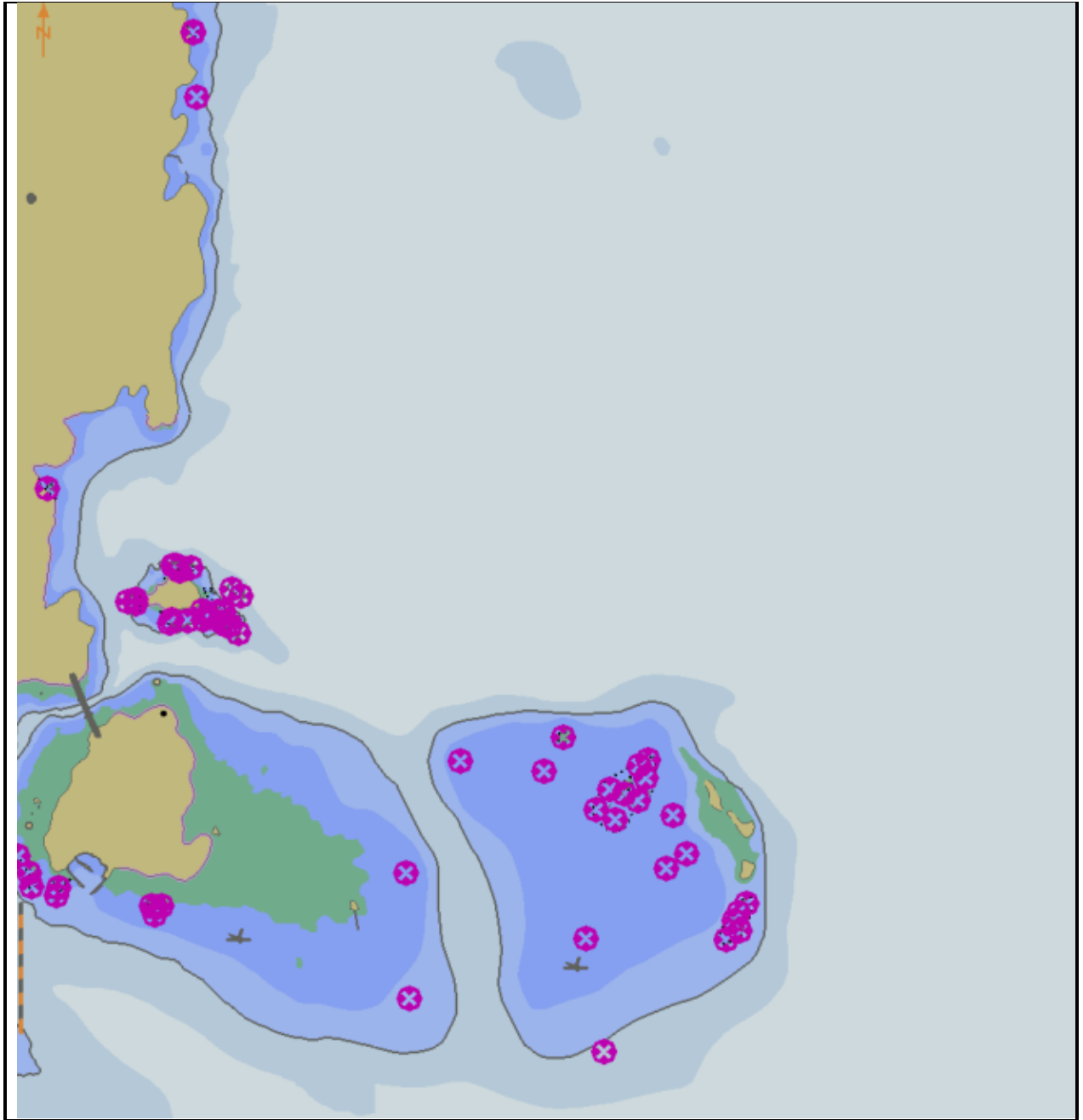
The Safety Contour must be emphasised and the isolated dangers within the unsafe water enclosed by the ship's Safety Contour must be displayed as shown in the image below.

**Action**

Select Safety contour value to 10 m.

Results


The Safety Contour must be emphasised and the isolated dangers within the unsafe water enclosed by the ship's Safety Contour must be displayed as shown in the image below.



3.7 Display of User Selected Safety contour.

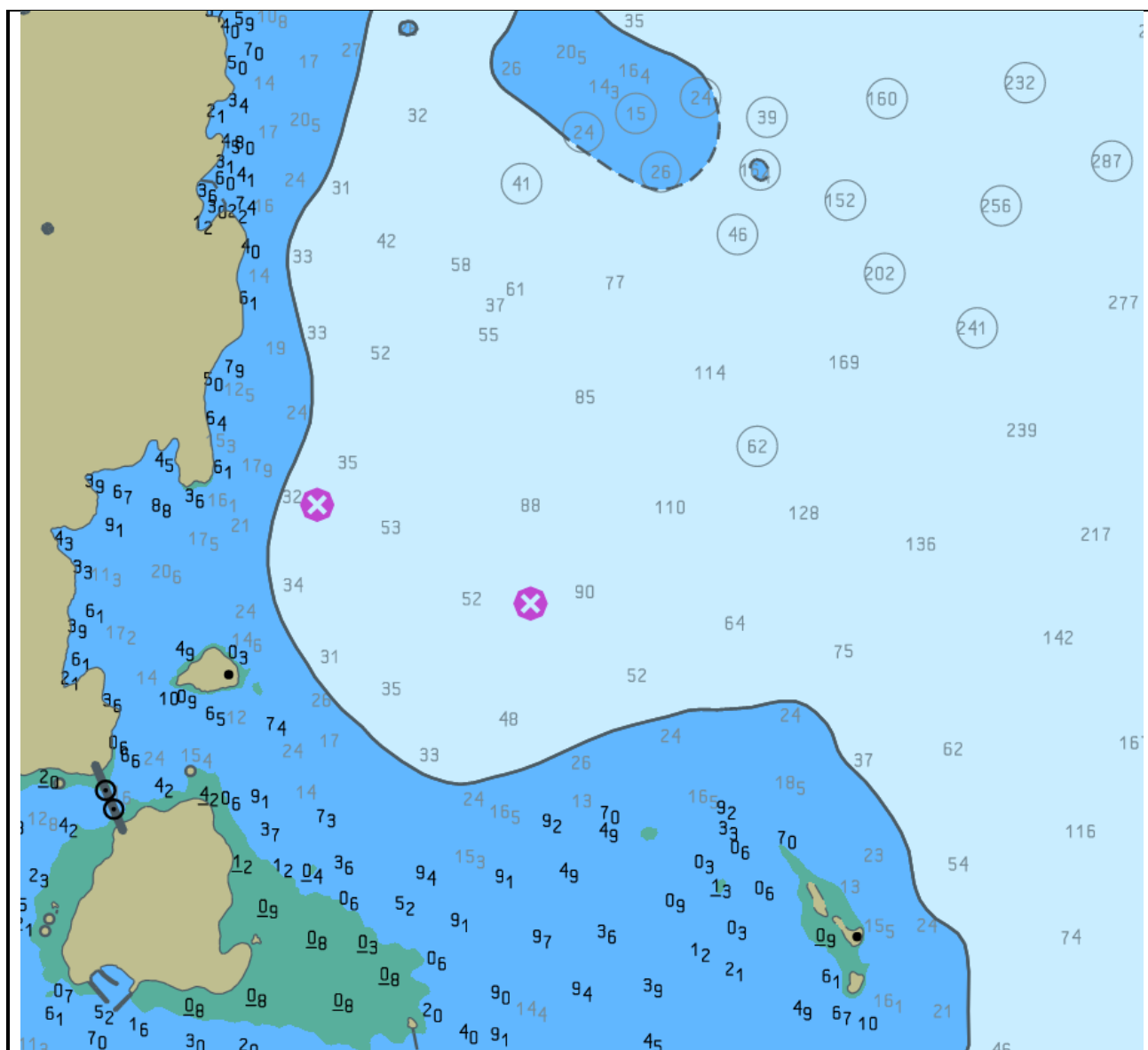
3.7.1 Setting User Selected Safety contour.

Test Reference	UserSelectedSafetyContour	IHO Reference	S-98 Appendix D-1
Test Description			
This test ensures the user is able to set a user selected safety contour in areas of S-102 and S-104 coverage.			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			

Chart (Standard)			
Alert Highlights (Standard)			
Additional			
Setup			
Load the exchange set PowerUp with the following settings:			
<ul style="list-style-type: none"> - Set User selected safety contour = 11.4m - Set Water Level Adjustment = false 			
Action			
1. Set ship's position to XX YY, Viewing Scale NN,000			
Results			
<p>The ENC depth area is substituted for the S-102 values and a safety contour drawn delimiting the area deeper than 11.3m</p> <p>Verify</p> <ol style="list-style-type: none"> 1. User is able to set a user defined safety contour 2. Verify portrayal of DepthArea, DredgedArea and DepthContours in area of S-102 coverage. 			
			
TBD			

3.7.2 Safety depth

Test Reference		SafetyDepth		IHO Reference		
Test Description						
This test ensures EUT supports the display of default safety contour.						
Exchange Set Name						
InitialPowerUp						
Display Mode			Independent Mariner's Selections			
Other			Accuracy		Off	
Context Parameters			Contour label		Off	
Safety contour		N/A	Highlight date dependent		Off	
Safety depth		N/A	Highlight document		Off	
Deep Contour		N/A	Highlight info		Off	
Shallow contour		N/A	Shallow pattern		Off	
Four shades		Off	Unknown		Off	
Radar overlay		Off	Update review		Off	
Plain boundaries		Off	Text Groups			
Simplified symbols		Off	Chart Text		Off	
Full light lines		Off	Important text		Off	
Ignore scale minimum		On	Other Text			
Shallow water dangers		Off	Names		Off	
Palette			Light description		Off	
Day			All other chart text		Off	
Viewing Date or Range			Display			
Start viewing date		N/A	Centre		32°28.00'S 61°00.00'E	
End viewing date		N/A	Scale		1:60 000	
Viewing Groups						
Standard Display			Other			
Drying lines		Off	Spot soundings		On	
Buoys. Beacons, aids to navigation			Submarine cables and pipelines		Off	
Buoys, beacons, structures		Off	All isolated dangers		Off	
Lights		Off	Magnetic variation		Off	
Boundaries and limits		Off	Depth contours		Off	
Prohibited and restricted areas		Off	Seabed		Off	
Chart scale boundaries		Off	Tidal		Off	
Cautionary notes		Off	Miscellaneous (Other)		Off	
Ships' routeing systems and ferry routes		Off				
Archipelagic sea lanes		Off				
Miscellaneous (Standard)		Off				
Chart (Standard)		Off				
Alert Highlights (Standard)		Off				
Setup						
As per SafetyContourDisplay test.						
Action						
Display dataset 10100AA_X0000.000 at indicated scale and centred position.						
Results						
The features shown with depth values shallower than 10 m must be emphasised.						

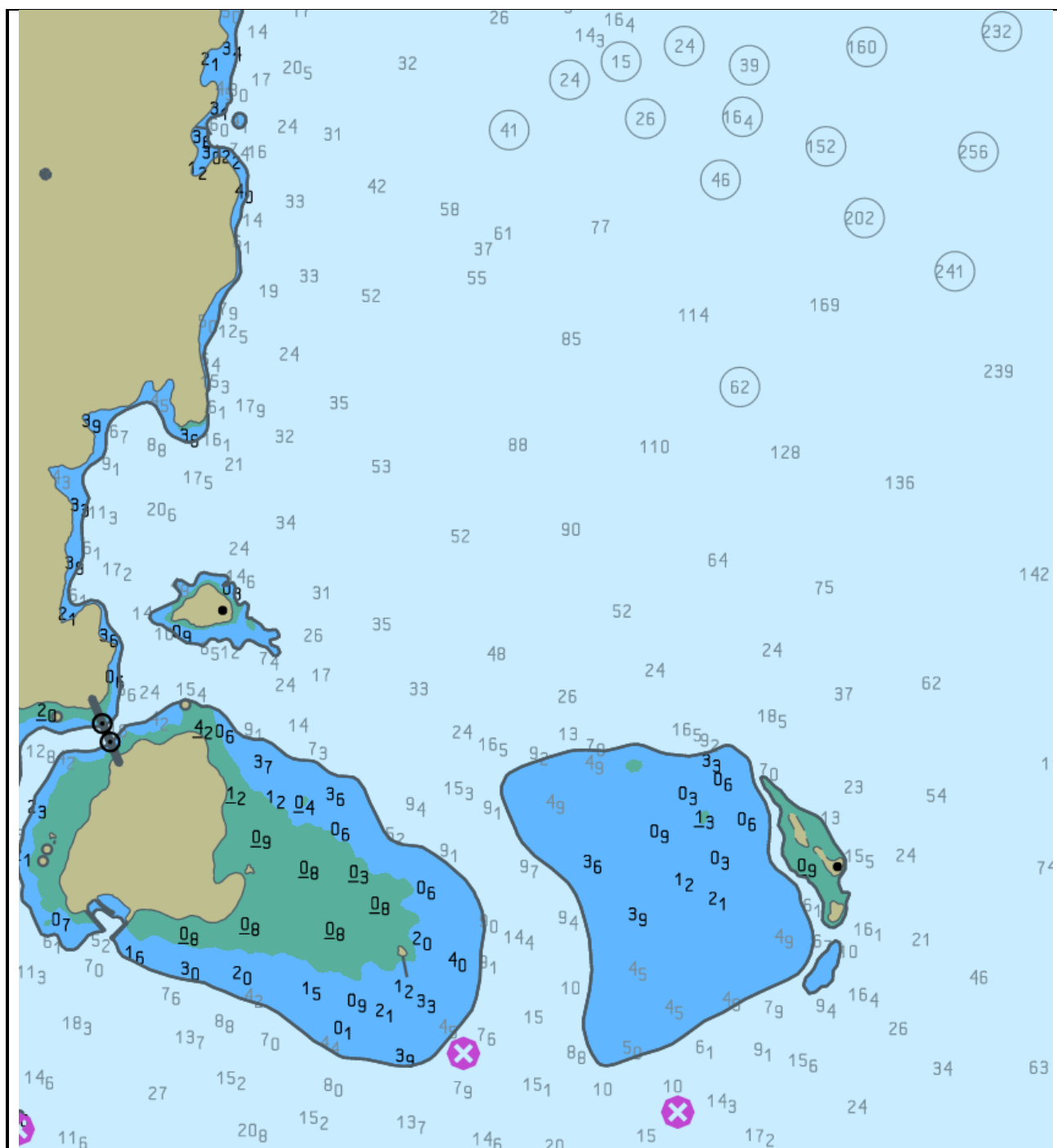


Action

Set the Safety depth value to 4 m (Safety contour 5 m).

Results

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

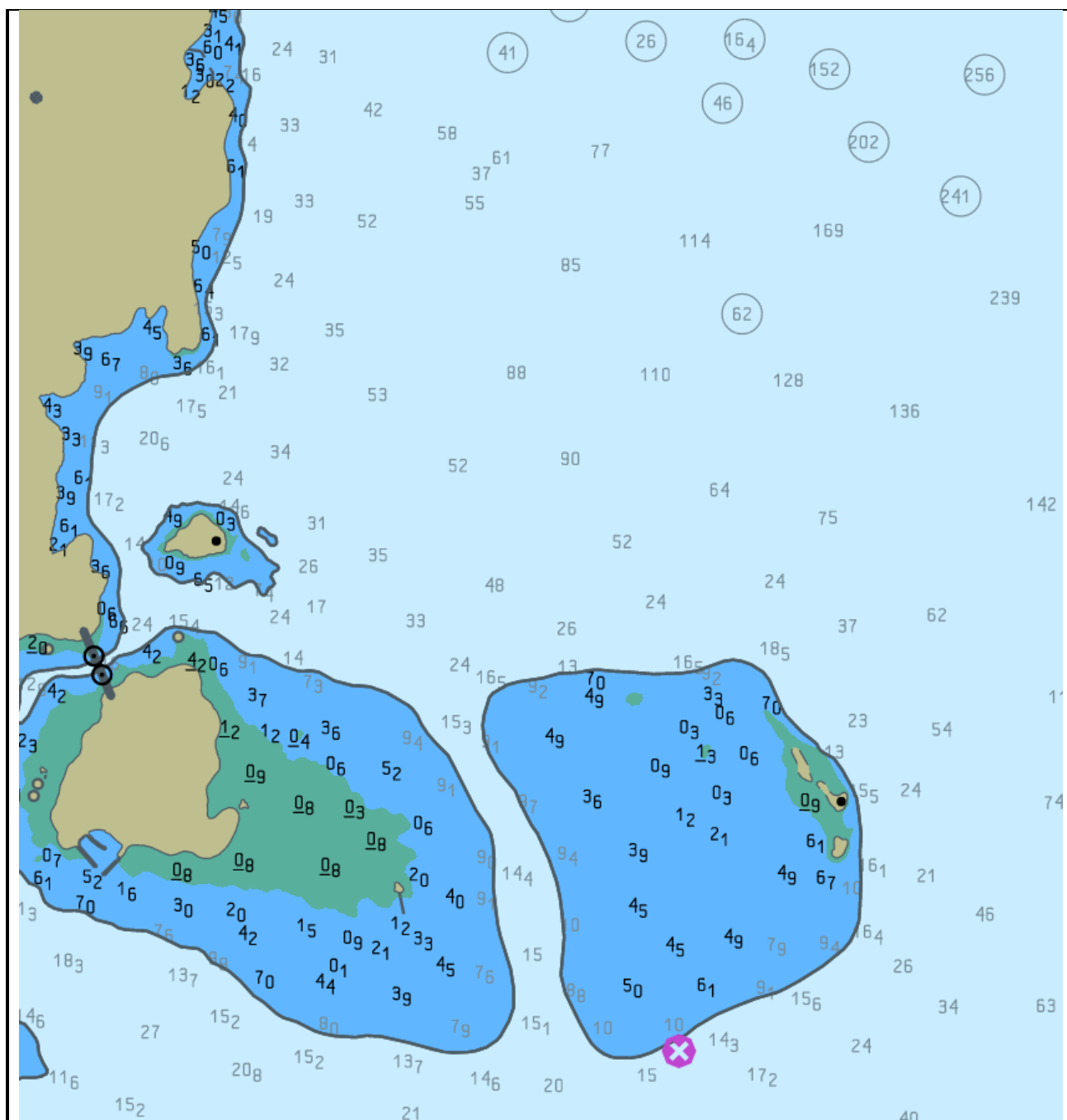


Action

Set the Safety depth value to 7 m (Safety contour 10 m).

Results

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

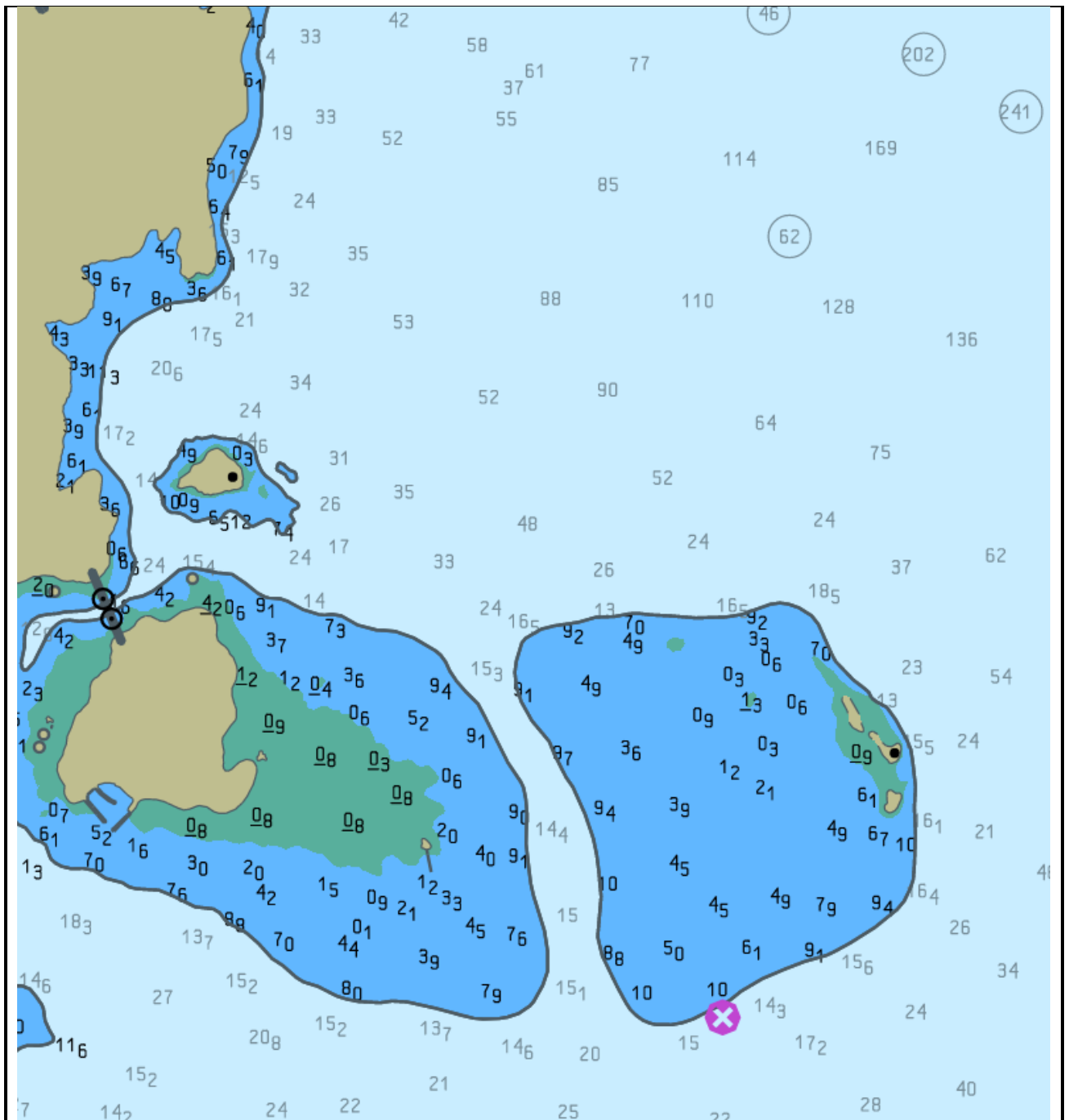


Action

Set the Safety depth value to 12 m (Safety contour 10 m).

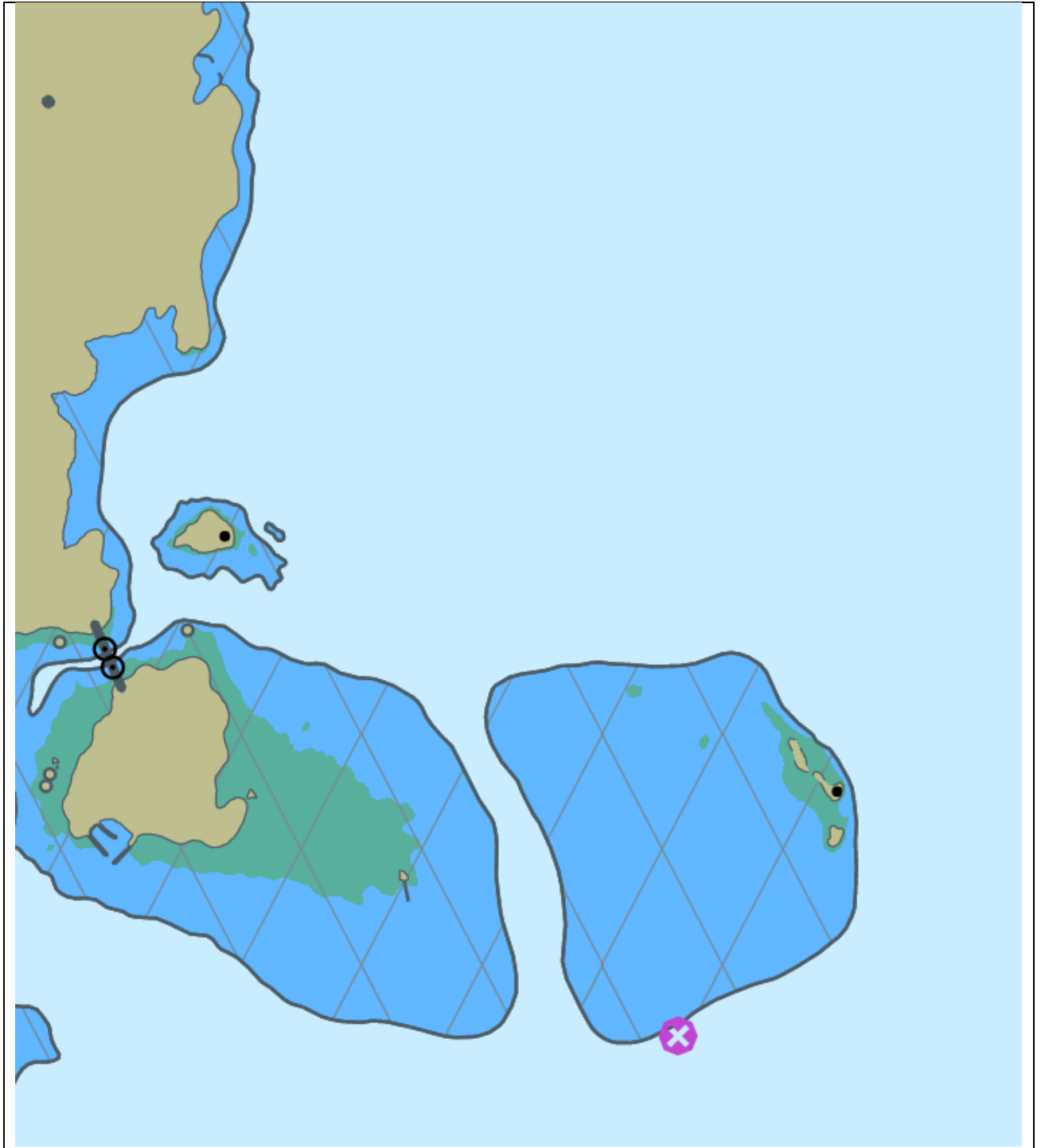
Results

The spot soundings shallower than 12 m must be emphasised.



3.7.3 Shallow pattern

Test Reference	ShallowPattern	IHO Reference	S-101 Portrayal
Test Description			
<i>This test ensures EUT supports the display of default safety contour.</i>			
Exchange Set Name			
Display Mode		Independent Mariner's Selections	
Other		Accuracy	Off
Context Parameters		Contour label	Off
Safety contour	N/A	Highlight date dependent	Off
Safety depth	N/A	Highlight document	Off
Deep Contour	N/A	Highlight info	Off
Shallow contour	N/A	Shallow pattern	Off
Four shades	Off	Unknown	Off
Radar overlay	Off	Update review	Off
Plain boundaries	Off	Text Groups	
Simplified symbols	Off	Chart Text	Off
Full light lines	Off	Important text	Off
Ignore scale minimum	On	Other Text	
Shallow water dangers	Off	Names	Off
Palette		Light description	Off
Day		All other chart text	Off
Viewing Date or Range		Display	
Start viewing date	N/A	Centre	32°28.00'S 61°00.00'E
End viewing date	N/A	Scale	1:60 000
Viewing Groups			
Standard Display		Other	
Drying lines	Off	Spot soundings	Off
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	Off
Buoys, beacons, structures	Off	All isolated dangers	Off
Lights	Off	Magnetic variation	Off
Boundaries and limits	Off	Depth contours	Off
Prohibited and restricted areas	Off	Seabed	Off
Chart scale boundaries	Off	Tidal	Off
Cautionary notes	Off	Miscellaneous (Other)	Off
Ships' routing systems and ferry routes	Off		
Archipelagic sea lanes	Off		
Miscellaneous (Standard)	Off		
Chart (Standard)	Off		
Alert Highlights (Standard)	Off		
Setup			
<i>Load the exchange set PowerUp with the above settings:</i>			
Action			
<i>Display dataset 10100AA_X0000.000 at maximum display scale (1:52 000), select Display Category Display Base</i>			
Results			
<i>Confirm that the diamond shallow pattern is displayed as follows:</i>			



3.7.4 Contour labels

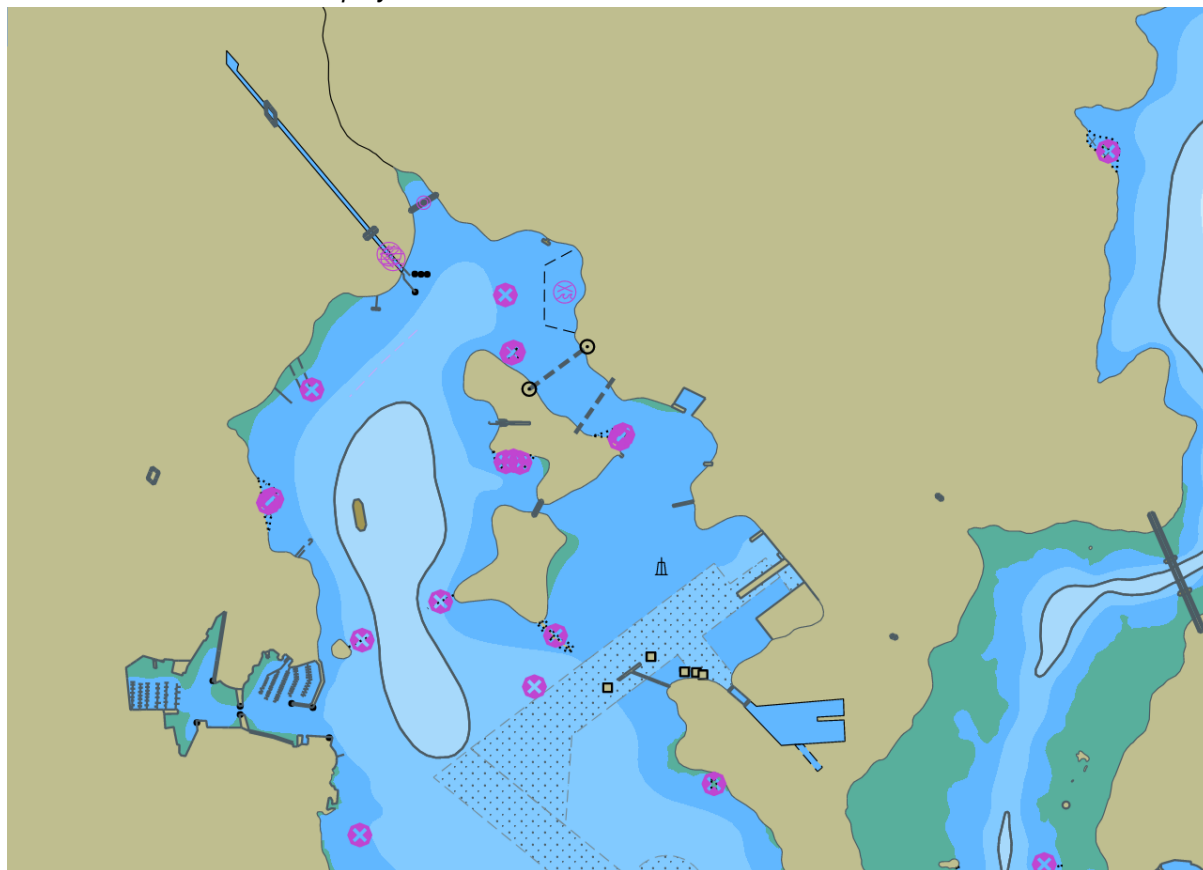
Test Reference	ContourLabels	IHO Reference	S-101 Portrayal
Test Description			
Contour labels are an optional Mariners' selection. This test shall be performed, if the contour label option is provided.			
Exchange Set Name			
Display Mode		Independent Mariner's Selections	
Other		Accuracy	Off
Context Parameters		Contour label	Off
Safety contour	N/A	Highlight date dependent	Off
Safety depth	N/A	Highlight document	Off
Deep Contour	N/A	Highlight info	Off
Shallow contour	N/A	Shallow pattern	Off
Four shades	Off	Unknown	Off
Radar overlay	Off	Update review	Off
Plain boundaries	Off	Text Groups	
Simplified symbols	Off	Chart Text	Off
Full light lines	Off	Important text	Off
Ignore scale minimum	Off	Other Text	
Shallow water dangers	Off	Names	Off
Palette		Light description	Off
Day		All other chart text	Off
Viewing Date or Range		Display	
Start viewing date	N/A	Centre	32°28.00'S 61°00.00'E
End viewing date	N/A	Scale	1:60 000
Viewing Groups			
Standard Display		Other	
Drying lines	Off	Spot soundings	Off
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	Off
Buoys, beacons, structures	Off	All isolated dangers	Off
Lights	Off	Magnetic variation	Off
Boundaries and limits	Off	Depth contours	Off
Prohibited and restricted areas	Off	Seabed	Off
Chart scale boundaries	Off	Tidal	Off
Cautionary notes	Off	Miscellaneous (Other)	Off
Ships' routing systems and ferry routes	Off		
Archipelagic sea lanes	Off		
Miscellaneous (Standard)	Off		
Chart (Standard)	Off		
Alert Highlights (Standard)	Off		
Setup			
Load the exchange set PowerUp with the above settings:			
Action			
Display dataset 10100AA_X01NE.000 at maximum display scale (1:25 000)			
Results			
Confirm that the features display as follows :			



3.7.5 Colour Palettes

Test Reference	ColourPalettes1	IHO Reference	S-101 PC
Test Description			
Display of ENC in Day palette			
Setup			
Load all datasets from the exchange set PowerUp with the following settings:			
Exchange Set Name			
DisplayBase			
Display Mode		Independent Mariner's Selections	
Displaybase		Accuracy	Off
Context Parameters		Contour label	Off
Safety contour	10 m	Highlight date dependent	Off
Safety depth	10 m	Highlight document	Off
Deep Contour	20 m	Highlight info	Off
Shallow contour	5 m	Shallow pattern	Off
Four shades	On	Unknown	Off
Radar overlay	Off	Update review	Off
Plain boundaries	Off	Text Groups	
Simplified symbols	Off	Chart Text	Off
Full light lines	Off	Important text	Off
Ignore scale minimum	Off	Other Text	
Shallow water dangers	Off	Names	Off
Palette		Light description	Off
Day		All other chart text	Off
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:52000
Viewing Groups			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			
Setup			
Load all datasets from the exchange set PowerUp with the above settings:			
Action			
Display dataset 10100AA_X01NW.000 at maximum display scale (1:25 000)			
Results			

Confirm that the features display as follows:

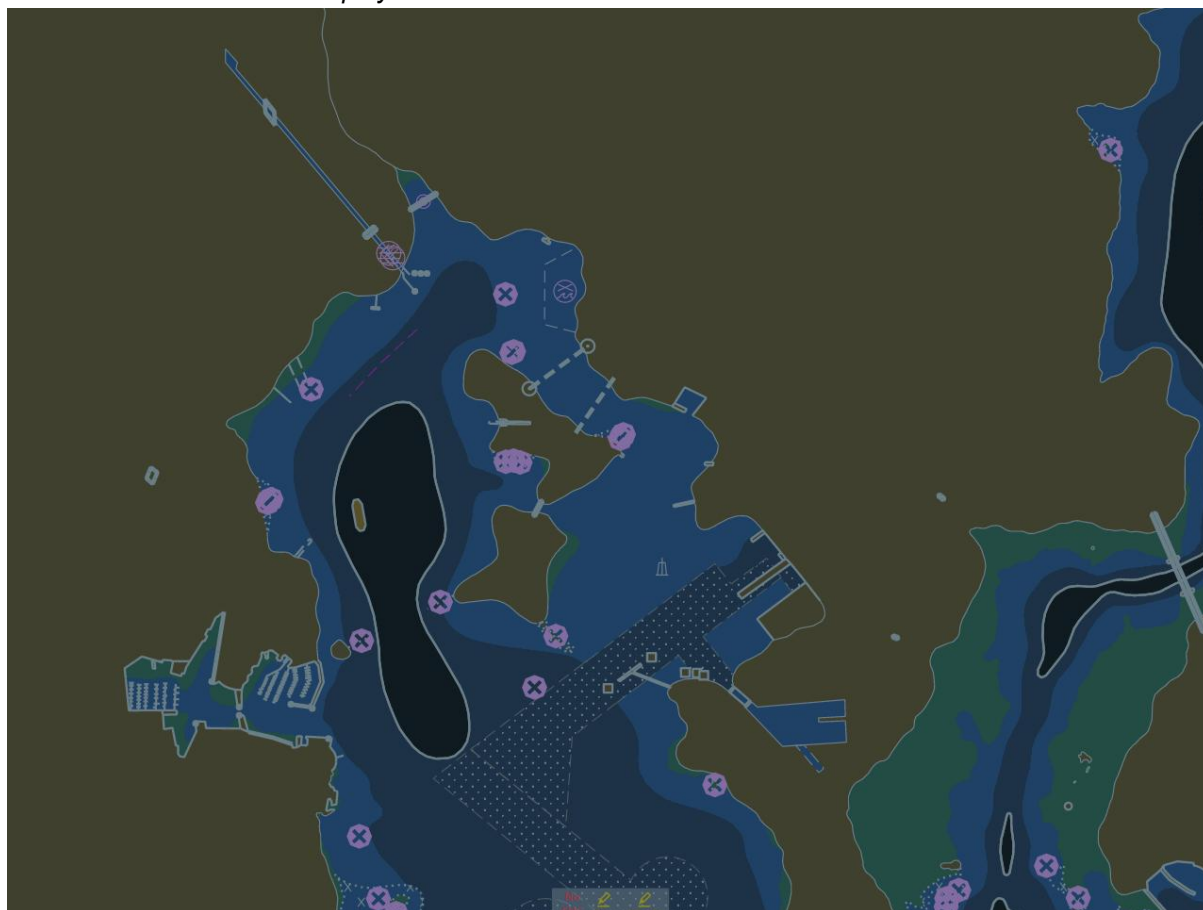



Action

Select Dusk palette.

Results

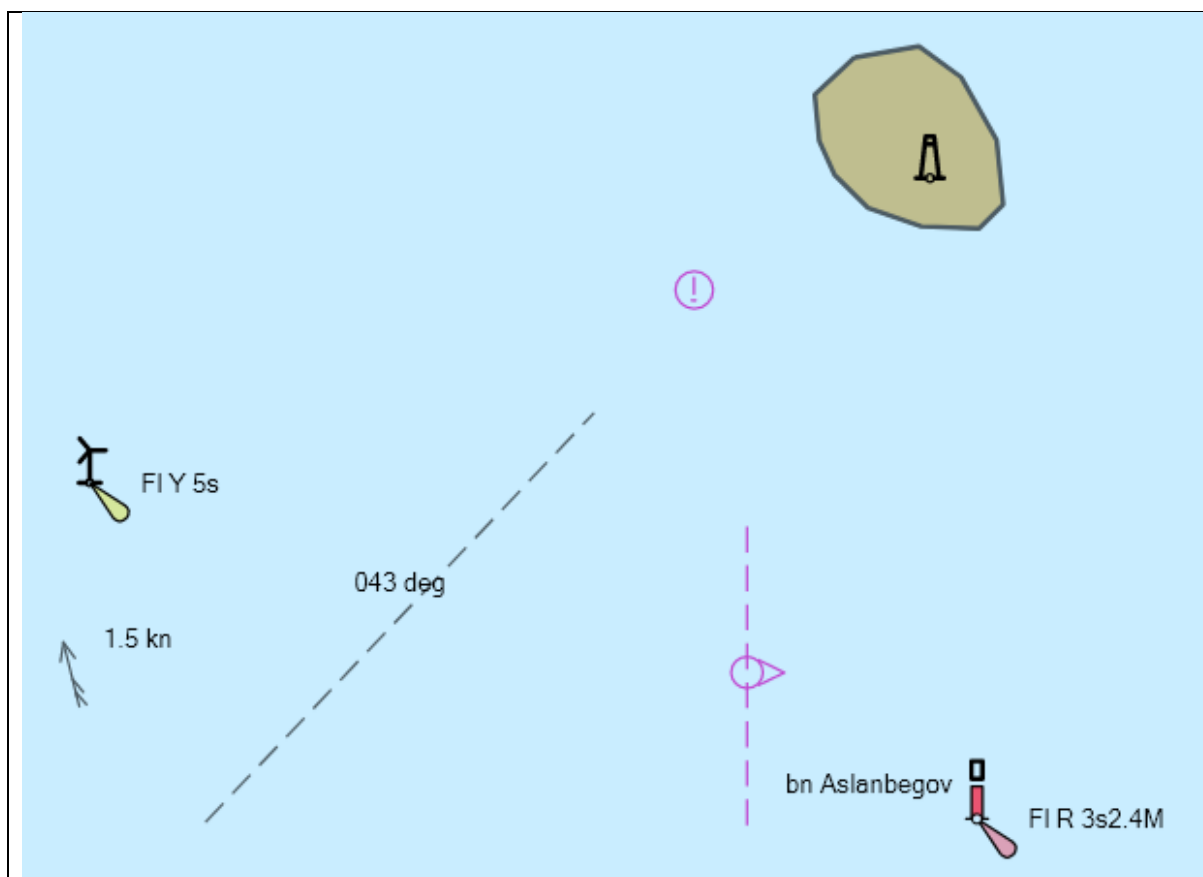
Confirm that the features display as follows:



Action
Select Night palette.
Results
Confirm that the features display as follows


3.7.6 Display of Additional Chart Information Symbol

Test Reference	AdditionalInformation1	IHO Reference IEC Reference	
Test Description			
Display of additional chart information symbol (Information).			
Setup			
Load the exchange set Settings with the following settings: Ensure that the system date is set to the current date and time.			
Exchange Set Name			
DisplayOther			
Display Mode		Independent Mariner's Selections	
Other		Accuracy	Off
Context Parameters		Contour label	Off
Safety contour	8 m	Highlight date dependent	Off
Safety depth	8 m	Highlight document	Off
Deep Contour	30 m	Highlight info	Off
Shallow contour	2 m	Shallow pattern	Off
Four shades	Off	Unknown	Off
Radar overlay	Off	Update review	Off
Plain boundaries	Off	Text Groups	
Simplified symbols	Off	Chart Text	On
Full light lines	Off	Important text	On
Ignore scale minimum	Off	Other Text	
Shallow water dangers	Off	Names	On
Palette		Light description	On
Day		All other chart text	On
Date Dependent Objects		Display	
Start Date		Centre	32°34.00'S 61° 21.70'E
End Date		Scale	1:20 000
Viewing Groups			
Standard Display		Other	
Drying lines	Off	Spot soundings	Off
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	Off
Buoys, beacons, structures	On	All isolated dangers	Off
Lights	On	Magnetic variation	Off
Boundaries and limits	Off	Depth contours	Off
Prohibited and restricted areas	Off	Seabed	Off
Chart scale boundaries	Off	Tidal	Off
Cautionary notes	Off	Miscellaneous (Other)	Off
Ships' routing systems and ferry routes	On		
Archipelagic sea lanes	Off		
Miscellaneous (Standard)	Off		
Chart (Standard)	Off		
Alert Highlights (Standard)	Off		
Setup			
Load the exchange set Settings with the above settings: Ensure that the system date is set to the current date and time.			
Action			
Centre the display on position 32°34.000'S - 61° 21.705'E and then zoom in to a scale of 1:20,000.			
Results			
Confirm that the features display as in the image below:			



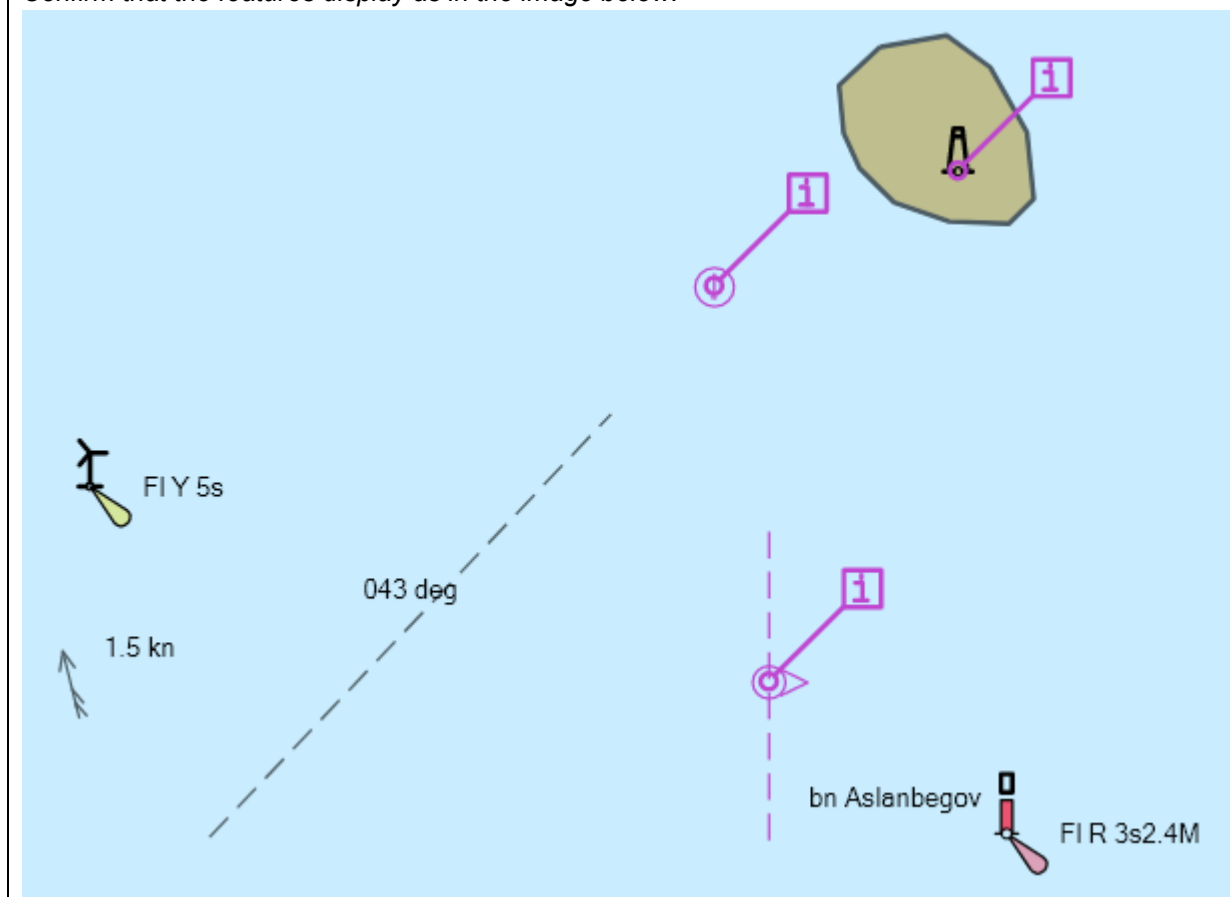
Note: the display should show all of the features above without the chart information symbols.

Action

Turn "Highlight document" selector **On**.

Results

Confirm that the features display as in the image below:



Action
Turn "Highlight info" selector On .
As for test AdditionalInformation1
Confirm that the features display as in the image below:

The image shows a simulated ECDIS display with the following features:

- A brown landmass in the top right corner with a lighthouse icon.
- A purple circle with a white exclamation mark in the center.
- A dashed grey line running diagonally from the bottom left towards the center.
- A purple circle with a white exclamation mark on the dashed line, labeled "043 deg".
- A purple circle with a white exclamation mark to the left of the dashed line, labeled "1.5 kn".
- A black ship icon with a yellow wake to the left of the "1.5 kn" label, labeled "FI Y 5s".
- A vertical dashed purple line to the right of the center, with a purple circle with a white exclamation mark.
- A black ship icon with a red wake at the bottom right, labeled "FI R 3s2.4M".
- A label "bn Aslanbegov" above the bottom right ship icon.

3.7.7 Scale minimum

Test Reference	ScaleMinimum		IHO Reference IEC Reference	S-98 12.9
Test Description				
Disabling Scale Minimum using the Scale min context parameter				
Setup				
Load the exchange set PowerUp with the following settings:				
Exchange Set Name				
DisplayBase				
Display Mode		Independent Mariner's Selections (Default=On)		
Other		Accuracy		
Context Parameters		Contour label		
Safety contour	30m	Highlight date dependent		
Safety depth	30m	Highlight document		
Deep Contour		Highlight info		
Shallow contour		Shallow pattern		
Four shades		Unknown		
Radar overlay		Update review		
Plain boundaries		Text Groups		
Simplified symbols	Off	Chart Text		
Full light lines		Important text		
Ignore scale minimum	Off	Other Text		
Shallow water dangers		Names		
Palette		Light description		
Night		All other chart text		
Date Dependent Objects		Display		
Start Date		Centre		
End Date		Scale	1:52000	
		Orientation		
Viewing Groups				
Standard Display		Other		
Drying lines		Spot soundings	On	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines		
Buoys, beacons, structures		All isolated dangers		
Lights		Magnetic variation		
Boundaries and limits		Depth contours		
Prohibited and restricted areas		Seabed		
Chart scale boundaries		Tidal		
Cautionary notes		Miscellaneous (Other)		
Ships' routing systems and ferry routes				
Archipelagic sea lanes				
Miscellaneous (Standard)				
Chart (Standard)				
Alert Highlights (Standard)				
Additional				
Setup				

Load the exchange set **PowerUp** with the above settings:

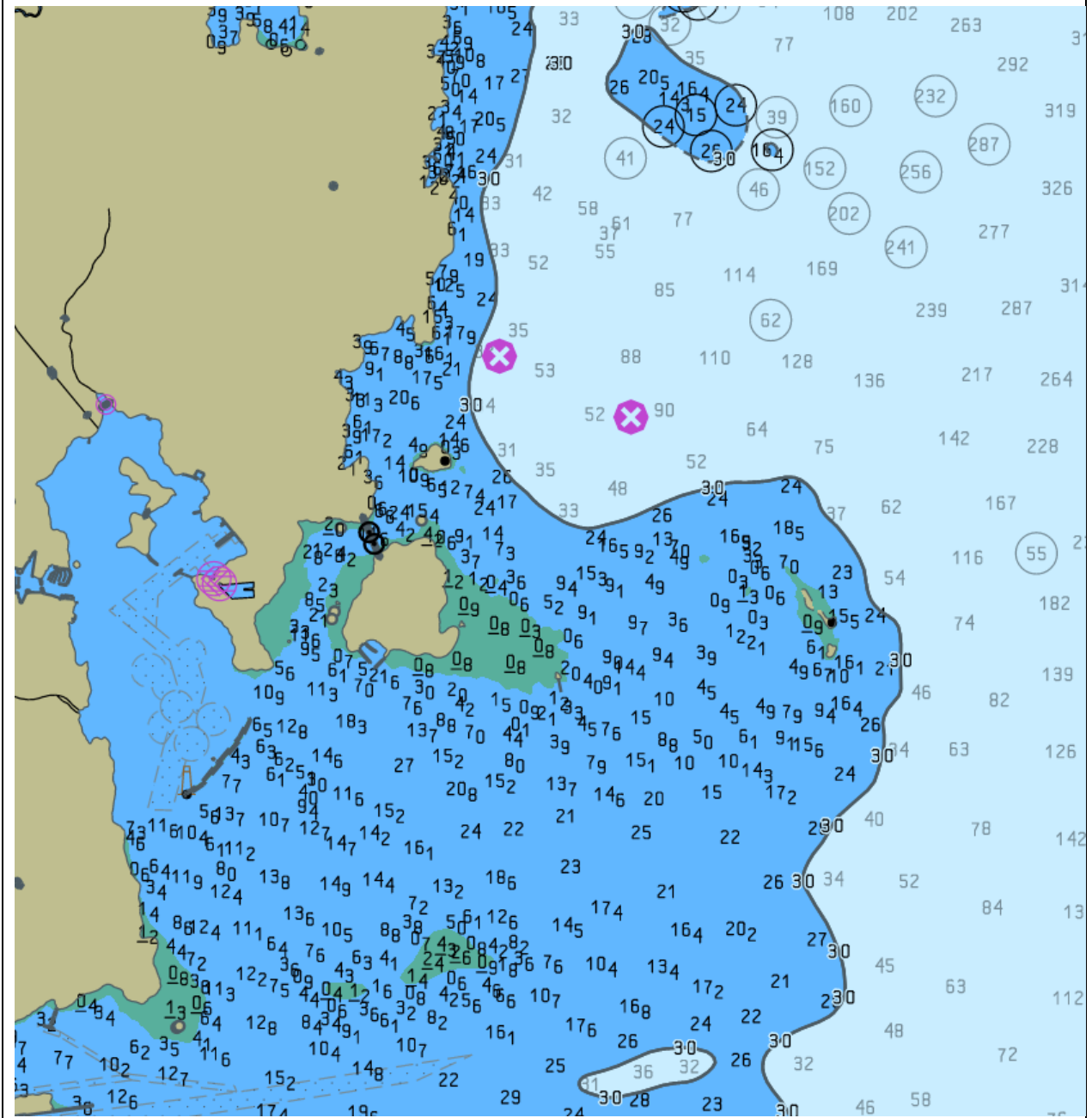
Action

Centre the display on position 32°28.600'S 61° 02.800'E and then zoom in to a scale of 1:100 000.

1. Observe the display

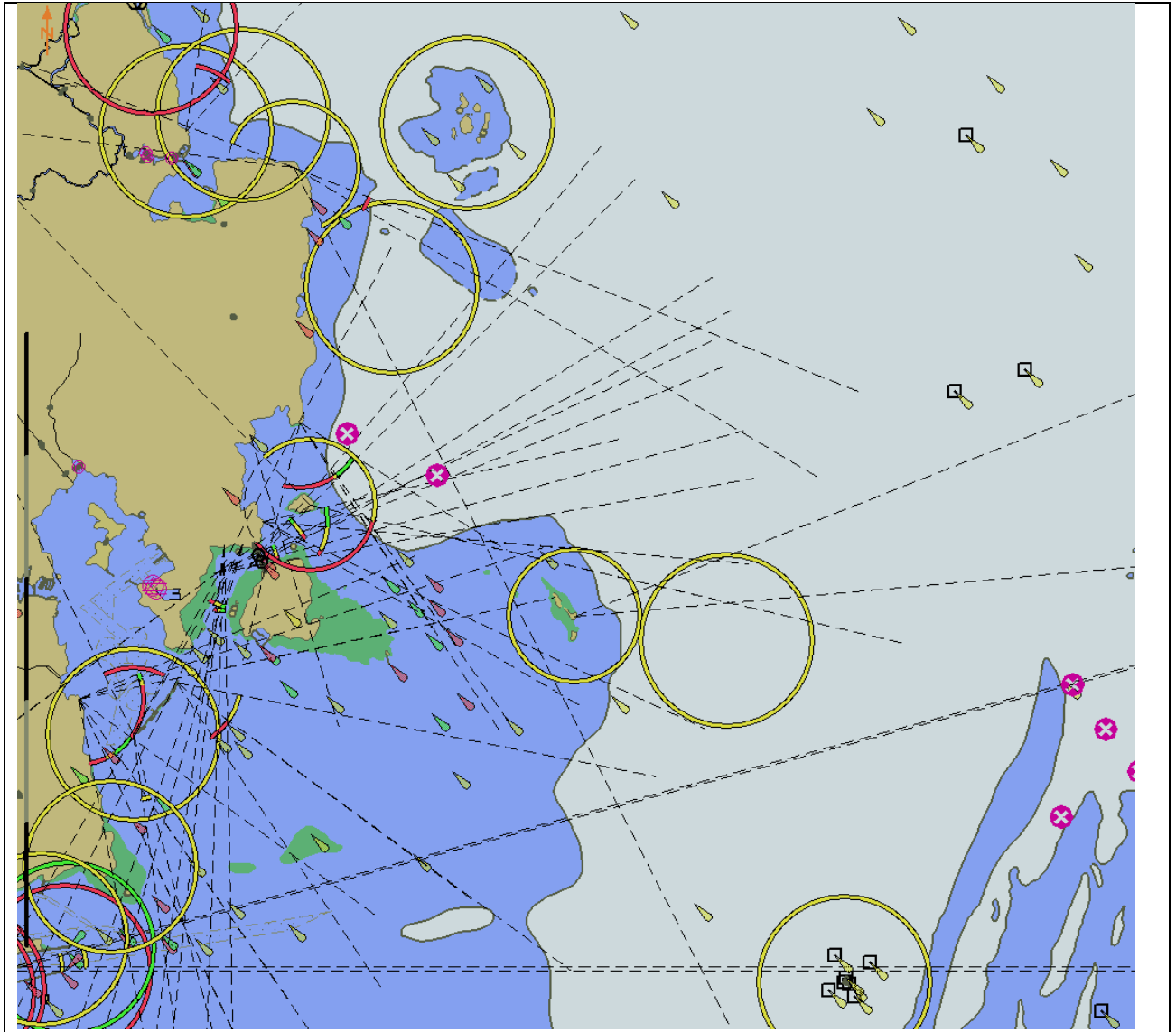
As for test AdditionalInformation1

1. Confirm that the features display as in the image below (scale 1:100 000):




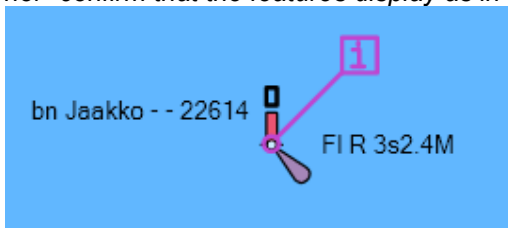
3.7.8 Full light lines

Test Reference	FullLightLines	IHO Reference	
Test Description			
<i>Disabling Full light lines using the Full light lines Mariner's Selection</i>			
Setup			
Load the exchange set PowerUp with the following settings:			
Exchange Set Name			
InitialPowerUp			
Display Mode		Independent Mariner's Selections (Default=On)	
Displaybase		Accuracy	
Context Parameters		Contour label	
Safety contour	30m	Highlight date dependent	
Safety depth	30m	Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols	Off	Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Night		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:52000
		Orientation	
Viewing Groups			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights	On	Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			
Setup			



3.7.9 Display of Text in other languages

Test Reference	OtherLanguages	IHO Reference	S-98 10.3
Test Description			
Selecting the display of text in other languages.			
Setup			
Load the Settings exchange set			
Exchange Set Name			
DisplayOther			
Display Mode		Independent Mariner's Selections (Default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour	8m	Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	On
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	On
Simplified symbols	false	Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Night		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:52000
		Orientation	
Viewing Groups			
Standard Display		Other	
Drying lines		Spot soundings	On
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			

Setup			
Load the Settings exchange set :			
Action			
Centre the display on position 32°34.700'S 61° 22.300'E and then zoom in to a scale of 1:10 000. 1. Observe the display 2. Select language setting "nor"			
Result			
1. Confirm that the feature displays as in the image below:			
			
2. After selecting language "nor" confirm that the features display as in the image below:			
			
Note: This feature has names in multiple languages.			

Test Reference	Language Selections	IHO Reference	S-98 10.3
Test description			
<p>Multiple language preferences are now mandatory in S-100 ECDIS under S-98:</p> <ul style="list-style-type: none"> • New tests for nameUsage values • Set user preference list • Show display. Need to note multiple languages in labels on screen • Change preference ? • Also make sure default edge case is included. This will require multiple features and multiple languages. Also include cases where no nameUsage is given (a default). • Also include information.text and picrep which have language preferences as well. A check of the S-101 FC should be done to ensure all cases are captured. 			

3.7.10 Use of language packs.

Test Reference	LanguagePacks	IHO Reference	S-98 15.1
Test description			
<p><i>This test ensures the ECDIS is capable of displaying text and catalogue entries in multiple languages.</i></p> <p><i>This is likely to be using the S-124 language pack (currently under development)</i></p>			
Setup			
<ul style="list-style-type: none"> - Load exchange set InitialPowerUp - Load exchange set LanguagePacks 			
Action			
<p><i>Centre the display on position 32°34.700'S 61° 22.300'E and then zoom in to a scale of 1:10 000.</i></p> <ol style="list-style-type: none"> 1. <i>Observe the display</i> 2. <i>Select language setting "fra"</i> 			
Results			
<p><i>Verify</i></p> <ol style="list-style-type: none"> 1. Confirm that the pick report contains the following information: [TBD] 2. After selecting language "fra" confirm that the pick report contains the following information: [TBD] 			

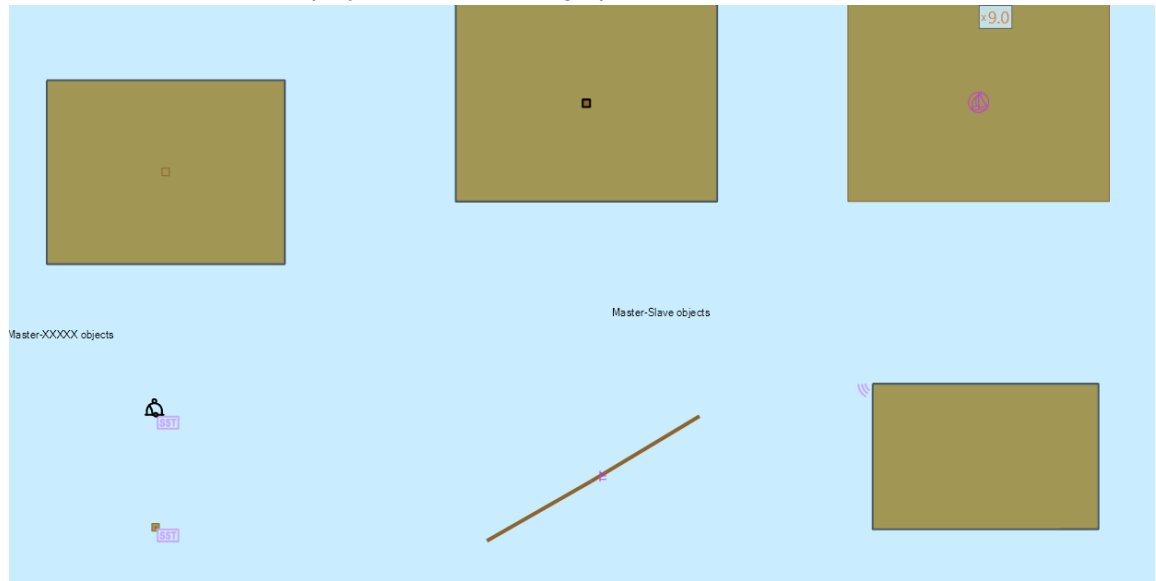
3.8 Display priority

3.8.1 Different priority

Test Reference	DifferentPriority	IHO Reference	S-101PC
Test Description			
<i>Different priority and different geometry</i>			
Exchange Set Name			
DisplayOther			
Display Mode		Independent Mariner's Selections (Default=On)	
Other		Accuracy	Off
Context Parameters		Contour label	Off
Safety contour	30 m	Highlight date dependent	Off
Safety depth	N/A	Highlight document	Off
Deep Contour	N/A	Highlight info	Off
Shallow contour	N/A	Shallow pattern	On
Four shades	Off	Unknown	Off
Radar overlay	Off	Update review	Off
Plain boundaries	Off	Text Groups	
Simplified symbols	Off	Chart Text	On
Full light lines	Off	Important text	On
Ignore scale minimum	Off	Other Text	
Shallow water dangers	Off	Names	On
Palette		Light description	On
Day		All other chart text	On
Date Dependent Objects		Display	
Start Date		Centre	32°20.400'S 61°20.650' E
End Date		Scale	1:5 000
		Orientation	
Viewing Groups			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			

Setup
Action
Import the exchange set DisplayPriorities1 (101AA002J5X0001.000) View the features at indicated scale and position
Result

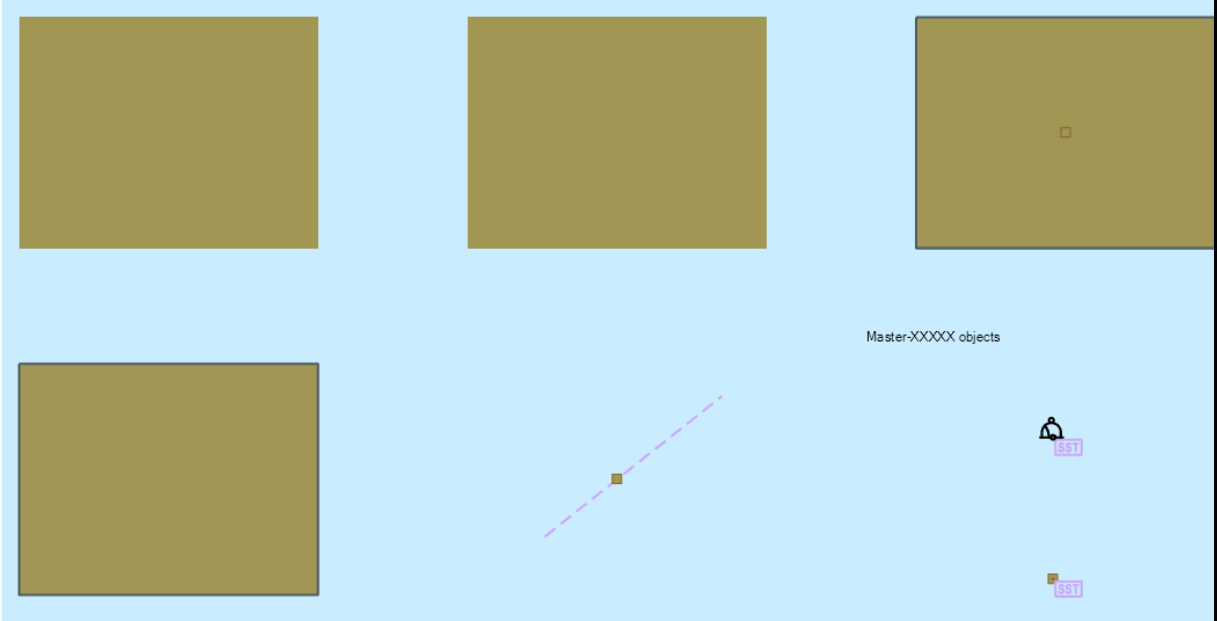
Confirm that items 1-6 display as shown in the graphic below:



3.9 Display Priorities

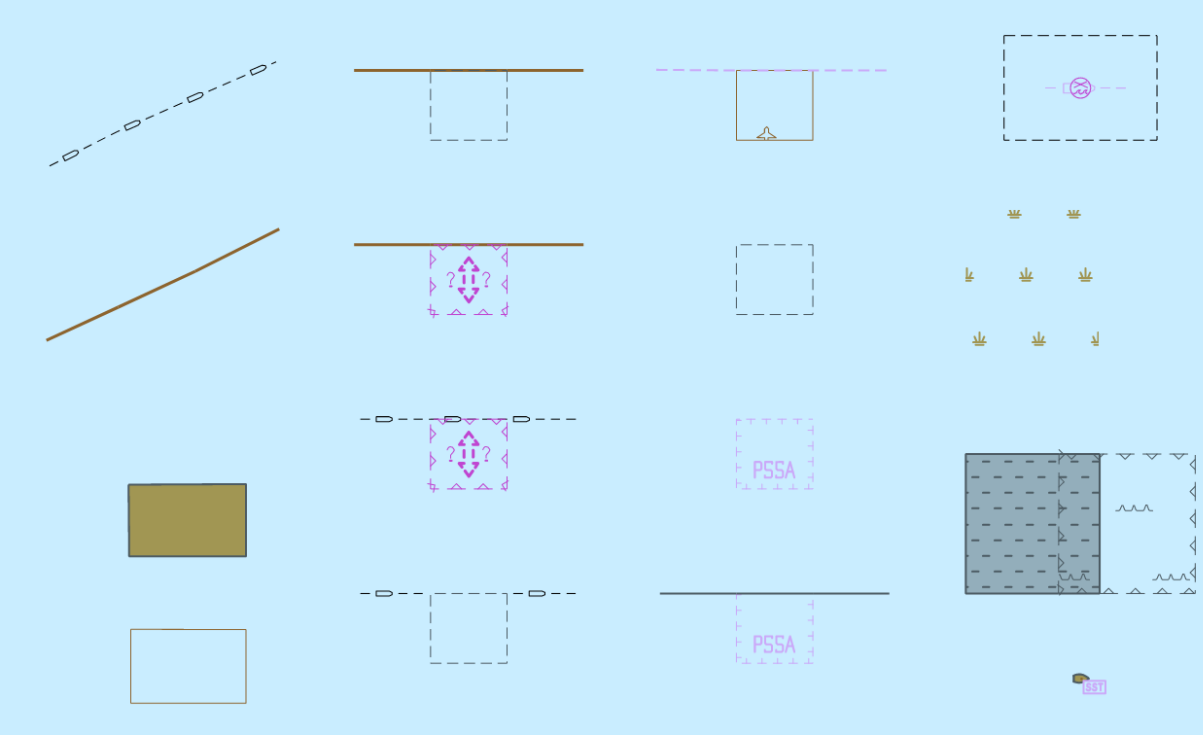
3.9.1 Same priority

Test Reference	SamePriority	IHO Reference	S-101PC
Test Description			
Same priority and different geometry			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			

Alert Highlights (Standard)			
Additional			
Setup			
As for test DifferentPriority ..			
Action			
View the features at position 32°20.400'S 61°21.900' E scale 1:5000			
Results			
Confirm that items 1-6 display as shown in the graphic below			
			

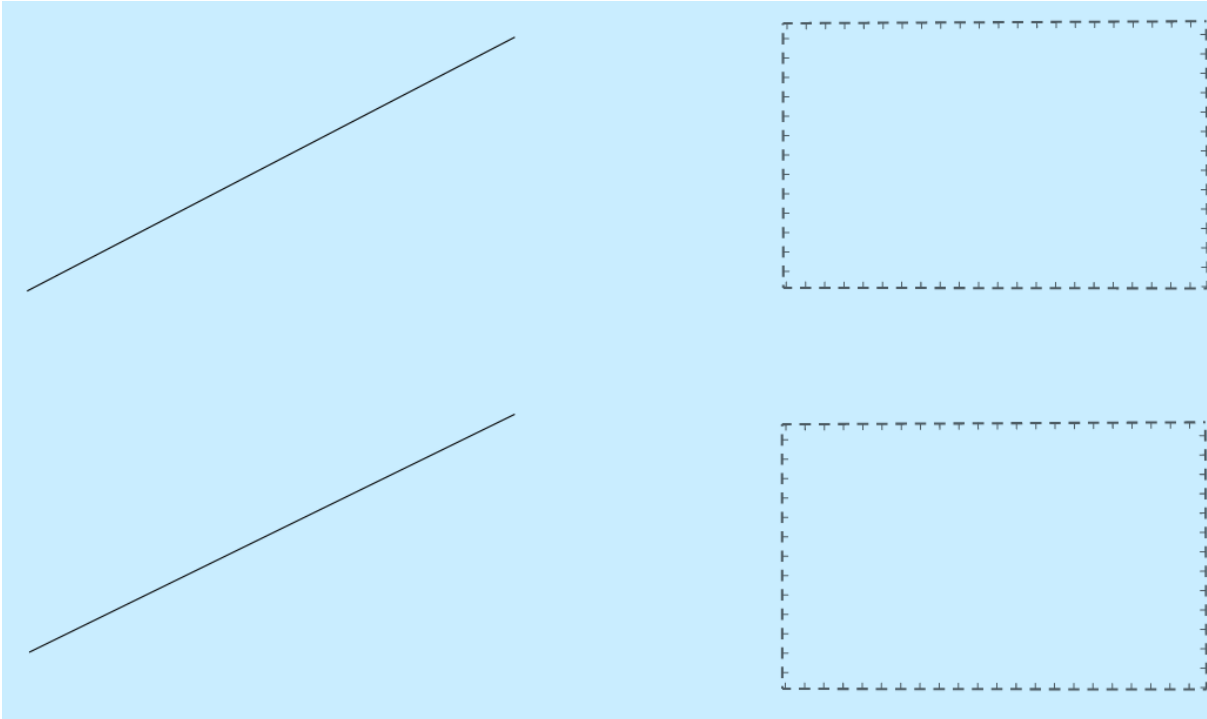
3.9.2 Line Suppression

Test Reference	LineSuppression	IHO Reference	S-101PC
Test Description			
Test for correct Line suppression			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			

Setup
As for test <i>DifferentPriority</i>
Action
View the features at position 32°20.400'S 61°23.150' E scale 1:5 000
Results
<p>Confirm that items 1-16 display as shown in the graphic below</p> 

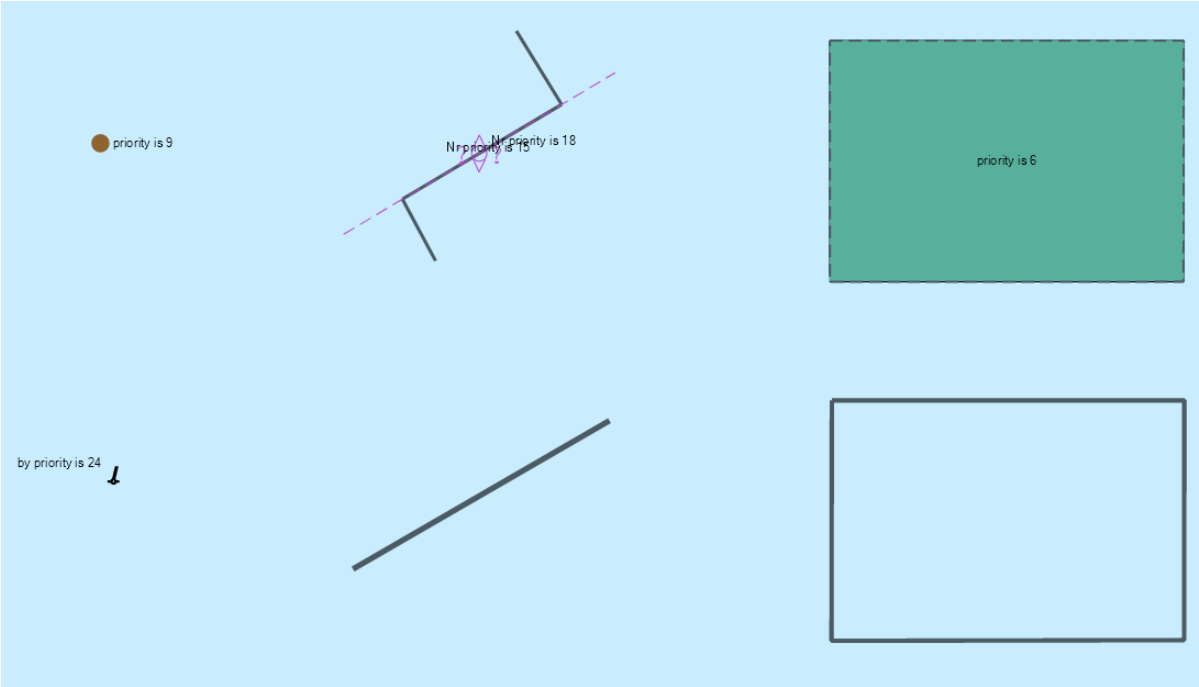
3.9.3 Manual Updates

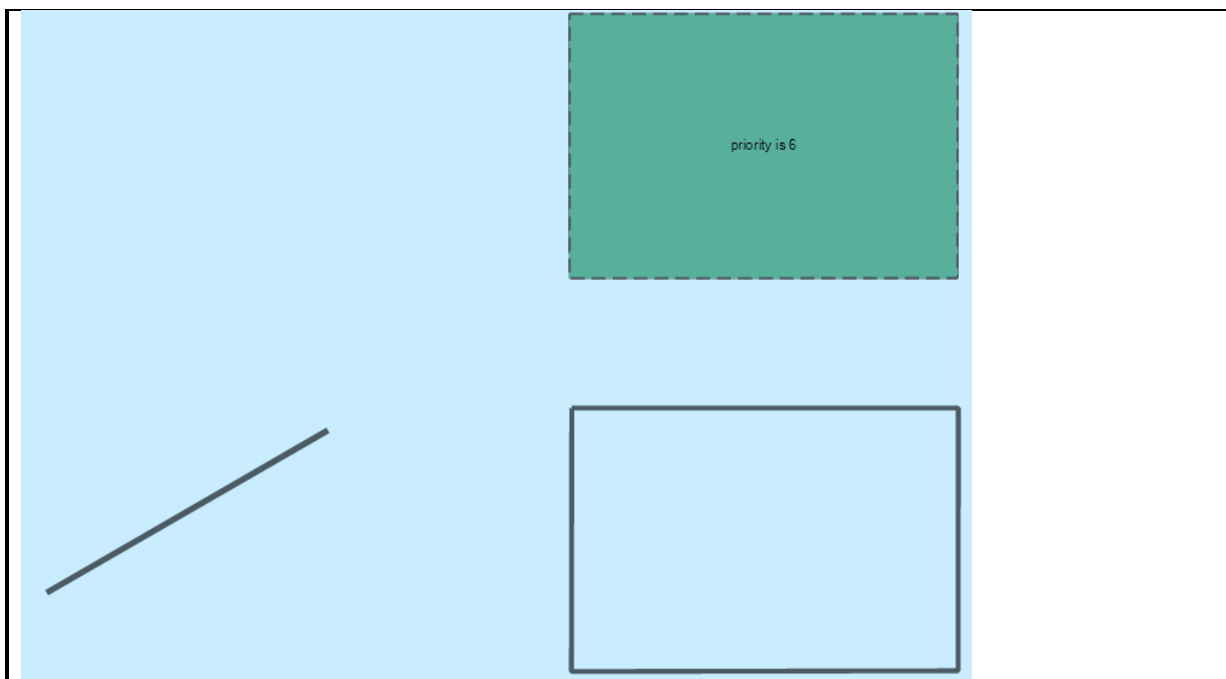
Test Reference	ManualUpdates	IHO Reference	S-98 12.12.1
Test Description			
Manual updates. Test for support for creation and correct alert/indication behaviour. S-98 12.12 and Appendix A			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	On
Full light lines		Important text	On
Ignore scale minimum		Other Text	
Shallow water dangers		Names	On
Palette		Light description	On
Day		All other chart text	On
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			

Setup			
<p>As for test <i>DifferentPriority</i></p> <p>TODO:</p> <ul style="list-style-type: none">- Make manual updates of a selection of primitives and features from the Manual Updates FC- Test portrayal matches displayed screen shots- Construct route across manual update features.- Ensure alerts and indications are preserved for manual updates.			
Action			
<p>View the feature at position <i>32°21.100'S-61°20.650'E</i> scale <i>1:5 000</i></p>			
Results			
<p>Confirm that items 1-4 display as shown in the graphic below</p> <div></div>			

3.9.4 Text Display

Test Reference	TextDisplay1		IHO Reference	
Test Description				
Text display				
Loaded Data				
Exchange Set Name				
Display Mode		Independent Mariner's Selections (default=On)		
Other		Accuracy		
Context Parameters		Contour label		
Safety contour		Highlight date dependent		
Safety depth		Highlight document		
Deep Contour		Highlight info		
Shallow contour		Shallow pattern		
Four shades		Unknown		
Radar overlay		Update review		
Plain boundaries		Text Groups		
Simplified symbols		Chart Text		
Full light lines		Important text		
Ignore scale minimum		Other Text		
Shallow water dangers		Names		
Palette		Light description		
Day		All other chart text		
Date Dependent Objects		Display		
Start Date		Centre		
End Date		Scale	1:60000	
		Orientation		
Viewing Groups (Default = On)				
Standard Display		Other		
Drying lines		Spot soundings		
Buoys. Beacons, aids to navigation		Submarine cables and pipelines		
Buoys, beacons, structures		All isolated dangers		
Lights		Magnetic variation		
Boundaries and limits		Depth contours		
Prohibited and restricted areas		Seabed		
Chart scale boundaries		Tidal		
Cautionary notes		Miscellaneous (Other)		
Ships' routing systems and ferry routes				
Archipelagic sea lanes				
Miscellaneous (Standard)				
Chart (Standard)				
Alert Highlights (Standard)				
Additional				

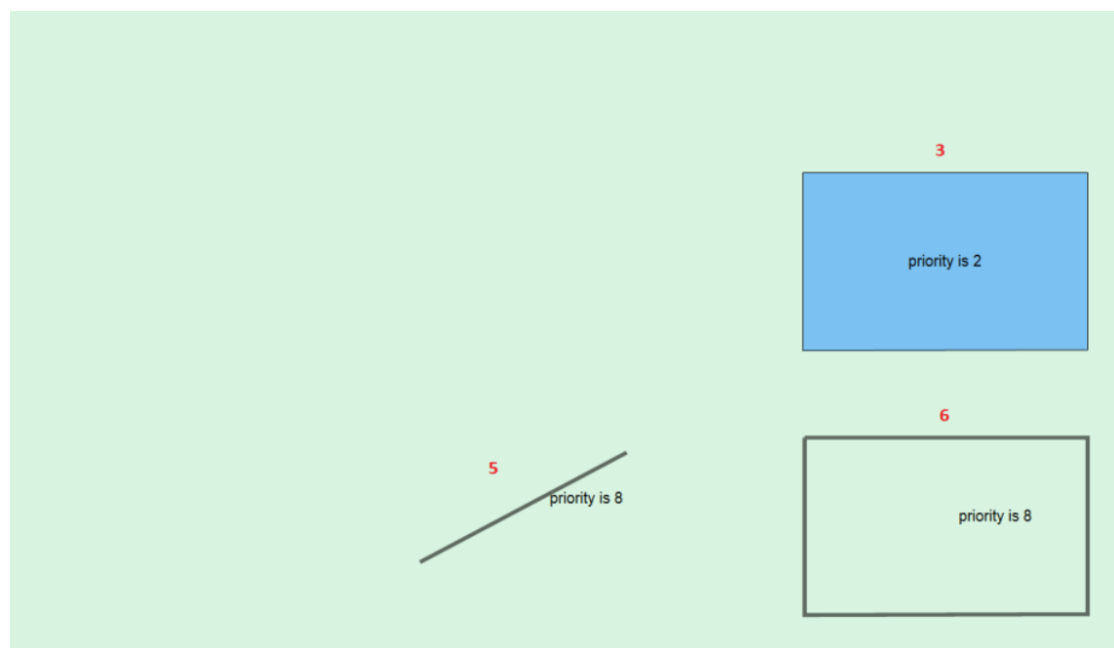
Setup			
As for test DifferentPriority..			
Action			
View the features at position 32°21.100'S 61°21.900'E scale 1:5 000			
Results			
<p>Confirm that items 1 to 6 display as shown in the graphic below:</p> 			
(Alternative 1: Manufacturer may implement display of text only once for a feature which is masked)			
<p>Set Display Category Standard</p> <p>Confirm that items 1 to 6 display as shown in the graphic below</p>			



set Display Category Base Display

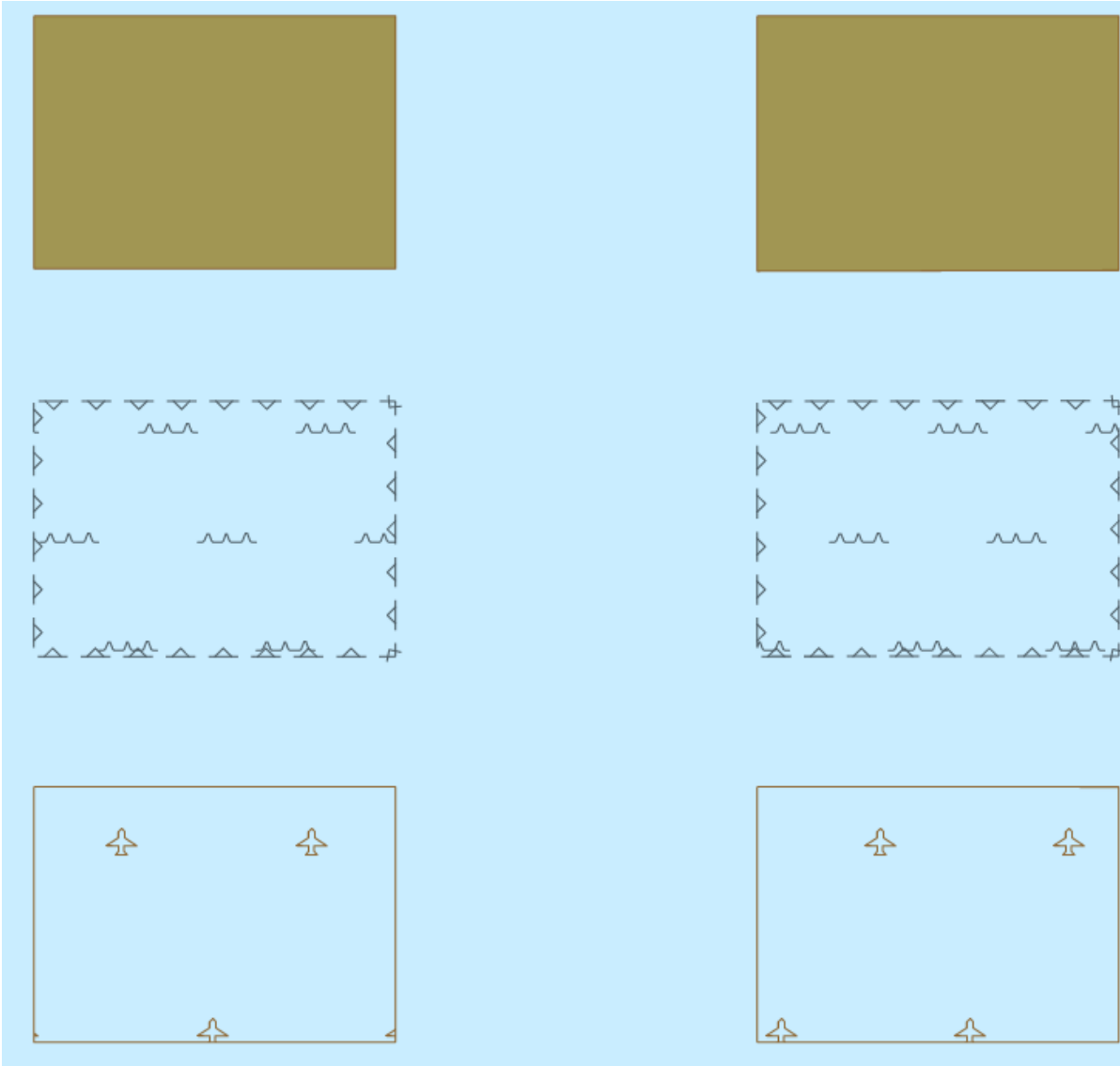
View the features at position 32°21.100'S 61°21.900'E scale 1:5 000

Confirm that items 3,5 and 6 display as shown in the graphic below:



3.9.5 Display of area borders

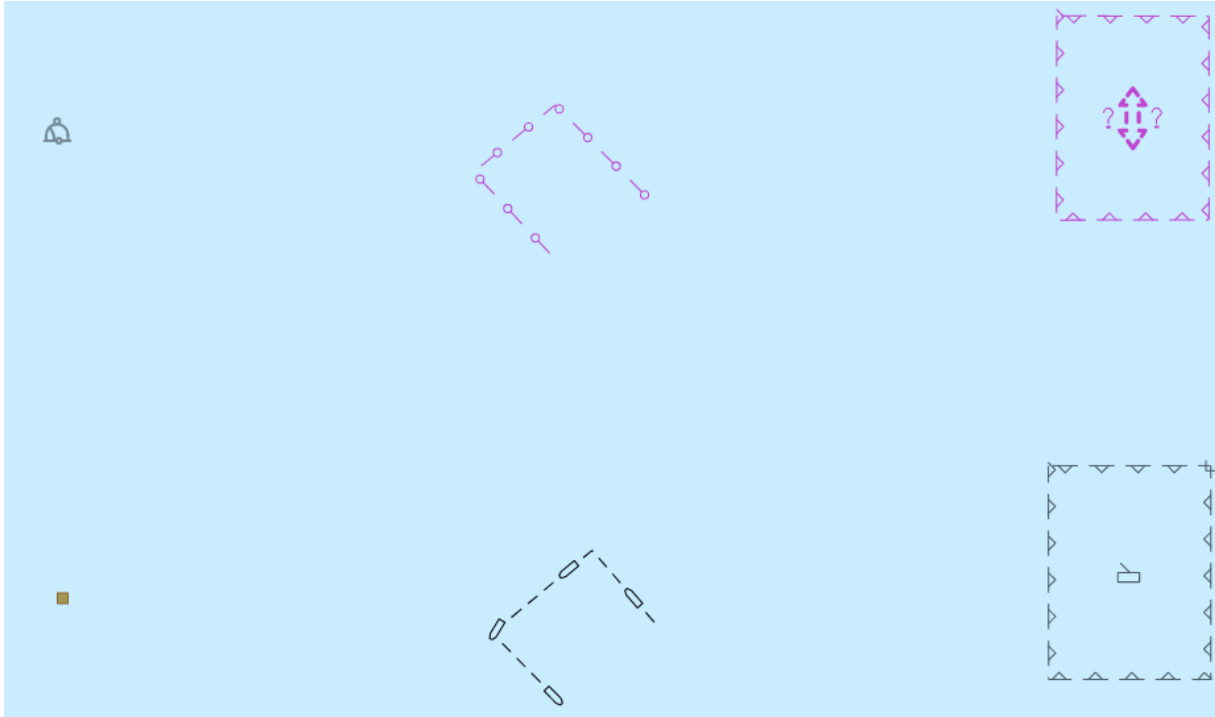
Test Reference	AreaBorders	IHO Reference	S-101PC
Test Description			
Display of area borders			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			

Setup			
As for test TextDisplay1 except Set Display Category Other			
Action			
View the features at position 32°21.100'S 61°23.150'E scale 1:5 000			
Results			
Confirm that items 1-6 display as shown in the graphic below:			
			

I

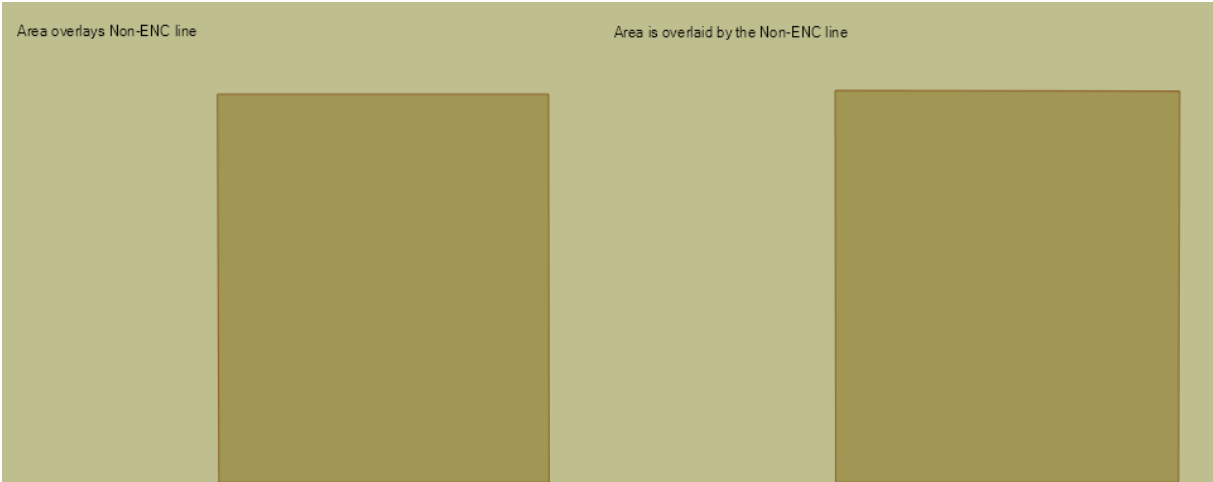
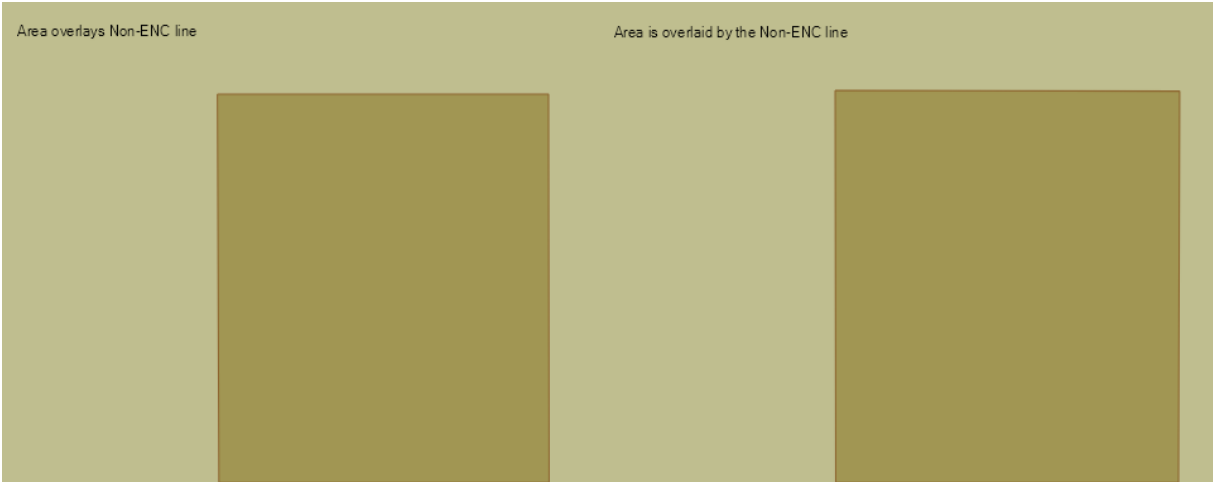
3.9.6 Display of unknown symbols

Test Reference	UnknownSymbols		IHO Reference	S-101PC
Test Description				
<i>Display of unknown symbol</i>				
Loaded Data				
Exchange Set Name				
Display Mode		Independent Mariner's Selections (default=On)		
Other		Accuracy		
Context Parameters		Contour label		
Safety contour		Highlight date dependent		
Safety depth		Highlight document		
Deep Contour		Highlight info		
Shallow contour		Shallow pattern		
Four shades		Unknown		
Radar overlay		Update review		
Plain boundaries		Text Groups		
Simplified symbols		Chart Text		
Full light lines		Important text		
Ignore scale minimum		Other Text		
Shallow water dangers		Names		
Palette		Light description		
Day		All other chart text		
Date Dependent Objects		Display		
Start Date		Centre		
End Date		Scale	1:60000	
		Orientation		
Viewing Groups (Default = On)				
Standard Display		Other		
Drying lines		Spot soundings		
Buoys. Beacons, aids to navigation		Submarine cables and pipelines		
Buoys, beacons, structures		All isolated dangers		
Lights		Magnetic variation		
Boundaries and limits		Depth contours		
Prohibited and restricted areas		Seabed		
Chart scale boundaries		Tidal		
Cautionary notes		Miscellaneous (Other)		
Ships' routing systems and ferry routes				
Archipelagic sea lanes				
Miscellaneous (Standard)				
Chart (Standard)				
Alert Highlights (Standard)				
Additional				

Setup
As for test AreaBorders
Action
View the features at position 32°21.850'S 61°20.650'E scale 1:5000
Results
Confirm that items 1-6 display as shown in the graphic below:


3.9.7 Boundary display for unofficial data

Test Reference	BoundaryDisplay1	IHO Reference	S-98 9.1.1
Test Description			
Unofficial data boundary display.			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			

Setup			
<i>As for test AreaBorders and in addition, load the exchange sets Settings and 1012J005X0002</i>			
Action			
<i>View the features at position 32°22.450'S 61°24.250'E scale 1:2 000</i>			
Results			
<i>Confirm that items 1 and 2 display as shown in the graphic below:</i>			
			
TBD			
Alternative 1: Orange slashes are under left hand side dark brown area			
			
TBD			
Alternative 2: Orange slashes are above left hand side dark brown area			

Test Reference	BoundaryDisplay2	IHO Reference	S-98 12.3.1
Test Description			
Scale boundary display			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries	On	Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			

Setup

As for test AreaBorders and in addition Load dataset **101AA002J4X0001.000**, contained in exchange set **DisplayPriorities**.

Action

View the features at position 32°22.450'S 61°23.800'E scale 1:2 000

Results

Confirm that items 1 and 2 display as shown in the graphic below:



Alternative 1: Line style indicating side of larger scale available (complex line style with thick line at edge and double 1 pixel lines on larger scale available side)

tbd

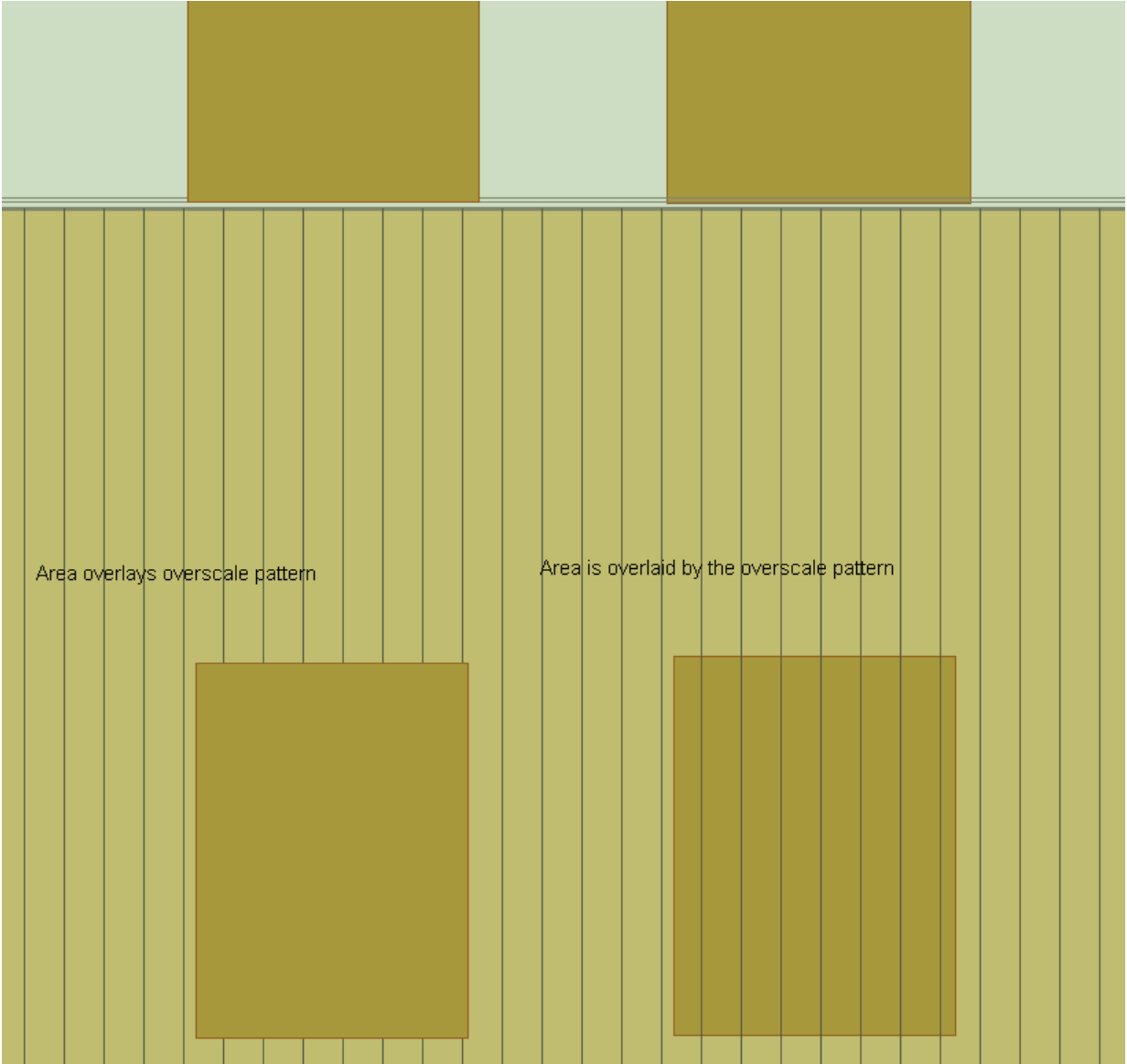


Alternative 2: Line style just indicating scale border (1 pixel line)

TBD

3.9.8 Overscale Pattern

Test Reference	OverscalePattern1	IHO Reference	S-98 12.3.2
Test Description			
<i>Overscale pattern display</i>			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries	On	Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			

Setup
As for test BoundaryDisplay2
Action
View the features at position 32°22.600'S 61°23.800'E scale 1:2 000
Results
<p>Confirm that items 1 and 2 display as shown in the graphic below:</p> 

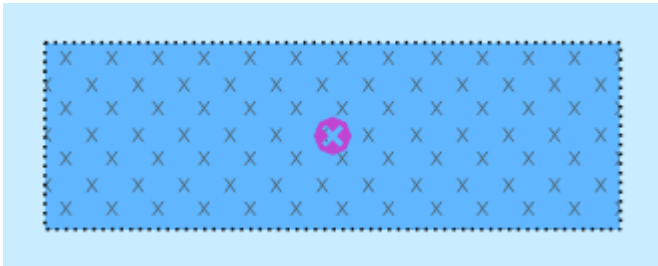
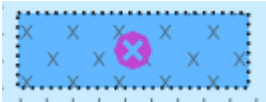
3.9.9 Display of features affected by Complex Portrayal Procedures

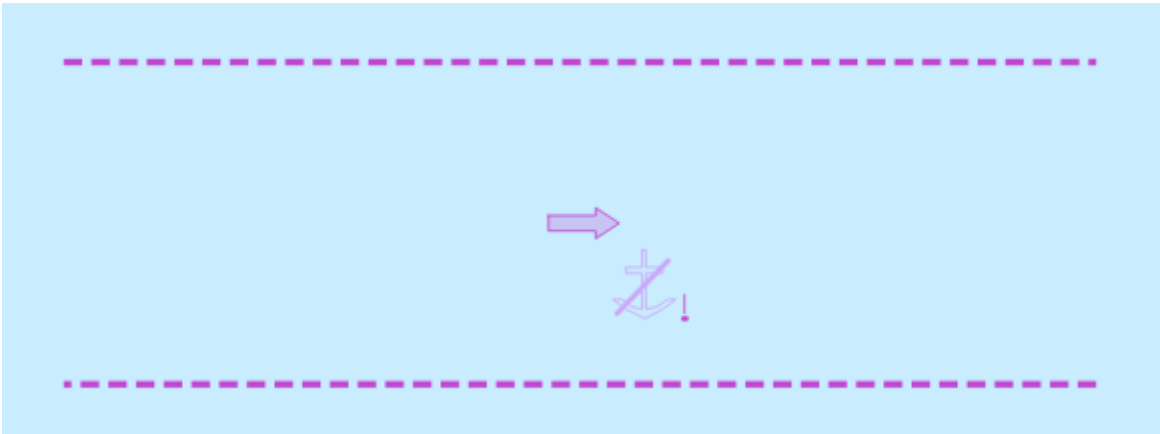

Test Reference	ComplexPortrayal	IHO Reference	S-101PC
Test Description			
Display of features with priority affected by complex portrayal algorithms			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			

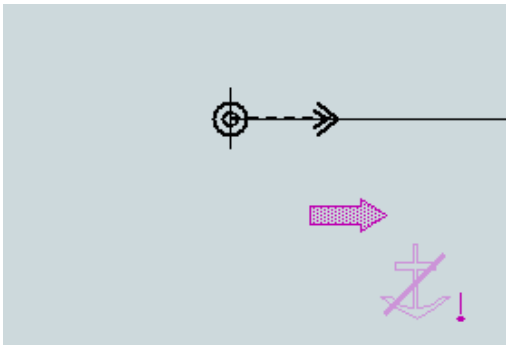
Setup			
As for test <i>DifferentPriority</i>			
Action			
View the features at position 32°21.850'S 61°23.150'E scale 1:5 000			
Results			
Confirm that items 1-12 display as shown in the graphic below:			
<p>Display priority, CSP changes priority</p> <p>Lower Area object overlays higher Area object</p> <p>CS(DEPARE) CS(RESARE) CS(UDWHAZ)</p> <p>Higher Area object overlays Lower Area object</p>			

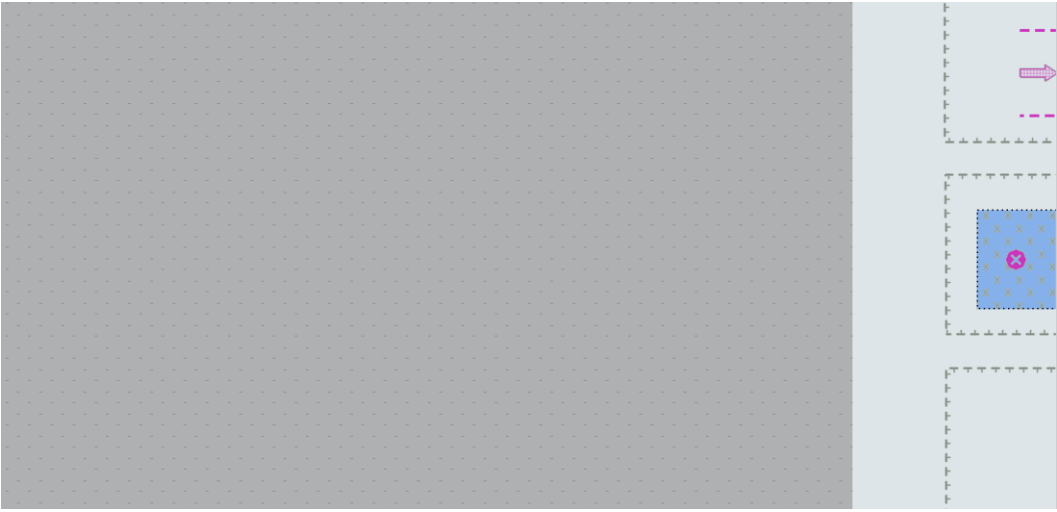
3.9.10 Display of Centred Symbols

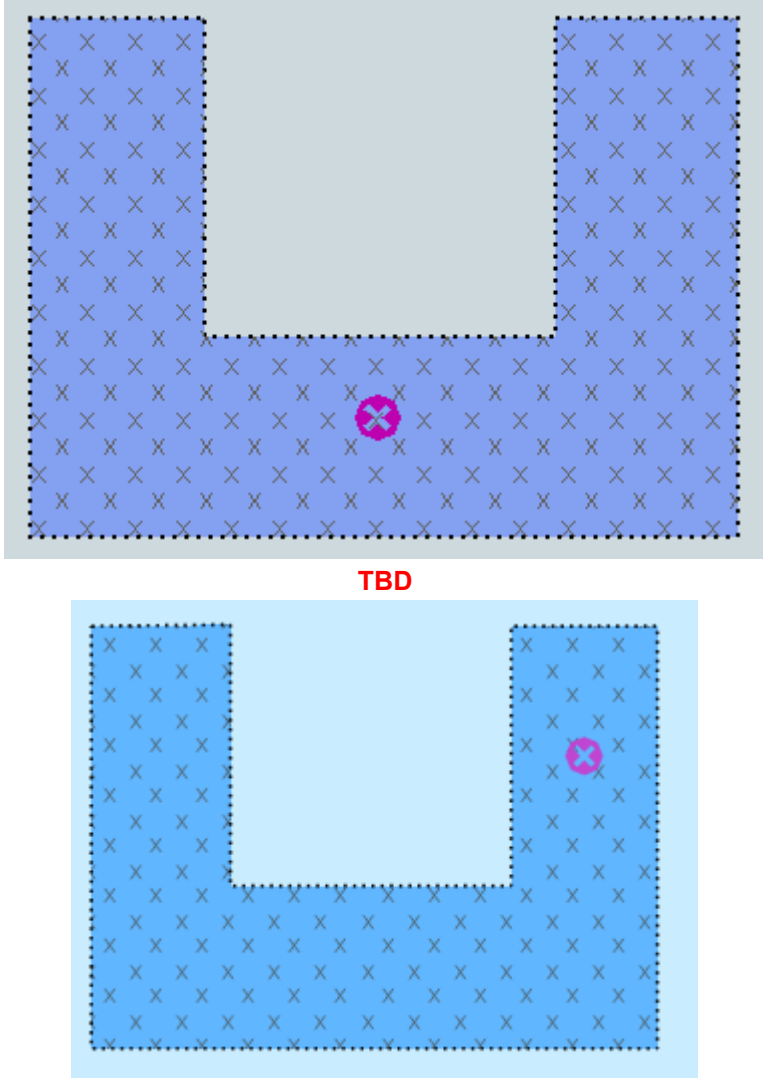
Test Reference	CentredSymbols1	IHO Reference	S-101PC
Test Description			
Display of centred symbol in the centre of an area			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			

Setup
<p>Load the exchange set Settings with the following settings:</p> <ul style="list-style-type: none">• Select Display Category Other• Select Symbolized Boundaries• Select Simplified Point Symbols = false• Set Safety contour value to 10 m• Select Shallow water dangers <p>..</p>
Action
<p>Centre the display on position 32°32.805'S 61° 21.290'E and then zoom in to a scale of 1:20 000</p>
Results
<p>Confirm that the feature displays as in the image below:</p>  <p>Zoom out to scale 1:50 000 and confirm that the feature now displays as follows</p> 

Action
<i>Centre the display on position 32°32.085'S 61° 21.415'E and then zoom in to a scale of 1:10 000.</i>
Results
<p>Display of centred symbols offset</p> <p>Confirm that the feature displays as in the image below:</p>  <p>Note: the display should show the centred symbol(s) offset.</p> <p>Zoom out to scale 1:50 000 and confirm that the feature now displays as follows:</p>  <p>Note: the display should only show the arrow as above without the centred symbol(s) offset.</p>

Action
<i>Centre the display on position 32°32.085'S 61° 21.415'E and then zoom in to a scale of 1:1 000.</i>
<i>Simulate own ship on position 32°32.085'S 61° 21.415'E</i>
Results
<p>Confirm that the feature displays as in the image below:</p>  <p>tbd</p> <p>Note: the display should show own ship symbol centred with the arrow and restriction symbol(s) offset. Even when changing the display scale the separation between own ship and the symbols shall be maintained.</p> <p>Note the offset between arrow and restriction symbol is specified while the own ship symbol just has to be not overlapping the centred symbols in the chart.</p>

Action
<i>Display of centred symbols when area is partially off screen</i> <i>Centre the display on position 32°32.805'S 61° 18.460'E and then zoom in to a scale of 1:20 000.</i>
Results
<i>Confirm that the feature displays as in the image below:</i>  <i>Note: the display should show the centred symbol in the centre of the visible area.</i>

Setup
As for test CentredSymbols1
Action
Display of centred symbols within complex areas
Centre the display on position 32°30.970'S 61° 21.330'E and then zoom in to a scale of 1:20 000.
Results
Confirm that the feature displays as in the image below:  <p style="text-align: center;">TBD</p>
<i>Note: the display should show the centred symbol within the Obstruction area. The display may be different from the example shown above as long as the centre of the centred symbol remains within the Obstruction area.</i>

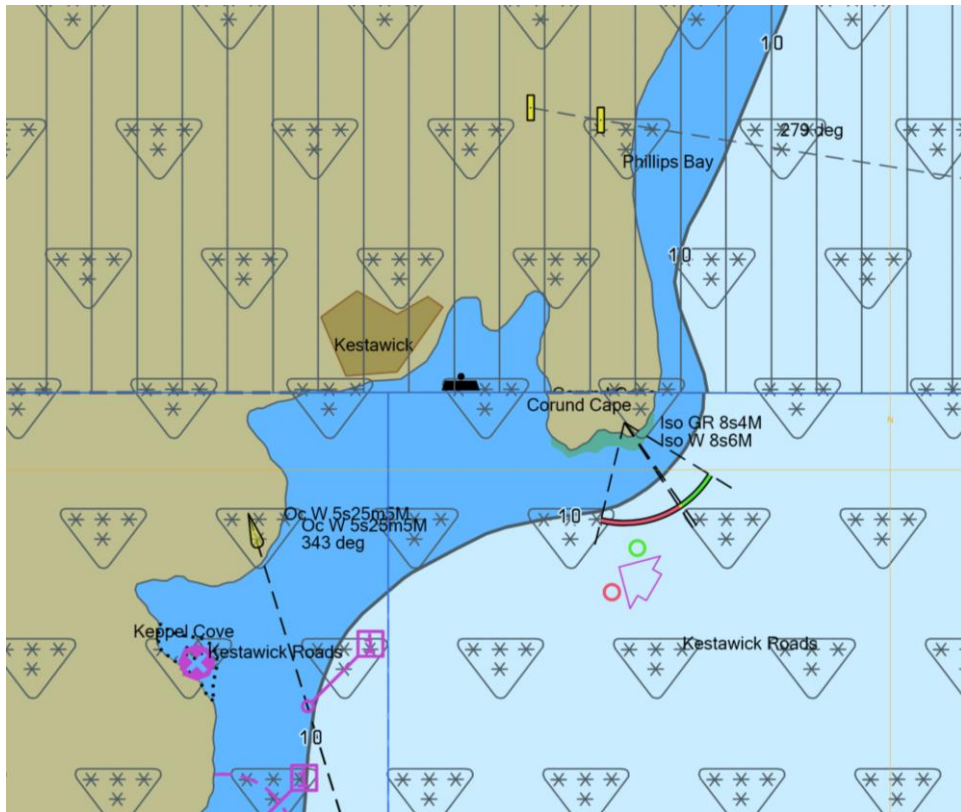
3.10 Overscale

3.10.1 Display of overscale indication

Test Reference	OverscaleIndication1	IHO Reference	S-98 12.3
Test Description			
<i>Display of overscale indication</i>			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections	
Other		Accuracy	On
Context Parameters		Contour label	Off
Safety contour	7 m	Highlight date dependent	Off
Safety depth	7 m	Highlight document	Off
Deep Contour	N/A	Highlight info	On
Shallow contour	N/A	Shallow pattern	Off
Four shades	Off	Unknown	Off
Radar overlay	Off	Update review	Off
Plain boundaries	Off	Text Groups	
Simplified symbols	Off	Chart Text	Off
Full light lines	Off	Important text	Off
Ignore scale minimum	Off	Other Text	
Shallow water dangers	Off	Names	On
Palette		Light description	On
Day		All other chart text	On
Date Dependent Objects		Display	
Start Date		Centre	32°27.447'S 060°58.599'E
End Date		Scale	1:60 000
		Orientation	
Viewing Groups			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			

Setup
As per test <i>UpdateCatalogues</i> .
Action
Import the exchange set PowerUp . Zoom to 1:40 000 or beyond. This is larger than the optimum display scale of the largest scale dataset.
Results
Confirm that an overscale indication is provided. For example, if scale zoomed is 1:40 000 then for areas based on optimum display scale 1:45 000 the overscale factor shown in the indication shall be x1.1 .

Results
Confirm that the overscale pattern AP(OVERSC01) is displayed.

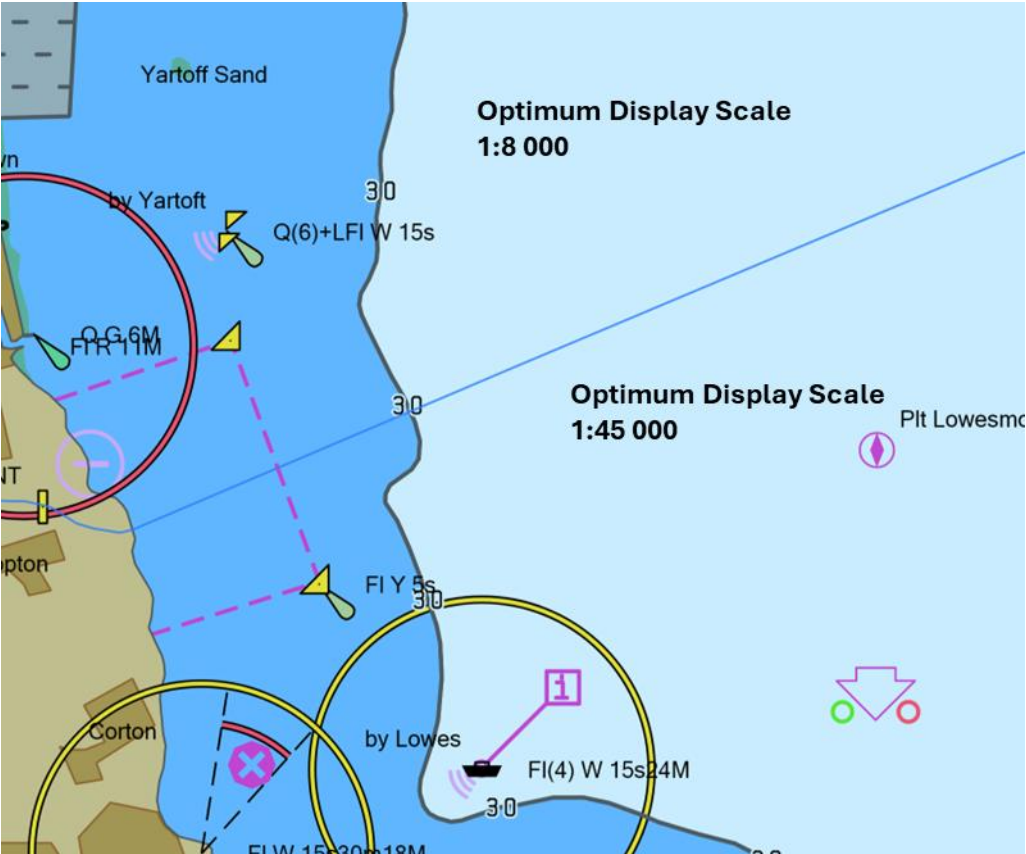


3.10.2 Indication of larger scale data

Test Reference	LargerScaleData	IHO Reference	S-9812.3.3
Test description			
<i>Indication of better (larger) scale data being available.</i>			
Setup			
<i>Load the exchange set PowerUp</i>			
<i>Position the own ship at 32°29.668'S, 060°55.864'E with a heading of 234.0 degrees. This will place the ship at the jetty in Micklefirth.</i>			
Action			
<i>Select a viewing scale of 1:100 000.</i>			
<i>Observe this dataset.</i>			
Results			
<i>Position the displayed area over the own ship.</i>			
<i>Confirm that an indication is provided that larger scale is available.</i>			

3.10.3 Boundaries between optimum display scales

Test Reference	ScaleBoundary	IHO Reference	S-98 12.3.1
Test Description			
Scale Boundaries between different areas of Optimum Display Scale			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Displaybase		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries	On	Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			

Setup
Load the exchange set PowerUp
Action
Centre the display on 32°21.071'S 060°57.730'E and zoom to 1:40 000
Results
<ol style="list-style-type: none"> 1. Confirm that the LS(SOLD,1,CHGRD) or LC(SCLBDY51) is shown for the diagonal limit across the dataset (upper section has optimumDisplayScale of 8,000) 2. Also confirm that the overscale indication is provided for the area in which the maximum display scale is 1:45 000 (the lower section)


3.10.4 Display of data from another scale

Test Reference		DifferentScale1		IHO Reference		S-98 Appendix E	
Test Description							
Display of data from a smaller scale to completely cover the display							
Loaded Data							
Exchange Set Name							
Display Mode				Independent Mariner's Selections (default=On)			
Other				Accuracy			
Context Parameters				Contour label			
Safety contour		10m		Highlight date dependent			
Safety depth		10m		Highlight document			
Deep Contour				Highlight info			
Shallow contour				Shallow pattern			
Four shades				Unknown			
Radar overlay				Update review			
Plain boundaries		Off		Text Groups			
Simplified symbols		Off		Chart Text			
Full light lines				Important text			
Ignore scale minimum				Other Text			
Shallow water dangers				Names			
Palette				Light description			
Day				All other chart text			
Date Dependent Objects				Display			
Start Date				Centre		32°33.000'S 60°56.000'E	
End Date				Scale		1:20 000	
				Orientation			
Viewing Groups (Default = On)							
Standard Display				Other			
Drying lines				Spot soundings			
Buoys. Beacons, aids to navigation				Submarine cables and pipelines			
Buoys, beacons, structures				All isolated dangers			
Lights				Magnetic variation			
Boundaries and limits				Depth contours			
Prohibited and restricted areas				Seabed			
Chart scale boundaries				Tidal			
Cautionary notes				Miscellaneous (Other)			
Ships' routing systems and ferry routes							
Archipelagic sea lanes							
Miscellaneous (Standard)							
Chart (Standard)							
Alert Highlights (Standard)							
Additional							
Setup							

Test Reference	OverlappingData	IHO Reference	S-98 20.3.1
Test Description			
Display of overlapping data			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	Off
Context Parameters		Contour label	
Safety contour	10	Highlight date dependent	
Safety depth	10	Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	Off
Four shades		Unknown	
Radar overlay		Update review	Off
Plain boundaries	Off	Text Groups	
Simplified symbols		Chart Text	Off
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	32°23.000'S 60°40.000'E
End Date		Scale	1:90000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys, Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			
Setup			

Load exchange set **Overlap**

Load exchange set **ScaleMinimum**

Action

Display cell 101AA00OVRLP at maximum display scale (1:90 000)

Results

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 101AA00SCAMN overlaps chart 101AA00OVRLP at the same Optimum Display Scale





b) Chart 101AA00OVRLP overlaps chart 101AA00SCAMN



3.10.5 Display of graphical index

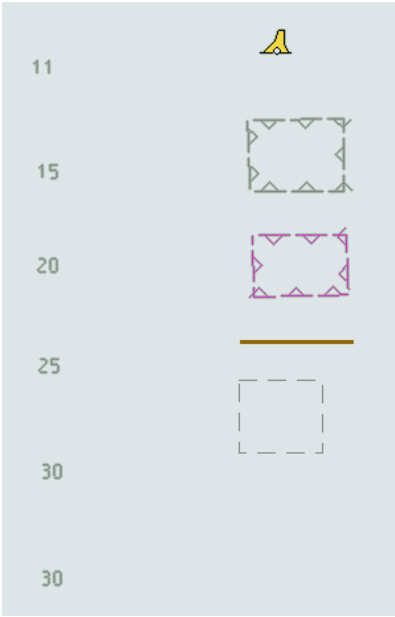
Test Reference	GraphicalIndex	IHO Reference	S-98 12.4.1
Test description			
<i>Display of graphical index of cell boundaries.</i>			
Setup			
<i>Load the exchange set PowerUp</i>			
Action			
<i>Navigate to a graphical index of dataset boundaries.</i>			
Results			
<p><i>Confirm that a graphical index of the dataset boundaries is displayed and access to the edition number and, where applicable, update number of each dataset is available.</i></p> <p>[Add S-102 and S-104 which are mandatory]</p> <p>[add test for graphical index of other products? ENC/102/104 only is mandatory]</p>			

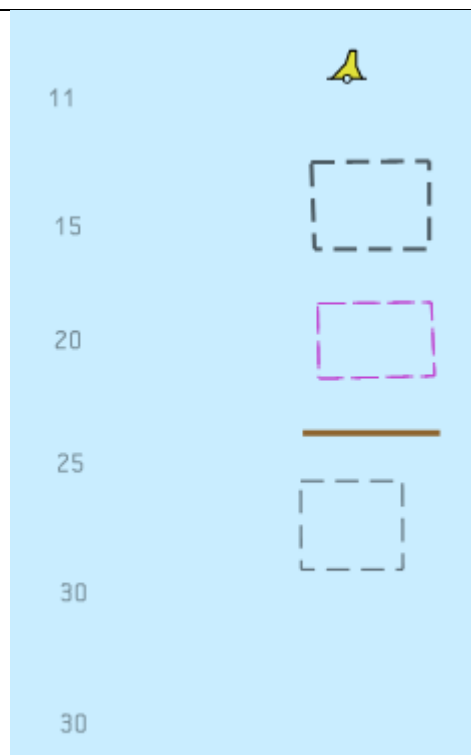
3.10.6 Change of display scale

Test Reference	DisplayScaleChange	IHO Reference	S-98 12
Test description			
<i>Change of display scale by chart scale values and by increments of displayed range values in nautical miles.</i>			
Setup			
<i>Load the exchange set PowerUp</i>			
Action			
<i>Change display scale by chart scale values or by increments of displayed range values in nautical miles.</i>			
Results			
<i>Confirm that the display changes accordingly.</i>			

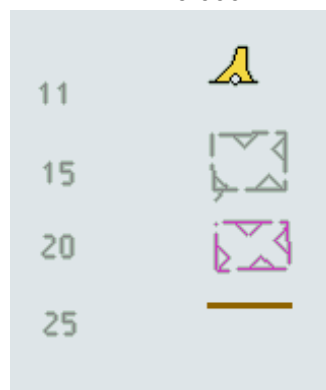
3.10.7 Impact of Scale Minimum on display

Test Reference		ScaleMinimum		IHO Reference		S-98 12.9	
Test Description							
Impact of ScaleMinimum values on display of charted features							
Loaded Data							
Exchange Set Name							
Display Mode			Independent Mariner's Selections				
Other			Accuracy			Off	
Context Parameters			Contour label			Off	
Safety contour		10 m	Highlight date dependent			Off	
Safety depth		10 m	Highlight document			Off	
Deep Contour		N/A	Highlight info			Off	
Shallow contour		N/A	Shallow pattern			Off	
Four shades		Off	Unknown			Off	
Radar overlay		Off	Update review			Off	
Plain boundaries		Off	Text Groups				
Simplified symbols		Off	Chart Text			Off	
Full light lines		Off	Important text			Off	
Ignore scale minimum		Off	Other Text				
Shallow water dangers		Off	Names			Off	
Palette			Light description			Off	
Day			All other chart text			Off	
Date Dependent Objects			Display				
Start Date			Centre				
End Date			Scale		1:90 000		
			Orientation				
Viewing Groups							
Standard Display			Other				
Drying lines			Spot soundings				
Buoys. Beacons, aids to navigation			Submarine cables and pipelines				
Buoys, beacons, structures			All isolated dangers				
Lights			Magnetic variation				
Boundaries and limits			Depth contours				
Prohibited and restricted areas			Seabed				
Chart scale boundaries			Tidal				
Cautionary notes			Miscellaneous (Other)				
Ships' routeing systems and ferry routes							
Archipelagic sea lanes							
Miscellaneous (Standard)							
Chart (Standard)							
Alert Highlights (Standard)							
Additional							

Setup			
Load the exchange set ScaleMinimum ..			
Action			
1. Centre the display on position 32°24.000'S 60°20.500'E 2. Change scale to 1:100 000 3. Change scale to 1:200 000 4. Deselect ScaleMinimum			
Results			
1. All features shall be shown. <div><div>11</div><div>15</div><div>20</div><div>25</div><div>30</div><div>30</div></div> 			
2. All features shall be shown			



3. The features with ScaleMinimum values of 119 000 and 179 999 shall not be shown.




4. All features shall be shown



3.11 Display and Operation of Water Level Adjustment.

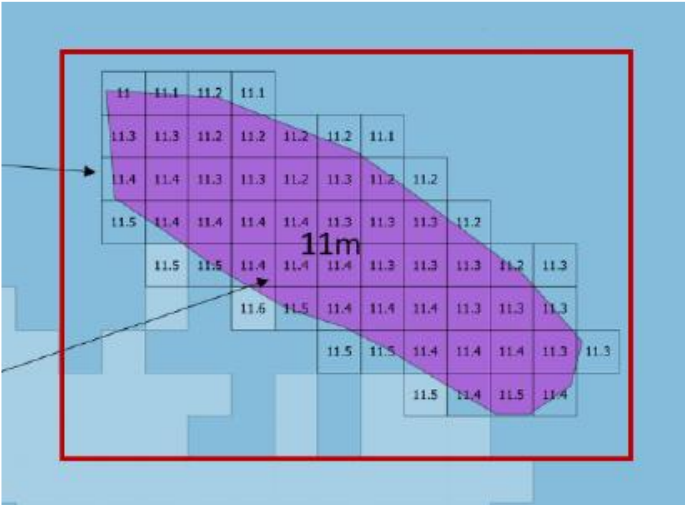
3.11.1 Enabling Water Level Adjustment

Test Reference	WaterLevelAdjustment	IHO Reference	S-98 Appendix D-2
Test Description			
This test verifies the ECDIS can harmonise S-104 Water Level with S-101 Depth Values.			
TODO: Add test for control of WLA based on data producer code			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			

Chart (Standard)			
Alert Highlights (Standard)			
Additional			
Setup			
<p>.. Load the exchange set PowerUp with the following settings.</p> <ul style="list-style-type: none"> - User Selected Safety contour = 11.4m - Water Level Adjustment = true - Interoperability Level = 2 - Water Level Adjustment boundary = 100 metres (S-98 D-3) 			
Action			
<p>Navigate to point (Xx,YY Coverage Area S-102, S-104</p>			
Results			
<p>Verify</p> <ol style="list-style-type: none"> 1. Water Level Adjustment is enabled and a permanent message is displayed to user as per S-98 Appendix D-3.1 2. The boundary of the Water Level Adjustment is shown.  <ol style="list-style-type: none"> 3. Verify the ECDIS legend correctly reports the vertical datum of the S-102 and S-104 data 			

3.11.2 Adjustment of Other Depth Values

Test Reference	AdjustmentOfDepthValues	IHO Reference	S-98 Appendix D-3.1
Test Description			
<i>This test verifies the ECDIS can harmonise S-104 Water Level with S-101 Depth Values on other features</i>			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys, Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			

Additional			
Setup			
<i>As for test WaterLevelAdjustment</i>			
Action			
A) Navigate to Point (XX,YY). Inspect Adjusted Depth Values (S-102 and S-104) B) Navigate to Point (XX,YY) Inspect Adjusted Depth Values (S-104 only)			
Results			
<p>Verify</p> <p>1) All depth values in ENC are adjusted according to the S-104 values as shown</p> 			

3.11.3 Feature information - Water Level Adjustment.

Test Reference	WLAFeatureInformation		IHO Reference	S-98 Appendix D-3	
Test Description					
This test verifies the ECDIS Water Level Adjustment communicates correct information to the user during feature interrogation					
Loaded Data					
Exchange Set Name					
Display Mode		Independent Mariner's Selections (default=On)			
Other		Accuracy			
Context Parameters		Contour label			
Safety contour		Highlight date dependent			
Safety depth		Highlight document			
Deep Contour		Highlight info			
Shallow contour		Shallow pattern			
Four shades		Unknown			
Radar overlay		Update review			
Plain boundaries		Text Groups			
Simplified symbols		Chart Text			
Full light lines		Important text			
Ignore scale minimum		Other Text			
Shallow water dangers		Names			
Palette		Light description			
Day		All other chart text			
Date Dependent Objects		Display			
Start Date		Centre			
End Date		Scale	1:60000		
		Orientation			
Viewing Groups (Default = On)					
Standard Display		Other			
Drying lines		Spot soundings			
Buoys, Beacons, aids to navigation		Submarine cables and pipelines			
Buoys, beacons, structures		All isolated dangers			
Lights		Magnetic variation			
Boundaries and limits		Depth contours			
Prohibited and restricted areas		Seabed			
Chart scale boundaries		Tidal			
Cautionary notes		Miscellaneous (Other)			
Ships' routeing systems and ferry routes					
Archipelagic sea lanes					
Miscellaneous (Standard)					
Chart (Standard)					
Alert Highlights (Standard)					

Additional	
Setup	
<i>As for test WaterLevelAdjustment</i>	
Action	
A) Navigate to Point (XX,YY). B) Interrogate each of the features as shown in the image	
Results	
<p>Verify</p> <ol style="list-style-type: none"> 1. All depth values in ENC are adjusted according to the S-104 values as shown 2. Pick Report information contains the correct values including the source of the depth values as defined in S-98 D-3.1 	
S-102 Coverage only.	Value Of Sounding 12.3 m [S-102]
S-104 and S-102 Coverage	Value Of Sounding 15.5m [WLA 12:34 08 Nov 2021]
Vertical Clearance value	Vertical Clearance Value 5.3 m Mean Sea Level [WLA 12:34 08 Nov 2021]

3.11.4 Water Level Adjustment Uncertainty

Test Reference	UncertaintyWLA	IHO Reference	S-98 Appendix D-2
Test description			
<ul style="list-style-type: none"> • Test that the vertical uncertainty values are included in the WLA calculations. • This is done with the specific datasets and via interrogation to ensure the user is aware of the WLA uncertainty values (from S-104) and their addition to S-102. • Datasets must include vertical uncertainty in both S-102 and S-104 and the values / calculations be visible to the end user. • The calculations must also be carried out on drying heights as well as depth. • Projected and unprojected test cases should be added. 			

3.11.5 Water Level Adjustment across a time period

Test Reference	WLATimePeriod	IHO Reference	S-98 Appendix D-2.5
Test description			
<i>This test verifies that the ECDIS is able to correctly adjust water level depth values across a user defined time period.</i>			
Setup			
<i>As for test WaterLevelAdjustment</i>			
<i>Set Water Level Adjustment time Period = 2021-11-08 12:30:00 to 2021-11-08 14:00:00</i>			
Action			
<i>A) Navigate to Point (XX,YY).</i> <i>B) Interrogate features as shown in the image.</i>			
Results			
<i>Verify the permanent indication is given:</i> <p style="text-align: center;">WLA from 12:34 08 Nov 2021 to 14:56 08 Nov 2021</p> <i>Verify the Adjusted Water Level values as follows:</i> <i>[ADJUSTED values from S-102, S-104 and S-102/S-104 features across the area of coverage]</i>			

3.11.6 WLA with non matching vertical datums

Test Reference	IncompatibleDatums	IHO Reference	
Test description			
<i>This test verifies the ECDIS will correctly reject the installation of data for Water Level Adjustment if the layers are incompatible.</i>			
Setup			
<i>Load Exchange set PowerUp</i>			
Action			
<i>Load exchange set WLAInvalid</i>			
Results			
<i>Verify the ECDIS rejects the installation of the following datasets:</i> <ul style="list-style-type: none"> - 104AA005X01NW.H5 - 102AA005X01NW.H5 - 111AA005X01NW.H5 <i>Verify the ECDIS correctly load the following dataset</i> <ul style="list-style-type: none"> - 102AA005X01SE.H5 			

3.11.7 Route planning with Water Level Adjustment

Test Reference	WLAPanning1	IHO Reference	S-98 Appendix D-2.7
Test description			
<i>Verify the ECDIS correctly allows routes to be planned accounting for Water Level Adjustment corrections</i>			
Setup			
<i>As for test WaterLevelAdjustment</i>			
Action			
<ol style="list-style-type: none"> 1. Ensure exchange set is loaded correctly 2. Load cell 10100AA_X01NW.000 3. Plot a route between the waypoints WP1-WP4 using the following parameters <ol style="list-style-type: none"> i) Speed = 11knots ii) Planned route start date/time = 2022-14-11:00:00:00 4. Run a route check on the defined route. 5. Reset route start date/time to 2022-04-22:00:00:00 6. Rerun the route check 			
Results			
<p><i>Verify the route contains the following warnings when run at (4)</i></p> <p><i>[list of warnings – this is because the S-104/S-102 adjusts Water Level to shoaler than 11.4m at the defined time)</i></p> <p><i>Verify the route check is clear when run at (6) (Water Level adjustment is clear at this time)</i></p> <p><i>Verify a permanent message is shown to the user as per S-98 Appendix D-3</i></p> <p style="text-align: center;">WLA from 12:34 08 Nov 2021 to 14:56 08 Nov 2021</p>			

3.12 Display of ENC covering Polar Regions

Test 3.10.1 and 3.10.2 is for all ECDIS. Test 3.10.3 is optional and should only be carried out on ECDIS claiming to be approved to function in Polar Regions.

3.12.1 Display of ENC Data up to 85 degrees

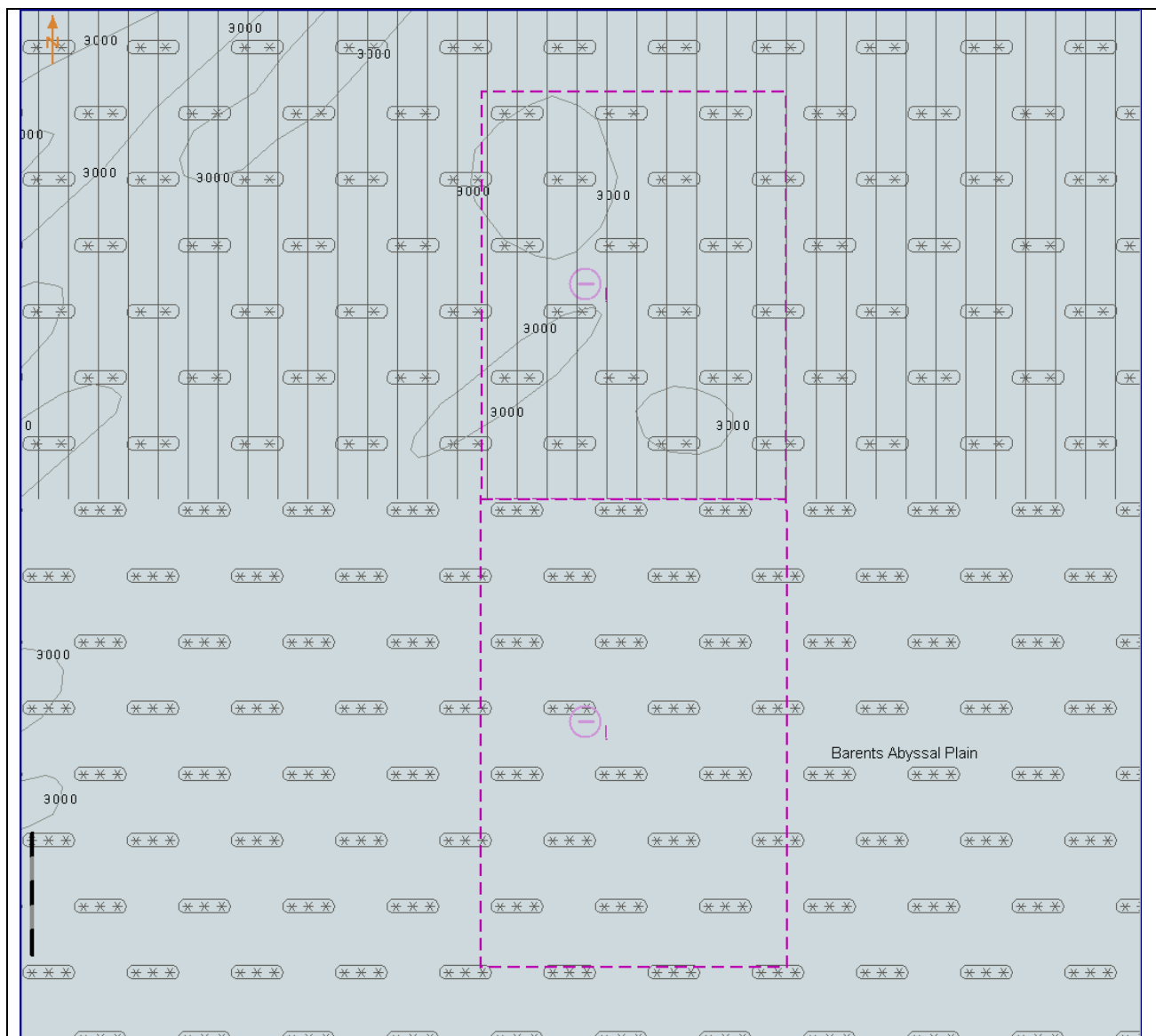
Test Reference	PolarData1	IHO Reference	
Test Description			
<i>Display of charts up to 85 degrees</i>			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys, Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			

Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			
Setup			
<p>Load the exchange set PolarData</p> <ul style="list-style-type: none"> • Select Display Category Other • Select Safety contour value to 30 m • Select Plain boundaries • Select Simplified Point Symbols = false • Select Accuracy <p>Select Contour label</p> <p>..</p>			
Action			
<p>Select chart 101AA00NPOL3.000 at maximum display scale (1:3 000 000). Check ENC symbols shown in the ECDIS against the graphical plot</p>			
Results			
<p>The ENC should be displayed in the ECDIS like one of the options below</p>			





TBD: Note: Implementation of support for latitudes higher than 85° is an option for ECDIS. Polar projection is typically used for latitudes higher than 85° . ECDIS image in this example is based on polar projection

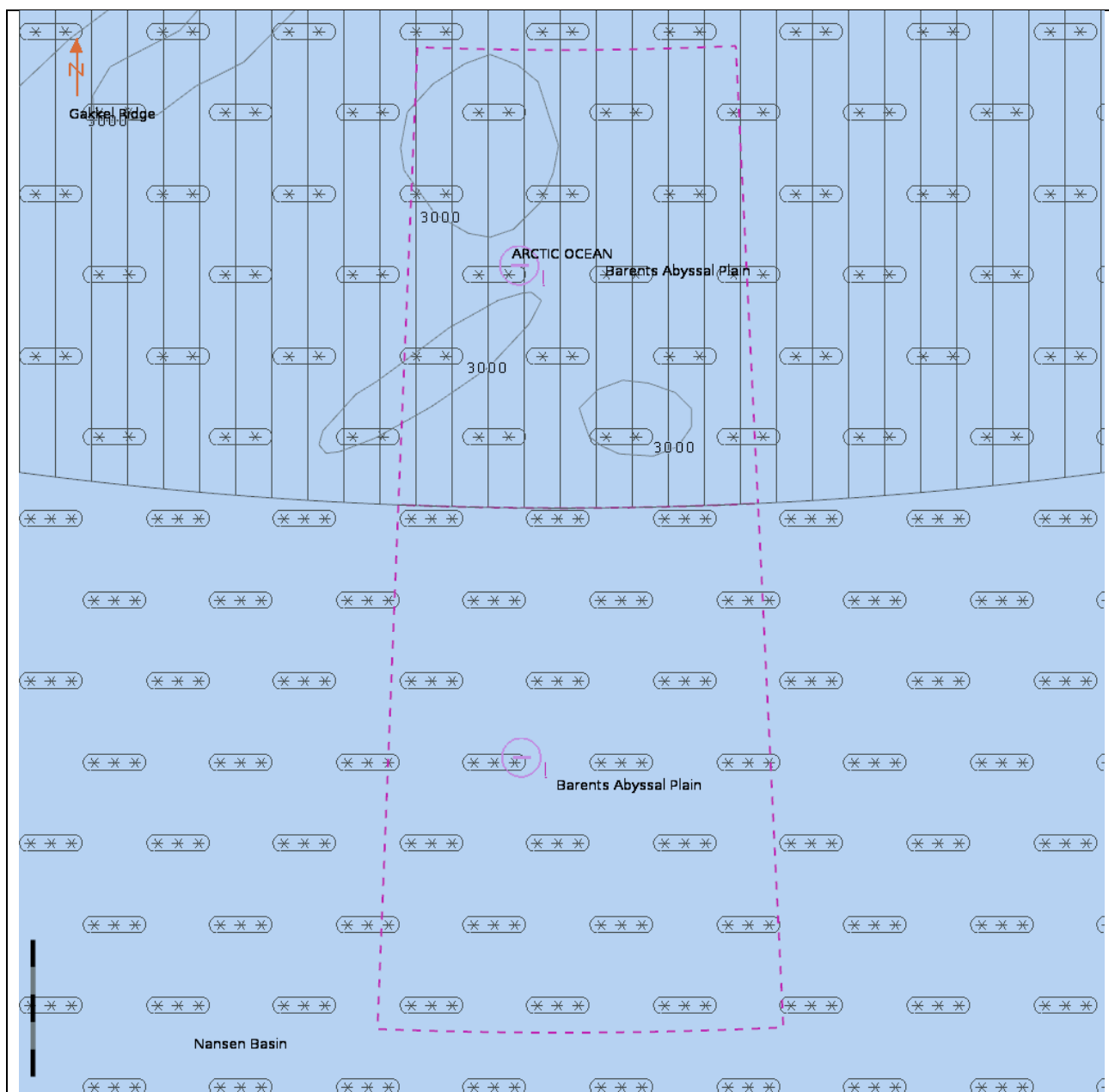


Select 85°00.000'N 25°00.000'E as centre of the display, scale is 1:500 000

Display is based on Mercator projection

TBD

Note: Implementation of support for latitudes higher than 85° is an option for ECDIS. If not implemented, then there should be no chart displayed above latitude 85°. If implemented, the chart above latitude 85° may or may not have overscale pattern depending of the chart available in the ECDIS for the area above latitude 85°.



TBD

Select 85°00.000'N 25°00.000'E as centre of the display, scale is 1:500 000

Display is based on polar projection

Note: Implementation of support for latitudes higher than 85° is an option for ECDIS. If not implemented, then there should be no chart displayed above latitude 85°. If implemented, the chart above latitude 85° may or may not have overscale pattern depending of the chart available in the ECDIS for the area above latitude 85°.

3.12.2 Scale Bar at high latitudes

Test Reference	HighLatitudeScaleBar	IHO Reference	S-98 12.10.1
Test description			
<i>Display of latitude bar in high latitudes</i>			
Setup			
<i>As Per PolarData1</i>			
Action			
<i>Position display in a location > 70d North.</i>			
Results			
<p><i>If the displayed area together with the used projection is such that scale is not uniform over the displayed area then the scale bar (more than 5% difference in uniformity for all directions or displayed area is over latitude 70°) or latitude scale (more than 5% difference in uniformity for latitude direction or displayed area is over latitude 70°) shall indicate the scale either at own ship location or at the centre of the displayed area. In such case a permanent indication “at own ship” or “at centre” shall be close to the scale bar or latitude scale. [IEC 61174:2015].</i></p> <p>Verify “at own ship” is displayed close to the scale bar.</p>			

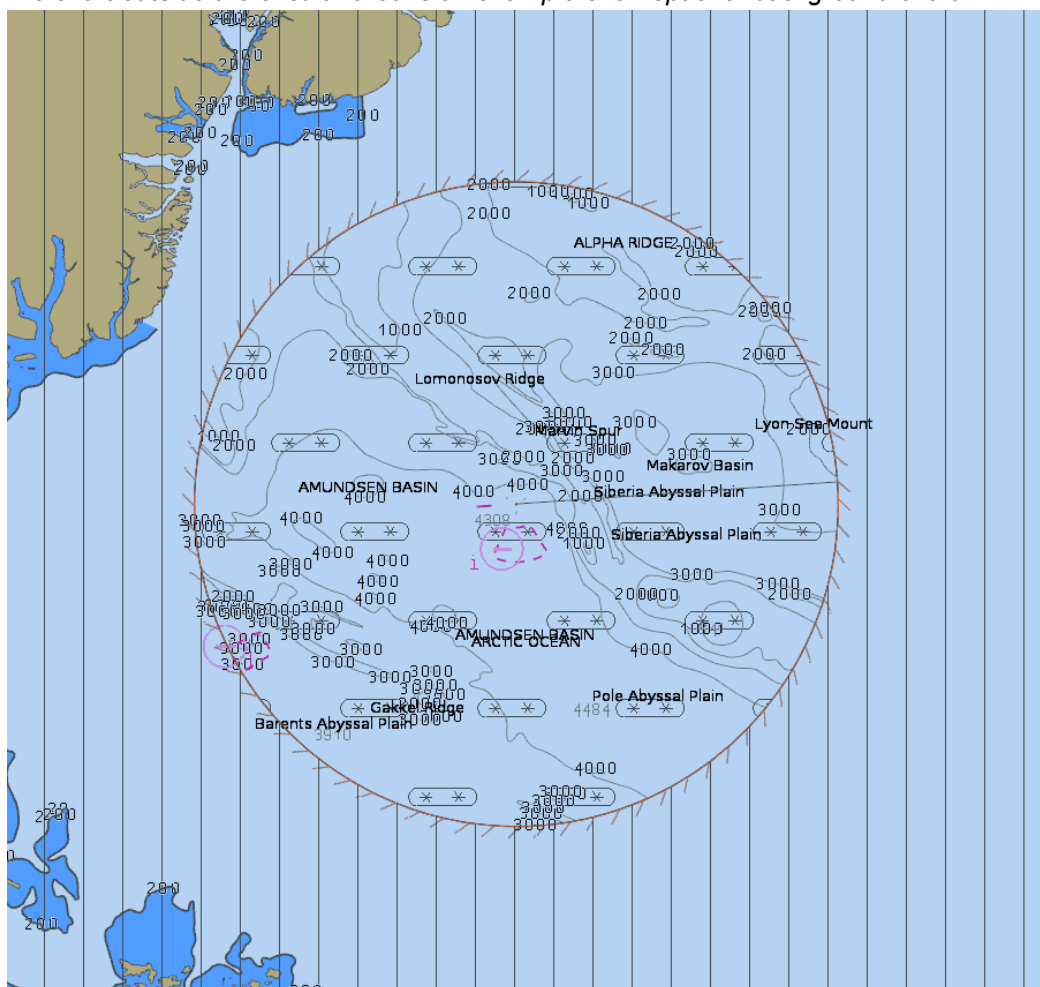
3.12.3 Display of data at extreme high latitudes

Test Reference	PolarData2	IHO Reference	S-52 10.1.10.2
Test Description			
<p>ONLY TO BE TESTED FOR EQUIPMENT CLAIMING THE CAPABILITY TO DISPLAY ENC DATA AT LATITUDES GREATER THAN 85 DEGREES</p> <p>Display of charts above 85 degrees</p>			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys, Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routeing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			

Additional		
Setup		
<p>.. Load the exchange set PolarData</p> <ul style="list-style-type: none"> • Select Display Category Other • Select Safety contour value to 30 m • Select Plain boundaries • Set symbolized symbols to Off • Select Accuracy <p>Select Contour label</p>		
Action		
Check ENC symbols shown in the ECDIS against the graphical plot		
Results		

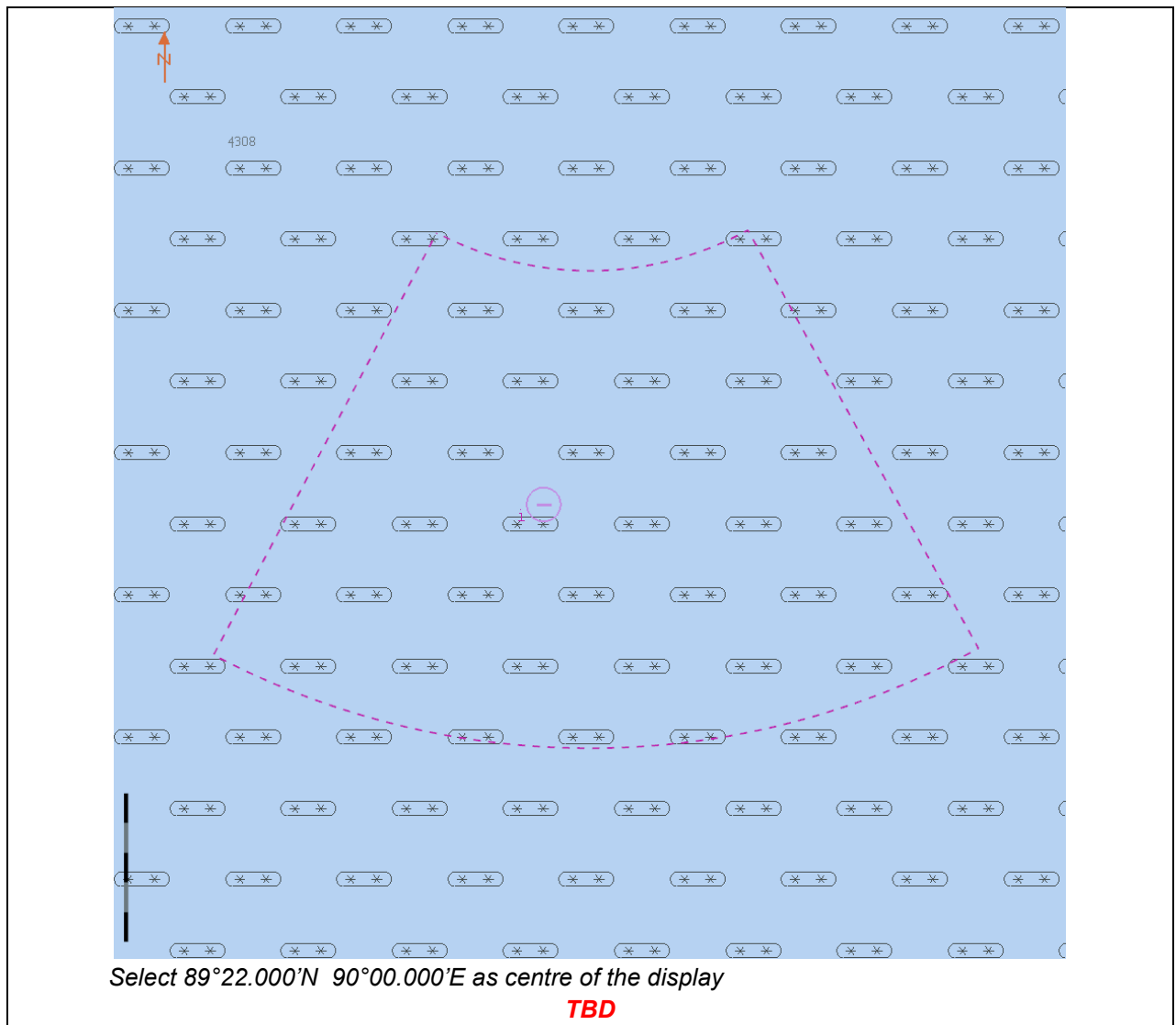
The ENC in the ECDIS should be shown like in the picture below.

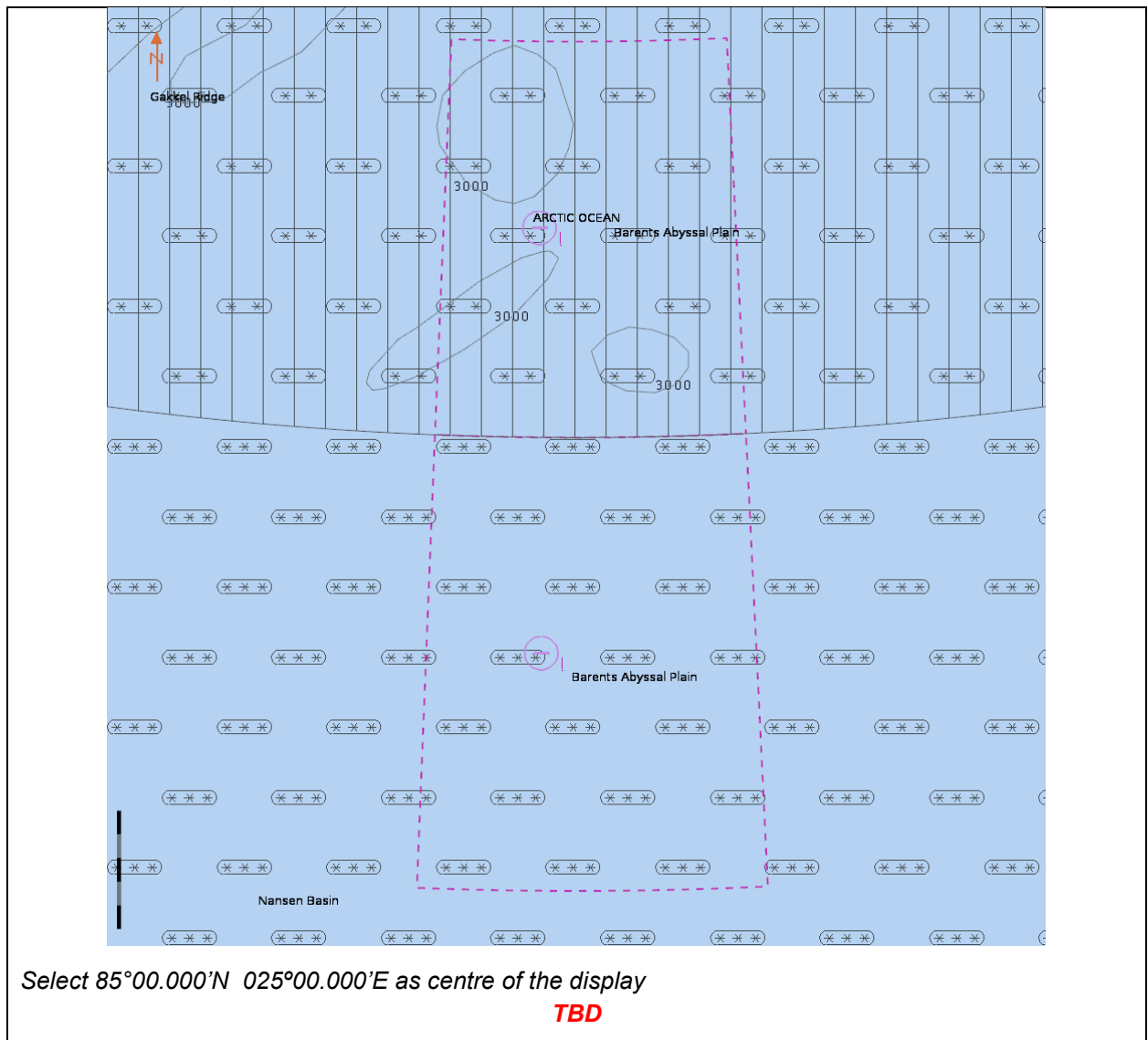
Note: The chart outside the circular area is an example of an optional background chart.



North Pole is in the centre of the display

TBD





4. Chart related functions

3.12.4 Mode and orientation

Test Reference	ModeOrientation1	IHO Reference	
Test description			
<i>Display of the north arrow symbol.</i>			
Setup			
<i>Load the exchange set PowerUp</i>			
Action			
<i>Observe the display.</i> <i>If the EUT offers the capability to show other than north-up presentation; Change the presentation to non-north up and observe the display.</i>			
Results			
<i>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 when the scale bar extends to the full height of the display</i> <i>If the EUT supports changing to non-north up presentations confirm that the symbol realigns to north.</i>			

Test Reference	ModeOrientation2	IHO Reference	
Test description			
<i>True motion operation.</i>			
Setup			
<i>As for ModeOrientation1</i>			
Action			
<i>Ensure that true motion is provided.</i> <i>Reset the display and check that the generation of the neighbouring area takes place automatically at a distance selected by the Mariner.</i>			
Results			
<i>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.</i>			

Test Reference	ModeOrientation3	IHO Reference	
Test description			
<i>Manual adjustment of chart display area and own ship position.</i>			
Setup			
<i>As for ModeOrientation</i>			
Action			
<i>Manually adjust the chart display area.</i> <i>Change the position of own ship relative to the edge of the display.</i>			
Results			
<i>Confirm that it is possible to change manually the chart area and the position of own ship relative to the edge of the display.</i>			

Test Reference	NoDataAvailable	IHO Reference	
Test description			
<i>No ENC data available.</i>			
Setup			
<i>As for ModeOrientation</i>			
<i>Ship position as follows: 32°27.88'S 061°20.66'E (an area with no ENC)</i>			
Action			
<i>Observe the display.</i>			
Results			
<i>Confirm that a "No ENC available" indication is provided.</i>			

Test Reference	NonNorthUp	IHO Reference	
Test description			
<i>Display in non 'north-up' orientation.</i>			
Setup			
<i>As for ModeOrientation</i>			
Action			
<i>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.</i>			
Results			
<i>Confirm that the displayed 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.</i>			

3.13 Scale bar

3.13.1 Display of scale bar

Test Reference	ScaleBar	IHO Reference	S-98 12.10.1
Test description			
<i>Display of scale bar at appropriate scales.</i>			
Setup			
<i>Load exchange set PowerUp</i>			
<i>Set Display Category Base Display.</i>			
Action			
<i>Zoom to a display scale greater than 1:80 000 (such as 1:25 000), observe the display.</i>			
Results			
<i>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.</i>			

3.13.2 Display of scale bar

Test Reference	LatitudeBar	IHO Reference	S-98 12.10.1
Test description			
<i>Display of latitude bar at appropriate scales.</i>			
Setup			
Load exchange set PowerUp Set Display Category Base Display.			
Action			
Zoom to a display scale less than 1:80 000 (such as 1:300 000), observe the display.			
Results			
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.			

3.14 Feature information

Test Reference	FeatureInformation1	IHO Reference	S-98 15.1
Test description			
<i>General rules for cursor pick report</i>			
Setup			
Load exchange set PowerUp Select Display Category Other.			
Action			
1. Select several features of - depth area; - restricted area; - sea area; - depth contour; - ferry route; - recommended track; - buoy (for example buoy and light at 32°29.50'S - 061°00.46'E); - light; - wreck. 2. Observe feature information. 3. Remove feature information from display.			
Results			

1) *The following rules shall be applied to the pick report:*

- Full feature and attribute names must be displayed. If a language pack is installed then the feature and attribute names must use the translated names contained in the language pack according to user preference – user language preferences are described in clause **Error! Reference source not found.**
- Listed value names must be displayed instead of the numerical code.
- There must not be any padding of attribute values, for example, a height of 10 metres must not be padded to 10.000000 metres as this could potentially confuse or mislead the Mariner.
- Units of measure must be included after all attribute values when available.
- Cursor pick report must extend to include both information associations and feature associations, including aggregations and compositions, which may link to information types or features that carry additional information such as a *featureName*.
- Dates must be given in the form “Day Month Year” DD-MMM-YYYY.
 - Month abbreviations must be: JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC.
- The Pick Report must only return information about the visible features on the ECDIS display. If the viewing group is turned on all features, even “no symbol” features without visible presentation within that viewing group, must be provided in the cursor Pick Report, i.e. only active drawing instructions must be included.
- Pick Report must include the information associated with the spatial object limited to the area of the cursor pick. For example, information related to accuracy.
- Complex or Simple Attributes with private visibility must not be included.
- Descriptions of attributes and their values, available in the feature catalogue, must be shown on demand.

2. *Text associated with chart features must be removed from the display.*

Note: The text and background colour of pick report is specified by the OEM

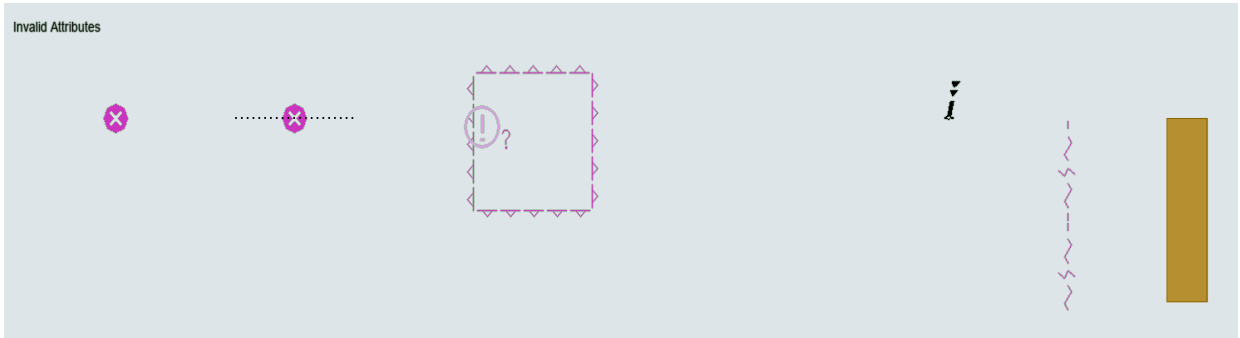
[This test needs to also include other data products (particularly S-124 where the area covered by NW is not portrayed)]

Test Reference	FeatureInformation2	IHO Reference	S-98 15.1
Test description			
<i>Pick report descriptions and sorting</i>			
Setup			
<i>As for test FeatureInformation1.</i>			
Action			
<i>Select several features as mentioned in 4.3</i>			
Results			
<ol style="list-style-type: none"> 1. <i>A plain language explanation of each symbol shall be used as included in portrayal catalogue to provide quick and understandable information which is not always obvious from the feature class and attribute information.</i> 2. <i>Attribute values provided in addition to the above explanation shall be connected to their meaning, and the definitions shall also be available.</i> 3. <i>The feature information shall be sorted by the drawing priority of the feature as defined in the portrayal catalogue. When the drawing priority of features is equal, the geometric primitive shall be used to order the information (points followed by curves and finally surfaces).</i> 4. <i>Check that the content displayed in the pick report is configurable by the user.</i> 			

Test Reference	FeatureInformation3	IHO Reference	S-98 15.2.2
Test description			
<i>User defined cursor pick parameters, if available</i>			
Setup			
<i>As for test FeatureInformation1.</i>			
Action			
<i>1. Configure the cursor pick parameter as available. 2. Select several features as mentioned in 4.3</i>			
Results			
<i>1. The cursor pick parameters may be configurable by the user and available for presentation. 2. The content of the pick report shall be presented as configured.</i>			

Test Reference	FeatureInformation4	IHO Reference	S-98 15.1
Test description			
Hover-over function for feature information (optional) Test shall only be performed if a hover-over function for feature information is provided.			
Setup			
As for test FeatureInformation1.			
Action			
1. Configure the hover-over function OFF. 2. Move cursor to one of the features in the table below and to features where additional information is available or date dependent features: 3. Configure the hover-over function ON. 4. Move cursor to one of the features mentioned in 2. 5. Move cursor to any other features.			
Features		S-101 Acronym	
Lights		AllRoundLight	
Beacon, cardinal		BuoyCardinal	
Beacon, isolated danger		BuoyIsolatedDanger	
Beacon, lateral		BeaconLateral	
Beacon, safe water		BeaconSafeWater	
Beacon, special purpose/general		BeaconSpecialPurpose	
Buoy, cardinal		BuoyCardinal	
Buoy, installation		BuoyInstallation	
Buoy, isolated danger		BuoyIsolatedDanger	
Buoy, lateral		BuoyLateral	
Buoy, safe water		BuoySafeWater	
Buoy, special purpose/general		BuoySpecialPurpose	
Landmarks		Landmark	
Results			
1. It shall be possible to switch OFF the hover-over function. 2. There shall be no information of chart features displayed when hovering over it. 3. It shall be possible to switch ON the hover-over function. 4. Important information of chart features shall be displayed when hovering over it. 5. When hovering over other chart features no information shall be displayed.			

Test Reference	FeatureInformation5	IHO Reference	S-98 15.1
Test description			
<i>Presentation of unknown attributes</i> <i>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 feature. The main purpose of this test is to check that ECDIS is able to accept ENC datasets 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.</i>			
Setup			
Load the exchange set InvalidFeatures dataset 101AA00INVOB.000 : <ul style="list-style-type: none"> Select Display Category Other Set the Safety contour value to 0 m Select Symbolized Boundaries Set symbolized symbols to Off 			

Action
Select chart features with unknown attribute for cursor pick report.
Results
<p>Check ENC symbols shown in the ECDIS against the corresponding graphical plot. Select one by one each of 6 features for cursor pick report.</p> <p>The result of cursor pick shall be:</p> <p>a) Wreck with attribute Water level effect (covers and uncovers);</p> <p>b) Obstruction with attribute Value of Sounding (no value) and Water Level Effect (no value);</p> <p>c) Restricted area without any attribute;</p> <p>d) Buoy, cardinal with attributes Buoy shape (spar (spindle)), Category of cardinal mark (north cardinal mark), Colour, Colour pattern (horizontal stripes), Topmark and UnknownAtt2;</p> <p>e) Cable, submarine with attribute UnknownAtt1;</p> <p>f) Silo/Tank with attribute UnknownAtt2.</p>
 <p style="text-align: center; color: red;">TBD</p>

Test Reference	InteroperabilityIdentifier	IHO Reference	15.1 (10)
Test description			
<p>TODO:</p> <ul style="list-style-type: none"> Test pick report function where the feature picked has an interoperabilityIdentifier which is referred to by an S-124 <i>featureReference.interoperabilityIdentifier</i>. This tests that NW can link to ENC features. This is accomplished by setting interoperabilityIdentifier in S-101 features then setting featureReference.interoperabilityIdentifier in S-124 to the same value and executing a pick report on the S-101. 			

Test Reference	TidalStreamPanelData	IHO Reference	S-98 15.4
Test description			
<i>Display of tidal stream panel Data</i>			
Setup			
<i>Load exchange set PowerUp</i>			
Action			
<p>1. Select an example of <i>TidalStreamPanelData</i> (tidal stream panel information)</p> <p>1a. select the complex attribute tidal stream panel values at 32°31.45'S 60°56.35'E for display;</p> <p>2. Select an example of <i>TidalAStreamPanelData</i> (tidal stream prediction by harmonic methods)</p> <p>2a. select tidal stream prediction by harmonic methods feature at 32°32.57'S 60°57.69'E for display;</p> <p>3. Repeat step 1 and 2 for different light conditions (DAY, DUSK, NIGHT).</p>			

Results

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

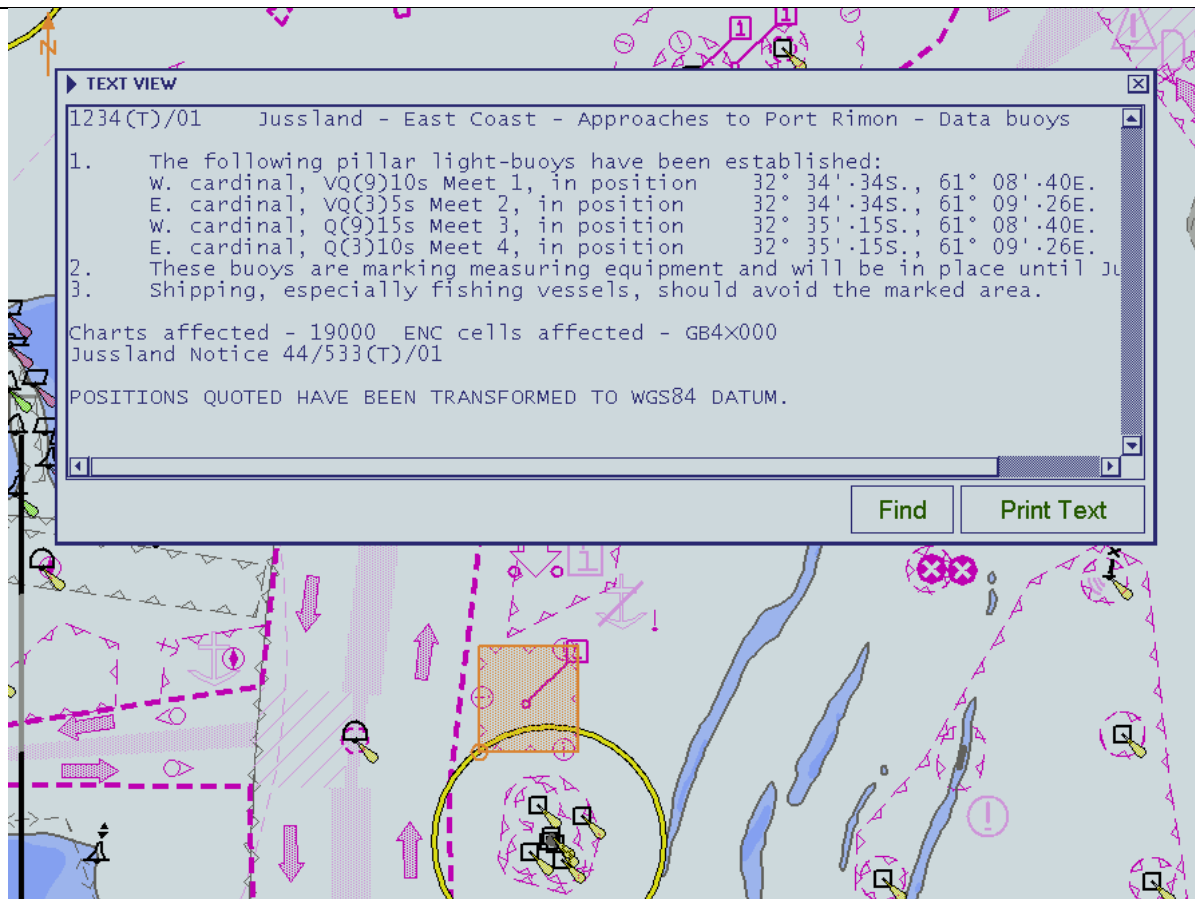
Tidal Station: PLYMOUTH (DEVONPORT)			
Tidal Station Identifier: 0014		Data from: ENC	
	Hours	Direction of stream (degrees)	Rates at spring tides (knots)
Before	-6	113	0.1
	-5	332	0.6
	-4	331	1.1
	-3	342	1.0
	-2	347	0.7
	-1	333	0.5
high water	0	317	0.3
After	+1	178	0.3
	+2	146	0.6
	+3	140	1.0
	+4	143	1.1
	+5	143	0.8
	+6	138	0.3

TODO: replace with S-98 Updated Image

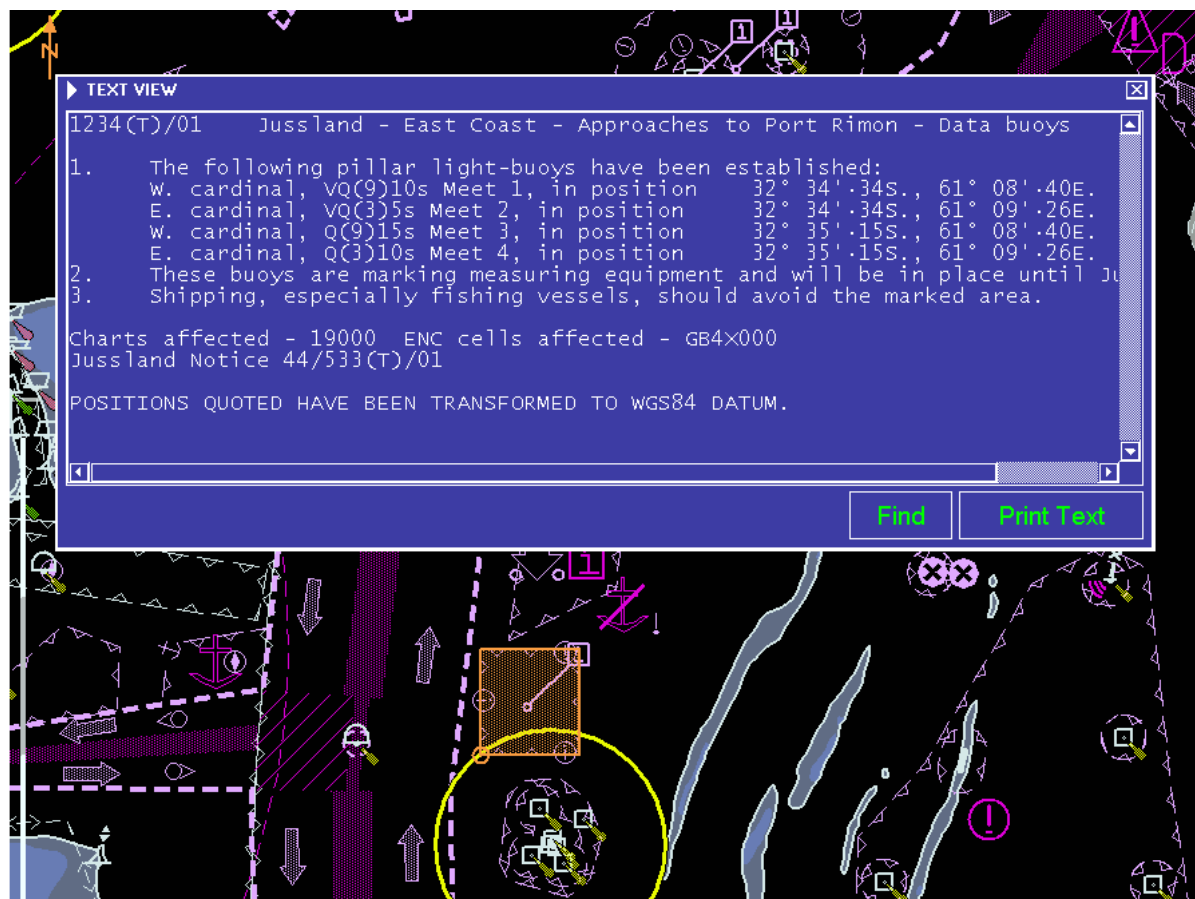
3. The data must be displayed as appropriate for the selected light condition (DAY, DUSK, NIGHT).

Test Reference	Tidal panels (2)	IHO Reference	S-98 15.4
Test description			
Show multiple tidal panels when more than one is included in the feature.			

Test Reference	SupplementaryFile2	IHO Reference	S-98 15.2.2
Test description			
Display of supplementary text file			
Setup			
As for test FeatureInformation1.			
Action			
1. Select an example of a note encoded using information attributes (for example Caution Area at approximately 32°34.74'S 061°08.92'E);			
2. Repeat step 1 for different light conditions (DAY, DUSK, NIGHT).			
Results			
1. The note must be displayed within the light level of the current display and in a way that it can be easily read, for example by displaying the note as it might appear on a paper chart (for example content of 10100AAIECTMP.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).			
3. The content of the note must commence at the location specified by the fileLocator reference, as shown in the image			

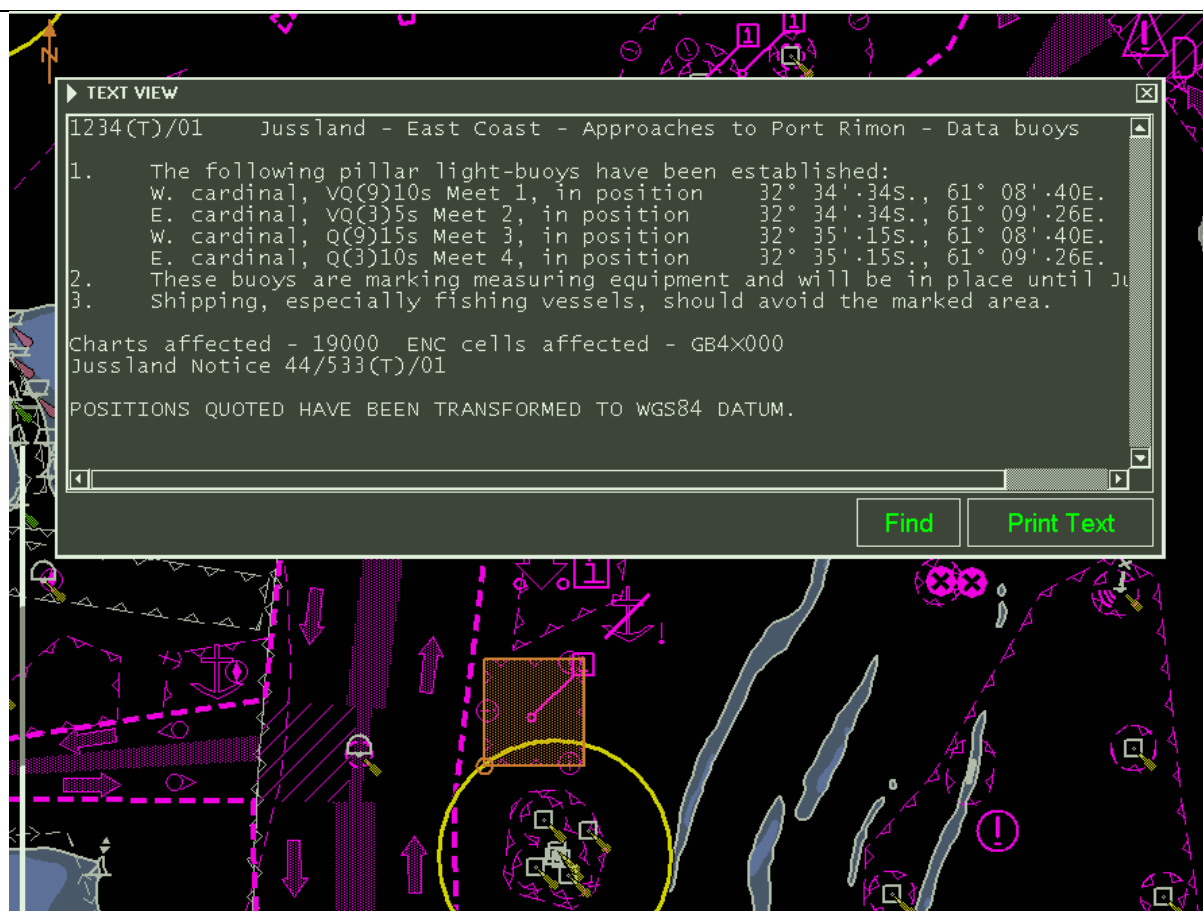


Example of Text 101AA00IECTMP.TXT over cell 10100AA_X0000.000, Day palette *tbd*




Example of Text 101AA00IECTMP.TXT over cell 10100AA_X0000.000, Dusk palette

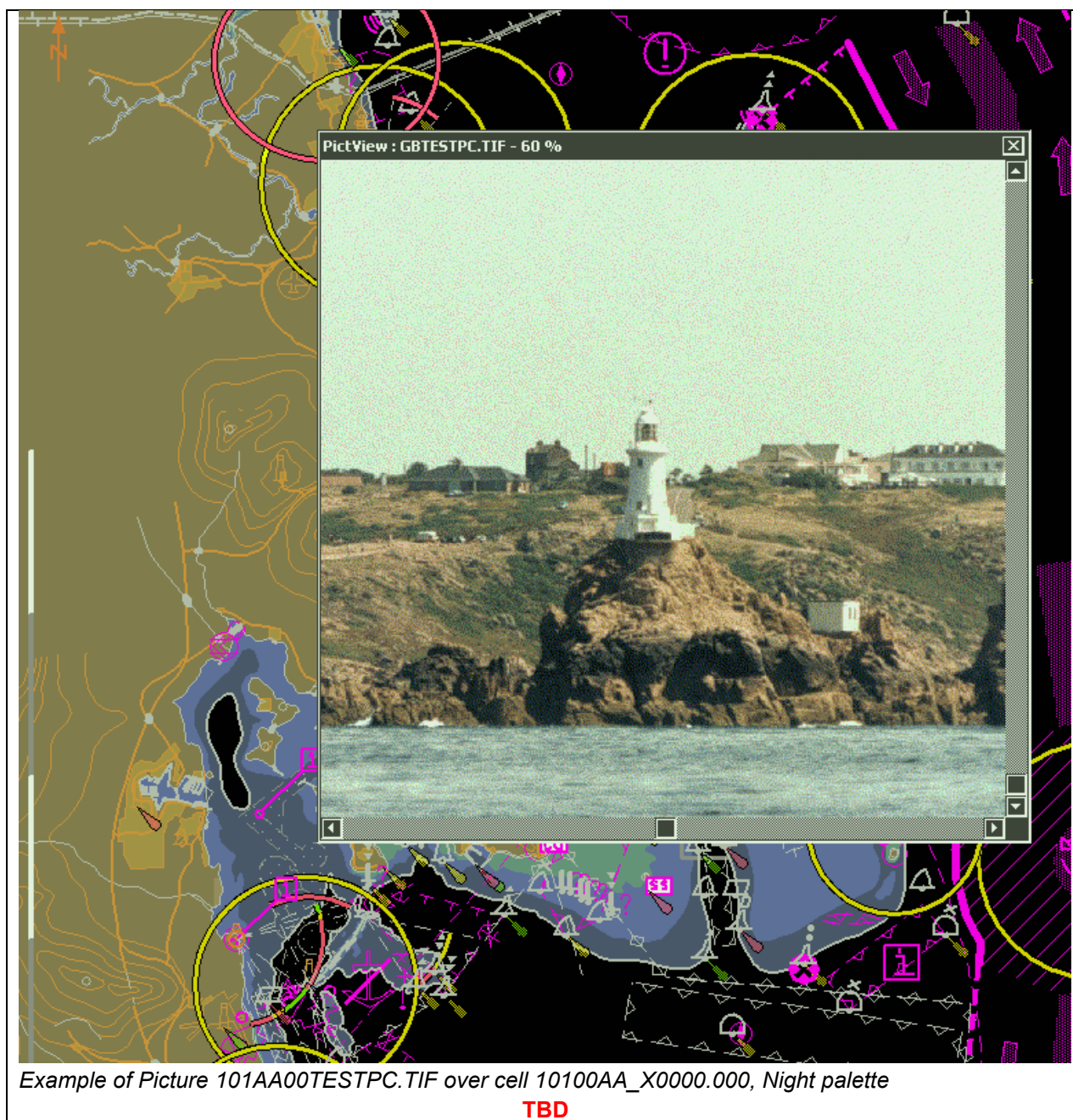
TBD

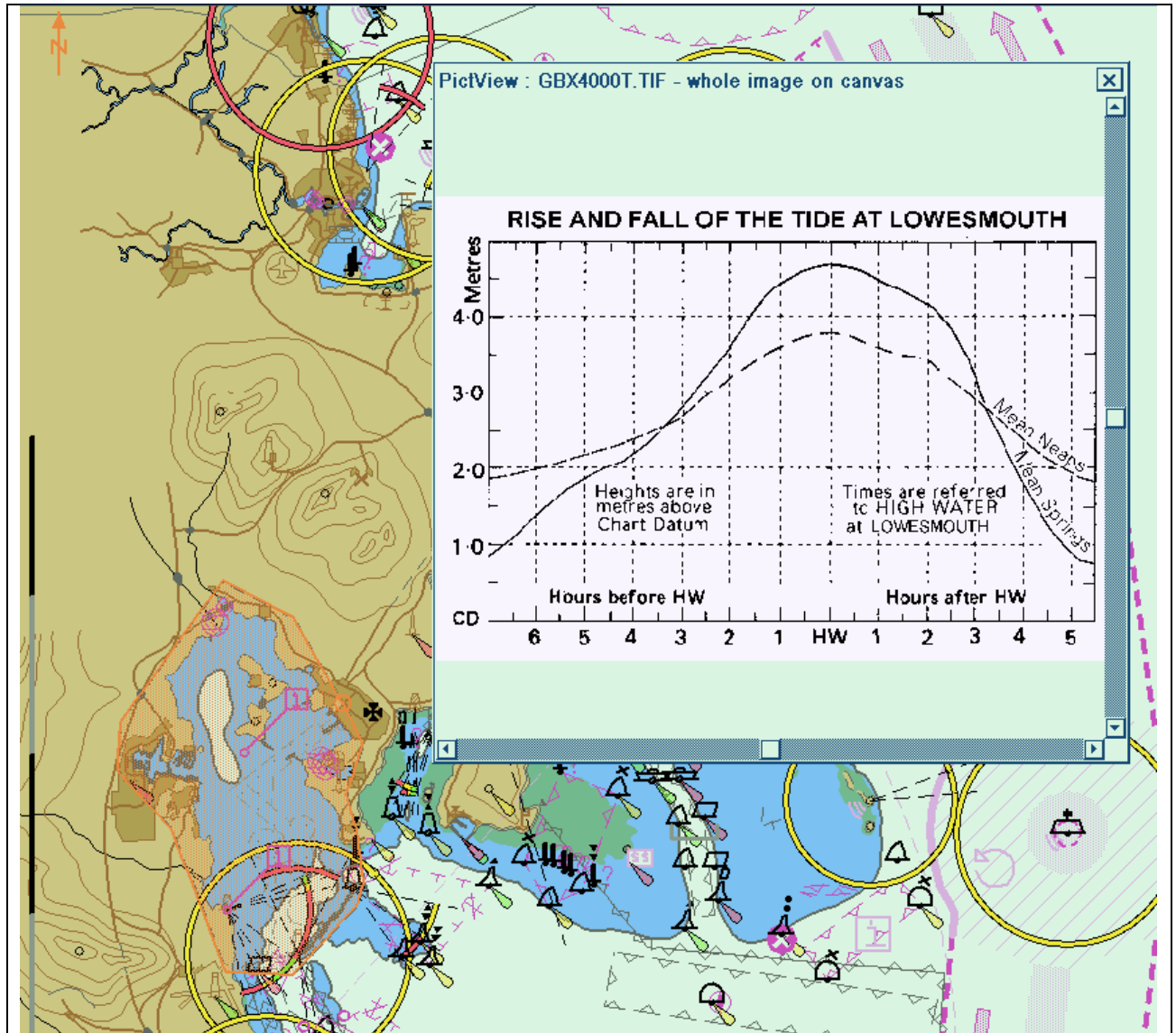


Example of Text 101AA00IECTMP.TXT over cell 10100AA_X0000.000, Night palette **tbd**

Test Reference	PictorialRepresentation	IHO Reference	S-98 15.2.2
Test description			
<i>Display of picture representation</i>			
Setup			
<i>As for test FeatureInformation</i>			
Action			
<p>1. Select an example of the attribute pictorialRepresentation</p> <p>1a. select landmark feature at 32°31.95'S 60°54.34'E and select picture representation for display;</p> <p>1b. select area feature of 32°30.25'S 60°54.64'E with NauticalInformation and select picture representation for display;</p> <p>2. Repeat step 1a and b for different light conditions (DAY, DUSK, NIGHT).</p>			
Results			
<p>1a. The picture 101AA00TESTPC.TIF must be displayed;</p> <p>1b. The picture 101AA00X4000T.TIF must be displayed;</p> <p>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.</p>			
 <p>Example of Picture 101AA00TESTPC.TIF over cell 10100AA_X0000.000, Day palette</p> <p style="color: red; text-align: center;">TBD</p>			








Example of Picture 101AA00X4000T.TIF over cell 10100AA_X0000.000, Day palette

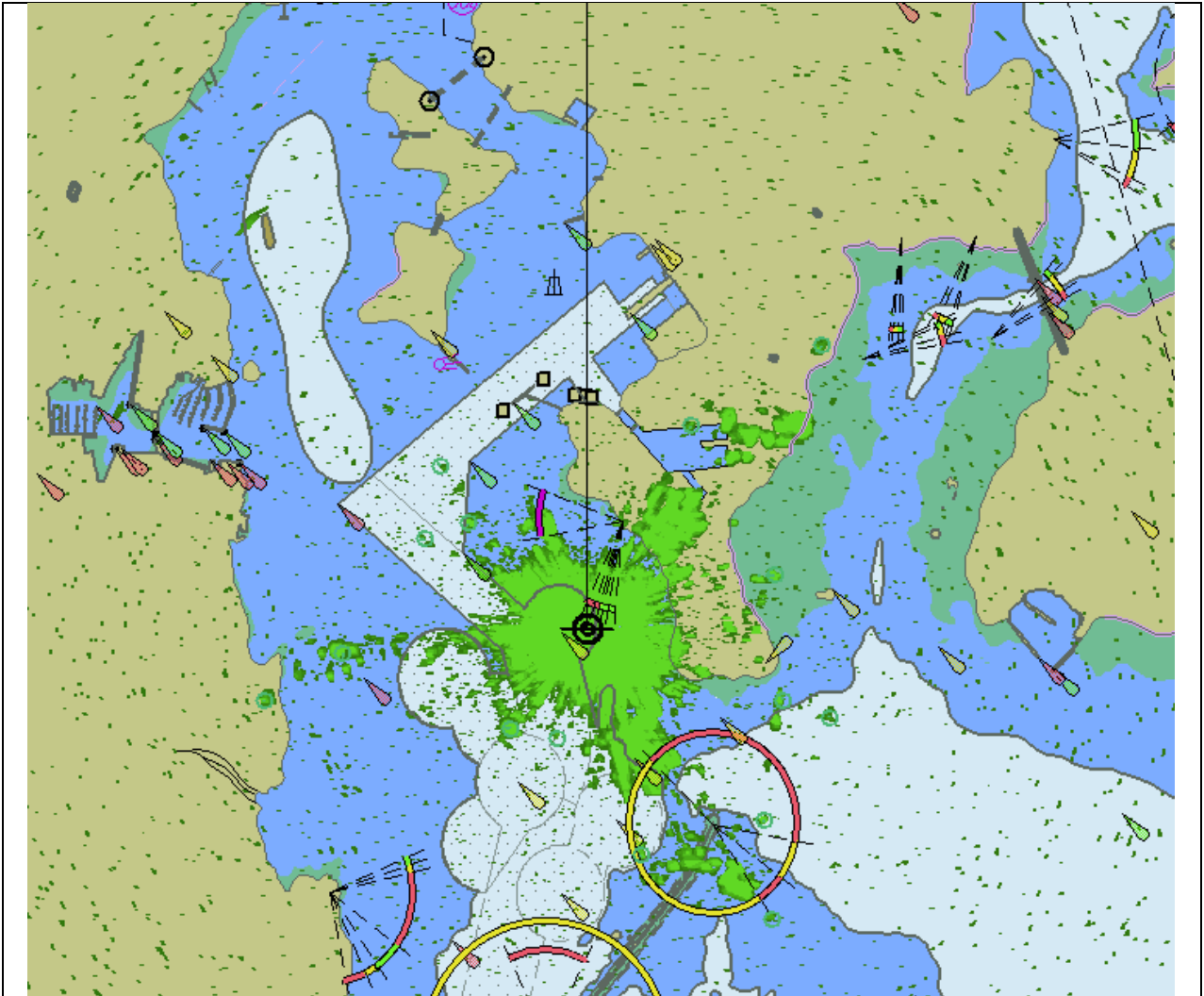
TBD

3.15 Radar and Plotting Information

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

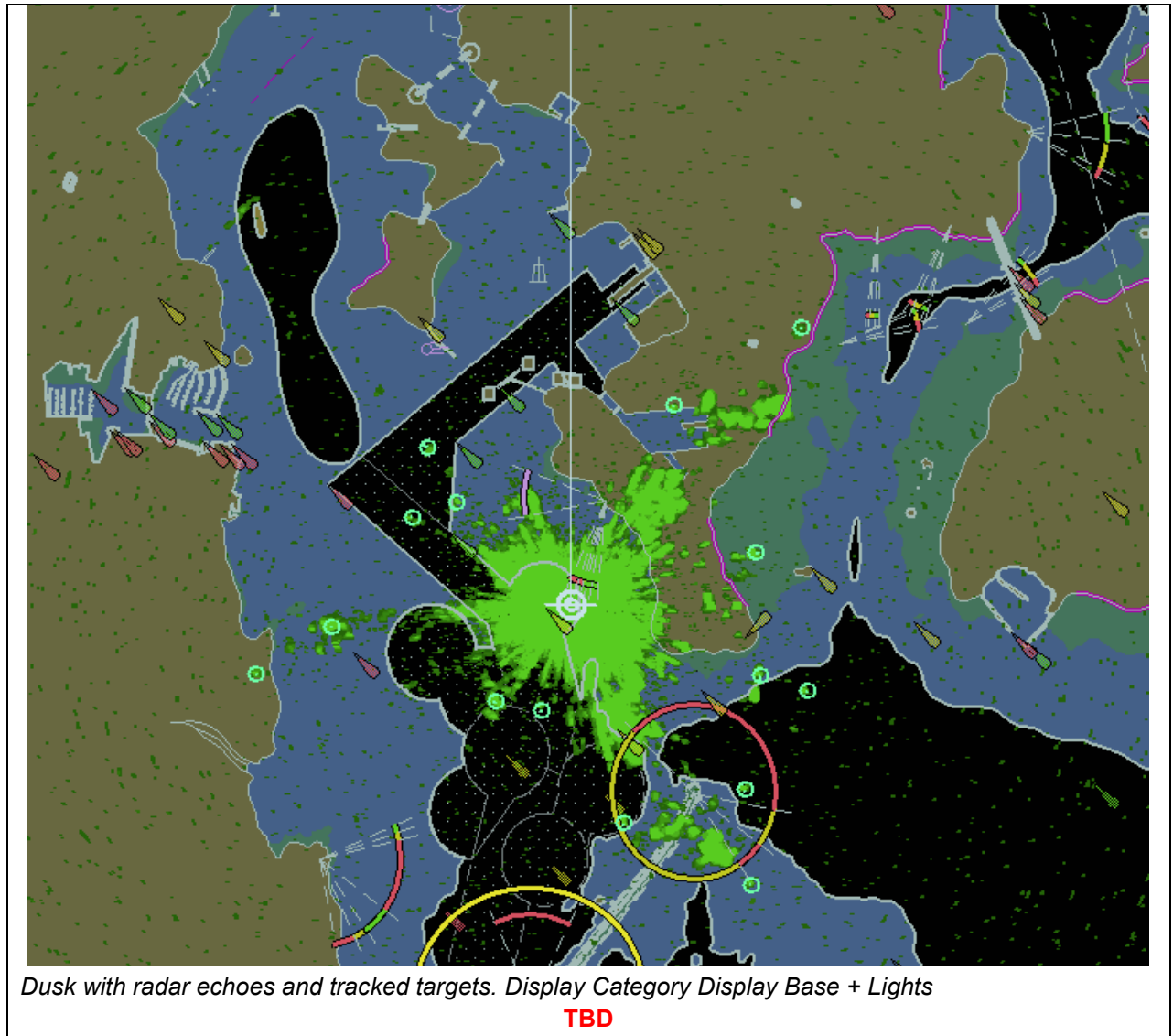
Test Reference	RadarOverlay	IHO Reference	S-98 9.2
Test Description			
<i>Display of Radar overlays with System Database information</i>			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			

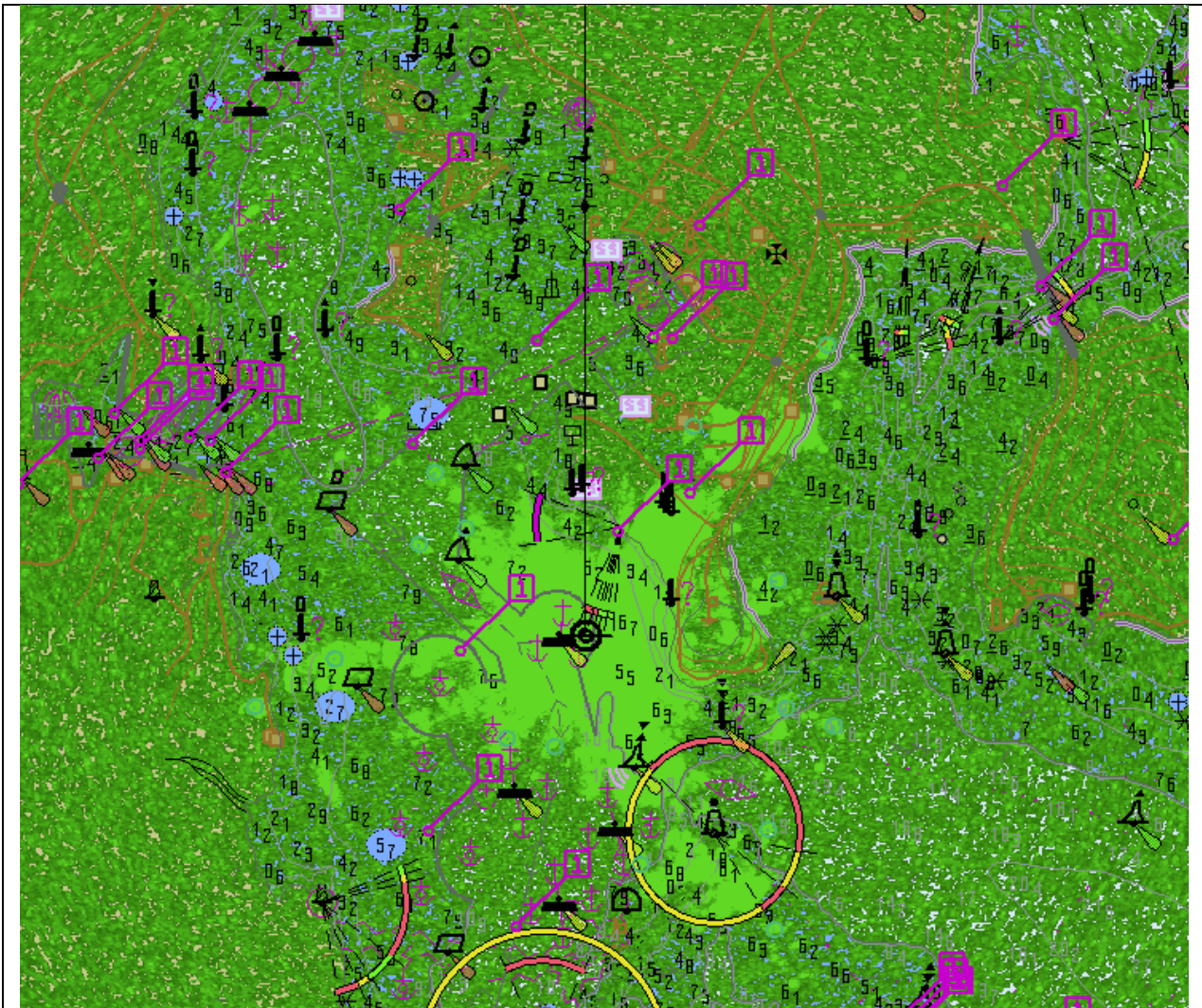
Alert Highlights (Standard)			
Additional			
Setup			
<p>Load exchange set PowerUp</p> <p>Display cell 10100AA_X01NE at 3 NM range scale</p> <ul style="list-style-type: none"> Select Safety contour value to 8 m Select Safety depth value to 8 m Select Plain boundaries <p>Set symbolized symbols to Off..</p>			
Action			
<p>Switch on the following (where available):</p> <ul style="list-style-type: none"> Radar image overlay Radar tracked target information <p>AIS information</p>			
Results			
<p>Confirm by observation that same System Database features 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 System Database features which shall be over or under radar echoes</p>			
			
<p>Day with radar tracked targets. Display Category Display Base + Lights</p> <p>TBD</p>			



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

TBD





Day with very noisy radar echoes and tracked targets. Display Category Other, Select Highlight info, Select Shallow water dangers.

Note: This example clearly shows which SYSTEM DATABASE features are above radar echoes

TBD



Dusk with very noisy radar echoes and tracked targets. Display Category Other, Select Highlight info, Select Shallow water dangers.

Note: This example clearly shows which SYSTEM DATABASE features are above radar echoes

TBD

3.16 Accuracy

Note:

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

The WGS-84 spheroid is defined by its semi-major axis and flattening $1/f = 1/298.257223563$.

The other parameters are derived from a and f.

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.

The tolerance for distances is 1% or 30m whichever is greater. The tolerance for bearings is 1°.

The positions used in this section are also included in the files "4.6 Accuracy-Geodesic.doc" and "4.6 Accuracy-Rhumb Lines.doc" in the "4.6 Accuracy" folder within the TDS.

3.16.1 Distance and azimuth between geographical positions

Test Reference	Accuracy1	IHO Reference	
Test description			
<i>True distance and azimuth between two geographical positions a).</i>			
Setup			
<i>Load the exchange set PowerUp</i>			
Action			
<i>Measure the distance and azimuth between the following two features:</i>			
<i>Viking 49/27-B 32°35.224'S 061°17.710'E</i>			
<i>Corund Cape Light 32°27.436'S 060°58.609'E</i>			
Results			
<i>Confirm that the results are as follows:</i>			
<i>True Distance 33193.554 m / 17.9231 NM</i>			
<i>Bearing from Viking 49/27-B to Corund Cape Light is 295.614 degrees</i>			
<i>Bearing from Corund Cape Light to Viking 49/27-B is 115.785 degrees</i>			

Test Reference	Accuracy2	IHO Reference	-
Test description			
<i>True distance and azimuth between two geographical positions b).</i>			
Setup			
<i>As for test Accuracy1</i>			
Action			
<i>Measure the distance and azimuth between the following two features:</i>			
<i>Viking 49/27-B 32°35.224'S 061°17.710'E</i> <i>Castlerigg Light 32°23.280'S 060°58.496'E</i>			
Results			
<i>Confirm that the results are as follows:</i>			
<i>True Distance 37326.351 m / 20.1546 NM</i> <i>Bearing from Viking 49/27-B to Castlerigg Light is 306.172 degrees</i> <i>Bearing from Castlerigg Light to Viking 49/27-B is 126.344 degrees</i>			

Test Reference	Accuracy3	IHO Reference	-
Test description			
<i>True distance and azimuth between two geographical positions c).</i>			
Setup			
<i>As for test Accuracy1</i>			
Action			
<i>Measure the distance and azimuth between the following two features:</i>			
<i>Corund Cape Light 32°27.447'S 060°58.599'E</i> <i>Worm Head Light 32°31.958'S 060°54.337'E</i>			
Results			
<i>Confirm that the results are as follows:</i>			
<i>True Distance 10680.859 m / 5.7672 NM</i> <i>Bearing from Corund Cape Light to Worm Head Light is 218.665 degrees</i> <i>Bearing from Worm Head Light to Corund Cape Light is 38.703 degrees</i>			

3.16.2 Geographical position from a known position and distance/azimuth

Test Reference	Accuracy4	IHO Reference	-
Test description			
<i>Geographical position from known position and distance/azimuth a).</i>			
Setup			
<i>As for test Accuracy1.</i>			
Action			
<i>From the following position:</i> <i>Viking 49/27-B 32°35.224'S 061°17.710'E</i> <i>Enter a distance and bearing of:</i> <i>True Distance 33193.554 m / 17.9231 NM</i> <i>Bearing 295.614 degrees</i>			
Results			
<i>Confirm that the end geographical position is:</i> <i>Corund Cape Light 32°27.436'S 060°58.609'E</i>			

Test Reference	Accuracy5	IHO Reference	-
Test description			
<i>Geographical position from known position and distance/azimuth b).</i>			
Setup			
As for test Accuracy1			
Action			
From the following position: Viking 49/27-B 32°35.224'S 061°17.710'E Enter a distance and bearing of: True Distance 37326.351 m / 20.1546 NM Bearing 306.172 degrees			
Results			
Confirm that the end geographical position is: Castlerigg Light 32°23.280'S 060°58.496'E			

Test Reference	Accuracy6	IHO Reference	-
Test description			
<i>Geographical position from known position and distance/azimuth c).</i>			
Setup			
As for test Accuracy1			
Action			
From the following position: Corund Cape Light 32°27.447'S 060°58.599'E Enter a distance and bearing of: True Distance 10680.859 m / 5.7672 NM Bearing 218.665 degrees			
Results			
Confirm that the end geographical position is: Worm Head Light 32° 31.958'S 60° 54.337'E			

3.16.3 Rhumb line distance and azimuth between geographical positions

Test Reference	Accuracy7	IHO Reference	-
Test description			
<i>Rhumb line distance and azimuth between two geographical positions a).</i>			
Setup			
Load the exchange set PowerUp			
Action			
Measure the distance and azimuth between the following two features: Viking 49/27-B 32°35.224'S 061°17.710'E Corund Cape Light 32°27.436'S 060°58.609'E			
Results			
Confirm that the results are as follows: True Distance 33193.567 m / 17.9231 NM Bearing from Viking 49/27-B to Corund Cape Light is 295.699 degrees Bearing from Corund Cape Light to Viking 49/27-B is 115.699 degrees			

Test Reference	Accuracy8	IHO Reference	-
Test description			
<i>Rhumb line distance and azimuth between two geographical positions b).</i>			
Setup			
<i>As for test Accuracy1</i>			
Action			
<i>Measure the distance and azimuth between the following two features:</i>			
<i>Viking 49/27-B 32°35.224'S 061°17.710'E</i> <i>Castlerigg Light 32°23.280'S 060°58.496'E</i>			
Results			
<i>Confirm that the results are as follows:</i>			
<i>True Distance 37326.365 m / 20.1546 NM</i> <i>Bearing from Viking 49/27-B to Castlerigg Light is 306.258 degrees</i> <i>Bearing from Castlerigg Light to Viking 49/27-B is 126.258 degrees</i>			

Test Reference	Accuracy9	IHO Reference	-
Test description			
<i>Rhumb line distance and azimuth between two geographical positions c).</i>			
Setup			
<i>As for test Accuracy1</i>			
Action			
<i>Measure the distance and azimuth between the following two features:</i>			
<i>Corund Cape Light 32°27.447'S 060°58.599'E</i> <i>Worm Head Light 32°31.958'S 060°54.337'E</i>			
Results			
<i>Confirm that the results are as follows:</i>			
<i>True Distance 10680.859 m / 5.7672 NM</i> <i>Bearing from Corund Cape Light to Worm Head Light is 218.684 degrees</i> <i>Bearing from Worm Head Light to Corund Cape Light is 38.684 degrees</i>			

3.16.4 Geodesics

Test Reference	Accuracy10	IHO Reference	-
Test description			
<i>Geodesic lines and circle, northern quadrant.</i>			
Setup			
<i>As for test Accuracy1</i>			
Action			
<i>Plot positions listed in sets 2-6 of the positions listed in section "Positions for use in Accuracy Tests – Geodesics".</i>			
Results			
<i>Confirm that the lines drawn pass through or sufficiently close to the listed positions and that the Geodesic circle corresponds to range rings at 2 000 000 m intervals.</i>			

Test Reference	Accuracy11	IHO Reference	-
Test description			
<i>Geodesic lines and circle, crossing the equator.</i>			
Setup			
<i>As for test Accuracy1</i>			
Action			
<i>Plot positions listed in sets 7-11 of the positions listed in section "Positions for use in Accuracy Tests – Geodetics".</i>			
Results			
<i>Confirm that the lines drawn pass through or sufficiently close to the listed positions and that the Geodesic circle corresponds to range rings at 2 000 000 m intervals.</i>			

Test Reference	Accuracy12	IHO Reference	-
Test description			
<i>Geodesic lines southern quadrant.</i>			
Setup			
<i>As for test Accuracy1</i>			
Action			
<i>Plot positions listed in sets 12-16 of the positions listed in section "Positions for use in Accuracy Tests – Geodetics".</i>			
Results			
<i>Confirm that the lines drawn pass through or sufficiently close to the listed positions and that the Geodesic circle corresponds to range rings at 2 000 000 m intervals.</i>			

3.16.5 Rhumb Lines

Test Reference	Accuracy13	IHO Reference	-
Test description			
<i>Rhumb lines, northern quadrant.</i>			
Setup			
<i>As for test Accuracy1</i>			
Action			
<i>Plot positions listed in sets 2-5 of the positions listed in section "Positions for use in Accuracy Tests – Rhumb Lines".</i>			
Results			
<i>Confirm that the lines drawn pass through or sufficiently close to the listed positions.</i>			

Test Reference	Accuracy14	IHO Reference	-
Test description			
<i>Rhumb lines, crossing the equator.</i>			
Setup			
<i>As for test Accuracy1.</i>			
Action			
<i>Plot positions listed in sets 6-9 of the positions listed in section "Positions for use in Accuracy Tests – Rhumb Lines".</i>			
Results			
<i>Confirm that the lines drawn pass through or sufficiently close to the listed positions.</i>			

Test Reference	Accuracy15	IHO Reference	-
Test description			
<i>Rhumb lines, southern quadrant.</i>			
Setup			
<i>As for test Accuracy1.</i>			
Action			
<i>Plot positions listed in sets 10-13 of the positions listed in section "Positions for use in Accuracy Tests – Rhumb Lines".</i>			
Results			
<i>Confirm that the lines drawn pass through or sufficiently close to the listed positions.</i>			

3.16.6 Positions for use in Accuracy Tests - Geodesics

The following sections contain a series of latitudes and longitudes which define a number of geodesics. These points are intended to allow type approval authorities to test the ability of ECDIS to calculate geodesics correctly.

Conversion of metres (m) to nautical miles (NM) uses

1 NM = 1852 m.

Set 1 Micklefirth

Usage Band 4

Viking 49/27-B 32°35.224S 061°17.710E
 Corund Cape Light 32°27.436S 060°58.609E
 True Distance 33193.554 m / 17.9231 NM
 Forward Bearing 295.614 degrees
 Reverse Bearing 115.785 degrees

Viking 49/27-B 32°35.224S 061°17.710E
 Castlerigg Light 32°23.280S 060°58.496E
 True Distance 37326.351 m / 20.1546 NM
 Forward Bearing 306.172 degrees
 Reverse Bearing 126.344 degrees

Usage Band 5

Corund Cape Light 32°27.447S 060°58.599E
 Worm Head Light 32°31.958S 060°54.337E
 True Distance 10680.859 m / 5.7672 NM
 Forward Bearing 218.665 degrees
 Reverse Bearing 38.703 degrees

Long Geodesics - North West Quadrant.

Set 2 Long Diagonal (30°N, 60°W to 60°N, 30°W)

Point1	30°00.0000N	060°00.0000W
Point2	31°38.1452N	059°05.9571W
Point3	33°15.8706N	058°09.9924W
Point4	34°53.1348N	057°11.9156W
Point5	36°29.8923N	056°11.5178W
Point6	38°06.0926N	055°08.5692W
Point7	39°41.6796N	054°02.8166W
Point8	41°16.5909N	052°53.9805W
Point9	42°50.7564N	051°41.7515W
Point10	44°24.0976N	050°25.7868W
Point11	45°56.5257N	049°05.7067W
Point12	47°27.9409N	047°41.0895W
Point13	48°58.2294N	046°11.4681W
Point14	50°27.2626N	044°36.3244W
Point15	51°54.8937N	042°55.0855W

Point16	53°20.9554N	041°07.1195W
Point17	54°45.2565N	039°11.7330W
Point18	56°07.5789N	037°08.1699W
Point19	57°27.6730N	034°55.6135W
Point20	58°45.2547N	032°33.1935W
Point21	60°00.0000N	030°00.0000W

Set 3 Long Diagonal (30°N, 30°W to 60°N, 60°W)

Point1	30°00.0000N	030°00.0000W
Point2	31°38.1452N	030°54.0429W
Point3	33°15.8706N	031°50.0076W
Point4	34°53.1348N	032°48.0844W
Point5	36°29.8923N	033°48.4822W
Point6	38°06.0926N	034°51.4308W
Point7	39°41.6796N	035°57.1833W
Point8	41°16.5909N	037°06.0195W
Point9	42°50.7564N	038°18.2485W
Point10	44°24.0976N	039°34.2132W
Point11	45°56.5257N	040°54.2933W
Point12	47°27.9409N	042°18.9105W
Point13	48°58.2294N	043°48.5319W
Point14	50°27.2626N	045°23.6756W
Point15	51°54.8937N	047°04.9145W
Point16	53°20.9554N	048°52.8805W
Point17	54°45.2565N	050°48.2670W
Point18	56°07.5789N	052°51.8301W
Point19	57°27.6730N	055°04.3865W
Point20	58°45.2547N	057°26.8065W
Point21	60°00.0000N	060°00.0000W

Set 4 Long Horizontal (45°N, 60°W to 45°N, 30°W)

Point1	45°00.0000N	060°00.0000W
Point2	45°11.2519N	058°31.7916W
Point3	45°21.3608N	057°03.0317W
Point4	45°30.3133N	055°33.7738W
Point5	45°38.0973N	054°04.0740W
Point6	45°44.7022N	052°33.9908W
Point7	45°50.1188N	051°03.5849W
Point8	45°54.3397N	049°32.9185W
Point9	45°57.3588N	048°02.0555W
Point10	45°59.1720N	046°31.0608W
Point11	45°59.7767N	045°00.0000W
Point12	45°59.1720N	043°28.9392W
Point13	45°57.3588N	041°57.9446W
Point14	45°54.3397N	040°27.0815W
Point15	45°50.1188N	038°56.4152W
Point16	45°44.7022N	037°26.0092W
Point17	45°38.0973N	035°55.9260W
Point18	45°30.3133N	034°26.2263W
Point19	45°21.3608N	032°56.9684W
Point20	45°11.2519N	031°28.2085W
Point21	45°00.0000N	030°00.0000W

Set 5 Long Vertical (30°N, 45°W to 60°N, 45°W)

The geodesic runs along the 45°W meridian.

Set 6 Circle (Centre 45°N, 45°W Radius 2 000 000 m Points every 15 degrees)

Point1	62°58.1482N	045°00.0000W
Point2	62°02.9175N	035°13.1324W
Point3	59°29.7703N	027°21.3716W
Point4	55°47.3417N	022°13.6842W
Point5	51°25.6105N	019°41.1668W
Point6	46°49.0062N	019°14.2861W
Point7	42°16.1548N	020°24.1958W
Point8	38°1.4970N	022°48.2871W
Point9	34°16.6609N	026°09.5368W
Point10	31°11.2085N	030°14.5458W
Point11	28°52.8672N	034°51.8044W
Point12	27°27.4359N	039°50.5197W
Point13	26°58.5455N	045°00.0000W
Point14	27°27.4359N	050°09.4803W
Point15	28°52.8672N	055°08.1956W
Point16	31°11.2085N	059°45.4542W
Point17	34°16.6609N	063°50.4632W
Point18	38°01.4970N	067°11.7129W
Point19	42°16.1548N	069°35.8042W
Point20	46°49.0062N	070°45.7139W
Point21	51°25.6105N	070°18.8332W
Point22	55°47.3417N	067°46.3158W
Point23	59°29.7703N	062°38.6284W
Point24	62°02.9175N	054°46.8676W
Point25	62°58.1482N	045°00.0000W

Long Geodesics (Crossing Equator).**Set 7 Long Diagonal (15°N, 60°W to 15°S, 30°W)**

Point1	15°00.0000N	060°00.0000W
Point2	13°31.8194N	058°26.4185W
Point3	12°03.0524N	056°53.9818W
Point4	10°33.7708N	055°22.5552W
Point5	09°04.0440N	053°52.0065W
Point6	07°33.9393N	052°22.2057W
Point7	06°03.5224N	050°53.0251W
Point8	04°32.8574N	049°24.3384W
Point9	03°02.0073N	047°56.0210W
Point10	01°31.0343N	046°27.9492W
Point11	00°00.0000N	045°00.0000W
Point12	01°31.0343S	043°32.0508W
Point13	03°02.0073S	042°03.9789W
Point14	04°32.8574S	040°35.6615W
Point15	06°03.5224S	039°06.9749W
Point16	07°33.9393S	037°37.7942W
Point17	09°04.0440S	036°07.9935W
Point18	10°33.7708S	034°37.4447W
Point19	12°03.0524S	033°06.0182W
Point20	13°31.8194S	031°33.5815W

Point21 15°00.0000S 030°00.0000W

Set 8 Long Diagonal (15°N, 30°W to 15°S, 60°W)

Point1	15°00.0000N	030°00.0000W
Point2	13°31.8194N	031°33.5815W
Point3	12°03.0524N	033°06.0182W
Point4	10°33.7708N	034°37.4448W
Point5	09°04.0440N	036°07.9935W
Point6	07°33.9393N	037°37.7943W
Point7	06°03.5224N	039°06.9749W
Point8	04°32.8574N	040°35.6616W
Point9	03°02.0073N	042°03.9790W
Point10	01°31.0343N	043°32.0508W
Point11	00°00.0000N	045°00.0000W
Point12	01°31.0343S	046°27.9492W
Point13	03°02.0073S	047°56.0211W
Point14	04°32.8574S	049°24.3385W
Point15	06°03.5224S	050°53.0251W
Point16	07°33.9393S	052°22.2058W
Point17	09°04.0440S	053°52.0065W
Point18	10°33.7708S	055°22.5553W
Point19	12°03.0524S	056°53.9819W
Point20	13°31.8194S	058°26.4185W
Point21	15°00.0000S	060°00.0000W

Set 9 Long Horizontal (0°N, 60°W to 0°N, 30°W)

The geodesic runs along the Equator.

Set 10 Long Vertical (15°S, 45°W to 15°N, 45°W)

The geodesic runs along the 45°W meridian.

Set 11 Circle (Centre 0°N, 45°W Radius 2 000 000 m Points every 15 degrees)

Point1	18°04.8887N	045°00.0000W
Point2	17°26.7433N	040°12.0936W
Point3	15°35.6306N	035°47.3375W
Point4	12°40.8191N	032°05.0570W
Point5	08°55.8234N	029°18.7826W
Point6	04°36.5608N	027°36.4877W
Point7	00°00.0000N	027°02.0217W
Point8	04°36.5608S	027°36.4877W
Point9	08°55.8234S	029°18.7826W
Point10	12°40.8191S	032°05.0570W
Point11	15°35.6306S	035°47.3375W
Point12	17°26.7433S	040°12.0936W
Point13	18°04.8887S	045°00.0000W
Point14	17°26.7433S	049°47.9064W
Point15	15°35.6306S	054°12.6625W
Point16	12°40.8191S	057°54.9430W
Point17	08°55.8234S	060°41.2174W
Point18	04°36.5608S	062°23.5123W
Point19	00°00.0000N	062°57.9783W
Point20	04°36.5608N	062°23.5123W

Point21	08°55.8234N	060°41.2174W
Point22	12°40.8191N	057°54.9430W
Point23	15°35.6306N	054°12.6625W
Point24	17°26.7433N	049°47.9064W
Point25	18°04.8887N	045°00.0000W

Long Geodesics - South West Quadrant.

Set 12 Long Diagonal (30°S, 60°W to 60°S, 30°W)

Point1	30°00.0000S	060°00.0000W
Point2	31°38.1452S	059°05.9571W
Point3	33°15.8706S	058°09.9924W
Point4	34°53.1348S	057°11.9156W
Point5	36°29.8923S	056°11.5178W
Point6	38°06.0926S	055°08.5692W
Point7	39°41.6796S	054°02.8166W
Point8	41°16.5909S	052°53.9805W
Point9	42°50.7564S	051°41.7515W
Point10	44°24.0976S	050°25.7868W
Point11	45°56.5257S	049°05.7067W
Point12	47°27.9409S	047°41.0895W
Point13	48°58.2294S	046°11.4681W
Point14	50°27.2626S	044°36.3244W
Point15	51°54.8937S	042°55.0855W
Point16	53°20.9554S	041°07.1195W
Point17	54°45.2565S	039°11.7330W
Point18	56°07.5789S	037°08.1699W
Point19	57°27.6730S	034°55.6135W
Point20	58°45.2547S	032°33.1935W
Point21	60°00.0000S	030°00.0000W

Set 13 Long Diagonal (30°S, 30°W to 60°S, 60°W)

Point1	30°00.0000S	030°00.0000W
Point2	31°38.1452S	030°54.0429W
Point3	33°15.8706S	031°50.0076W
Point4	34°53.1348S	032°48.0844W
Point5	36°29.8923S	033°48.4822W
Point6	38°06.0926S	034°51.4308W
Point7	39°41.6796S	035°57.1833W
Point8	41°16.5909S	037°06.0195W
Point9	42°50.7564S	038°18.2485W
Point10	44°24.0976S	039°34.2132W
Point11	45°56.5257S	040°54.2933W
Point12	47°27.9409S	042°18.9105W
Point13	48°58.2294S	043°48.5319W
Point14	50°27.2626S	045°23.6756W
Point15	51°54.8937S	047°04.9145W
Point16	53°20.9554S	048°52.8805W
Point17	54°45.2565S	050°48.2670W
Point18	56°07.5789S	052°51.8301W
Point19	57°27.6730S	055°04.3865W
Point20	58°45.2547S	057°26.8065W
Point21	60°00.0000S	060°00.0000W

Set 14 Long Horizontal (45°S, 60°W to 45°S, 30°W)

Point1	45°00.0000S	060°00.0000W
Point2	45°11.2519S	058°31.7916W
Point3	45°21.3608S	057°03.0317W
Point4	45°30.3133S	055°33.7738W
Point5	45°38.0973S	054°04.0740W
Point6	45°44.7022S	052°33.9908W
Point7	45°50.1188S	051°03.5849W
Point8	45°54.3397S	049°32.9185W
Point9	45°57.3588S	048°02.0555W
Point10	45°59.1720S	046°31.0608W
Point11	45°59.7767S	045°00.0000W
Point12	45°59.1720S	043°28.9392W
Point13	45°57.3588S	041°57.9446W
Point14	45°54.3397S	040°27.0815W
Point15	45°50.1188S	038°56.4152W
Point16	45°44.7022S	037°26.0092W
Point17	45°38.0973S	035°55.9260W
Point18	45°30.3133S	034°26.2263W
Point19	45°21.3608S	032°56.9684W
Point20	45°11.2519S	031°28.2085W
Point21	45°00.0000S	030°00.0000W

Set 15 Long Vertical (30°S, 45°W to 60°S, 45°W)

The geodesic runs along the 45°W meridian.

Set 16 Circle (Centre 45°S, 45°W Radius 2 000 000 m Points every 15 degrees)

Point1	62°58.1482S	045°00.0000W
Point2	62°02.9175S	035°13.1324W
Point3	59°29.7703S	027°21.3716W
Point4	55°47.3417S	022°13.6842W
Point5	51°25.6105S	019°41.1668W
Point6	46°49.0062S	019°14.2861W
Point7	42°16.1548S	020°24.1958W
Point8	38°01.4970S	022°48.2871W
Point9	34°16.6609S	026°09.5368W
Point10	31°11.2085S	030°14.5458W
Point11	28°52.8672S	034°51.8044W
Point12	27°27.4359S	039°50.5197W
Point13	26°58.5455S	045°00.0000W
Point14	27°27.4359S	050°09.4803W
Point15	28°52.8672S	055°08.1956W
Point16	31°11.2085S	059°45.4542W
Point17	34°16.6609S	063°50.4632W
Point18	38°01.4970S	067°11.7129W
Point19	42°16.1548S	069°35.8042W
Point20	46°49.0062S	070°45.7139W
Point21	51°25.6105S	070°18.8332W
Point22	55°47.3417S	067°46.3158W
Point23	59°29.7703S	062°38.6284W
Point24	62°02.9175S	054°46.8676W
Point25	62°58.1482S	045°00.0000W

3.16.7 Positions for use in Accuracy Tests – Rhumb Lines

The following sections contain a series of latitudes and longitudes which define a number of rhumb lines. These points are intended to allow type approval authorities to test the ability of ECDIS to calculate rhumb lines correctly.

All calculations are based on the WGS-84 spheroid:

Semi-major axis	6378137.0000m
Semi-minor axis	6356752.3142m
Eccentricity squared	0.0066943800
Flattening	298.25722356

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

Set 1 – not applicable

Long Rhumb Lines - North West Quadrant.

Set 2 Long Diagonal (30°N, 30°W to 60°N, 60°W)

Point1	30°00.0000N	030°00.0000W
Point2	31°30.2165N	031°11.4806W
Point3	33°00.4119N	032°24.1146W
Point4	34°30.5854N	033°37.9913W
Point5	36°00.7368N	034°53.2065W
Point6	37°30.8656N	036°09.8628W
Point7	39°00.9713N	037°28.0713W
Point8	40°31.0539N	038°47.9519W
Point9	42°01.1129N	040°09.6347W
Point10	43°31.1484N	041°33.2615W
Point11	45°01.1601N	042°58.9871W
Point12	46°31.1481N	044°26.9812W
Point13	48°01.1124N	045°57.4306W
Point14	49°31.0531N	047°30.5417W
Point15	51°00.9704N	049°06.5435W
Point16	52°30.8645N	050°45.6910W
Point17	54°00.7358N	052°28.2698W
Point18	55°30.5845N	054°14.6010W
Point19	57°00.4111N	056°05.0479W
Point20	58°30.2161N	058°00.0234W
Point21	60°00.0000N	060°00.0000W

Set 3 Long Diagonal (60°N, 30°W to 30°N, 60°W)

Point1	60°00.0000N	030°00.0000W
Point2	58°30.2161N	031°59.9767W
Point3	57°00.4111N	033°54.9521W
Point4	55°30.5845N	035°45.3990W
Point5	54°00.7358N	037°31.7302W
Point6	52°30.8645N	039°14.3090W
Point7	51°00.9704N	040°53.4565W
Point8	49°31.0531N	042°29.4583W
Point9	48°01.1124N	044°02.5694W
Point10	46°31.1481N	045°33.0188W

Point11	45°01.1601N	047°01.0129W
Point12	43°31.1484N	048°26.7385W
Point13	42°01.1129N	049°50.3653W
Point14	40°31.0539N	051°12.0481W
Point15	39°00.9713N	052°31.9287W
Point16	37°30.8656N	053°50.1372W
Point17	36°00.7368N	055°06.7935W
Point18	34°30.5854N	056°22.0087W
Point19	33°00.4119N	057°35.8854W
Point20	31°30.2165N	058°48.5194W
Point21	30°00.0000N	060°00.0000W

Set 4 Long Horizontal (45°N, 60°W to 45°N, 30°W)

The rhumb line runs along the 45°N parallel.

Set 5 Long Vertical (30°N, 45°W to 60°N, 45°W)

The rhumb line runs along the 45°W meridian.

Long Rhumb Lines (Crossing Equator).

Set 6 Long Diagonal (15°N, 60°W to 15°S, 30°W)

Point1	15°00.0000N	060°00.0000W
Point2	13°30.0344N	058°28.2185W
Point3	12°00.0581N	056°57.0084W
Point4	10°30.0722N	055°26.3012W
Point5	09°00.0778N	053°56.0303W
Point6	07°30.0761N	052°26.1306W
Point7	06°00.0683N	050°56.5384W
Point8	04°30.0555N	049°27.1908W
Point9	03°00.0391N	047°58.0260W
Point10	01°30.0202N	046°28.9826W
Point11	00°00.0000N	045°00.0000W
Point12	01°30.0202S	043°31.0173W
Point13	03°00.0391S	042°01.9740W
Point14	04°30.0555S	040°32.8092W
Point15	06°00.0683S	039°03.4616W
Point16	07°30.0761S	037°33.8694W
Point17	09°00.0778S	036°03.9697W
Point18	10°30.0722S	034°33.6988W
Point19	12°00.0581S	033°02.9916W
Point20	13°30.0344S	031°31.7815W
Point21	15°00.0000S	030°00.0000W

Set 7 Long Diagonal (15°N, 30°W to 15°S, 60°W)

Point1	15°00.0000N	030°00.0000W
Point2	13°30.0344N	031°31.7815W
Point3	12°00.0581N	033°02.9916W
Point4	10°30.0722N	034°33.6988W
Point5	09°00.0778N	036°03.9697W
Point6	07°30.0761N	037°33.8694W
Point7	06°00.0683N	039°03.4616W
Point8	04°30.0555N	040°32.8092W

Point9	03°00.0391N	042°01.9740W
Point10	01°30.0202N	043°31.0174W
Point11	00°00.0000N	045°00.0000W
Point12	01°30.0202S	046°28.9827W
Point13	03°00.0391S	047°58.0260W
Point14	04°30.0555S	049°27.1908W
Point15	06°00.0683S	050°56.5384W
Point16	07°30.0761S	052°26.1306W
Point17	09°00.0778S	053°56.0303W
Point18	10°30.0722S	055°26.3012W
Point19	12°00.0581S	056°57.0084W
Point20	13°30.0344S	058°28.2185W
Point21	15°00.0000S	060°00.0000W

Set 8 Long Horizontal (0°N, 60°W to 0°N, 30°W)

The rhumb line runs along the Equator.

Set 9 Long Vertical (15°S, 45°W to 15°N, 45°W)

The rhumb line runs along the 45°W meridian.

Long Rhumb Lines - South West Quadrant.

Set 10 Long Diagonal (30°S, 30°W to 60°S, 60°W)

Point1	30°00.0000S	030°00.0000W
Point2	31°30.2165S	031°11.4806W
Point3	33°00.4119S	032°24.1146W
Point4	34°30.5854S	033°37.9913W
Point5	36°00.7368S	034°53.2065W
Point6	37°30.8656S	036°09.8628W
Point7	39°00.9713S	037°28.0713W
Point8	40°31.0539S	038°47.9519W
Point9	42°01.1129S	040°09.6347W
Point10	43°31.1484S	041°33.2615W
Point11	45°01.1601S	042°58.9871W
Point12	46°31.1481S	044°26.9812W
Point13	48°01.1124S	045°57.4306W
Point14	49°31.0531S	047°30.5417W
Point15	51°00.9704S	049°06.5435W
Point16	52°30.8645S	050°45.6910W
Point17	54°00.7358S	052°28.2698W
Point18	55°30.5845S	054°14.6010W
Point19	57°00.4111S	056°05.0479W
Point20	58°30.2161S	058°00.0234W
Point21	60°00.0000S	060°00.0000W

Set 11 Long Diagonal (60°S, 30°W to 30°S, 60°W)

Point1	60°00.0000S	030°00.0000W
Point2	58°30.2161S	031°59.9767W
Point3	57°00.4111S	033°54.9521W
Point4	55°30.5845S	035°45.3990W
Point5	54°00.7358S	037°31.7302W
Point6	52°30.8645S	039°14.3090W

Point7	51°00.9704S	040°53.4565W
Point8	49°31.0531S	042°29.4583W
Point9	48°01.1124S	044°02.5694W
Point10	46°31.1481S	045°33.0188W
Point11	45°01.1601S	047°01.0129W
Point12	43°31.1484S	048°26.7385W
Point13	42°01.1129S	049°50.3653W
Point14	40°31.0539S	051°12.0481W
Point15	39°00.9713S	052°31.9287W
Point16	37°30.8656S	053°50.1372W
Point17	36°00.7368S	055°06.7935W
Point18	34°30.5854S	056°22.0087W
Point19	33°00.4119S	057°35.8854W
Point20	31°30.2165S	058°48.5194W
Point21	30°00.0000S	060°00.0000W

Set 12 Long Horizontal (45°S, 60°W to 45°S, 30°W)

The rhumb line runs along the 45°S parallel.

Set 13 Long Vertical (30°S, 45°W to 60°S, 45°W)

The rhumb line runs along the 45°W meridian.

3.17 Symbols

3.17.1 Symbol Size

Test Reference	SymbolSize	IHO Reference	S-98 10.2.3
Test description			
<i>Display of symbols in size shown in the IHO Presentation Library.</i>			
Setup			
<i>Load the exchange set PowerUp</i>			
Action			
<i>Perform zoom-in and zoom-out operations in each Display Category.</i>			
Results			
<i>Confirm that the symbols do not decrease in size below that shown in the IHO Presentation Library.</i>			

3.17.2 Display of ECDIS chart 1 symbols of correct size

Test Reference	Chart1Symbols	IHO Reference	S-98 19.6.1 S-98 10.2.2
Test description			
<i>Display of the check symbol of the correct size (in mm).</i>			
Setup			
<i>Use the ECDIS to access Chart 1 OR Load the exchange set Chart1</i>			
Action			
<i>Observe the CHKSYM01 symbol within the Information about the chart display (A,B) section.</i>			
Results			
<i>Confirm that the height of the CHKSYM01 symbol is not less than 5.0mm and not greater than 5.5mm.</i>			

3.17.3 Size in pixels of the check symbol CHKSYM01

Test Reference	CheckSym	IHO Reference	S-98 10.2.2
Test description			
<i>Display of the check symbol of the correct size (in pixels).</i>			
Setup			
<i>As for test Chart1Symbols</i>			
Action			
<i>Observe the CHKSYM01 symbol within the Information about the chart display (A,B) section.</i>			
Results			
<i>Confirm that the number of pixels (lines) which comprise the vertical extent of the symbol CHKSYM01 is not less than 16.</i>			
<i>This test may be conducted by calculation based on the properties of the EUT.</i>			

3.17.4 Display of text at the correct size

Test Reference	TextSize	IHO Reference	S-52 [3.1.5]
Test description			
<i>Display of text within the chart display and pick report.</i>			
Setup			
<i>Load the exchange set PowerUp</i>			
Action			
<i>Observe the chart display. Pick a feature and observe the text within the pick report. Create a Mariner's note with text and observe its display.</i>			
Results			
<i>Based on viewing distance specified in manufacturer manuals, confirm that for all text observed the height of upper-case characters is not less than 3.5 mm per 1 metre viewing distance</i>			

3.17.5 ECDIS Chart 1

Test Reference	Chart 1	IHO Reference	S-98 Chart 1
Test description			
<i>Access to chart 1 datasets</i>			
Setup			
<i>Load the exchange set Chart 1</i>			
Action			
<i>Monitor the display at a viewing scale of 1:20,000</i>			
Results			
<i>TODO: Align these tests with full S-98 text Confirm correct display of Chart 1 datasets</i>			

3.17.6 Display redraw

Test Reference	Redraw	IHO Reference	S-98 19.1
Test description			
<i>Display of text within the chart display and pick report.</i>			
Setup			
<i>Load the exchange set PowerUp</i> <ul style="list-style-type: none"> • <i>Select North up true motion</i> • <i>Select Display Category Other</i> • <i>Select All Independent Mariner selectors</i> • <i>Simulate the own ship's movement from Mickelfirth through the Mickelfirth channel and to the Mickleden TSS roundabout.</i> 			
Action			
<i>Monitor the display at a viewing scale of 1:20,000</i>			
Results			
<i>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 and confirm that the display redraws in 5 seconds or informs the user and retains the previous display until ready.</i>			

3.18 Units and Legend

Test Reference	UnitsLegend	IHO Reference	S-98 9.1.5
Test description			
Display units and chart legend.			
Setup			
Load the exchange set PowerUp			
Action			
Select a position for display applicable chart legend			
Results			
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	m		
Units for height	m		
Note: Units for depth and height: Although the ENC Product Specification, S-101 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 optimum display scale) Overscale indication where appropriate.		
Data quality indicator	a. category of zone of confidence attribute of the Quality of Bathymetric Data feature for bathymetric data. b. Quality of Non Bathymetric Data attribute (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 features 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 m).		
Value of safety contour	Selected by Mariner (default is 30 m).		
Note: If the Mariner has selected a contour that is not available in the ENC and the EUT displays a default contour, both the contour selected and the contour displayed shall be quoted.			
Magnetic variation	Value of Magnetic variation, RYRMGV and VALACM of the MAGVAR feature shall be displayed as: VALMAG RYRMGV (VALACM) For example, 4°15W 1990 (8'E)		
Edition number and date of issue of the datasets currently in use	Edition number and date of issue of the datasets currently in use Edition Number – Issue date -		
Date and number of latest update affecting chart cells currently in use	Issue date and update number of the last update cell update file (ER data set) applied. Issue Date – 20010409 Update Number - 0		
Projection	The ENC chart projection in use		
WLA Method	The method of water level adjustment (if used)		
In addition, the following units shall be indicated:			
- position;			
- distance;			
- speed.			

3.18.1 Legend – Multiple Product Specifications.

Test Reference	LegendItems	IHO Reference	S-98 9.1.5
Test description			
<p><i>Multiple product specifications (particularly gridded data) may have an effect on the Legend and the interpretation of the requirement in S-98: This test adds those elements.</i></p> <ul style="list-style-type: none">• <i>Test behaviour of the legend with multiple product specifications loaded.</i>			

3.19 Other ECDIS and Chart Related Functionality

3.19.1 ECDIS Chart 1

Test Reference	ChartOne	IHO Reference	S-52 19.6.1
Test Description			
<i>Display of ECDIS chart 1</i>			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	On
Safety contour	10	Highlight date dependent	
Safety depth	8	Highlight document	
Deep Contour	30	Highlight info	
Shallow contour	5	Shallow pattern	
Four shades	On	Unknown	On
Radar overlay		Update review	
Plain boundaries	Off	Text Groups	On
Simplified symbols	Off	Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routeing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			

Setup			
Ensure the ECDIS has a feature to allow Chart 1 to be displayed			
Action			
<p><i>Navigate to ECDIS chart 1.</i></p> <p><i>Compare the displayed image with the plots shown below</i></p> <p>[any other instructions for display? NFN?]</p> <p><i>Screen plots are as displayed by compilation scale, that is 1:60 000 or 1:14 000. Screen plot number 1 is 1:60 000 and all others are 1:14 000.</i></p> <ol style="list-style-type: none"> <i>Two of the screen plots (numbers 11 and 13) use “Select Simplified Point Symbols”</i> <i>One screen plot (number 6) use “Select Accuracy”.</i> 			
Results			
<p><i>Confirm that ECDIS chart 1 is displayed and fills the screen when first displayed</i></p> <p><i>Confirm that the displayed images are consistent with the plots provided</i></p> <p><i>Ensure Chart 1 is labelled Not For Navigation</i></p> <p><i>Confirm Revision information of Chart 1 – issue date and edition number should be 2.0.0</i></p>			

Test Reference	ChartOne2	IHO Reference	S-52 19.6.1
Test description			
<i>Interrogation of ECDIS chart 1.</i>			
Setup			
<i>With ECDIS chart 1 displayed.</i>			
Action			
<i>Interrogate 3 symbols by cursor pick.</i>			
Results			
<p>[Requires input from the Chart 1 datasets according to S-98]</p> <p><i>Upon interrogation the description of the feature is presented.</i></p>			

3.19.2 Use of the Colour Differentiation Diagram

The following preparatory text has been brought from S-98 into S-164 and provides instructions for testers carrying out ECDIS type approval.

These procedures should be carried out prior to executing the tests on the colour differentiation diagram.

The dusk and night tables should be checked by means of the colour differentiation test diagram, which is provided as an S-101 file.

Prior to the test:

(1) The person carrying out the test should have passed the Ishihara colour blindness test, or other test used to qualify bridge watch keepers, and should adapt to night viewing for 10 minutes before checking the night display;

(2) The controls should be set to their calibrated settings;

(3) While the display is off, adjust the ambient light reflected from white paper positioned on the display screen to the following values:

Colour profile	Light level
Day	200 cd/sq. m
Dusk	10 cd/sq. m
Night	darkness (the ECDIS display is the predominant light source)

Preferably use natural daylight for the day table;

The tester should also ensure that the colour differentiation diagram has the correct issue date and edition number (from IHO).

The Colour Test must be applied on the day and dusk colour tables.

Before the Colour Test diagram is used, the black-adjust symbol BLKADJ01 must be brought up on the screen and the contrast and brightness controls (or equivalent controls for an LCD) must be adjusted as follows:

1 First, set contrast to a maximum, brightness to a minimum. Look at the black-adjust symbol. Then either:

2A If the centre square is not visible, turn up the brightness until it just appears;

or

2B If the centre square is clearly visible (with contrast at maximum, brightness at minimum), turn the contrast down until the inner square disappears, then turn contrast back up until the inner square is just visible again.

(If the above adjustment is not successful, select a more appropriate colour table and repeat this procedure).

The "black level" is then correctly set. If a brighter display is required use the contrast control, but preferably do not adjust the controls unless lighting conditions on the bridge change.

The test consists of being able to distinguish the background colours and to pick out the like foreground colours, that is to say that squares 3, 5, 11, 15, 18 and 20 all have a shallow water blue background, and that squares 3, 10 and 17 have a grey line.

Test Reference	ColourDifferentiation	IHO Reference	S-98 19.6.2
Test description			
Under each of the conditions described in the introduction, display the colour differentiation test diagram for the colour profiles.			
Select each table in turn and ensure that:			
<ul style="list-style-type: none"> Each foreground diagonal line is clearly distinguished from its background; and The foreground lines representing yellow, orange, magenta (purple), green, blue and grey may be clearly identified. 			

Test Reference	ColourCalibration	IHO Reference	S-98 19.3.5
Test description			
<ul style="list-style-type: none"> • Relocated test from S-98 on colour calibration. • Ensure the ECDIS has instructions for colour calibration, as per S-98 19.3.5 • Check colour calibration controls have a provision to return to the calibrated settings. • Check for a warning that uncalibrated settings may adversely affect visibility of information on the display. • For instance: <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>First, set brilliance to calibration position. Look at the black-adjust symbol.</p> <p>Then either:</p> <ul style="list-style-type: none"> • If the centre square is not visible, turn up the brilliance until it just appears; <p>or</p> <ul style="list-style-type: none"> • If the centre square is clearly visible, turn down the brilliance until the inner square disappears, then turn brilliance back up until the inner square is just visible again. <p>(If the above adjustment is not successful, select a more appropriate colour table and repeat this procedure.)</p> <p>The "black level" is now correctly set. If a brighter display is required use the brilliance control, but it is better not to re-adjust the controls unless lighting conditions on the bridge change.</p> <p>Note that the black-adjust symbol should be displayed to check that the inner square remains visible on the following occasions:</p> <ul style="list-style-type: none"> • Every time that the brightness or contrast controls are adjusted. • Every time that the display is switched to the night colour table. </div>			

3.19.3 Data Quality Indicators and Portrayal

Test Reference	DataQualityPortrayal	IHO Reference	S-98 12.10.10
Test description			
<ul style="list-style-type: none"> • Test for existence of Data Quality selector. • Test that Data quality is taken into consideration, can be configured, and meets the S-98 requirement, particularly when moving between different Data Quality areas. • Test that different combinations of data quality portrayal behave correctly. • Include all situations from Figure 11.1 in S-101PS. • Vertically overlapping QoBD features. <p>These tests test horizontal quality portrayal. The use of vertical uncertainty in safety contour and water level adjustment processing is included in the WLA tests later</p>			
Setup			
Action			
Results			

3.19.4 Miscellaneous encoding

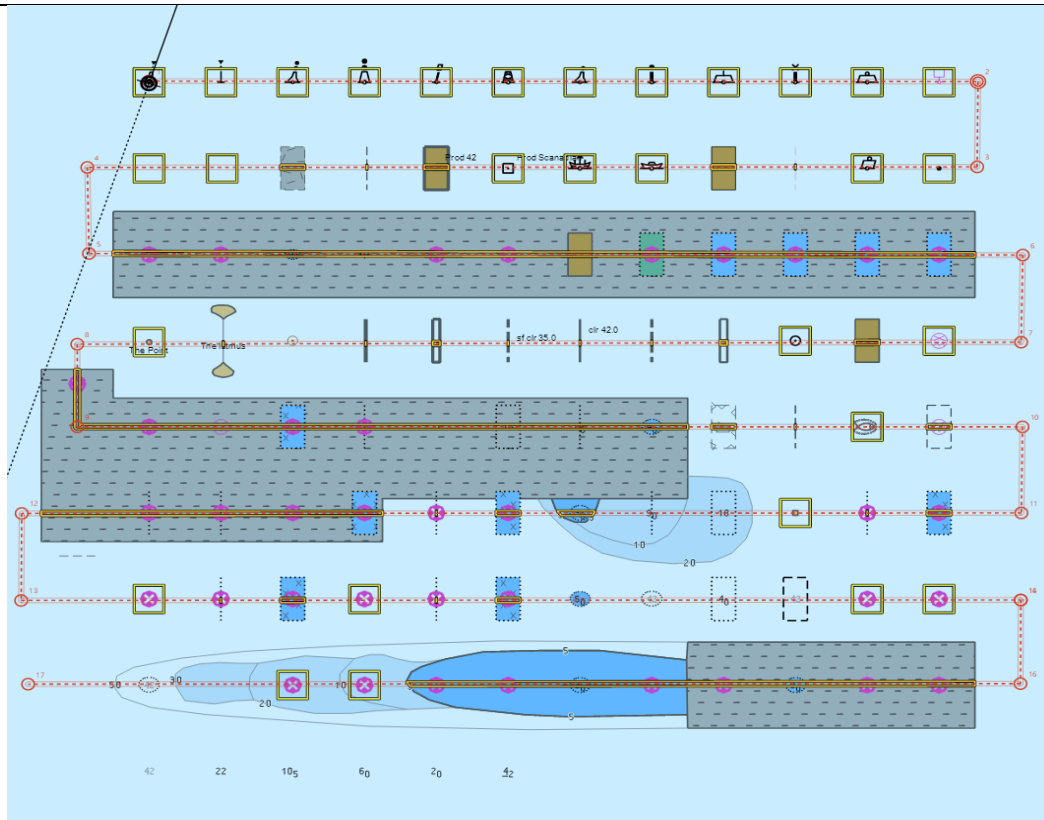
Test Reference	ENC encoding	IHO Reference	S-98 DC Annex S-101PC S-100 Part 10a Part 10b
Test description			
<p>TODO: Complete lists of tests from S-98 relating to dataset encoding.</p> <ul style="list-style-type: none"> • Tests for complex portrayal of ENC – from portrayal catalogue. • Long record test for ISO8211 00000 header • Multiple spatial associations (in pick reports) • Composite curves and others as multiple records/repeated subfields • Exhaustive ISO8211 tests according to S-101's profile of Part 10a • Portrayal of Shared Edges • GML encoding as per S-98 Data Constraints Annex 			

5 Detection and Notification of Navigational Hazards

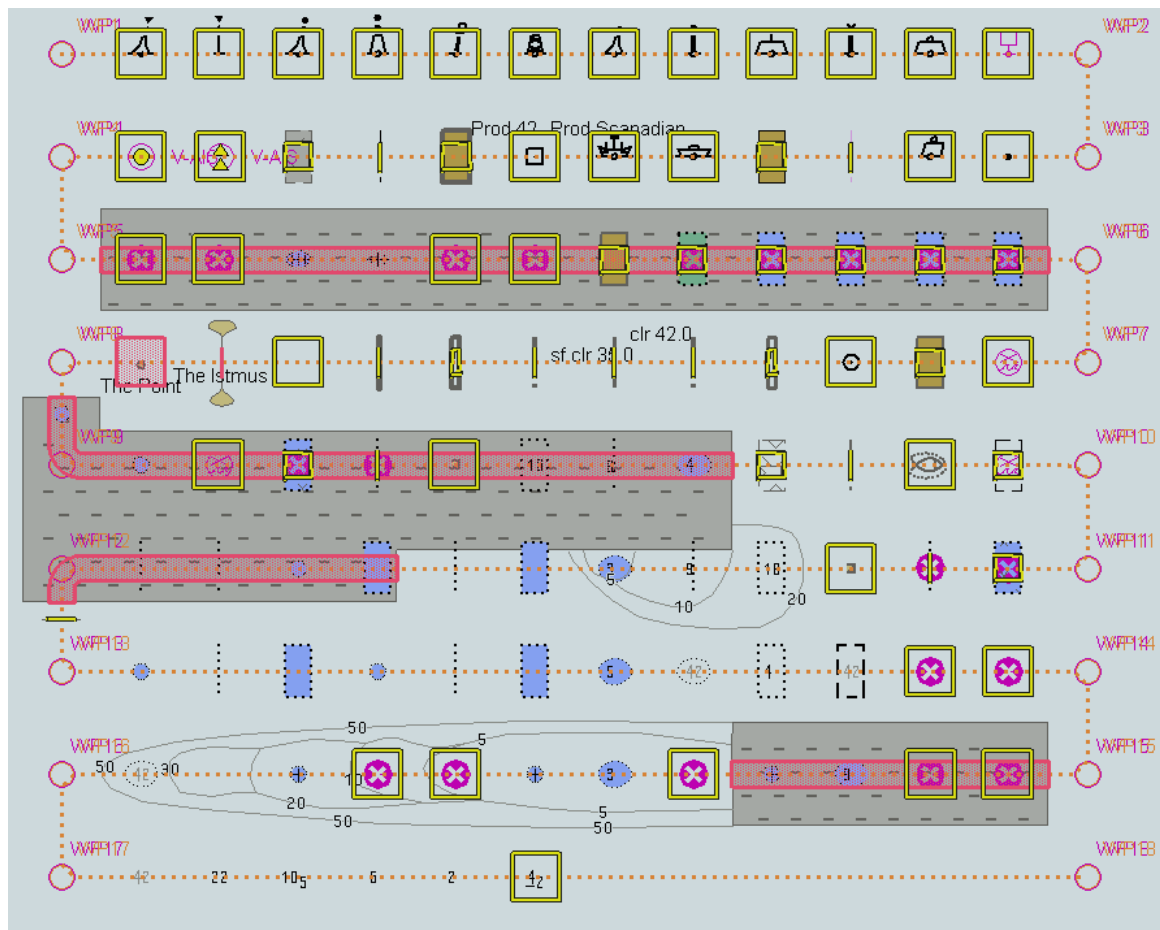
5.1 Detection and Notification of Navigational Hazards - Basic test

Test Reference	NavigationalHazards		IHO Reference	S-98 12.10.6
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 features satisfying the conditions for this test as listed in the S101 alert and indications catalogue and included in the test dataset 10100AA_NAVHZ.000.				
Loaded Data				
Exchange Set Name				
Display Mode		Independent Mariner's Selections (default=On)		
Other		Accuracy		
Context Parameters		Contour label		
Safety contour		Highlight date dependent		
Safety depth		Highlight document		
Deep Contour		Highlight info		
Shallow contour		Shallow pattern		
Four shades		Unknown		
Radar overlay		Update review		
Plain boundaries		Text Groups		
Simplified symbols		Chart Text		
Full light lines		Important text		
Ignore scale minimum		Other Text		
Shallow water dangers		Names		
Palette		Light description		
Day		All other chart text		
Date Dependent Objects		Display		
Start Date		Centre		
End Date		Scale	1:60000	
		Orientation		
Viewing Groups (Default = On)				
Standard Display		Other		
Drying lines		Spot soundings		
Buoys. Beacons, aids to navigation		Submarine cables and pipelines		
Buoys, beacons, structures		All isolated dangers		
Lights		Magnetic variation		
Boundaries and limits		Depth contours		
Prohibited and restricted areas		Seabed		
Chart scale boundaries		Tidal		
Cautionary notes		Miscellaneous (Other)		
Ships' routeing systems and ferry routes				
Archipelagic sea lanes				
Miscellaneous (Standard)				
Chart (Standard)				

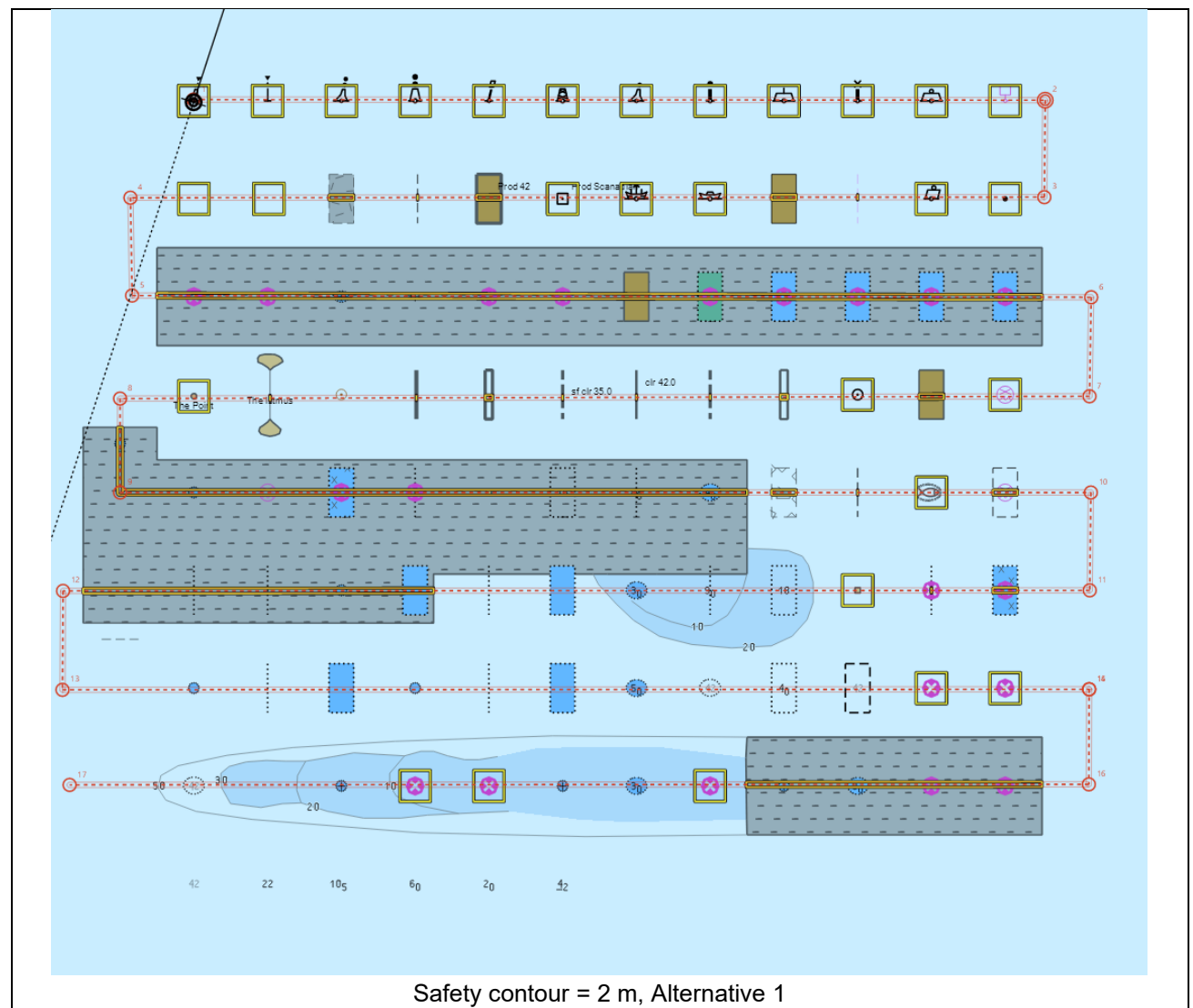
Alert Highlights (Standard)			
Additional			
Setup			
<p><i>This test is performed by loading the test cell 10100AA_NAVHZ.000, manually creating a route connecting all way points between features marked as WP1 through WP18 and checking display against the corresponding graphical plot</i></p> <p><i>View dataset 101AA00NAVHZ.000 from exchange set NavigationalHazards</i></p> <ul style="list-style-type: none"> <i>Select Display Category Other</i> <i>Set the Safety contour value to 0 m</i> <i>Set the Safety depth value to 30 m</i> <i>Set Plain Boundaries to On</i> <i>Set Simplified symbols to Off</i> <i>Select all Text groups</i> <i>Manually create a route connecting all way points between features marked WP1 through WP18</i> <p><i>Set user-specified distance for indication navigational hazards as 0.1 NM</i></p>			
Action			
<p><i>Check ENC symbols shown in the ECDIS against the corresponding graphical plot.</i></p> <p><i>Repeat sequentially with a Safety contour value of 0m, 2m, 4m, 5m, 6m, 8m, 9m, 10m, 11m, 16m, 21m, 31m, 42m, 50m, 51m</i></p>			
Results			
<p><i>The ENC in the ECDIS should match the corresponding graphical plot shown below.</i></p> <p><i>Note: To increase the prominence of dangers in unsafe waters it is permitted to highlight features with an isolated danger mark when they are wholly located in this area</i></p>			

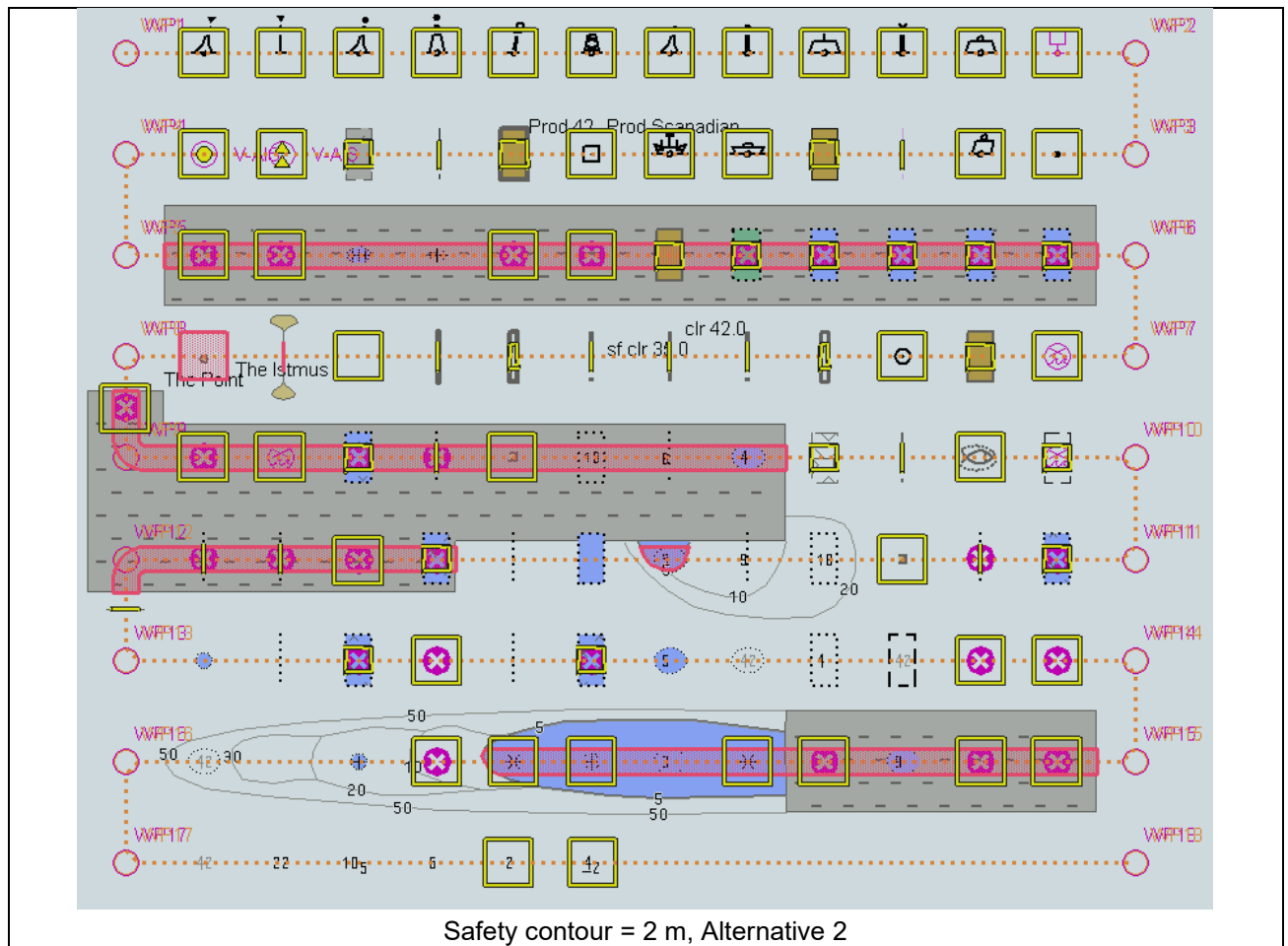


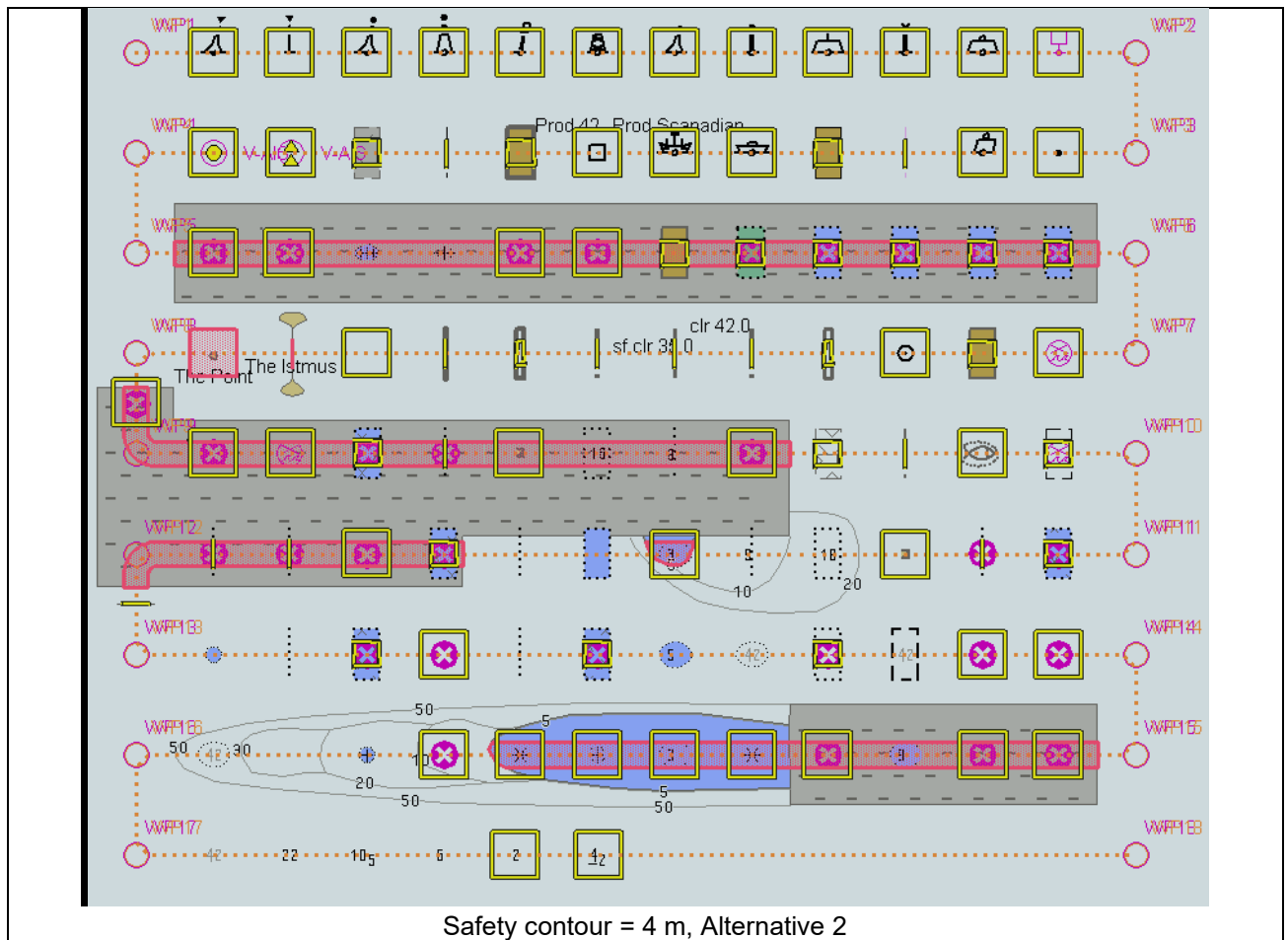
Safety contour = 0 m, Alternative 1

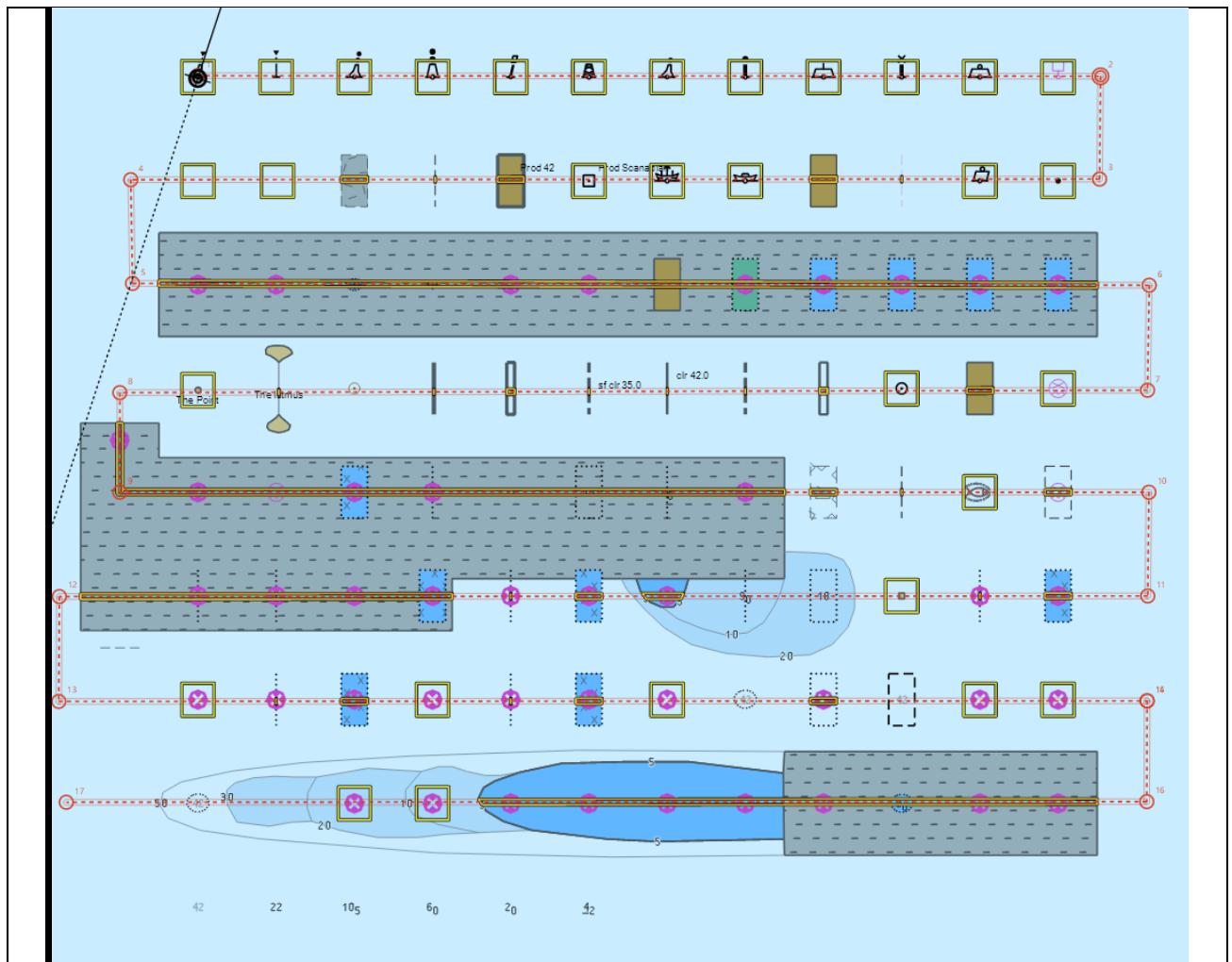


Safety contour = 0 m, Alternative 2

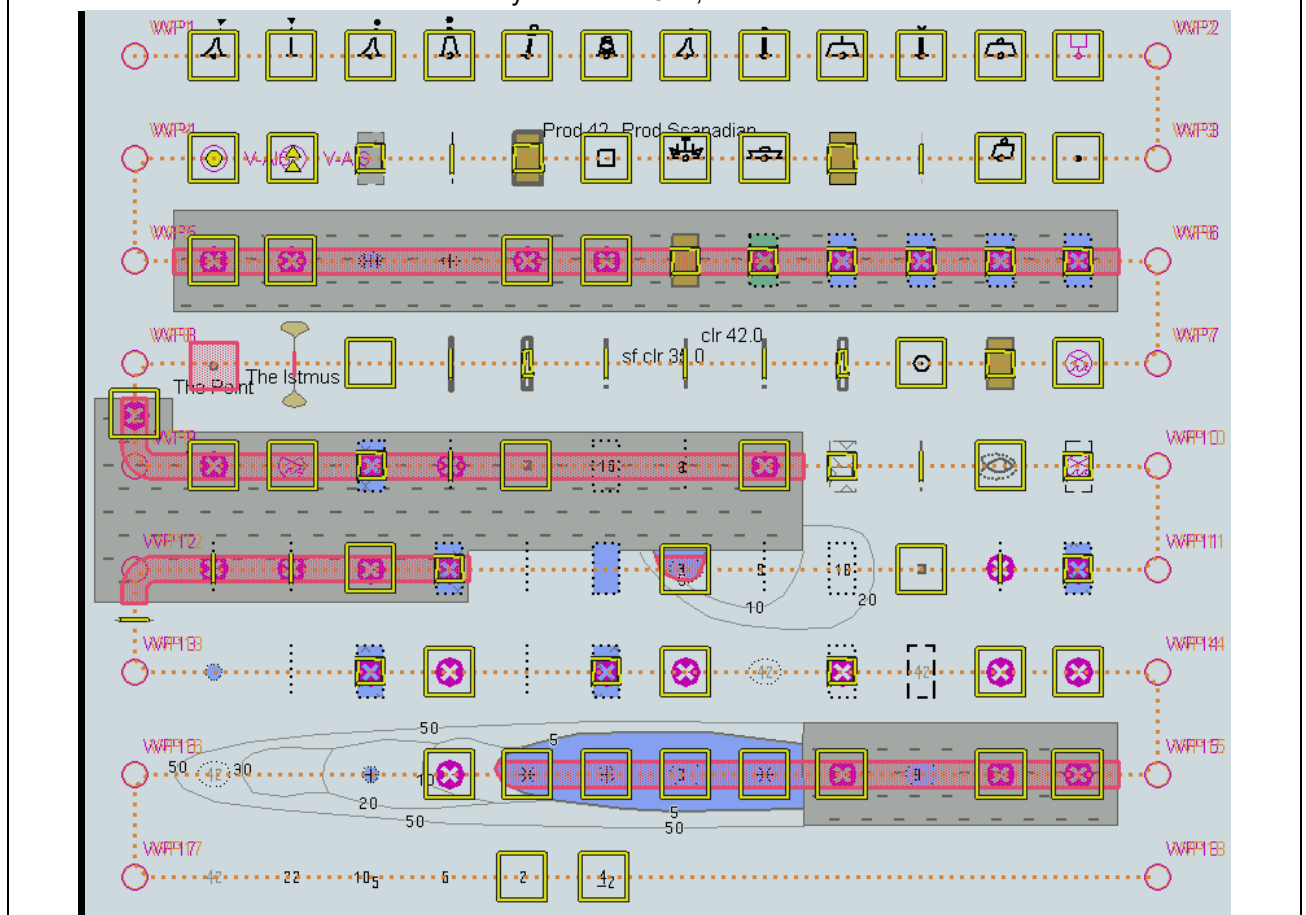




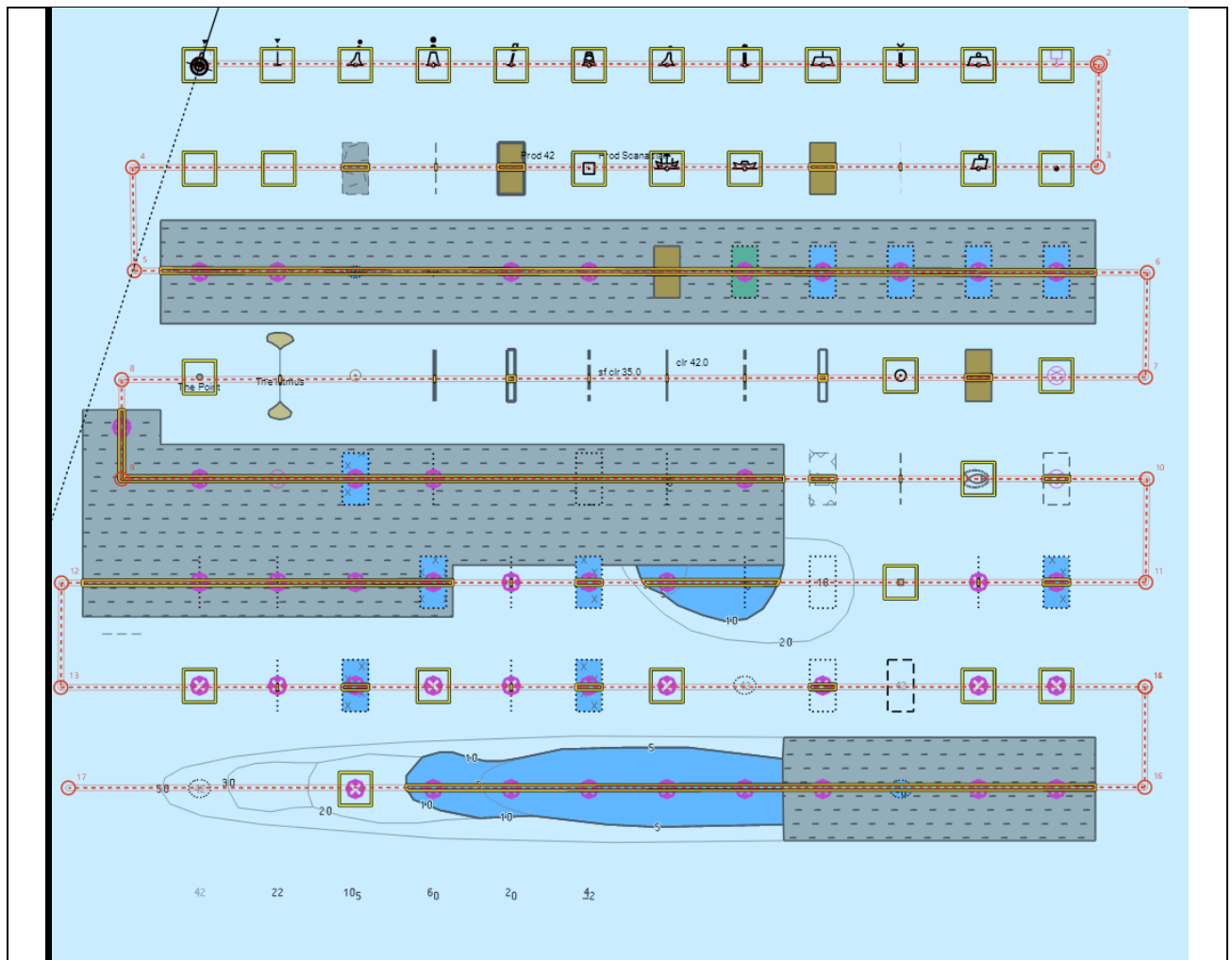




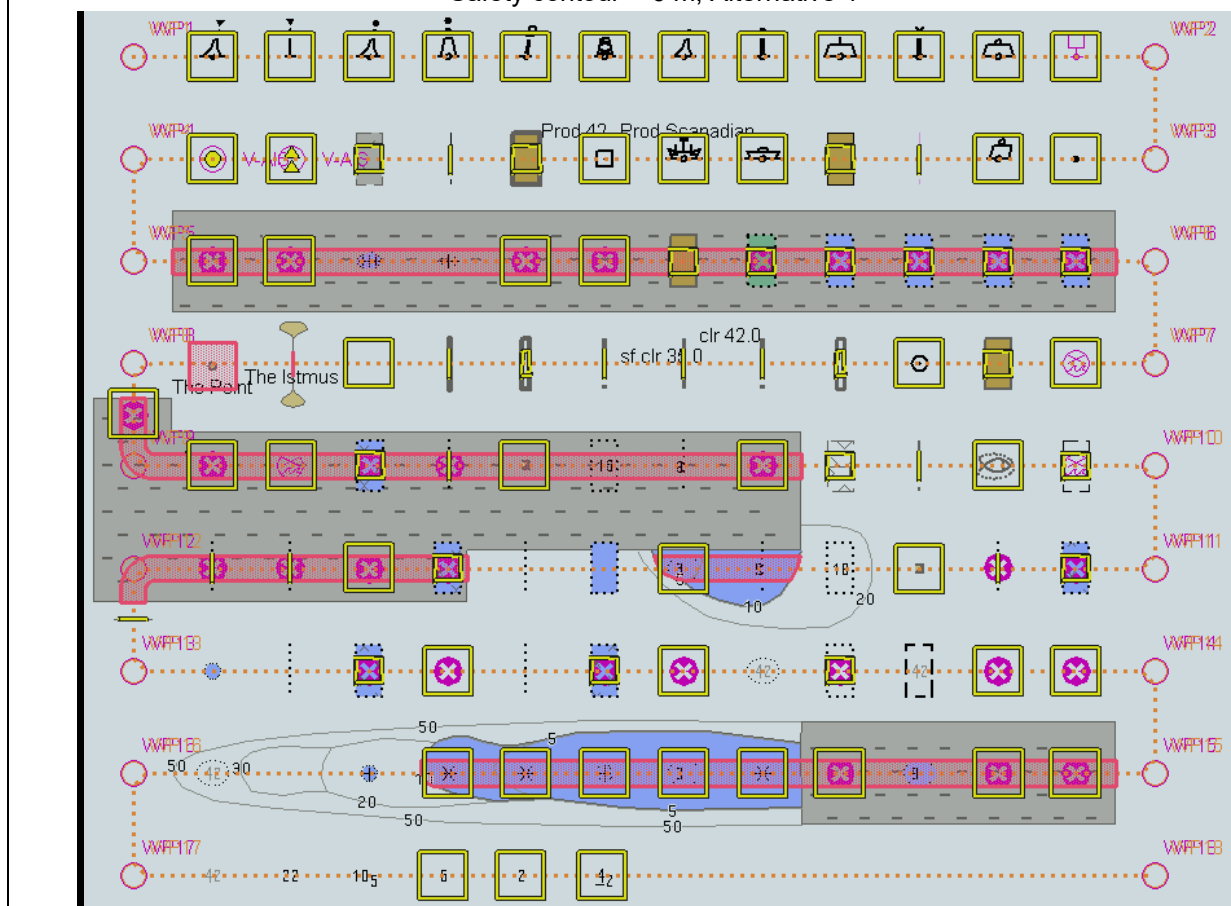
Safety contour = 5 m, Alternative 1



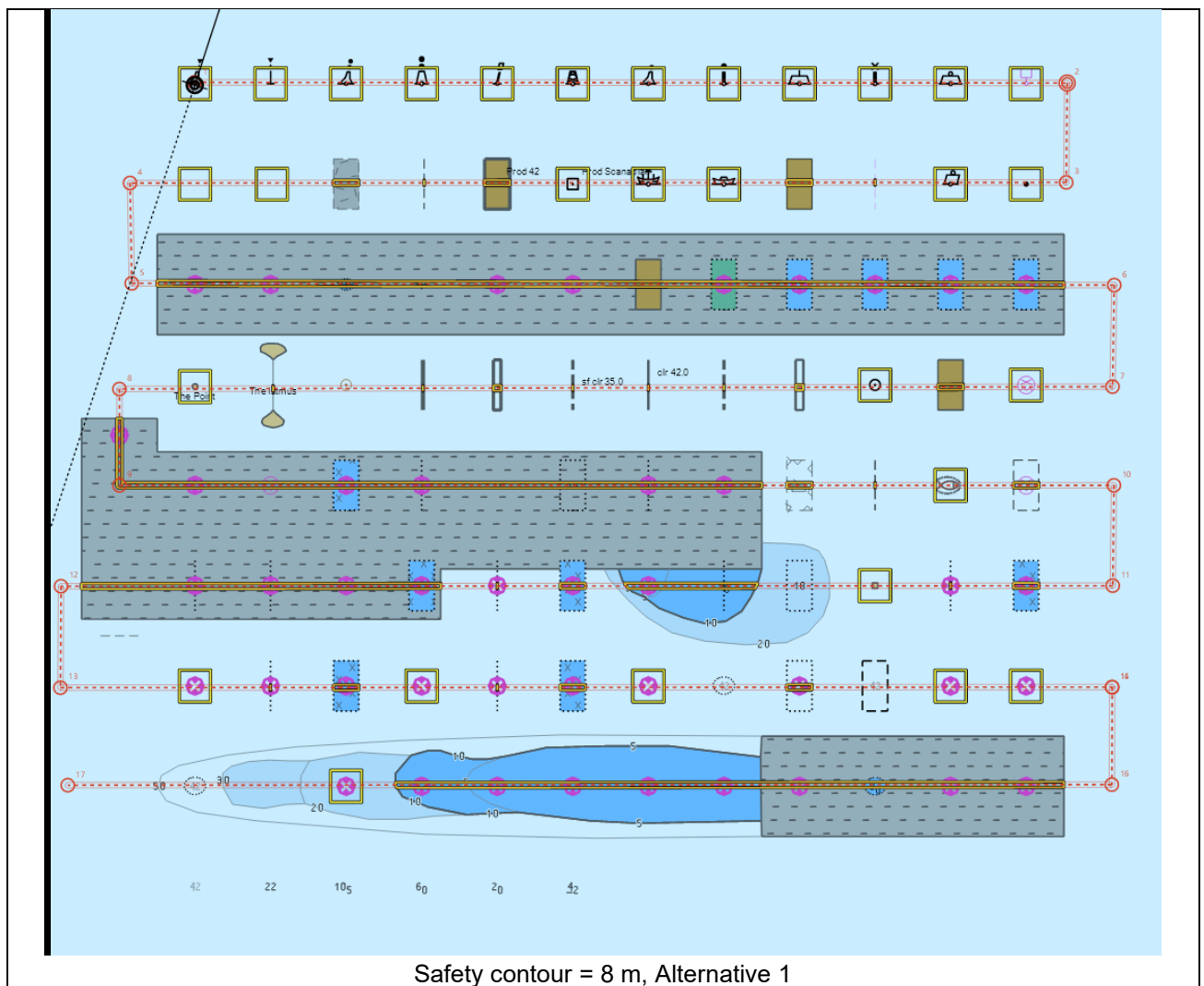
Safety contour = 5 m, Alternative 2

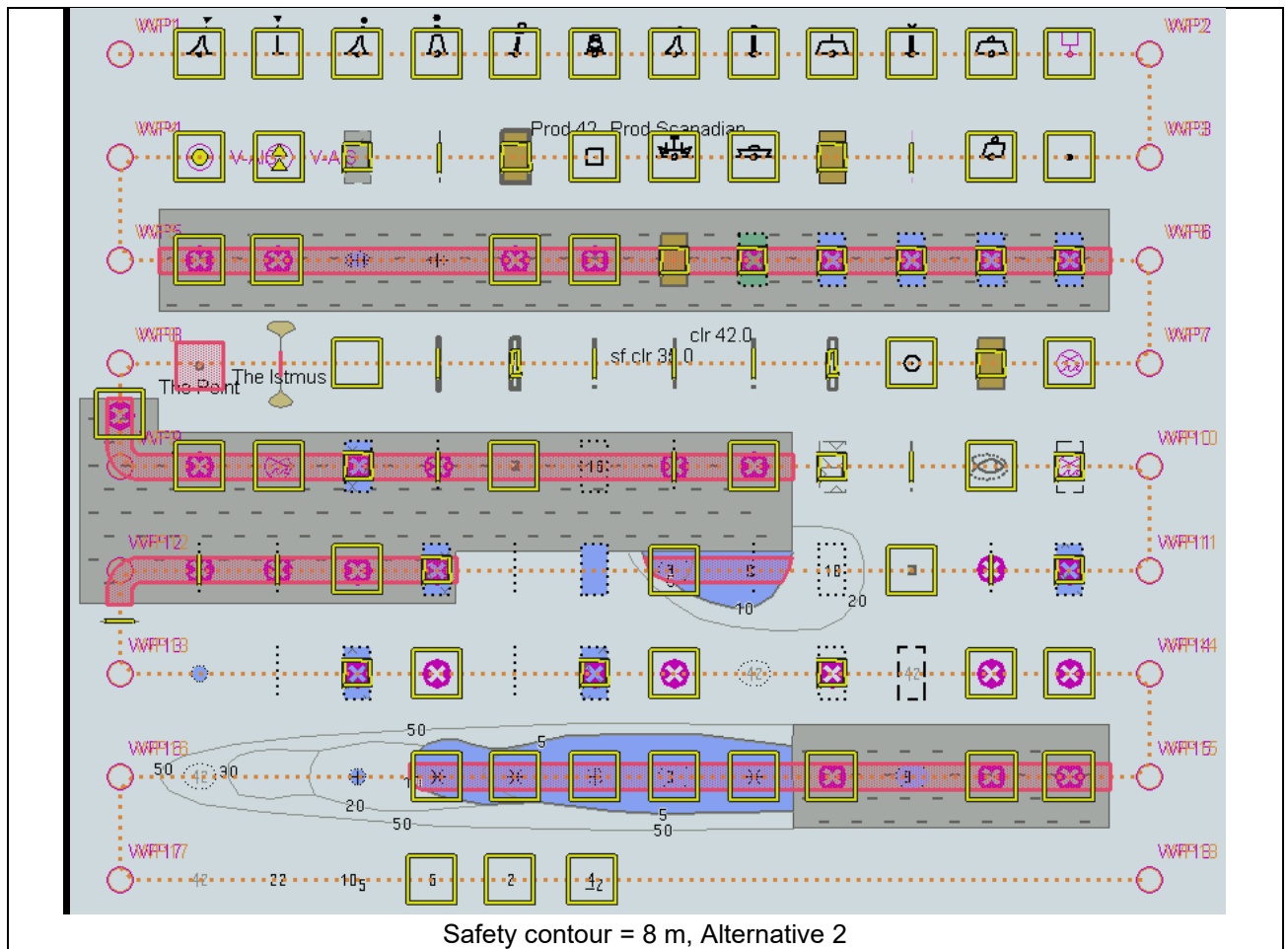


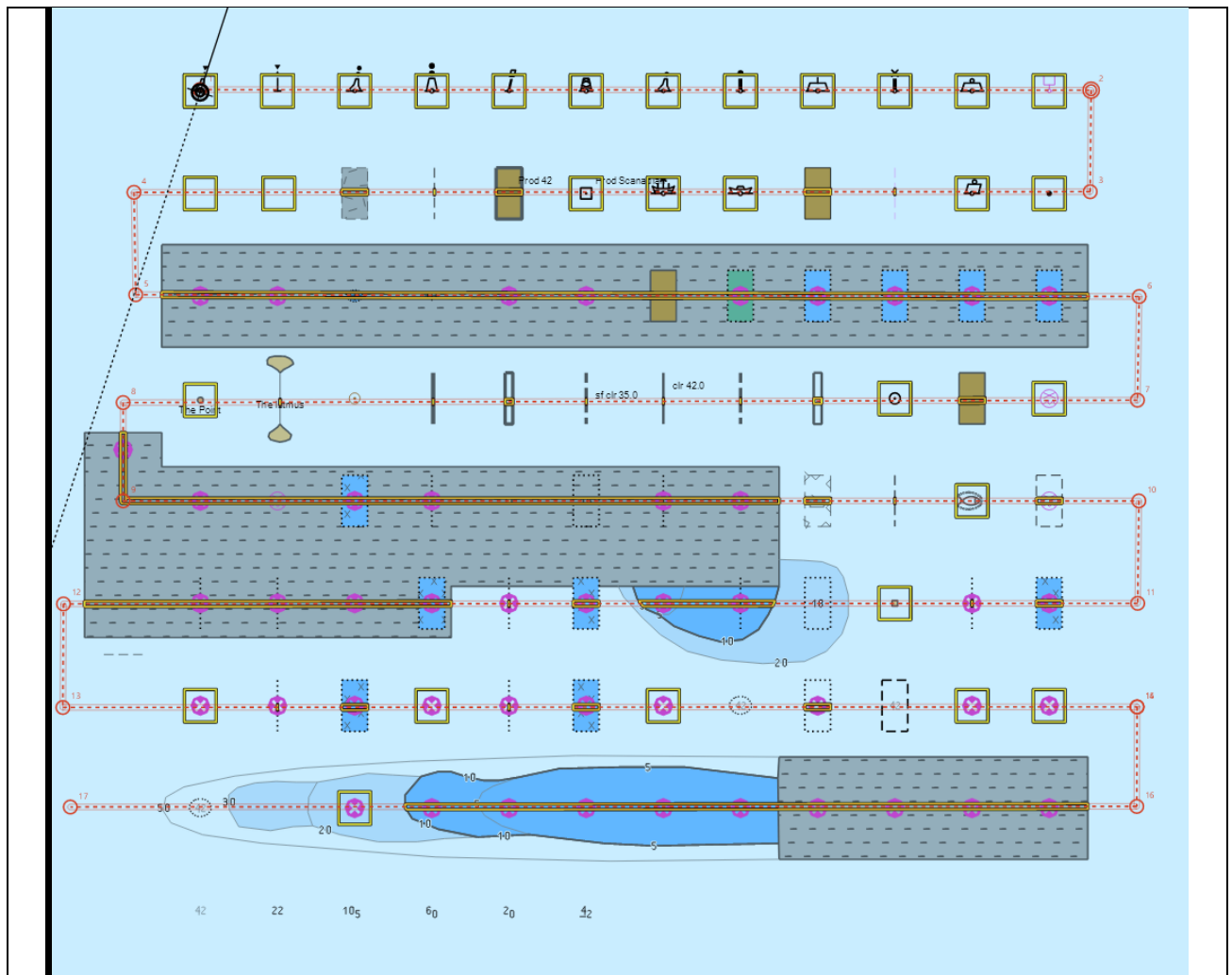
Safety contour = 6 m, Alternative 1



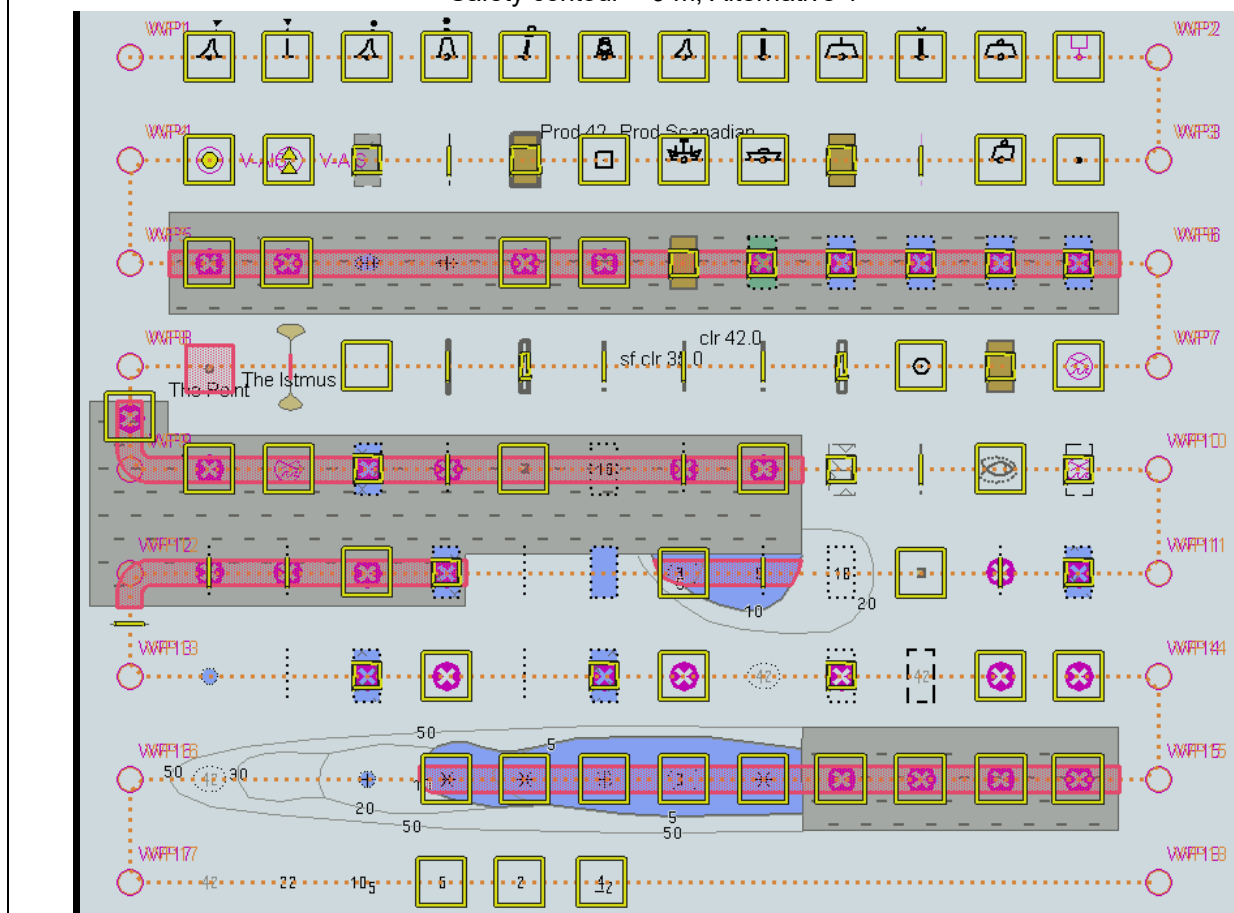
Safety contour = 6 m, Alternative 2



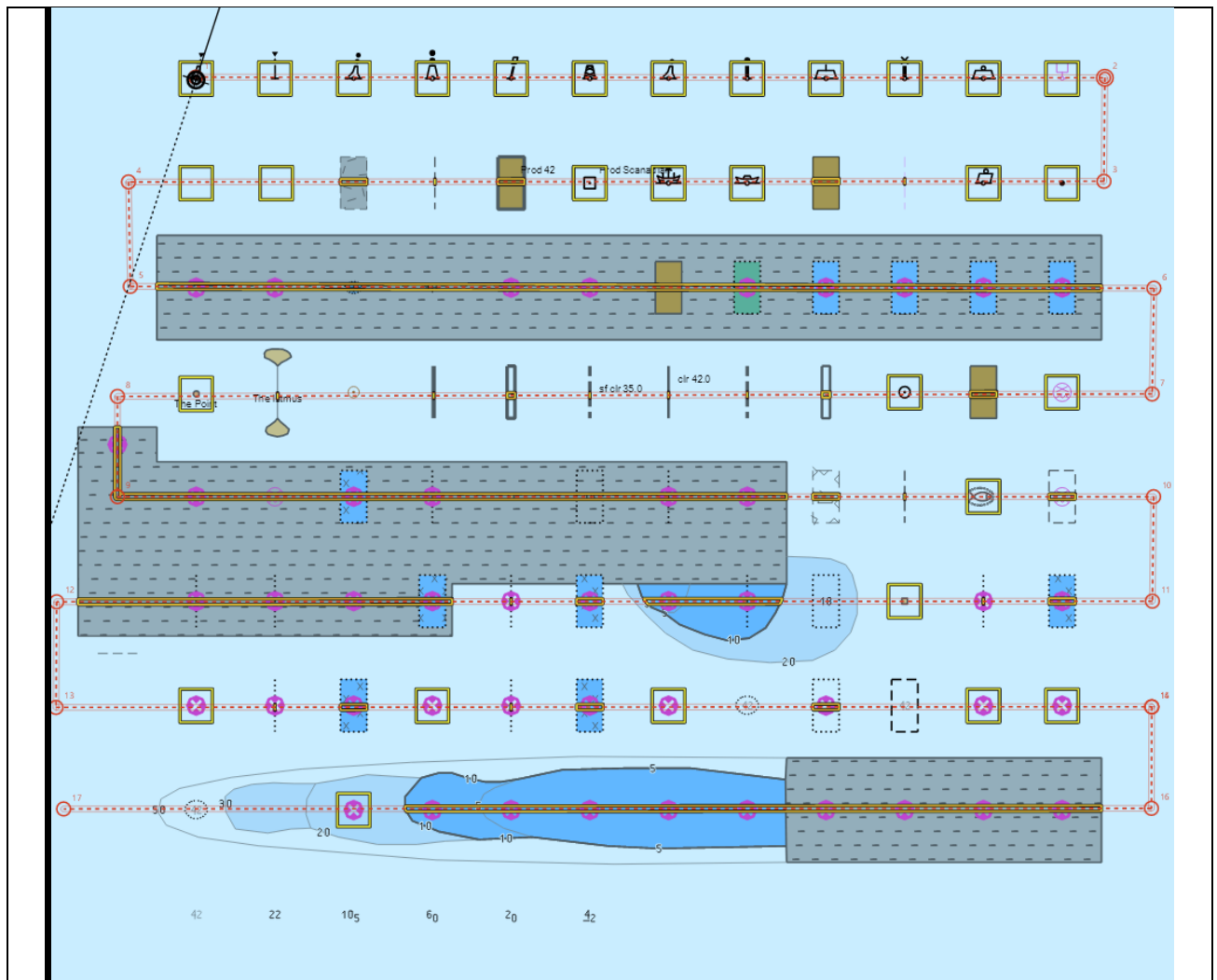


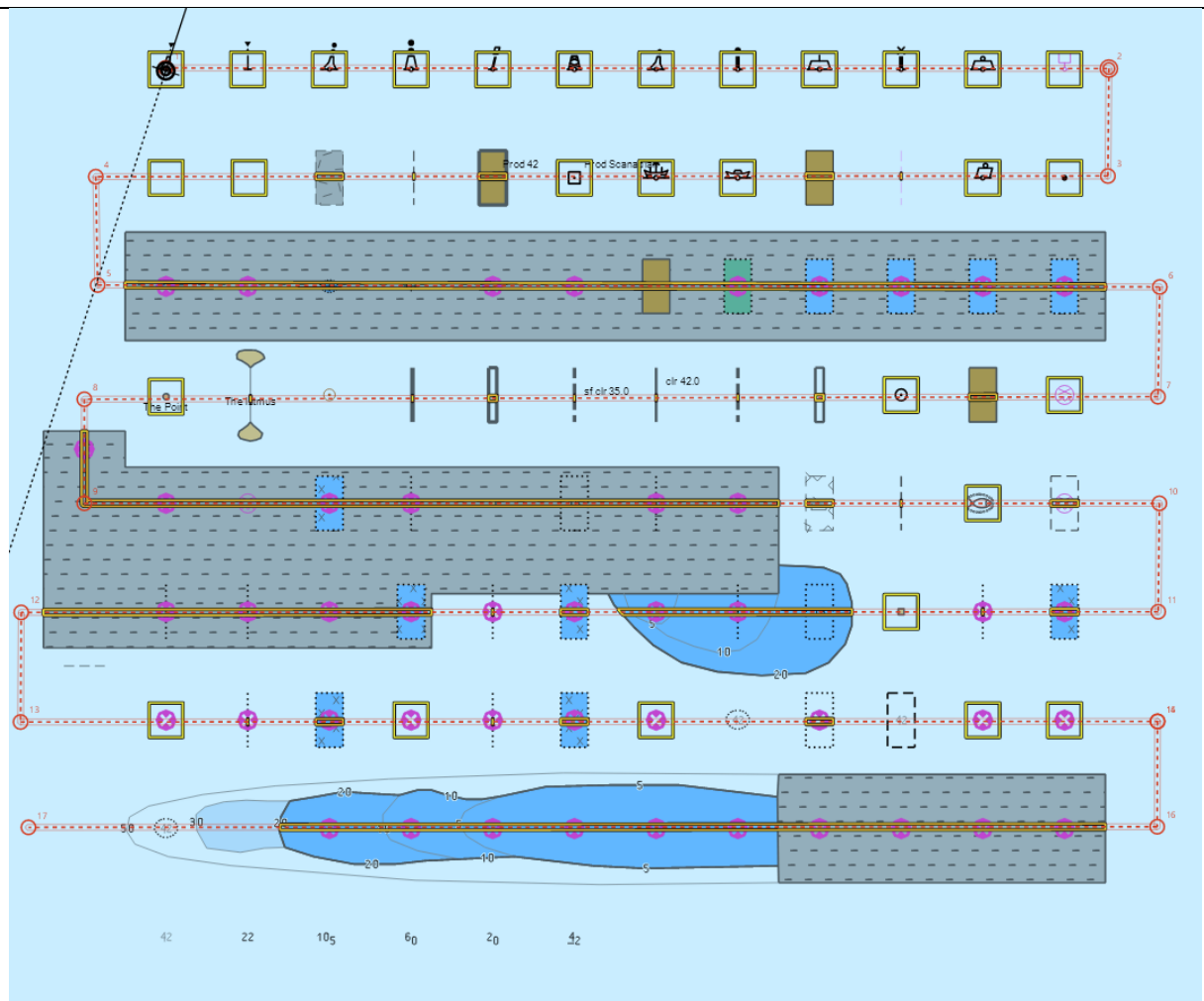


Safety contour = 9 m, Alternative 1

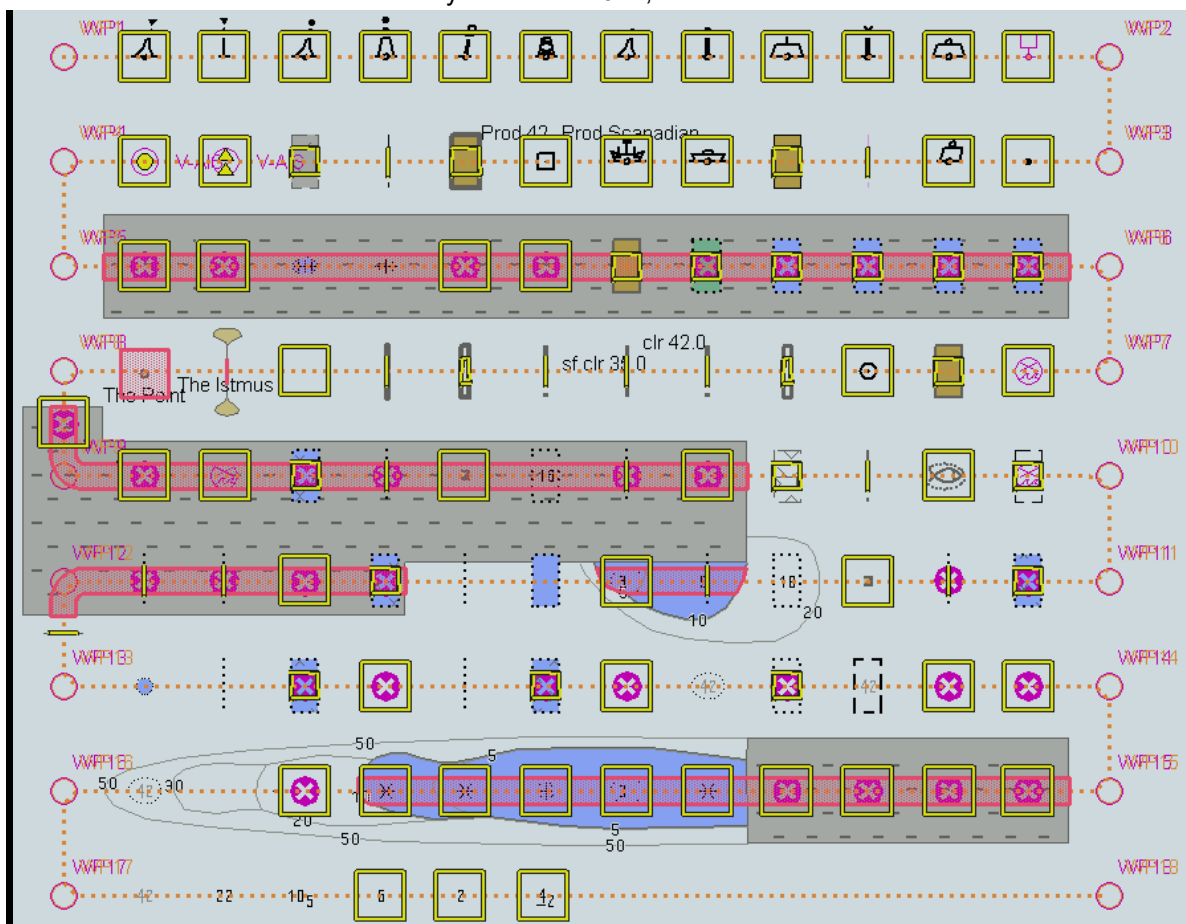


Safety contour = 9 m, Alternative 2

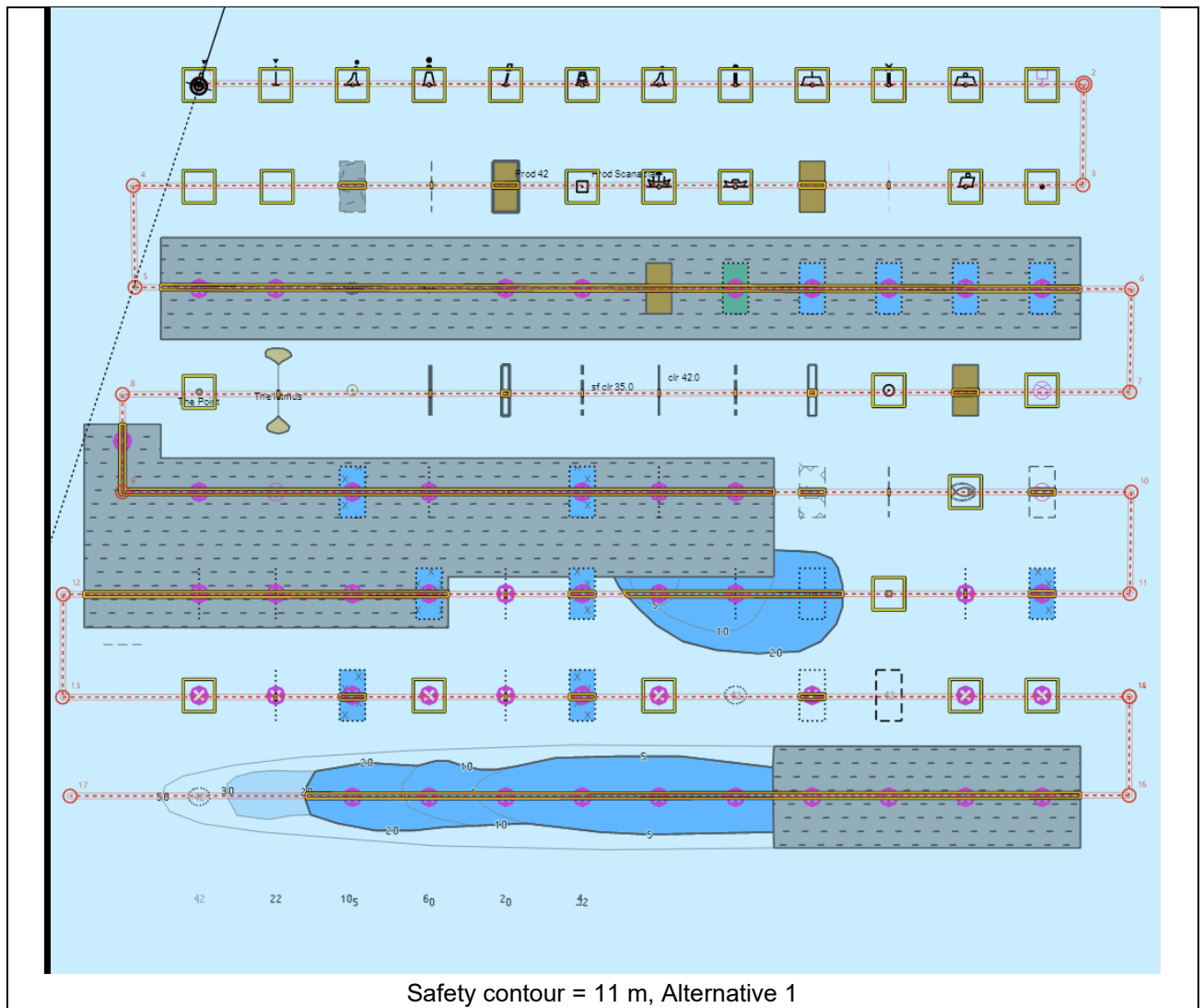


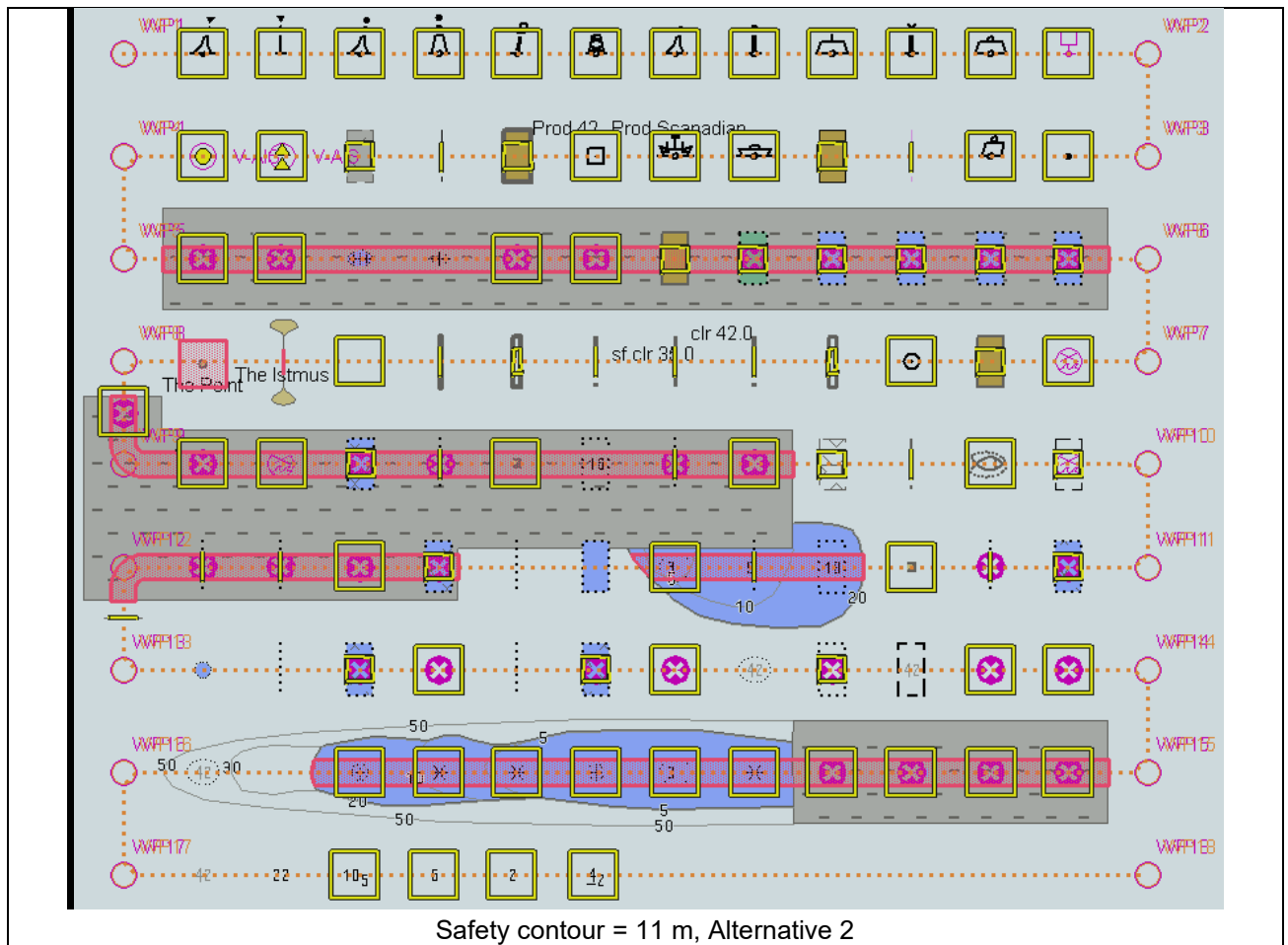


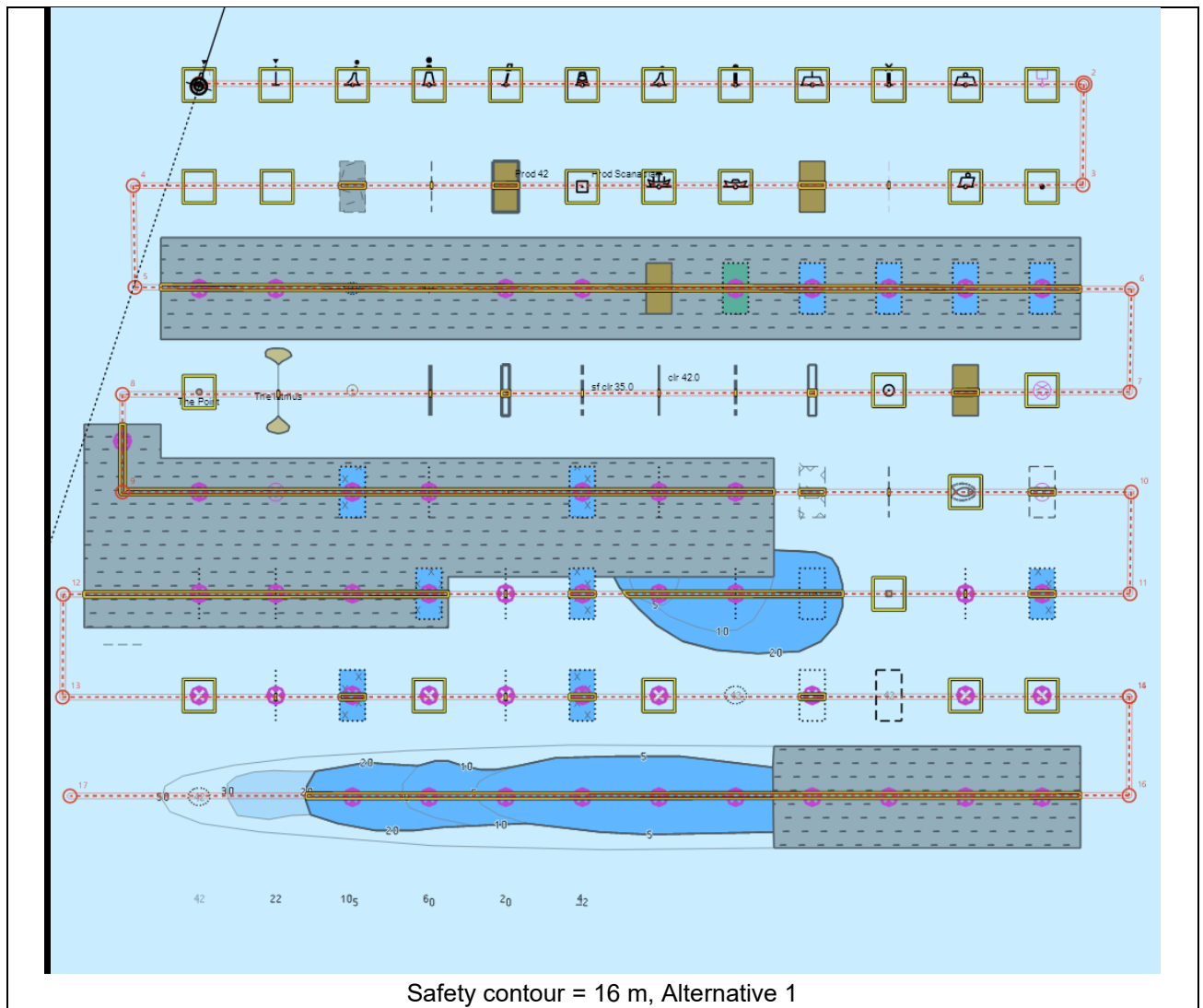
Safety contour = 10 m, Alternative 1

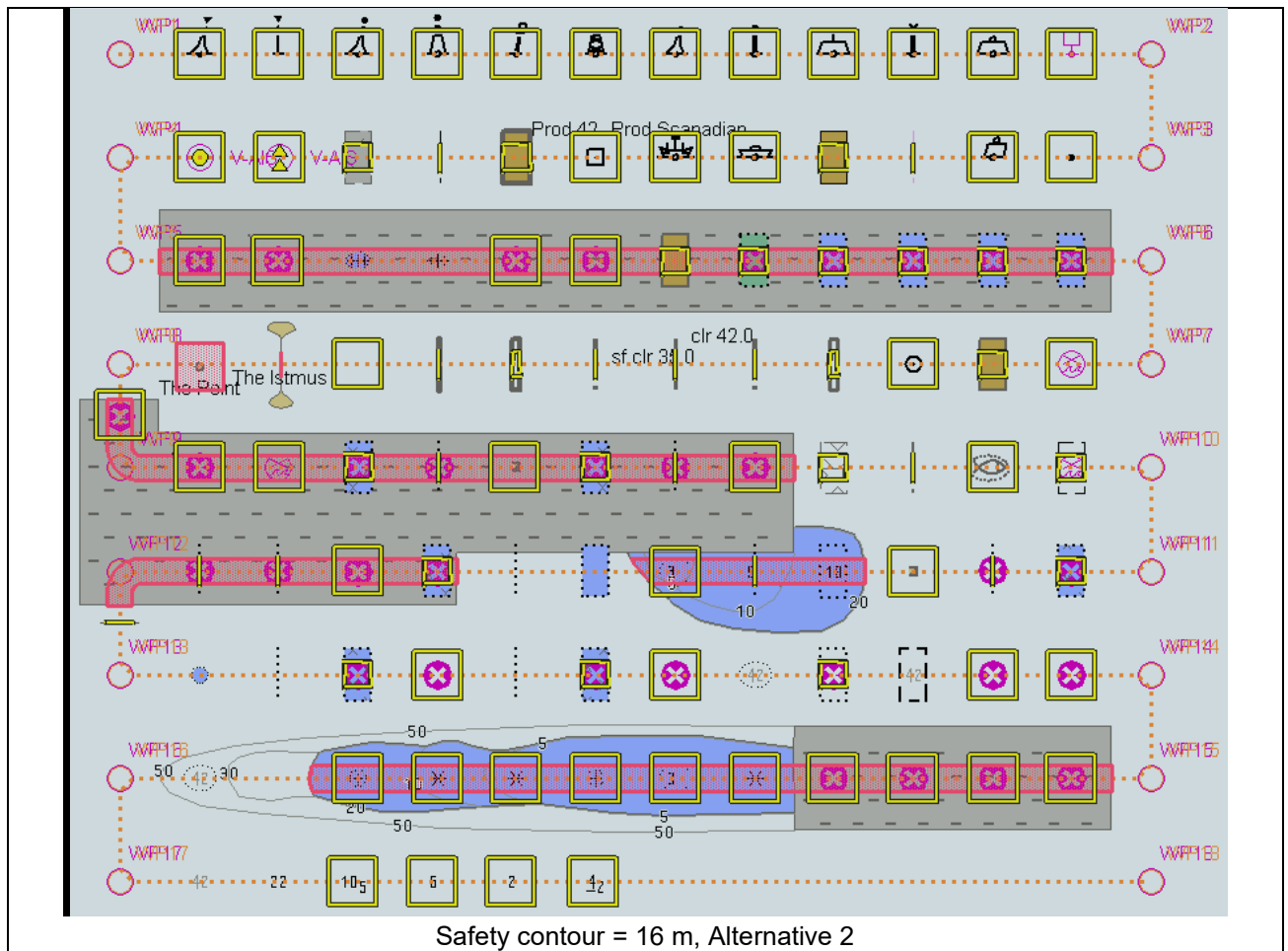


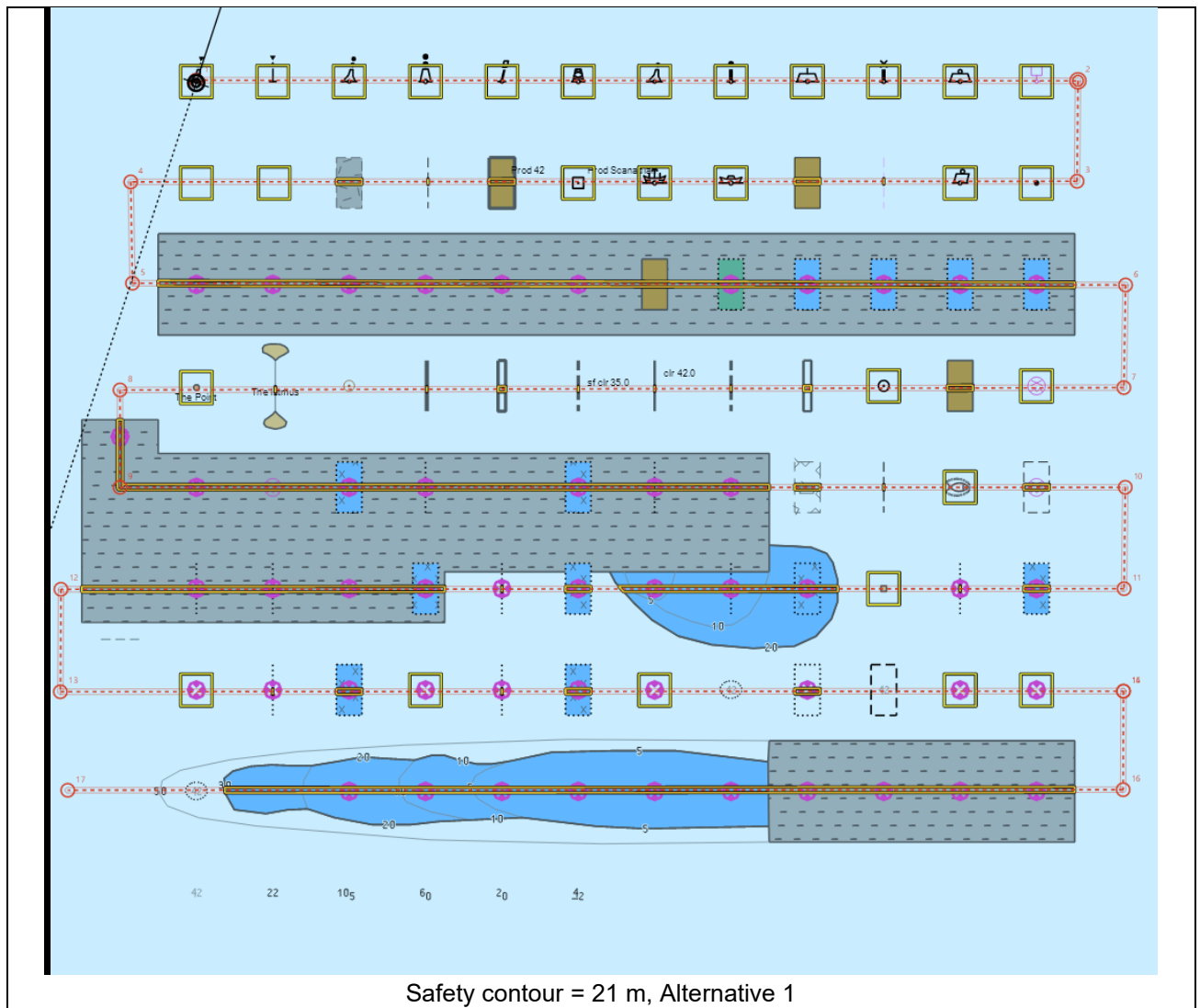
Safety contour = 10 m, Alternative 2

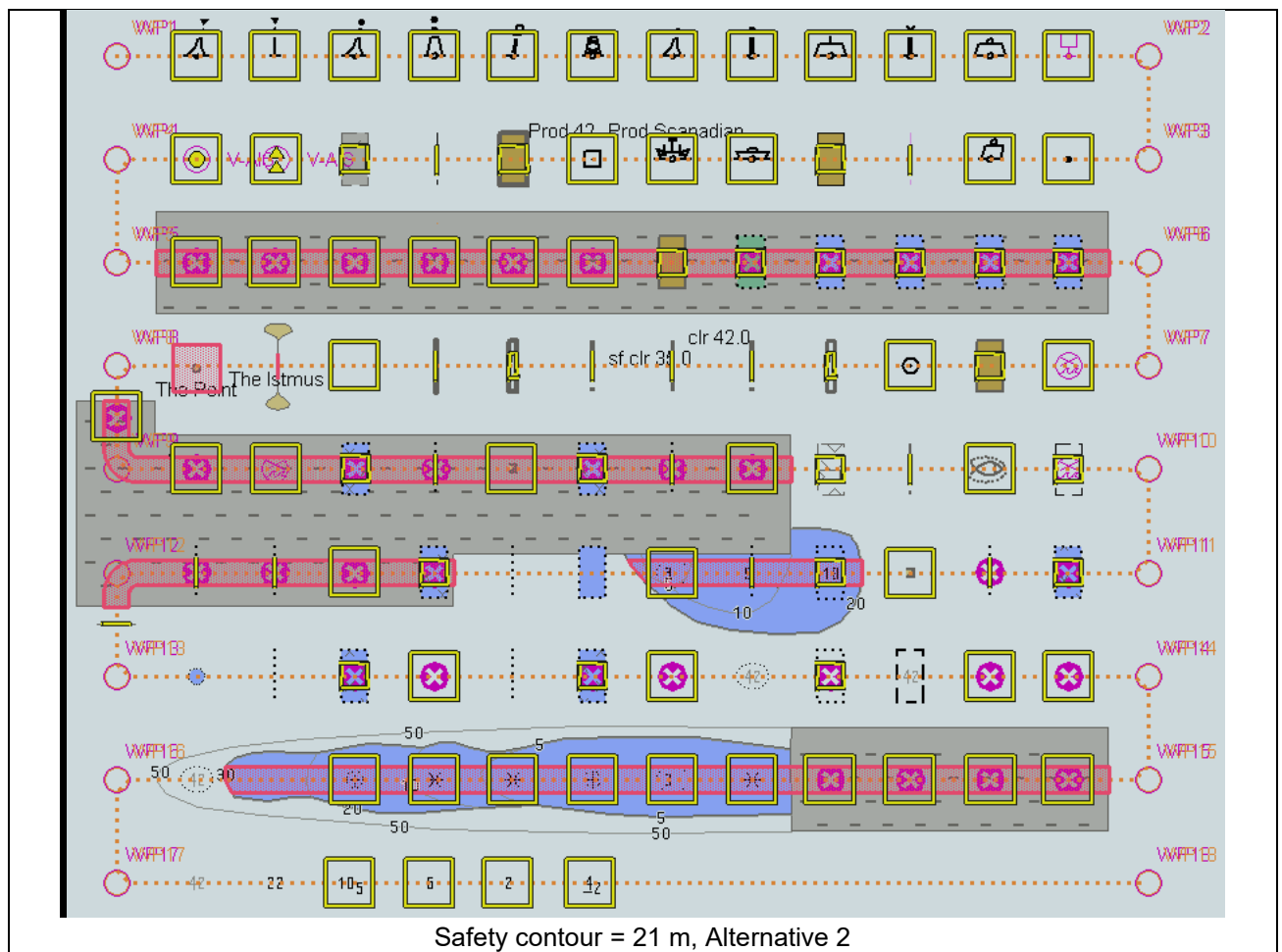


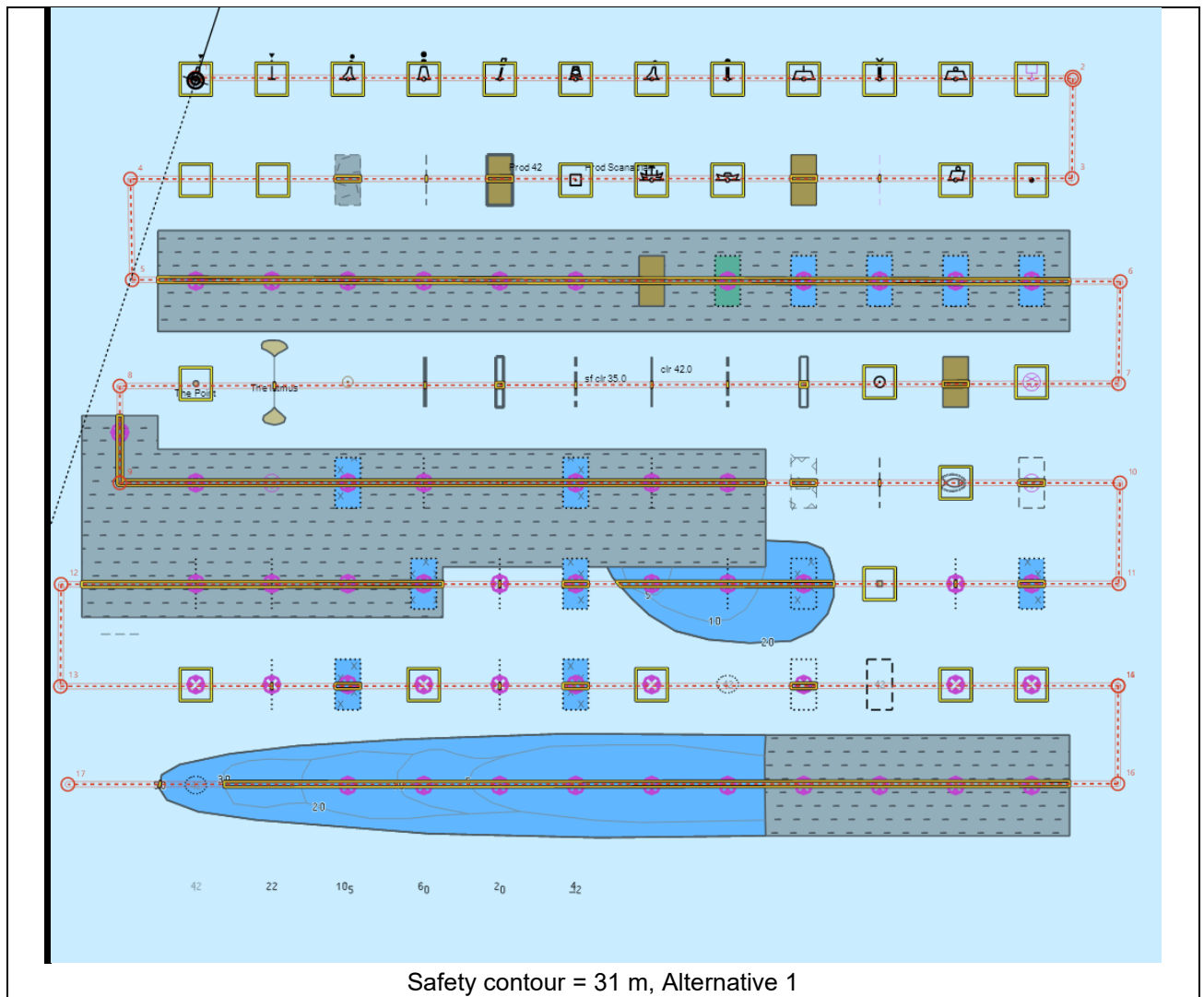


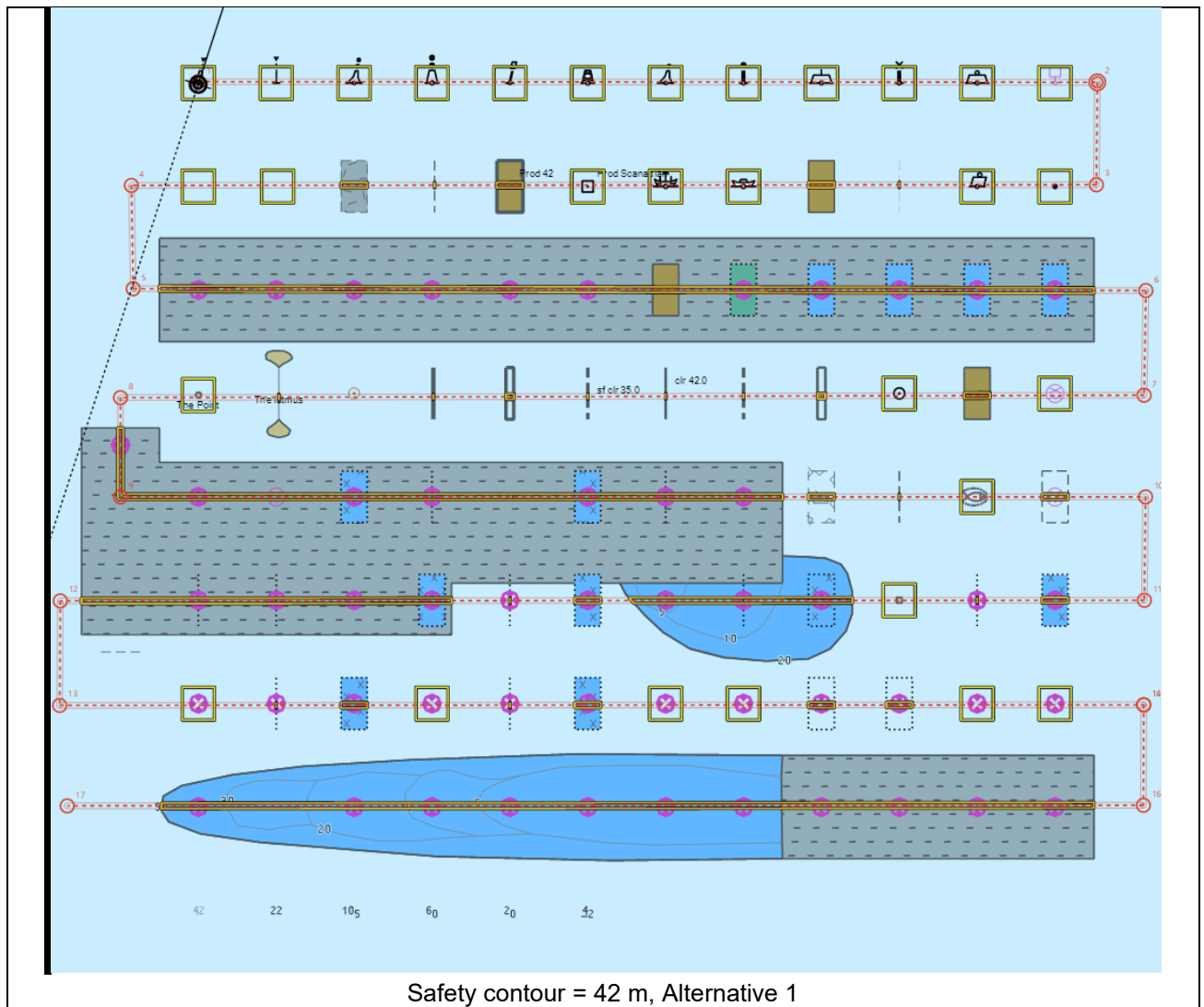


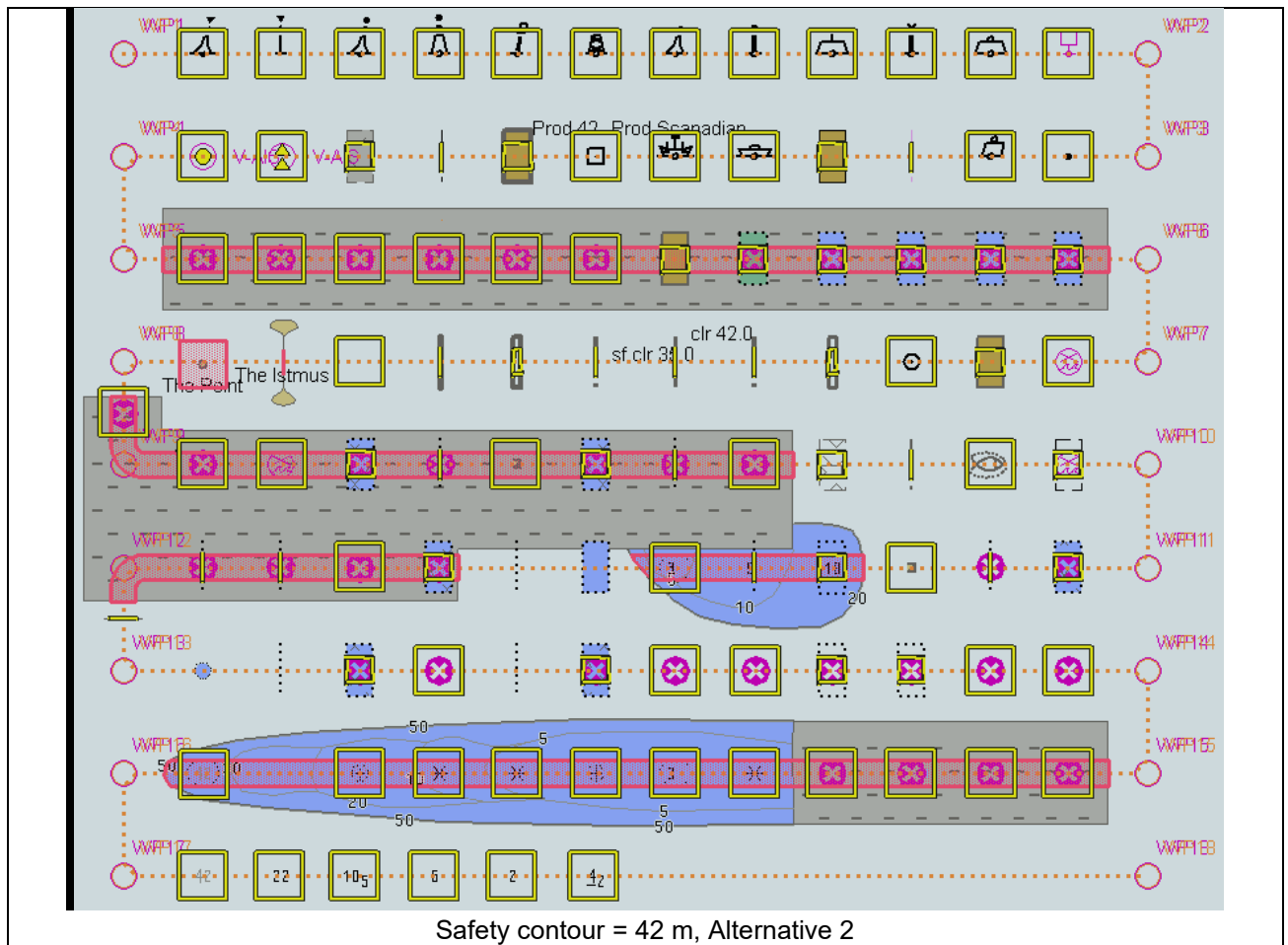


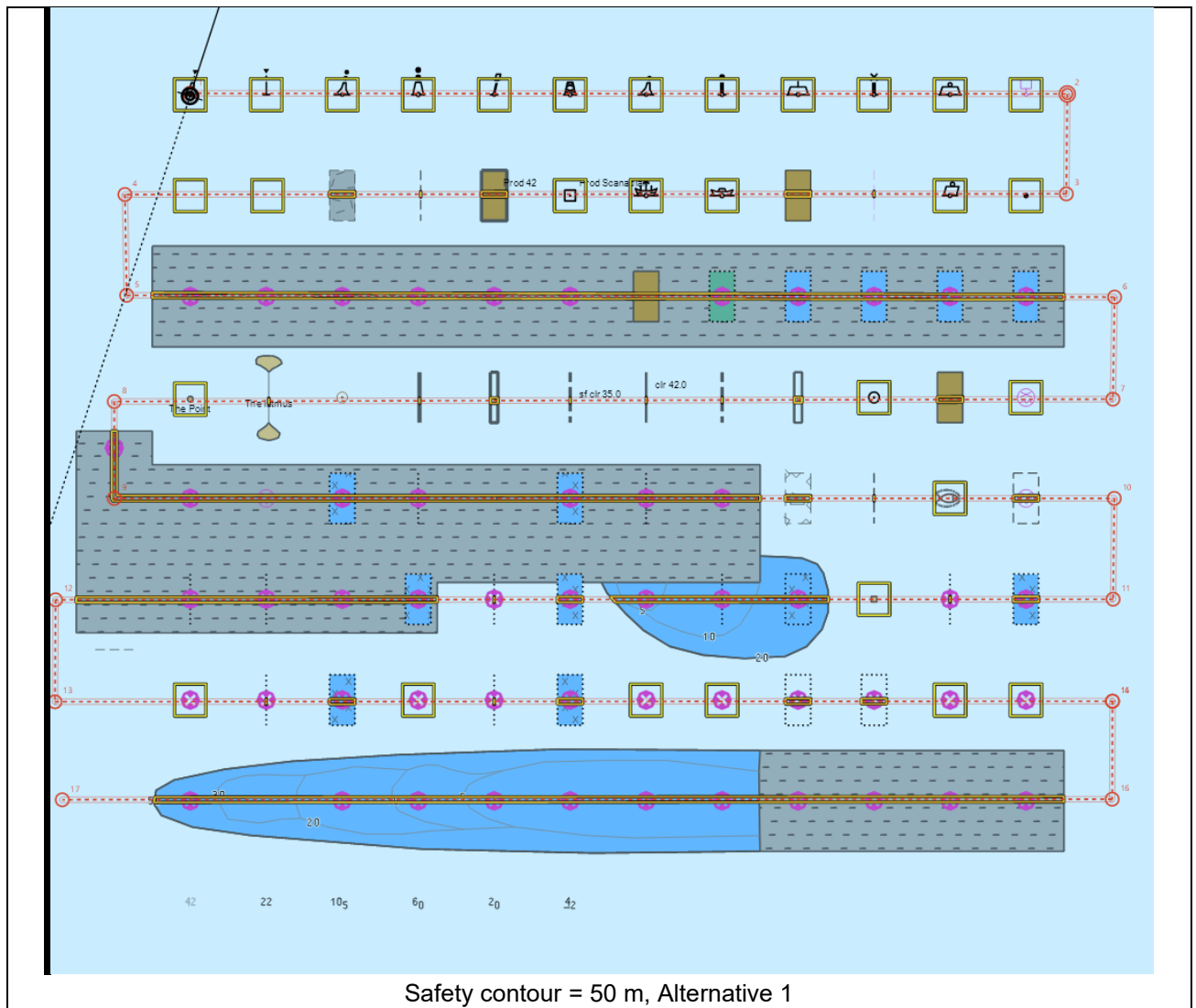


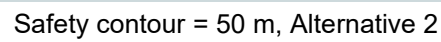


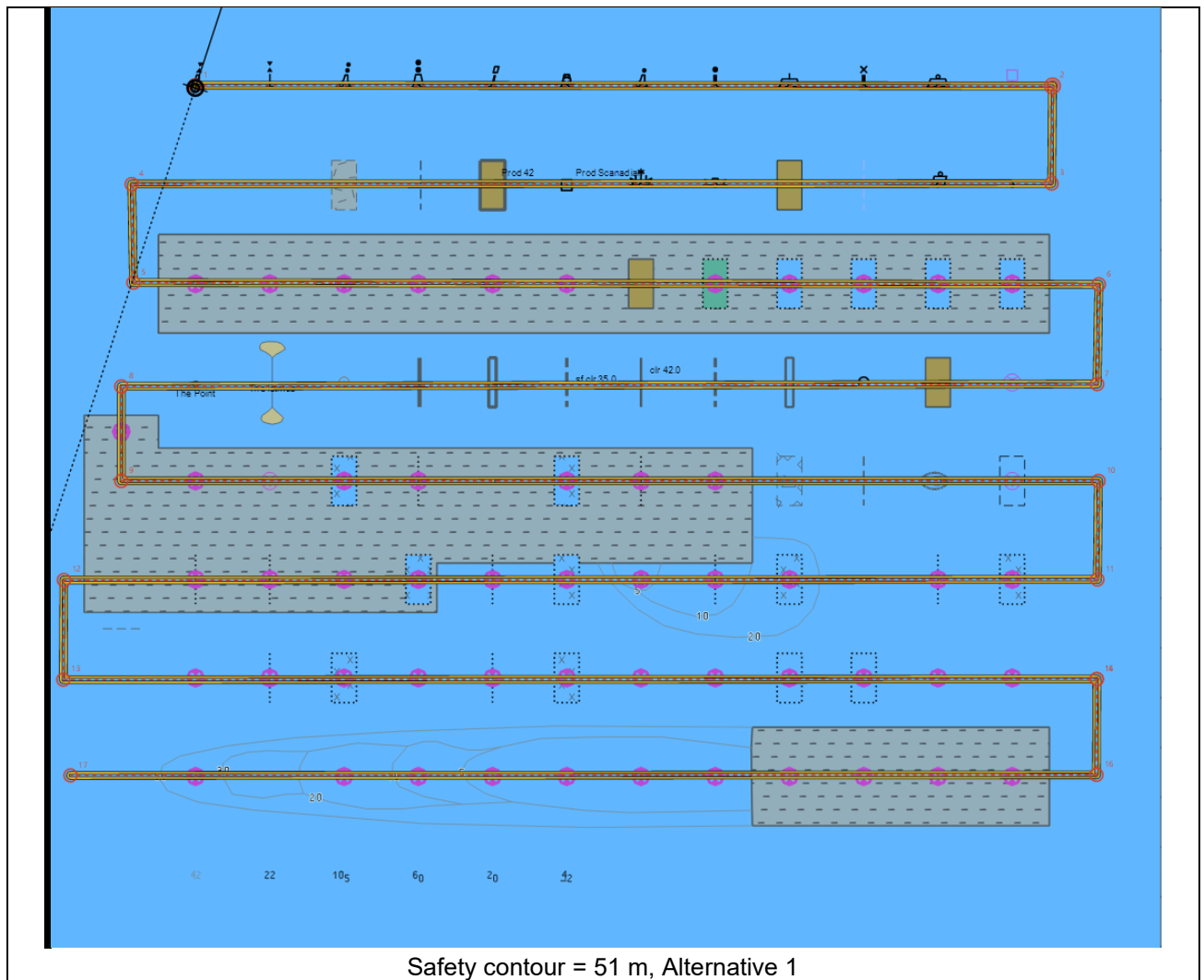


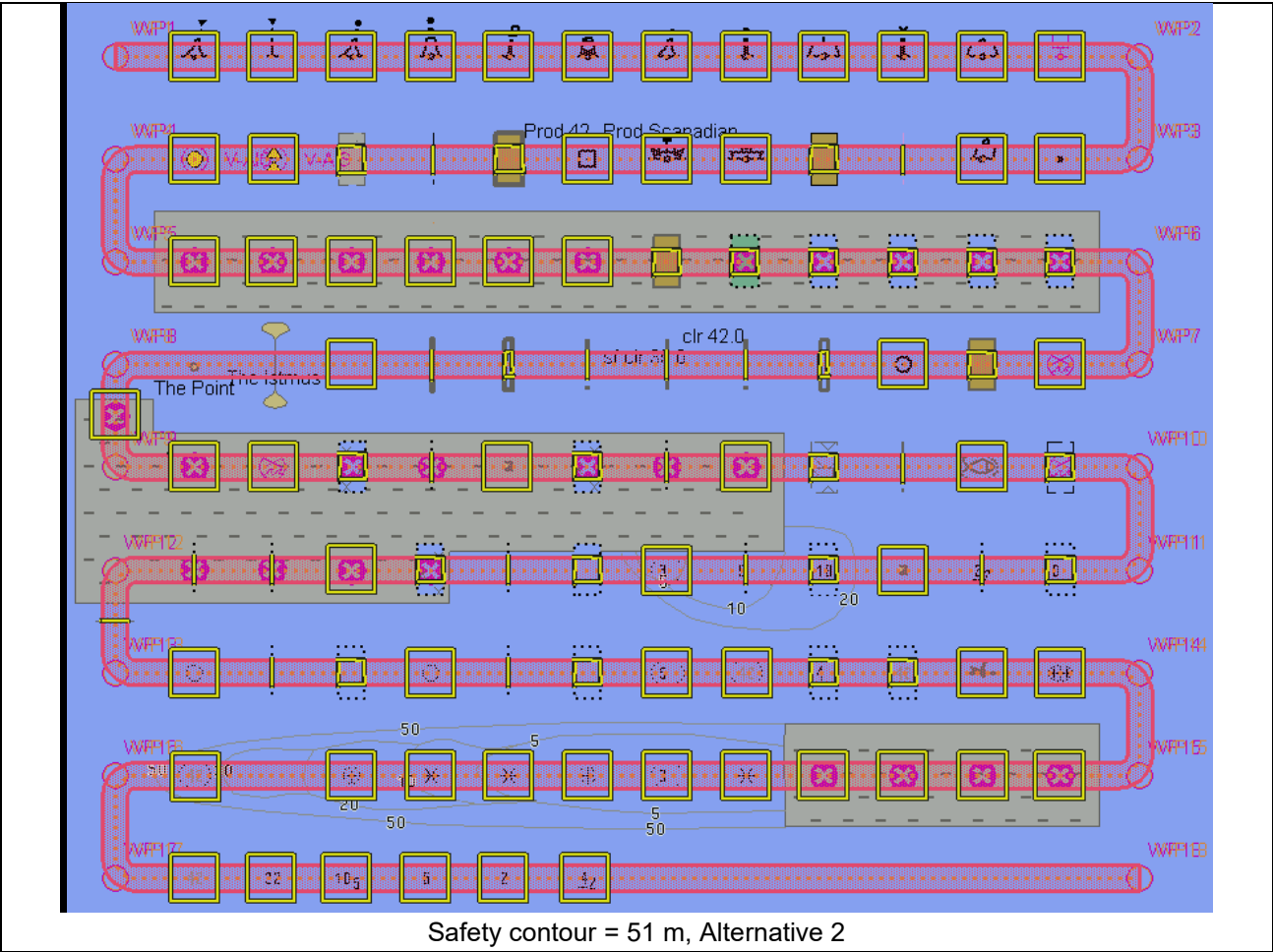










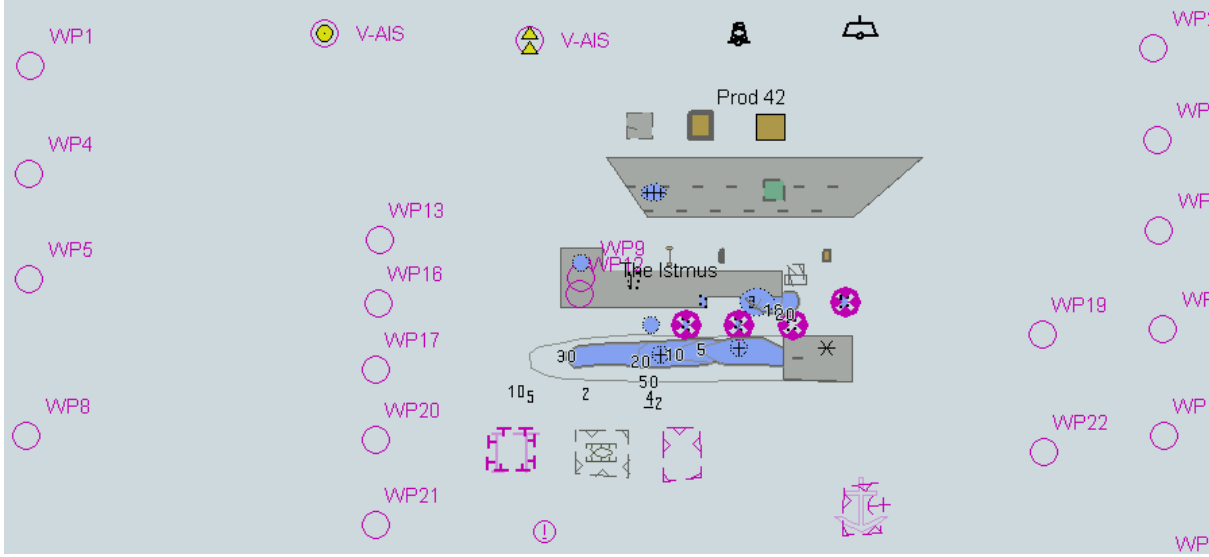


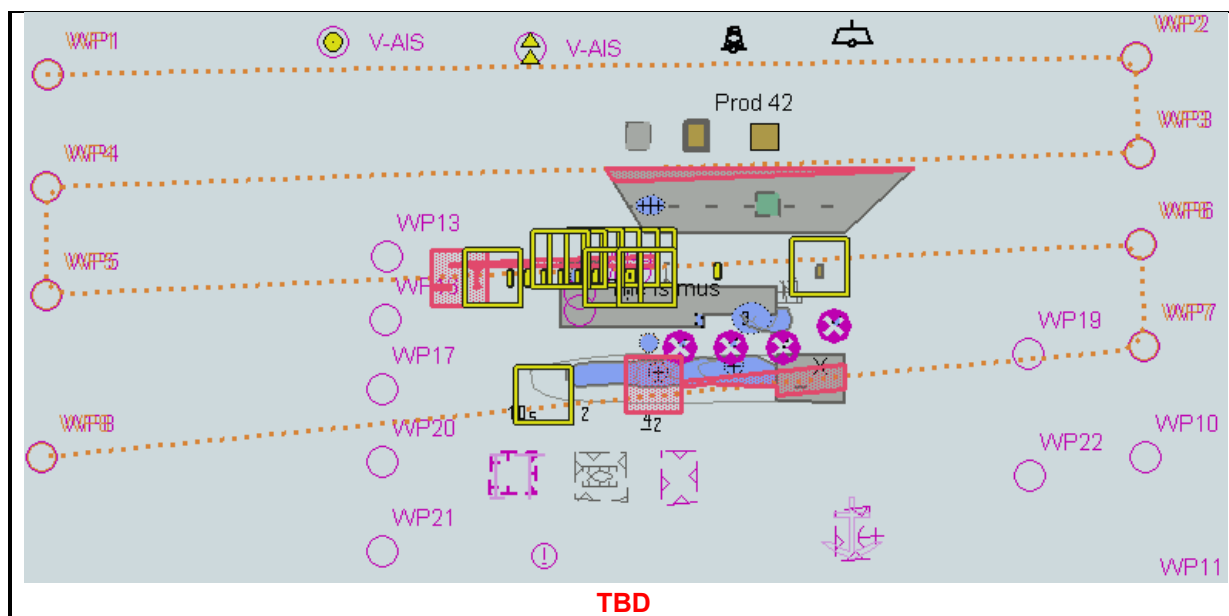
5.1.1 User selection of prohibited areas

Test Reference	UserSelectionProhibited Areas	IHO Reference	
Test description			
<ul style="list-style-type: none">From PC (Github Issue 136)Need to test selectors exist for each individual type of prohibited area.			

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

Test Reference	NavigationHazardsLS	IHO Reference	S-98 12.10.6
Test Description			
<p><i>The purpose of this test is to verify by observation that ECDIS uses the largest scale available for detection of navigational hazards.</i></p>			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			

Additional			
Setup			
<p><i>This test is performed by loading the TDS 101AA00OVRVU.000 and 101AA00NAVHZ.000, manually creating a route connecting all way points between features marked as WP1 through WP8 and checking display against the corresponding graphical plot</i></p> <p><i>... Load the exchange set NavigationHazards and the exchange set NavigationHazardsOverview</i></p> <ul style="list-style-type: none"> • <i>Select Display Category Other</i> • <i>Set the Safety contour value to 30 m</i> • <i>Set the Safety depth value to 30 m</i> • <i>Set Plain boundaries to On</i> • <i>Set Simplified symbols to Off</i> • <i>Select all Text groups to On</i> 			
Action			
<p><i>Select position 39°57.000'N 104°49.000'W at optimum display scale (1:350 000) of 101AA00OVRVU.</i></p> <p><i>1) View chart before route planning.</i></p> <p><i>2) Manually create a route connecting all way points between features 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</i></p>			
Results			
<p><i>The ENC in the ECDIS should match the corresponding graphical plot shown below</i></p> <p><i>1) Situation before route planning. Chart 101AA00OVRVU displayed as it is</i></p>  <p style="text-align: center; color: red;">TBD</p> <p><i>2) Situation after route planning. Alerts indicated from largest scale available for each location</i></p>			



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

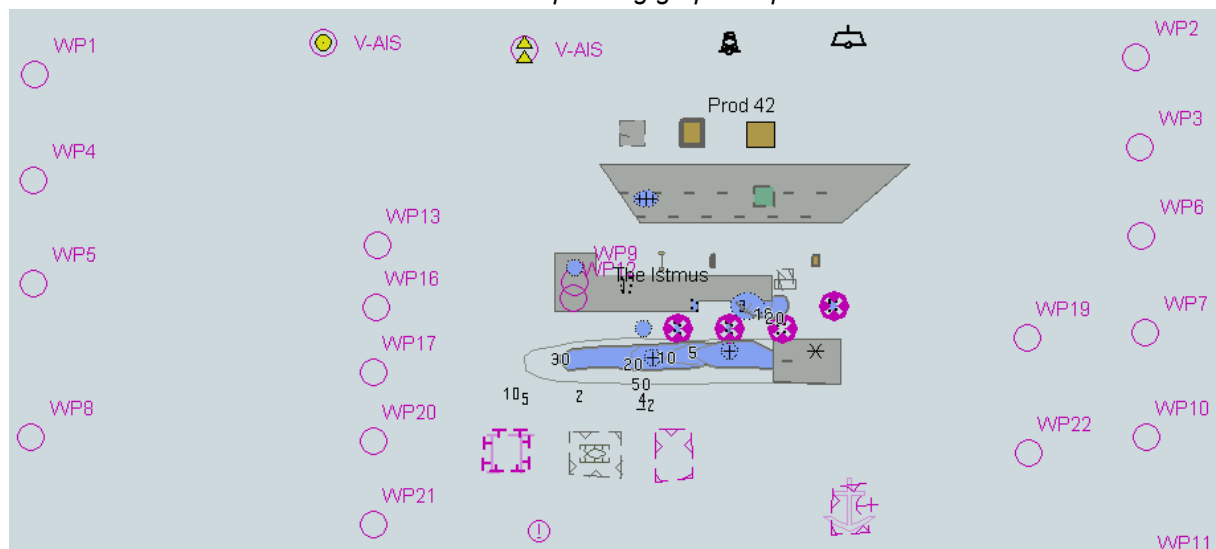
Test Reference	NavigationHazardsMon	IHO Reference	
Test Description			
<p>The purpose of this test is to verify by observation that ECDIS provides an appropriate indication if, continuing on its present course and speed, over a specified time or distance set by the Mariner, own ship will pass closer than a user-specified distance from any features satisfying the conditions for this test (as listed in section 10.5.9 of IHO S-52 and included in the test cell 101AA00NAVHZ.000) that is shallower than the Mariner's safety contour.</p>			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routeing systems and ferry routes			
Archipelagic sea lanes			

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

Test Reference	NavigationalHazardsMonLS	IHO Reference	
Test Description			
<p>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 101AA00OVRVU.000 and 101AA00NAVHZ.000, manually creating a route connecting all way points between features marked as WP1 through WP8 and checking display against the corresponding graphical plot.</p>			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			

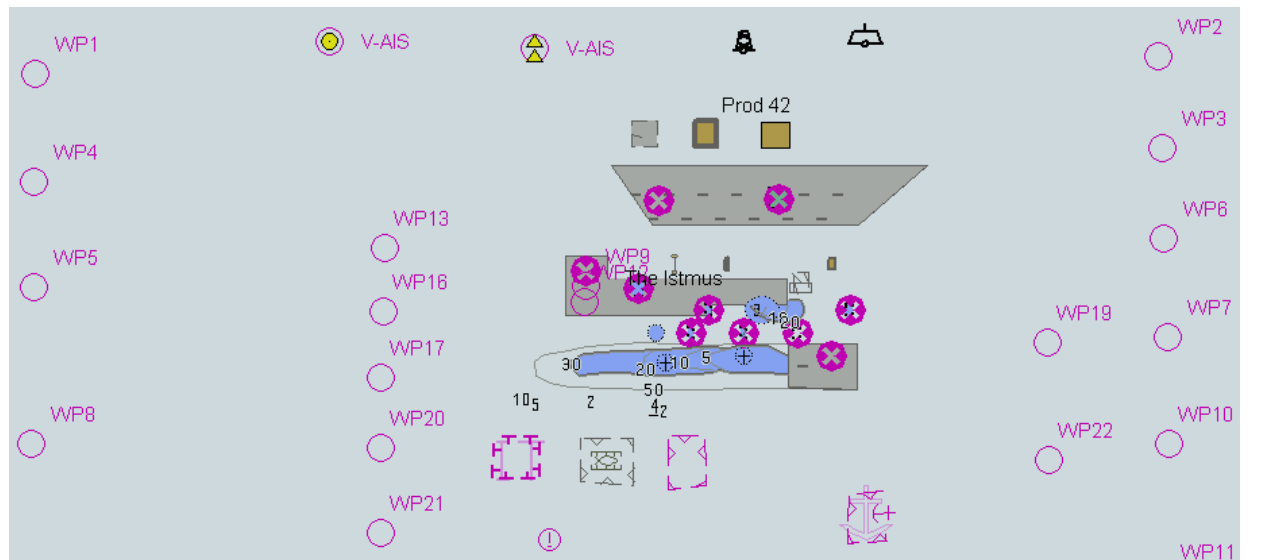
Chart (Standard)			
Alert Highlights (Standard)			
Additional			
Setup			
<p>Load the exchange set NavigationHazards</p> <p>Load the exchange set NavigationHazardsOverview</p> <ul style="list-style-type: none"> • Select Display Category Other • Set the Safety contour value to 30 m • Set the Safety depth value to 30 m • Select Symbolized Boundaries <p>Set symbolized symbols to Off</p> <p>Select all Text groups</p> <p>..</p>			
Action			
<p>Select position 39°57.000'N 104°49.000'W at the maximum display scale (1:350 000) of 101AA00OVRVU.</p> <p>Set simulated own ship for 39°49.587'N 104°54.930'W with heading set for 10.0°</p> <p>Select size of own ship check area as 1.0 NM width and 8.0 NM length.</p>			
Results			

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



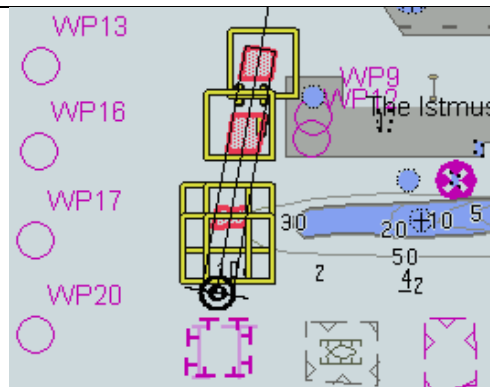
TBD

1) Situation before route monitoring. Chart 101AA00OVRVU displayed as it is. Presentation alternative 1



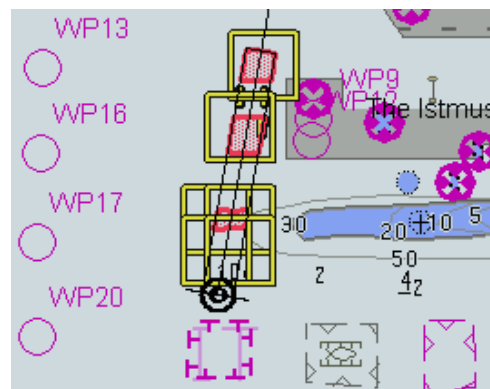
TBD

Situation before route monitoring. Chart 101AA00OVRVU displayed as it is. Presentation alternative 2



TBD

*2) Situation during route monitoring. Alerts indicated from largest scale available for each location
Presentation alternative 1*



TBD

*Situation during route monitoring. Alerts indicated from largest scale available for each location.
Presentation alternative 2*

Note: The parameters and shapes of the ship's check area are examples

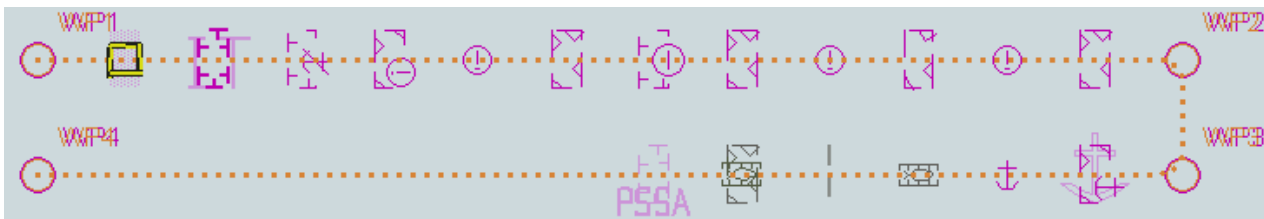
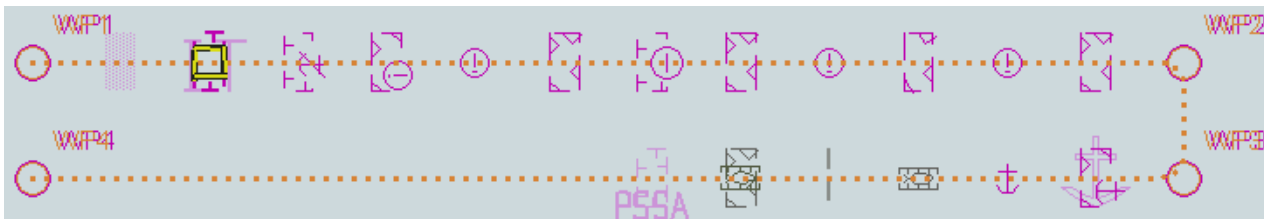
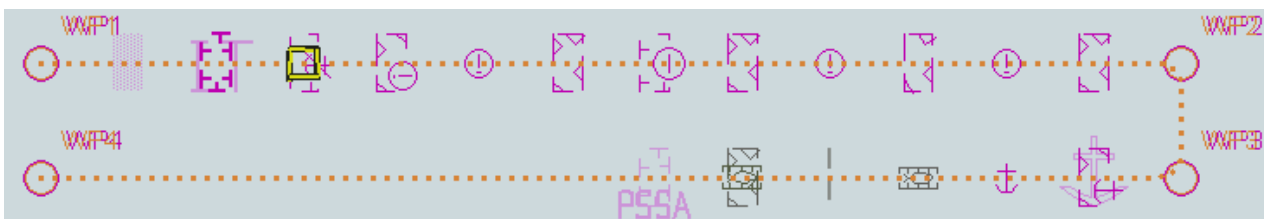
5.5 Use of Data Quality Information.

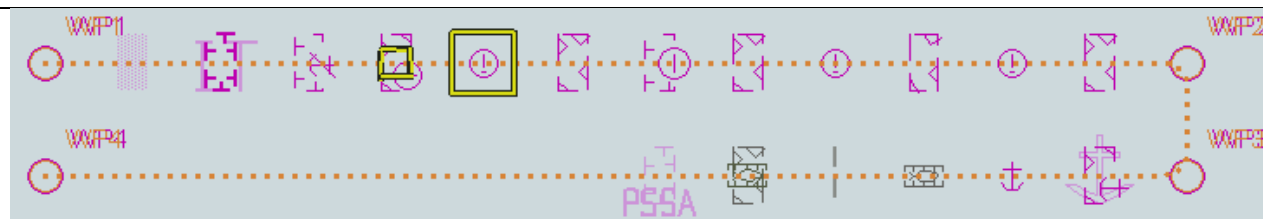
Test Reference	DataQuality	IHO Reference	
Test description			
<p><i>This new test could be located in the Data Quality section or left here.</i></p> <ul style="list-style-type: none">• <i>Test use of data quality mode.</i>• <i>Test for offset of lookahead for alerts and indications.</i>• <i>Also test for different CATZOC zones.</i>			

6 Detection of Areas for which Special Conditions Exist

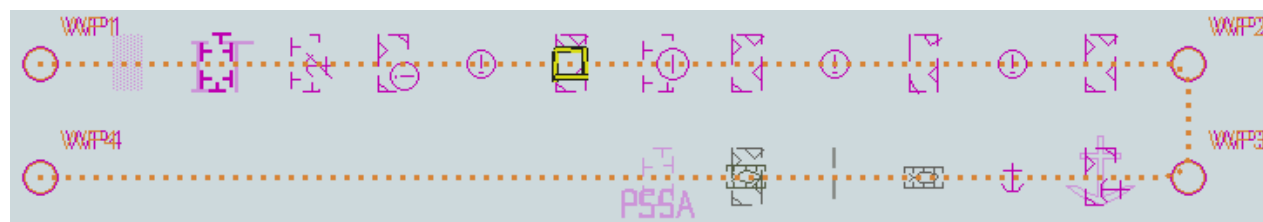
6.1 Detection of Areas for which Special Conditions Exist - Basic test

Test Reference	SpecialConditions	IHO Reference	S-98 12.10.7
Test Description			
<p>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 features satisfying the conditions for this test are listed the S-101 Alerts and indications catalogue and are included in the test cell 101AA00ARSPC.000.</p>			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys, Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			

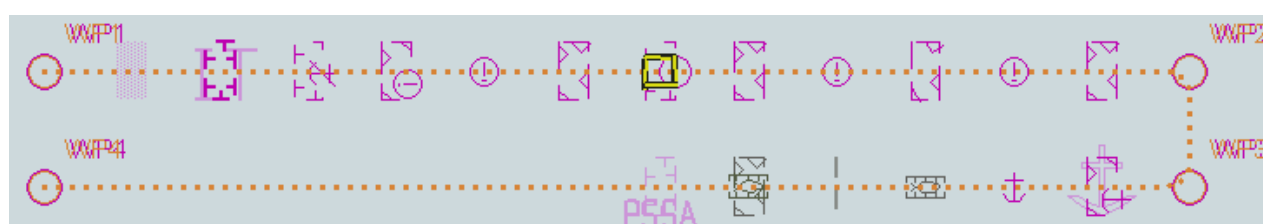
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			
Setup			
<p>This test is performed by loading the test cell 101AA00ARSPC.000, manually creating a route connecting all way points between features marked as WP1 through WP4 and checking display against the corresponding graphical plot</p> <p>Load the exchange set SpecialConditions</p> <ul style="list-style-type: none"> • Select Display Category Other • Set the Safety contour value to 0 m • Set the Safety depth value to 30 m • Select Symbolized Boundaries • Set symbolized symbols to Off • Manually create a route connecting all way points between features marked WP1 through WP4 <p>Set user-specified distance for indication of areas with special condition as 0.1 NM</p>			
Action			
<p>Check ENC symbols shown in the ECDIS against the corresponding graphical plot. selecting one by one each special condition for the test</p>			
Results			
<p>The ENC in the ECDIS should match the corresponding graphical plot shown below.</p>  <p>Selected: Traffic separation zone</p>  <p>Selected: Inshore traffic zone</p>  <p>Selected: Restricted area</p>			



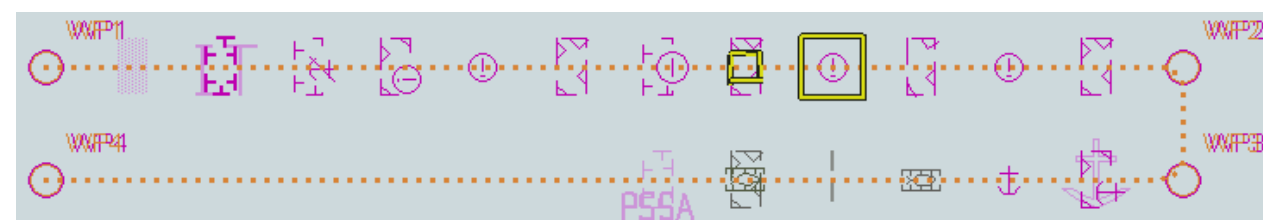
Selected: Caution area



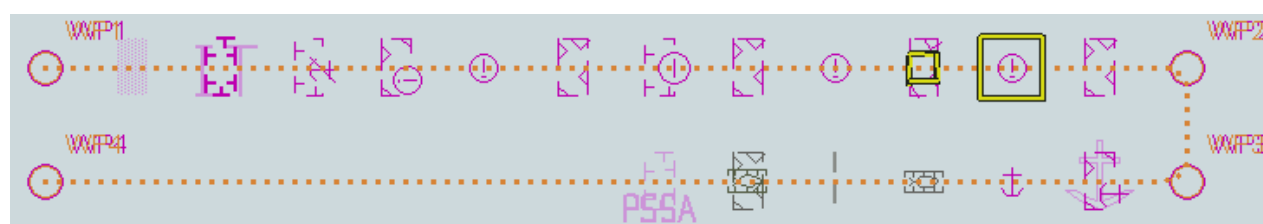
Selected: Offshore production area



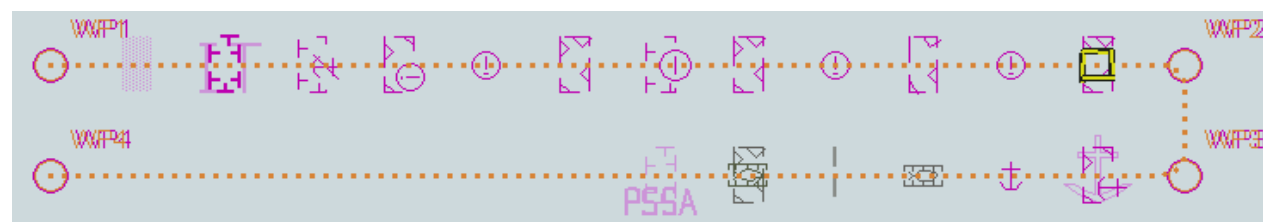
Selected: Area to be avoided



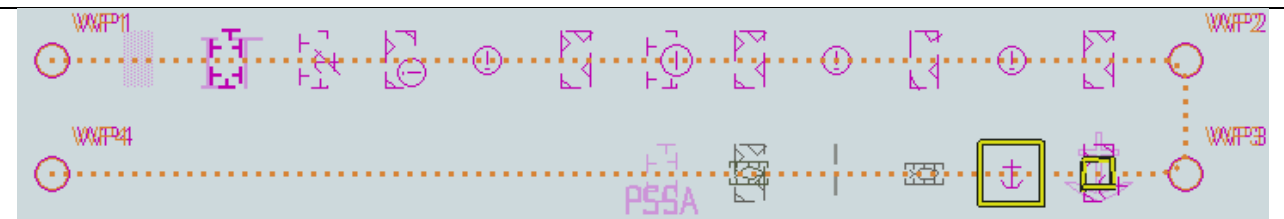
Selected: Military practice area



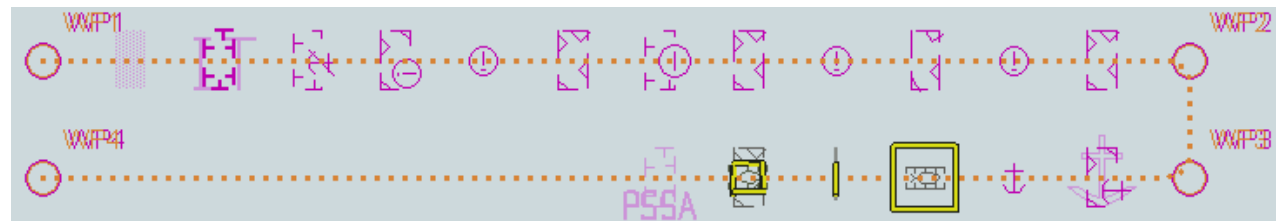
Selected: Seaplane landing area



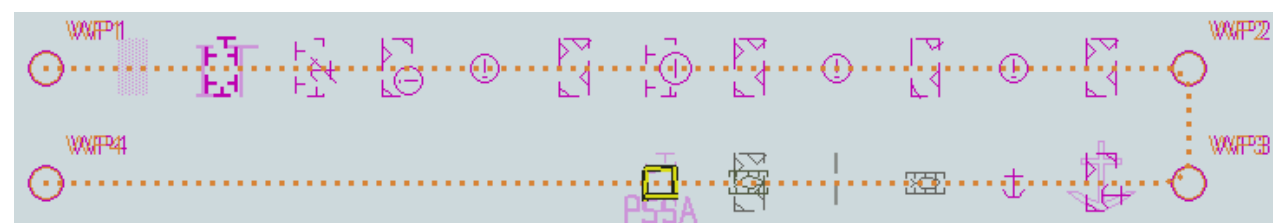
Selected: Submarine transit lane



Selected: Anchorage area



Selected: Marine farm/aquaculture



Selected: PSSA (Particularly Sensitive Sea Area)

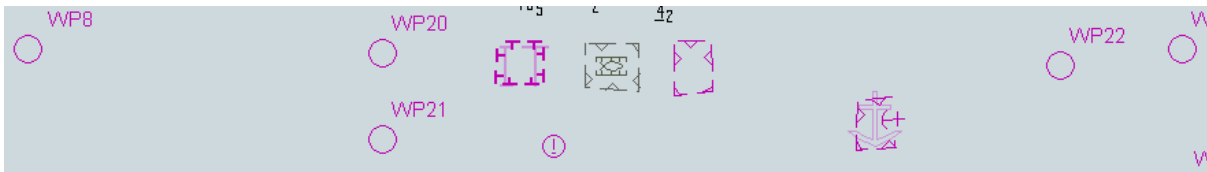
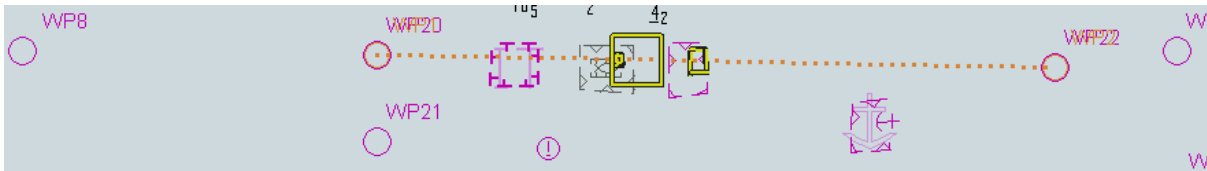
tbd

6.1.1 User selection of Areas with Special Conditions

Test Reference	UserSelectionProhibited Areas	IHO Reference	
Test description			
<ul style="list-style-type: none"> From PC (Github Issue 136) Need to test selectors exist for each individual type areas with special conditions.. <p><i>[check that an S-98 requirement exists? Or is this all in the S-101PC?]</i></p>			

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

Test Reference	SpecialConditionsLS	IHO Reference	S-98 12.10.7
Test Description			
<p><i>The purpose of this test is to verify by observation that ECDIS uses the largest scale available for detection of areas with special condition.</i></p> <p><i>This test is performed by loading the test cells 101AA00OVRVU.000 and 10100AA_ARSPC.000, manually creating a route connecting way points between features marked as WP20 and WP22 and checking display against the corresponding graphical plot</i></p>			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			

Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			
Setup			
<p>As for test <i>SpecialConditions</i> and in addition load the exchange set NavigationHazardsOverview</p> <ul style="list-style-type: none"> • Select Display Category Other • Set the Safety contour value to 0 m • Set the Safety depth value to 30 m • Set Plain Boundaries to Off • Set Simplified symbols to On <p>Select all Text groups</p>			
Action			
<p>Select position 39°45'000N 104°49'000W at compilation scale (1:350 000) of 101AA00OVRVU.</p> <p>1) View chart before route planning.</p> <p>2) Manually create a route connecting two way points between features 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</p>			
Results			
<p>The ENC in the ECDIS should match the corresponding graphical plot shown below</p>  <p>1) Situation before route planning. Chart 101AA00OVRVU displayed as it is</p>  <p>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.</p> <p style="text-align: center;">TBD</p>			

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

Test Reference	SpecialConditionsMon	IHO Reference	S-98 12.10.7
Test Description			
<p>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 features satisfying the conditions for this test are listed in the Alerts and Indications section of the portrayal catalogue and are included in the test cell 101AA00ARSPC.000.</p> <p>This test is performed by loading the test cell 101AA00ARSPC.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</p>			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			

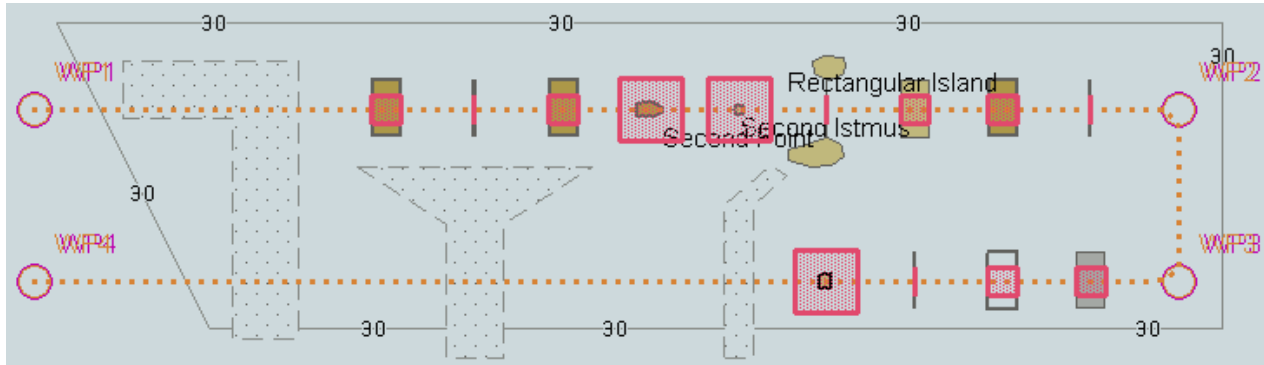
6.4 Detection of Areas for which Special Conditions Exist - Use of largest scale available – Monitoring Mode

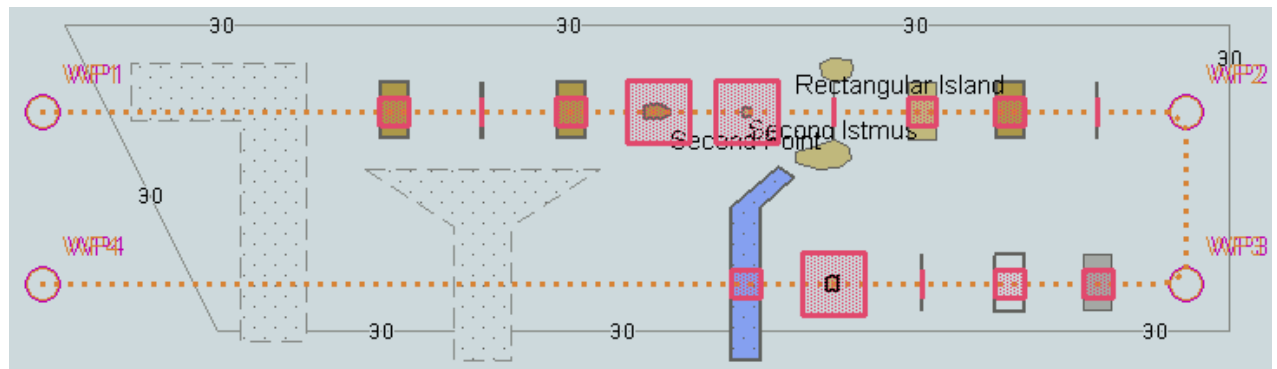
Test Reference	SpecialConditionsMonLS	IHO Reference	S-98 12.10.7
Test description			
<p><i>The purpose of this test is to verify by observation that ECDIS uses the largest scale available for detection of areas with special condition.</i></p> <p><i>This test is performed by loading the test cells 101AA00OVRVU.000 and 101AA00ARSPC.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.</i></p>			
Setup			
As for test SpecialConditionsLS			
Action			
<p><i>Select position 39°45'•000N 104°49'•000W at compilation scale (1:350 000) of 101AA00OVRVU. Heading approximately 100°.</i></p> <p><i>Set vessel position to 39°47.877'N 104°57.590'W, heading 94.3°.</i></p> <p><i>Check ENC symbols shown in the ECDIS for each special condition against the corresponding graphical plot.</i></p>			
Results			
<p><i>The ENC in the ECDIS should match the corresponding graphical plot of test 6.1 and 6.2.</i></p> <div> </div> <p><i>An example with Caution area, Military practice area and PSSA as selected</i></p> <p style="text-align: center;">TBD</p>			

7 Detection and Notification of the Safety contour

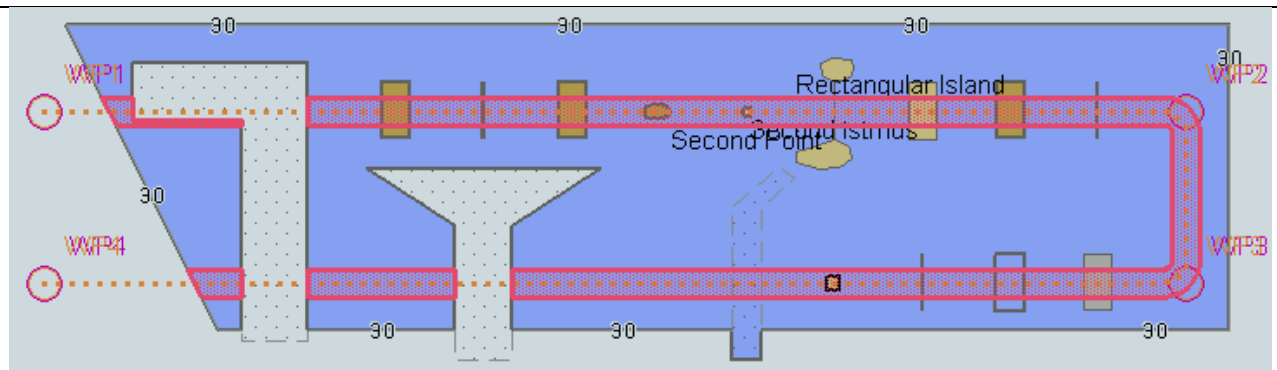
7.1 Detection and Notification of the Safety contour - Basic test

Test Reference	SafetyContour	IHO Reference	S-98 12.10.9
Test Description			
<p>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 features satisfying the conditions for this test are listed in the alerts and indications catalogue in the S-101 Portrayal Catalogue and are included in the test dataset 10100AA_SAFECO.000.</p>			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			

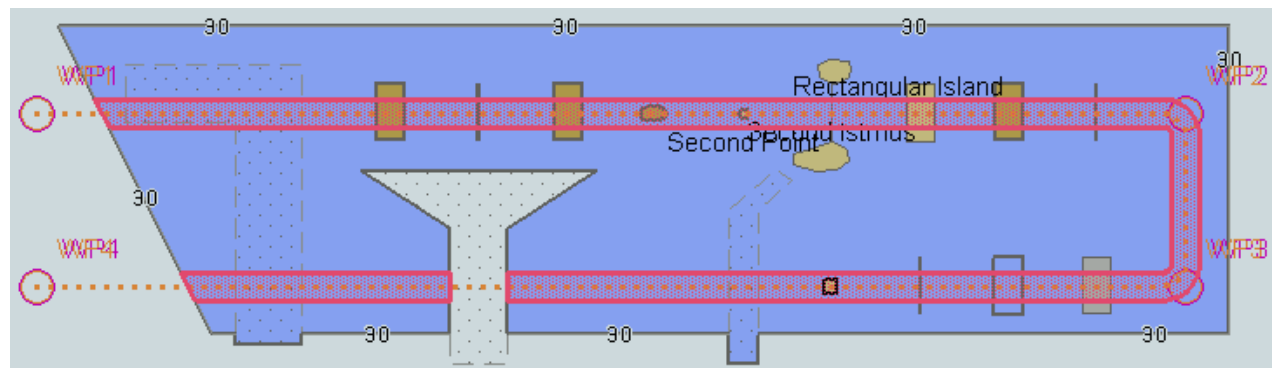
Chart (Standard)			
Alert Highlights (Standard)			
Additional			
Setup			
<p><i>This test is performed by loading the test cell 10100AA_SAFCO.000, manually creating a route connecting all way points between features marked as WP1 through WP4 and checking display against the corresponding graphical plot</i></p>			
Action			
<p>Load the exchange set SafetyContour</p> <ul style="list-style-type: none"> • Select Display Category Other • Set the Safety contour value to 0 m • Set the Safety depth value to 30 m • Select Symbolized Boundaries • Set symbolized symbols to Off • Select all Text groups • Select Contour label • Manually create a route connecting all way points between features marked WP1 through WP4 <p>Set user-specified distance for detecting of Safety contour as 0.1 NM</p> <p>Check ENC symbols shown in the ECDIS against the corresponding graphical plot.</p> <p>Repeat sequentially for Safety contour value 0m, 6m, 11m, 13m, 43m</p>			
Results			
<p>The ENC in the ECDIS should match the corresponding graphical plot shown below.</p> <p>Note: To increase the prominence of dangers in unsafe waters it is permitted to highlight features with an isolated danger mark when they are wholly located in this area.</p>			
			
<p>Safety contour = 0 m</p>			



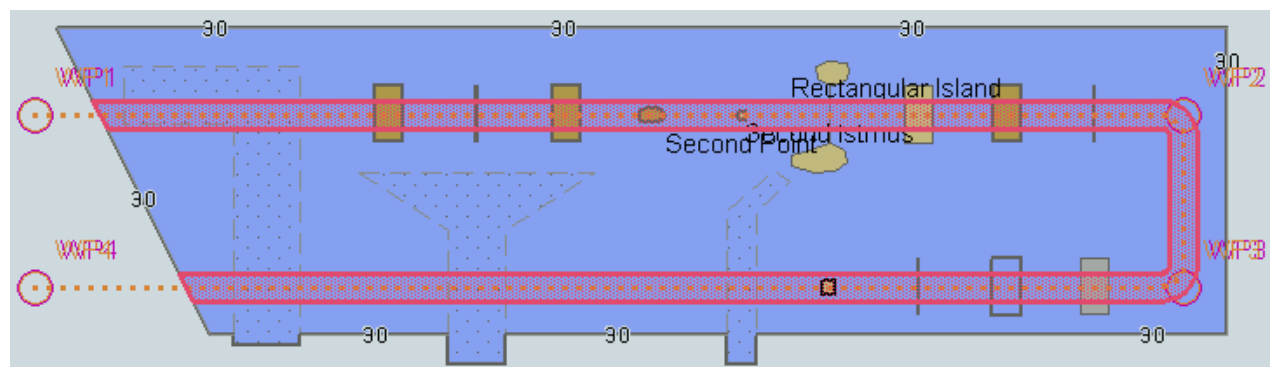
Safety contour = 6 m



Safety contour = 11 m



Safety contour = 13 m

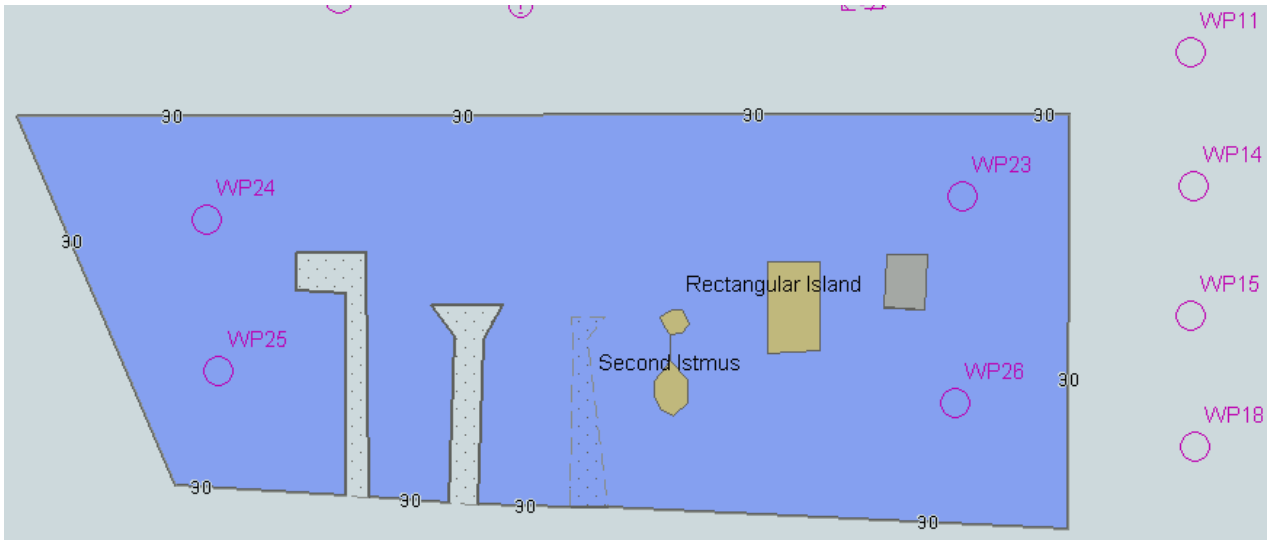


Safety contour = 43 m

tbd

7.2 Detection and Notification of the Safety contour – Use of largest scale available

Test Reference	SafetyContourLS	IHO Reference	S-98 12.10.9
Test Description			
<p><i>The purpose of this test is to verify by observation that ECDIS uses the largest scale available for detecting that the route crosses an own ship's safety contour.</i></p>			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routeing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			

Setup			
<p><i>This test is performed by loading the test cells 101AA00OVRVU.000 and 101AA00ARSPC.000, manually creating a route connecting way points between features marked as WP11, WP24, WP25 and WP26 and checking display against the corresponding graphical plot</i></p> <p><i>As for test 7.1 and in addition load the exchange set NavigationalHazardsOverview</i></p> <ul style="list-style-type: none"> • <i>Select Display Category Other</i> • <i>Set the Safety contour value to 11 m</i> • <i>Set the Safety depth value to 30 m</i> • <i>Select Symbolized Boundaries</i> • <i>Select Simplified Point Symbols = false</i> <p><i>Select Contour label</i></p>			
Action			
<p><i>Select position 39°27'000N 104°49'000W at maximum display scale (1:350 000) of 101AA00OVRVU.</i></p> <p><i>1) View chart before route planning.</i></p> <p><i>2) Manually create a route connecting way points between features marked WP11, WP24, WP25 and WP26.</i></p> <p><i>Set user-specified distance for indication navigational hazards as 0.5 NM. Check ENC symbols shown in the ECDIS against the corresponding graphical plot.</i></p>			
Results			
<p><i>The ENC in the ECDIS should match the corresponding graphical plot shown below.</i></p>			
 <p>1) Situation before route planning. Chart 101AA00OVRVU displayed as it is</p>			
TBD			

7.3 Detection and Notification of Safety contour Next Leg - Planning Mode

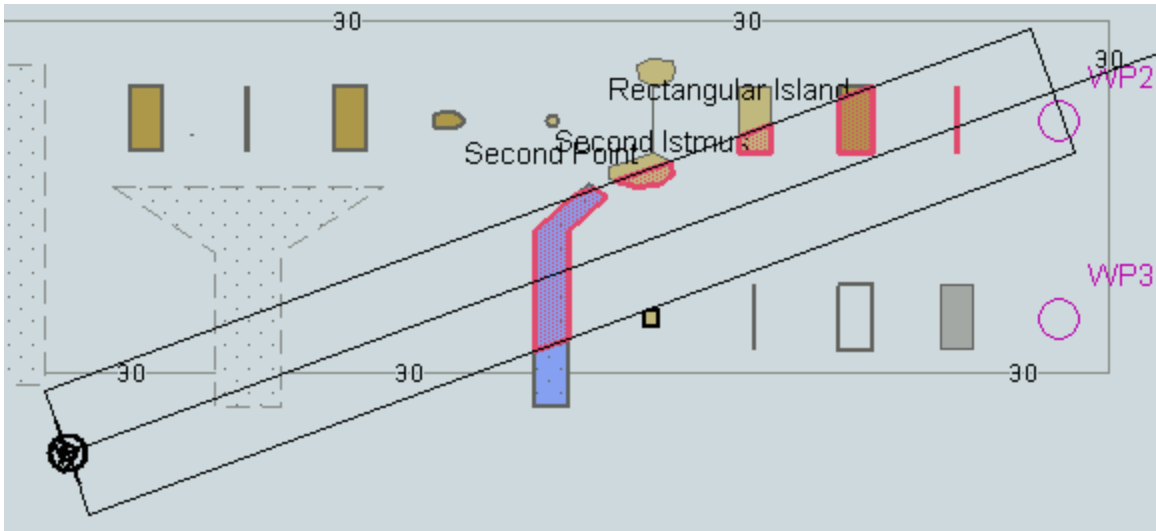
Test Reference	SafetyContourNextLeg	IHO Reference	S-98 12.10.9
Test description			
<p><i>TBD – New Requirement in S-98 requires a new test.</i></p> <p><i>The purpose of this test is to verify by observation that ECDIS provides an appropriate indication when the Mariner plans a route where the next leg passes closer than a user-specified distance from the safety contour.</i></p>			
Setup			
-			
Action			
<p><i>Check ENC symbols shown in the ECDIS against the corresponding graphical plot.</i></p>			
Results			
<p><i>Verify safety contour detection in next leg of planned route.</i></p>			

7.4 Detection and Notification of Safety contour – Water Level Adjustment.

Test Reference	SafetyContourWLA	IHO Reference	S-98 Appendix D-3
Test description			
<i>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 whilst operating with Water Level Adjustment enabled in areas of S-101, S-102 and S-104 coverage.</i>			
Setup			
<p>As for test SafetyContour with the additional settings:</p> <ul style="list-style-type: none"> - Set User Selected Safety contour = 11.4m - Select Water Level Adjustment = true - Set system date = 2022-14-11 			
Action			
<i>Check ENC symbols shown in the ECDIS against the corresponding graphical plot.</i>			
Results			
<p><i>Verify correct existence of user selected safety contour in areas without either S-102 or S-104 coverage, areas with only S-102 coverage and areas with both S-102 and S-104 coverage.</i></p> <p><i>Areas should be delimited and permanent indications of WLA mode shown as per test WaterLevelAdjustment.</i></p>			

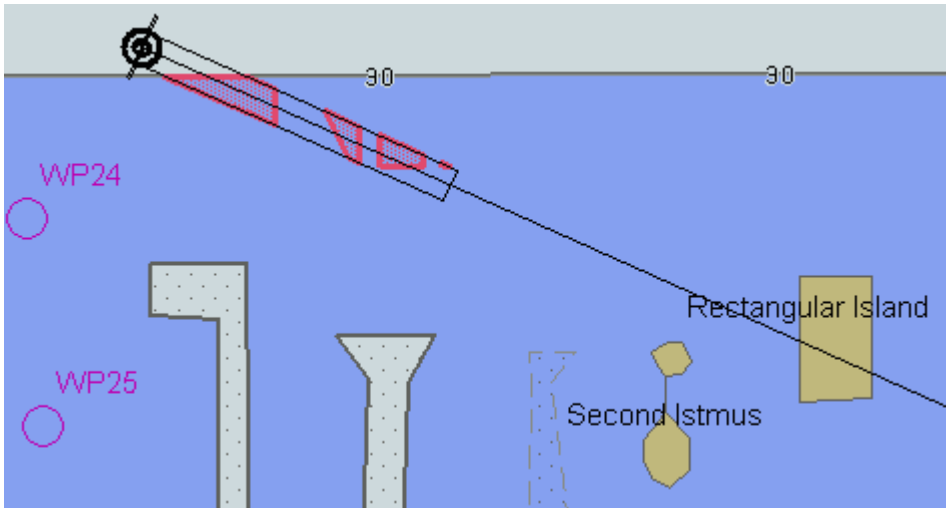
7.5 Detection and Notification of the Safety contour - Basic test – Monitoring Mode

Test Reference	SafetyContourMon	IHO Reference	S-98 12.10.9
Test Description			
<p>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 features satisfying the conditions for this test are listed in the S-101 Alert and indications catalogue and are included in the test cell 101AA00SAFCO.000.</p>			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			

Chart (Standard)			
Alert Highlights (Standard)			
Additional			
Setup			
<p><i>This test is performed by loading the test cell 101AA00SAFCO.000, sailing with a simulated ship over the test area, setting the 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</i></p> <p><i>As for test SafetyContour</i> <i>Select all Text groups</i> <i>Select Contour label..</i></p>			
Action			
<p><i>Set vessel position to 39°36.516'N 104°55.737'W, heading 70.3°. Check ENC symbols shown in the ECDIS for each Safety contour setting against the corresponding graphical plot</i></p>			
Results			
<p><i>The ENC in the ECDIS should match the corresponding graphical plot of test 7.1</i></p>  <p><i>An example with Safety contour = 6 m.</i></p> <p>TBD</p>			

7.6 Detection and Notification of the Safety contour – Use of largest scale available – Monitoring Mode

Test Reference	SafetyContourMonLS	IHO Reference	S-98 12.10.9
Test Description			
<p>The purpose of this test is to verify by observation that ECDIS uses the largest scale available for providing an appropriate alarm if the ship, within a specified time set by the Mariner, is going to cross own ship's safety contour. The features satisfying the conditions for this test are listed in the S-101 Alerts and Indications catalogue and are included in the test cell 10100AA_SAFCO.000.</p> <p>This test is performed by loading the test cells 101AA00OVRVU.000 and 10100AA_SAFCO.000, sailing with a simulated ship over the test area, setting the 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</p>			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	

Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			
Setup			
As for test SafetyContourLS ..			
Action			
Set vessel position to 39°40.522'N 105°05.654'W, heading 112°. Check ENC symbols shown in the ECDIS for each Safety contour setting against the corresponding graphical plot			
Results			
The ENC in the ECDIS should match the corresponding graphical plot of test 7.1 and 7.2			
 <p>The graphical plot shows a vessel (black circle with a cross) at the top left, heading towards the bottom right. A red line with a white 'V' symbol indicates a vessel's path. Two waypoints, WP24 and WP25, are marked with pink circles. Land features include a 'Rectangular Island' and a 'Second Isthmus', both shown in yellow. A blue line with a white 'V' symbol indicates a depth contour. The background is blue, representing water. The plot is labeled with '30' at the top and '30' on the right side.</p>			
An example with Safety contour = 11 m.			
TBD			

8 S-57 Testing

8.1 Introduction

During the transition period to full S-100 operation on all ECDIS parallel operation of S-57 and S-100 services will take place servicing users who still require the S-57 legacy format. During this period ECDIS systems will require compatibility with both S-100 and S-57 formats of ENC data. The next section in this manual deals with testing of the so-called “Duel Fuel mode” of operation of such ECDIS where S-57 and S-101 data are used simultaneously. The next section deals specifically with those test scenarios using both S-57 and S-101 at the same time.

In order to maintain minimum levels of safety and conformance with IMO documentation compatibility with S-57 data must be maintained by systems under test. Therefore, during this period, and by reference from this manual there is a continued requirement for EUT to be tested for correct operation under S-5 and S-63, supported by this manual and IHO TDS.

This manual, therefore, references the existing IHO S-64 guidance for testing the operation of type approved ECDIS available at:

https://iho.int/iho_pubs/standard/S-64/S-64_Edition_3.0.2/index.htm

8.2 Notes on specific tests.

Whilst testing under the existing S-57 is still a requirement during the transition period a number of caveats should be made prior to the execution of the S-64 test suites.

1. It may not be necessary to do all the tests if certain generic functionality has already been tested as part of the S-100 elements of testing done. Some sections should be considered complete if successfully executed in an S-100 mode of operation
 - **To Be Determined from testing:**
2. Skin of the Earth tests relate to anomalies detected in an S-57 mode and do not apply in the S-100 test suite.
3. S-100 replaces many user settings with “Context Parameters”. Where the S-57/S-64 tests refer to certain user controls and parameters there is an equivalence between such parameters. A future edition of this manual will list these exhaustively.

9 Dual Fuel Mode testing

9.1 Introduction

As referenced in the previous section of this manual, during the transition period from S-57 to S-101 ENC's ECDIS will be required to support "Dual Fuel" mode. This entails display of either S-57 or S-101, or both in areas where S-101 is not available yet. The tests in this section verify the ECDIS operation when both S-57 and S-101 are in operation together.

9.2 Data Scheming for Dual Fuel testing

In order to simplify the arrangement of test data for Dual Fuel testing, some original S-57 datasets (from IHO S-64) have been used alongside S-101 versions to create the reference TDS. The arrangement of data coverage for these tests is therefore largely unchanged. A notable exception is the data scheming for the tests for navigational hazards, safety contour detection and areas where special conditions exist. These have been created alongside the original S-57 datasets, allowing exhaustive tests to be run across both types of chart format using single routes. All data is arranged in exchange sets to allow for straightforward test setup and execution.

9.3 Chart Loading and Update

9.3.1 Initial Loading of charts in Dual fuel mode.

Test Reference	DualFuelSimple	IHO Reference	S-98 18.2
Test description			
<i>Initial import of a dual fuel exchange set.</i>			
Setup			
<i>Load exchange set DualFuelSimple</i>			
Action			
<i>Ensure exchange set is loaded. Inspect contents of System Database.</i>			
Results			
<i>The System Database should contain the following entries.</i>			
ENC	Edition (EDTN)	Update number (UPDN)	Issue Date (ISDT)
10100AA_X0000.000	1	0	20190409
10100AA_X01NE.000	1	0	20210406
GB5X01NW.000	1	0	20210406

9.3.2 Update(s) of combined exchange set.

Test Reference	DualFuelSimpleUpdate	IHO Reference	S-98 18.2	
Test description				
<p><i>This test verifies the ECDIS is able to load updates to Dual Fuel datasets from a combined update exchange set.</i></p> <p><i>[these tests are very basic and may be expanded with more comprehensive exchange sets including ones where S-57 is deleted and S-101 installed instead. Additionally, dual updates, multiple data coverage and exchange sets with multiple datasets at different MSVS will be supplied. The aim is to test all reasonable edge cases when loading and basic portrayal of dual fuel is enabled.</i></p> <p><i>Additionally, the viewing of extra layers on top of dual fuel displays will be tested. This will show interleaving on S-101, not on S-57 – S-98 18.2]</i></p>				
Setup				
<p>As per previous test DualFuelSimple</p>				
Action				
<p>Load exchange set DualFuelSimpleUpdate</p>				
Results				
<p>System Database contents should show:</p>				
ENC	Edition (EDTN)	Update number (UPDN)	Update Application Date (UADT)	Issue Date (ISDT)
GB5X01NW.000	1	1	20190409	20190409
10100AA_X01NE.000	1	1	20210406	20210406

9.4 Functions associated with chart display

9.4.1 Dual Fuel feature information

Test Reference	DualFuelFeatureInformation	IHO Reference	S-98 18.2
Test description			
<i>Cursor picking in an area of DF should result in a unified display of information..</i>			
Setup			
<i>As per test DualFuelUpdate</i>			
Action			
<ol style="list-style-type: none"> 1. Set position to (60.9277,-32.4966) 2. Set display scale = 45,000 3. Interrogate features in display 			
Results			
<p><i>Verify the information available to the user contains information from both S-57 and S-101 sources. The pick report information should contain the following information.</i></p> <ul style="list-style-type: none"> - DRGARE (S-57) from GB5X01NW.000 - DredgedArea (S-101) from 10100AA_X01NW.000 			

9.5 Detection and Notification of Navigational Hazards

9.5.1 Detection and Notification of Navigational Hazards – basic test

Test Reference	NavigationalHazardsDF	IHO Reference	
Test Description			
<p><i>The purpose of this test is to verify by observation that ECDIS operating in Dual Fuel mode provides an appropriate indication when the Mariner plans a route closer than a user-specified distance from any features satisfying the conditions for this test as listed in S-98 and the S-101 Alerts and Indications Catalogue. These are included in the TDS AA5NAVHZ.000 and 101AA00NAVHZ.000.</i></p>			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	

Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys, Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routeing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			
Setup			
<p><i>This test is performed by loading the dual fuel exchange set NavigationalHazards, WP1 through WP36 and checking the display against the corresponding graphical plot.</i></p> <p><i>Load the exchange set NavigationalHazardsDF</i></p> <ul style="list-style-type: none"> <i>Select Display Category Other</i> <i>Set the Safety contour value to 0 m</i> <i>Set the Safety depth value to 30 m</i> <i>Select Symbolized Boundaries</i> <i>Select Simplified Point Symbols = false</i> <i>Select all Text groups</i> <i>Manually create a route connecting all way points between features marked WP1 through WP36</i> <p><i>Set user-specified distance for indication navigational hazards as 0.1 NM</i></p>			
Action			

Check ENC symbols shown in the ECDIS against the corresponding graphical plot.

Repeat sequentially with a Safety contour value of 0m, 2m, 4m, 5m, 6m, 8m, 9m, 10m, 11m, 16m, 21m, 31m, 42m, 50m, 51m.

Results

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

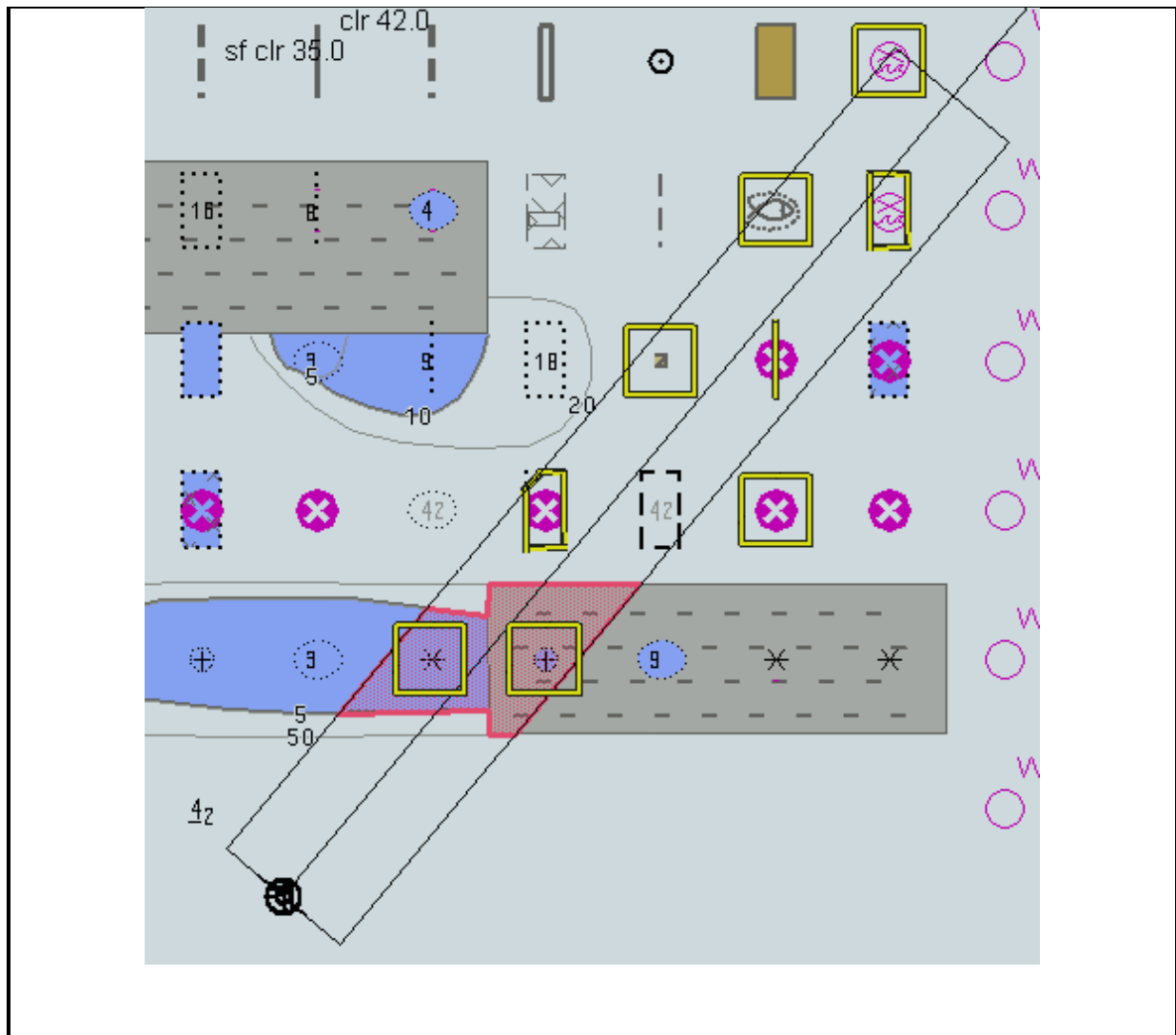
9.5.2 Dual Fuel Detection and Notification of Navigational Hazards – Use of largest scale available.

Test Reference	<i>NavigationalHazardsDFLS</i>	IHO Reference	S-101PC
Test description			
<p><i>The purpose of this test is to verify by observation that ECDIS uses the largest scale available for detection of navigational hazards.</i></p> <p><i>This test is performed by loading dual fuel exchange sets, manually creating a route connecting all way points between marked features and checking display against a corresponding graphical plot. The same test is run twice with different overview exchange sets comprising the smaller scale data.</i></p>			
Setup			
<p>(A) Load the exchange set <i>NavigationalHazardsDF</i> and the exchange set <i>NavigationalHazardsOverviewDF1</i></p> <ul style="list-style-type: none"> • Select Display Category Other • Set the Safety contour value to 30 m • Set the Safety depth value to 30 m • Select Symbolized Boundaries • Select Simplified point symbols = false • Select all Text groups <p>(B) Repeat test using exchange sets <i>NavigationalHazardsDF</i> and <i>NavigationalHazardsOverviewDF2</i></p>			
Action			
<p>For each of (1) and (2)</p> <p>Select position 39°57.000'N 104°49.000'W at maximum display scale (1:350 000) of 101AA00OVRVU.</p> <p>1) View chart before route planning.</p> <p>2) Manually create a route connecting all way points between features 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.</p>			
Results			
<p><i>The ENC in the ECDIS should match the corresponding graphical plot shown below.</i></p> <p>A) Situation before route planning. Chart 101AA00OVRVU displayed as it is-</p> <p>B) Situation before route planning. Chart AA5OVRVU displayed as it is-</p>			

9.5.3 Detection and Notification of Navigational Hazards – monitoring mode

Test Reference	NavigationalHazardsDFMon	IHO Reference	
Test Description			
<p>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 features satisfying the conditions for this test. These are included in the test cells AA5NAVHZ.000 and 101AA00NAVHZ.000) that is shallower than the Mariner's safety contour.</p>			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	
Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys. Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routeing systems and ferry routes			

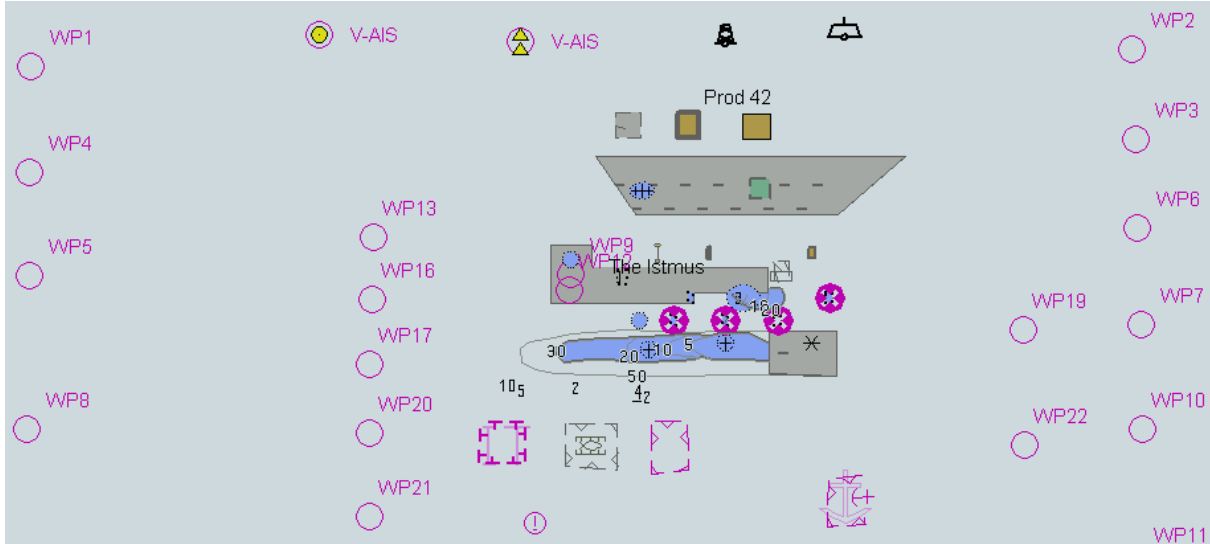
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			
Setup			
<p><i>This test is performed by loading the exchange set NavigationalHazardsDF, sailing with a simulated ship over the test area, setting the Safety contour to the appropriate values (0m, 2m, 5m, 6m, 8m, 9m, 10m, 11m, 16m, 21m, 31m, 42m, 50m, 51m) and checking display against the graphical plots of test NavigationalHazardsDF (Route plan) corresponding to each set of Safety contour settings</i></p> <p><i>As for test NavigationalHazardsDF</i> <i>Select all Text groups</i></p>			
Action			
<p><i>Check ENC symbols shown in the ECDIS for each Safety contour setting against the corresponding graphical plot</i></p>			
Results			
<p><i>The ENC in the ECDIS should match the corresponding graphical plot of test NavigationalHazardsDF.</i></p>			



9.5.4 Detection and Notification of Navigational Hazards – use of largest scale available – monitoring mode

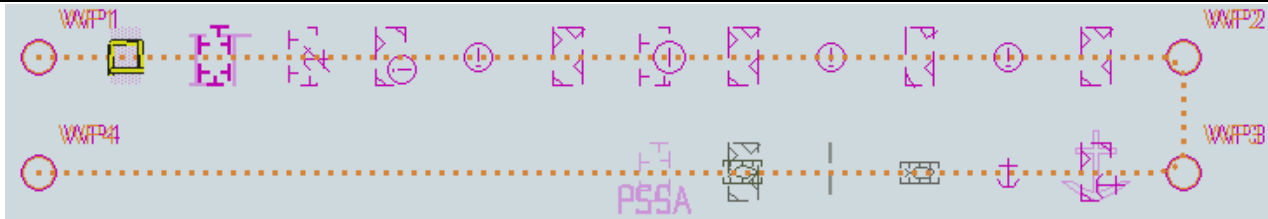
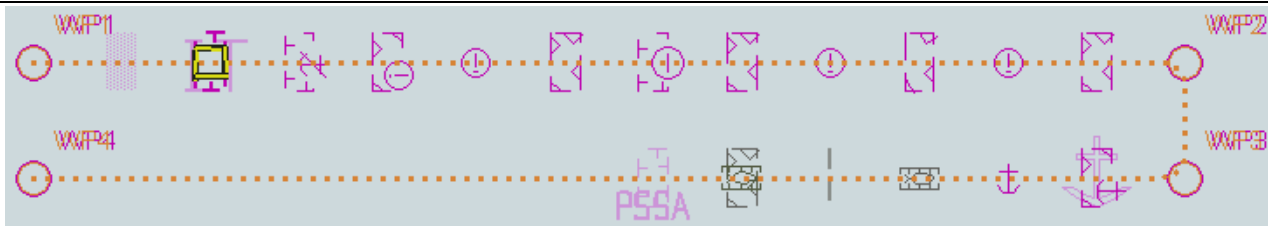
Test Reference	NavigationalHazardsDFMonLS	IHO Reference	
Test Description			
The purpose of this test is to verify by observation that ECDIS uses the largest scale available for detection of navigational hazards in dual fuel mode.			
Loaded Data			
Exchange Set Name			
Display Mode		Independent Mariner's Selections (default=On)	
Other		Accuracy	
Context Parameters		Contour label	
Safety contour		Highlight date dependent	
Safety depth		Highlight document	
Deep Contour		Highlight info	

Shallow contour		Shallow pattern	
Four shades		Unknown	
Radar overlay		Update review	
Plain boundaries		Text Groups	
Simplified symbols		Chart Text	
Full light lines		Important text	
Ignore scale minimum		Other Text	
Shallow water dangers		Names	
Palette		Light description	
Day		All other chart text	
Date Dependent Objects		Display	
Start Date		Centre	
End Date		Scale	1:60000
		Orientation	
Viewing Groups (Default = On)			
Standard Display		Other	
Drying lines		Spot soundings	
Buoys, Beacons, aids to navigation		Submarine cables and pipelines	
Buoys, beacons, structures		All isolated dangers	
Lights		Magnetic variation	
Boundaries and limits		Depth contours	
Prohibited and restricted areas		Seabed	
Chart scale boundaries		Tidal	
Cautionary notes		Miscellaneous (Other)	
Ships' routeing systems and ferry routes			
Archipelagic sea lanes			
Miscellaneous (Standard)			
Chart (Standard)			
Alert Highlights (Standard)			
Additional			
Setup			
<p><i>This test is performed by loading the exchange sets NavigationalHazardsOverviewDF1 and NavigationalHazardsDF, manually creating a route connecting all way points between features marked as WP1 through WP8 and checking the display against a corresponding graphical plot</i></p> <p>A) Load the exchange set <i>NavigationalHazardsDF</i> Load the exchange set NavigationalHazardsOverviewDF1</p> <ul style="list-style-type: none"> • Select Display Category Other • Set the Safety contour value to 30 m • Set the Safety depth value to 30 m • Select Symbolized Boundaries <p>Set symbolized symbols to Off Select all Text groups</p> <p>(B) The test should then be repeated using the exchange sets <i>NavigationalHazardsDF</i> and <i>NavigationalHazardsOverviewDF2</i></p>			

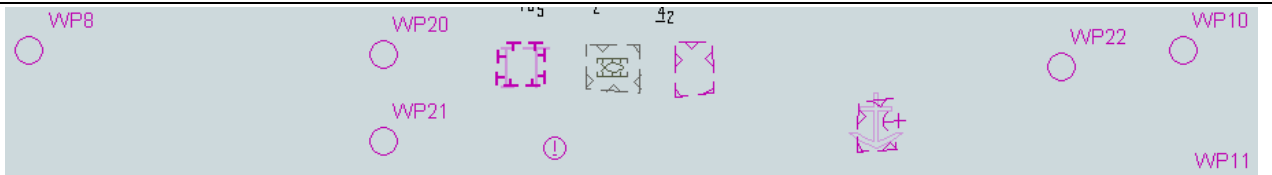
Action
<p>Select position 39°57.000'N 104°49.000'W at the maximum display scale (1:350 000) of 101AA00OVRVU (or AA5OVRVU).</p> <p>Set simulated own ship for 39°49.587'N 104°54.930'W with heading set for 10.0°</p> <p>Select size of own ship check area as 1.0 NM width and 8.0 NM length</p>
Results
<p>The ENC in the ECDIS should match the corresponding graphical plots shown below (A).</p>  <p>The graphical plot (A) displays a simulated own ship (Prod 42) at the top center, oriented towards the bottom. The ship's heading is 10.0°. Below the ship, a central area is labeled 'The Isthmus' and 'Prod 42'. The plot shows various waypoints (WP1-WP22) marked with circles. WP1-WP8 are on the left, WP9-WP11 are on the right, and WP12-WP22 are in the center and bottom. The plot also includes depth contours (10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, 260, 270, 280, 290, 300, 310, 320, 330, 340, 350, 360, 370, 380, 390, 400, 410, 420, 430, 440, 450, 460, 470, 480, 490, 500, 510, 520, 530, 540, 550, 560, 570, 580, 590, 600, 610, 620, 630, 640, 650, 660, 670, 680, 690, 700, 710, 720, 730, 740, 750, 760, 770, 780, 790, 800, 810, 820, 830, 840, 850, 860, 870, 880, 890, 900, 910, 920, 930, 940, 950, 960, 970, 980, 990, 1000, 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100, 1110, 1120, 1130, 1140, 1150, 1160, 1170, 1180, 1190, 1200, 1210, 1220, 1230, 1240, 1250, 1260, 1270, 1280, 1290, 1300, 1310, 1320, 1330, 1340, 1350, 1360, 1370, 1380, 1390, 1400, 1410, 1420, 1430, 1440, 1450, 1460, 1470, 1480, 1490, 1500, 1510, 1520, 1530, 1540, 1550, 1560, 1570, 1580, 1590, 1600, 1610, 1620, 1630, 1640, 1650, 1660, 1670, 1680, 1690, 1700, 1710, 1720, 1730, 1740, 1750, 1760, 1770, 1780, 1790, 1800, 1810, 1820, 1830, 1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000, 2010, 2020, 2030, 2040, 2050, 2060, 2070, 2080, 2090, 2100, 2110, 2120, 2130, 2140, 2150, 2160, 2170, 2180, 2190, 2200, 2210, 2220, 2230, 2240, 2250, 2260, 2270, 2280, 2290, 2300, 2310, 2320, 2330, 2340, 2350, 2360, 2370, 2380, 2390, 2400, 2410, 2420, 2430, 2440, 2450, 2460, 2470, 2480, 2490, 2500, 2510, 2520, 2530, 2540, 2550, 2560, 2570, 2580, 2590, 2600, 2610, 2620, 2630, 2640, 2650, 2660, 2670, 2680, 2690, 2700, 2710, 2720, 2730, 2740, 2750, 2760, 2770, 2780, 2790, 2800, 2810, 2820, 2830, 2840, 2850, 2860, 2870, 2880, 2890, 2900, 2910, 2920, 2930, 2940, 2950, 2960, 2970, 2980, 2990, 3000, 3010, 3020, 3030, 3040, 3050, 3060, 3070, 3080, 3090, 3100, 3110, 3120, 3130, 3140, 3150, 3160, 3170, 3180, 3190, 3200, 3210, 3220, 3230, 3240, 3250, 3260, 3270, 3280, 3290, 3300, 3310, 3320, 3330, 3340, 3350, 3360, 3370, 3380, 3390, 3400, 3410, 3420, 3430, 3440, 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9.6 Detection of Areas for which Special Conditions Exist

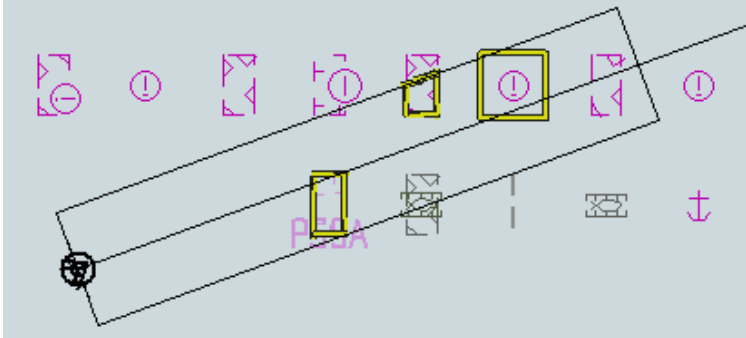
9.6.1 Detection and Notification of Areas for which special conditions exist – basic test

Test Reference	SpecialConditionsDF	IHO Reference	
Test description			
<p>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 whilst operating in Dual Fuel mode. The features satisfying the conditions for this test are listed in the alerts and indications catalogue within the S-101 Portrayal Catalogue and are included in the test cells AA5ARSPC.000 and 101AA00ARSPC.000.</p>			
Setup			
<p>This test is performed by loading the exchange set SpecialConditionsDF, manually creating a route connecting all waypoints between features marked as WP1 through WP4 and checking the display against the corresponding graphical plot</p> <p>Load the exchange set SpecialConditionsDF</p> <ul style="list-style-type: none"> • Select Display Category Other • Set the Safety contour value to 0 m • Set the Safety depth value to 30 m • Select Symbolized Boundaries • Set symbolized symbols to Off • Manually create a route connecting all way points between features marked WP1 through WP4 <p>Set user-specified distance for indication of areas with special condition as 0.1 NM</p>			
Action			
<p>Check ENC symbols shown in the ECDIS against the corresponding graphical plot. selecting one by one each special condition for the test</p>			
Results			
<p>The ENC in the ECDIS should match the corresponding graphical plot shown below.</p> <p>9.7</p>			
			
<p>Selected: Traffic separation zone</p>			
			

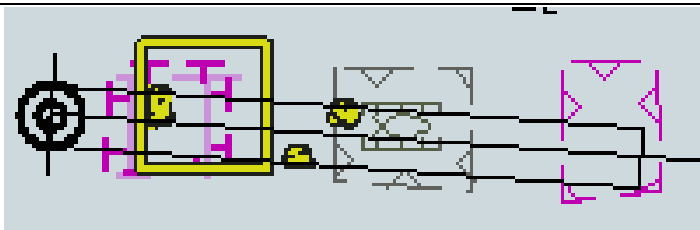
9.7.1 Detection and Notification of Areas for which special conditions exist – use of largest scale available

Test Reference	SpecialConditionsDFLS	IHO Reference	
Test description			
<p>The purpose of this test is to verify by observation that ECDIS uses the largest scale available for detection of areas with special conditions whilst operating in Dual Fuel mode.</p>			
Setup			
<p>This test is performed by loading test exchange sets, manually creating a route connecting way points between features marked as WP20 and WP22 and checking the display against a corresponding graphical plot.</p> <p>(A) As for test SpecialConditionsDF and in addition load the exchange set NavigationalHazardsOverviewDF1</p> <ul style="list-style-type: none"> • Select Display Category Other • Set the Safety contour value to 0 m • Set the Safety depth value to 30 m • Select Symbolized Boundaries • Select Simplified symbols <p>Select all Text groups</p> <p>(B) Repeat test using exchange sets SpecialConditionsDF and NavigationalHazardsOverviewDF2</p>			
Action			
<p>Select position 39°45'000N 104°49'000W at compilation scale (1:350 000) of 101AA00OVRVU (or AA2OVRVU).</p> <p>1) View chart before route planning.</p> <p>2) Manually create a route connecting two way points between features 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.</p>			
Results			
<p>The ENCs in the ECDIS should match the corresponding graphical plot shown below.</p>			
			
tbd			
<p>1) Situation before route planning. Chart 101AA00OVRVU displayed as it is</p>			

9.7.2 Detection and Notification of Areas for which special conditions exist – monitoring mode

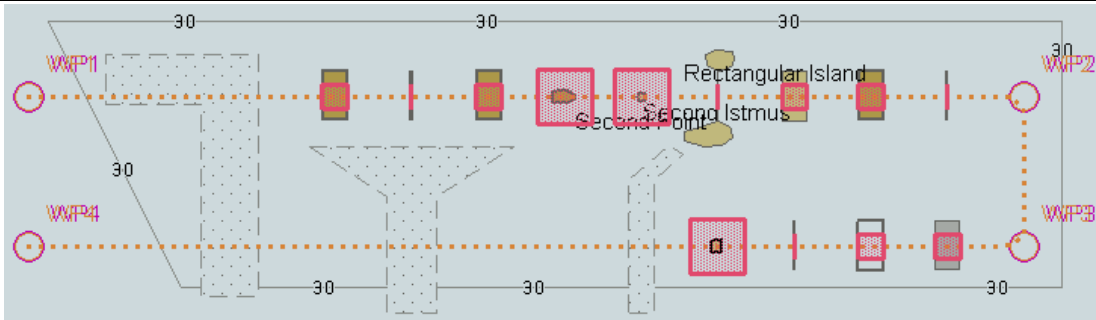
Test Reference	SpecialConditionsMonDF	IHO Reference	
Test description			
<p>The purpose of this test is to verify by observation that ECDIS provides an appropriate alarm or indication, as selected by the Mariner, if, within a specified time set by the Mariner, own ship will cross the boundary of a prohibited area or area for which special conditions exist whilst operating in Dual Fuel mode.</p> <p>The features satisfying the conditions for this test are listed in listed in the alerts and indications catalogue within the S-101 Portrayal Catalogue and are included in the test cells AA5ARSPC.000 and 101AA00ARSPC.000.</p>			
Setup			
<p>This test is performed by loading the exchange set SpecialConditionsDF, 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 SpecialConditions (Route plan) corresponding to each set of Safety contour settings..</p> <p>As for test SpecialConditionsDF</p>			
Action			
Check ENC symbols shown in the ECDIS for each special condition against the corresponding graphical plot			
Results			
<p>The ENC in the ECDIS should match the corresponding graphical plot of test 6.1.</p>  <p>An example with PSSA and Military practice area as selected.</p>			
TBD			

9.7.3 Detection and Notification of Areas for which special conditions exist – use of largest scale available – monitoring mode

Test Reference	SpecialConditionsDFLSMon	IHO Reference	
Test description			
<p><i>The purpose of this test is to verify by observation that ECDIS uses the largest scale available for detection of areas with special condition whilst operating in Dual Fuel mode..</i></p>			
Setup			
<p><i>This test is performed by loading test exchange sets, 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 SpecialConditionsDF and SpecialConditionsDFLS (Route plan) corresponding to each special condition settings.</i></p> <p><i>As for test SpecialConditionsDFLS</i></p>			
Action			
<ol style="list-style-type: none"> (1) <i>Select position 39°45'000N 104°49'000W at compilation scale (1:350 000) of 101AA00OVRVU. Heading approximately 100°.</i> (2) <i>Set vessel position to 39°47.877'N 104°57.590'W, heading 94.3°.</i> (3) <i>Check ENC symbols shown in the ECDIS for each special condition against the corresponding graphical plot</i> (4) <i>Repeat test as described in SpecialConditionsDFLS</i> 			
Results			
<p><i>The ENC in the ECDIS should match the corresponding graphical plot of tests SpecialConditionsDF and SpecialConditionsDFLS.</i></p>			
 <p style="color: red; text-align: right;">TBD</p>			
<p><i>An example with Caution area, Military practice area and PSSA as selected</i></p>			

9.8 Detection and Notification of the Safety contour

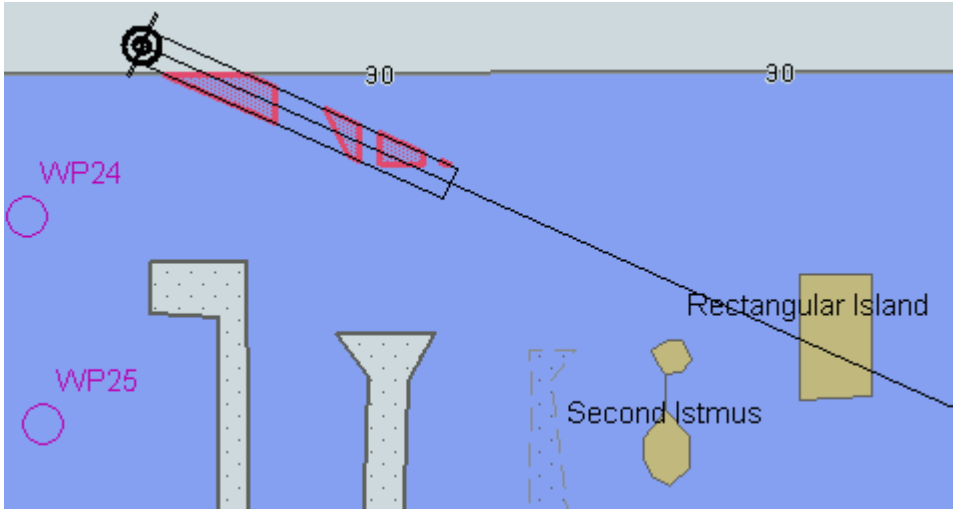
9.8.1 Detection and Notification of the safety contour – Basic test

Test Reference	SafetyContourDF	IHO Reference	
Test description			
<p>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 whilst operating in Dual Fuel mode. The features satisfying the conditions for this test are listed in the alerts and indications catalogue within the S-101 Portrayal Catalogue and are included in the TDS AA5SAFCO.000 and 101AA00SAFCO.000.</p>			
Setup			
<p>This test is performed by loading the test exchange set, manually creating a route connecting all way points between features marked as WP1 through WP4 and checking the display against the corresponding graphical plot.</p> <p>Load the exchange set SafetyContourDF</p> <ul style="list-style-type: none"> • Select Display Category Other • Set the Safety contour value to 0 m • Set the Safety depth value to 30 m • Select Symbolized Boundaries • Select Simplified Point Symbols = true • Select all Text groups • Select Contour label • Manually create a route connecting all way points between features marked WP1 through WP4 <p>Set user-specified distance for detecting of Safety contour as 0.1 NM</p>			
Action			
<p>Check portrayal shown in the ECDIS against the corresponding graphical plot. Repeat sequentially for Safety contour value 0m, 6m, 11m, 13m, 43m.</p>			
Results			
<p>The ENC in the ECDIS should match the corresponding graphical plot shown below..</p>			
 <p>Safety contour = 0 m</p> <p>TBD</p>			

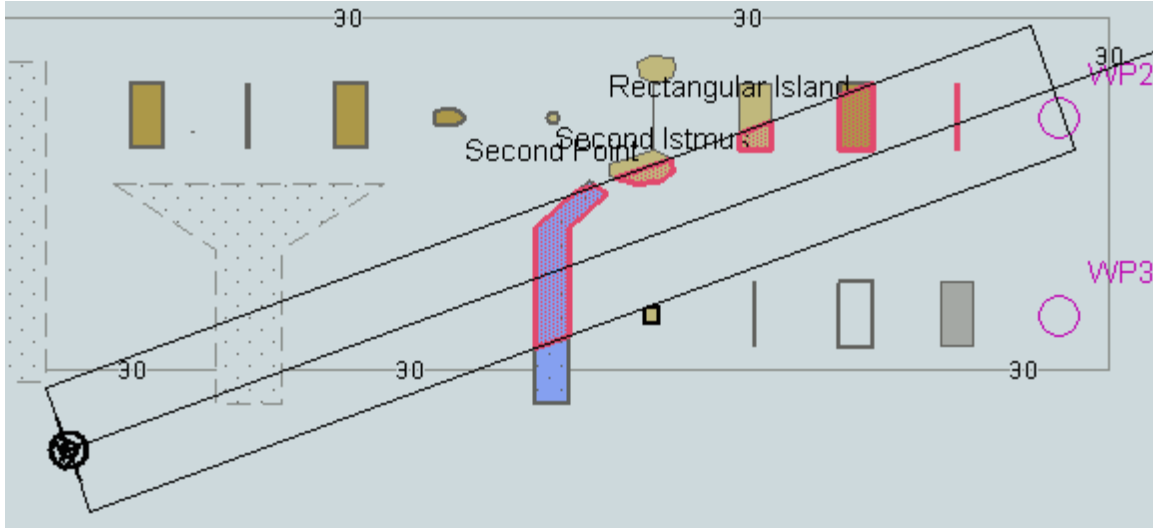
9.8.2 Detection and Notification of the safety contour – use of largest scale available.

Test Reference	SafetyContourDFLS	IHO Reference	
Test description			
<p><i>The purpose of this test is to verify by observation that ECDIS uses the largest scale available for detecting that the route crosses an own ship's safety contour whilst operating in Dual Fuel mode.</i></p>			
Setup			
<p><i>This test is performed by loading the test exchange sets, manually creating a route connecting way points between features marked as WP11, WP24, WP25 and WP26 and checking display against the corresponding graphical plot. The same test is run twice with different overview exchange sets comprising the smaller scale data</i></p> <p>(A) As for test SafetyContourDF and in addition load the exchange set NavigationalHazardsOverview1</p> <ul style="list-style-type: none"> • Select Display Category Other • Set the Safety contour value to 11 m • Set the Safety depth value to 30 m • Select Symbolized Boundaries <p>Set symbolized symbols to Off Select Contour label</p> <p>(B) Repeat test using exchange sets SafetyContourDF and NavigationalHazardsOverview2</p>			
Action			
<p>Select position 39°27'000N 104°49'000W at maximum display scale (1:350 000) of 101AA00OVRVU.</p> <p>1) View chart before route planning.</p> <p>2) Manually create a route connecting way points between features 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.</p>			
Results			
<p>The ENC in the ECDIS should match the corresponding graphical plot shown below [Images To Follow]</p>  <p>TBD</p>			

9.8.3 Detection and Notification of the safety contour – use of largest scale available – monitoring mode

Test Reference	SafetyContourDFMonLS	IHO Reference	
Test description			
<p>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 whilst operating in monitoring mode. The features satisfying the conditions for this test are listed in the alerts and indications catalogue within the S-101 Portrayal Catalogue and are included in the TDS AA5SAFCO.000 andl 101AA00SAFCO.000.</p>			
Setup			
<p>This test is performed by loading the exchange set SafetyContourDFMon, sailing with a simulated ship over the test area, setting the Safety contour to the appropriate values (0m, 6m, 11m, 13m, 43m) and checking display against the graphical plots of test SafetyContourDF (Route plan) corresponding to each set of Safety contour settings</p> <p>Load exchange set SafetyContourDFMon</p>			
Action			
<p>Set vessel position to 39°40.522'N 105°05.654'W, heading 112°. Check ENC symbols shown in the ECDIS for each Safety contour setting against the corresponding graphical plot.</p>			
Results			
<p>The ENC in the ECDIS should match the corresponding graphical plot of test 7.1 and 7.2.</p>  <p>TBD</p>			

9.8.4 Detection and Notification of the safety contour – monitoring mode

Test Reference	SafetyContourDFMon	IHO Reference	
Test description			
<p>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 features satisfying the conditions for this test are listed in the alerts and indications catalogue within the S-101 Portrayal Catalogue and are included in the test cells AA5SAFCO.000 and 101AA00SAFCO.000.</p>			
Setup			
<p>This test is performed by loading the exchange set SafetyContourDFMon, sailing with a simulated ship over the test area, setting the Safety contour to the appropriate values (0m, 6m, 11m, 13m, 43m) and checking display against the graphical plots of test SafetyContourDF (Route plan) corresponding to each set of Safety contour settings.</p> <ul style="list-style-type: none"> - As for test SafetyContourDF - Select all Text groups - Select Contour label 			
Action			
<p>Set vessel position to 39°36.516'N 104°55.737'W, heading 70.3°. Check ENC symbols shown in the ECDIS for each Safety contour setting against the corresponding graphical plot</p>			
Results			
<p>The ENC in the ECDIS should match the corresponding graphical plot of SafetyContourDF</p>  <p style="text-align: center;">TBD</p> <p>An example with Safety contour = 6 m.</p>			

ANNEX A: Automatic Updates via Telecommunications networks (SECOM)

As described in the introduction to this manual, S-164 now contains specifications for tests of updates using online services implemented using the SECOM specification (IEC 63173-2).

If the EUT has implemented the capability of receiving S-124 and/or S-129 official updates via a SECOM based telecommunications network, then the following tests should be executed.

These tests are executed using the following IHO standard access details:

To Be Added:

1. ***UserName(s)***
2. ***Addresses***
3. ***Authentication key information***

Connection

Test Reference	SECOMSelection	IHO Reference IEC Reference	S-98: 20.4.3 (i) 63173-2:
Test Description			
<i>Check SECOM identity.</i>			
Safety contourSafety depthShallow contourShallow patternFour shadesRadar overlayUpdate reviewPlain boundariesSimplified symbolsFull light linesShallow water dangers Setup			
Action			
Connect User to SECOM network (IHO hosted, or locally hosted depending on resources) 1- Connect the ECDIS to the IHO based SECOM service using the details provided in this section. 2- Select the update data service for S-124 and S-129 data. 3- Verify that the identity is correctly authenticated on the ECDIS. The details are listed below: Insert User Details available through the SECOM network.			
Results			

Service Management

Test Reference	SECOMManagement	IHO Reference IEC Reference	S-98: 20.4.3 (i)
Test Description			
Check SECOM management.			
Loaded Data			
Exchange Set Name			
Safety contourSafety depthShallow contourShallow patternFour shadesRadar overlayUpdate reviewPlain boundariesSimplified symbolsFull light linesShallow water dangersSetup			
Action			
Verify user is able to “manage” the SECOM connection / status [it may be that other mandatory functionality is able to be added here]			
<ul style="list-style-type: none">Verify SECOM status is available to the ECDIS user.Reference details are listed below:Ensure that an update is available to the following datasets within the System Database			

<ul style="list-style-type: none"> - 129AA00XXXX, 124AA00XXXX - <i>[user details, history and subscription status – these should all be viewable to the user]</i>
Results

Update and Acknowledgment.

Test Reference	SECOMAcknowledgment	IHO Reference IEC Reference	S-98: 20.4.3 (iii)																
Test Description																			
Check SECOM acknowledgment.																			
Loaded Data																			
Exchange Set Name																			
Safety contourSafety depthShallow contourShallow patternFour shadesRadar overlayUpdate reviewPlain boundariesSimplified symbolsFull light linesShallow water dangersSetup																			
Action																			
Perform and acknowledge an update to the system database through the SECOM network. <ul style="list-style-type: none">- Perform an update through the SECOM network to the S-129 and S-124 datasets as listed in the resources available.- Ensure an acknowledgment of receipt and verification of data integrity is observed on the ECDIS.- Ensure the data is correctly ingested into the System Database.- Interrogate the ECDIS System Database and ensure the following revision information is correct.																			
Results																			
<table><tr><th>Dataset</th><th>Edition</th><th>Update number</th><th>Issue Date (ISDT)</th></tr><tr><td>129AA00XXXA</td><td>1</td><td>0</td><td>20240409</td></tr><tr><td>124AA00NEWA</td><td>1</td><td>0</td><td>20240406</td></tr><tr><td>124AA00UPDB</td><td>1</td><td>0</td><td>20240406</td></tr></table>				Dataset	Edition	Update number	Issue Date (ISDT)	129AA00XXXA	1	0	20240409	124AA00NEWA	1	0	20240406	124AA00UPDB	1	0	20240406
Dataset	Edition	Update number	Issue Date (ISDT)																
129AA00XXXA	1	0	20240409																
124AA00NEWA	1	0	20240406																
124AA00UPDB	1	0	20240406																