



UK Hydrographic
Office

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S-100 Across the Channel ECDIS Trials UKHO & Shom

Presented by Tom Mellor
May 2026





UKHO – Shom S-100 ECDIS project

- › UKHO and Shom are collaborating on a joint project to test and evaluate S-100 ECDIS
- › A route between Portsmouth in the UK, transiting the Channel Islands and onwards through to St Malo in France has been selected
- › Project aims, gather evidence for S-100 ECDIS risk assessment to build the safety case to support IMO introduction of the S-100 ECDIS. Test and trial data and ECDIS to demonstrate the benefits of S-100.
- › Shore trials and S-100 ECDIS sea trials

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UK Ports

Southampton/Portsmouth

- › Supports commercial operations, cruise vessels, VLCCs and UK Royal Navy
- › Well surveyed ports
- › Busy area, very popular with recreational sailing vessels
- › Stena Vinga needs a Pilot for entry and exit



St Helier – Jersey

- › High tides
- › Shallow restricted port
- › Strong currents
- › Bad weather



Trialling and testing

OEMs	       
Shore tests	     
Sea trial	  
Hydrographic offices	   



HMS Tyne



Stena Vinga and Tarifa Jet

S-100 Data Testing

- ›ENCs: S-57 and S-101
- ›S-102 Bathymetric surface
- ›S-104 Water levels
- ›S-III Surface currents
- ›S-I 24 Navigational Warnings





Testing and Feedback

Text placement



Encoding of text placement: Text position and orientation an improvement?

(Text placement complied on three GB S-101 ENC's)

ENC	Useful? scale 1-5 1 = Not at all 5 = Very much	Feedback comments
101GB005DEVRF 101GB005DEVQF		

Speed Limits

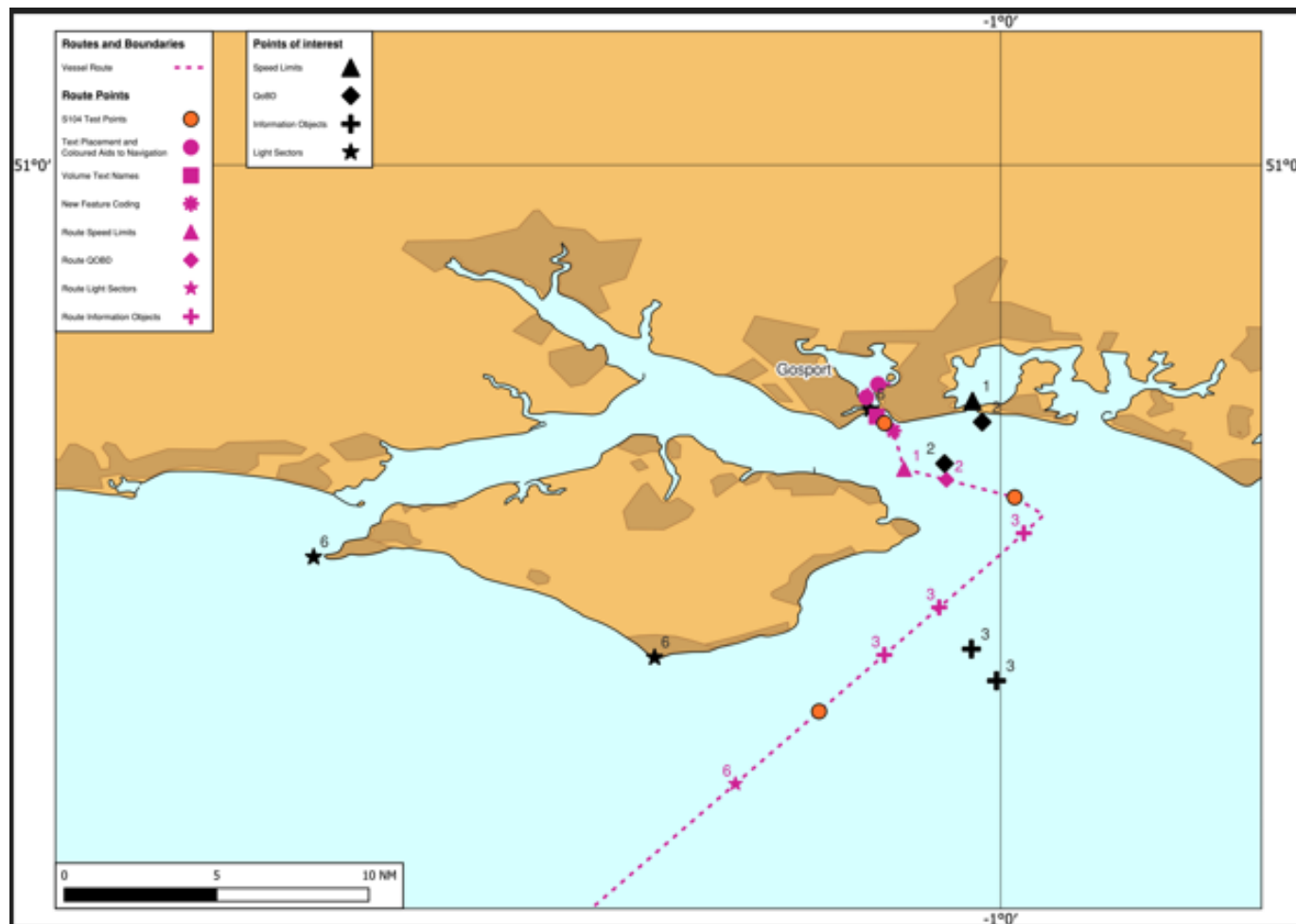


Encoding of speed limits on relevant features.

Restricted Area with Speed limit populated.

ENC	Position (Lat/Long)	Image	Useful: scale 1-5 1 = Not at all 5 = Very much
101GB- 5DEVQG	Centred on 50-47.802N 1-01.444W		
Feedback			

Geo-Infographic

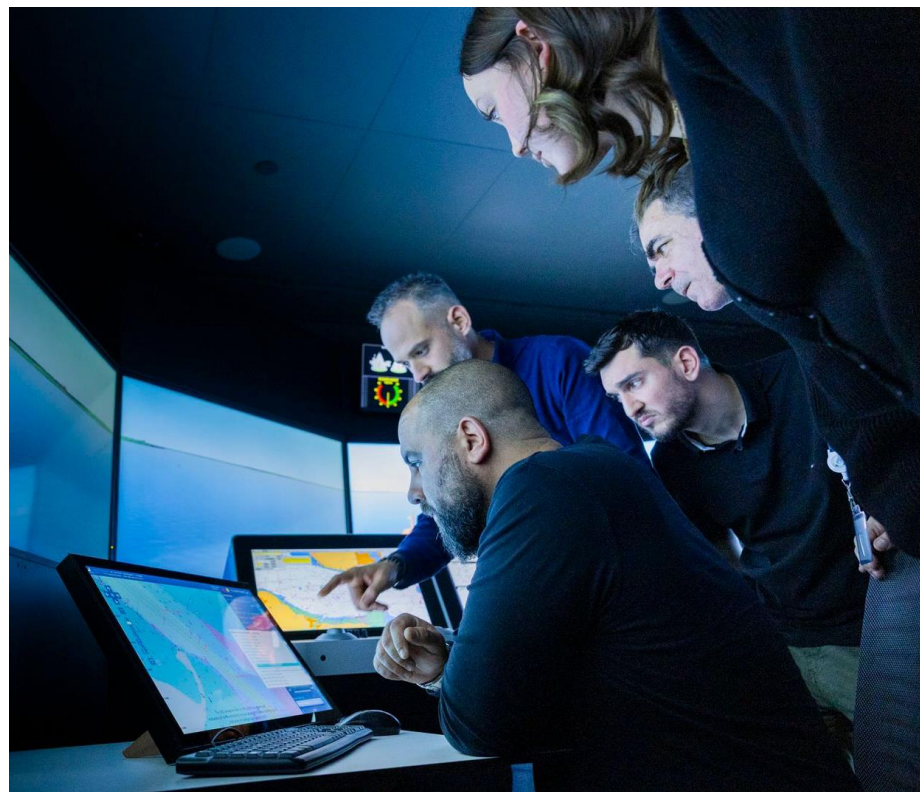




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Simulator Testing

- ECDIS LTD
- CSMART
- Angelicoussis
- Minerva



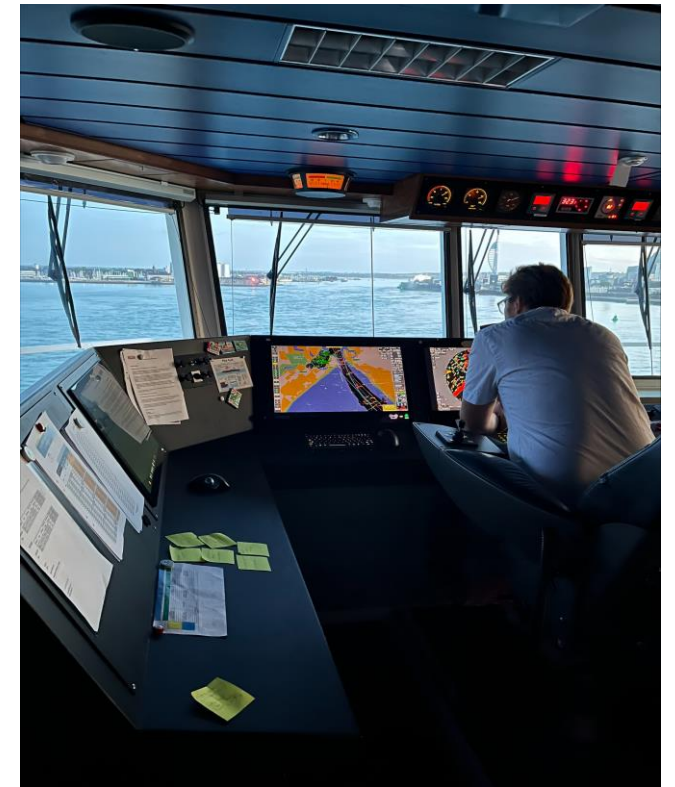
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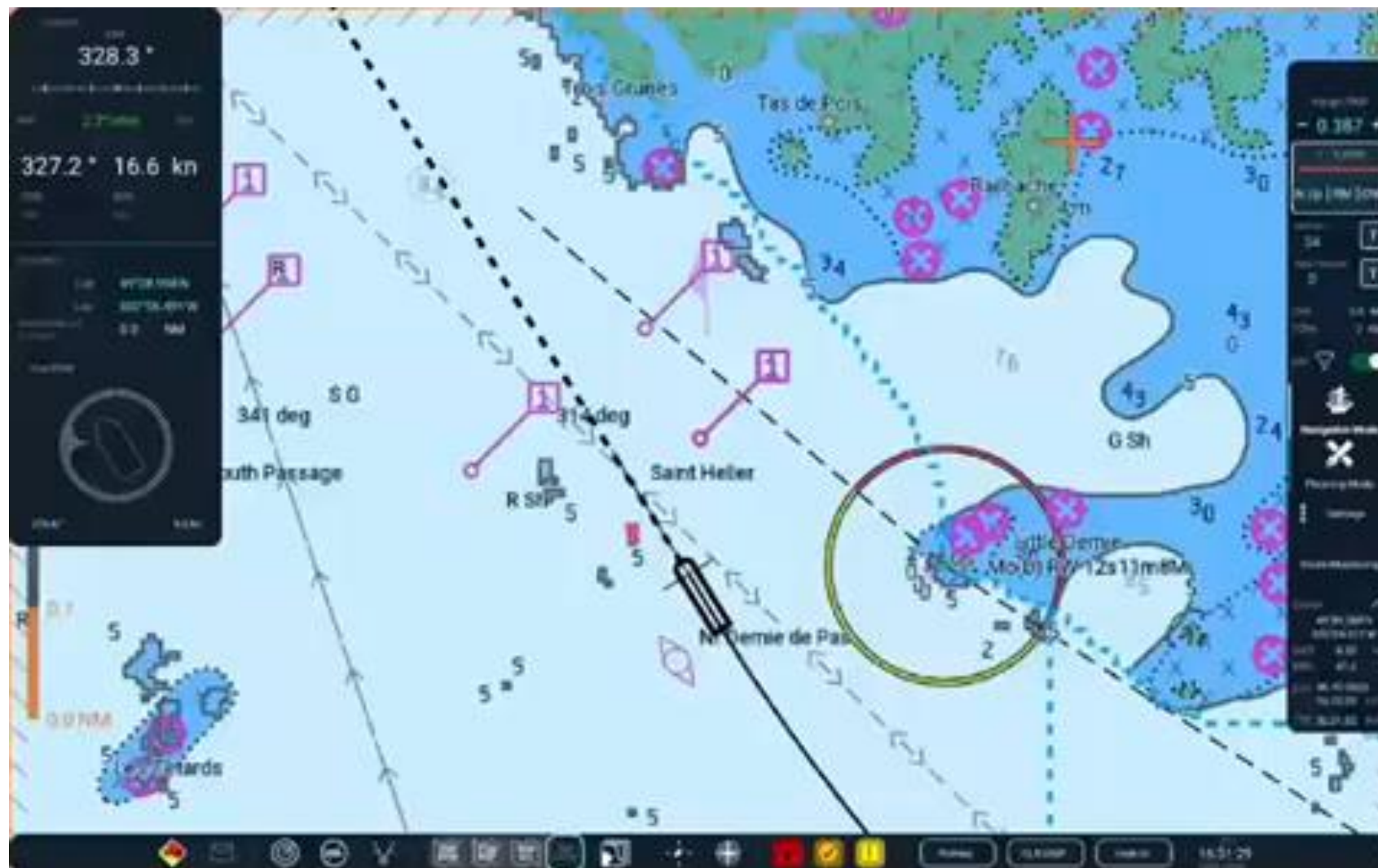
Sea Trials

27 & 28 Aug
06 & 07 Oct
09 Dec (In Port)



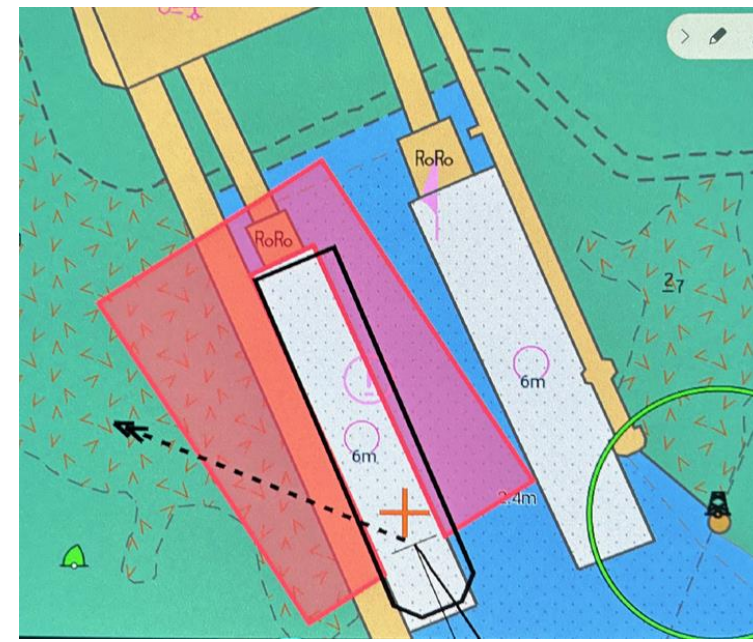
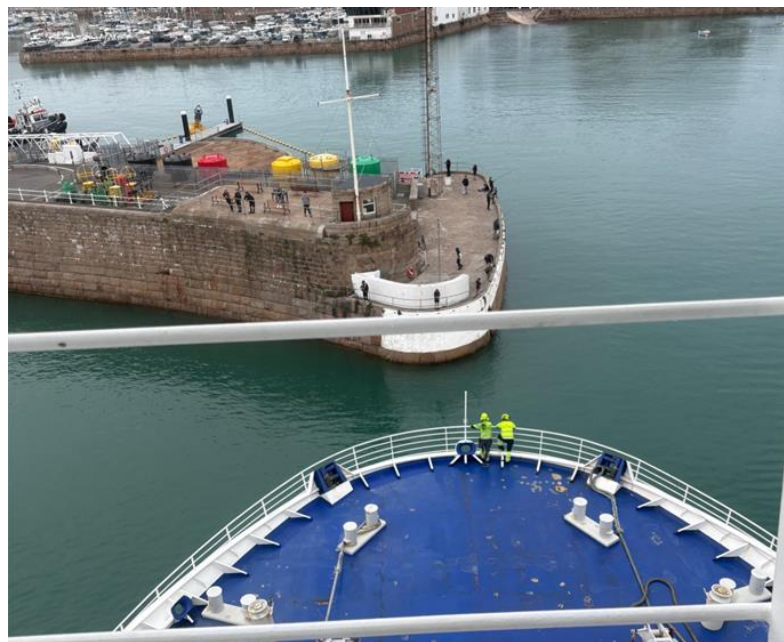
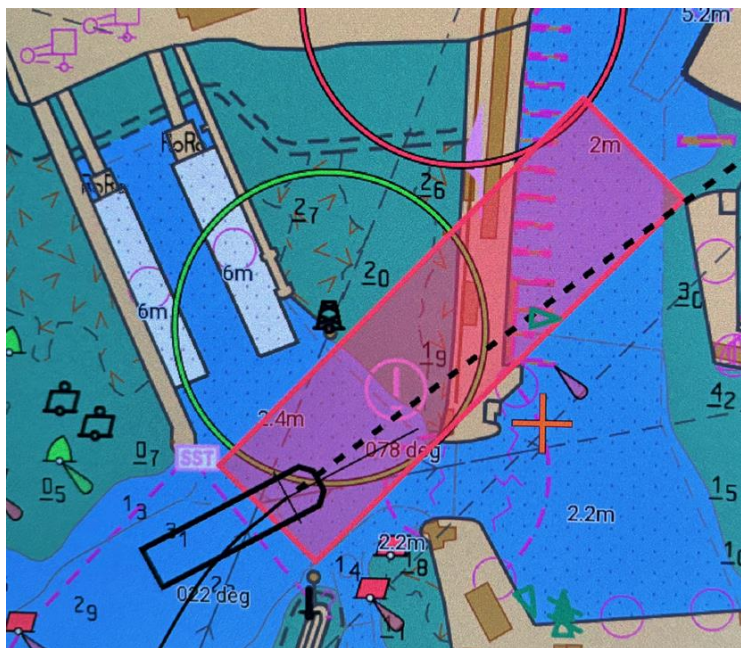


Route to Jersey





Entry into St. Helier - Jersey





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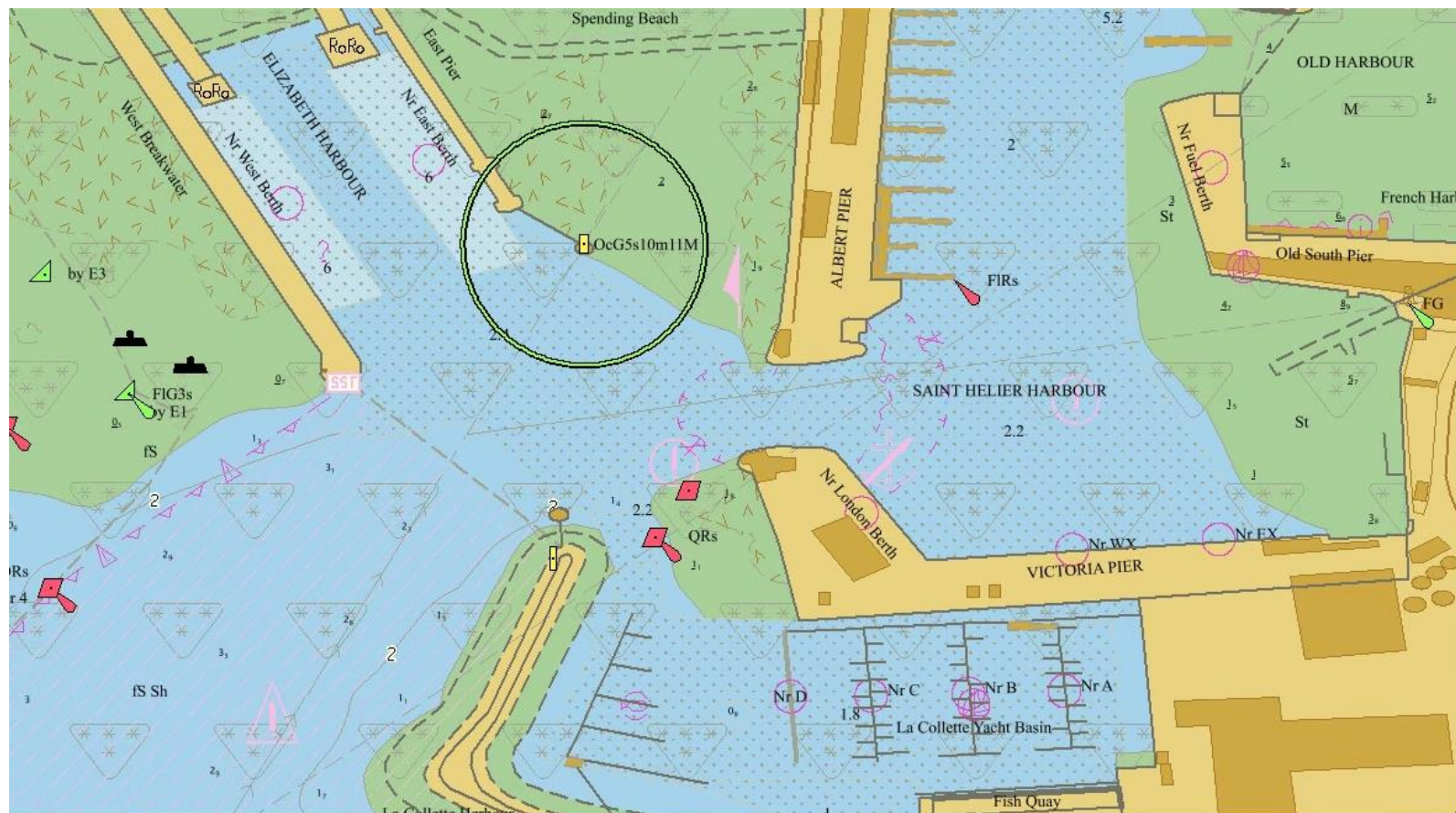
S-101: Electronic Navigational Charts

A hand in a light blue shirt sleeve points at a digital electronic navigational chart (ENC) displayed on a tablet. The chart shows a coastal area with various navigational symbols, including depth soundings, buoys, and navigational aids. The text 'S-101: Electronic Navigational Charts' is overlaid on the left side of the image. The background is dark and out of focus.



S-101 ENC

- › Text placement improvements
- › Speed limits
- › Lights
- › Coloured traditional buoyage



What mariners are saying

Improved symbology and portrayal:

100%

agreed buoyage
symbology was an
improvement

94%

agreed mooring
symbology would
improve understanding

100%

agreed rotated text
improved display

73%

would leave the text
turned on as a result





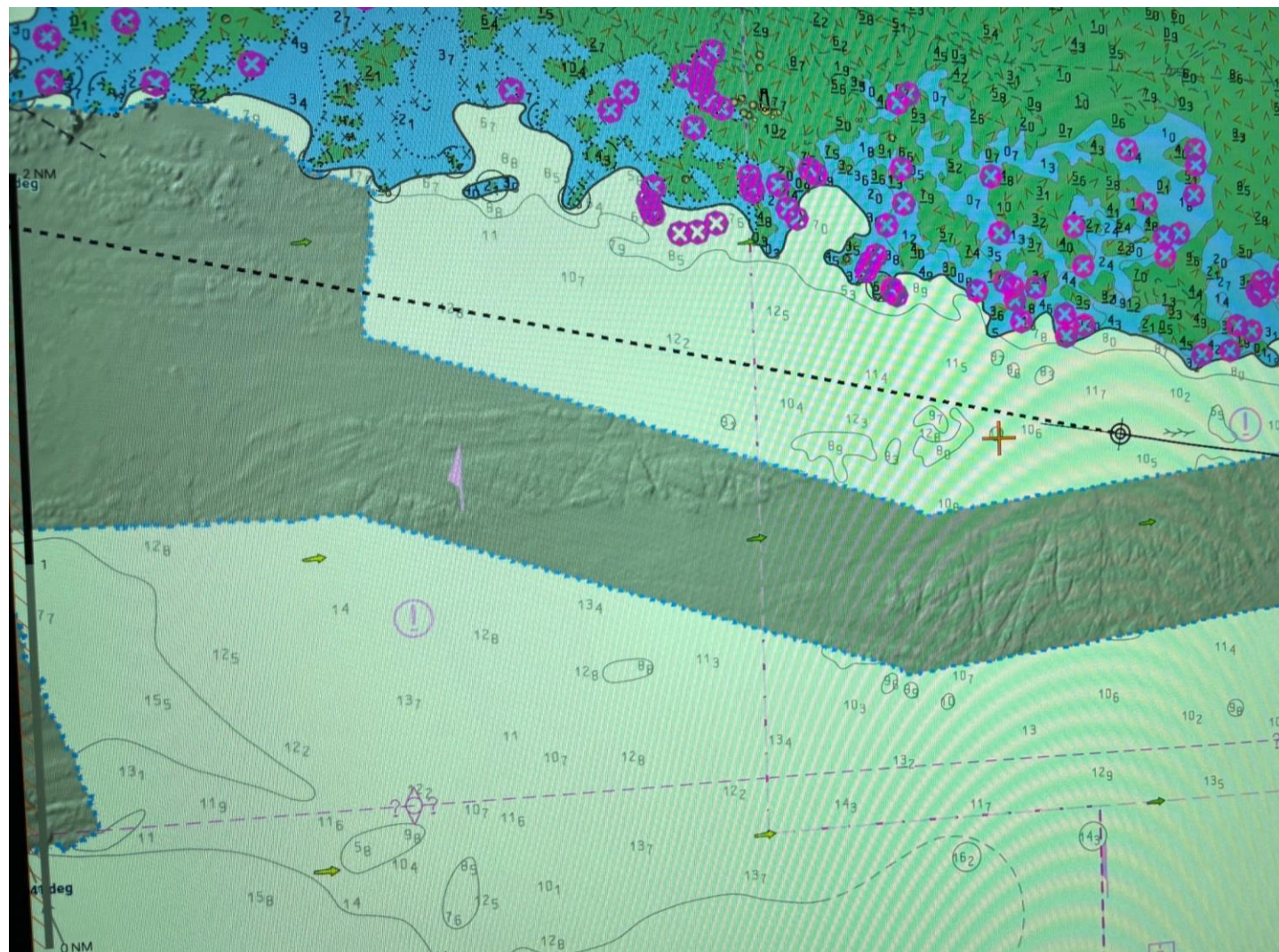
S-102: Bathymetric Surface

A bathymetric surface plot showing a cross-section of the ocean floor. The plot uses a color gradient where red and orange represent shallow depths, transitioning through yellow and green to dark blue and black for deeper areas. The terrain is rugged with various ridges and valleys. The text 'S-102: Bathymetric Surface' is overlaid in white on the left side of the plot.



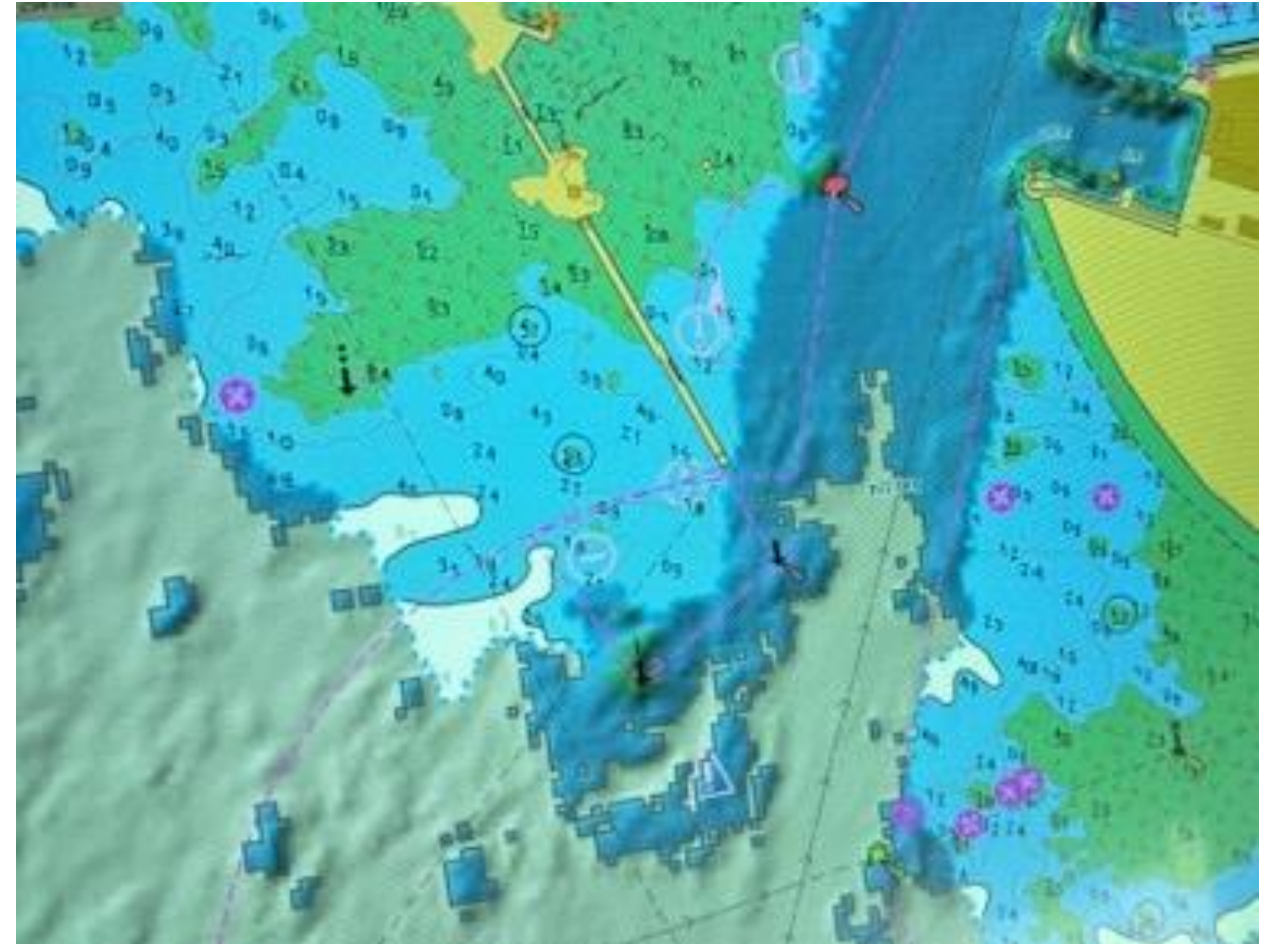
S-102 Bathymetric Surface

- › New multibeam bathymetric survey of Jersey conducted in Port and approach of St Helier
- › Survey conducted without discussions with HO's
- › Coverage does not reflect vessel route!



S-I02 Grid Resolution

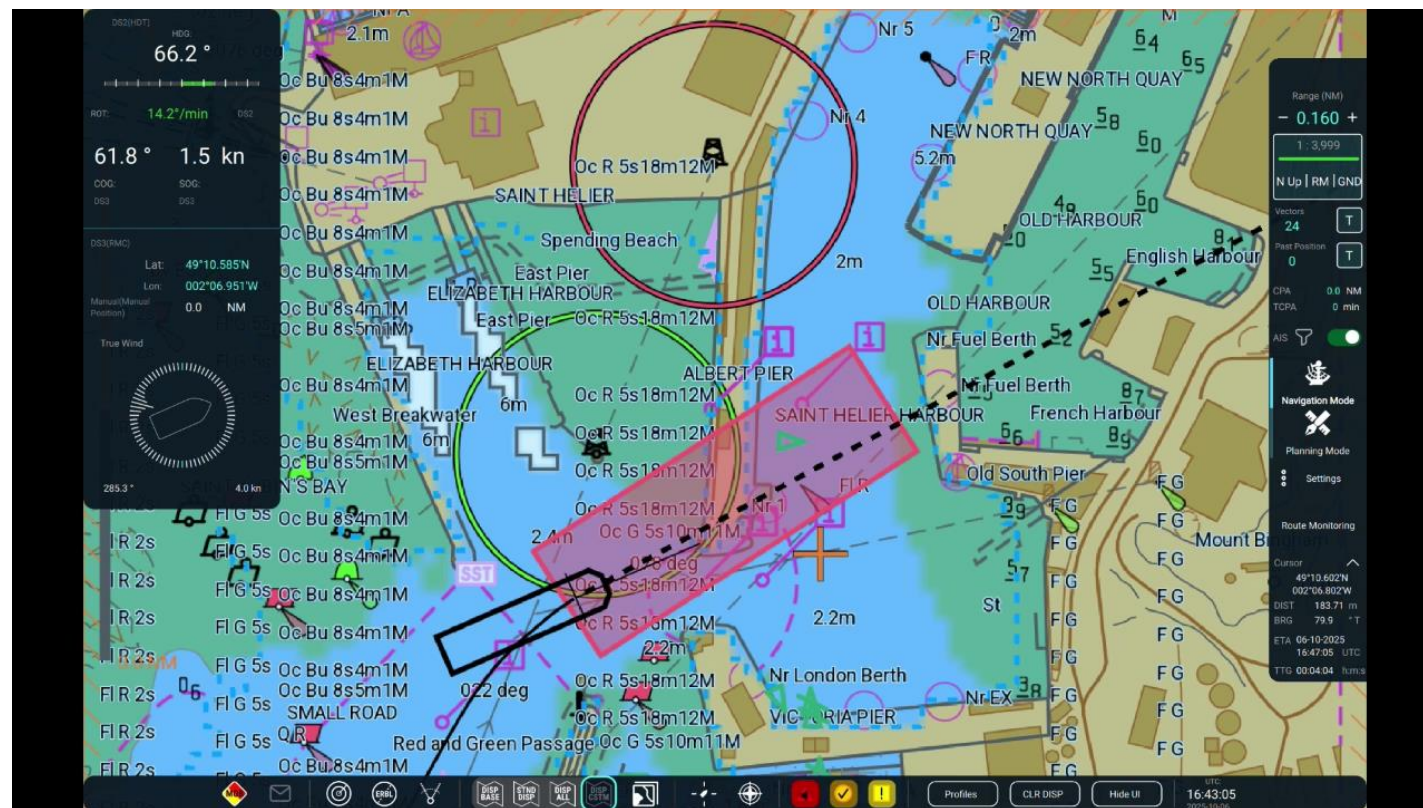
- › 10m grid resolution originally selected for creation of S-I02 data
- › Presentation is not great and does not clearly show dangers in detail.
- › The survey by Port of St Helier does support higher grid resolution of S-I02
- › UKHO created S-I02 at 1m and 2m resolutions to compare increased resolution and usability of data with the increase in data file sizes
- › Bespoke resolutions needed based on user requirements, more dangerous/shallow the area may require higher resolution





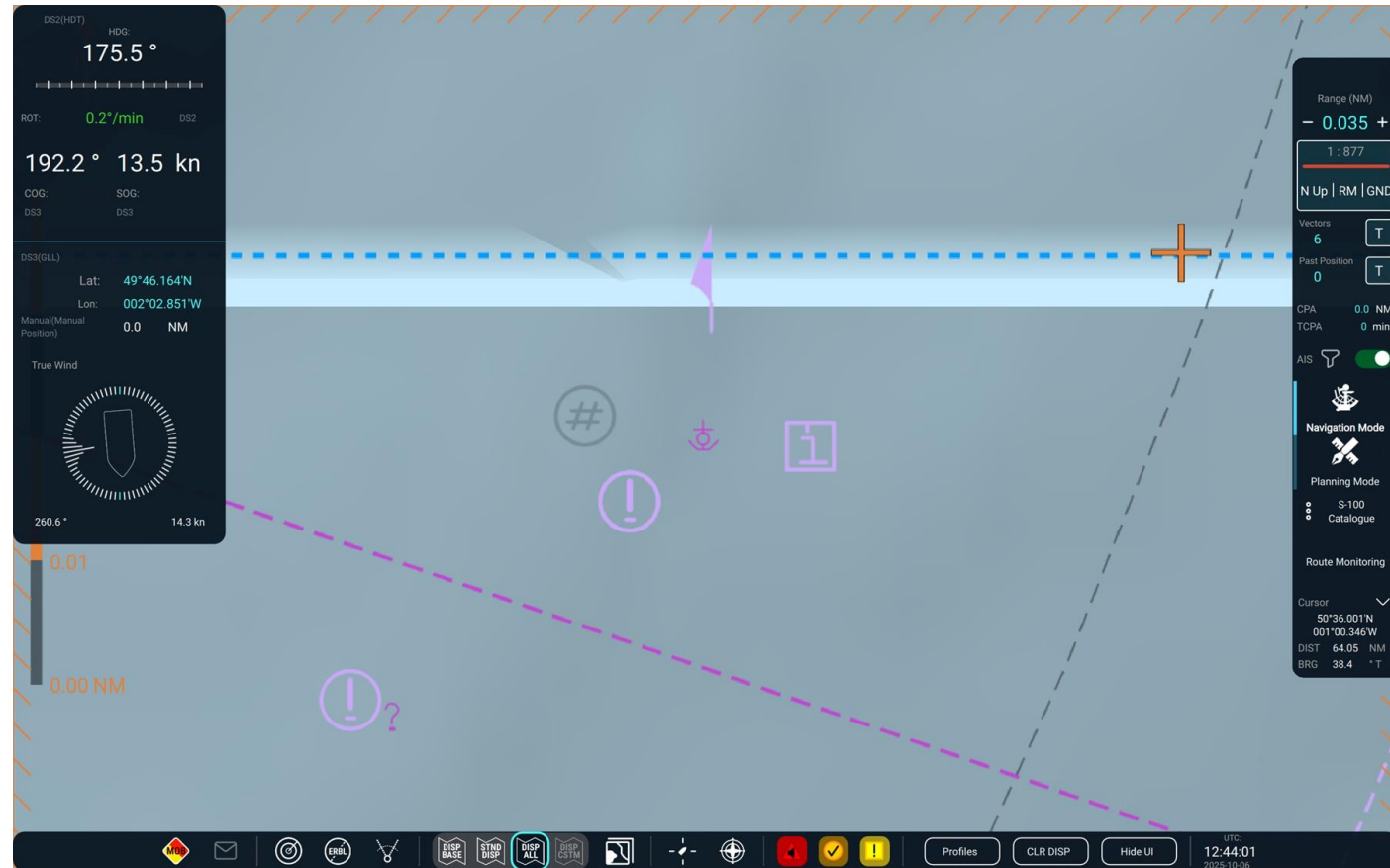
S-I01/S-I02 Overlaps

- › S-I02 Bathymetric data surface is designed to replace bathymetric data in S-I01 ENC, offering higher accuracy of rendering safety contour
- › We have observed S-I02 overlaps the land features in S-I01 ENC
- › Drawing order of S-I01 land feature objects and S-I02 bathymetric surface needs to be investigated
- › Is this now addressed in IHO S-98



S-102 Gaps in Coverage

- › Observed very small gaps in data coverage
- › Investigation underway into production to understand how this has occurred
- › Is this human error or production system issue?





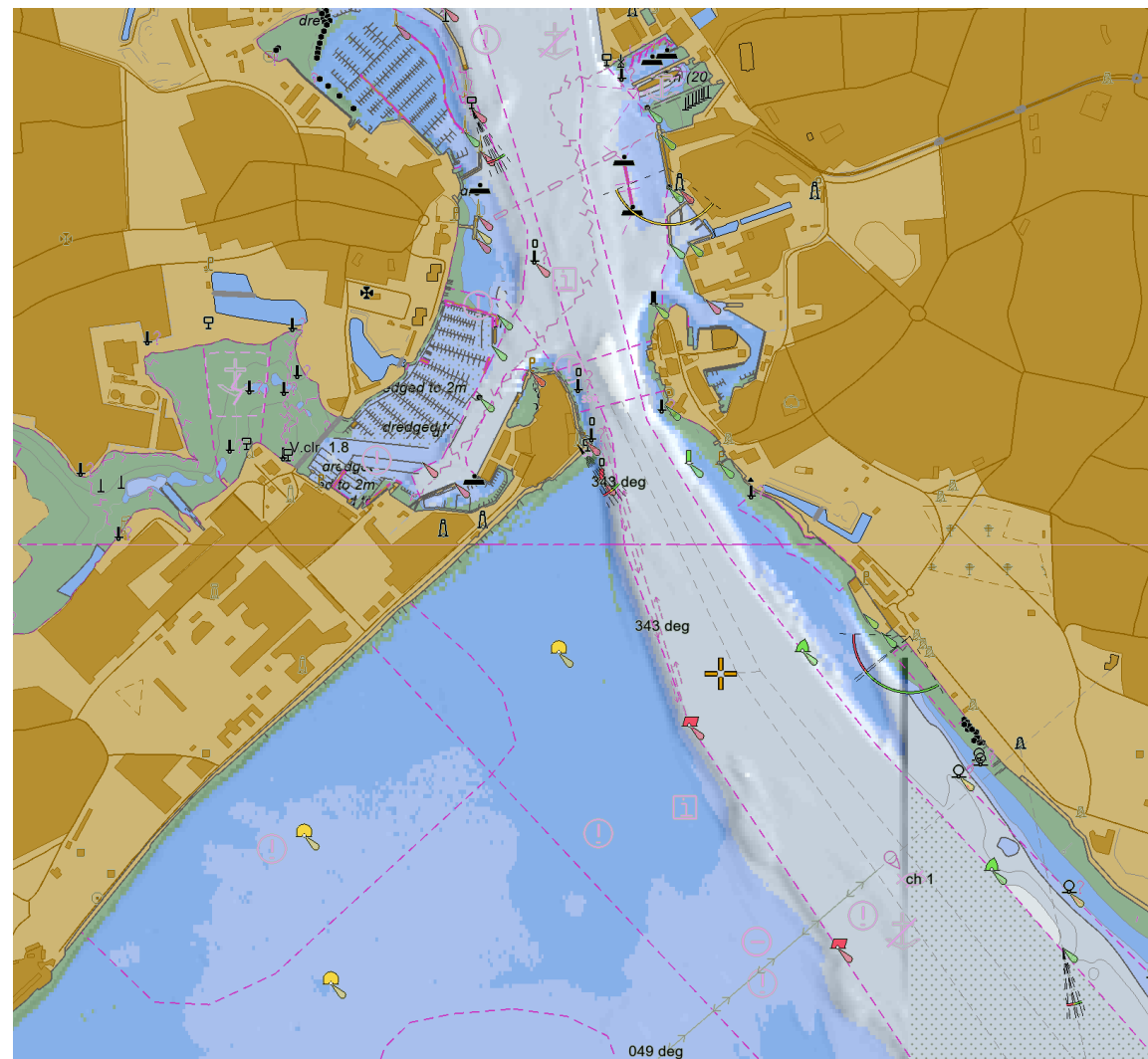
What mariners are saying

Benefits and user feedback:

Most significant benefit was the ability
to define a specific safety contour
(beyond 5m, 10, 15m or 20m)

3.9/5

rating usefulness
of sun illumination





S-104: Water Levels

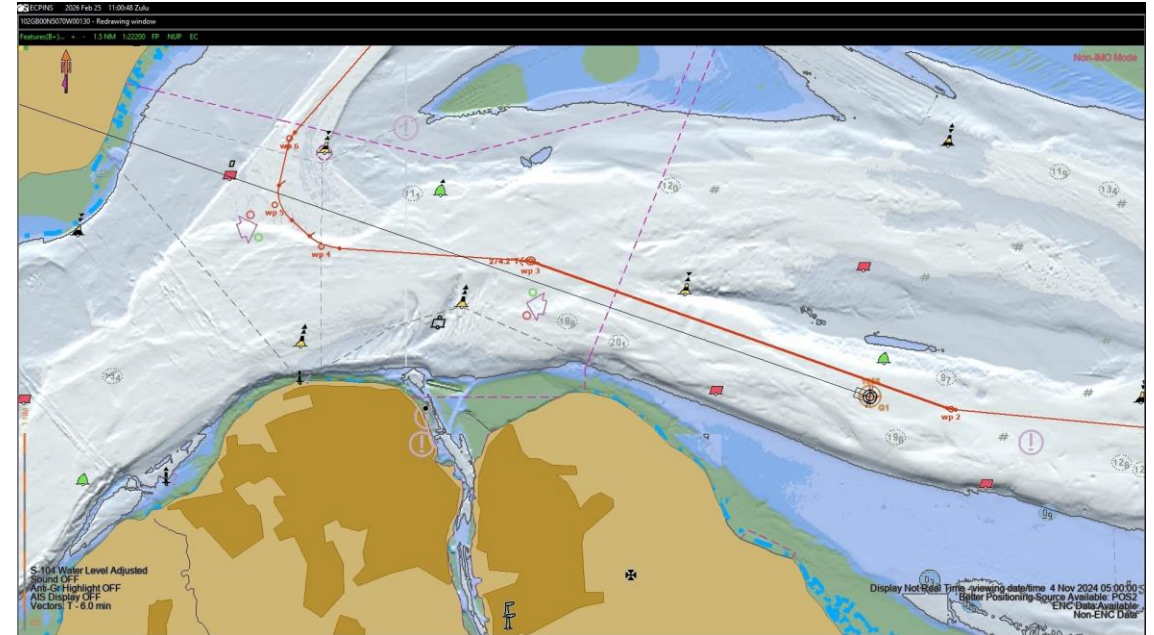


S-104: The benefits

Traditional ENCs only show static depths.

Combining S-102 and S-104 enables:

- › Dynamic, time-aware navigation
- › Predictive clearance calculations
- › Safer navigation in shallow waters
- › Smarter port operations



$\text{S-102 depth} + \text{S-104 water level offset} = \text{actual water depth}$

Example:

S-102 depth at grid cell	8.5m
S-104 water level	1.2m
Resulting depth	9.7m



What mariners are saying

4.5/5

rating usefulness of
dynamic water level
adjustments

76%

would consider
reducing safety
margins as a result

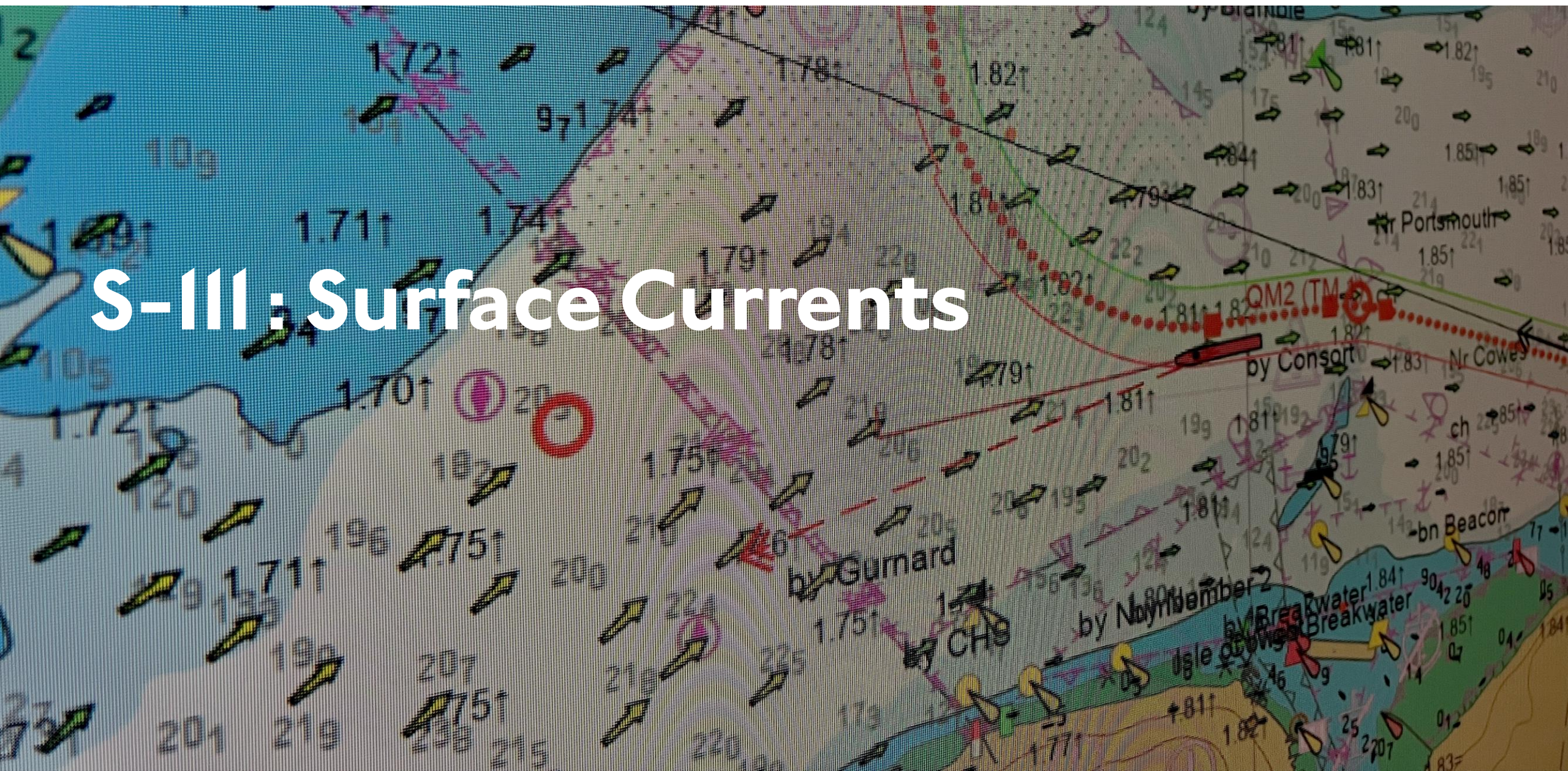
97%

thought S-I04 would
support commercial
benefits (fuel savings /
waiting times)

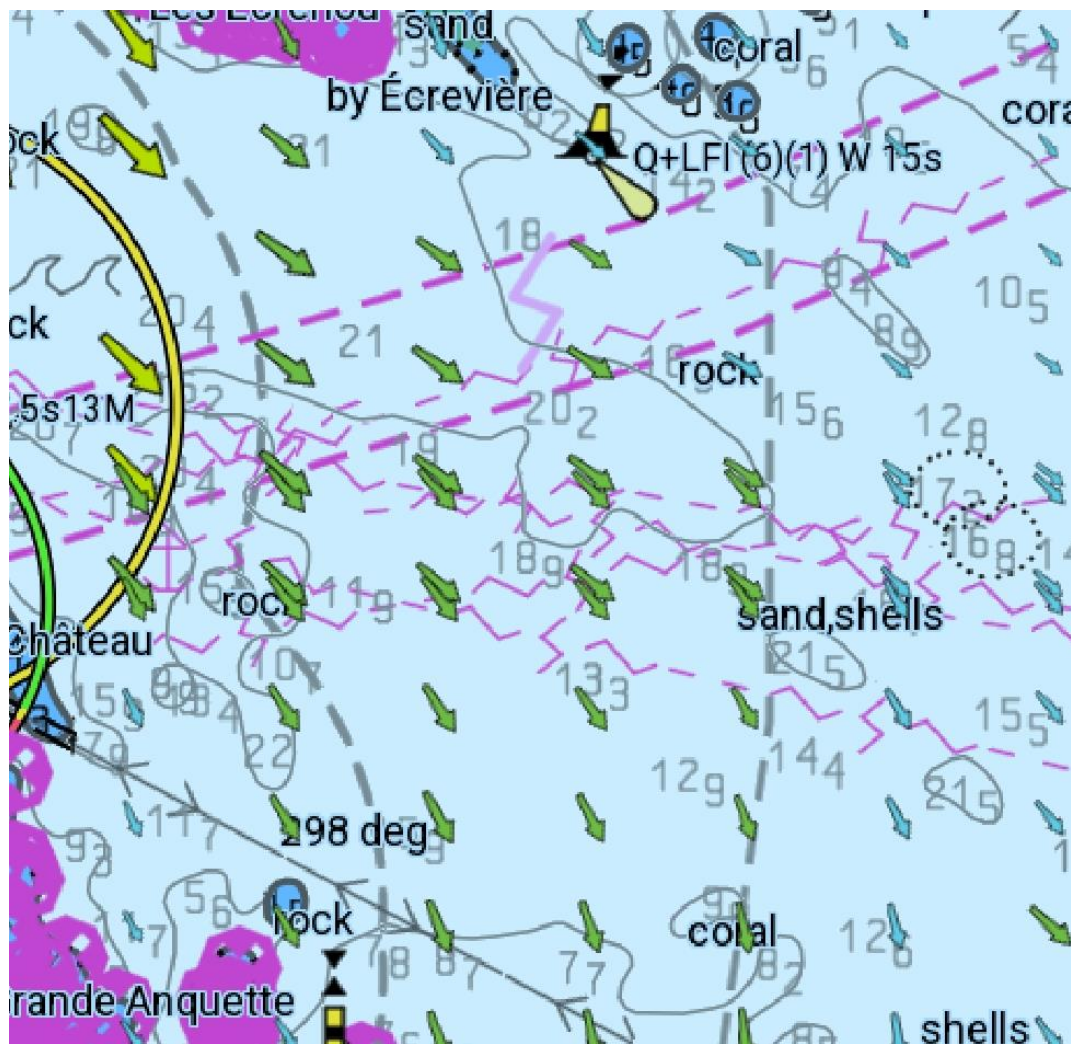
100%

felt S-I04 would
improve confidence in
shallow or constrained
waterways





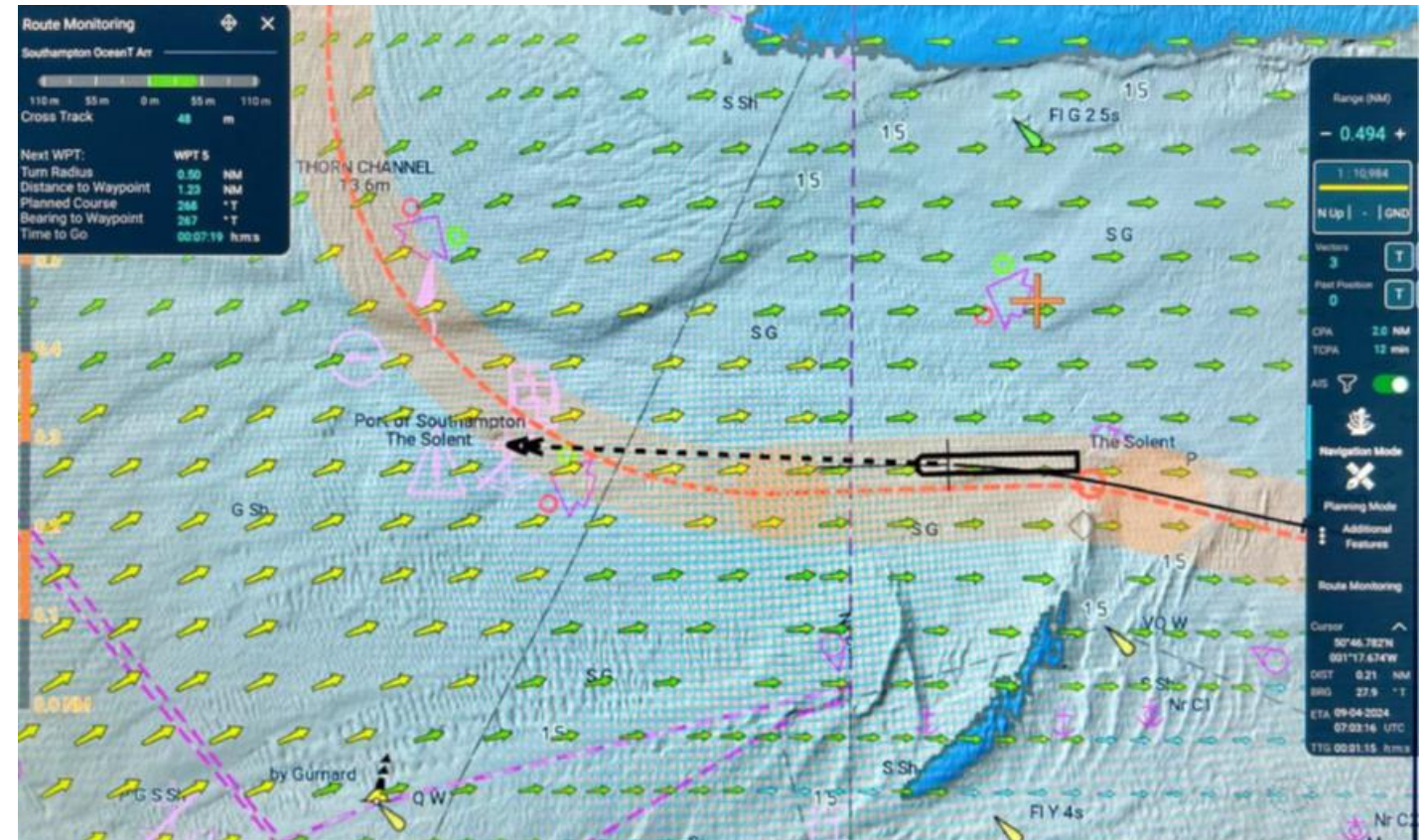
S-III Surface Currents





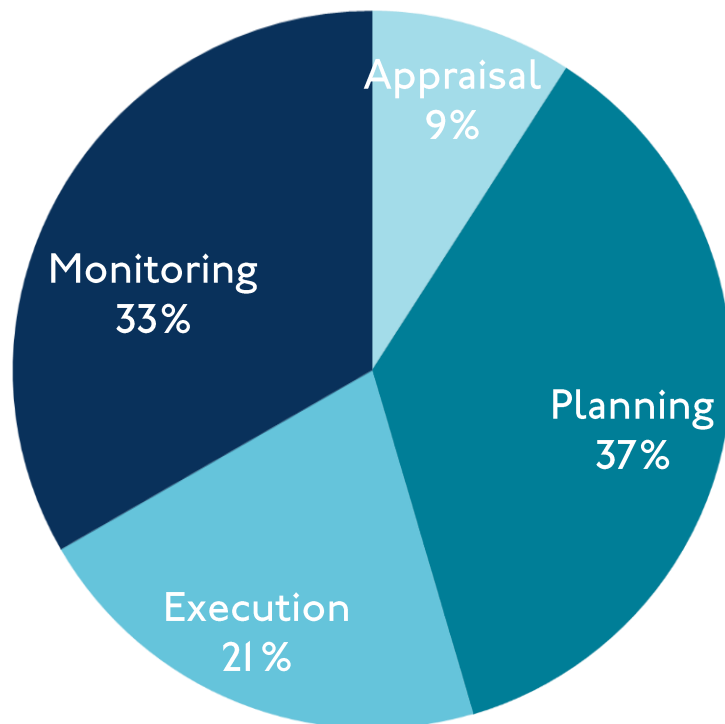
C-SMART Simulator

- › Inbound and outbound transits of cruise ships were simulated in three areas of the approach to Southampton
- › Thorne Channel in particular is known for significant and quickly changing tidal streams
- › Access to S-III data during pilotage helped keep vessel on track by adjusting speed during the turn. In this scenario it was necessary to keep speed up to avoid being pushed onto shoal bank.

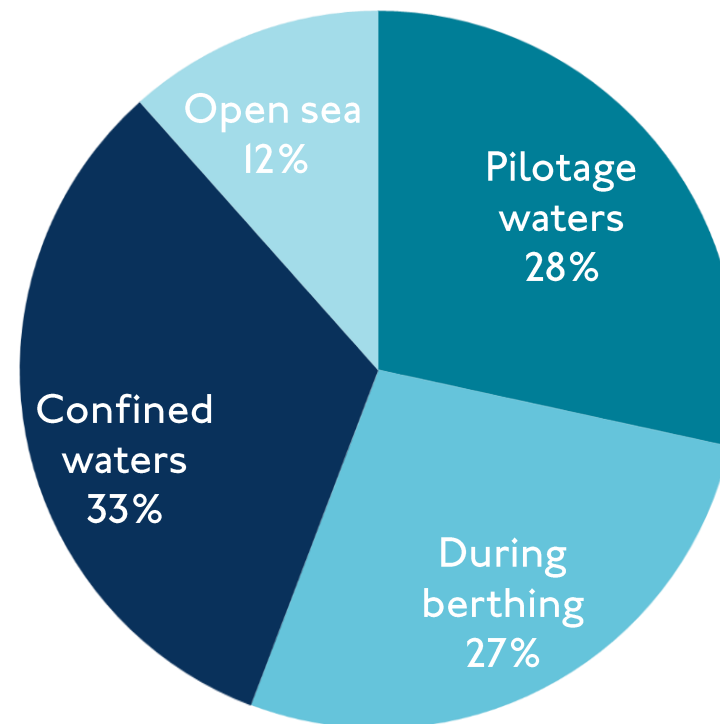


What mariners are saying

At what stage is
S-III most useful?



In what scenarios is
S-III most useful?



97%

would use S-III for
favourable routeing



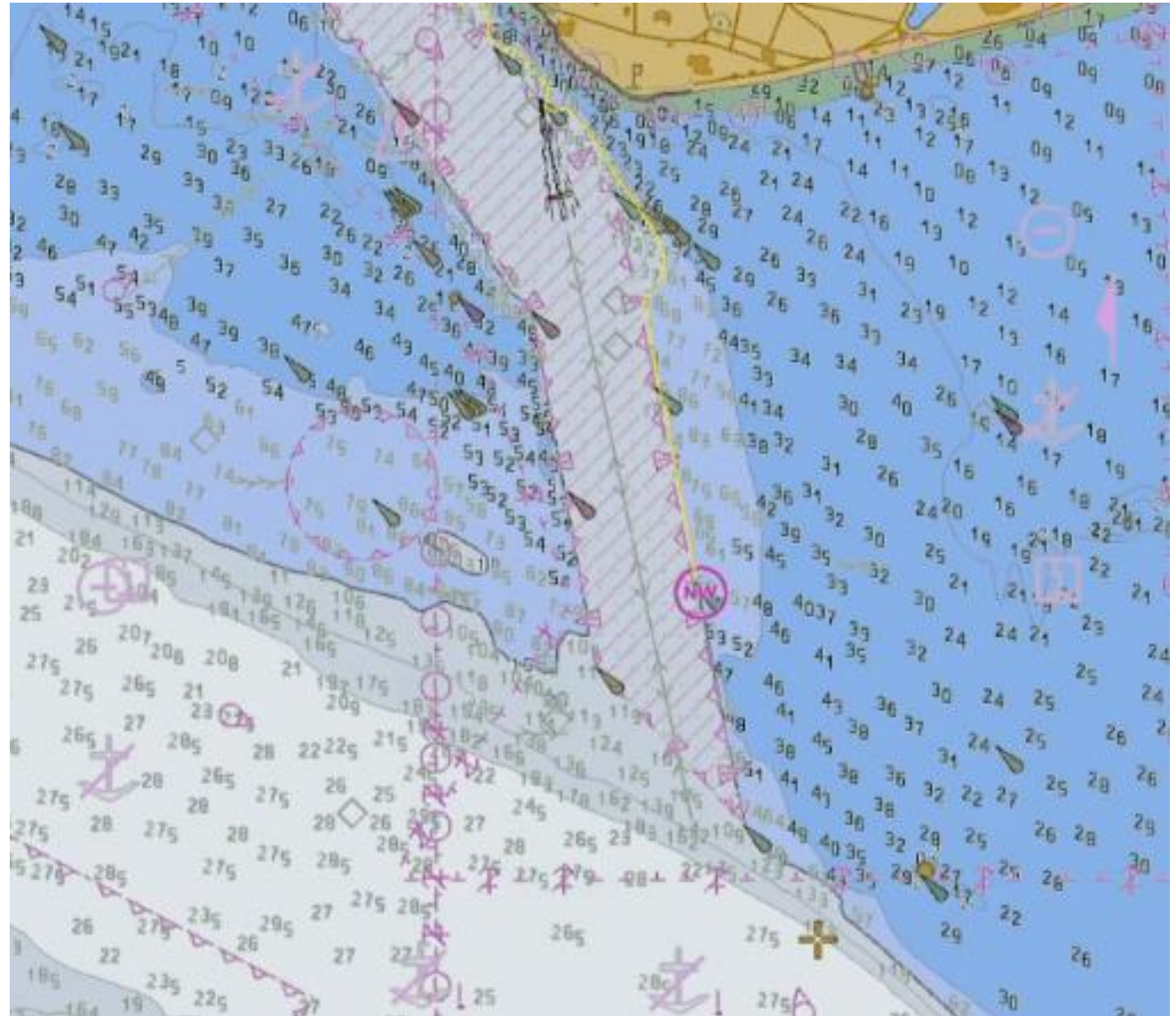
S-124 Navigational Warnings





S-I24 Navigation Warnings

- › Navigational warnings delivered via S-I 24 allow for geospatially referenced alerts to be automatically overlaid on the S-I01 ENC
- › This approach minimizes the need for manual plotting of warnings and enhances bridge team efficiency
- › In simulated tests using S-I00 ECDIS Mariners could tangibly see the time saving and accuracy gains that would be achieved using S-I 24 over current manual NAVTEXT processes in use with S-57 ECDIS



Future S-100 Testing

Planned Simulator Testing

ECDIS LTD – Furuno, OSI

Simwave - Navtor

Planned Sea Trials

Tarifa Jet Fast Ferry – St Malo to Jersey

Stena Vinga – Portsmouth to Jersey

HMS Tyne Portsmouth, Jersey, St Malo



Future S-100 Standards Testing

Stakeholders	Task	Standards	Testing
HOs, RENCs	Production validation	IHO S-100 phase 1 product specifications	S-101 S-102 S-104 S-111 S-124
VAR, Distributor	Delivery	S-128 - Catalogue of nautical products S-100 Part 15 encryption and chart licencing	S-128 S-100 security
ECDIS OEMs	Display integration	S-98 Interoperability	S-98

IHO S-100 International Trial Testbed – Across the Channel

- › Launch of webpage 20/04/2026
- › S-100 Data from UKHO and Shom
 - › S-101
 - › S-102
 - › S-104
 - › S-111
 - › S-124
- › Data updated monthly
- › Stakeholder feedback forms
- › Collection and processing of results

SUPPORTING THE IHO INTERNATIONAL TESTBED

Build what comes next with S-I 00 data

The IHO testbed brings together industry stakeholders to explore how S-I 00 can be used in practice and to support development ahead of wider adoption.

Developed in collaboration between the UK Hydrographic Office and the French Hydrographic and Oceanographic Service (Shom), these data sets form a cross-Channel testbed designated by the IHO to investigate how S-I 00 standards can be applied in practice. They have been created and exercised through **live and simulated sea trials** to support industry testing and interoperability.

Feedback from stakeholders and end-users is used to inform the ongoing development of S-I 00 standards, ECDIS GUI design and future hydrographic data production. The results from the trials will also contribute to the safety case required by the International Maritime Organization (IMO) for the application of S-I 00 ECDIS.

Explore the data sets below





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Thank you

