

Using Port ENCs for Decision Support

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Introduction

- Challenges for Ports
- Why use a Port or Bathymetric ENC
- Simple steps to create PENC/bENC
- Case Studies
 - Brent Delta
 - Clydeport
 - Southampton

Challenges for Ports

- Vessels are getting bigger
 - New Aircraft Carrier – 280m long, 11m draught
 - Largest Cruise Ship – 362m long, 9.3m draught
 - Latest Container ships – 400m long, 16m draught
- Ports are expanding
 - New wharves/jetties
 - More dredging



Challenges for Ports

- New areas to be charted
- Reduced margin for error
- More detailed charts and accurate charts
- Safer and more confident decision making
- New (?) technologies – PPU

Requirement for Higher Resolution **Digital** Data

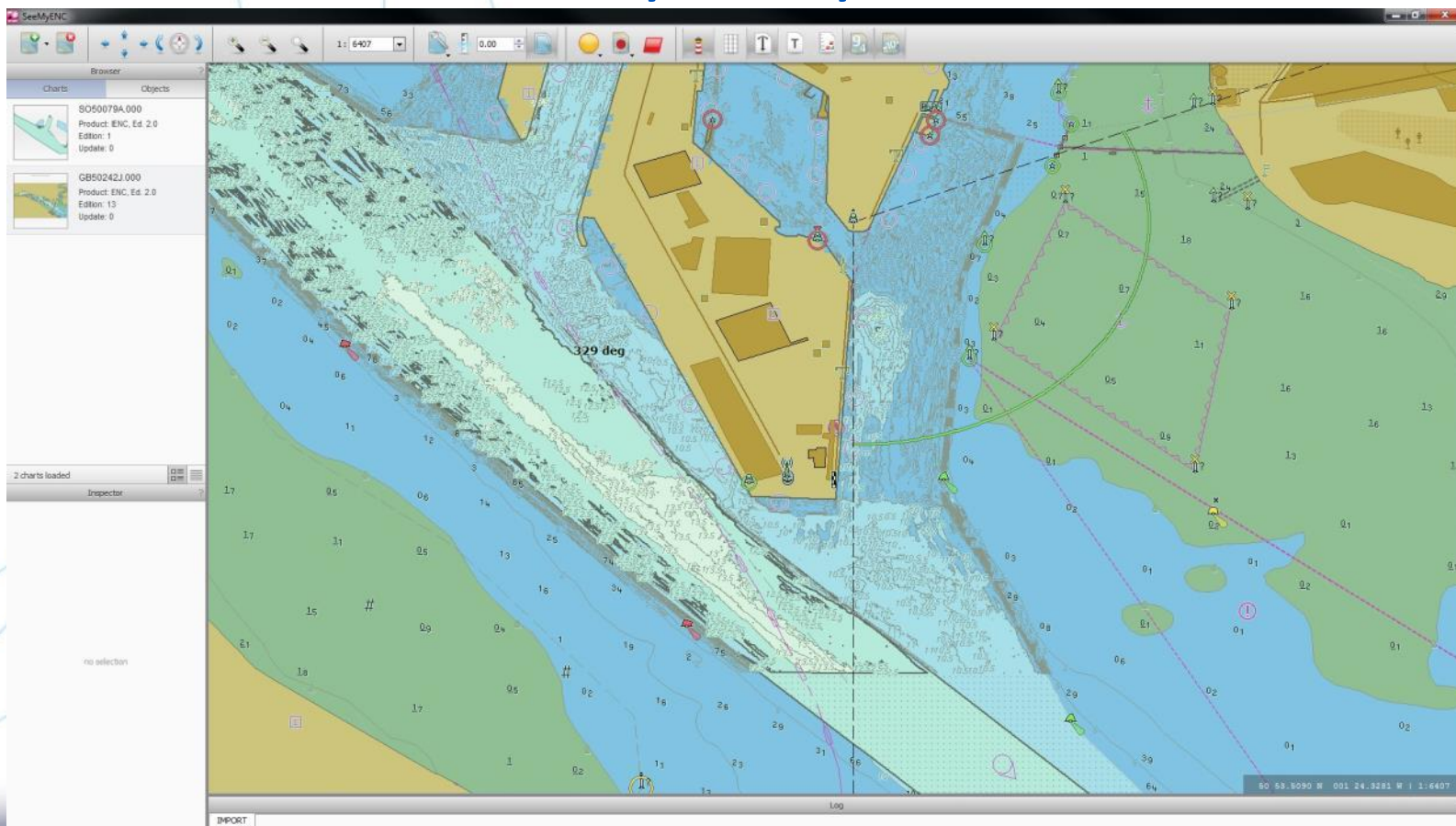
- Ports regularly survey their channels and environs and publish their own paper charts
- Hydrographic Offices' priority is in frequently navigated areas and is general purpose
- Hydrographic Offices' ENC update process likely to be too slow for ports
- SOLAS needs are not the same as ports' needs

Definitions

- **Bathymetric ENC (bENC)** is a Cell containing high resolution bathymetry (only Depth Areas, Soundings and Contours and/or grid)
- **Port ENC (PENC)** contains the bENC data and combines with high resolution topographic data

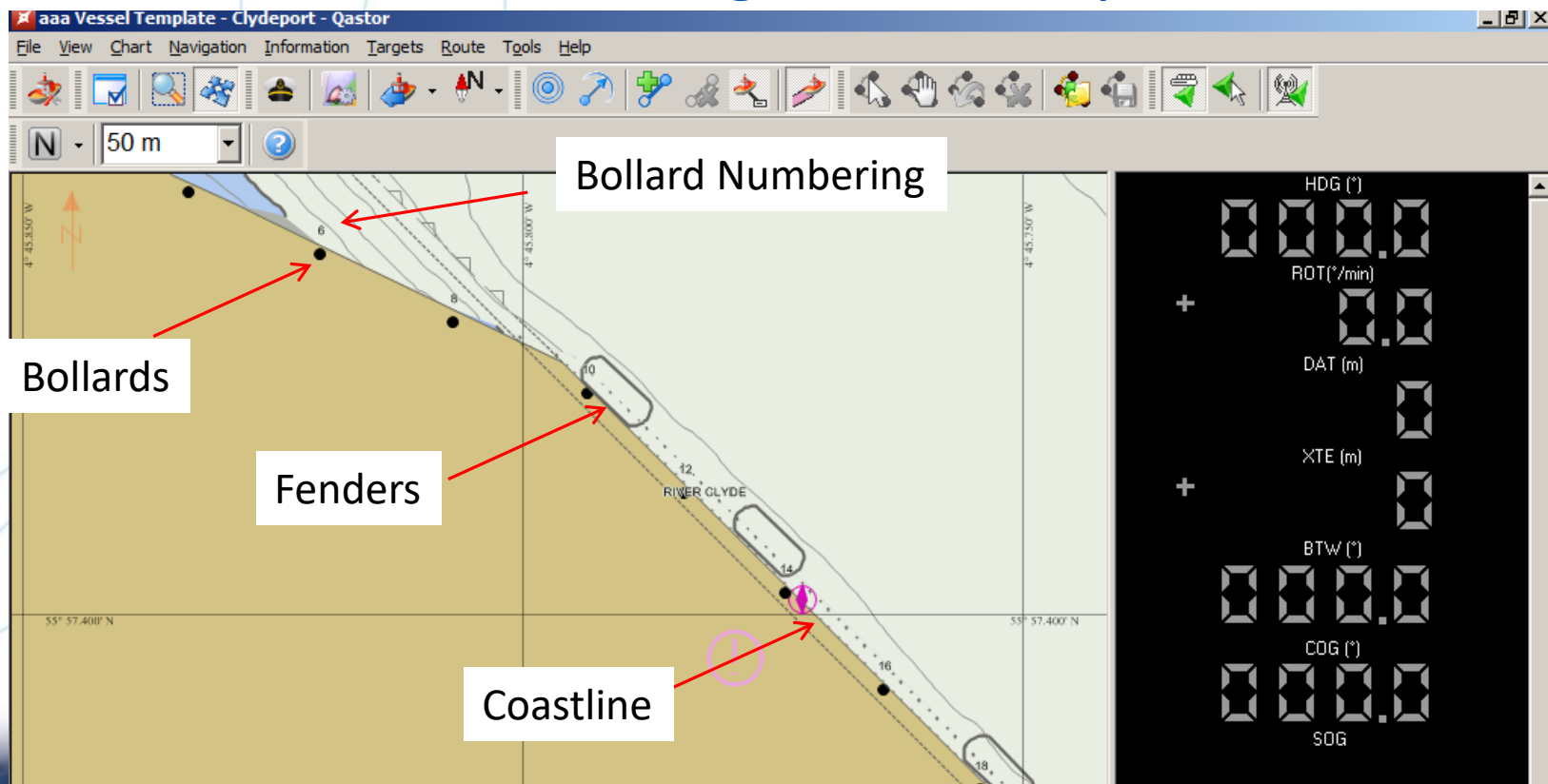
Why use Port or Bathymetric ENC

- More detailed bathymetry



Why use Port or Bathymetric ENC

- More useful information
 - Additional features, higher accuracy features



Why use Port or Bathymetric ENC

- Up-to-date
 - Created by your in-house teams giving quick turn around

Latest Published Chart

The screenshot displays the SeeMyENC software interface. The main window shows a nautical chart of the Tees River Channel. The chart features a grid with latitude and longitude coordinates. A red rectangular box highlights a specific area in the upper-left portion of the channel. The chart includes various navigational symbols, such as buoys and lights, and depth soundings. The interface includes a toolbar at the top with various navigation and editing tools. On the left side, there is a browser panel showing the chart's metadata: GB52586Y.000, Product: ENC, Ed. 2.0, Edition: 6, and Update: 0. Below the browser panel, there is a status bar indicating "1 chart loaded" and "Inspector" mode. At the bottom of the interface, there is a "Log" button and a status bar showing the current coordinates: 54 36.7384 N 001 10.1780 W | 1:2000.

Port ENC from latest survey data

The screenshot displays the SeeMyENC software interface. The main window shows a nautical chart of Port ENC with a red rectangular box highlighting a specific area. The chart includes depth soundings, navigational markers, and a coordinate grid. The interface features a top toolbar with navigation and display controls, a left sidebar with a chart browser, and a bottom status bar.

Chart Browser:

- GB52566Y.000
Product: ENC, Ed. 2.0
Edition: 6
Update: 0
- 6G60001A.000
Product: IENC, Ed. 2.0
Edition: 1
Update: 1

Chart Coordinates:

- Longitude: 001°10.50'W to 001°08.50'W
- Latitude: 54°36.50'N to 54°36.00'N

Status Bar: 54 36.7102 N 001 10.3229 W | 1:2000

Why use Port or Bathymetric ENC

- Standard digital format for use in PPU/VTS



Simple Steps to create a PENC/bENC

- Up-to-date high resolution survey data from Hydrographic Team
- Accurate land mapping from National Mapping Agencies (e.g. Ordnance Survey)
- Accurate additional local information from central resources
 - Bollard positions & names
 - Navigation Aids
 - Channels/Fairways
- And OceanWise ENC Writer Tools!

Ordnance Survey MasterMap

The screenshot displays the Cadcorp SIS Map Modeller software interface. The title bar reads "Cadcorp SIS Map Modeller - 6G600007.swd". The main menu includes Home, Edit, Create, Format, Topology, Analysis, CAD, View, and Applications. The Applications toolbar contains various tools categorized by function: MTB Export (Export Features, Export Overlays), MTB Construct (Areas from Min Bounding Rectangle, Run Lines, Column Calculator), MTB Surface (Grid Calculator), MTB Overlays (Batch Apply Styles, Filter Overlays), MTB Import (Locate, Add ASCII), MTB Extensions (HSM, DLM, ESM), MTB Help (Help, About), MTB ENC (Build ENC, Set Attributes, Validate Nav Lines, Create Nav Lines), and other utility tools (Create Quote, Finalise Raster, Quotations).

The left-hand pane shows the "Maps" workspace with a tree view of "SIS Workspace Definitions". The tree structure is as follows:

- SIS Workspace Definitions
 - 6G600007
 - Coastline.bds
 - bENC
 - MASTERMAP
 - bENC Areas
 - Features - Land area
 - MIO_Installations
 - SEATON CH 2_5M SORT 300417.xyz
 - seaton basin 1m sort 010517.xyz
 - 6G600007.000
 - Map 2

The main map area displays a coastal region with a large body of water, a pier extending into the water, and surrounding land with buildings and vegetation. A green line is drawn across the map. The status bar at the bottom shows the current coordinates as 54.630°, -1.195°, 0.0000m, a scale of 1:7120, and a distance of 1.3km.

Land area created from best Topographic Data

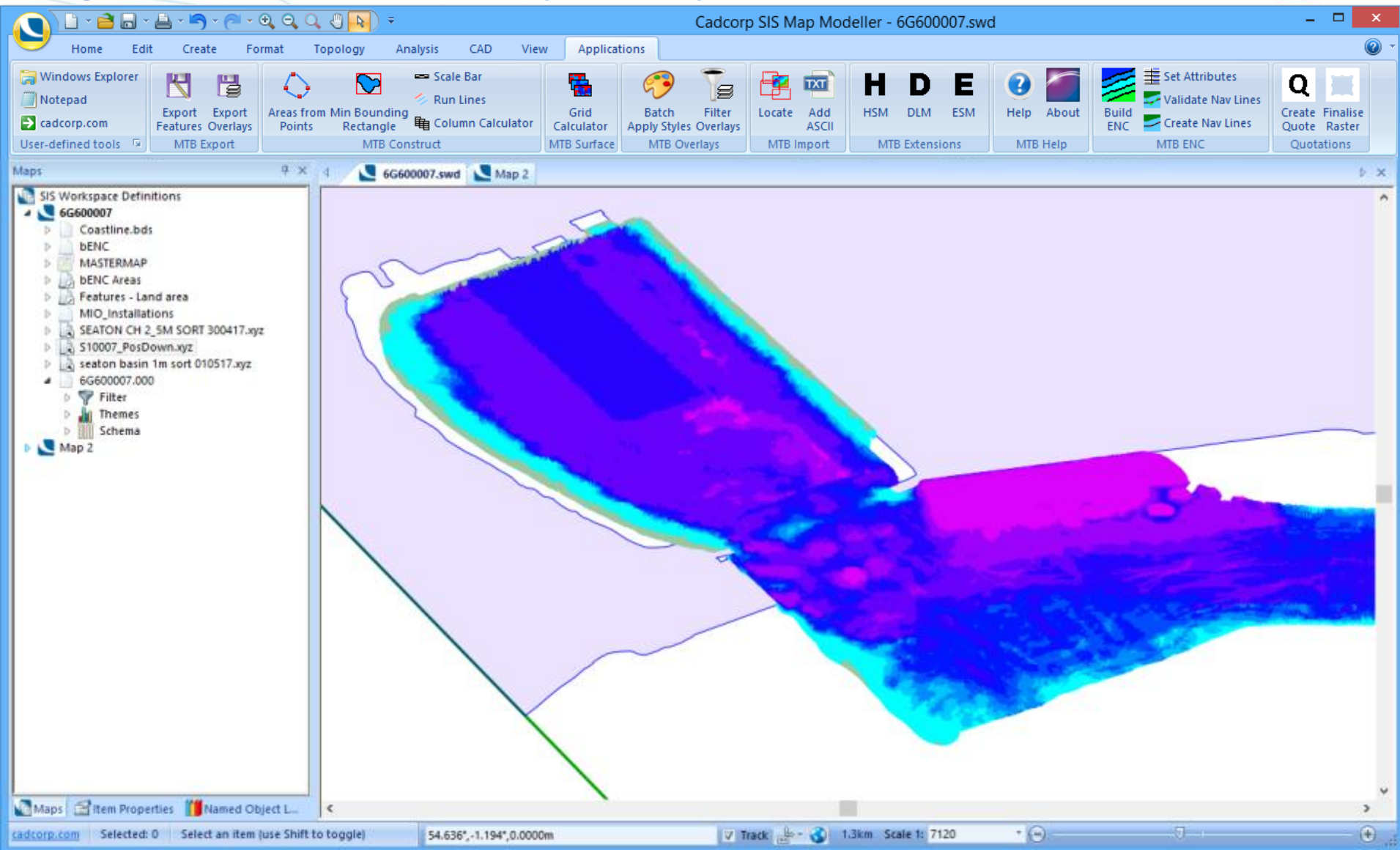
The screenshot displays the Cadcorp SIS Map Modeller software interface. The title bar reads "Cadcorp SIS Map Modeller - 6G600007.swd". The menu bar includes Home, Edit, Create, Format, Topology, Analysis, CAD, View, and Applications. The Applications ribbon contains various tool groups: MTB Export (Export Features, Export Overlays), MTB Construct (Areas from Min Bounding Rectangle, Run Lines, Column Calculator), MTB Surface (Grid Calculator), MTB Overlays (Batch Apply Styles Overlays, Filter), MTB Import (Locate, Add ASCII), MTB Extensions (HSM, DLM, ESM), MTB Help (Help, About), MTB ENC (Build ENC, Set Attributes, Validate Nav Lines, Create Nav Lines), and Quotations (Create Quote, Finalise Raster, Quotations).

The main map area shows a light purple shaded region representing land area, outlined in blue. A green line is visible in the lower-left corner of the map. The left sidebar shows the "SIS Workspace Definitions" tree with the following structure:

- 6G600007
 - Coastline.bds
 - bENC
 - MASTERMAP
 - bENC Areas
 - Features - Land area
 - MIO_Installations
 - SEATON CH 2_5M SORT 300417.xyz
 - seaton basin 1m sort 010517.xyz
 - 6G600007.000
- Map 2

The status bar at the bottom shows the current coordinates as 54.636°, -1.195°, 0.0000m, a scale of 1:7120, and a distance of 1.3km. The bottom-left corner of the interface includes the Cadcorp logo and the text "Selected: 0 Select an item (use Shift to toggle)".

High resolution bathymetry



Navigation Aids from central source

Cadcorp SIS Map Modeller - 6G600007.swd

Home Edit Create Format Topology Analysis CAD View Applications

Windows Explorer Notepad cadcorp.com User-defined tools

Export Features MTB Export Export Overlays MTB Construct Areas from Min Bounding Rectangle MTB Surface Grid Calculator MTB Surface Batch Apply Styles Overlays MTB Overlays Filter Filter Apply Styles Overlays MTB Import Locate Add ASCII MTB Extensions HSM DLM ESM MTB Help Help About MTB ENC Build ENC Create Nav Lines Set Attributes Validate Nav Lines Create Nav Lines Quotations Create Finalise Raster

Maps 6G600007.swd Map 2

SIS Workspace Definitions

- 6G600007
 - Coastline.bds
 - bENC
 - MASTERMAP
 - bENC Areas
 - Features - Land area
 - SEATON CH 2_5M SORT 300417.xyz
 - S10007_PosDown.xyz
 - seaton basin 1m sort 010517.xyz
 - MIO_Installations
 - 6G600007.000
 - Filter
 - Themes
 - Schema

Map 2

Installations - Database (Access 2007 - 2010) - Microsoft Access

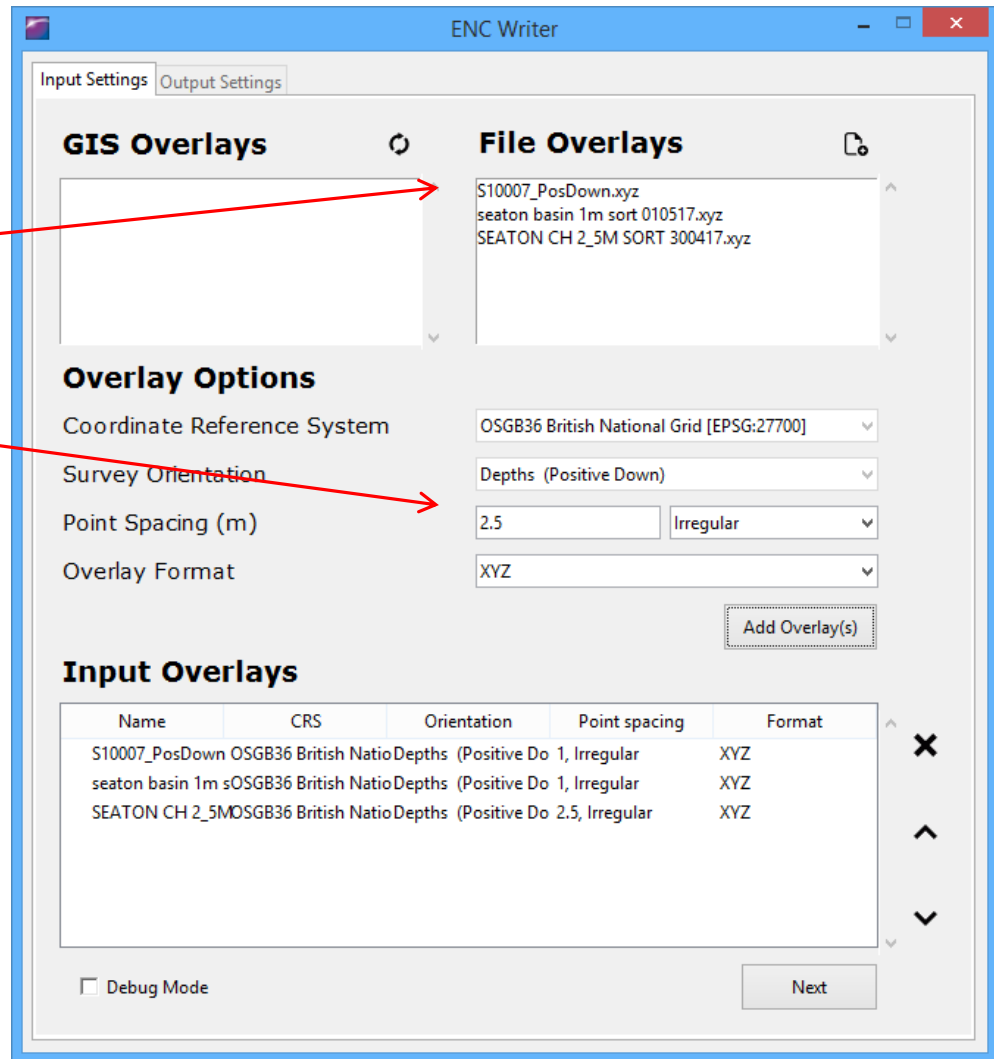
P_Number	N_Number	Station	Description	Installation_Type	CATCAM	CATLUM	CATSPM	FUNCTION	Light_chars	Height	Range
P2917	N33315	Able Middlehaven Inset	Unlighted Buo	39							
P2917	N33314	Able Middlehaven Inset	Unlighted Buo	39							
P2917	N31408	Billingham Beach Wharf	Unlighted Buo	39							
P2917	N31407	Billingham Beach Wharf	Unlighted Buo	39							
P2918	N17576	Cargo Fleet Winker buoy	Lighted Buoy	60	1			GR		28	
P2917	N25903	Clarence Wharf	Lighted Buoy	187				3FG (vert)		± 18.13	
P2916	N25940	Dredge Land Buoy 1	Lighted Buoy	60	2			GG		28	
P2918	N25941	Dredge Land Buoy 2	Lighted Buoy	60	1			GR		28	
P2917	N26206	Cooperative Jetty - Downs	Lighted Beacon	187				3FR (vert)		2	
P2917	N26205	Cooperative Jetty - Downs	Lighted Beacon	187				3FR (vert)		2	
P2918	N26165	Front Leading Light	Lighted Beacon	187				FR		16 18.38	11
P2918	N26166	Harbour Office Data Buoy	Lighted Buoy	31	1			GP		30	
P2918	N26400	Harlepool Traffic Signal	Traffic Signal	130				F DWS / 3 F R		7	
P2918	N31206	Heugh Lighthouse	Lighthouse	120		33		FR2 3R		14 18	18
P2917	N26467	Hexcel Chuffal Beacon, 1	Unlighted Buo	39							
P2917	N26553	Huttonian Towline Buoy	Unlighted Buo	37		2					
P2917	N26502	Islebuoy Jetty	Lighted Beacon	187							
P2917	N26212	Jessie North Pier (beating)	Lighted Beacon	187				3FG (vert)		± 1.58	
P2918	N23288	Jessie's Quay Outer Buoy	Lighted Beacon	187				FG		8 6.65	2
P2918	N23305	Langscar Buoy	Lighted Buoy	79				3FR (vert)		8	
P2917	N24213	Mable Pier (harlepool)	Lighted Beacon	187			7	GR 3R		29	
P2917	N24504	N Side Middleborough Dr	Unlighted Buo	39				FR		16 6.65	2
P2917	N24505	N Side Middleborough Dr	Unlighted Buo	39							
P2917	N24506	N Side Middleborough Dr	Unlighted Buo	39							
P2918	N24508	N Side Middleborough Dr	Unlighted Buo	39							
P2918	N24425	Navigator No. 3 Winker B	Lighted Buoy	60	2			GG		28	
P2918	N31286	No 1 Buoy (harlepool)	Lighted Buoy	60	2			GG		28	
P2918	N26127	No 1 Buoy (tees)	Lighted Buoy	60	2			GR 3R		28	
P2918	N26841	No 30 Buoy (tees)	Lighted Buoy	60	1			GR 3R		27	
P2918	N26843	No 21 Buoy (tees)	Lighted Buoy	60	2			FR 2s		8	
P2918	N26844	No 22 Buoy (tees)	Lighted Buoy	60	1			FR 2s		16	
P2918	N26845	No 23 Buoy (tees)	Lighted Buoy	60	1			GR		28	
P2918	N26815	No 25 Buoy	Lighted Buoy	60				GR 20 5s		23 7	

Scale 1: 7120

OceanWise ENC Writer

Input Settings:

- Input Surveys
- Custom settings per survey



The screenshot shows the 'ENC Writer' application window with the 'Input Settings' tab selected. The interface is divided into several sections:

- GIS Overlays:** An empty list box with a refresh icon.
- File Overlays:** A list box containing three survey files: 'S10007_PosDown.xyz', 'seaton basin 1m sort 010517.xyz', and 'SEATON CH 2_5M SORT 300417.xyz'.
- Overlay Options:** A series of dropdown menus and input fields:
 - Coordinate Reference System: OSGB36 British National Grid [EPSG:27700]
 - Survey Orientation: Depths (Positive Down)
 - Point Spacing (m): 2.5 (input field) and Irregular (dropdown)
 - Overlay Format: XYZ
- Input Overlays:** A table summarizing the configured overlays.

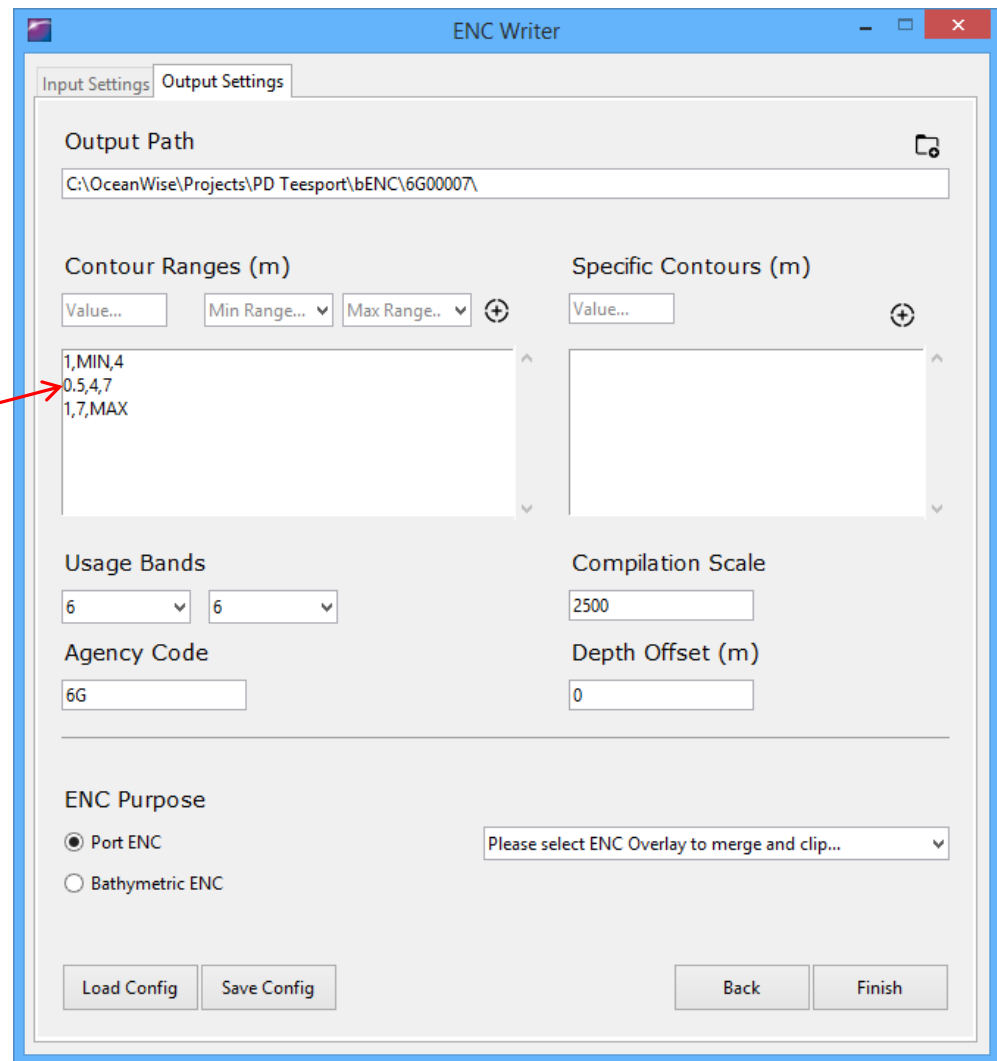
Name	CRS	Orientation	Point spacing	Format
S10007_PosDown	OSGB36 British Natio	Depths (Positive Do 1, Irregular		XYZ
seaton basin 1m s	OSGB36 British Natio	Depths (Positive Do 1, Irregular		XYZ
SEATON CH 2_5M	OSGB36 British Natio	Depths (Positive Do 2.5, Irregular		XYZ
- Additional Elements:** An 'Add Overlay(s)' button, a 'Debug Mode' checkbox (unchecked), and a 'Next' button.

Red arrows from the text on the left point to the 'File Overlays' list and the 'Survey Orientation' dropdown menu.

OceanWise ENC Writer

Output Settings:

- Enter configuration parameters
- Set varying contour intervals



The screenshot shows the 'ENC Writer' application window with the 'Output Settings' tab selected. The interface includes the following elements:

- Output Path:** A text field containing 'C:\OceanWise\Projects\PD Teesport\bENC\6G00007\'. A folder icon is visible on the right.
- Contour Ranges (m):** A list box containing three entries: '1,MIN,4', '0.5,4,7', and '1,7,MAX'. A red arrow points to this list box. Above the list are input fields for 'Value...', 'Min Range...', and 'Max Range..', along with a '+' button.
- Specific Contours (m):** An empty list box with a '+' button above it.
- Usage Bands:** Two dropdown menus, both set to '6'.
- Agency Code:** A text field containing '6G'.
- Compilation Scale:** A text field containing '2500'.
- Depth Offset (m):** A text field containing '0'.
- ENC Purpose:** Two radio buttons: 'Port ENC' (selected) and 'Bathymetric ENC'. To the right is a dropdown menu with the text 'Please select ENC Overlay to merge and clip...'.
- Buttons:** 'Load Config', 'Save Config', 'Back', and 'Finish' are located at the bottom of the window.

Output Port ENC

The screenshot displays the Cadcorp SIS Map Modeller software interface. The title bar reads "Cadcorp SIS Map Modeller - 6G600007.swd". The main window shows a map of a port area with depth contours and various features. The interface includes a menu bar (Home, Edit, Create, Format, Topology, Analysis, CAD, View, Applications), a toolbar with various tools (e.g., Scale Bar, Run Lines, Grid Calculator, Batch Apply Styles Overlays), and a sidebar with "SIS Workspace Definitions" for the project "6G600007". The workspace includes folders like "Coastline.bds", "bENC", "MASTERMAP", "bENC Areas", "Features - Land area", "SEATON CH 2_5M SORT 300417.xyz", "S10007_PosDown.xyz", "seaton basin 1m sort 010517.xyz", "MIO_installations", and "6G600007.000". The map shows a large body of water with depth contours and several red rectangular markers. The status bar at the bottom indicates the selected item is "0", the coordinates are "54.636°,-1.193°,0.0000m", and the scale is "1.3km Scale 1: 7120".

Case Study – Brent Delta

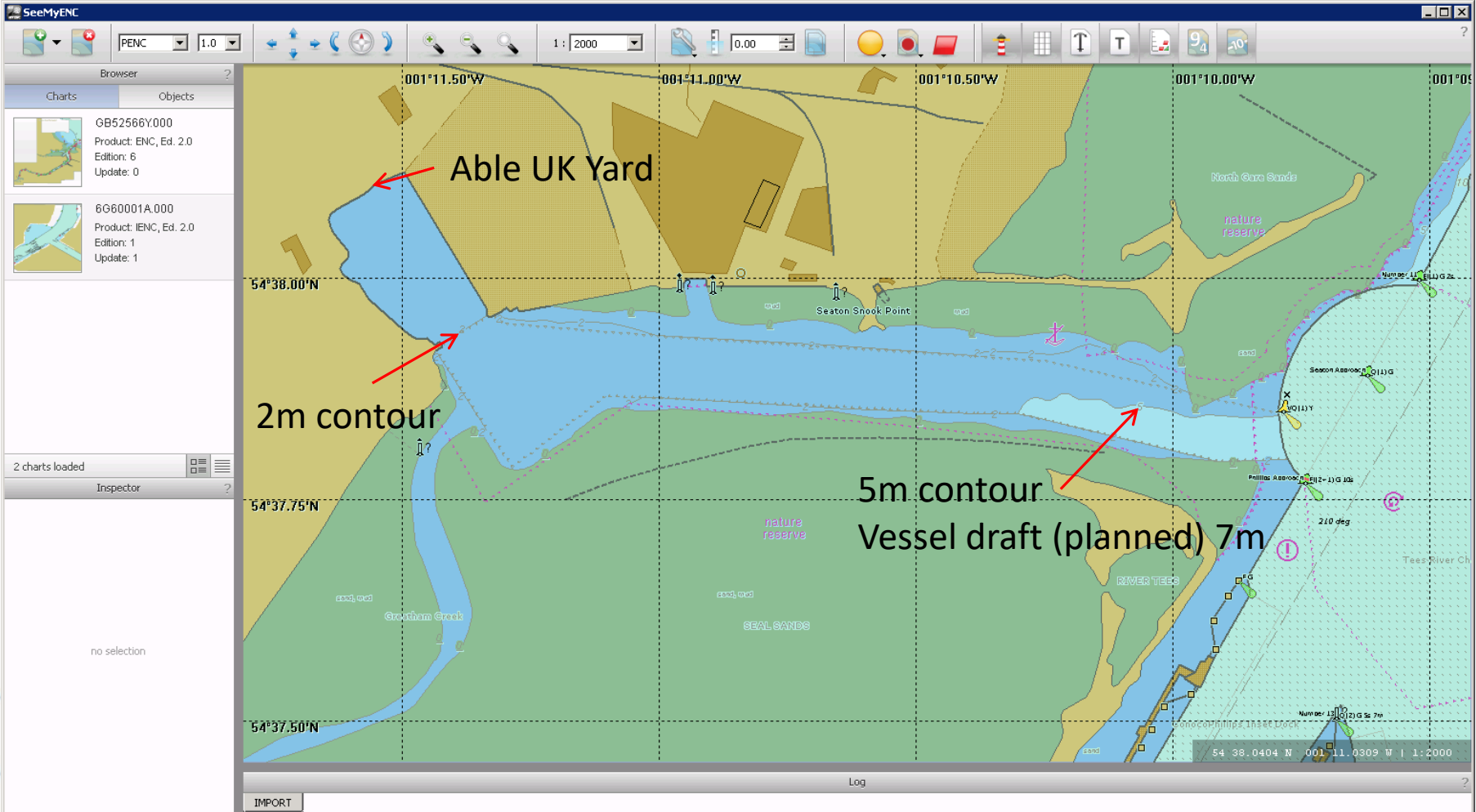
- Shell are decommissioning the Brent Field and removing their infrastructure
- To reduce the duration, risk and cost of decommissioning the topsides they engaged AllSeas' vessel Pioneering Spirit to remove the topside in one piece – all 24,200 tonnes of it!



- The topside was to be transferred to the barge Iron Lady and brought to Able UK Yard at the end of Seaton Channel in Teesside



Problem...



Solution

- PD Teesport were already working with OceanWise looking at in-house PENC production
- OceanWise could build PENC with latest survey data
 - providing immediate assistance
 - as interim step towards PD Teesport developing own capability

Timeline

- Seaton Channel/Basin dredging finished Sunday
- Final hydrographic surveys finished Bank Holiday Monday and sent to OceanWise
- Delivery of PENC to Tees Pilots Tuesday AM!
- Ready for Ship Movement Tuesday PM

SeeMyENC

ENC 1.0

1: 6608 0.00

Browser

- Charts
- Objects

GB52566Y.000
Product: ENC, Ed. 2.0
Edition: 6
Update: 0

6G600007.000
Product: ENC, Ed. 2.0
Edition: 1
Update: 1

2 charts loaded

Inspector

no selection

Seaton Sluick Point

North Gare Sands

mud

SC18 Winker Buoy

SC16 Winker Buoy

SC14 Winker Buoy

SC12 Winker Buoy

SC10 Winker Buoy

SC9 Winker Buoy

SC8 Winker Buoy

SC7 Winker Buoy

SC6 Winker Buoy

SC5 Winker Buoy

SC4 Winker Buoy

Gratham Creek

nature reserve

SEAL SANDS

54 38.0823 N 001 11.0991 W | 1:6608

Log

IMPORT

“Having the PENC available on the PPU display was vital in making real time decisions in an ever changing situation. A challenging job made more difficult by unexpected changes on the day was able to be managed easily and effectively by having the data available in this dynamic format. Thank you for your assistance, right up to an hour before we set off!!”

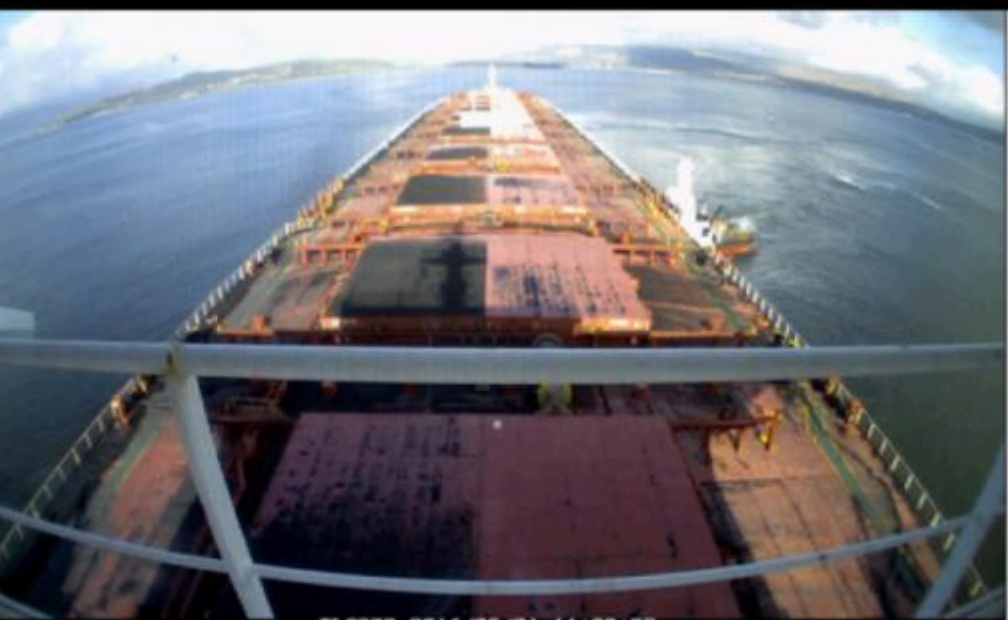
Mark Green, Pilot, Tees Bay Pilots

Case Study – Peel Ports Clydeport

- Ship with engine failure needed to be brought into the Clyde
- Bigger than vessels usually accommodated in the Clyde (289m x 45m)
- No engine meant purely being brought in with tugs

Solution

- Clydeport had already been creating Port ENCs using OceanWise ENC Writer from their survey data
- They were able to use the data to assess the risks involved in the ship movement prior to undertaking
- While doing the manoeuvre they used the data on the PPU, making the situation much safer



SeeMyENC

Charts

3 charts loaded



Vertical sidebar panel with a question mark icon at the top and a scale of 1:1500 at the bottom.

“Being able to get detailed up-to-date information from our in house Survey team, compared to a standard ENC, into our Portable Pilotage Unit (PPU) has made us more confident in manoeuvring larger ships in confined spaces.

This is not just about knowing the accurate depths around the ship being piloted but also providing high resolution data allowing the tugs involved sufficient space to safely manoeuvre”

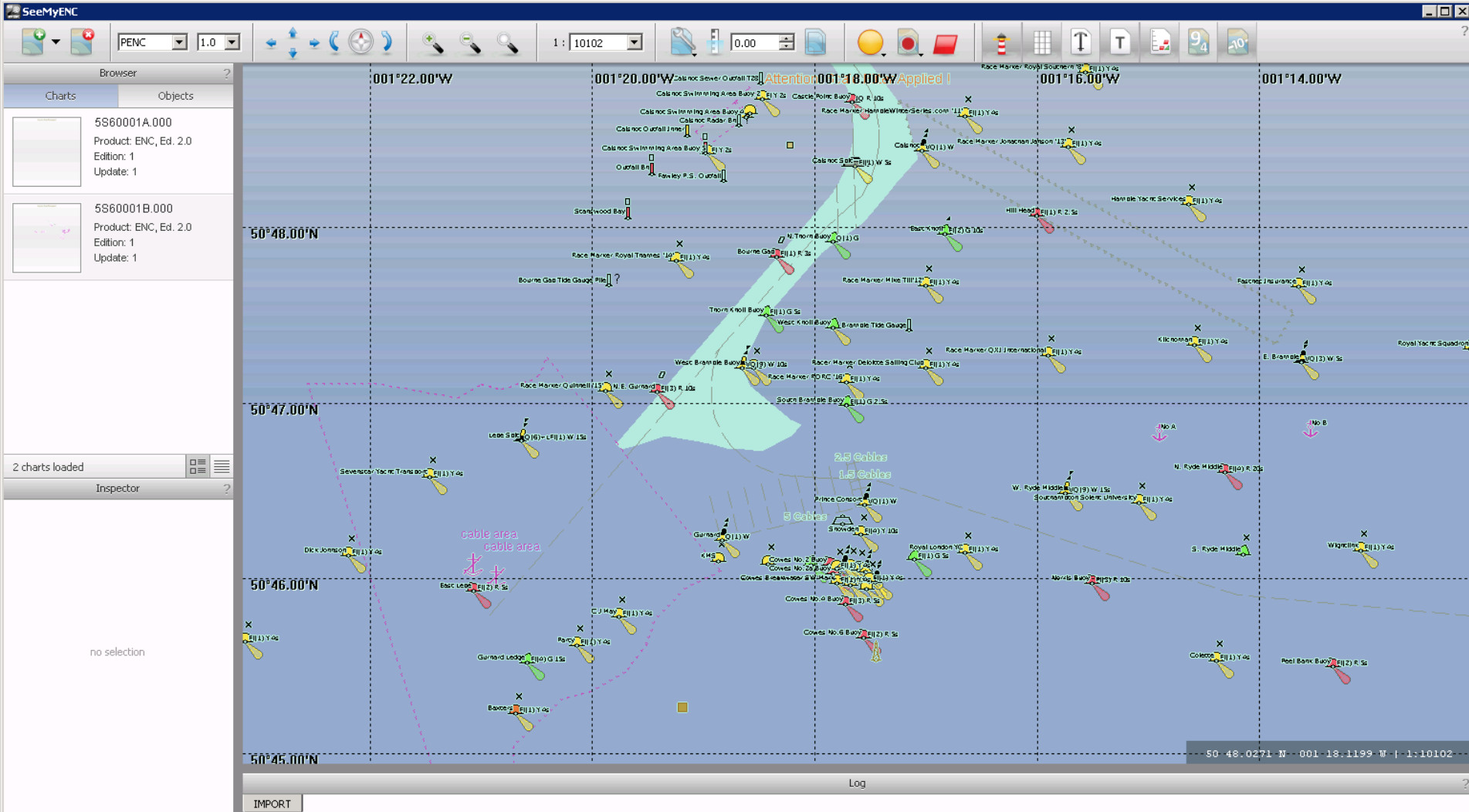
Gillan Locke, Marine Officer, Peel Ports Clydeport

Case Study – ABP Southampton

- ABP implementing a new VTS system
- Standard ENC's not updated frequently enough to reflect local updates
- Requirement to use their managed database of Navigation Aids as the source of data in the VTS in place of standard ENC's

Solution

- ABP Southampton already working with OceanWise to improve their data management so they have a single store of data accessed by multiple systems
- Easy step to take the same central data store and output to a different format (ENC)
- As changes to the central store of Navigation Aids are made they can be exported to ENC and brought into the VTS





where your data matters

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