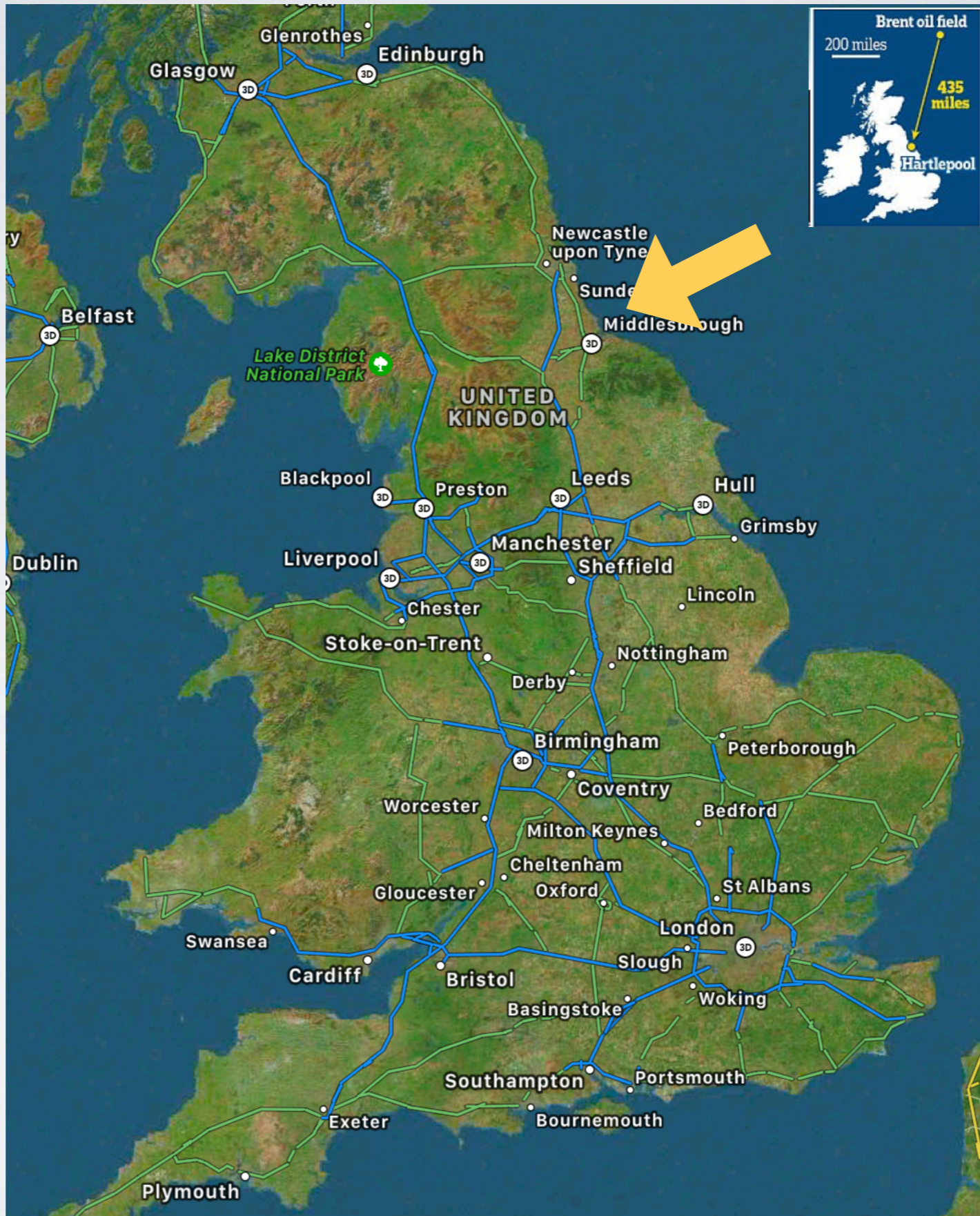


BRENT DELTA / IRON LADY ARRIVAL TO TERRC 02 MAY 2017

Mark Green - Tees Bay Pilot

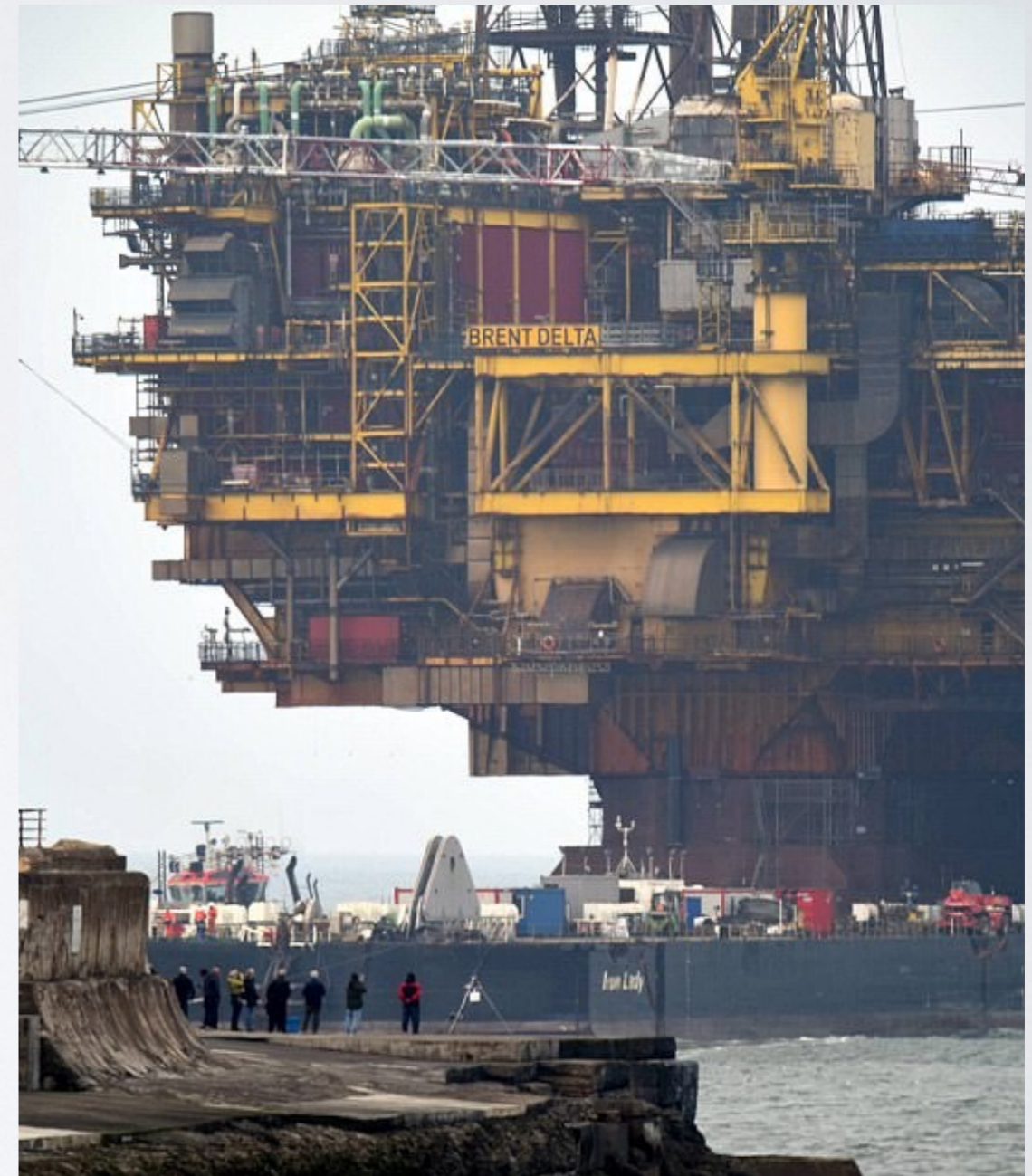


TEES BAY PILOTS LTD



BRENT DELTA / IRON LADY

- Brent Delta 24200 tonnes
- Iron Lady 200m x 57m



PIONEERING SPIRIT

The largest construction vessel ever built and the 5th longest ship in the world at 382m long with a beam of 124m





Pioneering Spirit
removing the Shell Brent Delta topsides
North Sea, 28 April 2017

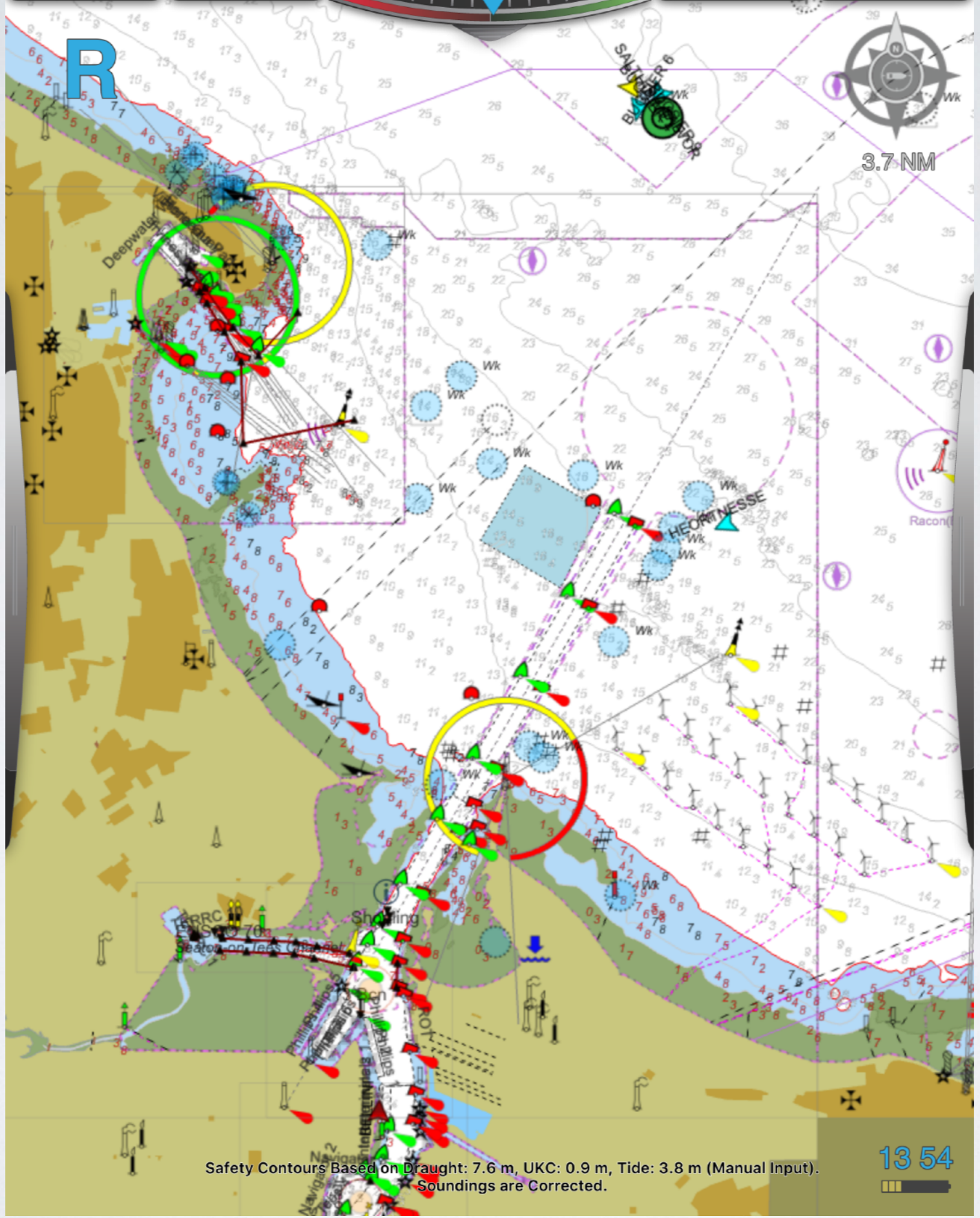
SBAS
HDOP: 1.1

1.8 kn
SOG

0.9 °/min
ROT

129.1°
HDG + 0.0°

150.1°
COG

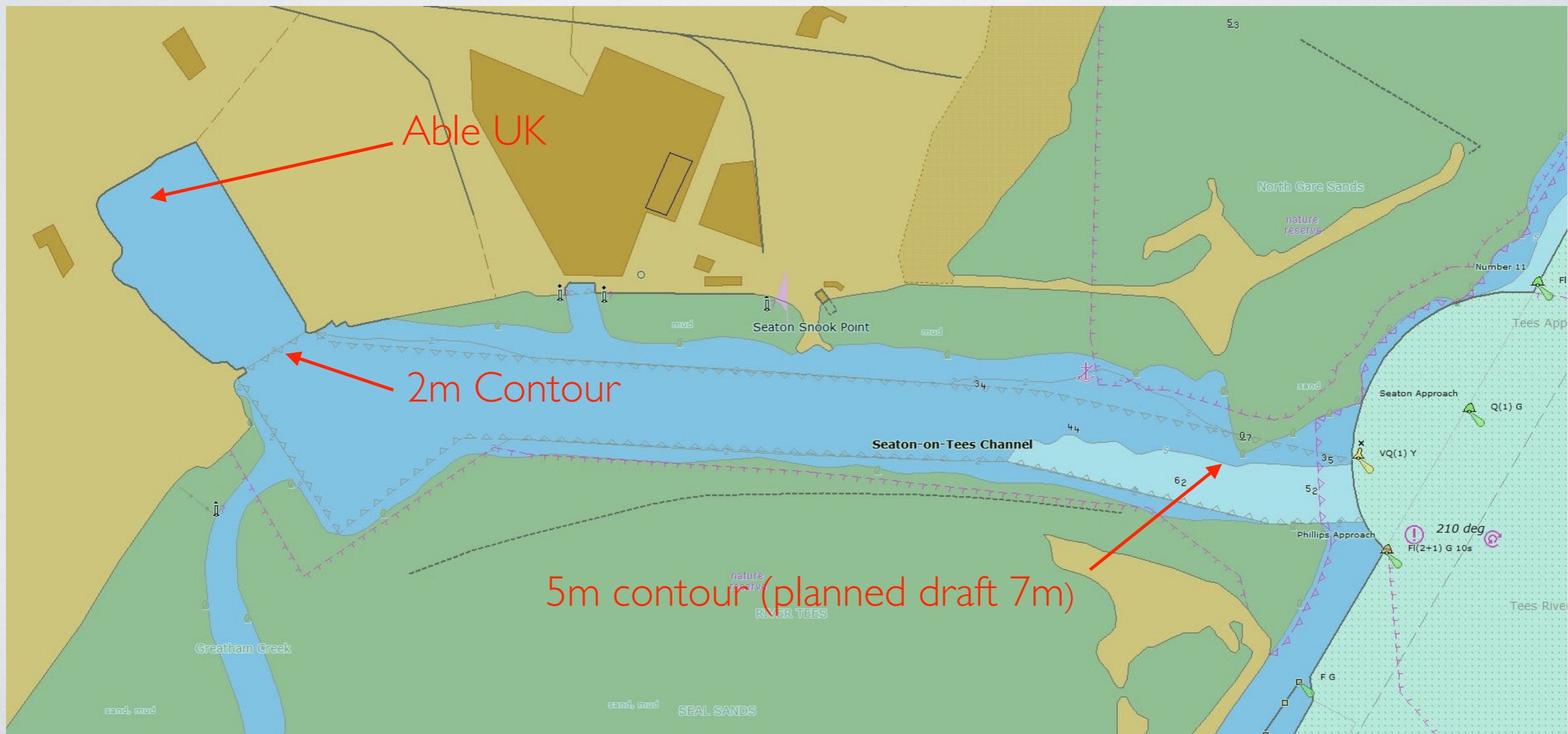


Safety Contours Based on Draught: 7.6 m, UKC: 0.9 m, Tide: 3.8 m (Manual Input).
Soundings are Corrected.

13 54

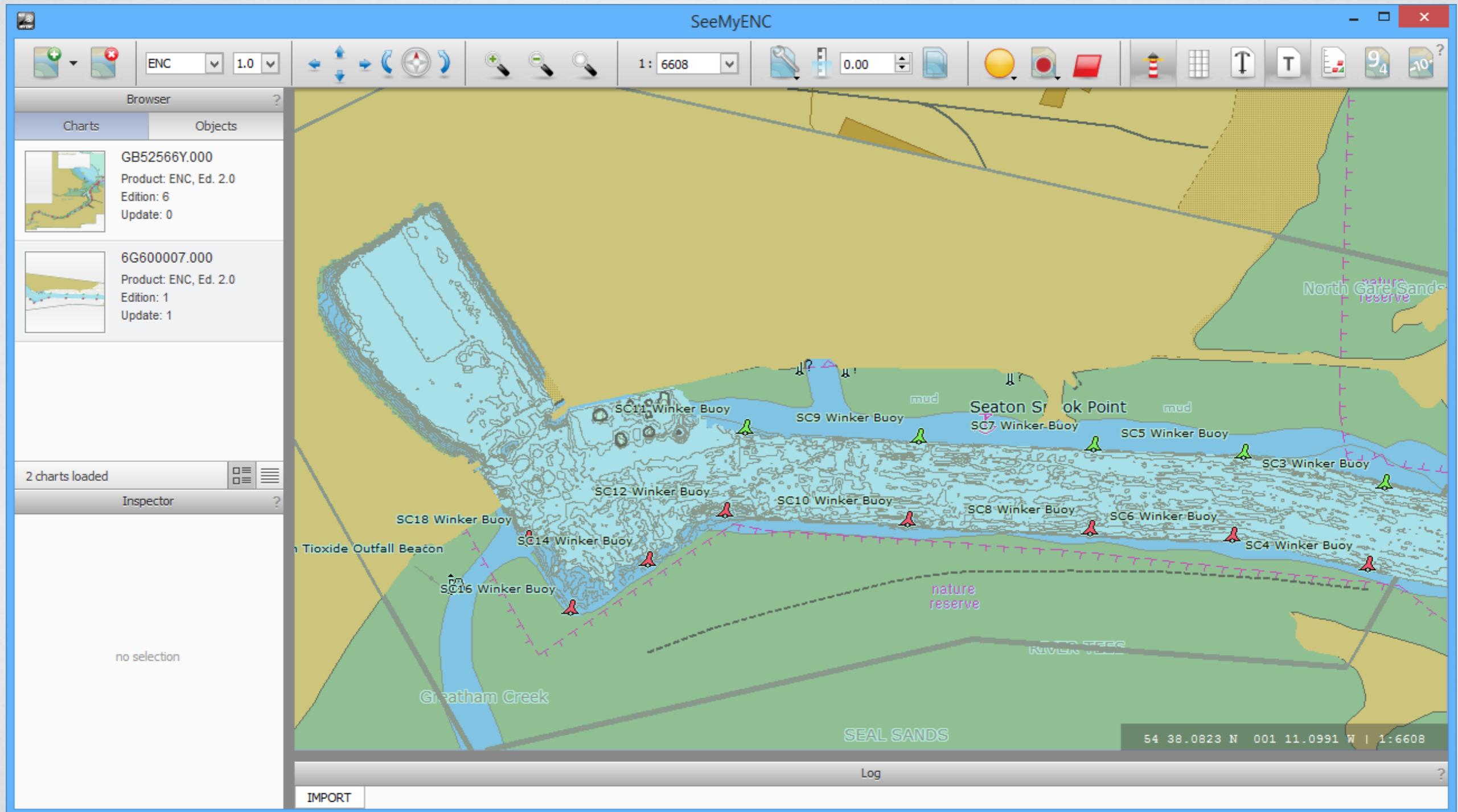
NAVIGATING IRON LADY

- Standard S57 ENC



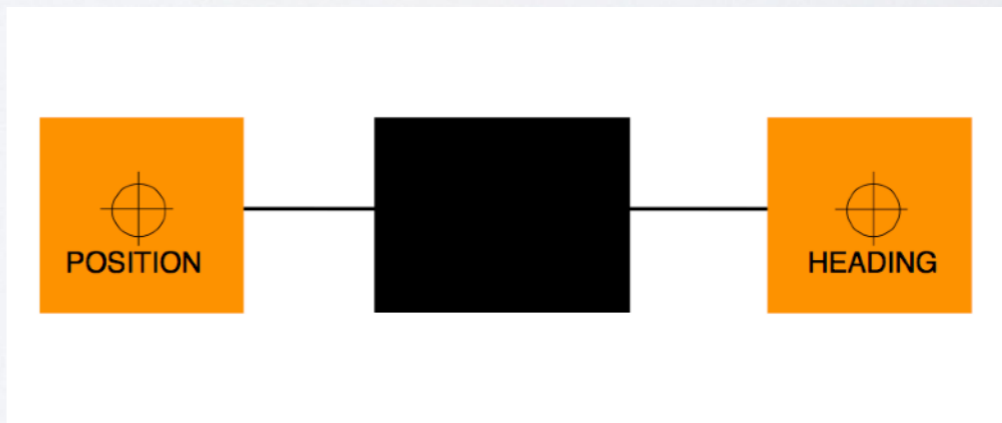
NAVIGATING IRON LADY

- Oceanwise bENC / PENC



NAVIGATING IRON LADY

- Position Monitoring & Control
- Safepilot PPU
- E Sea Fix CAT 2

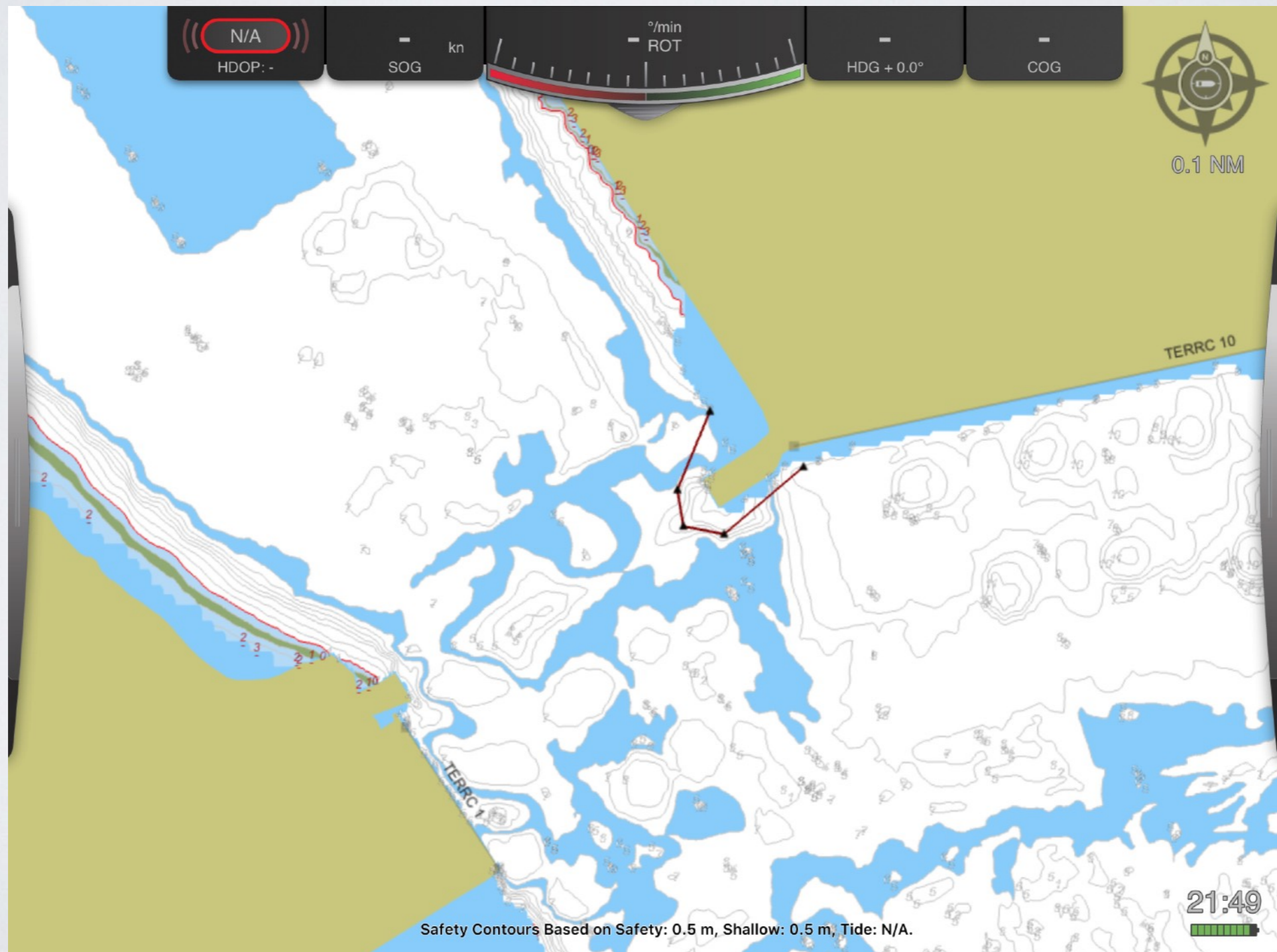


PRE ARRIVAL SEQUENCE

- Initial Hazid Meeting 21st Jan 2016 - Dredging Requirement to 6.0m Identified
- 2nd Hazid Meeting 14th Dec 2016 - **No significant dredging progress**
- Pre Arrival Meeting 12th April 2017 - **Concerns raised regarding dredging progress**
- Emergency Survey Review 26th April - **Continuous dredging/survey program commenced**
- 2nd Pre Arrival Meeting 30th April 2017 / Dredging ceased
- Final hydrographic surveys completed **Bank Holiday Monday and sent to OceanWise**
- Tug Master Channel Familiarisation 01st May 2017
- PENC received from Oceanwise 0930 02nd May 2017
- Final Survey Review HM & Pilots 1100 - Dredged depth achieved 5.0m
- Go/No Go and WX Assessment Teleconference 1130_02nd May 2017 - Pilot Boarding Time 1230

NAVIGATING IRON LADY

- Safepilot - Clearing Lines



MANAGING THE TIDAL WINDOW

- Expected Timings:
 - TX Position to Seaton Turning Circle - 4 Hours
 - Seaton Channel Transit - 0.5 Hours
 - Manoeuvring at Dock Entrance - 0.5 Hours
 - Connecting Moorings - 4.0 Hours
 - Positioning for Grounding - 0.5 Hours
 - **Total Time Required - 9.5 Hours**
- Tidal Times / Heights
 - 02 May - LW 1520 1.2m / HW 2134 4.7m
 - **03 May - LW 0346 1.8m**

PILOTING IRON LADY

- 4 Man Team
- 2 Pilots
- 2 Assistants



PILOTING IRON LADY

- Visibility
- Environmental Factors:
 - Swell - E'ly 1.0m
 - Wind - E'ly 15 Kts
 - Tidal Current - S'Ely 1.5-2.0 Kts
- Windage - approximately 12400m²
- Unpredictable Handling?
- Abort Point?



SBAS HDOP: 0.9 2.4 kn SOG 20 °/min ROT 186.8° HDG + 0.0° 218.6° COG



Safety Contours Based on Draught: 7.6 m, UKC: 0.9 m, Tide: 1.3 m (). Soundings are Corrected.

13:41

100 m 100 m

Tees N/S	ETA	66 m XTD	TERRC Basin	ETA
1.94 NM/209°	14:30		5.76 NM	16:05

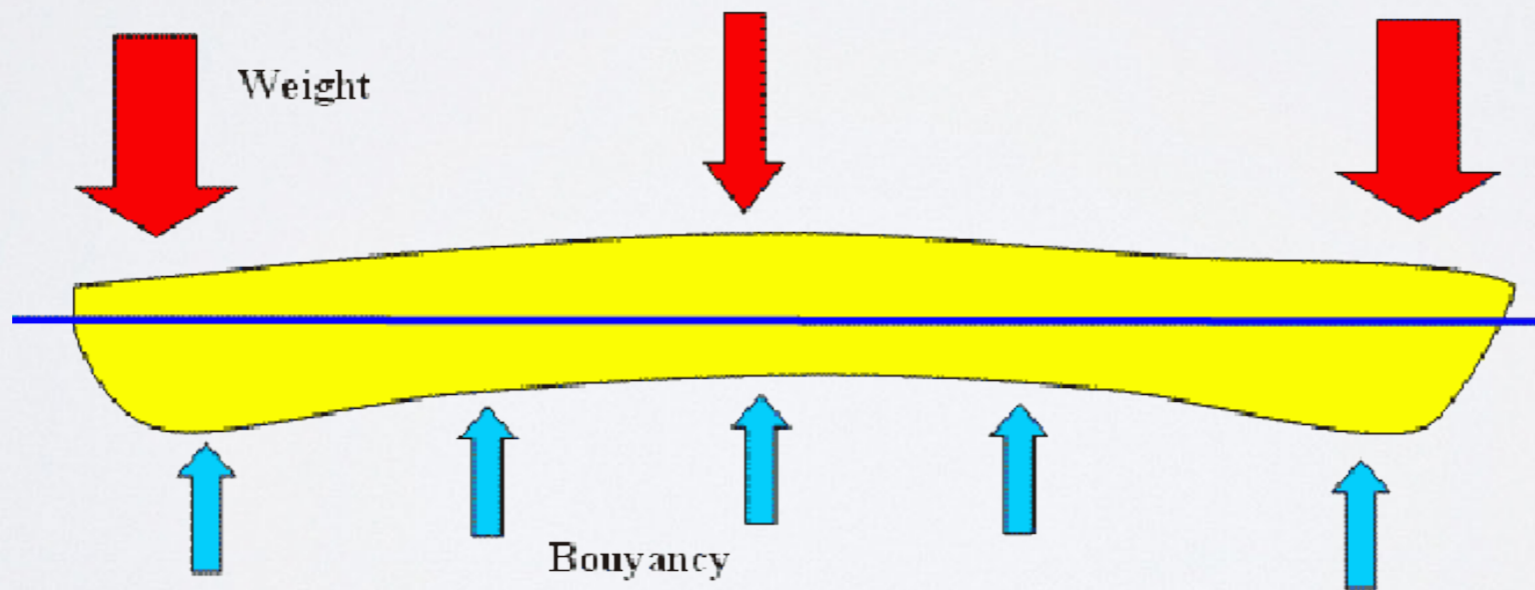


MANAGING THE TIDAL WINDOW

<u>Planned Draft 7.0m</u>	<u>Planned Draft 7.0m</u>	<u>Declared Draft (On Boarding) 7.6m</u>
Channel & Basin Planned Dredged Depth 6.0m	Channel & Basin Actual Dredged Depth 5.0m	Channel & Basin Actual Dredged Depth 5.0m
Minimum Planned UKC 0.9m	Minimum Planned UKC 0.9m	Minimum Planned UKC 0.9m
HOT Req'd for Seaton Channel Transit 1.9m	HOT Req'd for Seaton Channel Transit 2.9m	HOT Req'd for Seaton Channel Transit 3.5m
Seaton Channel Earliest Entry 1700	Seaton Channel Earliest Entry 1830	Seaton Channel Earliest Entry 1900
HOT <0.93m to ground Iron Lady	HOT <0.93m to ground Iron Lady	HOT <1.53m to ground Iron Lady
Estimated Time to Completion 5.5hours	Estimated Time to Completion 5.5hours	Estimated Time to Completion 5.5hours
Predicted Time of Unintentional Grounding - N/A	Predicted Time of Unintentional Grounding - N/A	Predicted Time of Unintentional Grounding -N/A
Predicted Time of Grounding - N/A	Predicted Time of Grounding - N/A	Predicted Time of Grounding - N/A
Unintentional Grounding Risk - Zero	Unintentional Grounding Risk - Zero	Unintentional Grounding Risk - ZERO

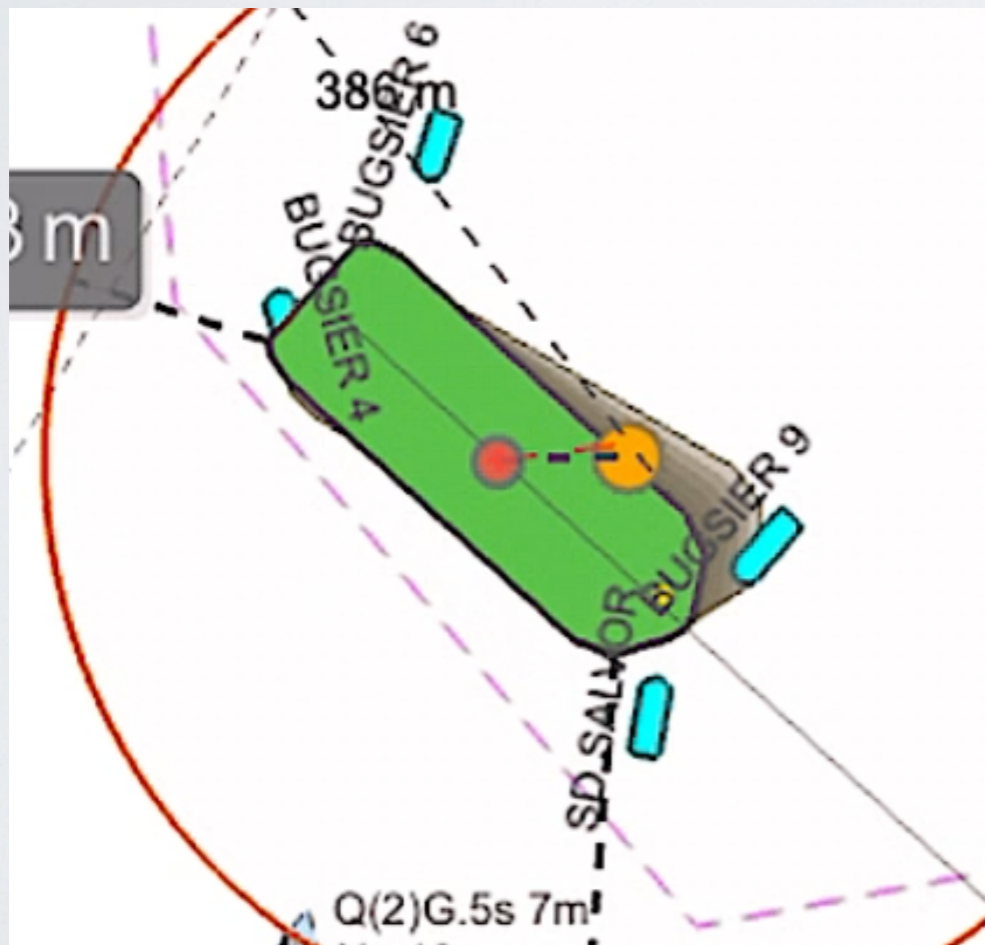
DYNAMIC DECISIONS

- Changes to Ballast Condition
 - Hogged



NAVIGATING IRON LADY

- BACKWARDS OR FORWARDS



DYNAMIC DECISIONS

- Unforeseen Problem

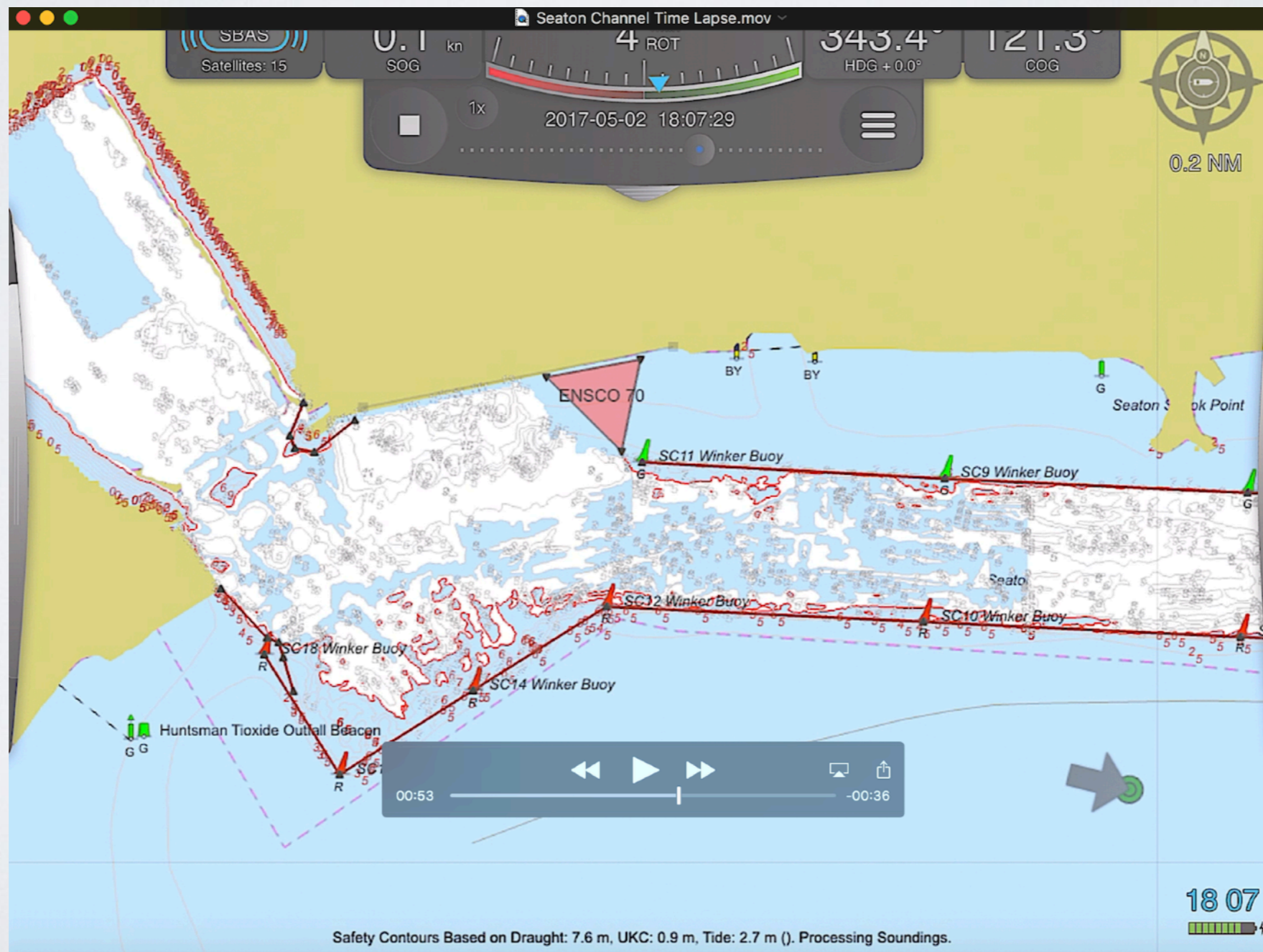


MANAGING THE TIDAL WINDOW

<u>Deepest Draft 8.2m</u>	<u>Final Draft 7.9m</u>
Channel & Basin Actual Dredged Depth 5.0m	Channel & Basin Actual Dredged Depth 5.0m
Minimum Planned UKC 0.9m	Minimum Planned UKC 0.9m
HOT Req'd for Seaton Channel Transit 4.1m	HOT Req'd for Seaton Channel Transit 3.8m
Seaton Channel Earliest Entry 1950	Seaton Channel Earliest Entry 1925
HOT <2.13m to ground Iron Lady	HOT <1.83m to ground Iron Lady
Estimated Time to Completion 5.5hours	Estimated Time to Completion 5.5hours
Predicted Time of Unintentional Grounding -03 May 0130	Predicted Time of Unintentional Grounding 03 May 0055
Predicted Time of Grounding 03 May 0120	Predicted Time of Grounding May 0100
Unintentional Grounding Risk - V High	Unintentional Grounding Risk - V High

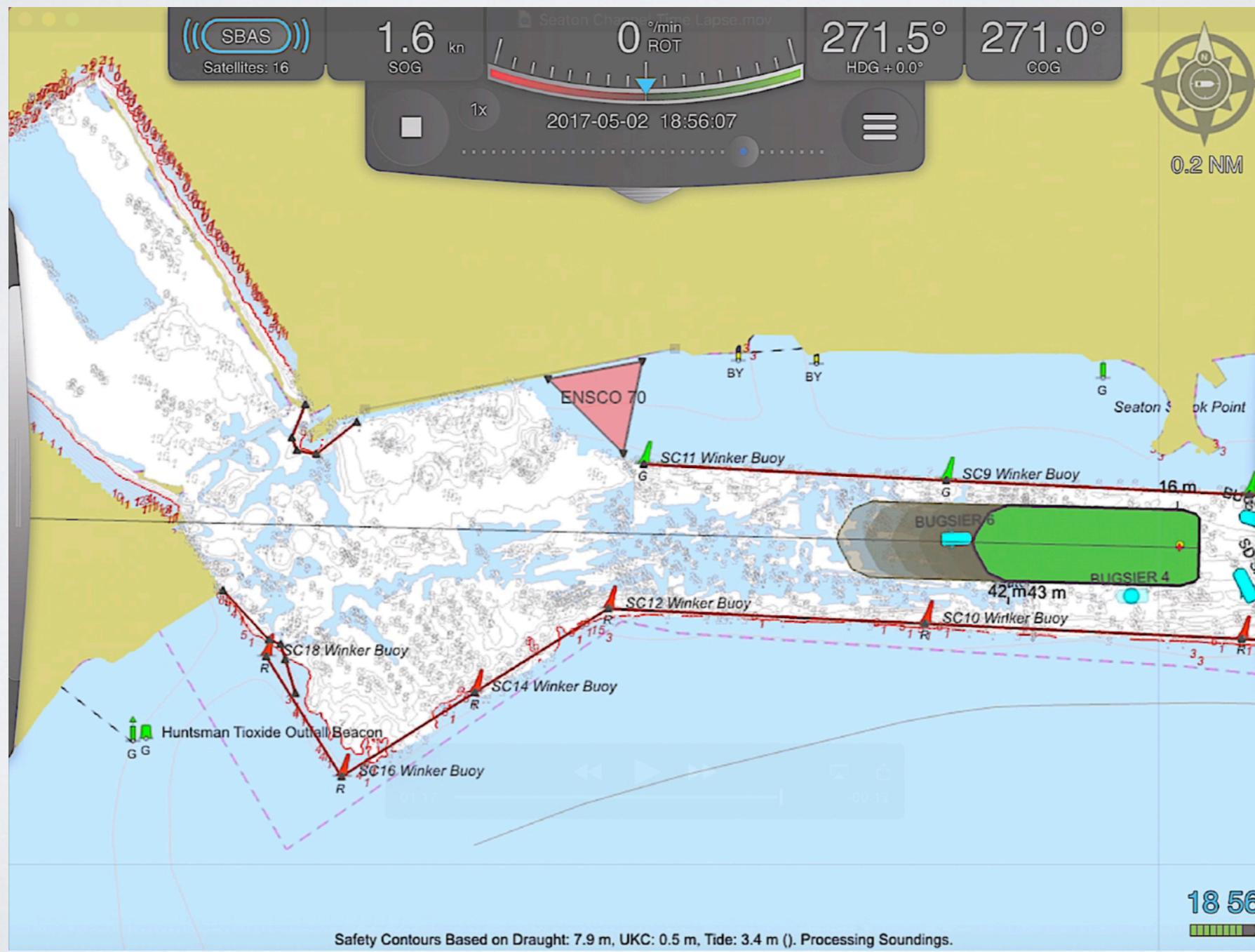
DYNAMIC DECISIONS

- Available Water on Entering Seaton Channel with 0.9m UKC



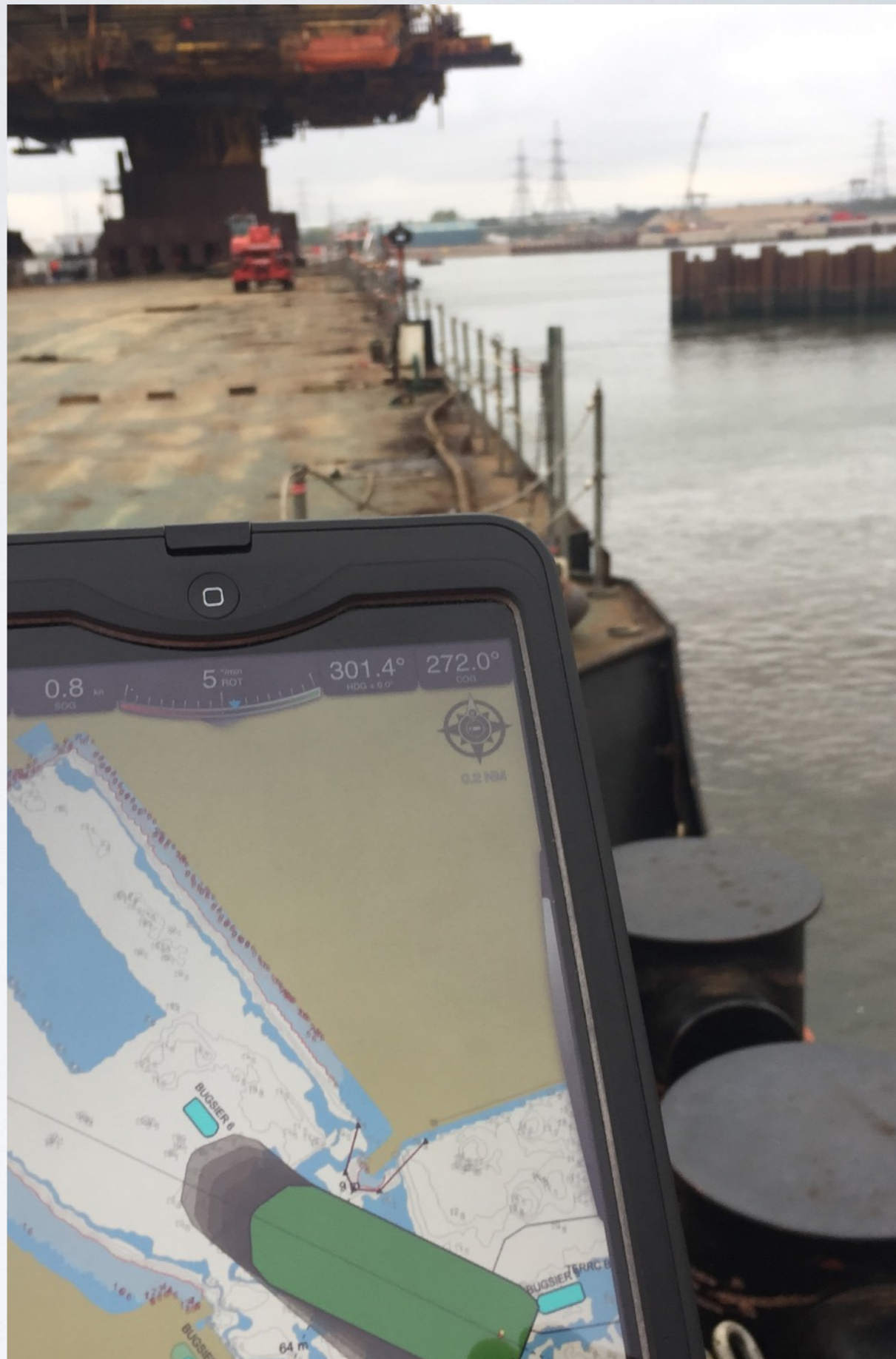
DYNAMIC DECISIONS

- Available Water At TERRRC Basin 0.5m UKC



MANAGING THE TIDAL WINDOW

<u>Final Draft 7.9m</u>
Channel & Basin Actual Dredged Depth 5.0m
<u>Minimum Planned UKC 0.5m</u>
HOT Req'd for Seaton Channel Transit 3.3m
<u>Seaton Channel Earliest Entry 1805</u>
HOT <1.83m to ground Iron Lady
Estimated Time to Completion 5.5hours
<u>Predicted Time of Unintentional Grounding 03 May 0055</u>
<u>Predicted Time of Grounding 02 May 2335</u>
Unintentional Grounding Risk - Mod/Low







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ANY QUESTIONS?