

MDT Tory Channel S-100 Testbed

Tory Channel S-100 Products TestBed

Situational Awareness Evaluation

The Challenge

The IHO has developed the S-100 Universal Data Model as the next generation for electronic products. This represents a fundamental shift from the current products and services.

Why Tory Channel?

Located in New Zealand's Marlborough Sounds, Tory Channel has strong currents exceeding 3 knots and challenging seafloor conditions. It's part of the critical Interislander ferry route between Wellington and Picton.

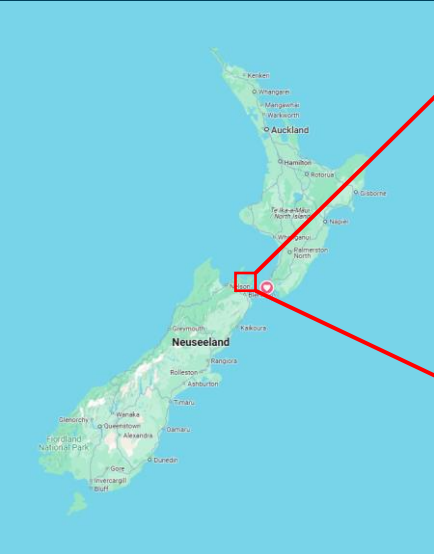
The Team

Experienced navigators from Kiwirail who regularly operate through Tory Channel.

The Goal

Evaluate the effectiveness of **S-102, S-104, and S-111** compared to traditional S-57 ENC's in enhancing navigational decision-making and situational awareness.

Tory Channel



What is Situational Awareness?

Situational awareness in maritime navigation contains and understanding of the vessels position, movement, and relationship to the surrounding environment.



Perception

Perception of elements in the environment

"What is happening right now?"



Comprehension

Comprehension of their meaning and significance

"What does it mean?"



Projection

Projection of their future status

"What could happen next?"

Methodology

🎯 Objectives

- Do S-100 products help better understand what's on the chart?
- What measurable improvements in situational awareness can be attributed to the new products?
- Do benefits show up more in normal sailing or emergency scenarios?

👥 Setup

- Bridge team: Lead navigator, co-navigator, helmsman, facilitator
- Route: 10.4 nautical miles with specific stop points
- Software: SEAiq
- Conditions: Spring tidal (2.3 hours before high water)

🧭 Test Scenarios

Business-as-Usual (BAU)

everyday operations with normal plan and no surprises

Emergency Scenarios

Included unexpected engine failure

✅ Assessment Methods

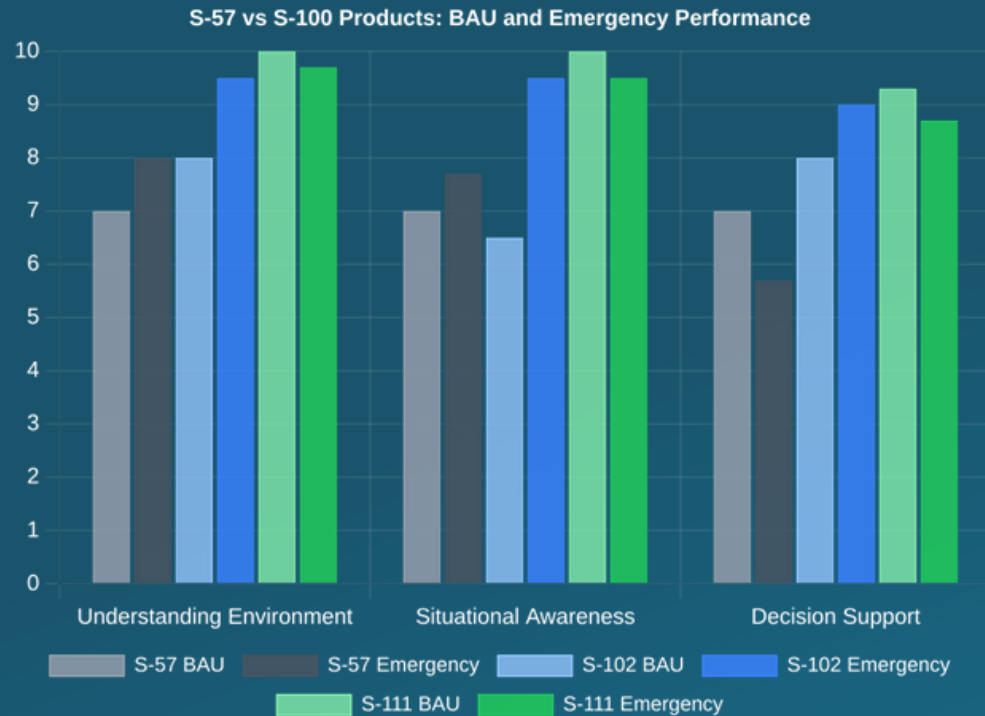
10-point scale questionnaires

- Capturing confidence level and situational awareness
- Situational awareness assessments at pause points
- Detailed debriefing discussions after each run



Key Findings Overview

Comparison (10-point scale)



★ Key Improvements

- 📈 **19% improvement** in understanding charted environment during emergency scenarios with S-102
- ⚠️ **27% improvement** in emergency scenario with S-102
- 🌊 S-111 Surface Currents achieved **perfect 10.0 scores**
- 💡 **58% improvement** in decision-making support during emergency with S-102
- 📄 Challenges
 - information overload and
 - display clutter

S-102 Bathymetric Surface

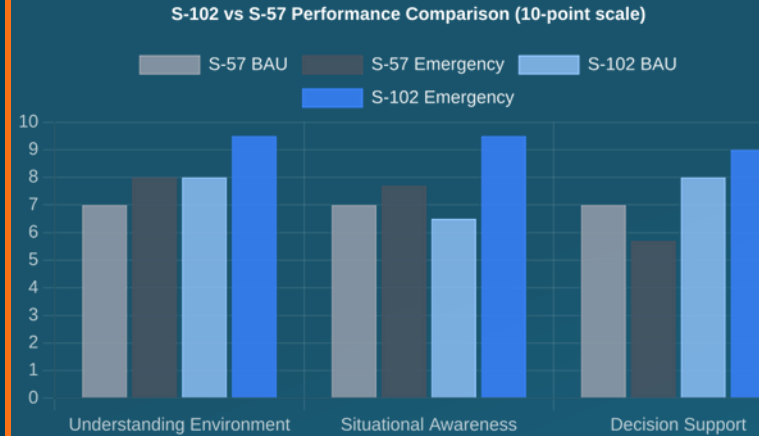
Key Benefits

- Enhanced seabed visualization
- Improved anchoring decisions
- Better current understanding
- 19% confidence improvement

Team Feedback

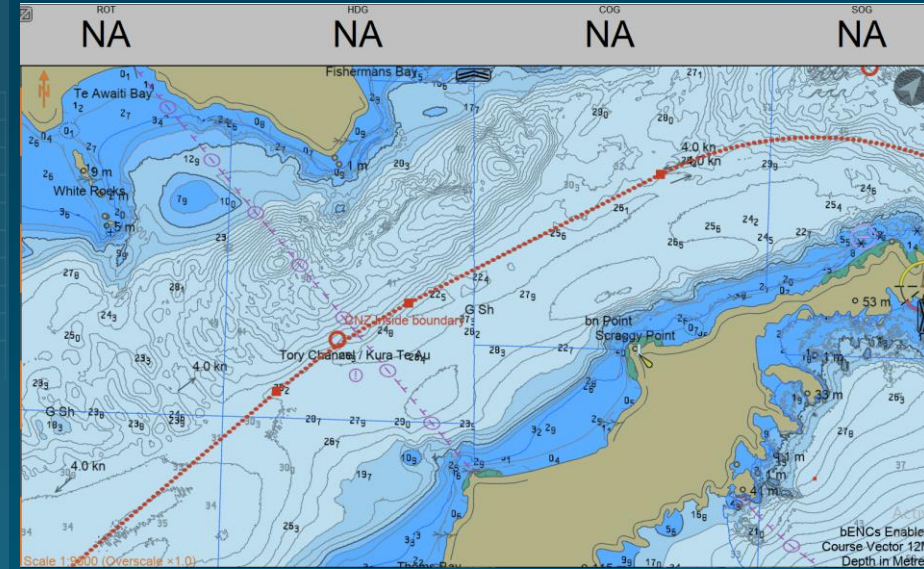
"The detailed bathymetric information allowed us to see where the slope is and aim for the anchor at the other side."

Performance Data



Challenges

- display clutter
- overwhelmed users
- learning curve observed during BAU operations
- requires careful interface design to prevent information overload



S-111 Surface Currents

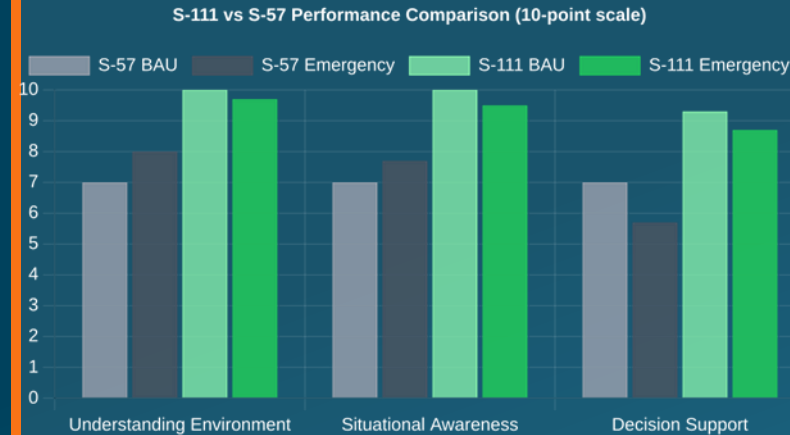
Key Benefits

- Understanding of why vessels behave differently in various parts of the channel
- Improved assessment of anchor holding and vessel swing patterns
- From experience-based to understanding-based

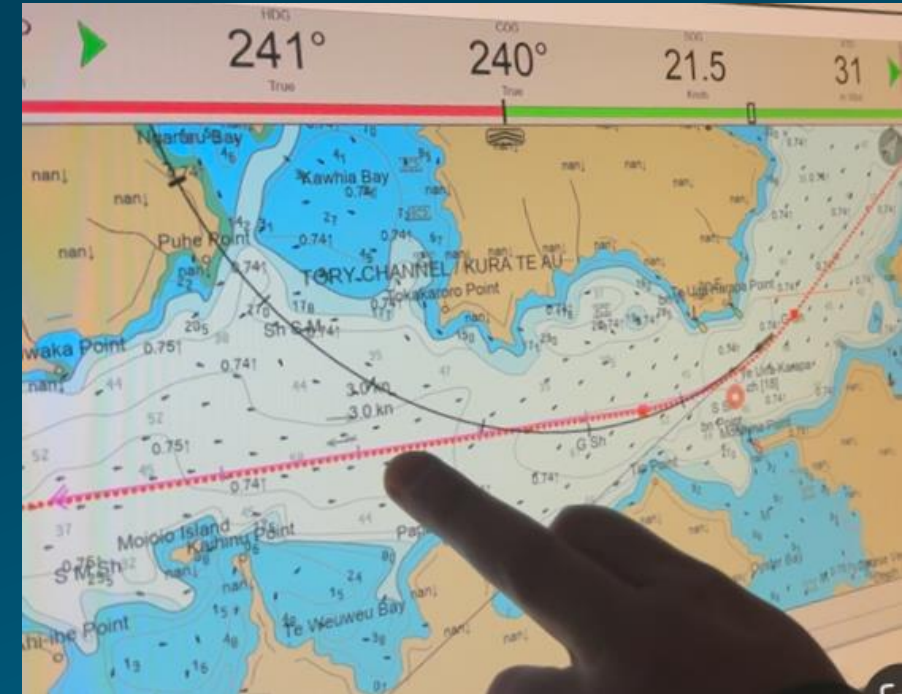
Team Feedback

"Current information revealed why they get pushed sideways sometimes and helped explain course corrections that were previously based on experience rather than understanding."

Performance Data



- generated the most consistent positive feedback
- perfect 10.0 score during BAU operations
- 9.7 confidence during emergency scenarios
- highest situational awareness ratings across all scenarios



Emergency Scenario Performance

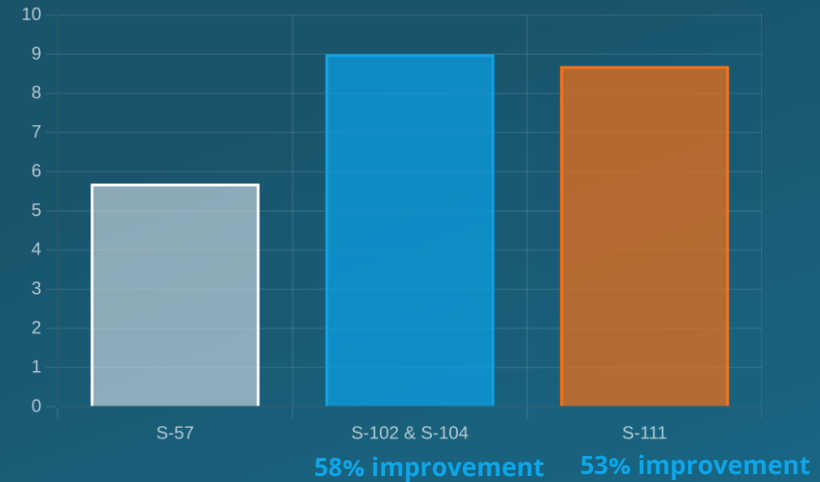
⚠ Emergency Response Confidence

↑ With S-102 the scoring jumped from 6.7 to 8.5

↑ With S-111 the scoring also jumped to 8.5

27% Improvement

🧠 Decision-Making Support



⚓ Anchoring Decisions S-102

The team could quickly identify suitable anchoring areas by seeing seabed slopes, shapes, and depth variations.

🌊 Current Prediction S-111

Helped the team to predict how the ship would behave during an emergency and how it would affect anchor holding.

Conclusions & Success Factors

Key Findings Summary

19% to 100%

Improvement range across different indicators

58 %

Decision-making support improvement in emergencies

27 %

Emergency response confidence improvement

Key Insights

- maximum value during emergency scenarios
- enhanced understanding translates directly into more confident and informed decision-making
- information overload is a real challenge
- S-100 products enhance rather than replace existing processes

Success Factors

- Training
- User interface designs
- Phased implementation approaches

Thank you! Questions?