

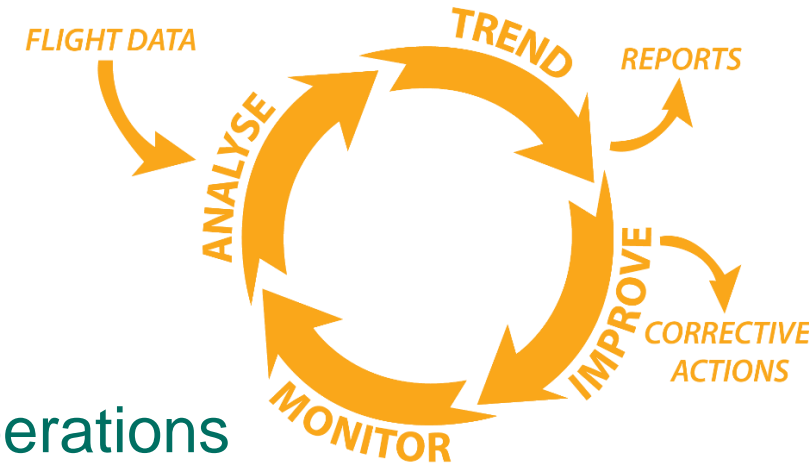


**Are Ports and Pilots ready for POQA?**

**Port/Pilot Operations Quality Assurance**

## Where it all began - FOQA – An aviation overview

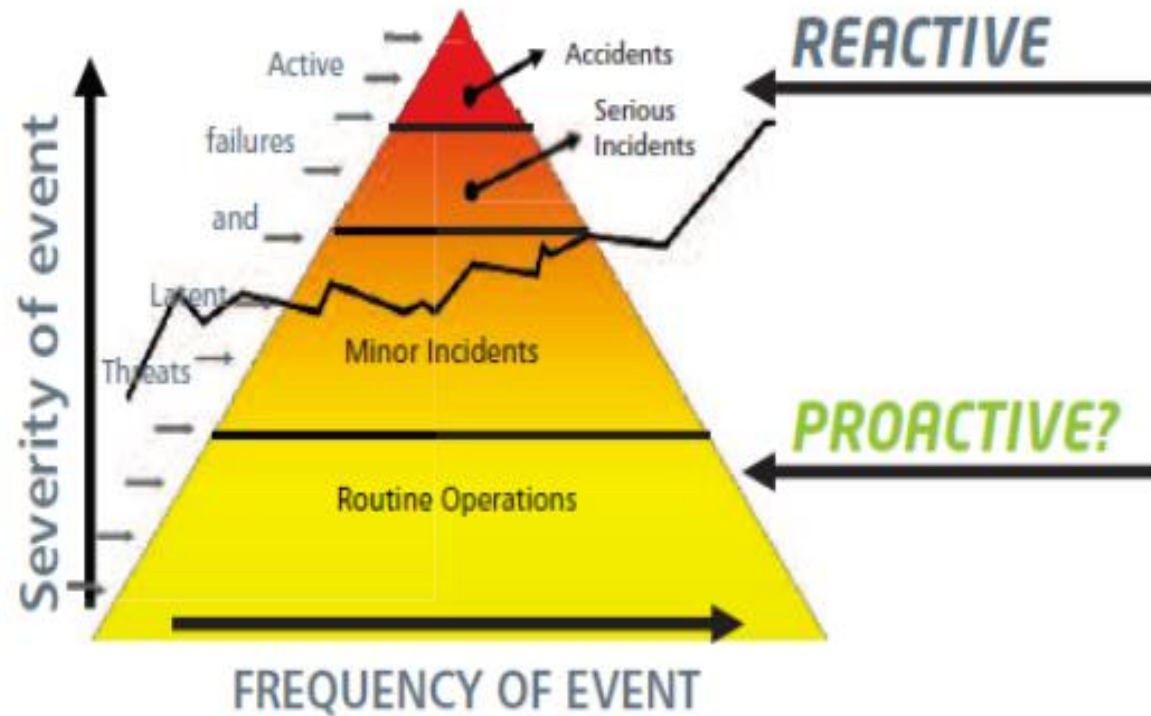
- Flight Operational Quality Assurance (FOQA) began 60 years ago by British Airways in 1962
- Whilst voluntary; today all pilots take for granted that operations are being recorded and analysed, It provides more information about, and greater insight into, the total flight operations environment.
- Accident causes are more predictable due to detailed knowledge
- It combines data and operational experience to develop objective information to enhance safety, training effectiveness, operational procedures



***FOQA is probably the most important safety tool available to aviation***



## Event Pyramid

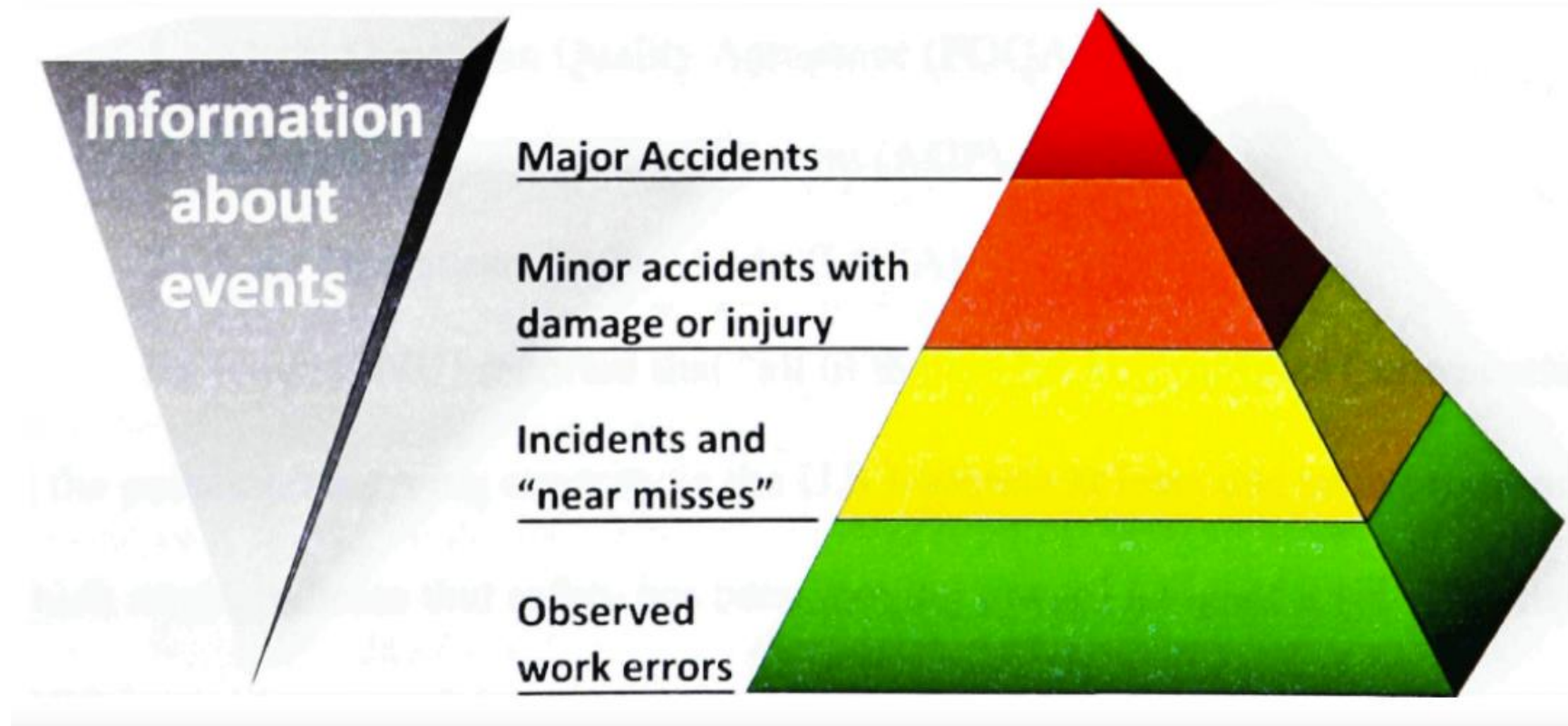


- The event severity / frequency triangle: the more serious the event, the less frequently it happens
- In normal or routine daily operations there are probably thousands of minor events which will quite often go unnoticed.

## Question

- Does “No paperwork” mean a safe operation?

## Information Pyramid



Available Information versus Events (Adapted from McVenes & Chidester, 2005).

## Is there a problem?

- There is a mistaken belief that not knowing about problems means they do not exist.
- There is a cultural issue : that of hubris, overconfidence and belief in one's own ability
- That pilots do not readily acknowledge their ability
- That incidents happen to others
- That pilot organisations are not and rarely subjected to third party scrutiny
- Summary : A industry with a belief there is no problem



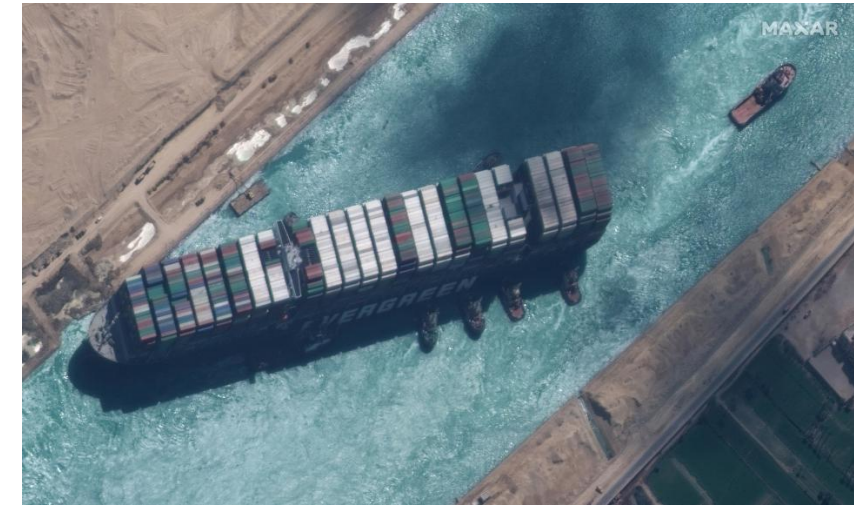
## Recent Incidents



***CMA CGM Vasco de Gama  
Thorn Channel, Southampton  
22 August 2016***



***CSCL Jupiter  
River Scheldt, Antwerp  
14 August 2017***



***Ever Given  
Suez Canal  
23 March 2021***



***Mumbai Maersk  
Weser Outer approaches  
2 February 2022***



***Ever Forward  
Chesapeake Bay  
13 March 2022***

## Common denominator?

- Speed ?
- Navigation (Position) ?
- Experience ?
- Environmental Conditions ?
- Underkeel Clearance Management ?
- Fatigue ?
- Communications/Language ?
- Bridge Resource Management failure ?
- External influences (other vessels) ?

## Unknown without investigation

- There is one common denominator : They all had a pilot on board

## Incident Investigation

Primarily uses VDR Data  
Comprehensive data but

- Difficult to obtain
- Costly to process
- Multiple formats
- Still requires additional information
- Extensive training required

Not viable for operational analysis or third-party audits

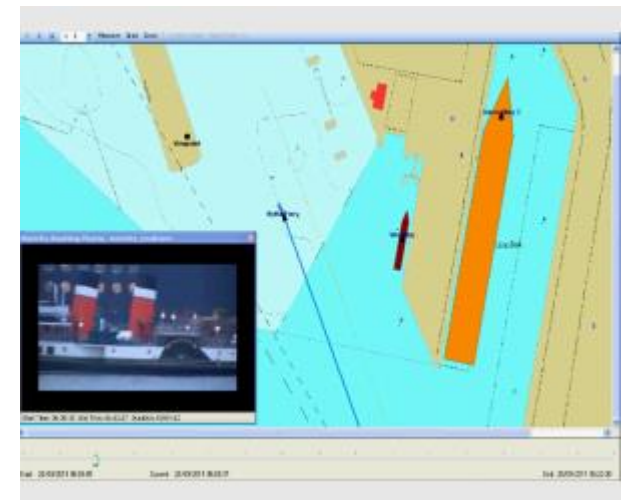
Can incur GDPR problems

In truth :

**This is not a situation any pilot wants to be at!**



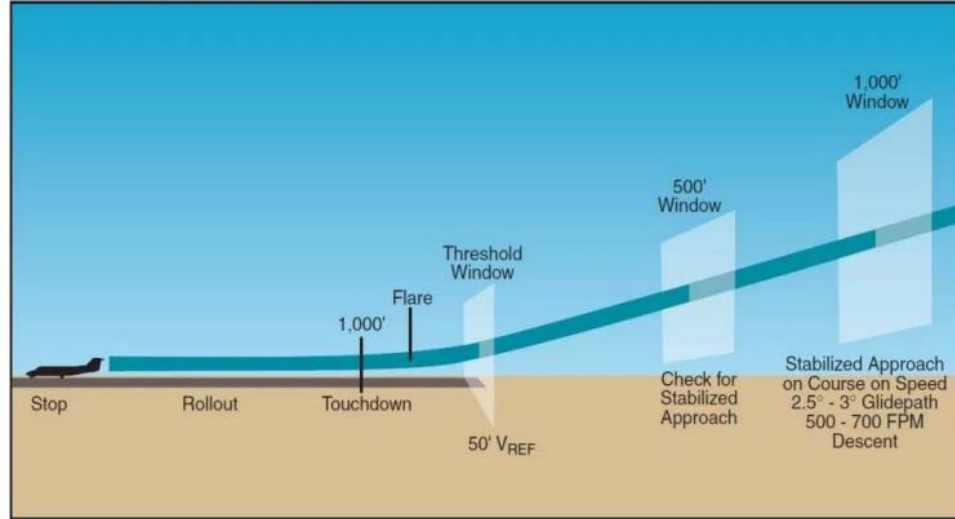
**MADAS enables investigators to fuse digital data from all the available sources to get the complete and accurate picture of what actually happened**





# Introducing POQA

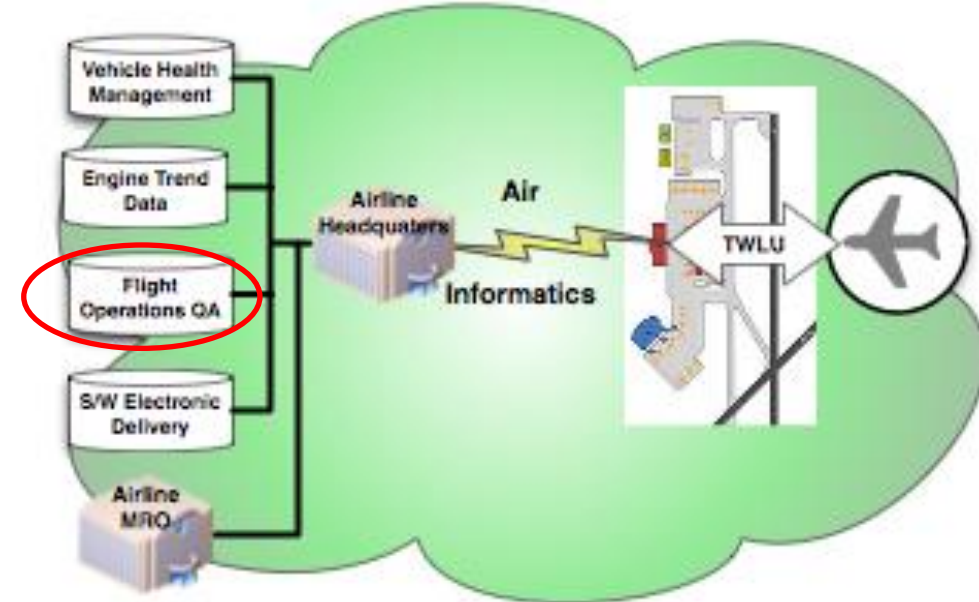
## Stabilised Approach Criteria



*"All flights must be stabilized by 1000 feet above airport elevation in Instrument Meteorological Conditions (IMC) and 500 feet above airport elevation in Visual Meteorological Conditions (VMC).*

“Flight Operations QA”  
 Air NZ presentation  
 NZMPA conference 2018

POQA – first steps



“Leading indicators” (Ravi Nijjer)

# It's possible due to Big Data



AIS

PPU recordings

Weather conditions

Ship Motion surveys

Pilot experience

Simulator runs

SOPs

VTS

# The Difficulties for POQA Implementation

In this highly technical age it is curious why POQA is not implemented:

## a) Motivation



## b) Cost



# The Difficulties for POQA Implementation

## c) Technical Difficulties and Standards



## d) Accessibility and Potential for Misuse



# Big Brother?



The data is readily available

Publicly and commercially

Any significant incident is likely to be in public domain before it is even investigated

<https://www.marinetraffic.com> :  
**MarineTraffic: Global Ship Tracking Intelligence | AIS Marine ...**  
 MarineTraffic Live Ships Map. Discover information and vessel positions for vessels around the world. Search the MarineTraffic ships database of more than ...  
 AIS Marine Traffic · Vessels Database · Online Services · Ports Database

<https://www.vesselfinder.com> :  
**Free AIS Ship Tracker - VesselFinder**  
 VesselFinder is a FREE AIS vessel tracking web site. VesselFinder displays real time ship positions and marine traffic detected by global AIS network.  
 Become AIS Partner · RealTime AIS Data · Historical AIS Data · Vessels Database

<https://www.myshiptracking.com> :  
**My Ship Tracking Free Realtime AIS Vessel Tracking Vessels ...**  
 My Ship Tracking is a FREE REALTIME AIS vessel finder tracking service. With this vessel tracker you can monitor ship positions, vessel tracking, ...

<https://ihsmarket.com> · products · ais-live-ship-tracker :  
**AIS Tracking, Ship Tracker for Maritime Traffic : AISLive - IHS ...**  
 The industry's first online software for tracking real-time marine traffic, AISLive delivers updated movements for 130,000+ ships and vessels every 60 seconds, ...

<https://www.fleetmon.com> :  
**Live AIS Vessel Tracker with Ship and Port Database**  
 The open database for ships and ports world-wide. Have access to real-time AIS position data, technical information and photos from more than 500000 vessels.

<https://comarsystems.com> · ais-action :  
**Live AIS data of the Isle of Wight, Solent & English Channel**  
 View live AIS data of ships and boats across the Isle of Wight, Solent and English channel. Will show competitors of the Round the Island Race & Cowes week.

<https://maritime.ihs.com> :  
**Index - Home**  
 AIS Antenna Network Partnerships. As part of IHS Markit's continuing AIS network expansion we are looking to work with reliable partners in coastal ...

<https://www.shiplocation.com> :  
**Ship Tracking of AIS Marine Traffic**  
 Ships' Location Live Map. Find out information and vessel positions for vessels around the globe. Search ships in our database of more than 80000 active and ...

<https://www.aishub.net> :  
**Free AIS vessel tracking | AIS data exchange | JSON/XML ship ...**  
 AISHub is a FREE AIS data sharing service which provides access to real time ship ... After our system receives your live AIS data stream, we will create a ...

<https://www.vesseltracker.com> :  
**Terrestrial & Satellite AIS Tracking Service in Realtime ...**  
 Comprehensive satellite detected AIS data completes the picture by providing vessel movements and destination and ETA changes at sea. SHIP DATABASE – ShipDB.

# And its already being analysed

Question : If regulators will analyse the data, shouldn't you?

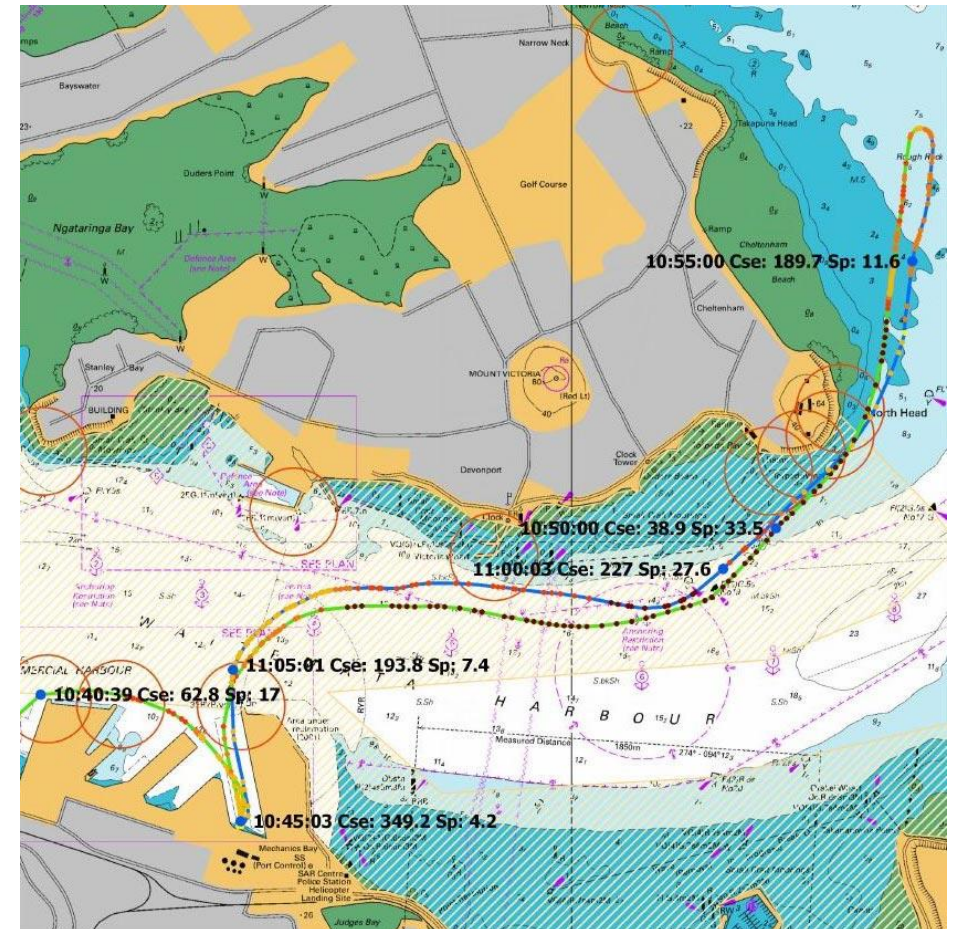
*“Maritime NZ’s investigation identified the pattern of excessive speed over many months and thousands of journeys.”*

Maritime NZ, July 2020

In short:

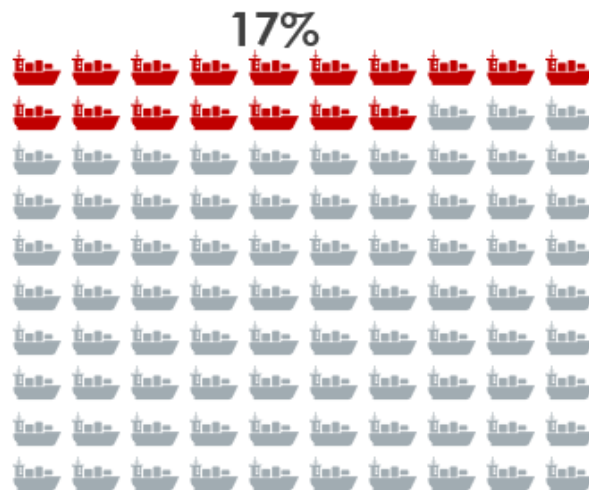
There are significant benefits which can be achieved through proactive marine safety management.

Very beneficial to identify potential problems before the next incident can take place...



Simple Truth – When transits are monitored safety improves - (Torres Strait)

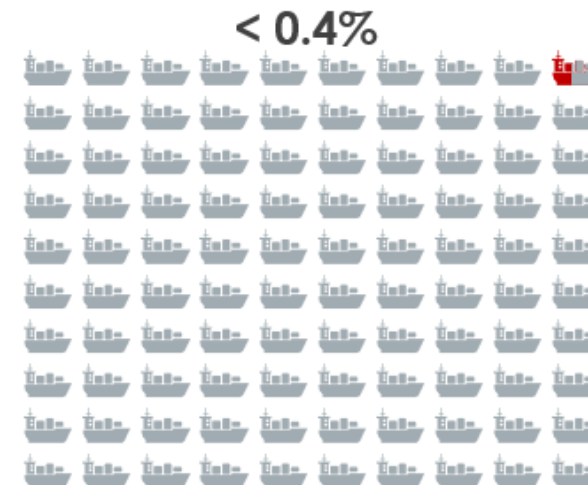
Vessel breaches of regulated UKC limits



Pre UKCMS

Pre UKCMS (2011) :

Maximum draft : 12.2m



Post UKCMS

Post UKCMS (2011) :

Maximum draft : 12.5m

(1 November 2021)

- IMO promulgated as a “Particularly Sensitive Sea Area”
- Jointly managed by AMSA, MSQ and GBRMPA

## Benefits Can be Grouped into Four Areas:

### **a) Alignment of Standard Operating Procedures (SOPs) and behaviour**

This is probably the most critical and useful part of POQA and is a continuous audit of performance.

SOP compliance is strongly encouraged by the mere existence of POQA. POQA analysis and feedback enhance that compliance.

### **b) Inadequate SOPs and Inadequate Published Procedures**

But if SOP compliance is not consistent, it is perhaps sensible to consider first that the SOPs could be improved

### **c) Ineffective Training and MPex delivery**

It is relatively straight forward to use POQA to assess effectiveness of training and compliance

Poor decision-making should diminish and may result in better Mpex delivery.

Consistency of delivery of service should improve

Unsafe practices should diminish

POQA also identifies pilots who need help in re-learning handling skills.

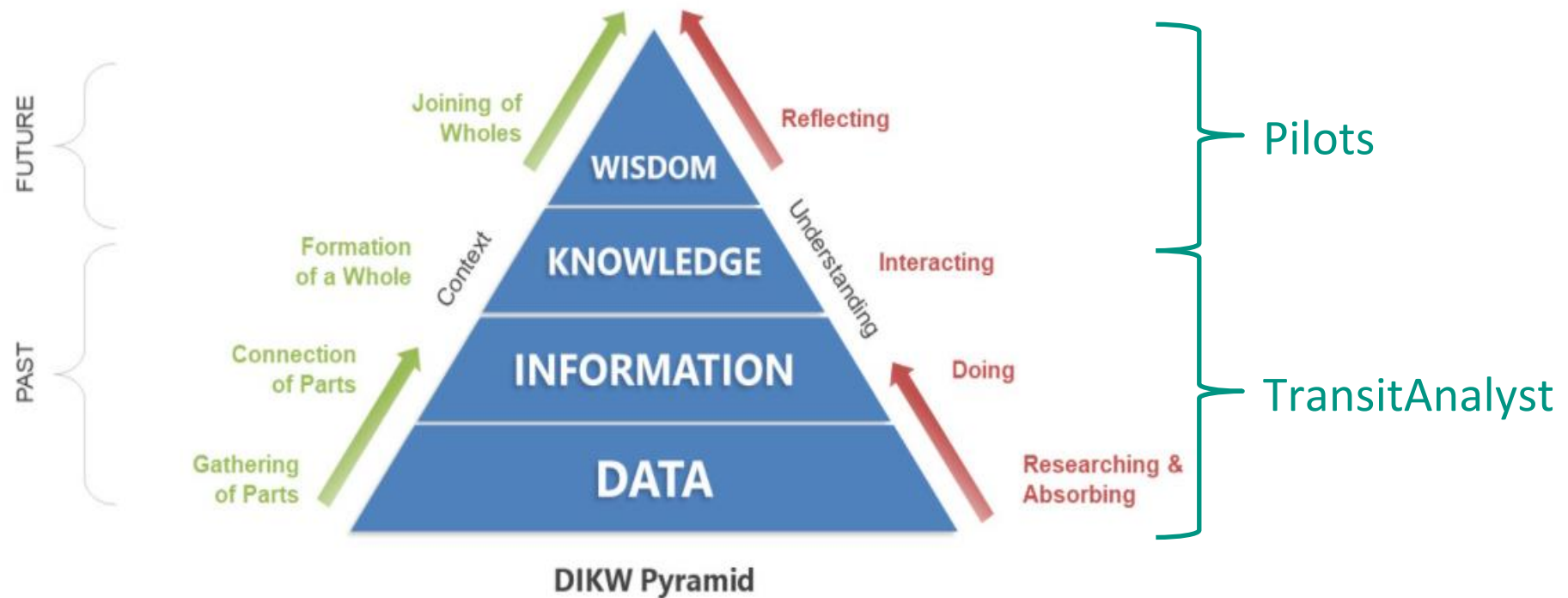
### **d) Channel and Safety Corridor Assessment**

Statistical analysis of route assists in refining transit planning.



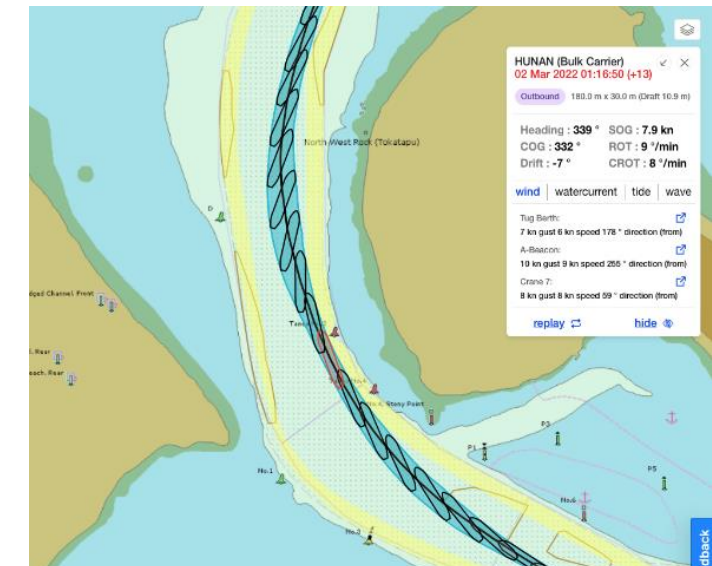
POQA raison d'être

The search for wisdom *will* lead to safer piloting



# POQA Use Cases

- Fact-based decision making on pilotage issues
- Determination of safety and reserve corridors
- Development of pilotage operating procedures
- Pilot training, self-assessment and check pilotage
- Monitoring compliance with pilotage procedures
- Planning and preparation for upcoming pilotages
- Operational risk assessments (“go”-“no go”)
- Preliminary (within team) incident analysis
- Channel design, dredging optimisation
- Marine structure monitoring



## Differentiators to other commercial products

- Focuses on port scale not voyage scale
- Working with the port/pilot to target analysis of their issues
- Proactive (not reactive) monitoring
- Pilot comments and notes attached
- Pilot-led self investigation (zero threshold for use)
- Localised inputs, charts and thresholds
- Augmented by local weather observations
- "Calibration" and improvement of ais data
- Dedicated search and filtering, with deidentification if required
- Services enhanced/implemented through pilot feedback
- Experienced marine pilot overview and assistance

# Introducing : TransitAnalyst

## TransitAnalyst

Analyse AIS and PPU data along with environmental observations, vessel characteristics and pilot comments to identify pilotage risks and improve operations.

Improving the **safety & efficiency**  
of pilotage operations



Search



Filter



Visualise



Analyse

# Transit Analyst : Pilotage Operations Quality Assurance

POQA combines pilotage big data with simple analytics to rapidly improve operational safety and efficiency and create the pilotage organisations of the future.

A proactive approach to safety management. Capturing and acting upon events, trends, incidents, and outliers in a timely fashion.

TransitAnalyst stores and facilitates reporting against many parameters i.e:

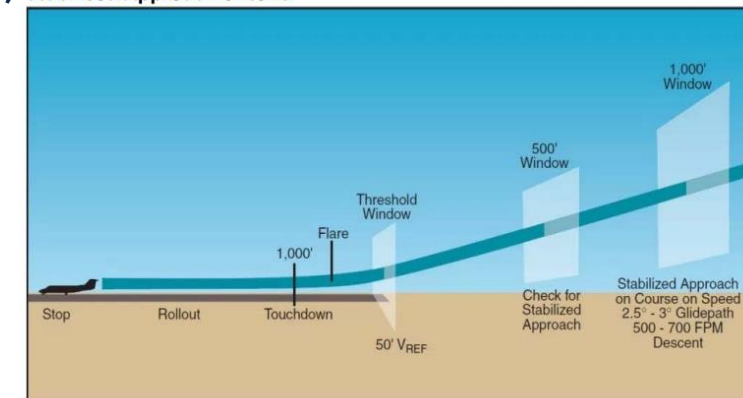
- Use of plan corridors,
- **Reserve** and no-go areas,
- **Speed** zones,
- **Rate of turn** limits,
- **Impact of environmental conditions on pilotage operations,**
- Use of tug **and** pilot boats.

Facilitates:

- Improved consistency and delivery of pilotage services,
- Evidence-based operational planning,
- **Targeted** training and retention of retired pilot **experience,**
- CPD (impartial peer review),
- Investigation of non-reportable incidents and near misses.



Stabilised Approach Criteria



"All flights must be stabilized by 1000 feet above airport elevation in Instrument Meteorological Conditions (IMC) and 500 feet above airport elevation in Visual Meteorological Conditions (VMC).

# Sophisticated filters and tags

**Chart**  
search and playback

**Grid**  
tabular transit data

Giles Lesser  
System administrator - Tauranga

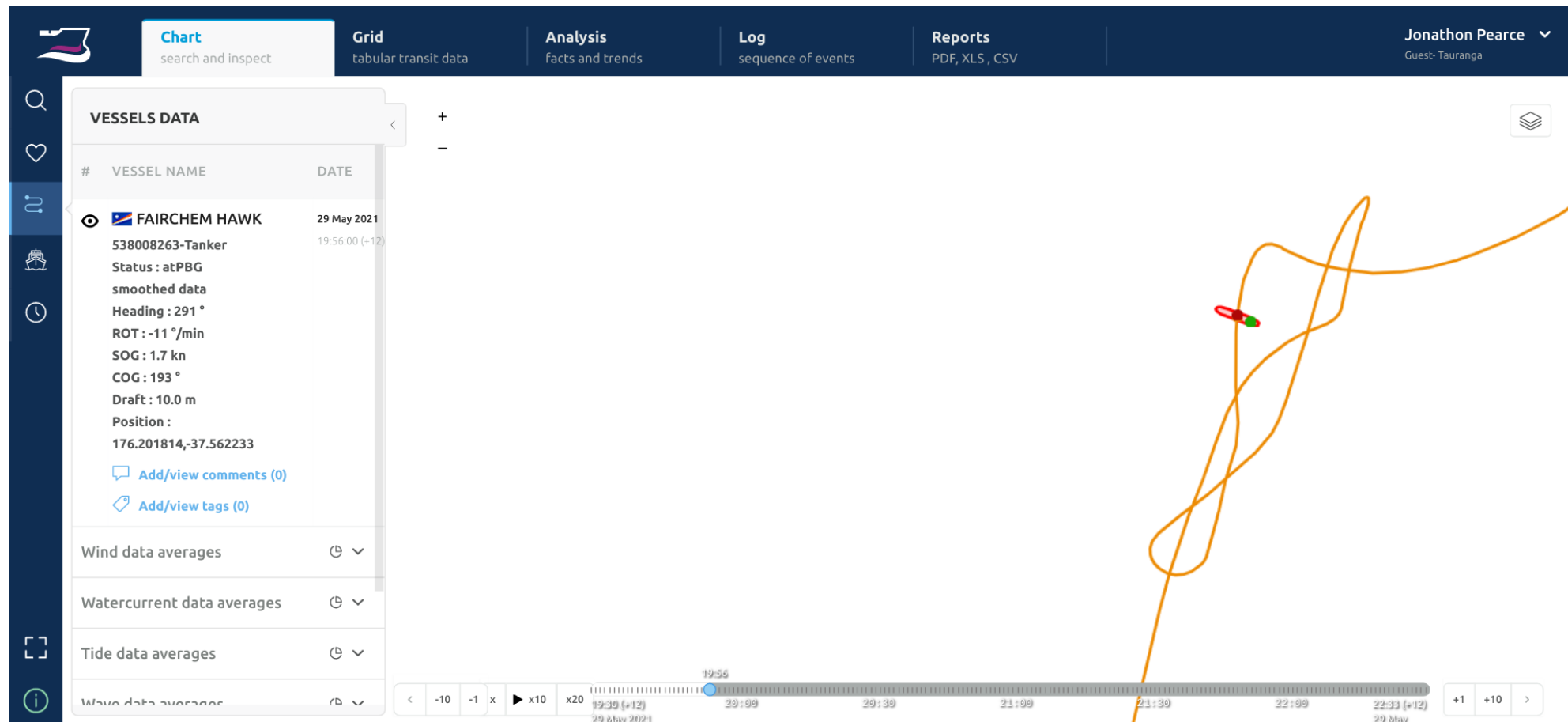
	VESSEL NAME	DATE	TRANSIT TYPE	ROUTE TAGS	SYSTEM TAGS	USER TAGS	OPTIONS
<div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 10px;"> <p><b>Search</b>   Inspect</p> <p>Displaying 7 transits between 05 Mar 2022 and 20 Mar 2022</p> <p>Favourite searches</p> <p>Vessel name</p> <p>Date range</p> <p>Vessel particulars</p> <p>MetOcean conditions</p> <p><b>Wind</b></p> <p>Tug Berth</p> <p>OR - A-Beacon</p> <p>OR - Crane 7</p> <p><b>Watercurrent</b></p> <p>Tanea Buoy</p> <p>speed (kn)- from 2.0 : to 3.5</p> <p>Direction - from 135 : to 360</p> <p>OR - Tanea Buoy Prediction</p> <p><b>Tide</b></p> <p>A-Beacon</p> <p>OR - Tug Berth</p> <p>Search Clear Save as</p> </div>	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 5px;"> <input checked="" type="checkbox"/> </div> <div> <p><b>TIANJIN BRIDGE</b> <span style="color: blue; font-weight: bold;">Inspect</span></p> <p><small>538005938-Container</small></p> <p><small>Draft : 11.0 m</small></p> </div> </div>	<p>20 Mar 2022</p> <p><small>14:56:37 (+13)</small></p>	Inbound	<span style="background-color: #e0f0ff; padding: 2px;">Pilot Boarding Ground</span> <span style="background-color: #e0f0ff; padding: 2px;">Main Channel</span> <span style="background-color: #e0f0ff; padding: 2px;">Berth 24</span>	<span style="background-color: #ffe0e0; padding: 2px;">Good Lateral</span> <span style="background-color: #ffe0e0; padding: 2px;">OK Heading</span>		<span style="font-size: 1.2em;">⋮</span> <span style="font-size: 1.2em;">🔗</span>
	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 5px;"> <input checked="" type="checkbox"/> </div> <div> <p><b>RIO NEGRO</b> <span style="color: blue; font-weight: bold;">Inspect</span></p> <p><small>583052300-Container</small></p> <p><small>Draft : 10.4 m</small></p> </div> </div>	<p>20 Mar 2022</p> <p><small>02:07:49 (+13)</small></p>	Inbound	<span style="background-color: #e0f0ff; padding: 2px;">Pilot Boarding Ground</span> <span style="background-color: #e0f0ff; padding: 2px;">Main Channel</span> <span style="background-color: #e0f0ff; padding: 2px;">Berth 24</span>	<span style="background-color: #ffe0e0; padding: 2px;">OK Lateral</span> <span style="background-color: #ffe0e0; padding: 2px;">Good Heading</span> <span style="background-color: #ffe0e0; padding: 2px;">Good Lateral</span>		<span style="font-size: 1.2em;">⋮</span> <span style="font-size: 1.2em;">🔗</span>
	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 5px;"> <input checked="" type="checkbox"/> </div> <div> <p><b>SAFMARINE BAYETE</b> <span style="color: blue; font-weight: bold;">Inspect</span></p> <p><small>477211100-Container</small></p> <p><small>Draft : 10.5 m</small></p> </div> </div>	<p>19 Mar 2022</p> <p><small>13:19:59 (+13)</small></p>	Inbound	<span style="background-color: #e0f0ff; padding: 2px;">Pilot Boarding Ground</span> <span style="background-color: #e0f0ff; padding: 2px;">Main Channel</span> <span style="background-color: #e0f0ff; padding: 2px;">Berth 25</span>	<span style="background-color: #ffe0e0; padding: 2px;">OK Lateral</span> <span style="background-color: #ffe0e0; padding: 2px;">OK Heading</span>		<span style="font-size: 1.2em;">⋮</span> <span style="font-size: 1.2em;">🔗</span>
	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 5px;"> <input checked="" type="checkbox"/> </div> <div> <p><b>MOANA CHIEF</b> <span style="color: blue; font-weight: bold;">Inspect</span></p> <p><small>512143000-Container</small></p> <p><small>Draft : 0.9 m</small></p> </div> </div>	<p>17 Mar 2022</p> <p><small>03:15:38 (+13)</small></p>	Inbound	<span style="background-color: #e0f0ff; padding: 2px;">Pilot Boarding Ground</span> <span style="background-color: #e0f0ff; padding: 2px;">Main Channel</span> <span style="background-color: #e0f0ff; padding: 2px;">Berth 24</span>	<span style="background-color: #ffe0e0; padding: 2px;">For Review</span> <span style="background-color: #ffe0e0; padding: 2px;">Bad Offset</span> <span style="background-color: #ffe0e0; padding: 2px;">OK Heading</span>		<span style="font-size: 1.2em;">⋮</span> <span style="font-size: 1.2em;">🔗</span>
	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 5px;"> <input checked="" type="checkbox"/> </div> <div> <p><b>TS KAOHSIUNG</b> <span style="color: blue; font-weight: bold;">Inspect</span></p> <p><small>538007728-Container</small></p> <p><small>Draft : 8.4 m</small></p> </div> </div>	<p>16 Mar 2022</p> <p><small>15:13:23 (+13)</small></p>	Inbound	<span style="background-color: #e0f0ff; padding: 2px;">Pilot Boarding Ground</span> <span style="background-color: #e0f0ff; padding: 2px;">Main Channel</span> <span style="background-color: #e0f0ff; padding: 2px;">Berth 25</span>	<span style="background-color: #ffe0e0; padding: 2px;">Good Lateral</span> <span style="background-color: #ffe0e0; padding: 2px;">OK Heading</span>		<span style="font-size: 1.2em;">⋮</span> <span style="font-size: 1.2em;">🔗</span>
	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 5px;"> <input checked="" type="checkbox"/> </div> <div> <p><b>RIO DE LA PLATA</b> <span style="color: blue; font-weight: bold;">Inspect</span></p> <p><small>583052200-Container</small></p> <p><small>Draft : 10.2 m</small></p> </div> </div>	<p>06 Mar 2022</p> <p><small>10:03:03 (+13)</small></p>	Inbound	<span style="background-color: #e0f0ff; padding: 2px;">Pilot Boarding Ground</span> <span style="background-color: #e0f0ff; padding: 2px;">Main Channel</span> <span style="background-color: #e0f0ff; padding: 2px;">Berth 24</span>	<span style="background-color: #ffe0e0; padding: 2px;">Good Lateral</span> <span style="background-color: #ffe0e0; padding: 2px;">OK Lateral</span> <span style="background-color: #ffe0e0; padding: 2px;">Good Heading</span>		<span style="font-size: 1.2em;">⋮</span> <span style="font-size: 1.2em;">🔗</span>
	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 5px;"> <input checked="" type="checkbox"/> </div> <div> <p><b>MAERSK INVERNESS</b> <span style="color: blue; font-weight: bold;">Inspect</span></p> <p><small>566781000-Container</small></p> <p><small>Draft : 11.9 m</small></p> </div> </div>	<p>05 Mar 2022</p> <p><small>02:29:51 (+13)</small></p>	Inbound	<span style="background-color: #e0f0ff; padding: 2px;">Pilot Boarding Ground</span> <span style="background-color: #e0f0ff; padding: 2px;">Main Channel</span> <span style="background-color: #e0f0ff; padding: 2px;">Berth 24</span>	<span style="background-color: #ffe0e0; padding: 2px;">OK Lateral</span> <span style="background-color: #ffe0e0; padding: 2px;">Good Lateral</span> <span style="background-color: #ffe0e0; padding: 2px;">OK Heading</span>		<span style="font-size: 1.2em;">⋮</span> <span style="font-size: 1.2em;">🔗</span>

1

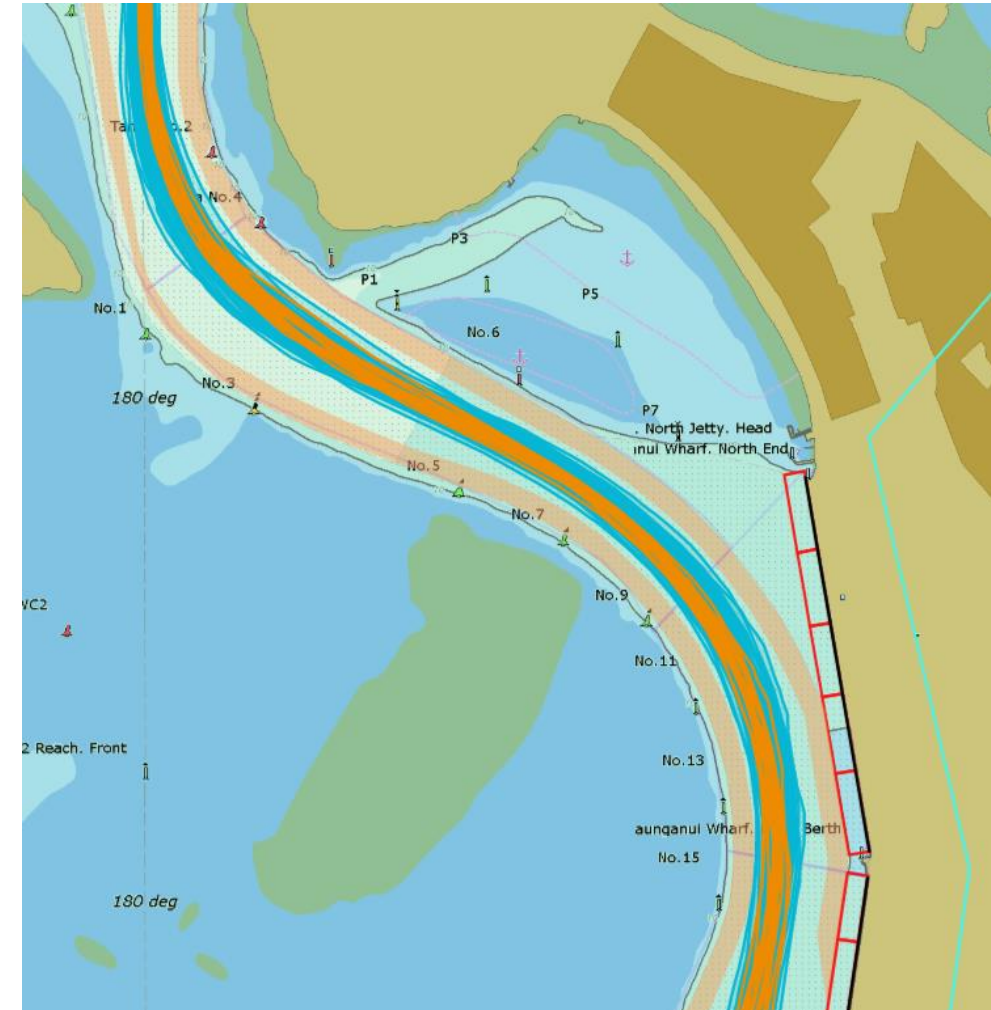
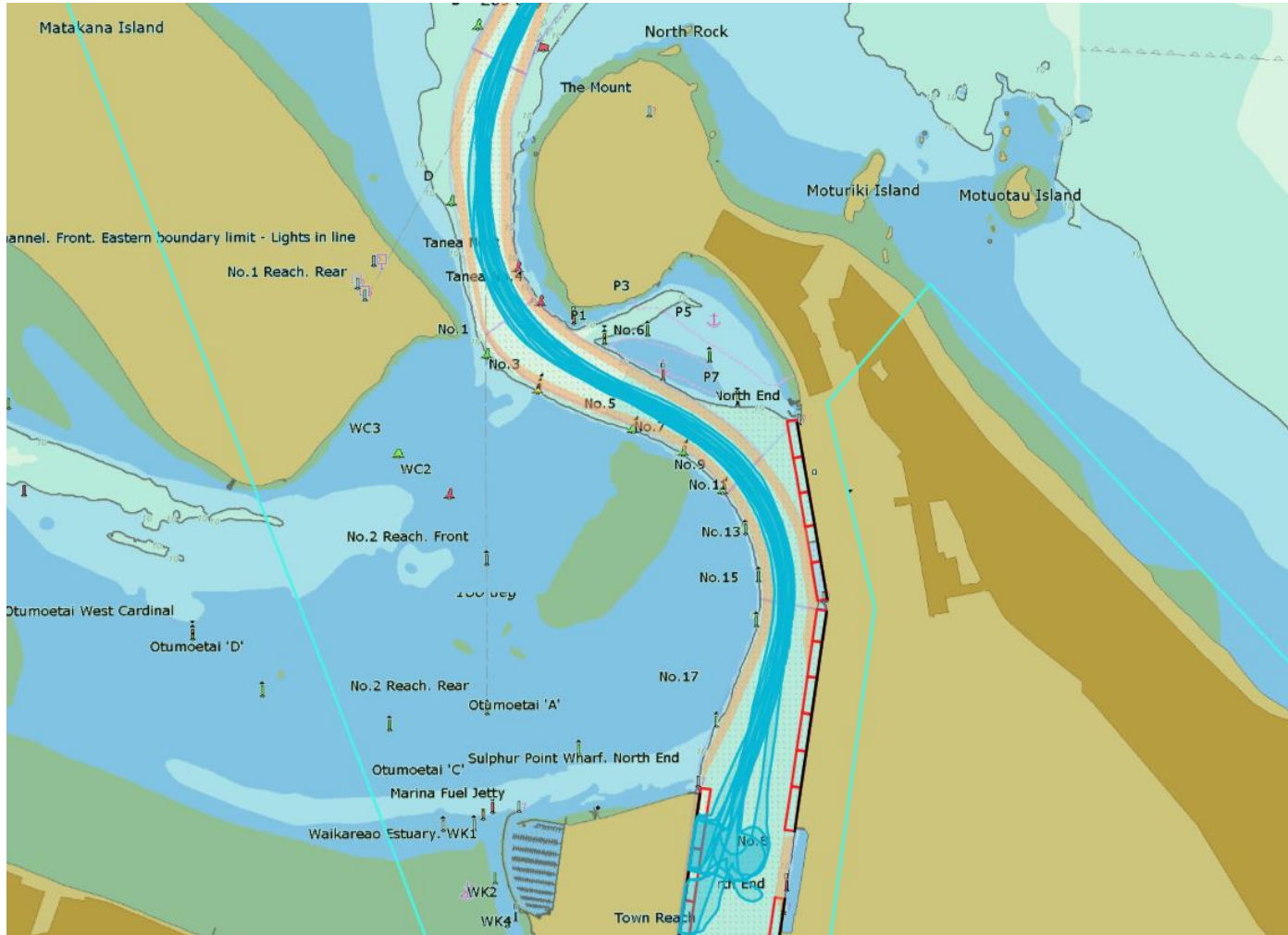
Showing 1 to 7 of 7 results

Feedback

# Peripatetic (+AIS) Smoothing for Accurate Turns and Swept Paths



# Channel and Safety Corridor Assessment





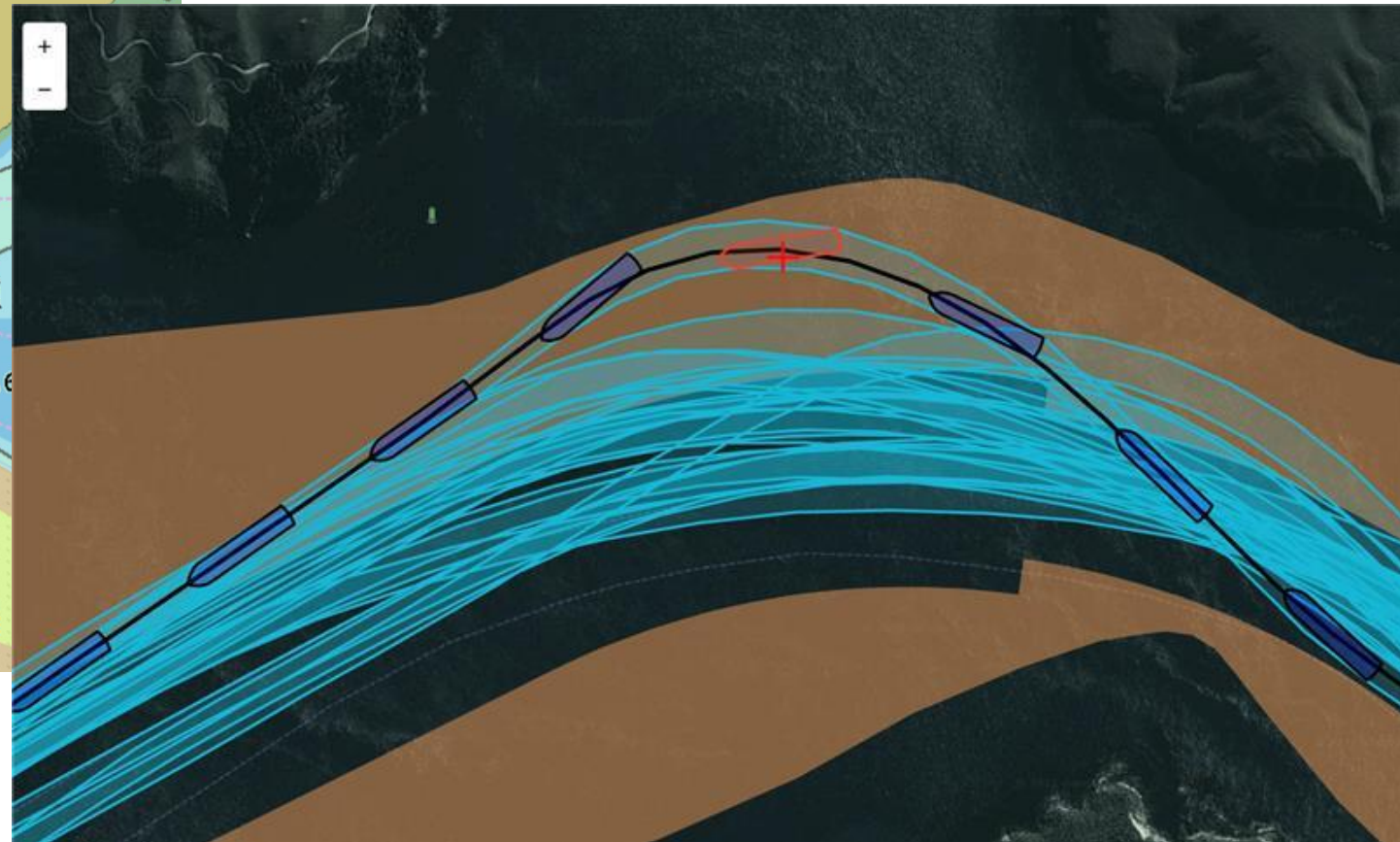
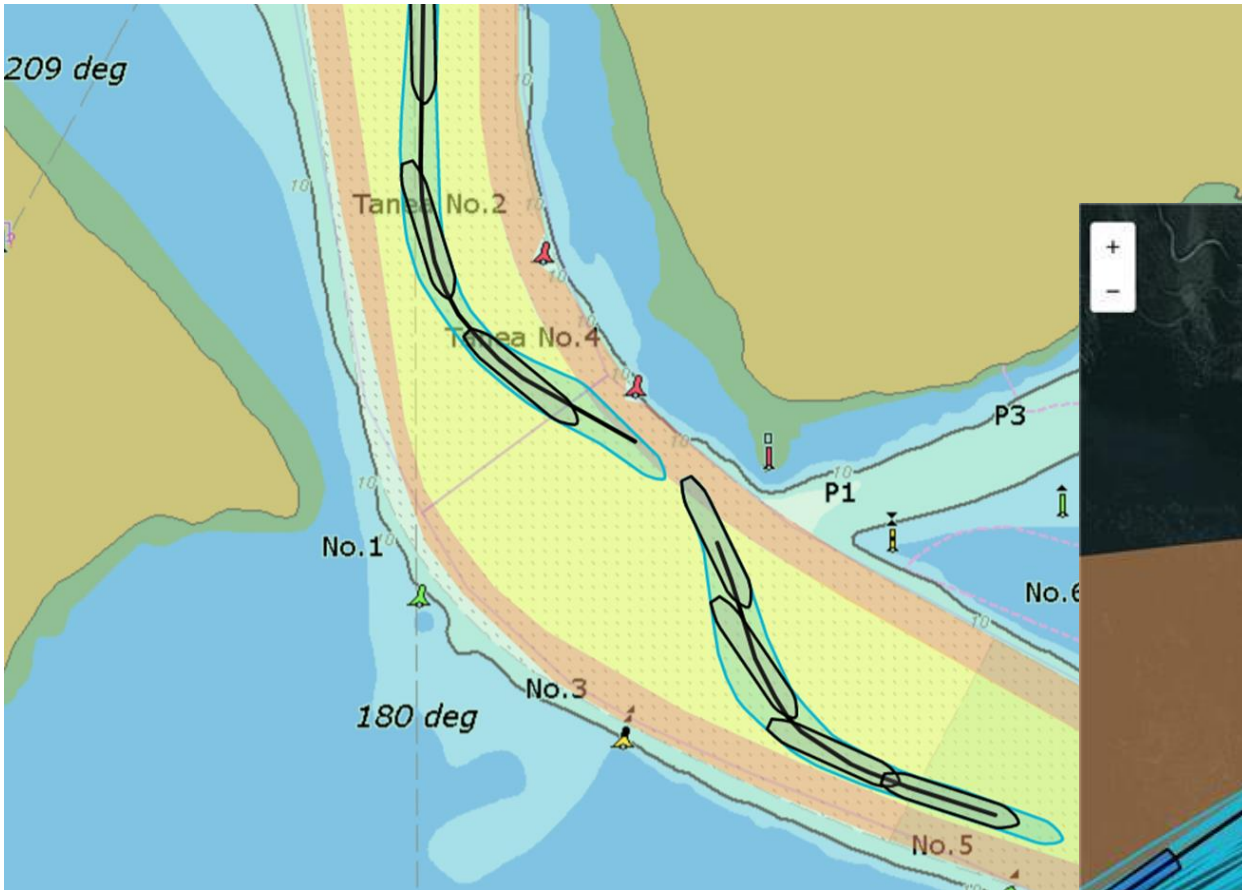
# Transit Inspection

The screenshot displays the OMC Transit Inspection interface. At the top, there are tabs for 'Chart' (search and playback) and 'Grid' (tabular transit data). The user is identified as 'Giles Lesser' (System administrator - Tauranga). The main map shows a harbor area with a vessel's path overlaid in blue and yellow. Key geographical features include 'The Mount', 'North West Rock (Tokatapu)', and 'Stony Point'. The vessel's path is marked with points No. 1 through No. 7. A detailed information panel for 'RIO NEGRO (Container)' is open, showing the following data:

- RIO NEGRO (Container)** (Inbound) - 20 Mar 2022 02:45:50 (+13)
- Inbound** 287.0 m x 40.0 m (Draft 10.4 m)
- Heading** : 150 ° **SOG** : 8.8 kn
- COG** : 165 ° **ROT** : N/A
- Drift** : 15 ° **CROT** : -24 °/min

Below this, there are tabs for 'wind', 'watercurrent', 'tide', and 'wave'. Further down, it shows 'Tanea Buoy' data: 1.6 kn speed 334 ° direction (to) and 'Tanea Buoy Prediction': 1.9 kn speed 21 ° direction (to). At the bottom of the panel are 'replay' and 'hide' buttons. On the left side, there is a search bar and an 'Inspect' button. Below that, a summary for 'RIO NEGRO (Container)' shows 'Pilot Boarding Ground at 02:07' and 'Berth 24 at 03:11'. There are sections for 'Tags and comments' (Comments 0), 'MetOcean data' (Wind, Watercurrent, Tide, Wave data averages), and 'Transit admin' (Data: Smoothed, AIS: Recieved, Lateral offsets: 0 (Good), MetOcean: Recieved, Heading offset: 0 (Good), Calculations: Done). It also shows 'Processed: 28 Mar 2022 00:37:38 (+13)' and a 'Transit: XLS data download' link. At the bottom left, there are 'replay transit' and 'hide transit' buttons. A 'Feedback' button is located at the bottom right of the map area.

# Incident Assessment



# Personalisation : Colour Coding and Alternative Maps (Google)

The screenshot displays a maritime data visualization interface. At the top, there are tabs for 'Chart' (search and playback) and 'Grid' (tabular transit data). The user is identified as 'Giles Lesser' (System administrator - Tauranga). The main map area shows a satellite view of a port with overlaid vessel tracks. The tracks are color-coded, with yellow and orange paths indicating vessel movements. A 'Chart Display' settings panel is open on the right, showing options for 'Basemap' (Google map, Google satellite, ENC, Markers), 'Analysis areas' (PBGs, Channels, Anchorages, Berths, Regions, Other), and 'Vessels' (Swept path, Vessel tracks, Vessel outline, Colour by type, Interval every 60 seconds). On the left, a search panel is visible, displaying 'Displaying 14 transits between 20 Mar 2022 and 21 Mar 2022' and various filter options like 'Date range', 'Vessel particulars', and 'System tags'. A 'Feedback' button is located in the bottom right corner.

## Potential uses

### Operational Planning

- Vessel Planning (Wx augmented)
- Risk Analysis Integration
- Historical decision inclusion
- Previous transit reports/notes

### Training

- Historical record of vessels (individual/ group)
- Experience of type/berth/conditions
- Training requirements / simulator planning
- Retired pilot legacy database (retention of experience)

And finally





**000 NEWS**