
HEFRING
MARINE
hefringmarine.com

HEFRING
MARINE

In Norse mythology, the sea giant Ægir and the sea goddess Rán had nine daughters, each representing a type of wave. Some daughters' names persist in modern Icelandic as wave terms.

One daughter embodied the 'rising wave,' representing the sea's dynamic power.

Her name was **HEFRING**.

# Main problems we set out to solve are crew safety and excessive fuel consumption and emissions

**96%** of boat accidents are due to human errors

**+300m** tons of fossil fuels annually in maritime

**US Coast Guard's top five reasons for boating accidents:**

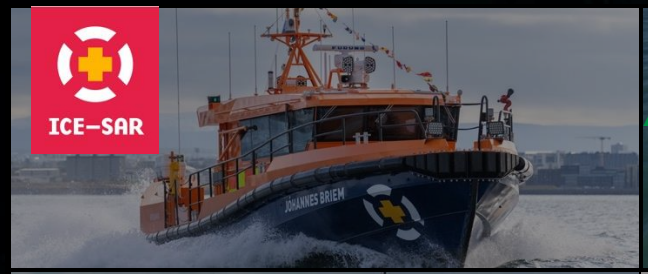
- operator inattention
- improper lookout
- operator inexperience
- excessive speed
- machinery failure

**Problems with net-zero emissions targets for commercial sector:**

- technology readiness
- suitability of solutions
- limited data & insights
- costly transition
- resistance to change

# Hefring Marine's AI-powered IMAS® solution gives you the tools to modernize your fleet


Patented internationally

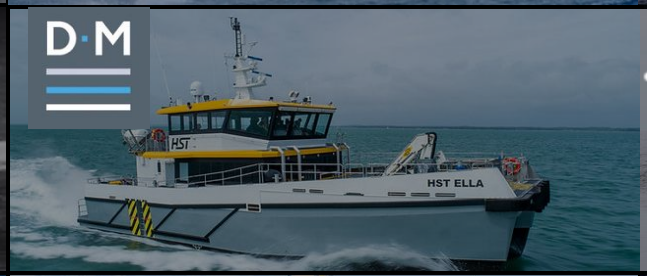

ICE-SAR


UNITED STATES NAVY


Loodswezen


VIKING
LIFE-SAVING EQUIPMENT


RS(+)
AMBULANSE
RS(+)


D·M
HST ELLA


PEIFA
PRINCE EDWARD ISLAND
FISHERMEN'S ASSOCIATION


PILOT


SVN


New Zealand
DEFENCE
FORCE


WIND
POWER
SERVICE


SAFEBOATS

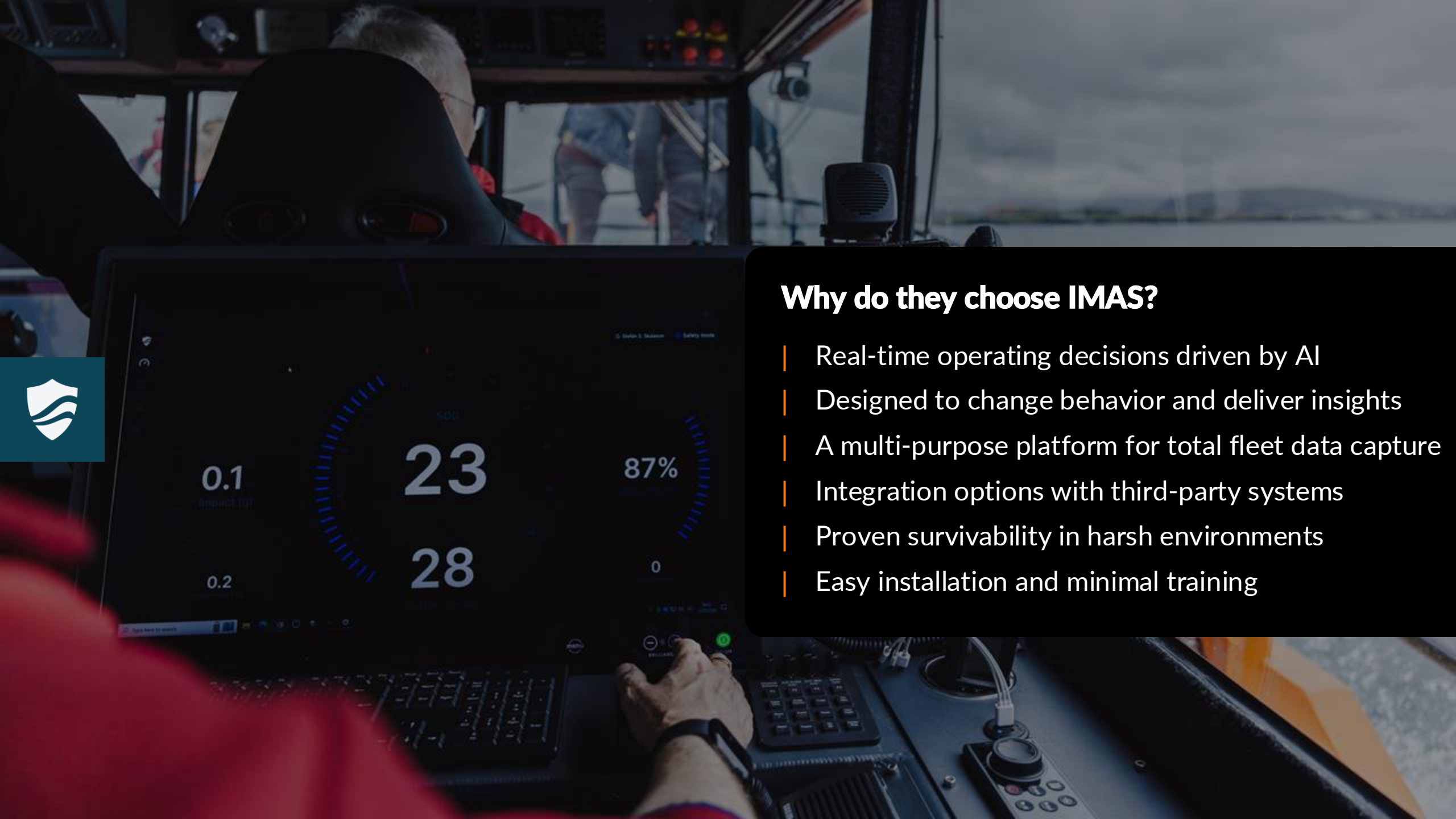

Lifeboats

**~40,000**
trips logged

**~450,000**
nautical miles sailed

**~2,000**
trips monthly

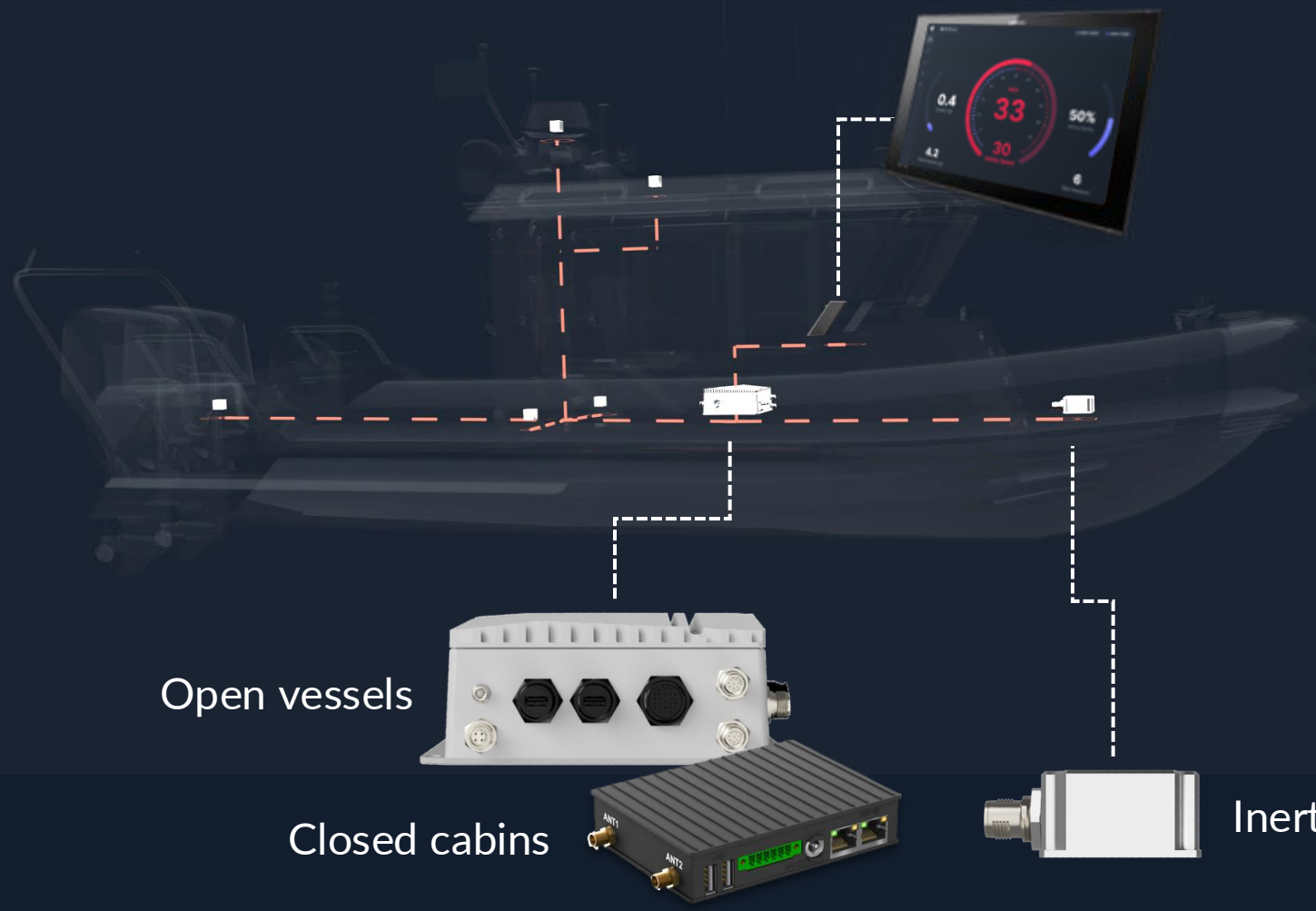
Rescue, defense, crew transfer, law enforcement fisheries, pilotage, diving.




## Why do they choose IMAS?

- Real-time operating decisions driven by AI
- Designed to change behavior and deliver insights
- A multi-purpose platform for total fleet data capture
- Integration options with third-party systems
- Proven survivability in harsh environments
- Easy installation and minimal training

# IMAS® Hardware is compact, robust, IP67 and military standard to survive the toughest marine environments




- Compact and simple to install
- Retrofit and new-build
- Available as MIL-STD-810G
- Available as IP67/69K
- NMEA2000 compatible

# Effects of IMAS® Helm SafetySpeed, verified over 330,000 nautical miles of collected data

| | |
|---|---|
| Operating at ±5% of SafetySpeed: | 87% lower impact exposure than when operating above safety speed |
| Effect on speed: | <1% reduction in average trip speed |

Þór

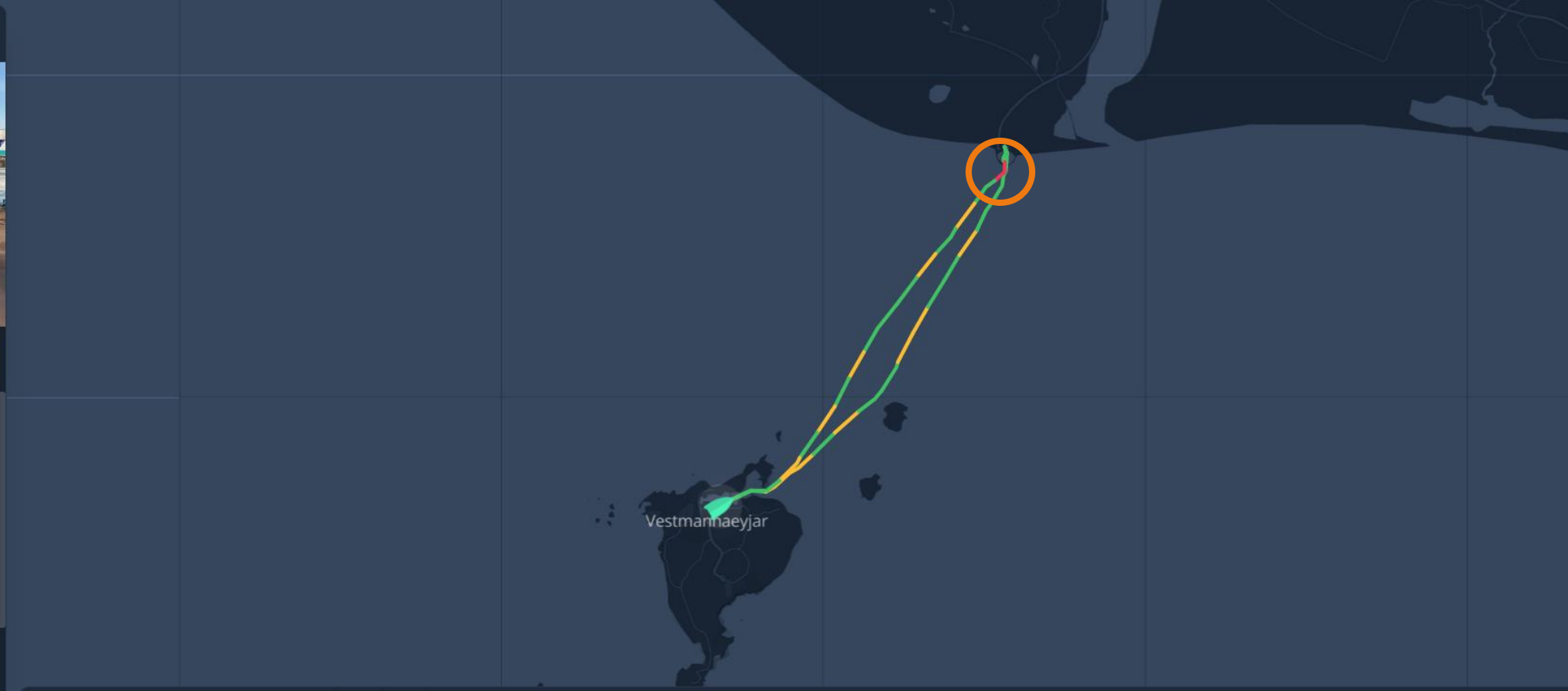
Vessel details | Trip details

**Trip information**

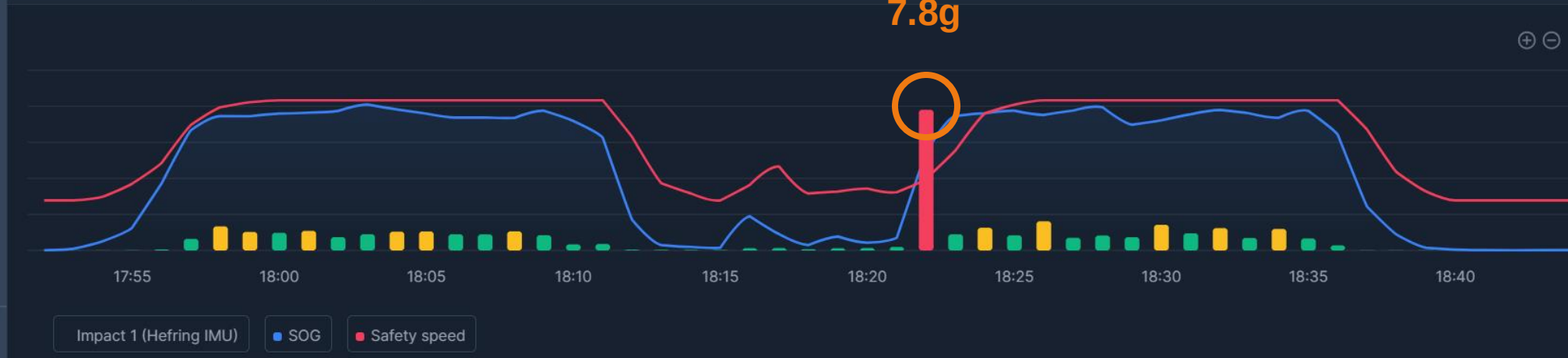
| | |
|---|---|
| START | 26/11/23 17:52 |
| END | 26/11/23 18:47 |
| DURATION | 0 hr 54 min |
| DISTANCE | 14.2 nmi |
| CAPTAIN | Halldór Ingi |

**Trip statistics**

| | |
|---|---|
| PEAK IMPACT | 7.8 g |
| RED IMPACTS | 2 |
| AVERAGE SOG | 16.3 kn |
| AVERAGE SAFETY SPEED | 22 kn |
| TRIP SCORE | 70 |




17:52 - 18:47 | Minutes



Þór

Vessel details | Trip details

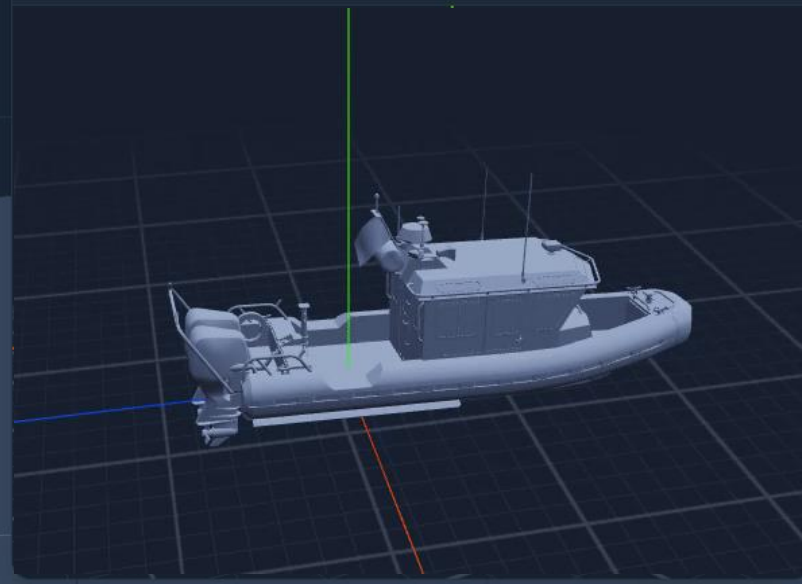
**Trip information**

| | |
|---|---|
| START | 26/11/23 17:52 |
| END | 26/11/23 18:47 |
| DURATION | 0 hr 54 min |
| DISTANCE | 14.2 nmi |
| CAPTAIN | Halldór Ingi |

**Trip statistics**

| | |
|---|---|
| PEAK IMPACT | 7.8 g |
| RED IMPACTS | 2 |
| AVERAGE SOG | 16.3 kn |
| AVERAGE SAFETY SPEED | 22 kn |
| TRIP SCORE | 70 |

3D Visualisation



18:22:00 - 18:22:59 | Seconds | Full trip view

# Example of SafetySpeed


All impacts happen when **Safety Speed** is exceeded

**“We were really impressed with the system. We were going from really choppy weather into an area that was more sheltered. Not 10 seconds after we said that our sea eyes would suggest we could go faster, the system started to increase the safe speed … the system gave me everything I wanted and more“.**

*Design Authority | Naval Architecture*
*Trials for the Royal Navy, UK*

# IMAS® EcoSpeed learns your vessel's operational profile and identifies its optimum efficiency range in real time

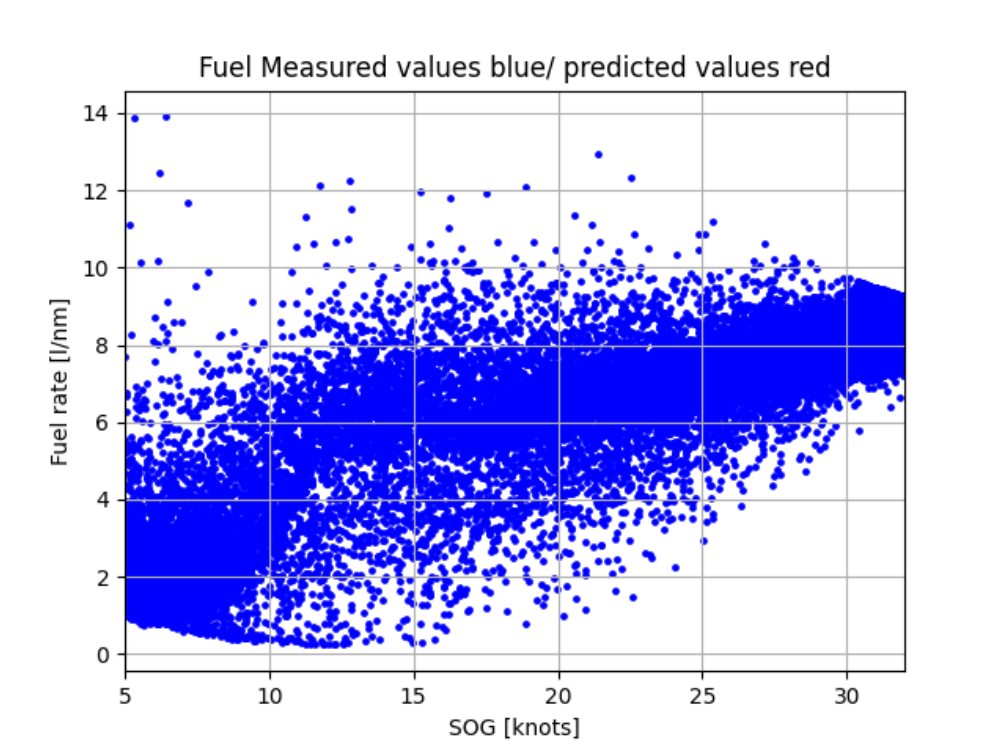
**Objective:** Minimize fuel rate for each nautical mile at an acceptable speed.

Fuel rate varies based on many factors, including:

- waves and wind
- throttle management
- rudder controls
- weight and distribution

All contribute to the overall efficiency and performance of the vessel.

Fuel rate (l/nm) and speed (SOG)



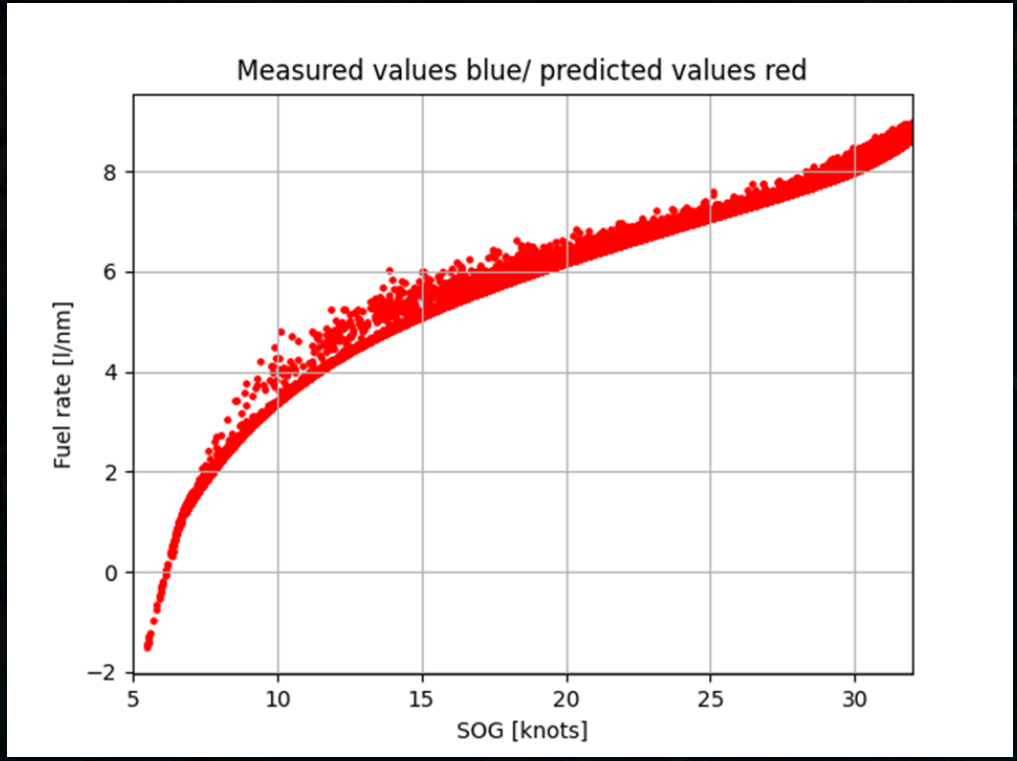
# IMAS® EcoSpeed learns your vessel's operational profile and identifies its optimum efficiency range in real time

**Focus:** optimizing operational and handling parameters for different environmental conditions.

**Methods:** linear and regression models, recurrent neural network, reinforcement learning, and deep neural networks, with focus on optimizing layers, deep learning, and training processes.

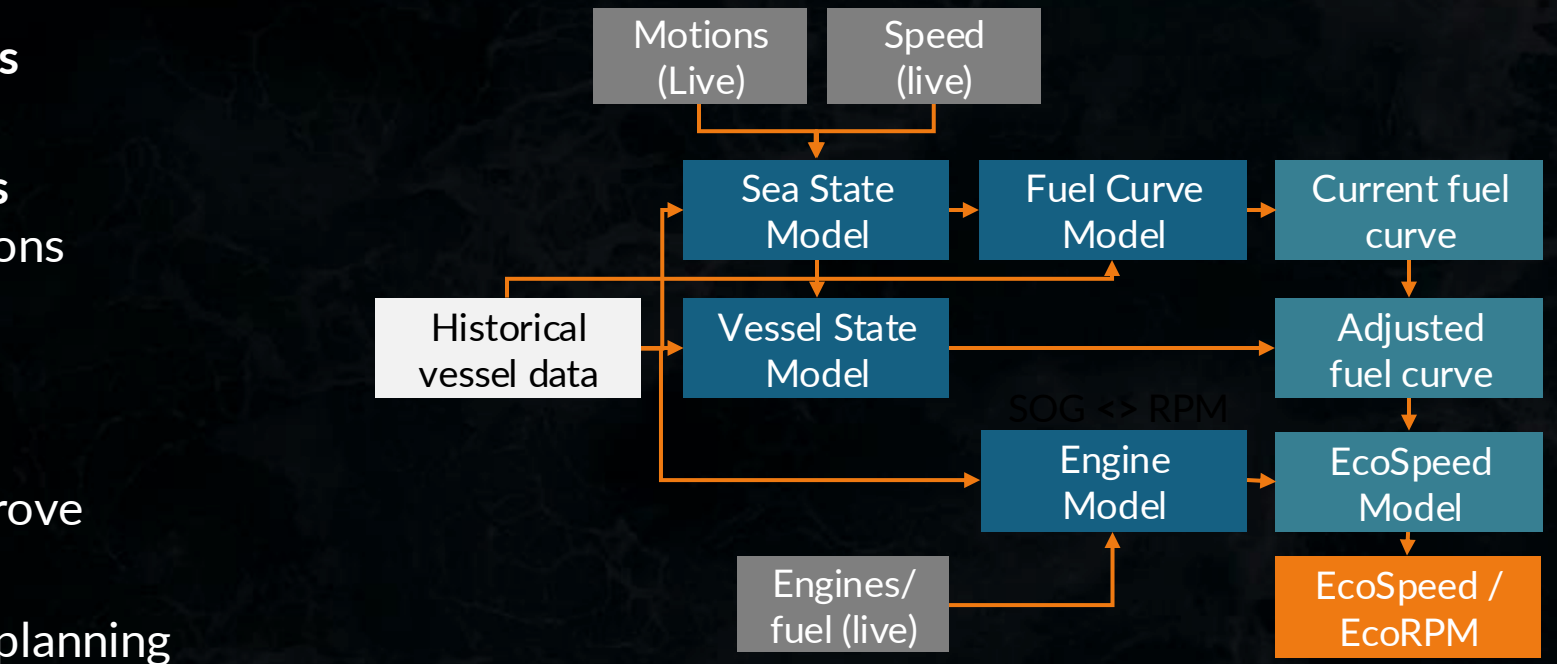
**Demonstration:** 32kn to 28kn reduces consumption by 17%, extending 10 nm distance trip by 2.5 mins

Predicted fuel rate and SOG for optimized operational and environmental parameters



# IMAS® EcoSpeed learns your vessel's operational profile and identifies its optimum efficiency range in real time

- **Dynamically predicts** speed & RPM
- **Continuously adapts** to prevailing conditions
- **Unique model** for each vessel
- **Adaptive learning** to continuously improve
- **Upcoming versions** for route and range planning

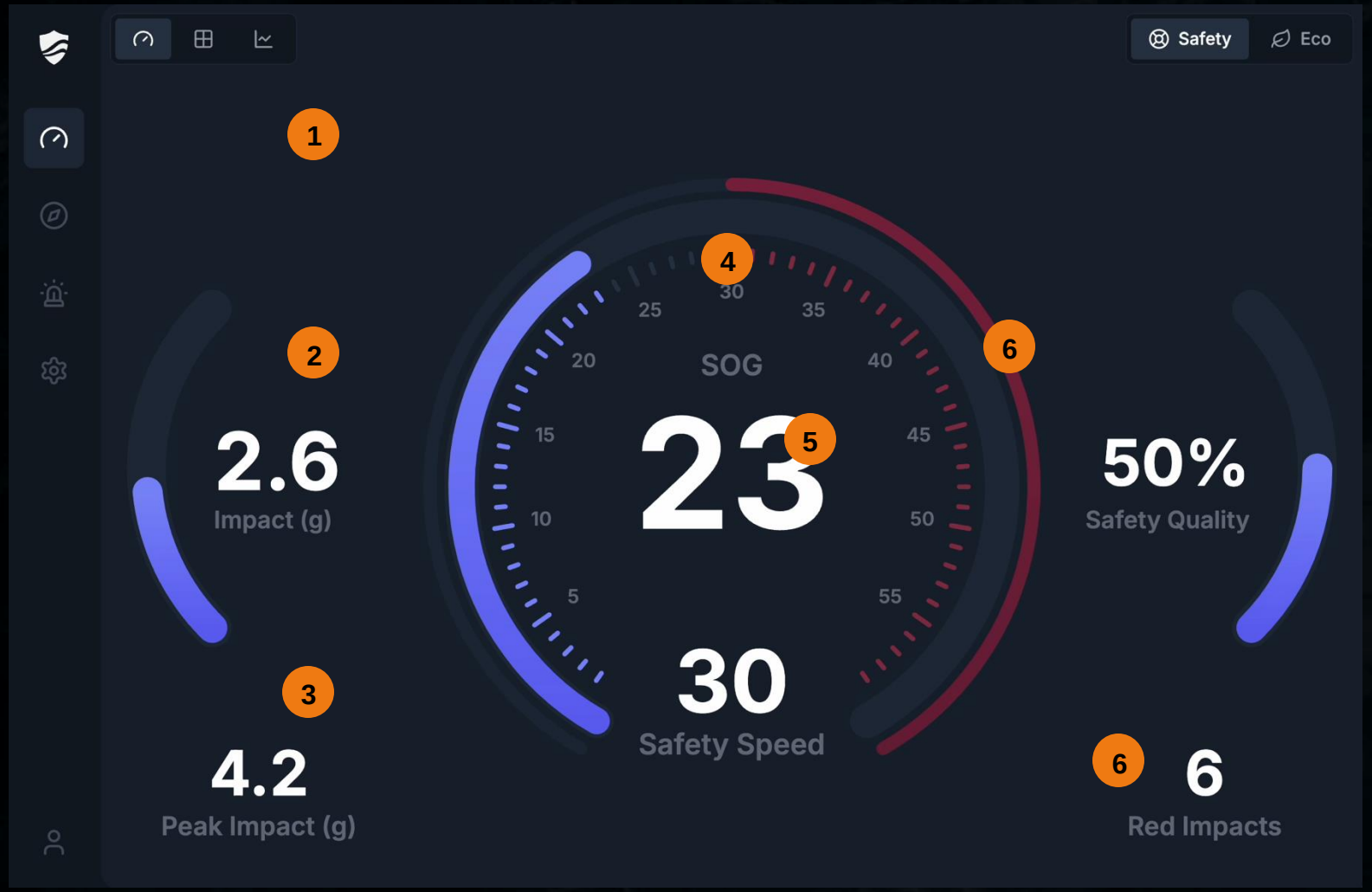



Up to **10-20%** lower fuel use and emissions

# IMAS® Helm EcoSpeed for More Efficient Operations


1. EcoSpeed/RPM, fuel efficiency ranges
2. Actual and target fuel consumption
3. Surplus fuel saved on trip vs. vessel average

# IMAS® Helm EcoSpeed for More Efficient Operations




1. Actual per nmi fuel consumption
2. Surplus fuel saved on trip vs. vessel average
3. Average consumption and actual fuel flow
4. Target fuel rate, set by fleet manager
5. Predicted fuel consumption curve
6. EcoSpeed/RPM, fuel efficiency ranges

# IMAS® Console is provides powerful tools to monitor and analyse your fleet, helping you stay informed at all times

# IMAS® Console is provides powerful tools to monitor and analyse your fleet, helping you stay informed at all times

- **Live Fleet Monitoring**
  Track vessels in real-time
- **Asset and Equipment Monitoring**
  Monitor asset status and health
- **Fleet Information Dashboard**
  Detailed fleet data at a glance
- **Automated Trip Logs & Analytics**
  Record and analyze trip data
- **Operator and Vessel Statistics**
  View detailed performance metrics
- **Operator Performance Index**
  Assess operator efficiency
- **Virtual Fleet Manager**
  Automatically monitor fleet condition
- **Trip Commenting System**
  Add notes and comments on trips
- **Data Studio and Download**
  Analyze and export data easily
- **Email & SMS Notifications**
  Stay updated with timely alerts


**Michael Given**
**Head of Sales**
**michael**@hefringmarine.com
**hefring**marine.com