POLE STAR

The digital eyes and ears of the seas.

Michael Pearson
Product Manager
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Pole Star & Government
Company Overview

- Pole Star is an innovative technology company providing a maritime-centric Platform-as-a-Service (PaaS) supporting a suite of ship tracking, safety, security, environmental, and financial compliance business applications
- The leading provider of enterprise-level ship tracking solutions worldwide

Strong Historical Track Record of Innovation

- Industry first, Purplefinder, the web-based ship tracking service (1998)
- Industry first, DSAS, the IMO Ship-Security Alert System blueprint (2004)
- Industry first, MarVTS, the IMO LRIT DC blueprint (2008)
- Industry first, PurpleTRAC, the maritime-KYC sanctions screening service (2016)
- Industry first, Pole Star API Platform, fully extensible, API platform providing access to the Pole Star platform (2017)

A Maritime Ecosystem

- Monitors over 13,500 ships on behalf of over 1,000 shipping companies
- Tracks over 18,000 ships for 50 government flags including Panama, Marshall Islands, and Liberia
- Provide critical maritime-KYC services to 40 blue chip financial institutions
- Innovative, enterprise-level Platform-API with white-labelled UI capability

Global Reach

- Founded in 1998
- Headquartered in London with additional offices in Hong Kong, Panama and Singapore
- Global customer base, serving many of the leading stakeholders in the maritime industry
- Approx. 95 employees
...to protect and serve our clients through the delivery of comprehensive, reliable, and secure actionable intelligence; leveraging the latest digital data and technologies via our maritime ecosystem.
One Platform Serving Multiple Markets

**Enterprise Platform-API**

Pole Star offers an enterprise-level, cloud-hosted, secure, resilient, Platform-API to 3rd parties for utilisation and integration into their own business applications and services.

- White-labeling and fully-API enabled
- Cloud-hosted Platform with fully interactive street / satellite / marine-chart mapping, met-ocean data, near real-time piracy data, multi-satellite communications, and multi-transceiver hardware enabled.

**Aggregated Maritime Data**

**Government**

Pole Star is the pre-eminent provider of LRIT Data Center, fisheries monitoring, and maritime domain awareness solutions to Government Agencies and inter-Governmental bodies.

- LRIT Data Centre Solutions (data management infrastructure)
- Non-SOLAS Tracking (small-craft)
- Fisheries reporting and compliance
- Maritime Domain Awareness (MDA)

**Financial Markets & Compliance**

Pole Star offers a multi award-winning Regtech product delivering a comprehensive set of compliance and risk management services for ship financing, trade & commodity financing, and physical commodity shipping institutions.

- Economic Sanctions Compliance Screening
- Risk Management Analysis
- Ship / Voyage Tracking
- Tamper-proof Reporting (evidentiary)

**Shipping & Offshore**

Pole Star is a leading provider of maritime safety, security, and environmental compliance solutions, serving many of the world’s largest international shipping companies.

- Ship Security Alert System (SSAS) Management
- Fleet Management
- Small Craft and Marine Asset Tracking
- Long Range Identification and Tracking (LRIT) Compliance (shipborne equipment)
An Expandable Integration Model

Service Provider

- inmarsat
- iridium
- MarineTraffic
- Globalstar
- DOW JONES
- IHS
- RiskIntelligence

Pole Star Interface

- Solutions for Commercial Shipping, LRIT and Fisheries Monitoring
- 24 x 7 x 365 availability (with monitoring across all services)
- Redundant links to all Communications Service Providers (CSP’s)

Customer Access

Cloud Hosted

- Secure worldwide access using any web browser

Support & Monitoring

- Follow the sun support and monitoring
- SLAs

APIs

- Military / Government
- Logistics / Dispatch
- Financial / Billing
- ERP systems
Safety & Security
Pole Star offers a comprehensive end-to-end LRIT service that consists of the most cost-effective and expandable Data Centre solutions available.

System conforms to rigorous IMO regulations, performance standards, and technical specifications.

Wider services are provided to 118 government clients worldwide (including LRIT equipment testing and certification services, and fisheries compliance).

Pole Star is a major provider of fisheries vessel monitoring systems and associated/extended services.

Our services are used by 35 governments and regulatory agencies, ensuring the rigorous compliance of approximately 1500 vessels.

Our specific business applications include: vessel monitoring systems, electronic logbooks, electronic catch reporting, quota management systems, seafood traceability reporting, catch documentation systems.
…[Maritime Domain Awareness] is the effective understanding of anything associated with the global maritime domain that could impact the security, safety, economy, or environment of any country’s territory.

United States National Plan to Achieve Maritime Domain Awareness
Environment
Implementation timeline for IMO’s DCS

The IMO fuel oil consumption data collection system (IMO DCS) becomes effective on 1 March 2018, requiring from ships of 5,000 gross tonnage and above to submit to their Administration annual reports on fuel oil consumption. This is a new requirement added to chapter 4 of MARPOL Annex VI, entitled as Regulation 22A.

In particular, Regulation 22A is expected to enter into force on 1 March 2018, with first data “calendar year” beginning 1 January 2019. As from that date, ships shall collect fuel oil consumption data according to a methodology to be described and included in the Ship Energy Efficiency Management Plan (SEEMP Part II) by latest 31 December 2018. This shall be in line with the 2016 Guidelines for the Development of a Ship Energy Efficiency Management Plan adopted by Resolution MEPC.282.

Following the end of each calendar year, by not later than 31 March of the subsequent year, ships shall submit to flag State or RO reports on fuel oil consumption data for the previous calendar year. The report related to the first reporting period which starts on 1 January 2019, shall be submitted by not later than 31 March 2020.
Information to IMO Ship Fuel Oil Consumption Database

- IMO number
- Period of calendar year covered
- Technical characteristics of the ship (ship type, gross tonnage, net tonnage, deadweight tonnage, power output of main and auxiliary engines)
- EEDI (if applicable)
- Ice class
- Fuel oil consumption, by fuel oil type, in metric tonnes and methods used for collecting fuel oil consumption data
- Distance travelled (over ground), hours underway
Upon verification of the submitted data, in line with Resolution MEPC.292(71) adopting the 2017 Guidelines for Administration verification of ship fuel oil consumption data, classification societies shall issue by 31 May 2020 to the ships a Statement of Compliance related to fuel oil consumption which should be kept on board for the period of its validity. The Statement of Compliance shall be valid for the calendar year in which it has been issued and for the first five months of the subsequent calendar year.

The disaggregated data that underlies the reported data for the previous calendar year shall be readily accessible for a period of not less than 12 months from the end of that calendar year and be made available to this Directorate upon request.

Ship owners and ship operators are encouraged to start considering the methodology for collecting the fuel oil consumption data that is most appropriate for each ship and its operation profile, incorporating Part II in their SEEMPs, in accordance with the sample form of ship fuel oil consumption data collection plan included in Appendix 2 of the 2016 Guidelines for the development of a Ship Energy Efficiency Management Plan. The data collection plan should be submitted to the classification societies for approval.
EU MRV vs IMO System

The table below sets out the core components of the two systems alongside each other for ease of comparison. The key differences of note include:

- The EU MRV regulation requires reporting of actual cargo carried onboard, fuel consumed, and CO2 emitted, whereas the IMO only requires reporting of fuel consumed.
- For EU MRV, calculations are made by the shipping companies and verified by an accredited verifier. For IMO, the calculations are verified by the administration, according to national procedures.
- The EU plans to make this information publicly available whereas, for IMO, the raw data will only be available to IMO and flag states who will then share aggregated anonymised data.
### IMO DCS vs. EU MRV

<table>
<thead>
<tr>
<th></th>
<th>EU MRV</th>
<th>IMO System</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Monitoring</strong></td>
<td>Ships 5000 GT and above</td>
<td>Ships 5000 GT and above</td>
</tr>
<tr>
<td></td>
<td>Voyages to/from EU port of calls</td>
<td>All voyages</td>
</tr>
<tr>
<td></td>
<td>EU Monitoring Plan</td>
<td>Updated SEEMP</td>
</tr>
<tr>
<td></td>
<td>Starting 1st January 2018</td>
<td>Starting 1st January 2019</td>
</tr>
<tr>
<td><strong>First Monitoring period</strong></td>
<td>2018</td>
<td>2019</td>
</tr>
<tr>
<td><strong>Exemptions</strong></td>
<td>Warships, naval auxiliaries, fish-catching/processing ships, ships not propelled by mechanical means and government ships used for non-commercial purposes.</td>
<td>TBD</td>
</tr>
<tr>
<td><strong>Parameters</strong></td>
<td>Fuel consumption (port/sea)</td>
<td>Fuel Consumption</td>
</tr>
<tr>
<td></td>
<td>Transport work (based on actual cargo carried)</td>
<td>Distance</td>
</tr>
<tr>
<td></td>
<td>Distance</td>
<td>Time</td>
</tr>
<tr>
<td></td>
<td>Time</td>
<td></td>
</tr>
<tr>
<td><strong>Verification</strong></td>
<td>Independent accredited verifiers</td>
<td>Flags/recognised organisations (work in progress)</td>
</tr>
<tr>
<td><strong>Reports to</strong></td>
<td>European Commission</td>
<td>Flag State</td>
</tr>
<tr>
<td><strong>Certification</strong></td>
<td>Document of Compliance (June 2019)</td>
<td>Statement of Compliance</td>
</tr>
<tr>
<td><strong>Publication</strong></td>
<td>Distinctive public database</td>
<td>Anonymous public data</td>
</tr>
</tbody>
</table>
**MRV Product**

**Shipside application**
- Allows the deck (and the engine) department to enter ship data (e.g. fuel tank capacity)
- Allow input of voyage data at each leg of the voyage (start of the voyage, NDRs, end of the voyage)
- Basic data validation prevents users from entering incorrect information

**Shoreside application**
- Stores basic information about a ship and other reports that come from the ship
- Aggregates fuel data for voyage or port operations
- Calculates CO2 emissions for a year
- Provides emissions reports for users to export and send to verifiers
MRV Product

1. MRV Ship Registration
2. Ship Shore Pairing
3. Record events on the ship
4. Reports sent to the shore
5. Generate emissions report
**MRV Ship Registration**

**Coral Leaf**

**IMO:** 9404626  
**Ship type:** LPG Tanker

**MRV registration details**

In order to start monitoring the ship please complete MRV registration details opposite to generate a unique identification code for ship monitoring.

**Voyage archive**  
**Emission reports**

**Ship data**

- **Name of the ship**  
  Coral Leaf

- **IMO identification number**  
  9404626

- **Port of registry**  
  Rotterdam

- **Home port**  
  Rotterdam

- **Ship Category**  
  LPG Tanker

- **Ice class of the ship**

- **Ship capacity**

- **Energy Efficiency Design Index (EEDI)**

- **Estimated Index Value (EIV)**

- **Name of the shipowner**

- **Address of the shipowner and its principal place of business**

- **City**

- **State/province/region**

- **Post code/ZIP**

- **Country**

- **Shipping company same as shipowner?**  
  [ ]
MRV Ship Registration

Emission Source category*: Main engines
Name*: Main engine
Monitoring method*: Method A: BDN and periodic stocktaking
Performance/Power: Enter performance/power kW
Specific fuel oil consumption (SFOC): Enter SFOC g/kwh

Emission Source category*: Auxiliary engines
Name*: Auxiliary engines
Monitoring method*: Method B: Bunker fuel tank monitoring
Performance/Power: Enter performance/power kW
Specific fuel oil consumption (SFOC): Enter SFOC g/kwh

MRV registration details
Incomplete

Ship data
Verifier details
Emission source
Monitoring method
Engine data
Fuel tank
Cargo
Cargo tank 1 name*: Cargo Tank 1
Cargo tank 2 name*: Cargo Tank 2

Add source
Delete source
Add source
Save
Save & complete

POLE STAR
MRV Ship Application Reports: In-Voyage

Voyage Data

<table>
<thead>
<tr>
<th>Departure (last port call)</th>
<th>Curitiba</th>
<th>Curitiba</th>
<th>Is this an EU voyage?</th>
<th>ETA for next port</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrival (next port call)</td>
<td>Apia</td>
<td>Apia</td>
<td></td>
<td>Status</td>
</tr>
</tbody>
</table>

Events

Choose a voyage event. If it requires a report you will be prompted to complete it.

- Departure from berth
- Noon report at sea or port
- Arrival at berth
- Bunker survey
- Bunkering
- Change of fuel tank

Completed Events

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Report</th>
<th>Distance-run</th>
<th>Speed</th>
<th>Time taken</th>
<th>Main Engine output</th>
<th>LFO Consumed</th>
<th>MFO Consumed</th>
<th>Status</th>
<th>Attachment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jul 22, 2017 11:03 AM</td>
<td>Noon Reporting</td>
<td>Noon report</td>
<td>100</td>
<td>6.001E</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>78.35</td>
<td>Pending</td>
</tr>
<tr>
<td>Jul 21, 2017 10:26 AM</td>
<td>Departure from Berth</td>
<td>Departure report</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Pending</td>
</tr>
<tr>
<td>Jul 21, 2017 08:25 AM</td>
<td>Bunkering</td>
<td>Post Bunkering report</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Pending</td>
</tr>
</tbody>
</table>
Emissions Report

Fuel consumption and CO₂

Fuel type: LFO
Emission Factor: 3.151 t(\text{CO}_2)/t(fuel)
Total Fuel Consumption: 1200.32 t

Fuel type: HFO
Emission Factor: 3.114 t(\text{CO}_2)/t(fuel)
Total Fuel Consumption: 4000.21 t

Total \text{CO}_2 emissions within scope of regulation: 16238.86226 t

Emissions for voyages departing from EU ports: 16238.86226 t
Emissions for voyages to EU ports: 0 t
Emissions for voyages between EU ports: 0 t
Emissions for port operations within EU ports: 4026275327 t

Distance travelled, time spent at sea and transport work

Total distance travelled: 2100 nm
Total time spent at sea: 144.0 hours
Total transport work: 525000000 t/nm

Energy efficiency

Average fuel consumption per distance: 0.00247644285714 t/nm
Average fuel consumption per transport work: 9.90577142857e-06 t/(fuel)/(cargo)*nm
Average \text{CO}_2 emissions per distance: 7.73279155238 g \text{CO}_2/nm
Average \text{CO}_2 emissions per transport work: 3.09311662095e-05 g \text{CO}_2/nm
IMO Regulation

- Preparers SEEMP by 31 Dec 2018
- Starts tracking fuel usage from 1 Jan 2019
- Submits fuel consumption data by end of March 2020

- Verifies fuel consumption data
- Issues document of compliance to the shipping company by end of May 2020
- Passes on anonymised fuel consumption data for managed vessels to IMO
Voyage Efficiency: Speed Variance
# Voyage Efficiency: Speed Variance

## Alarm Settings

Get the speed thresholds for which you would like to receive alarms outside of the vessel's planned speed.

### Average speed deviates 4 km above or below the planned speed over a period of 90 min

- **Major**
- **Activation Options:** Auto-clear

### Speed deviates 4 km above or 5 km below the planned speed for a period of 60 min

- **Major**
- **Activation Options:** Auto-clear

### Speed deviates 10 km above or 10 km below the planned speed at any time

- **Major**
- **Activation Options:** Auto-clear

### No planned speed applied to the ship

- **Mild**
- **Activation Options:** Auto-clear

### Ship not reporting for more than 60 min

- **Minor**
- **Activation Options:** Auto-clear

---

### Deviation over a period of:

<table>
<thead>
<tr>
<th>Speed deviation above planned speed</th>
<th>Speed deviation below planned speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deviation for a period of:</td>
<td></td>
</tr>
</tbody>
</table>

### Speed deviation above or below planned speed

<table>
<thead>
<tr>
<th>Speed deviation above planned speed</th>
<th>Speed deviation below planned speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deviation for a period of:</td>
<td></td>
</tr>
</tbody>
</table>
Voyage Efficiency: Speed Variance

MAERSK NORTHWOOD

Position
Ship information
Alarm Settings
Ship positions period range

From date: 2017-09-09 15:33
To date: 2017-09-12 15:33

Active Alarms - MAERSK NORTHWOOD

- **Severity**: Major
  - **Time (UTC)**: 12 Sep 2017 15:30
  - **Ship**: MAERSK NORTHWOOD
  - **Alarm Cause**: Speed deviates 4 km above or 3 km below the Planned
  - **Ack. Time (UTC)**: n/a
  - **Ack. By**: n/a
  - **Comment**: Add
  - **Actions**: Acknowledge

- **Severity**: Major
  - **Time (UTC)**: 12 Sep 2017 15:30
  - **Ship**: MAERSK NORTHWOOD
  - **Alarm Cause**: Average speed deviates 4 km above or below the Plan
  - **Ack. Time (UTC)**: n/a
  - **Ack. By**: n/a
  - **Comment**: Add
  - **Actions**: Acknowledge

- **Severity**: Major
  - **Time (UTC)**: 12 Sep 2017 15:20
  - **Ship**: MAERSK NORTHWOOD
  - **Alarm Cause**: Speed deviates 10 km above or 10 km below the Plan
  - **Ack. Time (UTC)**: n/a
  - **Ack. By**: n/a
  - **Comment**: Add
  - **Actions**: Acknowledge
Sanctions Risk & Compliance
PurpleTRAC has been designed in partnership with banks and commodity trading companies with exposures to shipping and cargoes. The platform is designed to mitigate the reputational, financial and criminal risk of accidental money laundering and terrorist financing non-compliance.

Pole Star offers an award-winning sanctions screening product, which delivers a comprehensive set of compliance and risk management services for ship financing, trade & commodity financing, and physical commodity shipping institutions.

- Economic Sanctions Compliance Screening
- Risk Management Analysis
- Ship / Voyage Tracking
- Tamperproof Reporting (evidentiary)
Banking Customers

- FAB (First Abu Dhabi Bank)
- CREDIT SUISSE
- UBS
- citi
- BNP PARIBAS
- ICBC (Standard Bank)
- BANK OF CHINA

Awards

- 16-17 MAS FINTECH AWARDS
- Citi Tech for Integrity Challenge
- Shield in the Cloud Innovation Challenge
- Microsoft BizSpark
Screening results

<table>
<thead>
<tr>
<th>Flag</th>
<th>Name</th>
<th>Type</th>
<th>Result</th>
<th>Last updated (UTC)</th>
<th>Previous result</th>
<th>Date of previous result (UTC)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SPIRIT OF LONDON</td>
<td>Crude Oil Tanker</td>
<td>OK</td>
<td>29 Feb 2016 14:35</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>CHAMPION TERN</td>
<td>Chemical/Products Tanker</td>
<td>Warning</td>
<td>25 Feb 2016 14:35</td>
<td>OK</td>
<td>22 Feb 2016 09:11</td>
</tr>
<tr>
<td></td>
<td>CENTAURUS</td>
<td>Crude Oil Tanker</td>
<td>OK</td>
<td>29 Feb 2016 14:35</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>EX INCORRECT</td>
<td>LPG Tanker</td>
<td>Warning</td>
<td>29 Feb 2016 14:35</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>ELIZABETH</td>
<td>Bulk Carrier</td>
<td>OK</td>
<td>29 Feb 2016 10:18</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>HARMONY OF THE SEAS</td>
<td>Fishing Vessel</td>
<td>OK</td>
<td>28 Feb 2016 16:22</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>HH SOUTH</td>
<td>Container Ship</td>
<td>Warning</td>
<td>28 Feb 2016 16:22</td>
<td>Warning</td>
<td>27 Feb 2016 16:22</td>
</tr>
<tr>
<td></td>
<td>INTSTAR</td>
<td>Anchor Handling</td>
<td>Warning</td>
<td>28 Feb 2016 16:22</td>
<td>OK</td>
<td>21 Feb 2016 16:22</td>
</tr>
<tr>
<td></td>
<td>ROBERTS</td>
<td>Vehicles Carrier</td>
<td>Warning</td>
<td>28 Feb 2016 16:22</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>SS ANNE</td>
<td>Products Tanker</td>
<td>OK</td>
<td>11 Feb 2016 09:52</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>NAVIGATOR OF THE SEAS</td>
<td>LPG Tanker</td>
<td>OK</td>
<td>10 Feb 2016 10:11</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>VICTORIA CONCORDIA CRES...</td>
<td>Container Ship</td>
<td>Warning</td>
<td>10 Feb 2016 10:32</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LEADING WAVE</td>
<td>LPG Tanker</td>
<td>Critical</td>
<td>09 Feb 2016 15:12</td>
<td>OK</td>
<td>08 Feb 2016 15:12</td>
</tr>
<tr>
<td></td>
<td>WALTER MONDALE</td>
<td>Container Ship</td>
<td>OK</td>
<td>28 Jan 2016 11:45</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>GRANIT X</td>
<td>Container Ship</td>
<td>Warning</td>
<td>28 Jan 2016 11:45</td>
<td>OK</td>
<td>27 Jan 2016 11:45</td>
</tr>
<tr>
<td></td>
<td>YORKSHIRE ROSE</td>
<td>Bulk Carrier</td>
<td>OK</td>
<td>28 Jan 2016 11:45</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>BOBAMA</td>
<td>Passenger/Cruise</td>
<td>OK</td>
<td>28 Jan 2016 11:45</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>TESTING</td>
<td>LPG Tanker</td>
<td>OK</td>
<td>28 Jan 2016 11:45</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Latest screening results
- Last updated: 29 Feb 2016 14:35 UTC
- Ship global sanctions list check: OK
- Company global sanctions list check: OK
- Country sanctions check: Warning
- Ship movement history check: OK
- Port state control history check: OK

Screening history

1. Rescreen
2. Decline
3. Archive
4. Export selection
A Partnership to Succeed
IMO Regulation

Shipping company

Flag state

IMO

Fuel data
Fuel Consumption Reports: Burden or Opportunity?

54,000

24,000

117

1

Ships

Companies

Flags

IMO
Pole Star: Trusted Technology Partner

- Enhanced voyage efficiency
- Reduced fuel costs
- Simplified reporting

- IMO/EU compliant reports
- MDA analytics
- Fleet/emissions analysis

- Fleets compliant with regulations
- Reduced carbon footprint
- Contributes to Sustainable Development Goals
Pole Star’s Trusted Technology Partner Proposal for Flags:

- to establish a standard IMO DCS data management and reporting system
- to provide a near real-time emissions dashboard for each flag to use for its own purposes, including:
  - smart data and analytics
  - fleet / emissions analysis
  - green credentials
  - future carbon trading schema