Integrated Maritime Surveillance: current directions

Space and Maritime Surveillance session
Cork, 19 April 2013

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Operations
Regulatory Agency of the European Union

- 10 years in existence
- Own legal identity
- Technical and operational support
- ~240 staff, 24 nationalities
- ~80 staff in Operations Department
- Annual overall budget: ~55 million Euros
- HQ Lisbon, Portugal
Updated EMSA mandate: Reg.100/2013/EC, published on 15 January 2013

“The Agency should provide operational assistance to the Member States and the Commission. This should include services such as the Union Maritime Information and Exchange System (SafeSeaNet), the European satellite Oil Monitoring Service (CleanSeaNet), the European Union Long Range Identification and Tracking Data Centre (EU LRIT Data Centre) and the EU Port State Control inspection data base (Thetis).”
New element under “Core tasks”
- facilitate cooperation between the Member States and the Commission:

- By providing, ..., relevant vessel positioning and earth observation data to the competent national authorities and relevant EU bodies ... in order to facilitate measures against threats of piracy and of intentional unlawful acts ...
Don’t be afraid of the unknown...

... EMSA integrated maritime services are here to help
1. Capabilities:
- Data fusion
- Dissemination (S2S)
- Automated monitoring
- Addition of custom data
- New analysis tools – for combined data
- Satellite AIS

2. Service Configuration:
- Data Streams (AIS, LRIT..)
- Community-specific data
- Custom visualisation
- Automated Monitoring Framework
- Alerting means
- Dissemination format

3. Rationalisation among applications:
- Single Sign-On
- Common user management
- Common databases
Integrated Data Information

Integrated ship’s track

Direct access to ship’s risk status

Navigation Status

Extended search capabilities

Direct access to PSC information
- PSC information
- Ship Risk Profile: High Risk
- Inspection Priority: 1 (mandatory)
- Eligible to be banned: No
- Eligible for Expanded Insp.: Yes

Direct access to voyage details

LRIT
Satellite AIS
Shore based AIS

Integrated ship’s track

Direct access to PSC information

Extended search capabilities

Navigation Status
- Not available
- Under way using engine
- At anchor
- Not under command
- Restricted manoeuvrability
- Constrained by her draught
- Moored
- Aground
- Engaged in Fishing
- Under way sailing

Direct access to voyage details

Ship Call info: Yes
Hazmat info: Yes
Incident/Accident: No
Last Port: Lisboa
ETD from Last Port: 2012-02-13 15:00:00
Port of Call: Santos
ETA to Port of Call: 2012-02-16 15:00:00
ATA to Port of Call: -
ETD from Port of Call: -
ATD from Port of Call: -
Single and multi-source vessel position reports

- LRIT only
- S-AIS only
- AIS only
- AIS+S-AIS+LRIT
AIS and S-AIS reports with track interpolation

Interpolation considers:
- Previous position reports
- Heading and speed
- Correctness thresholds
Route prediction using ship call information

- Predicted route
- Actual route
- Destination port: Rotterdam
Correlation between satellite detected vessels and ship position reports

A graphical interface may provide “time slider” visualization for replaying data.
Initial Monitoring Algorithms

- Vessel entering or leaving Area
- At sea encounter – 2 vessels
- Drastic change in ETA
- Vessel - Off track considering reported voyage
- Under/over reporting
- Sudden change of speed
- Sudden change of heading
- Sudden change of port of destination
- Check if vessel is anchored.
Roll-out of tailor-made IMDatE services:

- **EU Agencies and bodies**
  - EU NAVFOR
  - EFCA
  - Blue Belt (MOVE/TAXUD for customs as of 2014)

- **Volunteering EU Member States**
  - France,
  - Italy,
  - Netherlands,
  - Portugal,
  - Spain,
  - United Kingdom.
Example of Graphical Interface customisation

- Colour coded vessel - based on permit status
- Operation-specific data (ICCAT) is added in the display
- Fishing vessel inspector
- Fishing vessel sighting
- Detected infringement of fishing vessel
Tailor-made Integrated Maritime Awareness Picture

- **USER**
  - Mobile data
  - Local position data
  - Tailored Ship Register

- **EXCLUSIVE PICTURE**

- **EMSA**
  - SafeSeaNet
  - CleanSeaNet
  - EU LRIT DC
  - THETIS

- **/ Vessel Position Data /**
  - (radar, AIS, VMS, on board data)

- **/ Incidents, sightings or inspections /**

- **/ Domain Specific Ship Register /**

- **/ AIS data /**

- **/ EU LRIT Data /**

- **/ Earth Observation Data /**

- **/ Satellite AIS Data /**

- **/ Vessel information /**
IMDatE: Out-of-the-box features (1 of 2)

**Data Processing:**
- **Live picture of last known vessel positions**
  - From multi-source data (AIS, LRIT, S-AIS etc)
  - Multi-criteria vessel search
- **Ship track creation**
  - Track association
  - Track interpolation and prediction
  - History of vessel voyage
- **Position reporting correctness checks** - Kalman filter processing
- **Easy addition of new data** – e.g. surrounding AIS positions received by patrol vessels, on-scene incident reports etc

**Validation** - against complete EMSA vessel registry - operational databases

**Correlation:**
- Automated correlation of VDS from SAR images with position reports.
- Enrichment of position reports with data from multiple databases

**Display of satellite images** (SAR and optical) and overlay of ship tracks.

**Handling of ‘incident’ information** – inspections/sightings/events.

**Handling of reported voyage information** – next port of call, last port etc.
Automated behaviour monitoring and alerts:

- Monitoring engine
- Comprehensive and expandable set of automated monitoring functions.
  - E.g. vessel entered/exited a defined area
  - Detection of at-sea-encounter between two vessels.
  - Vessel deviated from expected and reported route.
  - Vessel not reporting or under-reporting.
- Choose between receiving emails, PDF reports, XML messages.

Supporting Tools:

- Aggregation - Single request to have ALL available information on a vessel from different EMSA applications
- Area Centric Query
  - All available information in a given area – ship tracks, incidents, satellite images, non-correlated VDS....
- Graphical interface with tailored symbols, filtering of data, user specific data.
- Overlay of community specific data using WMS/WFS web services

System-to-System interfaces:

- Position dissemination facility
- New XML interfaces