European Maritime Safety Agency

Meeting: 9th SSN / LRIT Group Meeting

Place and date: Videoconferencing, 25 May 2021

Agenda item: Port Call Detection service – outcome of pilot project

Document number: SSN/LRIT 9.6.2

Submitted by EMSA

Summary	The document presents the outcome of a pilot project on port calls detection.
Action to be taken	As per paragraph 4.
Related documents	n.a.

1 Background

At the 2nd meeting of the pilot project for the facilitation of Ship-to-Shore reporting, (25 September 2019), the group invited EMSA to investigate the possibility of detecting global port calls automatically. Considering other similar requests, EMSA launched in July 2020 a project to develop the service.

The development of the Port Call Detection service took place between September 2020 and February 2021 and was financed by the European Maritime and Fisheries Funds through the grant agreement between EMSA and DG MARE for the "promotion of interoperability between industry and competent authorities in the European Maritime Single Window environment (EMSWe) under the CISE Process" (see agenda item SSN/LRIT 9.6.1).

The Port Call Detection service automatically detects port calls worldwide by using ship position data available in EMSA's HP-IMS LTS[1]. The detection of port calls heavily depends on the definition of port calls areas. The port areas provided by Member States for EU ports under the STMID[2] project were used. For ports without port area defined, the contractor created areas as 5 km (configurable parameter) circles around the coordinates of the ports. The processing of the relevant data is executed through dedicated pipelines using Databricks[3] and Azure cloud services.

A port call is triggered when vessel positions are detected inside the port area and the speed of the vessel associated to these positions is reduced to less than 2 knots over a period of 15 minutes. This time is considered as the detected time of arrival and the Port Call is classified as 'Category A'. Furthermore, if the navigational status in AIS is set to "moored" over a period of 60 minutes while inside a port area, the Port Call category is updated to 'Category B' (moored) and if the navigational status is set to "at anchor" over a period of 60 minutes while inside a port area, the Port Call category is updated to 'Category C' (at anchor). A Port

[1] The High-Performance Integrated Maritime Services' Long Term Storage.
[2] The Shore-based Traffic Monitoring Infrastructure Database (STMID) has been established to simplify and facilitate the sharing of information regarding the competent authorities, port authorities and coastal stations which have been designated by Member States in accordance with Article 22 of Directive 2002/59/EC.
[3] System that reads the data streams from the HP-IM LTS, executes the detection algorithms for port areas and performs stream writing into database.

Call with ‘Category A’ can remain with this category or can be updated to ‘Category B’ or ‘Category C’. Once a Port Call is updated to either ‘Category B’ or ‘Category C’, its category will not be updated.

For each vessel, the first timestamp that meets the requirements for ‘Category A’ is recorded as the “arrival date-time” for the Port Call. The “departure date-time” is the first timestamp when the vessel is either outside the port area or has the speed above 2 knots over a period of 15 minutes inside the port area. Once a Port Call is closed, there are no more updates to it.

The following information regarding detected port calls is stored in the database:

- Ship identifiers (IMO, MMSI, Name, Callsign, CSDID);
- Location and time of the event corresponding to the arrival in port (i.e. latitude, longitude and timestamp);
- Location and time of the event corresponding to the departure from the port (i.e. latitude, longitude and timestamp);
- Identification of the port (LOCODE);
- Category of the detected port call (A, B or C).

The service is a near real time and is able to detect port calls retroactively in the period covered by vessel positions stored in the LTS (i.e. data since July 2017 is available). It is also possible to reprocess the detected Port Calls. This may be required when there are changes to the port areas impacting the detected start and end times or if a new source of data has been made available and needs to be taken into consideration for computing previously detected Port Calls.

2 Results of the validation tests

The service was tested by EMSA using the following business cases as a baseline for the business validation tests:

Business case	Description
A	A user needs to obtain the 3-month history of port calls at a global level, for selected ships: • User sends a list of around 40 distinct IMO numbers or MMSIs via a web interface and expects to receive for each of them historical port calls, at a global scale, over last 3 months. • Historical port calls shall cover identifiers of the vessel, list of ports (with UNECE location codes when known) and detected time of arrival and departure (from/to). • Typically, users will query for the vessels having IMO numbers and engaged in international trade.
B	The IRD system needs to generate an integrated ship report of a specific ship to be sent to a MS authority’s system. When building this report, the IRD system sends a request via webservice to get the list of detected port calls for that ship in the last 30 days or the last 10 port calls for that ship. The IRD system incorporate the results in the integrated ship report’s XML structure and sends the report to the authority’s system.
C	EMSA’s Maritime Support Services (MSS) performs data quality checks over port call information sent by MS according to the VTMIS Directive 2002/59/EC obligations. An MSS operator selects a list of ports of a MS via the web user interface to get the list of detected port calls for these ports in the last 30 days. An MSS operator gets the results in the form of an XLSX or CSV file.
D	An IMS user needs to obtain a list of vessels that called at a specific port in a defined period from date X to date Y, together with the details (date and time) of the port calls.
E	An IMS user needs to obtain last 10 port calls of a specific vessel.

The business validation tests proved that the service was delivering the expected results. It was noted that the quality of the information depends on the port areas definition and that they would need to be improved. This will be addressed separately since port areas definition was not part of the project and consequently, once the improved reference areas are available, the data for the detection of Port Calls will be reprocessed.

3 Getting information about detected Port Calls

For the purpose of the business validation and initial pre-operational phase, simplified web interfaces were developed in the Cloud infrastructure (Swagger, Databricks), allowing configuration and retrieval of the results from the services. By using these interfaces, the EMSA verified the webservices defined in the requirements for this project.

The web service allows the user to retrieve information based on the following criteria:

- Time period (start and end time);
- Ship IMO number (one or many);
- Ship MMSI number (one or many);
- Ship Flag (one or many);
- UN/LOCODE of the port (one or many).

The long-term objective is to integrate the Detected Port Calls service with the existing maritime services and interfaces offered by EMSA.

4 Actions required

Member States are invited to take note of the above information. Member States willing to participate in the testing of the Port Call Detection service and in the validation of their ports' areas are invited to express their interest.