



Quarterly Report

Q3 – 2021

EU LRIT CDC

and

EU LRIT Ship DB

DOCUMENT HISTORY

Version	Date	Comments
1.1	12/10/2021	First Issue

APPROVAL

	Name	Date	Signature
Approved by:	Lazaros Aichmalotidis	12/10/2021	LAI

DISTRIBUTION LIST: ACCESS ON-LINE (USER WEB INTERFACE)

EMSA, Commission, LRIT NCA, LRIT end-users

List of Contents

1. SCOPE OF THE DOCUMENT	5
2. EU CDC MAIN FIGURES	5
2.1. EU CDC HIGHLIGHTS	5
2.2. KEY PERFORMANCE INDICATORS	6
2.3. SYSTEM PERFORMANCE	6
2.4. SHIP INTEGRATION AND REPORTING	7
2.5. REQUESTS AND POSITIONS IN THE EU CDC	8
2.5.1. Standard requests activity per Flag	9
2.5.2. SAR requests activity per Flag	10
2.5.3. Evolution of messages exchanged	11
2.6. USER ACTIVITY IN THE EU CDC	12
2.6.1. User activity in the EU CDC UWI	12
2.6.2. User activity in the XML interfaces	13
2.7. FINANCIAL FIGURES	13
2.8. HIGHLIGHTS	15
3. ANNEXES	16
3.1. List of acronyms and abbreviations	16
3.2. Definitions	17
3.3. System performance	17
3.3.1. Global QoS	17
3.3.2. Delivered periodic position reports QoS (Type 1)	19
3.3.3. Delivered on-demand position reports QoS (Type 2 and Type 3)	19
3.4. Messages by source	20
3.4.1. General	20
3.4.2. Evolution of messages exchanged	21
3.5. Incidents and maintenance of the EU CDC	22
3.5.1. Incident management overview	22

List of Figures

Figure 1 – Evolution of reporting rate	8
Figure 2 – Number of requests processed by EU CDC (Message Type 4).....	9
Figure 3 – Number of reports received by the EU CDC (Messages Type 1 and 2)	10
Figure 4 – Number of SAR Requests per Flag	11
Figure 5 – Number of related position reports received	11
Figure 6 – Overall LRIT Business Financial Monthly Balance	14
Figure 7 – EU CDC Participants’ Paid Consumption	14
Figure 8 – Messages Sold by the EU CDC per Buying Data Centre	15
Figure 9 – IMO-24h and 30d QoS	18
Figure 10 – Position reports by network (Message Type 1, 2 and 3).....	20
Figure 11 – Position requests by role (Message Type 4, 5 and 6).....	20
Figure 12 – Number of position requests (Type 4)	21
Figure 13 – Number of SAR requests (Type 5)	21
Figure 14 – Number of SAR SURPIC requests (Type 6).....	21
Figure 15 – Number of position reports (Type 1, 2 & 3).....	22

List of Tables

Table 1 – Key Performance Indicators.....	6
Table 2 – Monthly 30d QoS	7
Table 3 – Integration and reporting statuses	7
Table 4 – Integration and reporting actions	7
Table 5 – User activities per flag	12
Table 6 – User activities.....	13
Table 7 – Information exchanged through XML interfaces.....	13
Table 8 – List of acronyms and abbreviations.....	16
Table 9 – Definitions.....	17
Table 10 – Delivered periodic position reports QoS figures.....	19
Table 11 – Delivered on-demand reports QoS figures	19
Table 12 – Incident management	22

1. SCOPE OF THE DOCUMENT

This document provides information on the performance of the European Union LRIT Cooperative Data Centre (EU LRIT CDC or EU CDC), European Union LRIT Ship Database (EU LRIT Ship DB), and events related to the EU CDC activities and operations during the 3rd Quarter of 2021. The report is made available to all LRIT users of the EU CDC via its User Web Interface (UWI).

To avoid overloading the report with figures, some graphs show data only for one month. The results of the quarter are presented and summarized in tables.

This document is divided into two parts:

- **EU CDC Main figures** gives a general overview of the status of the EU CDC, its main issues and Key Performance Indicators (KPI).
- **Annexes** show detailed graphs and figures of the EU CDC which are referred to in the first part.

2. EU CDC MAIN FIGURES

2.1. EU CDC HIGHLIGHTS

The following are the highlights for the 3rd Quarter of 2021:

- **Quality of Service (QoS):** All the performance indicators are above the targets set.
- **EU LRIT CDC releases:** A new release of the EU LRIT CDC is planned to be deployed before the end of 2021.
- **EU LRIT Ship DB releases:** A new release of the EU LRIT Ship DB version v3.1.02 was deployed during 3rd Quarter.
- **EU CDC IMSO audit:** The final report of the 12th audit of the EU LRIT CDC was issued by the LRIT Coordinator containing 3 observations (to be corrected in future release).
- **Serbia integration in the EU LRIT CDC:** The process for the integration of Serbia in the EU CDC is on-going.

2.2. KEY PERFORMANCE INDICATORS

Table 1 presents the KPIs used for measuring the EU CDC performance.

Table 1 – Key Performance Indicators

Activity/Service	Performance Indicator	July	August	September	Quarter	Target
EU LRIT CDC System operational*	Availability of the system over the period	99.87%	100.00%	100.00%	99.95%	≥ 99.00%
	Maximum continuous downtime of the EU LRIT CDC	00:04	00:02	00:04	00:04	< 12:00
EU LRIT CDC Reporting performance*	Percentage position reports delivered according	99.59%	99.85%	99.84%	99.76%	≥ 99.00%
EU LRIT CDC user web interface	Availability of the User Web Interface	99.83%	100%	100%	99.94%	≥ 99.00%
EU LRIT Ship DB user web interface	Availability of the User Web Interface	100%	100%	100%	100%	≥ 99.00%

* KPIs based on the IMO requirements (time format is hh:min)

2.3. SYSTEM PERFORMANCE

This section refers to messages delivered by the EU CDC. The Quality of Service (QoS) measures if messages were properly delivered.

According to MSC Res. 263(84) §13 document, the IMO definition of QoS is:

$$\text{QoS} = \frac{\text{Number of delivered LRIT reports meeting latency requirements}}{\text{Total number of LRIT information requests}} \times 100\%$$

The QoS refers to Periodic (Type 1), Poll (Type 2) and SAR (Type 3) position reports which were delivered by the EU LRIT CDC as per IMO requirements.

The target QoS is:

- 95% over any 24-hour period (24h QoS)
- 99% over any 1 month (30d QoS)

Table 2 presents the monthly QoS covering both the periodic and polled messages.

Table 2 – Monthly 30d QoS

	July	August	September
Monthly IMO-30d QoS (target 99%)	99.59%	99.85%	99.84%
Number of delivered reports that did not meet the IMO requirements	3,401	1,226	1,289
Percentage of delivered reports that did not meet the IMO requirements	0.41%	0.15%	0.16%
Total number of reports sent by EU CDC	832,230	828,138	805,416

The 30d QoS was above the IMO requirement this quarter.

Further detailed information on the 24h and 30d QoS as well as the QoS for periodic reports or for polled reports can be found in § 3.3 System Performance.

2.4. SHIP INTEGRATION AND REPORTING

Table 3 presents a snapshot of the ship integration and ship reporting during the first week of each month.

Table 3 – Integration and reporting statuses

	July	August	September
Total of ships in the EU LRIT CDC	8318	8293	8318
Ships integrated in the EU LRIT CDC (*=% of total of ships)	8037 96.6% *	8017 96.7% *	8061 96.9% *
Ships that have reported in the last 3 days (**=% of ships integrated)	6995 87% **	6985 87.1% **	6996 86.8% **

The formula used for the ship reporting calculation is:

$$\% \text{ ship reporting} = \frac{\text{ships statuses normal, under and over reporting}}{\text{all ships integrated}} \times 100\%$$

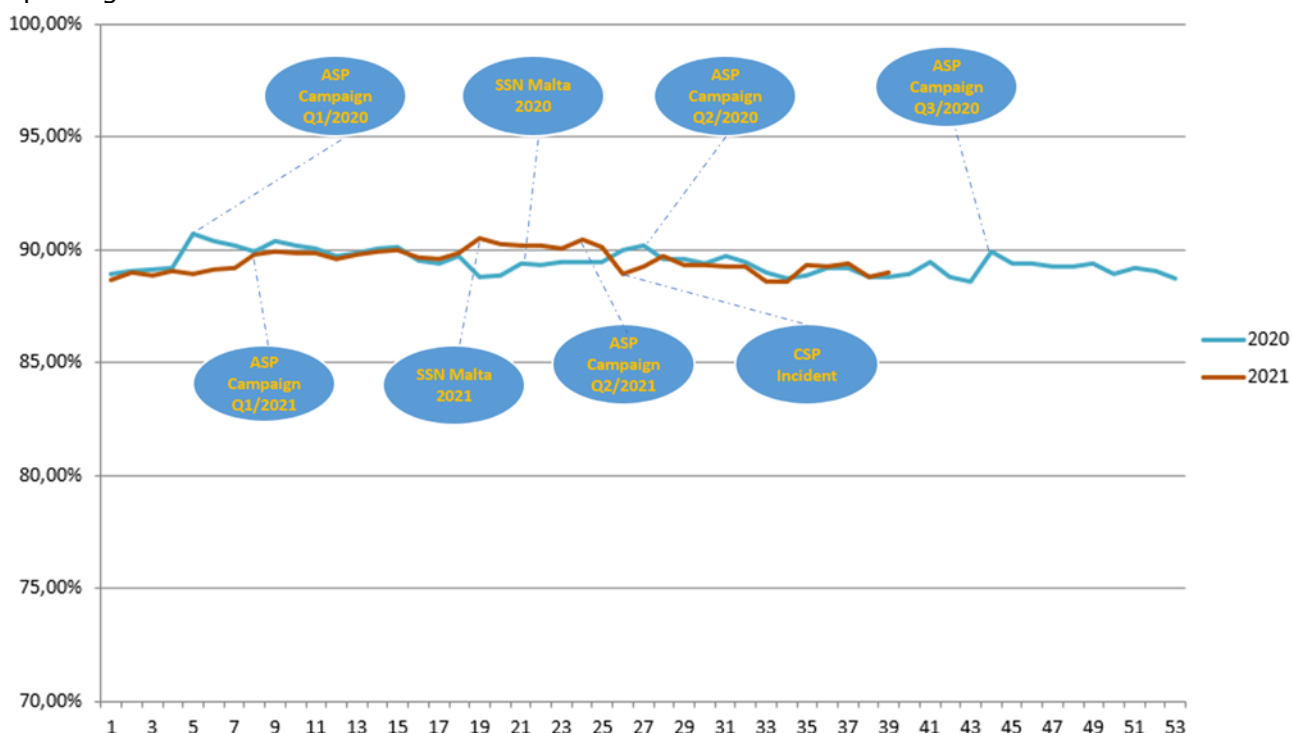
It should be noted that “stopped ships” are also included in the number of the integrated ships.

Table 4 presents a summary of the actions taken, mainly to improve the reporting, during the quarter:

Table 4 – Integration and reporting actions

	July	August	September
Number of ‘Stop’	40	40	55
Number of ‘Restart’	2033	1160	1172
Number of ‘Continue integration’	9	50	62
Number of ‘DNID upload’	164	321	267

The activity of restarting ship terminals not reporting as expected is measurable through the number of restarts and DNID uploads performed by LRIT users (or by the ASP, for countries which delegated the monitoring of their fleet to EMSA). Figure 1 shows the reporting evolution.



It is calculated as follows:

$$\% \text{ ship reporting} = \frac{\text{ships statuses normal, under and over reporting}}{\text{ships statuses normal, under, over and not reporting}} \times 100\%$$

Ships stopped, either by the National Administrations or by the ASP, are not included in this graph.

Currently 12 Contracting Governments (CGs) have delegated the monitoring of their fleet to EMSA. For these flags, the ASP takes the appropriate actions in case of non-reporting ships, or reports to the CGs the actions that remain under the responsibility of the CGs (such as updating the EU LRIT Ship DB or asking the shipowner to correctly log in the terminal to the satellite network).

EMSA, through the ASP, monitors almost 65% of the EU CDC fleet. The good result on the reporting is also due to the fact that some CGs monitor closely their fleet and take the appropriate actions to restart the reporting when needed. A high reporting rate is directly linked to the active monitoring of the fleet.

2.5. REQUESTS AND POSITIONS IN THE EU CDC

This chapter details the number of requests made by the CGs, and the positions processed by the EU CDC. It should be noted that the activity generated by ship

integration and reporting (Stop, Restart, DNID upload...) is reported in section 2.4 above.

97.3% of LRIT position reports came from the ASP (mandatory reporting), the remaining position reports came from the LRIT IDE.

Inmarsat C is the biggest CSP of the ASP, routing around 97.4% of the ASP reports.

89.2% of the position requests are split between requests generated automatically by the SAM anti-piracy tool and requests generated by EU CDC end-users: SAR, Coastal, Flag, and Port. The remaining position requests came from the LRIT IDE.

Figures showing these data are in § 3.4.1 General.

2.5.1. Standard requests activity per Flag

This section deals with requests made by LRIT users and position reports, processed by the EU CDC during September.

Figure 2 shows the standard requests (Message Type 4: polls, reporting rate changes, requests for most recent and archived positions, stop and restart) made by LRIT Users and the SAM anti-piracy tool. Countries with less than 4 requests are not included.

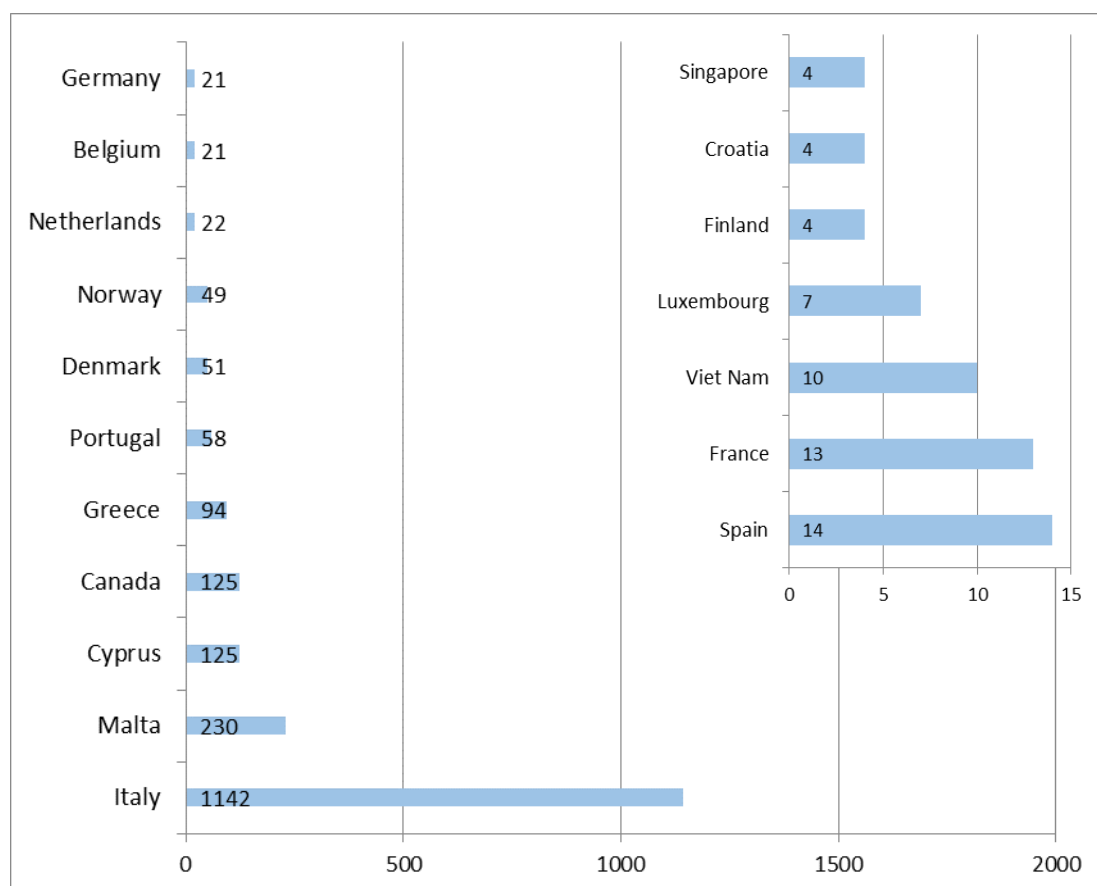


Figure 2 – Number of requests processed by EU CDC (Message Type 4)

Figure 2 that Italy is the country making most requests to the EU CDC to get EU LRIT positions. This is mainly due to the Automatic Rate Change tool activated on the Italian standing order off the coasts of Tunisia and Libya.

Figure 3 shows the position reports (Message Type 1: periodic position reports, and Message Type 2: polled position reports) per flag resulting from:

- the requests shown in Figure 2.
- Standing Orders (it includes positions from European ships and non-European ships passing through European waters).

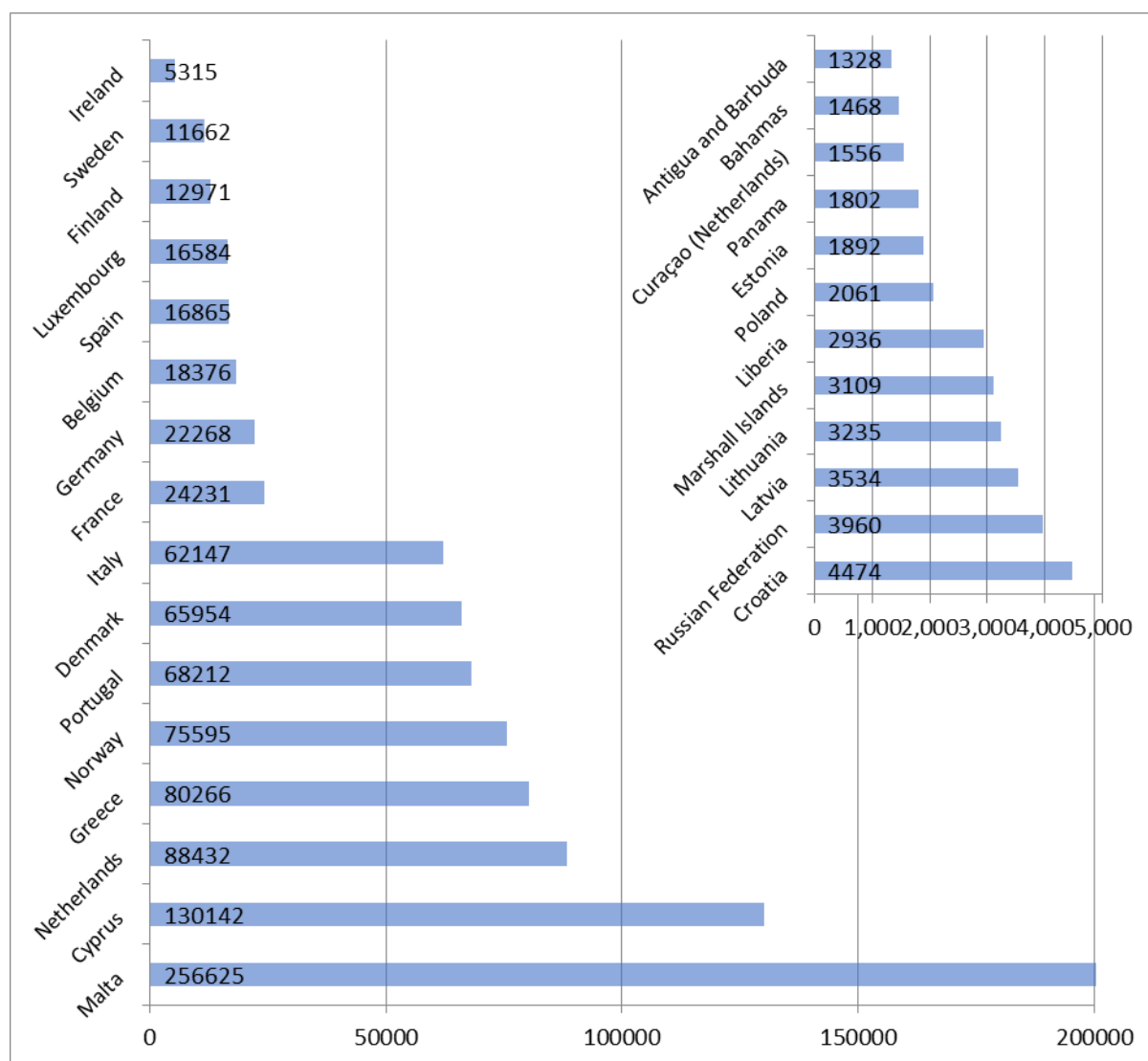


Figure 3 – Number of reports received by the EU CDC (Messages Type 1 and 2)

Countries with less than 1,000 position reports are not included. Malta, with 28% of the EU CDC fleet, is the country with the highest number of position reports received.

2.5.2. SAR requests activity per Flag

For the month of September:

- Figure 4 shows the SAR and SARSURPIC requests made by LRIT Users. Countries with less than 4 requests are not included.
- Figure 5 shows the related position reports (message Type 3). Countries with less than 20 positions received are not included.

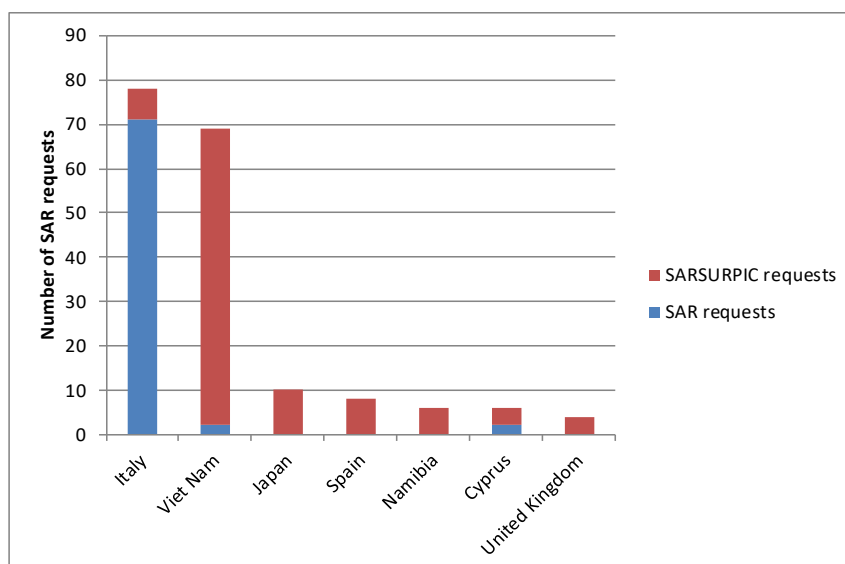


Figure 4 – Number of SAR Requests per Flag

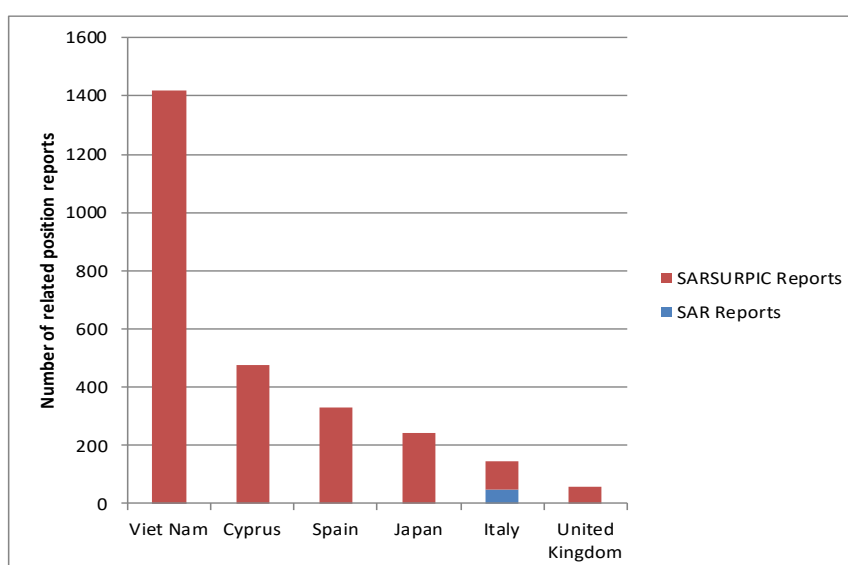


Figure 5 – Number of related position reports received

The SAR SURPIC is a request used by SAR Operators. In Europe, Italy was the biggest user of SAR and SAR SURPIC requests in September, and Cyprus and Spain also received the biggest amount of SAR related positions.

2.5.3. Evolution of messages exchanged

Position requests are in this quarter around 1,972 per month, which is almost 7% less than Q2 2021.

Position reports are in this quarter on average at 1,017,693, which is 0.1% more than Q2 2021.

Figures showing these data are in § 3.4.2 Evolution of Messages exchanged.

2.6. USER ACTIVITY IN THE EU CDC

This section details the user activity in the UWI and through the XML interfaces.

2.6.1. User activity in the EU CDC UWI

Table 5 illustrates the user activity in the UWI of the EU CDC during September. An inactive user is a user which has not connected to the EU CDC during this month.

Table 5 – User activities per flag

Contracting Governments	Total users	Inactive users	Number of connections
Belgium	52	48	42
Bulgaria	16	13	22
Croatia	15	12	43
Curaçao (Netherlands)	6	5	1
Cyprus	8	4	114
Czech Republic	1	1	0
Denmark	262	254	20
Estonia	5	4	1
Finland	27	22	17
France	20	15	61
Georgia	3	1	31
Germany	30	25	89
Greece	76	74	33
Greenland (Denmark)	8	8	0
Iceland	43	43	0
Ireland	6	5	47
Italy	616	584	681
Latvia	14	10	29
Lithuania	10	5	78
Luxembourg	13	10	21
Malta	14	11	52
Montenegro	19	12	43
Netherlands	13	11	11
Norway	30	28	28
Poland	16	12	104
Portugal	13	11	7
Romania	7	7	0
Slovakia	4	4	0
Slovenia	27	27	0
Spain	67	63	67
Sweden	30	29	13
Tunisia	3	3	0
TOTAL	1474	1361	1655

Italy is the country making the greatest number of connections to the EU LRIT CDC UWI.

Table 6 summarizes the user activity in the UWI during the quarter.

Table 6 – User activities

	July	August	September
Number of users	1466	1470	1474
Number of user connection	1854	1744	1655
Number of inactive users	1362	1371	1361

During Q3 2021 the number of users slightly increased.

2.6.2. User activity in the XML interfaces

The EU CDC XML interface is based on Web Services (SOAP v. 1.2) and gives the possibility to External Systems (ES) to request and receive LRIT Information in an automatic way through a system-to-system interface. Currently, eight XML interfaces are implemented with the EU CDC Participating countries:

- LRIT2ES interface allows EU CDC Participating countries ES to receive LRIT information from the EU CDC, typically the 6h mandatory position reports and position reports resulting from a Coastal Standing Order activated.
- ES2LRIT interface allows EU CDC Participating countries ES to receive the above information, but also to request LRIT information, including making specific requests. Belgium, Italy, Montenegro and Poland implemented this type of interface.

Table 7 – Information exchanged through XML interfaces

Country	Mandatory and polled position reports	Position requests	Ship particulars requests
BELGIUM-ES	40301	0	0
DENMARK-ES	153530	N/A	N/A
GREENLAND-ES	12278	N/A	N/A
IRELAND-ES	48340	N/A	N/A
ITALY-ES	199972	305	0
MONTENEGRO-ES	1277	0	0
NORWAY-ES	219965	N/A	N/A
POLAND-ES	6123	0	0

Table 7 shows the countries using XML interfaces, the information received and the number of requests done through ES2LRIT interfaces during Q3 2021.

2.7. FINANCIAL FIGURES

Figures 6 to 8 highlight the EU CDC Participants' Paid Consumption, the messages provided and sold by the EU CDC per buying Data Centre and the overall business financial balance, during Q3 2021.

This quarter, EMSA covered more than €255K of consumption costs. The remaining costs paid by the EU CDC Participants amounted more than €13K. The EU CDC sells more than €46K of LRIT messages to other DCs (Figure 6).

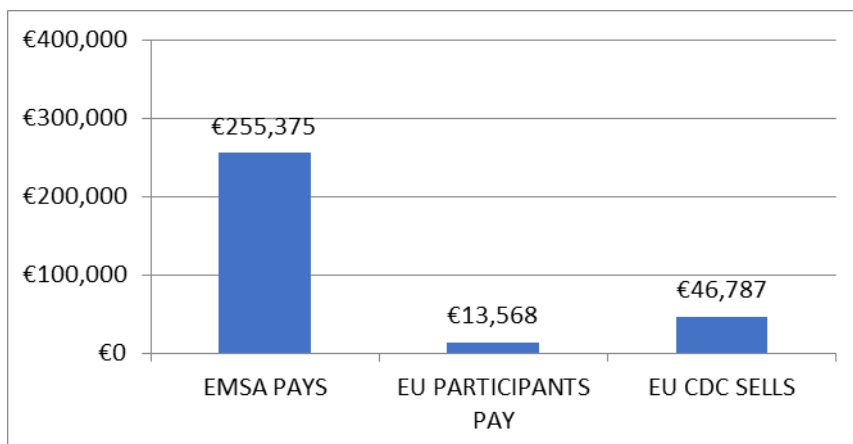


Figure 6 – Overall LRIT Business Financial Monthly Balance

The few relevant buyers of non-mandatory messages were Norway, Italy, and Ireland (Figure 7). To be noted that the increase for Italy is due to the activation of the Automatic Rate Change functionality over their Coastal State Standing Order off the coasts of Tunisia and Libya since June 2019.

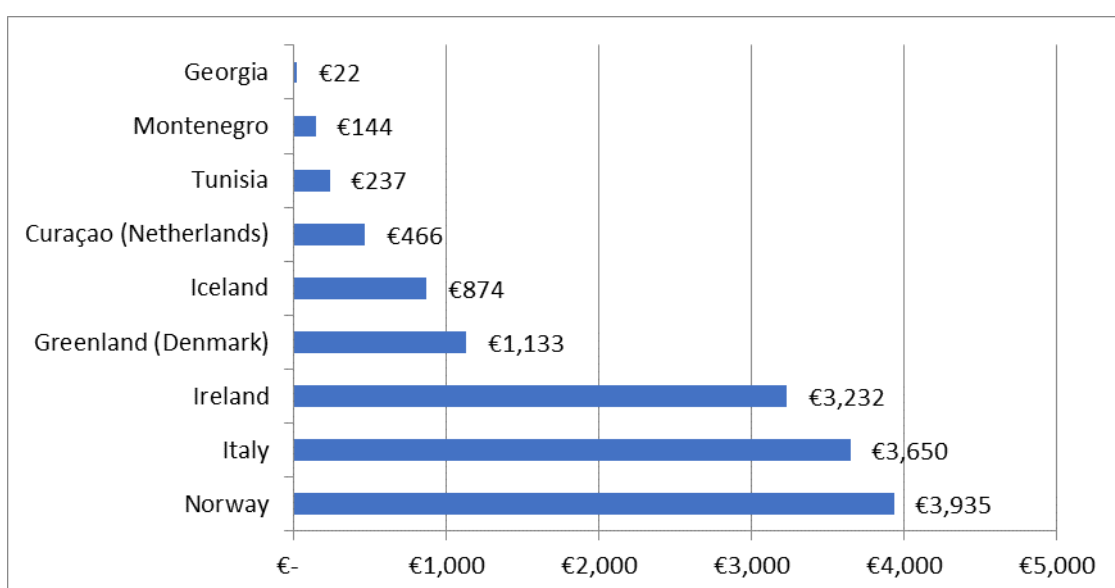


Figure 7 – EU CDC Participants' Paid Consumption

The biggest buyer of EU CDC data was the US LRIT NDC which bought 55.2% of the amount sold, followed by the Canada LRIT NDC with a 31.6% (Figure 8).

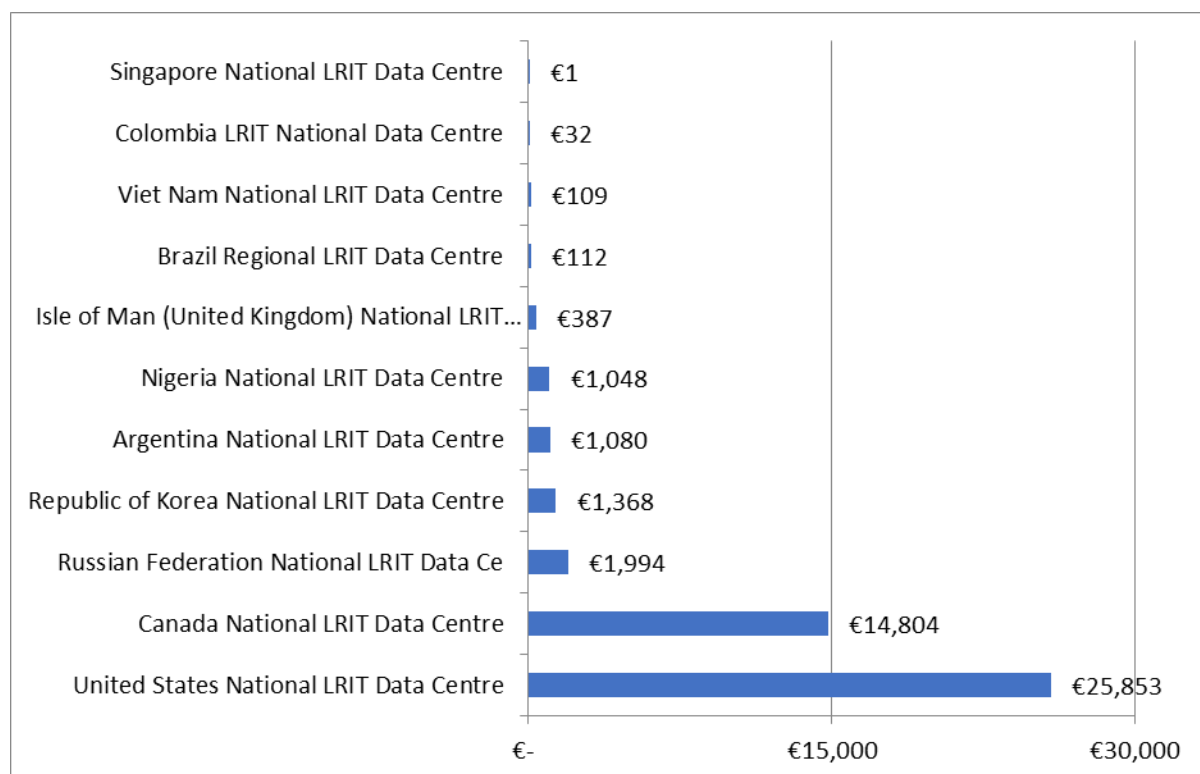


Figure 8 – Messages Sold by the EU CDC per Buying Data Centre

Legend:

- EMSA pays for all costs of mandatory periodic reports (periodic 6-hour reporting from EU ships), SAR messages and ship integration for Member States and EFTA countries.
- EU CDC participants pay for ship integration and LRIT messages for OCTs and third countries, and for all non-mandatory messages (on-demand), including reports from standing orders. This includes messages from other Data Centres through the LRIT IDE and from the ASP (detail in Figure 6).
- EU CDC sells all messages concerning ships belonging to the EU LRIT CDC that are requested by other DCs (detail in Figure 8).

2.8. HIGHLIGHTS

- All the performance indicators are above the targets during the 3rd Quarter.
- A new release of the EU LRIT CDC is planned to be deployed before the end of 2021.
- A new release of the EU LRIT Ship DB was deployed during the 3rd Quarter.
- The report of the 12th Audit was issued by IMSO.
- The process for the integration of Serbia in the EU CDC is on-going.

3. ANNEXES

3.1. List of acronyms and abbreviations

Table 8 – List of acronyms and abbreviations

Acronyms or abbreviations	Description
ASP	Application Service Provider
CG	Contracting Government
CSP	Communication Service Provider
EMSA	European Maritime Safety Agency
EU LRIT CDC	European Union LRIT Cooperative Data Centre
IDE	International Data Exchange
IMO	International Maritime Organization
LRIT	Long Range Identification and Tracking (of ships)
NCA	National Competent Authority
OCTs	Overseas Countries and Territories
QoS	Quality of Service
SAR	Search and Rescue
EU LRIT Ship DB	European Union LRIT Ship Database
UWI	User Web Interface
N/A	Not Applicable

3.2. Definitions

According to IMO MSC.1/Circ.1259/Rev.7, the definitions of internal routing and message Types 1 to 6 are:

Table 9 – Definitions

Type	Name	Description/Purpose
N/A	Internal Routing	Regional or Cooperative LRIT Data Centres internally route LRIT information transmitted by ships entitled to fly the flag of the Contracting Governments establishing or participating such centres (LRIT information does not go through the IDE)
1	Periodic position Report	Regular periodic position reports
2	Polled position report	Position report as a result of a one-time poll request
3	SAR position report	Position report as a result of a SAR request
4	Position request	Request by an LRIT user to poll, change the rate of transmission, or request for most recent and archived positions, for a given ship
5	SAR position request	Request by a SAR user to poll or request for most recent and archived positions, for a given ship
6	SAR SURPIC request	Request by a SAR user to get the most recent position in a specific geographical area, broadcast via the IDE to all DCs

3.3. System performance

This section refers to messages delivered by the EU LRIT CDC and gives further details on the QoS for the quarter.

3.3.1. Global QoS

Figure 9 illustrates the IMO-QoS for the quarter, showing that a major incident happened this quarter.

On July 23rd, the ASP experienced a sending delay due to a high CPU load on the site-entry firewall during a DDOS attack. Almost 1,302 data reports delayed.

An external anti-DDOS service was implemented on July 30th with together with the Internet Service Provider to block this kind of attack. The ASP also put in place 24/7 emergency procedures and processes with ISP to analyze and react in case of suspicious entries. The objective of this new anti-DDOS service is to block upstream any new attempts.

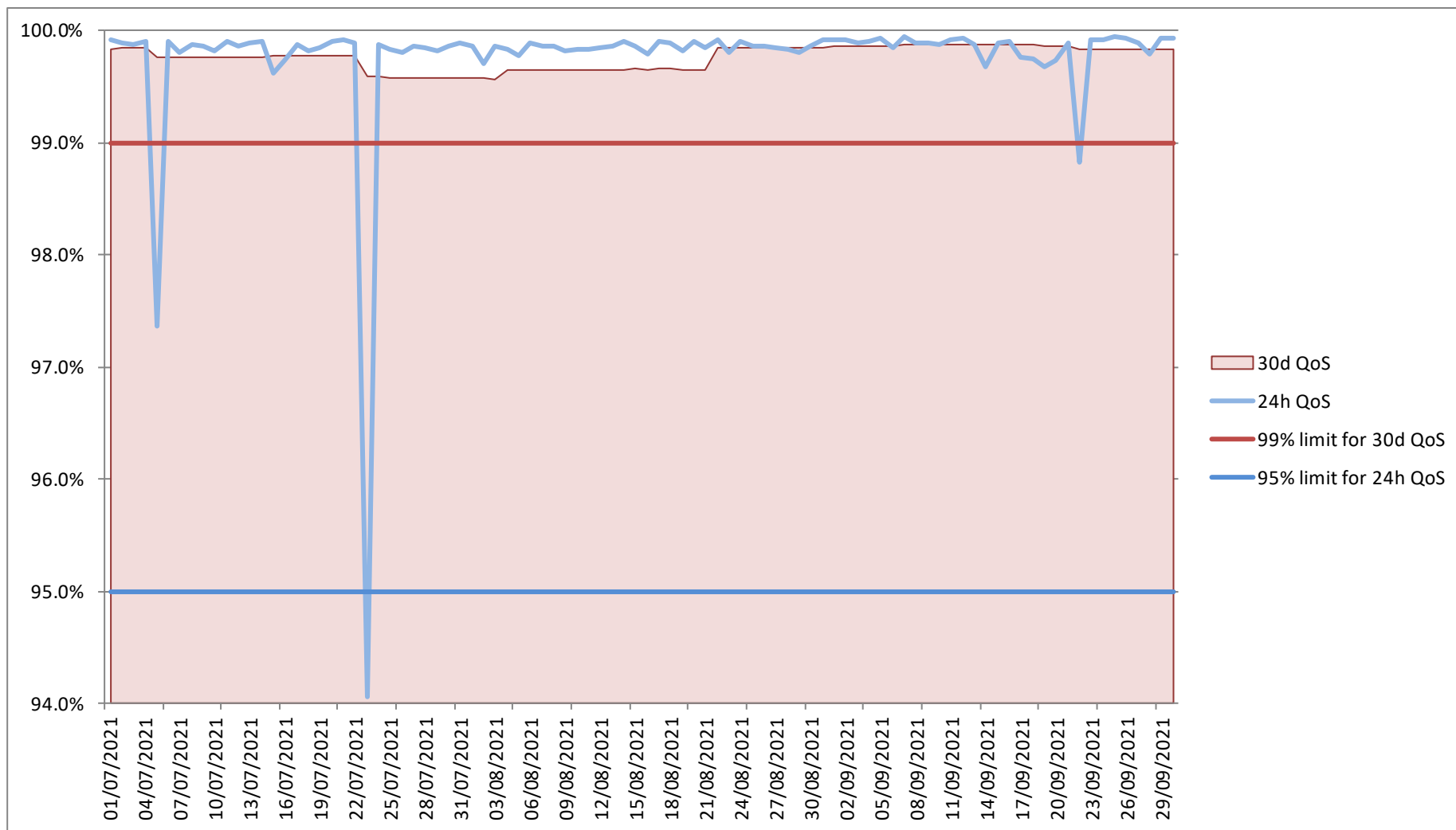


Figure 9 – IMO-24h and 30d QoS

3.3.2. Delivered periodic position reports QoS (Type 1)

Table 10 – Delivered periodic position reports QoS figures

	July	August	September
Monthly IMO-30d QoS (target 99%)	99.59%	99.85%	99.84%
Number of Reports that did not meet the 15 min limit	3,401	1,226	1,289
Percentage of Reports out of the 15 min limit	0.41%	0.15%	0.16%
Total number of Reports	832,192	828,098	805,356
Average Latency in minutes	3.65	3.15	3.11

These are mainly the mandatory position reports, sent every 6 hours.

3.3.3. Delivered on-demand position reports QoS (Type 2 and Type 3)

A poll is the action of sending a position request to a shipborne equipment and waiting for a ship position report or a receipt message. IMO defined that this action should not last more than 30mins to receive a position report.

The table below lists only the polls made to EU LRIT CDC ships, in order to measure the EU LRIT CDC QoS on requests. Reports as a result of polls originated by other DCs are not listed here, to avoid measuring the QoS of other DCs. This quarter, 30d Poll QoS was above the target.

Table 11 – Delivered on-demand reports QoS figures

	July	August	September
Monthly IMO-30d Poll QoS (target 99%)	100.00%	100.00%	100.00%
Number of Reports that did not meet the 30 min limit	0	0	0
Percentage of Reports out of the 30 min limit	0.00%	0.00%	0.00%
Total Number of Reports	38	40	60
Average Latency in minutes	2.27	2.36	2.69

3.4. Messages by source

3.4.1. General

The figure below shows the analysis of positions by source, for September.

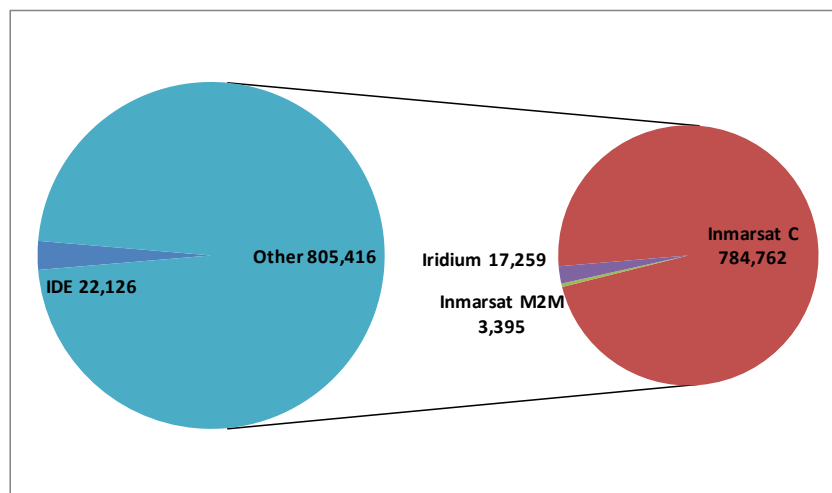


Figure 10 – Position reports by network (Message Type 1, 2 and 3)

The 3 pie charts below show the position requests by source, for September.

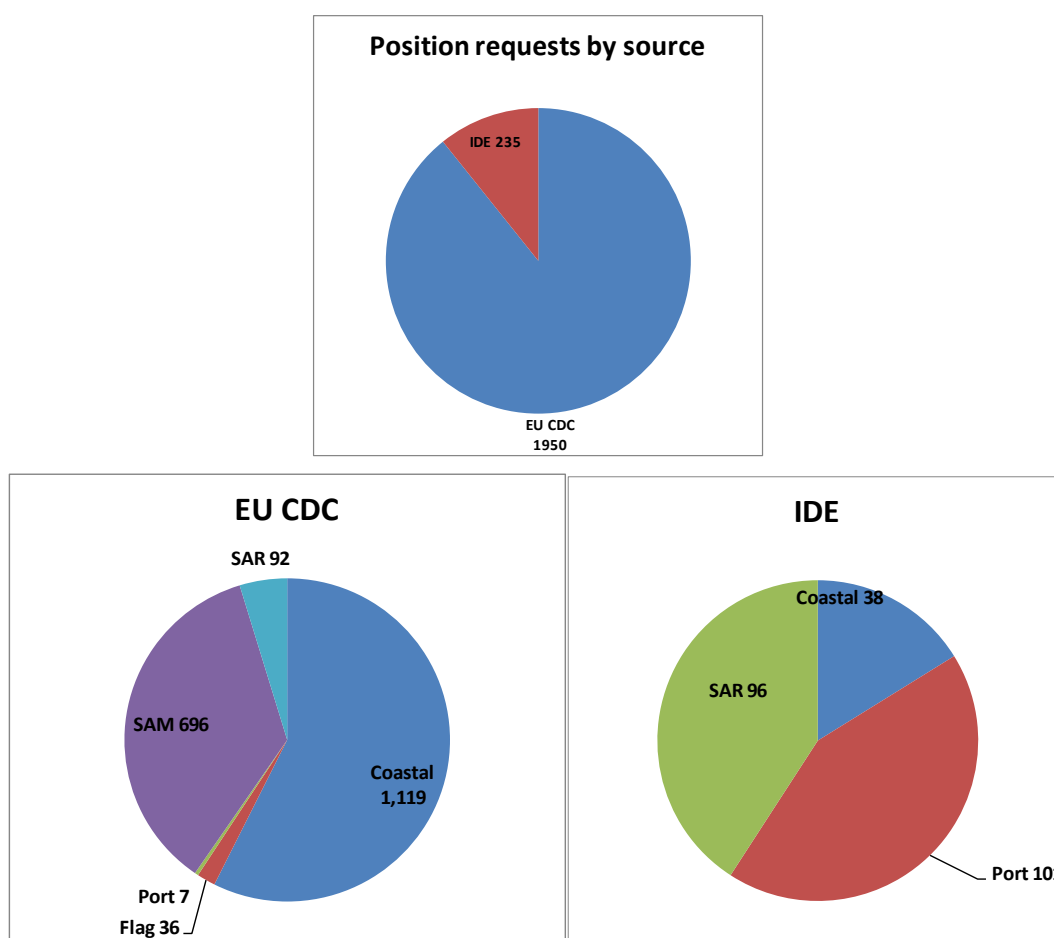


Figure 11 – Position requests by role (Message Type 4, 5 and 6)

3.4.2. Evolution of messages exchanged

This section illustrates the evolution of the message flow of the EU CDC.

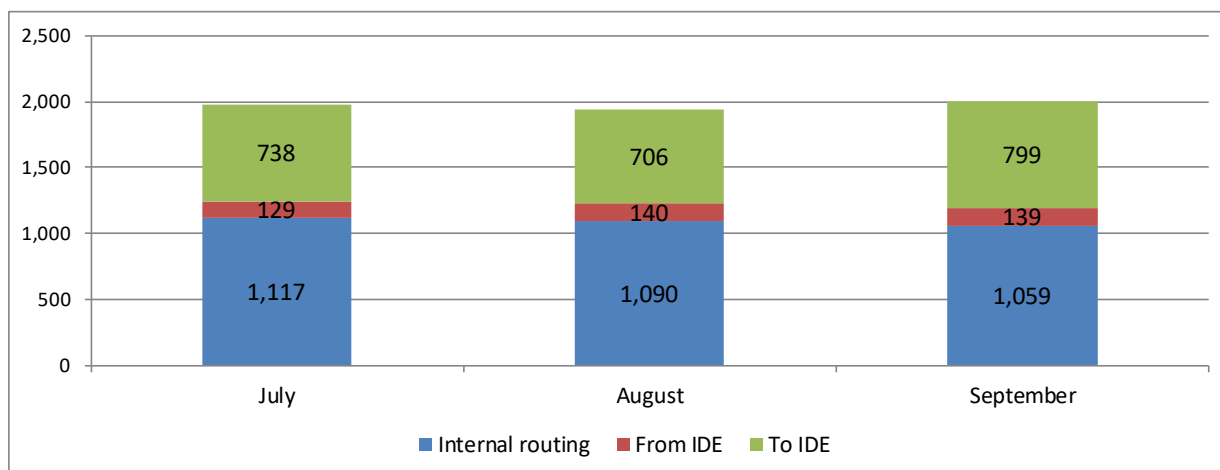


Figure 12 – Number of position requests (Type 4)

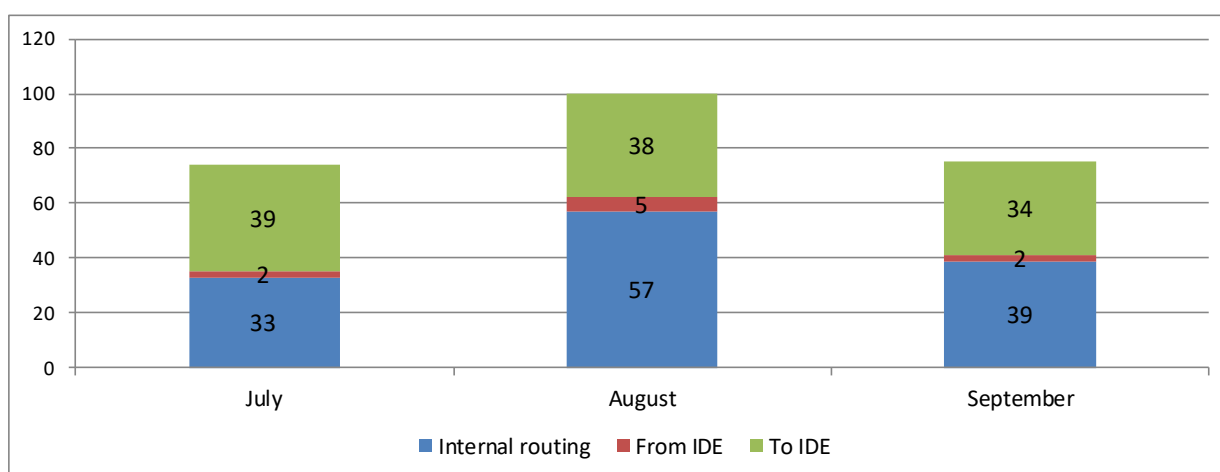


Figure 13 – Number of SAR requests (Type 5)

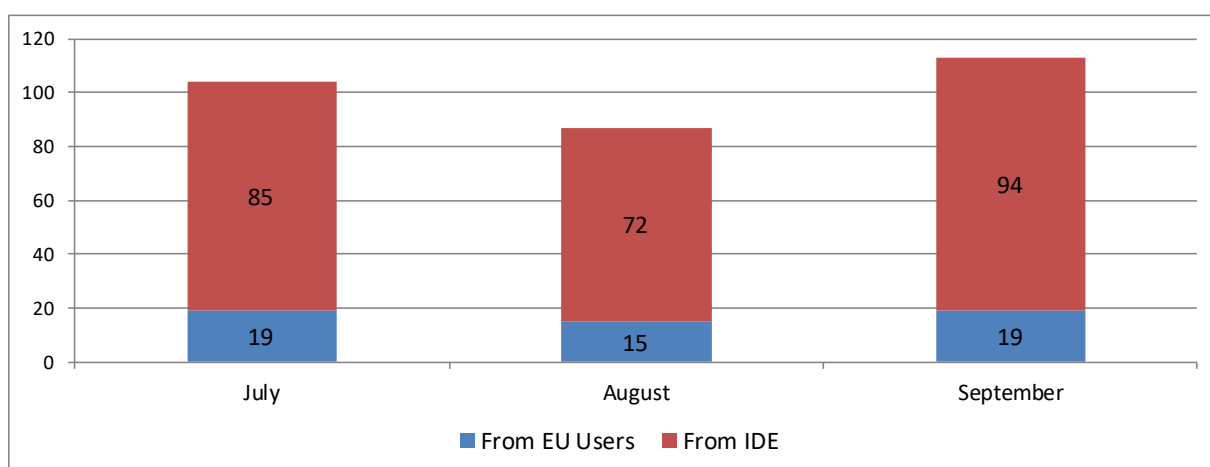


Figure 14 – Number of SAR SURPIC requests (Type 6)

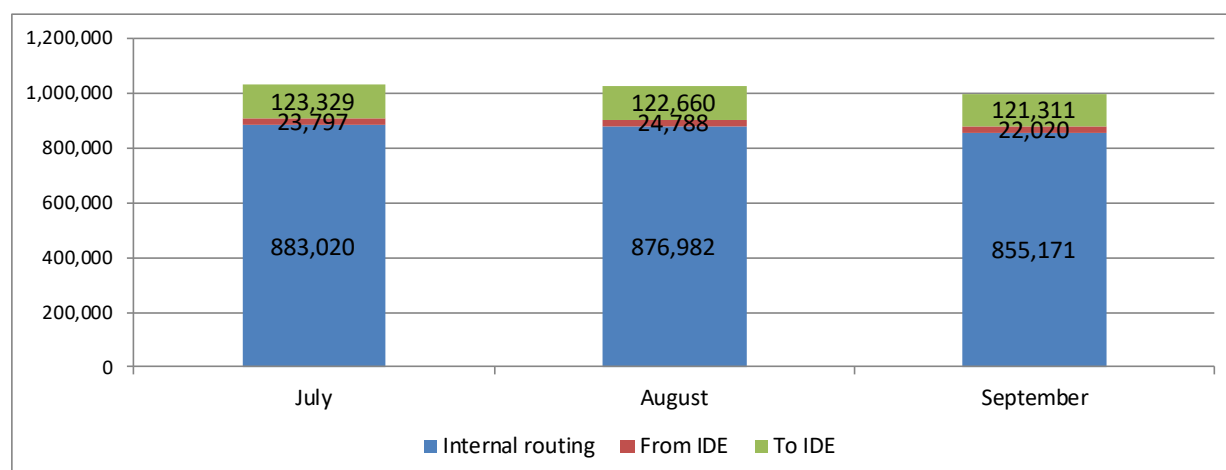


Figure 15 – Number of position reports (Type 1, 2 & 3)

3.5. Incidents and maintenance of the EU CDC

3.5.1. Incident management overview

Incidents in the EU CDC generate tickets in MSS through a monitoring tool called Task Monitor. Calls and emails from EU CDC Participating countries also generate tickets. For these, a new ticketing tool called Jira has been implemented since 14 February 2019.

For this quarter and the previous one, Table 12 shows the repartition of the tickets handled by the MSS:

Table 12 – Incident management

	Q2 2021	Q3 2021
Number of LRIT CDC and EU LRIT Ship DB tickets out of total number MSS tickets	198 / 4314 (4.6%)	250 / 4314 (5.8%)
<u>Ticket per type</u>		
Administration and reporting:	28	29
Helpdesk (CGs, ASP...):	68	81
Monitoring and Incident management (Task Monitor...):	219	139



Quarterly Report

Q4 – 2021

EU LRIT CDC

and

EU LRIT Ship DB

DOCUMENT HISTORY

Version	Date	Comments
1.0	07/01/2022	First Issue

APPROVAL

	Name	Date	Signature
Approved by:	Lazaros Aichmalotidis	07/01/2022	LAI

DISTRIBUTION LIST: ACCESS ON-LINE (USER WEB INTERFACE)

EMSA, Commission, LRIT NCA, LRIT end-users

List of Contents

1. SCOPE OF THE DOCUMENT	5
2. EU CDC MAIN FIGURES	5
2.1. EU CDC HIGHLIGHTS	5
2.2. KEY PERFORMANCE INDICATORS	6
2.3. SYSTEM PERFORMANCE	6
2.4. SHIP INTEGRATION AND REPORTING	7
2.5. REQUESTS AND POSITIONS IN THE EU CDC	9
2.5.1. Standard requests activity per Flag	9
2.5.2. SAR requests activity per Flag	11
2.5.3. Evolution of messages exchanged	12
2.6. USER ACTIVITY IN THE EU CDC	13
2.6.1. User activity in the EU CDC UWI	13
2.6.2. User activity in the XML interfaces	14
2.7. FINANCIAL FIGURES	15
2.8. CONCLUSION	17
3. ANNEXES	18
3.1. List of acronyms and abbreviations	18
3.2. Definitions	19
3.3. System performance	19
3.3.1. Global QoS	19
3.3.2. Delivered periodic position reports QoS (Type 1)	21
3.3.3. Delivered on-demand position reports QoS (Type 2 and Type 3)	21
3.4. Messages by source	22
3.4.1. General	22
3.4.2. Evolution of messages exchanged	23
3.5. Incidents and maintenance of the EU CDC	24
3.5.1. Incident management overview	24

List of Figures

Figure 1 – Evolution of reporting rate	8
Figure 2 – Number of requests processed by EU CDC (Message Type 4)	10
Figure 3 – Number of reports received by the EU CDC (Messages Type 1 and 2)	11
Figure 4 – Number of SAR Requests per Flag	12
Figure 5 – Number of related position reports received	12
Figure 6 – Overall LRIT Business Financial Monthly Balance	15
Figure 7 – EU CDC Participants' Paid Consumption	16
Figure 8 – Messages Sold by the EU CDC per Buying Data Centre	16
Figure 9 – IMO-24h and 30d QoS	20
Figure 10 – Position reports by network (Message Type 1, 2 and 3)	22
Figure 11 – Position requests by role (Message Type 4, 5 and 6)	23
Figure 12 – Number of position requests (Type 4)	23
Figure 13 – Number of SAR requests (Type 5)	23
Figure 14 – Number of SAR SURPIC requests (Type 6)	23
Figure 15 – Number of position reports (Type 1, 2 and 3)	24

List of Tables

Table 1 – Key Performance Indicators	6
Table 2 – Monthly 30d QoS	7
Table 3 – Integration and reporting statuses	7
Table 4 – Integration and reporting actions	8
Table 5 – User activities per flag	13
Table 6 – User activities	14
Table 7 – Information exchanged through XML interfaces	14
Table 8 – List of acronyms and abbreviations	18
Table 9 – Definitions	19
Table 10 – Delivered periodic position reports QoS figures	21
Table 11 – Delivered on-demand reports QoS figures	21
Table 12 – Incident management	24

1. SCOPE OF THE DOCUMENT

This document provides information on the performance of the European Union LRIT Cooperative Data Centre (EU LRIT CDC or EU CDC), European Union LRIT Ship Database (EU LRIT Ship DB) and events related to the EU CDC activities and operations during the 4th Quarter of 2021. The report is made available to all LRIT Users of the EU CDC via its User Web Interface (UWI).

To avoid overloading the report with figures, some graphs show data only for one month. The results of the quarter are presented and summarized in tables.

This document is divided into two parts:

- **EU CDC Main figures** gives a general overview of the status of the EU CDC, its main issues and Key Performance Indicators (KPI).
- **Annexes** show detailed graphs and figures of the EU CDC which are referred to in the first part.

2. EU CDC MAIN FIGURES

2.1. EU CDC HIGHLIGHTS

The following are the highlights for the 4th Quarter of 2021:

- **Quality of Service (QoS):** all the performance indicators are above the targets.
- **EU LRIT CDC v3.16:** testing is on-going. New version expected to be deployed in production in February 2022.
- **EU LRIT Ship DB v3.2:** testing is on-going. New version expected to be deployed in production in February 2022.
- **EU LRIT CDC in SEG:** developments for the integration of EU CDC functionalities in SEG are in progress.
- **Integration of Serbia in the EU LRIT CDC:** the process for integrating Serbia in the EU CDC is in-progress.

2.2. KEY PERFORMANCE INDICATORS

Table 1 presents the KPIs used for measuring the EU CDC performance (most of the KPIs are based on the IMO requirements - time format is hh:min):

Table 1 – Key Performance Indicators

Activity/Service	Performance Indicator	October	November	December	Quarter	Target
EU LRIT CDC System operational	Availability of the system over the period	100%	100%	99.8%	99.93%	≥ 99.00%
	Maximum continuous downtime of the EU LRIT CDC	00:00	00:03	00:39	00:39	< 12:00
EU LRIT CDC Reporting performance	Percentage position reports delivered according to IMO requirement	99.76%	99.64%	99.31%	99.57%	≥ 99.00%
EU LRIT CDC user web interface	Availability of the User Web Interface	100%	100%	99.82%	99.94%	≥ 99.00%

The availability of the User Web Interface of the EU CDC was very high.

The availability of the Web Interface of the EU LRIT Ship DB (not presented in the Table 1) was also high at 99.95% this quarter.

2.3. SYSTEM PERFORMANCE

This section refers to messages delivered by the EU CDC. The Quality of Service (QoS) measures if messages were properly delivered.

According to MSC Res. 263(84) §13 document, the IMO definition of QoS is:

$$\text{QoS} = \frac{\text{Number of delivered LRIT reports meeting latency requirements}}{\text{Total number of LRIT information requests}} \times 100\%$$

The QoS refers to Periodic (Type 1), Poll (Type 2) and SAR (Type 3) position reports which were delivered by the EU LRIT CDC as per IMO requirements.

The target QoS is:

- 95% over any 24-hour period (24h QoS).
- 99% over any 1 month (30d QoS).

Table 2 presents the monthly QoS covering both the periodic and polled messages:

Table 2 – Monthly 30d QoS

	October	November	December
Monthly IMO-30d QoS (target 99%)	99.76%	99.64%	99.31%
Number of delivered reports that did not meet the IMO requirements	2,009	2,927	5,646
Percentage of delivered reports that did not meet the IMO requirements	0.24%	0.36%	0.69%
Total number of reports sent by EU CDC	832,732	808,239	821,128

The 30d QoS was above the IMO requirement this quarter.

Further detailed information on the 24h and 30d QoS as well as the QoS for periodic reports or for polled reports can be found in Annexes, § 3.3 System Performance.

2.4. SHIP INTEGRATION AND REPORTING

Table 3 presents a snapshot of the ship integration and ship reporting during the last complete week of each referenced month:

Table 3 – Integration and reporting statuses

	October	November	December
Total of ships in the EU LRIT CDC	8304	8316	8310
Ships integrated in the EU LRIT CDC	8036	8054	8054
(*=% of total of ships)	96.77% *	96.85% *	96.92% *
Ships that have reported in the last 3 days	6975	6954	7007
(**=% of ships integrated)	86.8% **	86.34% **	87% **

The formula used for the ship reporting calculation is:

$$\% \text{Ship reporting} = \frac{\text{ships statuses normal, under and over reporting}}{\text{all ships integrated}} \times 100\%$$

It should be noted that “stopped ships” are also included in the number of the integrated ships.

Table 4 presents a summary of the actions taken, mainly to improve the reporting, during the quarter:

Table 4 – Integration and reporting actions

	October	November	December
Number of ‘Stop’	75	51	76
Number of ‘Restart’	1541	1097	1673
Number of ‘Continue integration’	14	11	32
Number of ‘DNID upload’	314	375	154

The activity of restarting ship terminals not reporting as expected is measurable through the number of restarts and DNID uploads performed by LRIT users (or by the ASP, for countries which delegated the monitoring of their fleet to EMSA).

Figure 1 shows the reporting evolution:

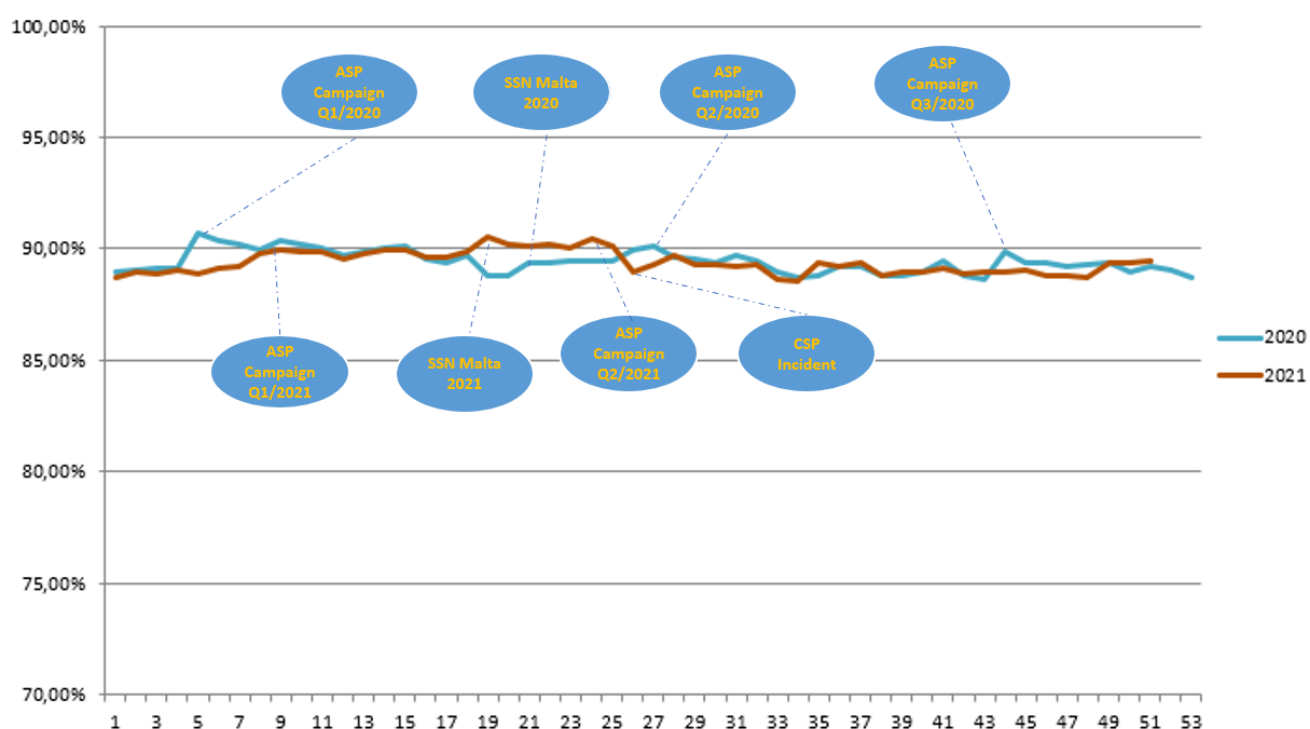


Figure 1 – Evolution of reporting rate

It is calculated as follow:

$$\% \text{Ship reporting} = \frac{\text{ships statuses normal, under and over reporting}}{\text{ships statuses normal, under, over and not reporting}} \times 100\%$$

Ships stopped, either by the National Administrations or by the ASP, are not included in this graph.

Currently 12 Contracting Governments (CGs) have delegated the monitoring of their fleet to EMSA. For these flags, the ASP takes the appropriate actions in case of non-reporting ships or reports to the CGs the actions that remain under the responsibility of the CGs (such as updating the EU LRIT Ship DB or asking the shipowner to correctly log in the terminal to the satellite network).

EMSA, through the ASP, monitors almost 65% of the EU CDC fleet. The good result on the reporting is also due to the fact that some CGs monitor closely their fleet and take the appropriate actions to restart the reporting when needed. A high reporting rate is directly linked to the active monitoring of the fleet.

2.5. REQUESTS AND POSITIONS IN THE EU CDC

This chapter details the number of requests made by the CGs, and the positions processed by the EU CDC. It should be noted that the activity generated by ship integration and reporting (Stop, Restart, DNID upload...) is reported in section 2.4 above.

97.65% of LRIT position reports came from the ASP (mandatory reporting), the remaining position reports came from the LRIT IDE.

Inmarsat C is the biggest CSP of the ASP, routing around 97.34% of the ASP reports.

92.16% of the position requests are split between requests generated automatically by the SAM anti-piracy tool and requests generated by EU CDC end-users: SAR, Coastal, Flag, and Port. The remaining position requests came from the LRIT IDE.

Figures showing these data are in Annexes § 3.4.1 General.

2.5.1. Standard requests activity per Flag

This section deals with requests made by LRIT users and position reports, processed by the EU CDC during December.

Figure 2 shows the standard requests (Message Type 4: polls, reporting rate changes, requests for most recent and archived positions, stop and restart) made by LRIT Users and the SAM anti-piracy tool, and Figure 3 the position reports (Message Type 1: periodic position reports, and Message Type 2: polled position reports). Countries with less than 4 requests are not included.

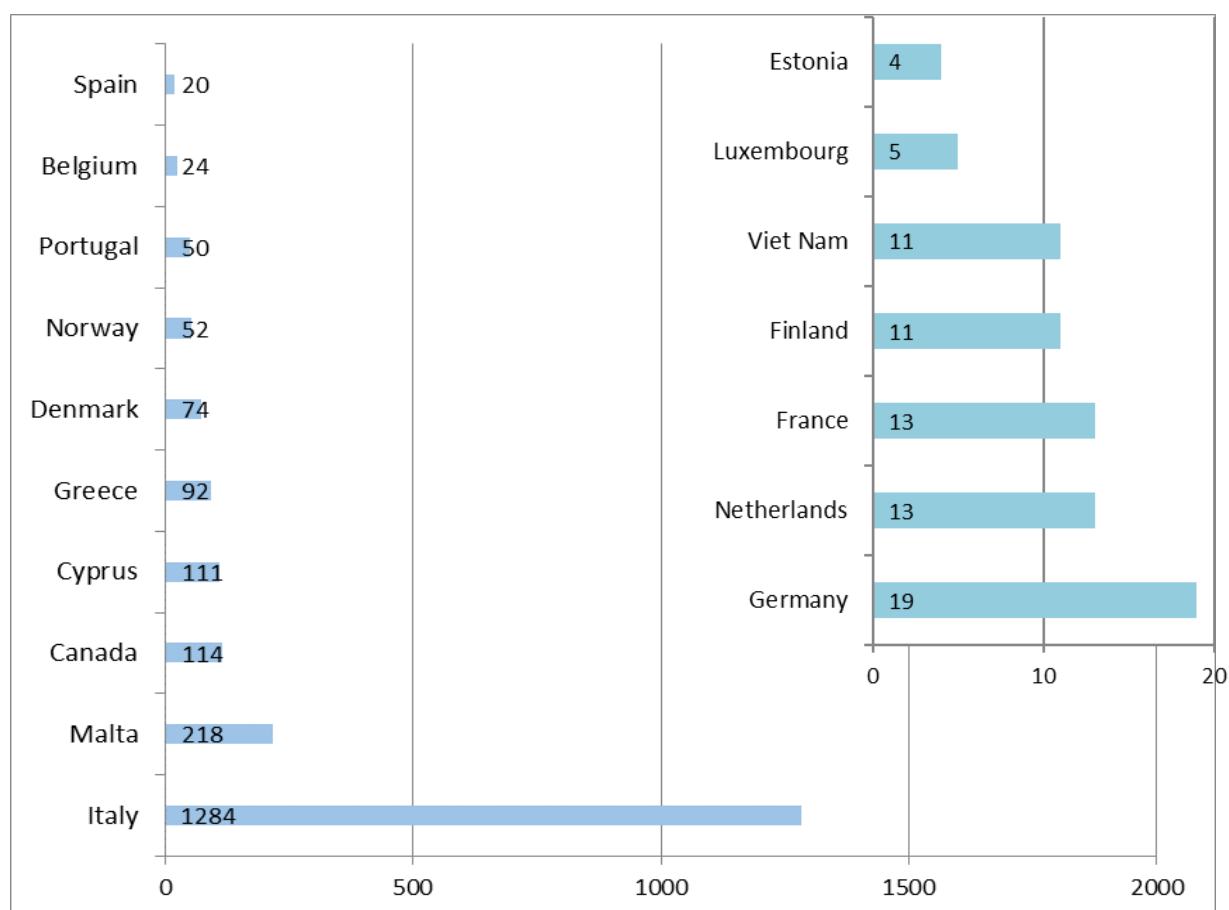


Figure 2 – Number of requests processed by EU CDC (Message Type 4)

Figure 2 shows that Italy is the country making most requests to the EU CDC to get EU LRIT positions. This is mainly due to the Automatic Rate Change tool activated on the Italian standing order off the coasts of Tunisia and Libya.

Figure 3 presents the number of position reports per flag resulting from:

- the requests shown in Figure 2.
- Standing Orders (includes positions from European ships and non-European ships passing through European waters).

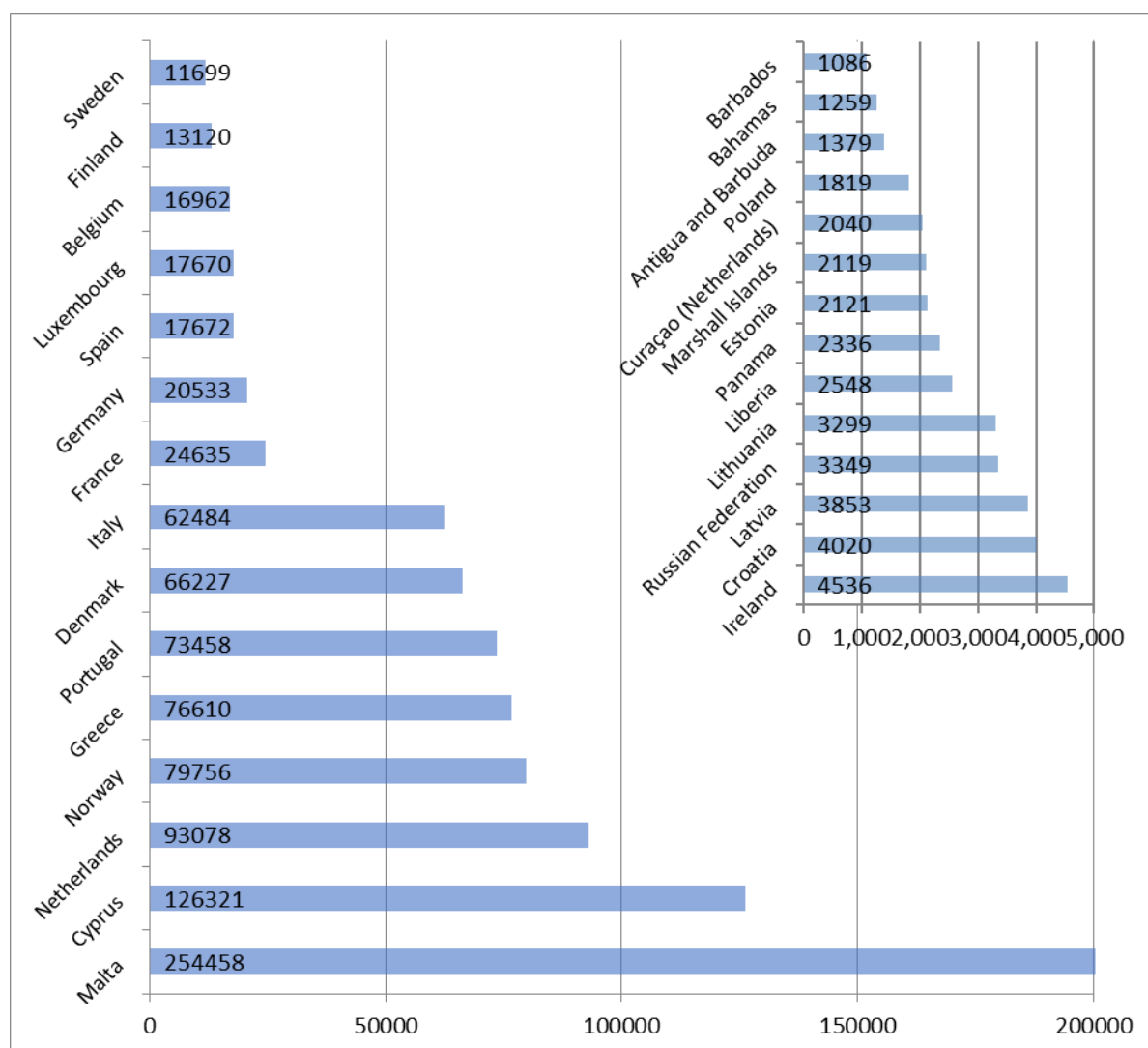


Figure 3 – Number of reports received by the EU CDC (Messages Type 1 and 2)

Countries with less than 1,000 position reports are not included. Malta, with 28% of the EU CDC fleet, is the country with the highest number of position reports received.

2.5.2. SAR requests activity per Flag

For the month of December:

- Figure 4 shows the SAR and SARSURPIC requests made by LRIT Users. Countries with less than 4 requests are not included.
- Figure 5 shows the related position reports (message Type 3). Countries with less than 20 positions received are not included.

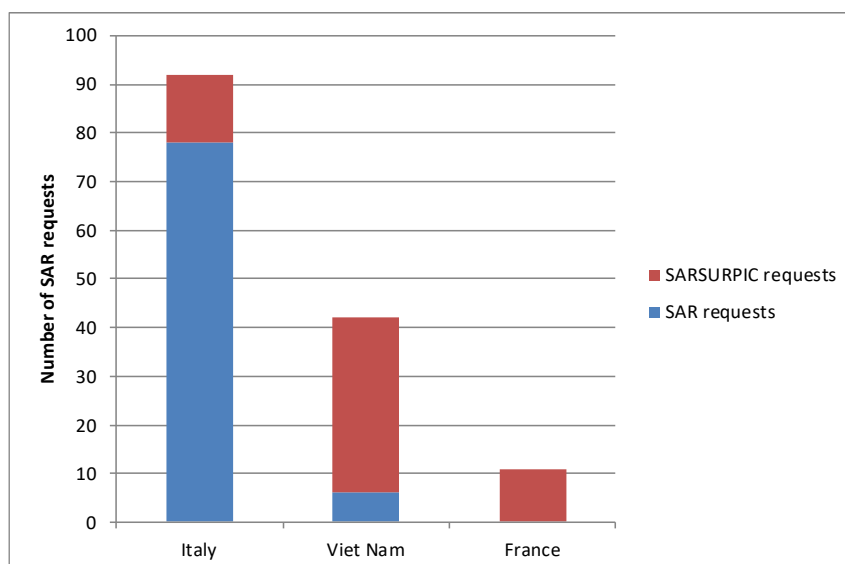


Figure 4 – Number of SAR Requests per Flag

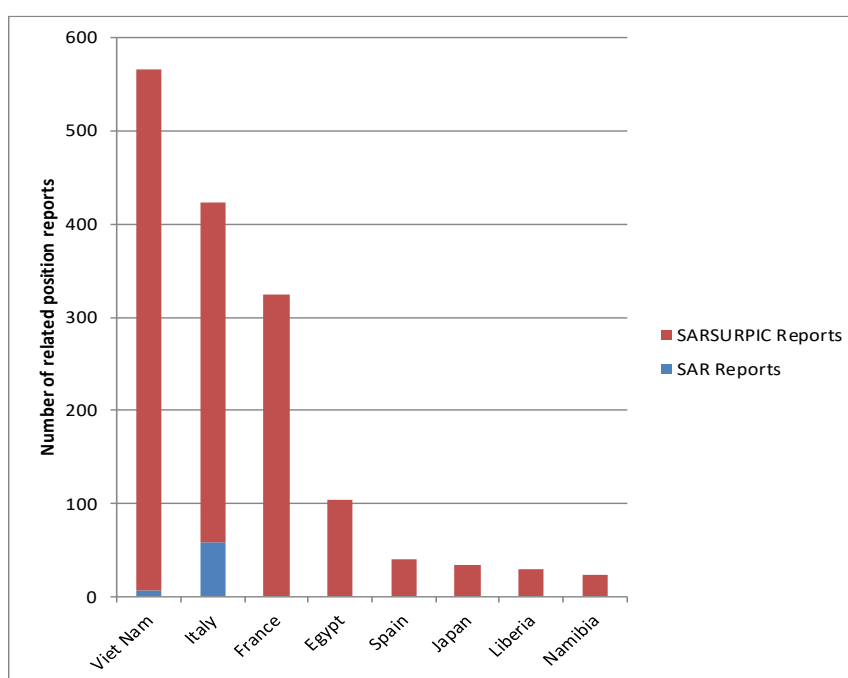


Figure 5 – Number of related position reports received

The SAR SURPIC is a request used by SAR Operators. In Europe, Italy was the biggest user of SAR and SAR SURPIC requests in December, and Italy and France also received the biggest amount of SAR related position.

2.5.3. Evolution of messages exchanged

Position requests are in Q4 around 2132 per month, which is almost 8% more than Q3 2021.

Position reports are in Q4 on average at 1,005,391, which is 1.2% less than Q3 2021.

Figures showing these data are in Annexes, § 3.4.2 Evolution of Messages exchanged.

2.6. USER ACTIVITY IN THE EU CDC

This chapter details the user activity in the UWI and through the XML interfaces.

2.6.1. User activity in the EU CDC UWI

Table 5 illustrates the user activity in the UWI of the EU CDC during December. An inactive user is a user who has not connected to the EU CDC during this month.

Table 5 – User activities per flag

Contracting Governments	Total users	Inactive users	Number of connections
Belgium	53	47	85
Bulgaria	15	12	36
Croatia	15	12	61
Curaçao (Netherlands)	6	6	0
Cyprus	14	6	198
Czech Republic	1	1	0
Denmark	278	261	2
Estonia	6	4	2
Finland	27	21	21
France	20	13	36
Georgia	3	1	25
Germany	30	27	80
Greece	77	71	28
Greenland (Denmark)	8	8	0
Iceland	43	43	0
Ireland	6	5	0
Italy	676	635	742
Latvia	14	10	48
Lithuania	8	2	49
Luxembourg	14	10	8
Malta	14	12	43
Montenegro	19	12	43
Netherlands	15	10	47
Norway	30	26	19
Poland	16	11	125
Portugal	13	9	41
Romania	7	7	0
Slovakia	4	4	0
Slovenia	27	26	0
Spain	67	58	97
Sweden	29	28	60
Tunisia	3	3	0
TOTAL	1558	1401	1896

Italy is the country making the greatest number of connections to the EU LRIT CDC UWI. Table 6 summarizes the user activity in the UWI during the quarter:

Table 6 – User activities

	October	November	December
Number of users	1485	1551	1558
Number of user connection	1854	1989	1896
Number of inactive users	1363	1411	1401

During Q4 2021 the number of users increased.

2.6.2. User activity in the XML interfaces

The EU CDC XML interface is based on Web Services (SOAP v. 1.2) and gives the possibility to External Systems (ES) to request and receive LRIT Information in an automatic way through a system-to-system interface. Currently, eight XML interfaces are implemented with the EU CDC Participating countries:

- LRIT2ES interface allows EU CDC Participating countries ES to receive LRIT information from the EU CDC, typically the 6h mandatory position reports and position reports resulting from a Coastal Standing Order activated.
- ES2LRIT interface allows EU CDC Participating countries ES to receive the above information, but also to request LRIT information, including making specific requests. Belgium, Italy, Montenegro and Poland implemented this type of interface.

Table 7 – Information exchanged through XML interfaces

Country	Mandatory and polled position reports	Position requests	Ship particulars requests
BELGIUM-ES	40780	0	0
DENMARK-ES	153714	N/A	N/A
GREENLAND-ES	6899	N/A	N/A
IRELAND-ES	44334	N/A	N/A
ITALY-ES	202657	644	0
MONTENEGRO-ES	1429	0	0
NORWAY-ES	220473	N/A	N/A
POLAND-ES	5636	0	0

Tables 7 shows the countries using XML interfaces, the information received and the number of requests done through ES2LRIT interfaces during Q4 2021.

2.7. FINANCIAL FIGURES

Figures 6 to 8 highlight the EU CDC Participants' Paid Consumption, the messages provided and sold by the EU CDC per buying Data Centre and the overall business financial balance, during Q4 2021.

This quarter, EMSA covered almost €254K of consumption costs. The remaining costs paid by the EU CDC Participants amounted almost €13K. The EU CDC sells more than €43K of LRIT messages to other DCs (Figure 6)

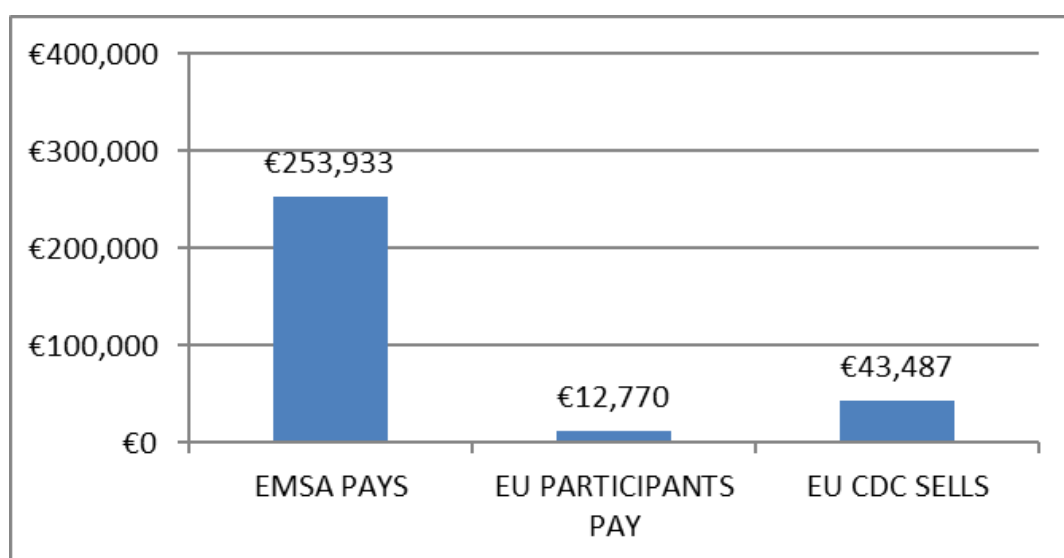


Figure 6 – Overall LRIT Business Financial Monthly Balance

The few relevant buyers of non-mandatory messages were Italy, Norway, and Ireland (Figure 7). To be noted that the increase for Italy is due to the activation of the Automatic Rate Change functionality over their Coastal State Standing Order off the coasts of Tunisia and Libya since June 2019.

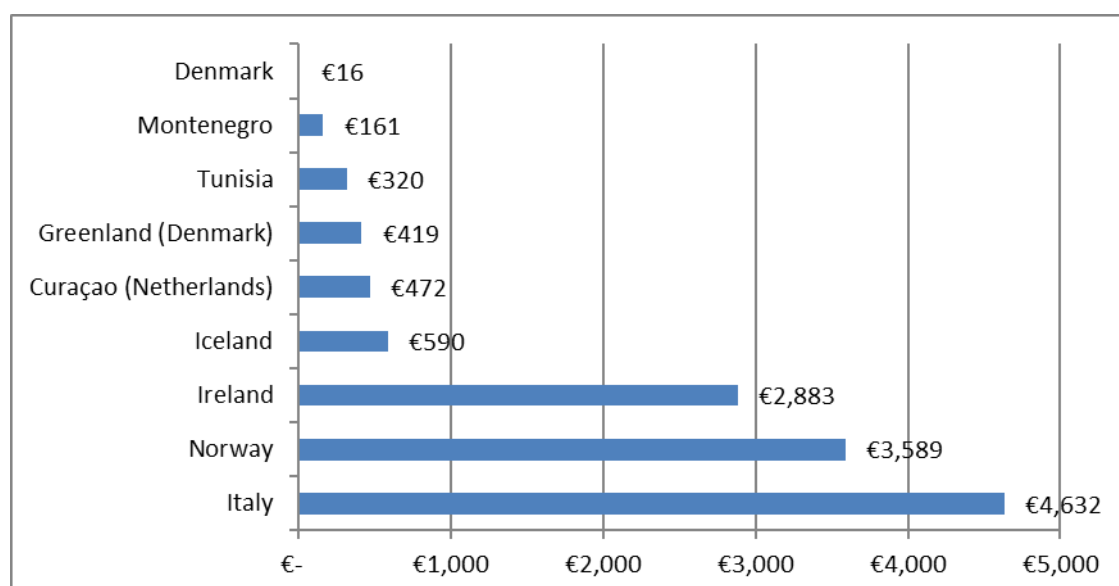


Figure 7 – EU CDC Participants' Paid Consumption

The biggest buyer of EU CDC data was the US LRIT NDC which bought 57.1% of the amount sold, followed by the Canada LRIT NDC with a 31.4% (Figure 8).

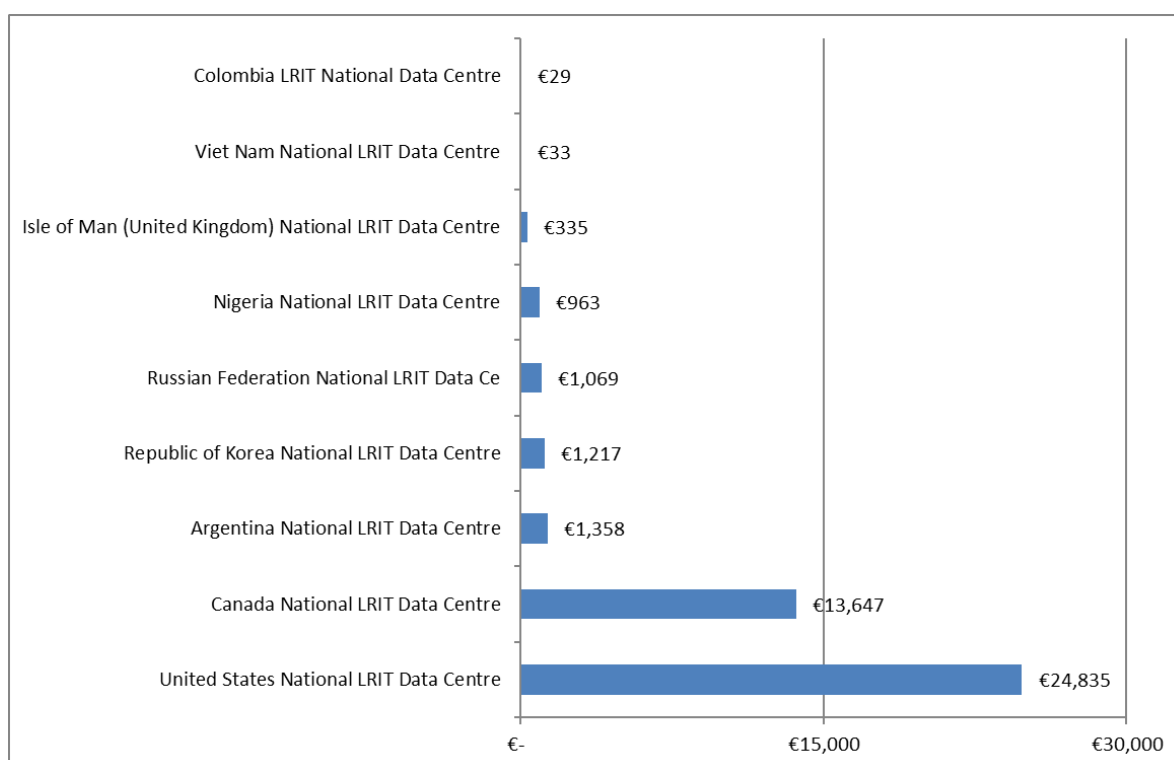


Figure 8 – Messages Sold by the EU CDC per Buying Data Centre

Legend:

- *EMSA pays for all costs of mandatory periodic reports (periodic 6-hour reporting from EU ships), SAR messages and ship integration for Member States and EFTA countries.*
- *EU CDC participants pay for ship integration and LRIT messages for OCTs and third countries, and for all non-mandatory messages (on-demand), including reports from standing orders. This includes messages from other Data Centres through the LRIT IDE and from the ASP (detail in Figure 7).*
- *EU CDC sells: all messages concerning ships belonging to the EU LRIT CDC that are requested by other DCs (detail in Figure 8).*

2.8. CONCLUSION

- | |
|--|
| <ul style="list-style-type: none">• All the performance indicators are above the set targets.• Testing on-going for EU LRIT CDC v3.16 and EU LRIT Ship DB v3.2 should be deployed in production in February 2022.• Developments for the integration of EU CDC functionalities in SEG are in progress.• The process for the integrating Serbia in the EU CDC is ongoing. |
|--|

3. ANNEXES

3.1. List of acronyms and abbreviations

Table 8 – List of acronyms and abbreviations

Acronyms or abbreviations	Description
ASP	Application Service Provider
CG	Contracting Government
CSP	Communication Service Provider
EMSA	European Maritime Safety Agency
EU LRIT CDC	European Union LRIT Cooperative Data Centre
IDE	International Data Exchange
IMO	International Maritime Organization
LRIT	Long Range Identification and Tracking (of ships)
NCA	National Competent Authority
OCTs	Overseas Countries and Territories
QoS	Quality of Service
SAR	Search and Rescue
EU LRIT Ship DB	European Union LRIT Ship Database
UWI	User Web Interface
N/A	Not Applicable

3.2. Definitions

According to IMO MSC.1/Circ.1259/Rev.7, the definitions of internal routing and message Types 1 to 6 are:

Table 9 – Definitions

Type	Name	Description/Purpose
N/A	Internal Routing	Regional or Cooperative LRIT Data Centres internally route LRIT information transmitted by ships entitled to fly the flag of the Contracting Governments establishing or participating such centres (LRIT information does not go through the IDE)
1	Periodic position Report	Regular periodic position reports
2	Polled position report	Position report as a result of a one-time poll request
3	SAR position report	Position report as a result of a SAR request
4	Position request	Request by an LRIT user to poll, change the rate of transmission, or request for most recent and archived positions, for a given ship
5	SAR position request	Request by a SAR user to poll or request for most recent and archived positions, for a given ship
6	SAR SURPIC request	Request by a SAR user to get the most recent position in a specific geographical area, broadcast via the IDE to all DCs

3.3. System performance

This section refers to messages delivered by the EU LRIT CDC and gives further details on the QoS for the quarter.

3.3.1. Global QoS

Figure 9 illustrates the IMO-QoS for the quarter, showing that no major incident happened this quarter.

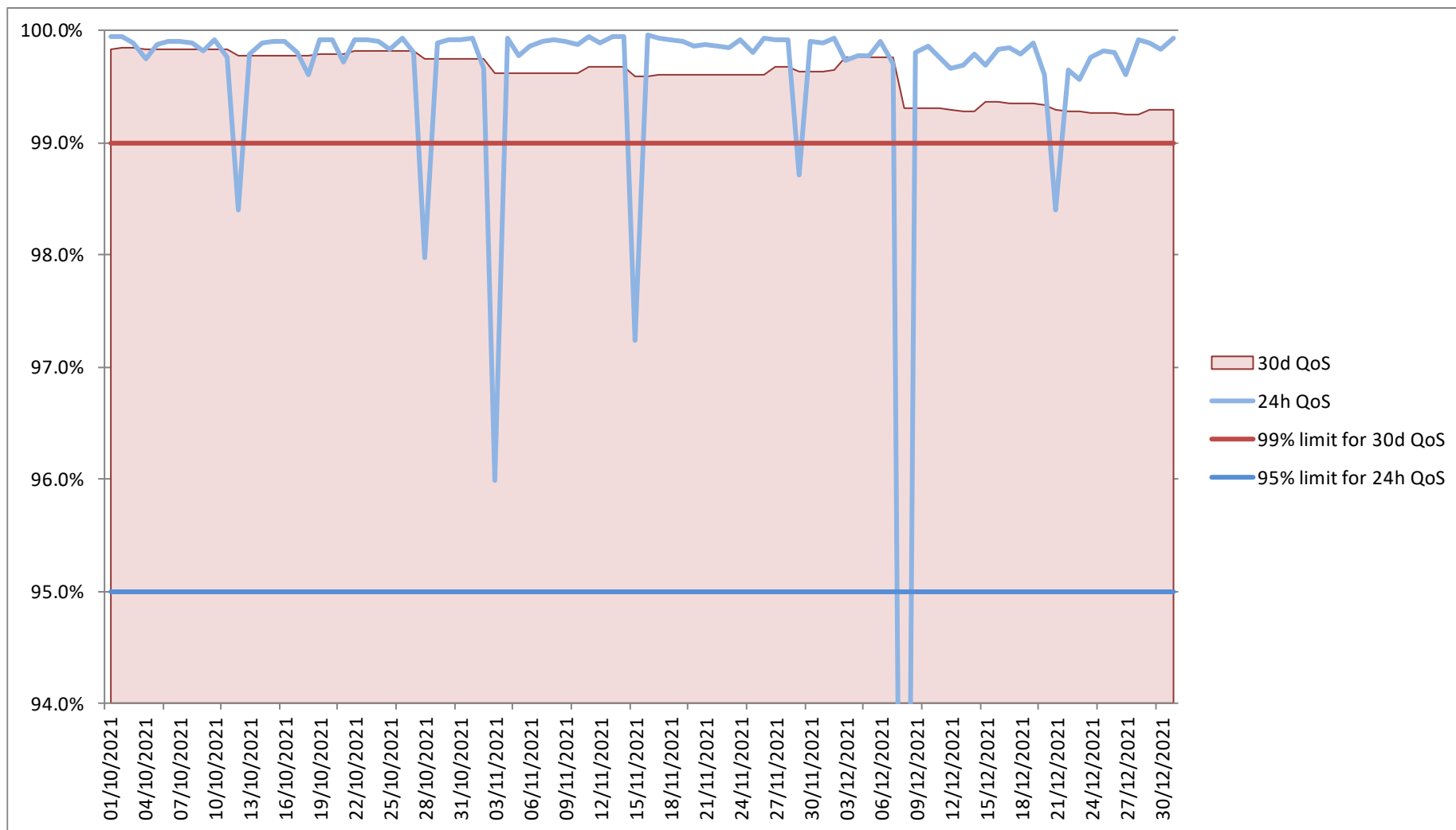


Figure 9 – IMO-24h and 30d QoS

3.3.2. Delivered periodic position reports QoS (Type 1)

Table 10 – Delivered periodic position reports QoS figures

	October	November	December
Monthly IMO-30d QoS (target 99%)	99.76%	99.64%	99.31%
Number of Reports that did not meet the 15 min limit	2,009	2,926	5,644
Percentage of Reports out of the 15 min limit	0.24%	0.36%	0.69%
Total number of Reports	832,653	808,130	821,011
Average Latency in minutes	3.11	3.32	3.81

These are mainly the mandatory position reports, sent every 6 hours.

3.3.3. Delivered on-demand position reports QoS (Type 2 and Type 3)

A poll is the action of sending a position request to a shipborne equipment and waiting for a ship position report or a receipt message. IMO defined that this action should not last more than 30mins to receive a position report.

The table below lists only the polls made to EU LRIT CDC ships, in order to measure the EU LRIT CDC QoS on requests. Reports as a result of polls originated by other DCs are not listed here, to avoid measuring the QoS of other DCs. This quarter, 30d Poll QoS was above the target.

Table 11 – Delivered on-demand reports QoS figures

	October	November	December
Monthly IMO-30d Poll QoS (target 99%)	100.00%	100.00%	99.14%
Number of Reports that did not meet the 30 min limit	0	0	1
Percentage of Reports out of the 30 min limit	0.00%	0.00%	0.86%
Total Number of Reports	79	106	116
Average Latency in minutes	2.53	2.36	3.11

3.4. Messages by source

3.4.1. General

The figure below shows the analysis of positions by source, for December.

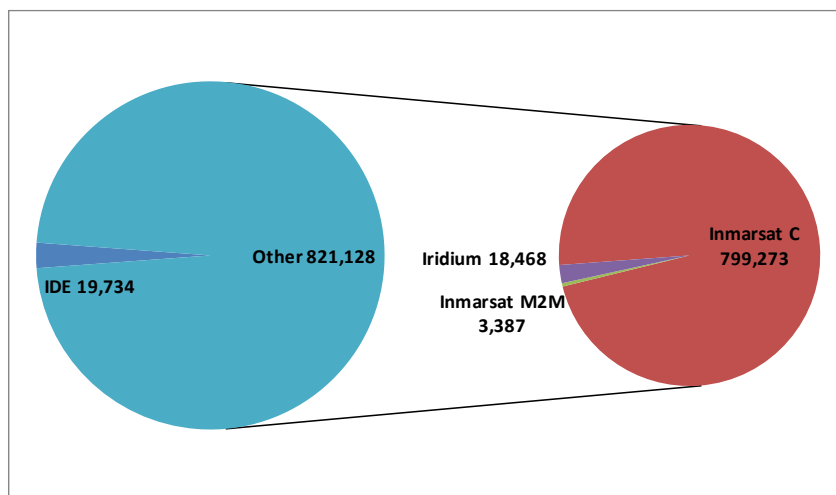


Figure 10 – Position reports by network (Message Type 1, 2 and 3)

The 3 pie charts below show the position requests by source, for December.

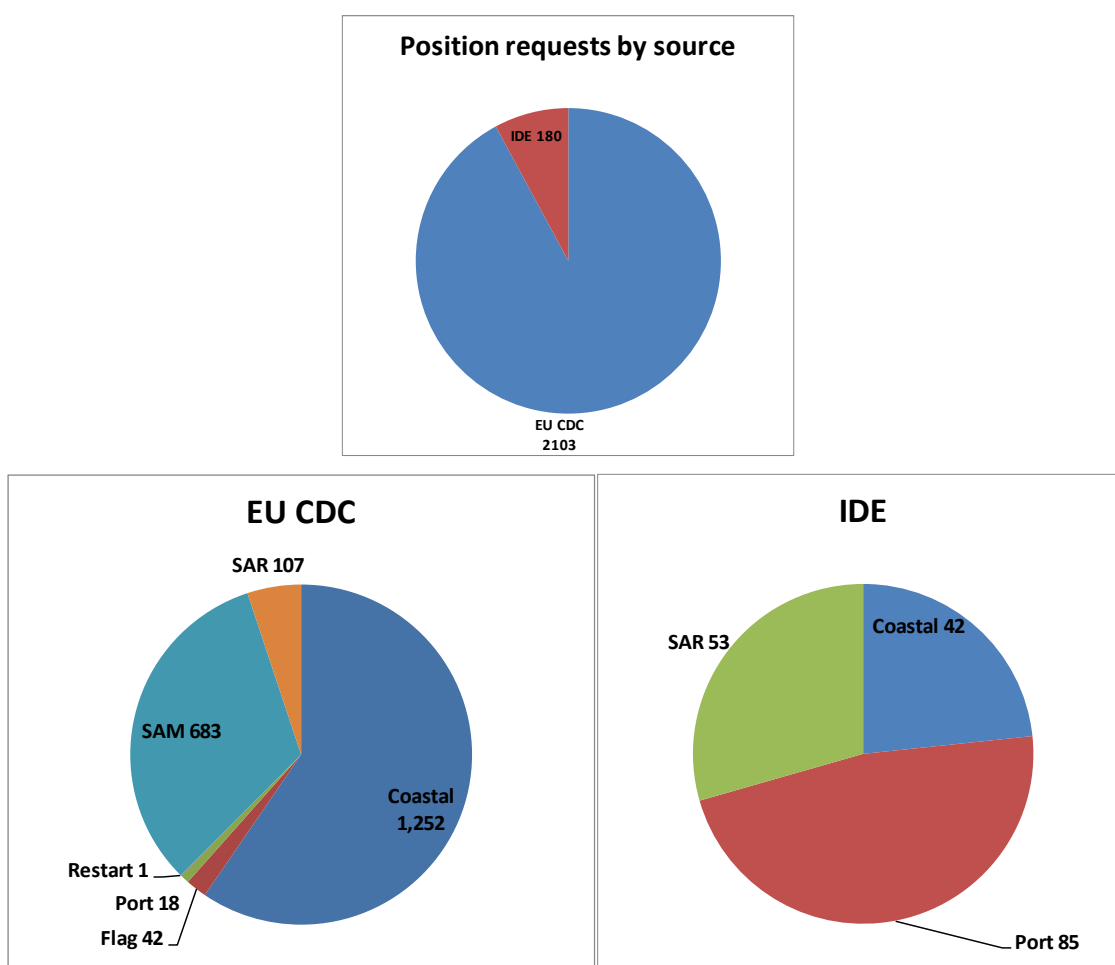
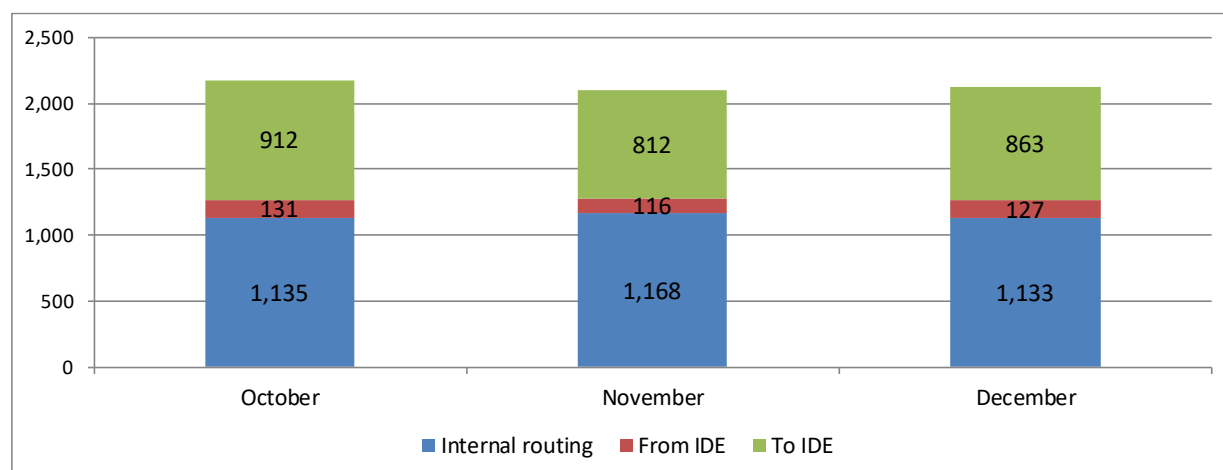
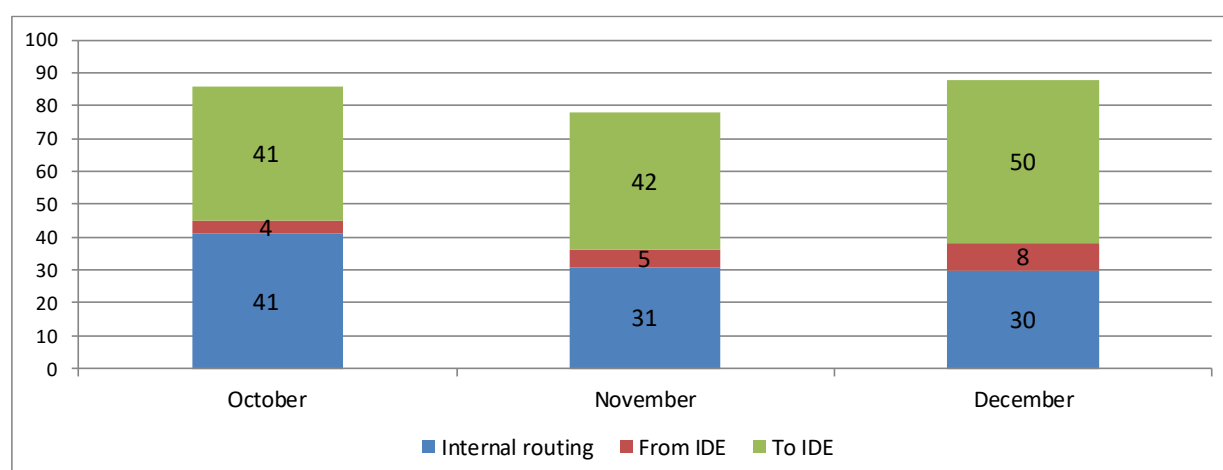
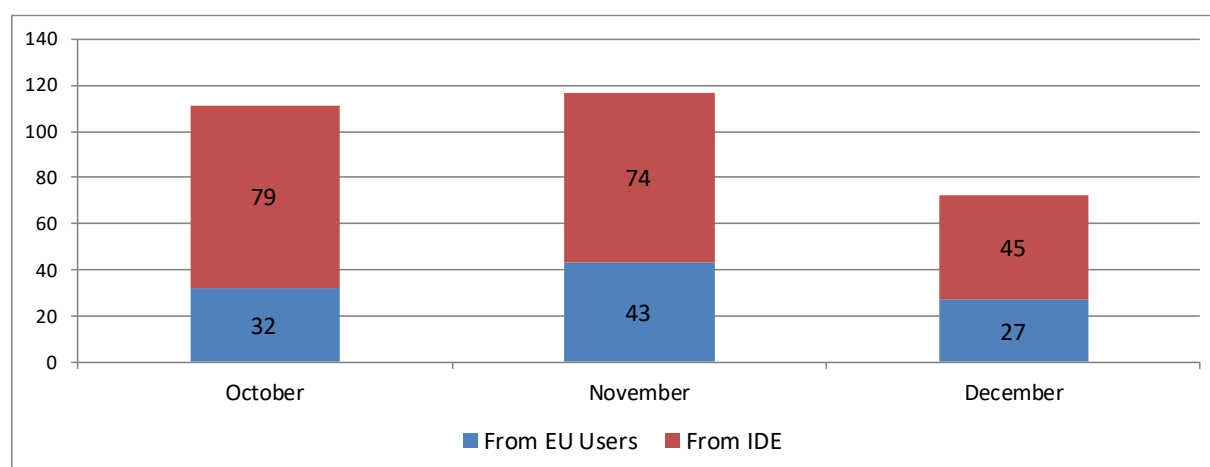


Figure 11 – Position requests by role (Message Type 4, 5 and 6)**3.4.2. Evolution of messages exchanged**

This section illustrates the evolution of the message flow of the EU CDC.

**Figure 12 – Number of position requests (Type 4)****Figure 13 – Number of SAR requests (Type 5)****Figure 14 – Number of SAR SURPIC requests (Type 6)**

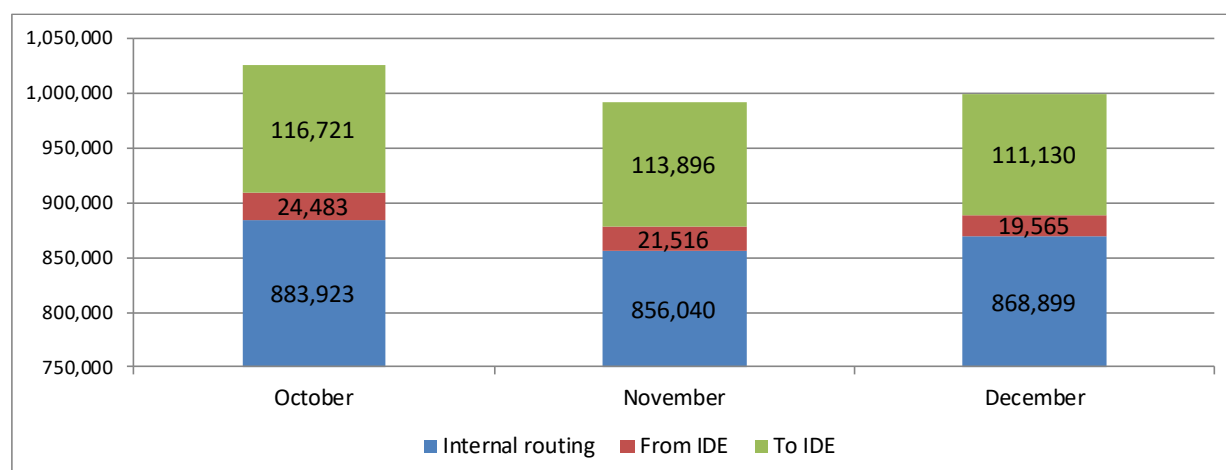


Figure 15 – Number of position reports (Type 1, 2 & 3)

3.5. Incidents and maintenance of the EU CDC

3.5.1. Incident management overview

Incidents in the EU CDC generate tickets in MSS through a monitoring tool called Task Monitor. Calls and emails from EU CDC Participating countries also generate tickets. For these, a new ticketing tool called Jira has been implemented since 14 February 2019.

For this quarter and the previous one, Table 12 shows the repartition of the tickets handled by the MSS:

Table 12 – Incident management

	Q3 2021	Q4 2021
Number of LRIT CDC and EU LRIT Ship DB tickets out of total number MSS tickets	250 / 4314 (5.8%)	157 / 4314 (3.64%)
<u>Ticket per type</u>		
Administration and reporting:	28	7
Helpdesk (CGs, ASP...):	68	59
Monitoring and Incident management (Task Monitor...):	219	91

This quarter, a major incident happened due to connection issues associated with the database on 8 Dec 21.



Quarterly Report

Q1 – 2022

EU LRIT CDC

and

EU LRIT Ship DB

DOCUMENT HISTORY

Version	Date	Comments
1.0	06/04/2022	First Issue
1.1	06/04/2022	Revision by HoU

APPROVAL

	Name	Date	Signature
Approved by:	Lazaros Aichmalotidis	06/04/2022	LAI

DISTRIBUTION LIST: ACCESS ON-LINE (USER WEB INTERFACE)

EMSA, European Commission, LRIT NCAs, LRIT End Users

List of Contents

1. SCOPE OF THE DOCUMENT	5
2. EU CDC MAIN FIGURES	5
2.1. EU CDC HIGHLIGHTS	5
2.2. KEY PERFORMANCE INDICATORS	6
2.3. SYSTEM PERFORMANCE	6
2.4. SHIP INTEGRATION AND REPORTING	7
2.5. REQUESTS AND POSITIONS IN THE EU CDC	9
2.5.1. Standard requests activity per Flag	9
2.5.2. SAR requests activity per Flag	11
2.5.3. Evolution of messages exchanged	12
2.6. USER ACTIVITY IN THE EU CDC	13
2.6.1. User activity in the EU CDC UWI	13
2.6.2. User activity in the XML interfaces	14
2.7. FINANCIAL FIGURES	15
2.8. CONCLUSION	16
3. ANNEXES	17
3.1. List of acronyms and abbreviations	17
3.2. Definitions	18
3.3. System performance	18
3.3.1. Global QoS	18
3.3.2. Delivered periodic position reports QoS (Type 1)	20
3.3.3. Delivered on-demand position reports QoS (Type 2 and Type 3)	20
3.4. Messages by source	21
3.4.1. General	21
3.4.2. Evolution of messages exchanged	22
3.5. Incidents and maintenance of the EU CDC	23
3.5.1. Incident management overview	23
3.5.2. Maintenance of the EU CDC, EU LRIT Ship DC/CCD, and LCT	23

List of Figures

Figure 1 – Evolution of reporting rate	8
Figure 2 – Number of requests processed by EU CDC (Message Type 4).....	10
Figure 3 – Number of reports received by the EU CDC (Messages Type 1 and 2)	11
Figure 4 – Number of SAR Requests per Flag	12
Figure 5 – Number of related position reports received	12
Figure 6 – Overall LRIT Business Financial Monthly Balance	15
Figure 7 – EU CDC Participants’ Paid Consumption	15
Figure 8 – Messages Sold by the EU CDC per Buying Data Centre	16
Figure 9 – IMO-24h and 30d QoS	19
Figure 10 – Position reports by network (Message Type 1, 2 and 3).....	21
Figure 11 – Position requests by role (Message Type 4, 5 and 6).....	21
Figure 12 – Number of position requests (Type 4)	22
Figure 13 – Number of SAR requests (Type 5)	22
Figure 14 – Number of SAR SURPIC requests (Type 6).....	22
Figure 15 – Number of position reports (Type 1, 2 & 3).....	23

List of Tables

Table 1 – Key Performance Indicators.....	6
Table 2 – Monthly 30d QoS	7
Table 3 – Integration and reporting statuses	7
Table 4 – Integration and reporting actions	8
Table 5 – User activities per flag	13
Table 6 – User activities.....	14
Table 7 – Information exchanged through XML interfaces.....	14
Table 8 – List of acronyms and abbreviations.....	17
Table 9 – Definitions.....	18
Table 10 – Delivered periodic position reports QoS figures.....	20
Table 11 – Delivered on-demand reports QoS figures	20
Table 12 – Incident management	23
Table 13 – Maintenance roadmap	24

1. SCOPE OF THE DOCUMENT

This document provides information on:

- the performance of the European Union LRIT Cooperative Data Centre (EU LRIT CDC or EU CDC) and European Union LRIT Ship Database (EU LRIT Ship DB).
- the performance of the European Union LRIT Ship Database (EU LRIT Ship DB).
- events related to the EU CDC activities and operations during the 1st Quarter of 2022.

The report is made available to all Participating Countries of the EU CDC via its User Web Interface (UWI).

To avoid overloading the report with figures, some graphs show data only for one month. The results of the quarter are presented and summarized in tables.

This document is divided into two parts:

- **EU CDC Main figures** give a general overview of the status of the EU CDC, its main issues and Key Performance Indicators (KPI).
- **Annexes** show detailed graphs and figures of the EU CDC which are referred to in the first part.

2. EU CDC MAIN FIGURES

2.1. EU CDC HIGHLIGHTS

The following are the highlights for the Q1 2022:

- **Quality of Service (QoS):** all performance indicators are above the targets set.
- **EU LRIT CDC v3.16:** the new release of the EU LRIT CDC is planned to be deployed during April 2022.
- **EU Ship LRIT CDC v3.2:** new release of the EU Ship LRIT DB is planned to be deployed during April 2022.
- **New releases along 2022:** further releases of the EU LRIT CDC, EU LRIT Ship DB, LRIT Consumption Tool (LCT), and Country Code Database (CCD) will be developed, tested, and deployed along 2022.
- **EU LRIT CDC IMSO audit:** the Audit Report no. 13 is on-going.
- **Integration of Serbia in the EU LRIT CDC:** the process of the integration of Serbia in the EU LRIT CDC is on-going.

2.2. KEY PERFORMANCE INDICATORS

Table 1 presents the KPIs used for measuring the EU CDC performance (most of the KPIs are based on the IMO requirements - time format is hh:min).

Table 1 – Key Performance Indicators

Activity/Service	Performance Indicator	January	February	March	Quarter	Target
EU LRIT CDC System operational	Availability of the system over the period	100.00%	99.85%	99.80%	99.88%	≥ 99.00%
	Maximum continuous downtime of the EU LRIT CDC	00:03	00:04	00:40	00:40	< 12:00
EU LRIT CDC Reporting performance	Percentage position reports delivered according to IMO requirement	99.83%	99.63%	98.90%	99.44%	≥ 99.00%
EU LRIT CDC user web interface	Availability of the User Web Interface	100%	99.80%	99.64%	99.87%	≥ 99.00%

The availability of the Web Interface of the EU LRIT Ship DB (not presented in the Table 1) was 99.91% during Q1 2022.

2.3. SYSTEM PERFORMANCE

This section refers to messages delivered by the EU CDC. The Quality of Service (QoS) measures if messages were properly delivered.

According to MSC Res. 263(84) §13 document, the IMO definition of QoS is:

$$\text{QoS} = \frac{\text{Number of delivered LRIT reports meeting latency requirements}}{\text{Total number of LRIT information requests}} \times 100\%$$

The QoS refers to Periodic (Type 1), Poll (Type 2) and SAR (Type 3) position reports which were delivered by the EU LRIT CDC as per IMO requirements. The target QoS is:

- 95% over any 24-hour period (24h QoS).
- 99% over any 1 month (30d QoS).

Table 2 presents the monthly QoS covering both the periodic and polled messages.

Table 2 – Monthly 30d QoS

	January	February	March
Monthly IMO-30d QoS (target 99%)	99.83%	99.63%	98.90%
Number of delivered reports that did not meet the IMO requirements	1,286	2,704	9,047
Percentage of delivered reports that did not meet the IMO requirements	0.17%	0.37%	1.10%
Total number of reports sent by EU CDC	777,362	732,493	819,549

The 30d QoS of March 2022 was below the IMO requirement this quarter due to an incident during planned switchovers to and from BCF on 10/14 March, and a planned intervention at the ASP side.

Further detailed information on the 24h and 30d QoS as well as the QoS for periodic reports or for polled reports can be found in section 3.3 System Performance.

2.4. SHIP INTEGRATION AND REPORTING

Table 3 presents a snapshot of the ship integration and ship reporting during the last week of each month.

Table 3 – Integration and reporting statuses

	January	February	March
Total of ships in the EU LRIT CDC	8314	8295	8324
Ships integrated in the EU LRIT CDC (=% of total of ships)	8053 96.86%	8036 96.88%	8057 96.79%
Ships that have reported in the last 3 days (=% of ships integrated)	6673 82.86%	6765 84.18%	6771 84.04%

The formula used for the ship reporting calculation is:

$$\text{Ship reporting\%} = \frac{\text{ships statuses normal, under and over reporting}}{\text{all ships integrated}} \times 100\%$$

It should be noted that “stopped ships” are also included in the number of the integrated ships.

Table 4 presents a summary of the actions taken to improve the reporting, during Q1 2022.

Table 4 – Integration and reporting actions

	January	February	March
Number of 'Stop'	78	54	55
Number of 'Restart'	2859	1862	1356
Number of 'Continue integration'	15	12	15
Number of 'DNID upload'	216	134	260

The activity of restarting ship terminals not reporting as expected is measurable through the number of restarts and DNID uploads performed by LRIT users (or by the ASP, for countries which delegated the monitoring of their fleet to EMSA).

Figure 1 shows the reporting evolution:

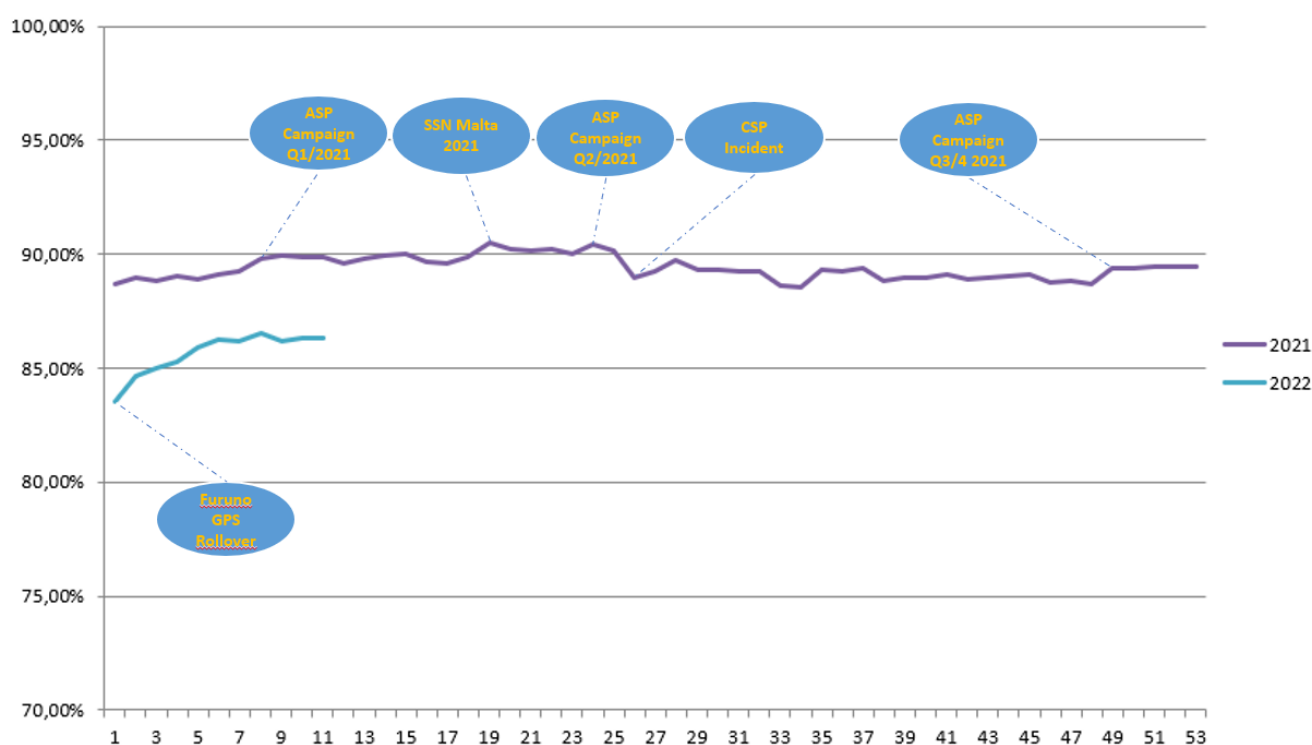


Figure 1 – Evolution of reporting rate

The reporting evolution is calculated using the formula follow:

$$\text{Ship reporting\%} = \frac{\text{ships statuses normal, under and over reporting}}{\text{ships statuses normal, under, over and not reporting}} \times 100\%$$

Ships stopped, either by the National Administrations or by the ASP, are not included in this graph.

Currently 12 Participating Countries have delegated the monitoring of their fleet to EMSA. For these flags, the ASP takes the appropriate actions in case of non-reporting ships or reports to the Participating Countries the actions that remain under their responsibility (such as updating the EU LRIT Ship DB or asking the shipowner to correctly log in the terminal to the satellite network).

EMSA, through the ASP, monitors almost 65% of the EU CDC fleet. The good result on the reporting is also due to the fact that some Participating Countries monitor closely their fleet and take the appropriate actions to restart the reporting when needed. A high reporting rate is directly linked to the active monitoring of the fleet.

2.5. REQUESTS AND POSITIONS IN THE EU CDC

This chapter details the number of requests made by the Participating Countries, and the positions processed by the EU CDC. It should be noted that the activity generated by ship integration and reporting (Stop, Restart, DNID upload...) is reported in Section 2.4 above.

97.49% of LRIT position reports came from the ASP (mandatory reporting), the remaining position reports came from the LRIT IDE.

Inmarsat C is the biggest CSP of the ASP, routing around 97.64% of the ASP reports.

90.56% of the position requests are split between requests generated automatically by the SAM anti-piracy tool and requests generated by EU CDC end-users: SAR, Coastal, Flag, and Port. The remaining position requests came from the LRIT IDE.

Figures showing these data are in 3.4.1 "General".

2.5.1. Standard requests activity per Flag

This section deals with requests made by LRIT users and position reports, processed by the EU CDC during March.

Figure 2 shows the standard requests (Message Type 4: polls, reporting rate changes, requests for most recent and archived positions, stop and restart) made by LRIT Users and the SAM anti-piracy tool, and Figure 3 the position reports (Message Type 1: periodic position reports, and Message Type 2: polled position reports). Participating Countries with less than 4 requests are not included.

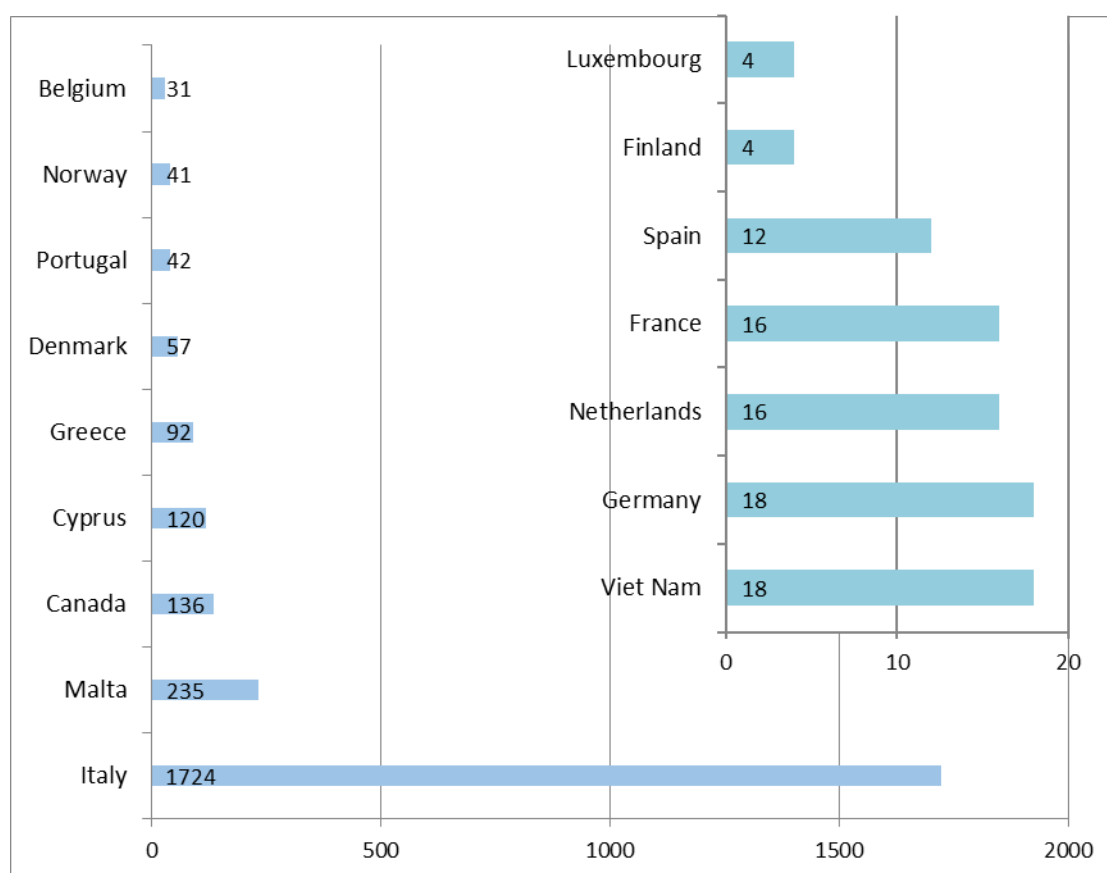


Figure 2 – Number of requests processed by EU CDC (Message Type 4)

Figure 2 shows that Italy is the country making most requests to the EU CDC to get EU LRIT positions. This is mainly due to the Automatic Rate Change tool activated on the Italian standing order off the coasts of Tunisia and Libya.

Figure 3 presents the number of position reports per flag resulting from:

- the requests shown in Figure 2.
- Standing Orders (include positions of EU flagged ships and non-EU flagged ships passing through European waters).

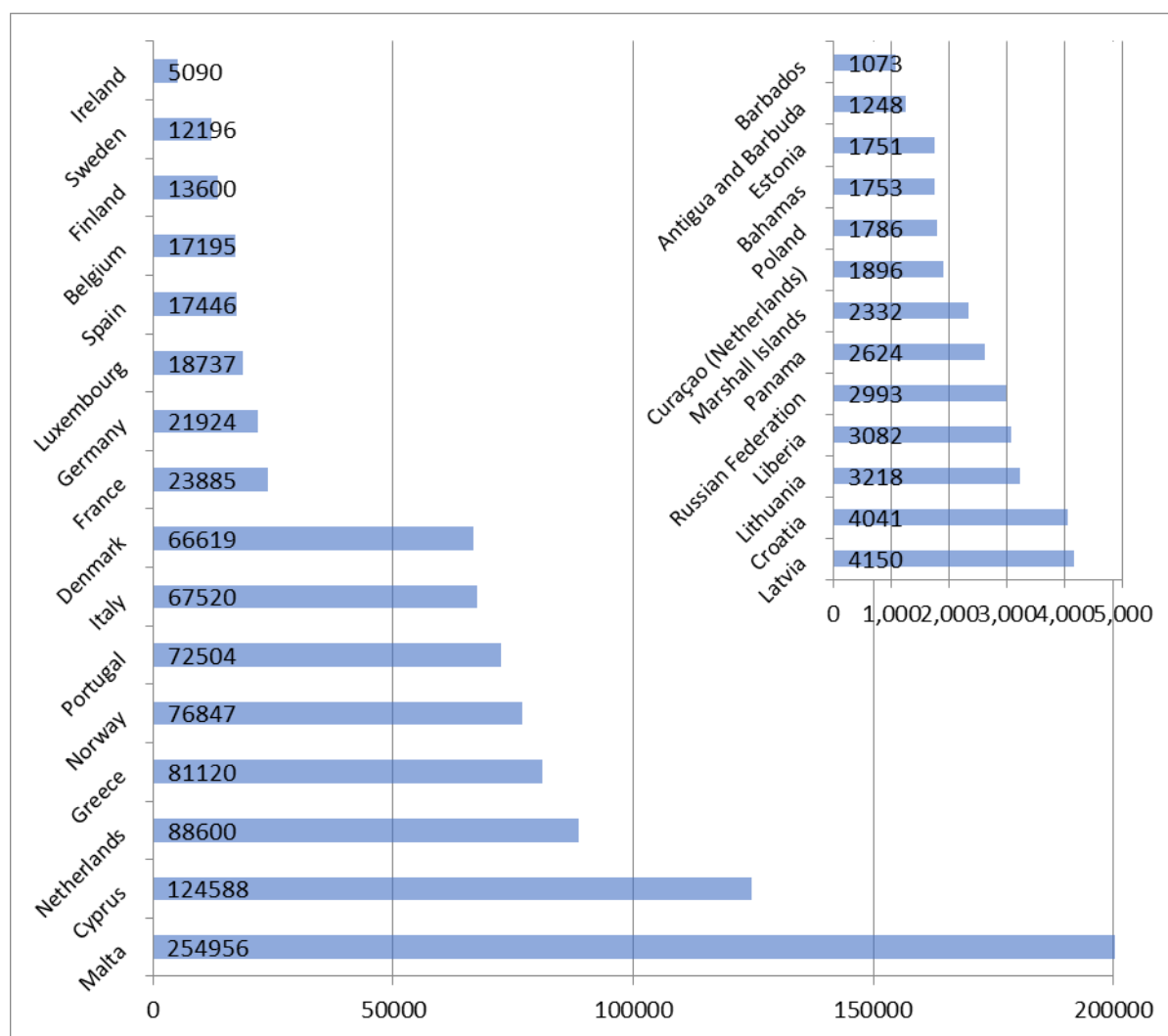


Figure 3 – Number of reports received by the EU CDC (Messages Type 1 and 2)

Participating Countries with less than 1,000 position reports are not included. Malta, with 28% of the EU CDC fleet, is the country with the highest number of position reports received.

2.5.2. SAR requests activity per Flag

For the month of March:

- Figure 4 shows the SAR and SARSURPIC requests made by LRIT Users. Participating Countries with less than 4 requests are not included.
- Figure 5 shows the related position reports (Message Type 3). Participating Countries with less than 20 positions received are not included.

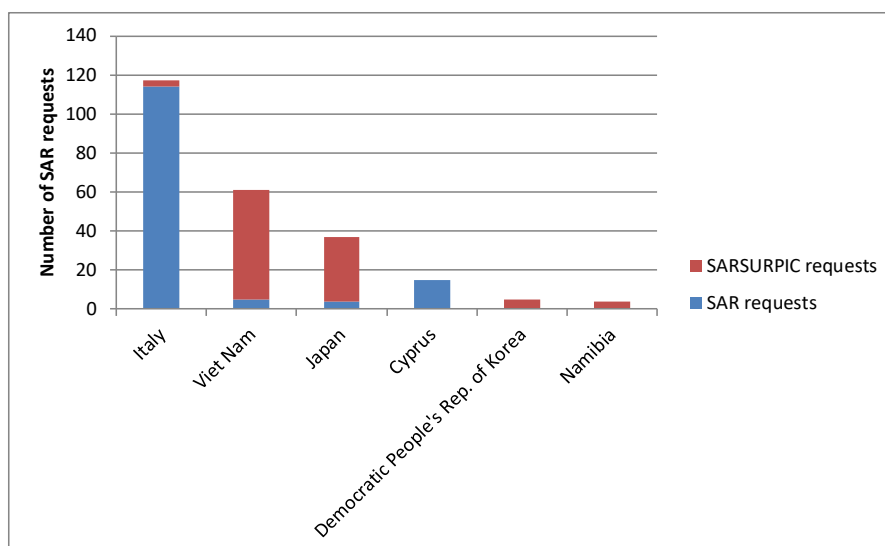


Figure 4 – Number of SAR Requests per Flag

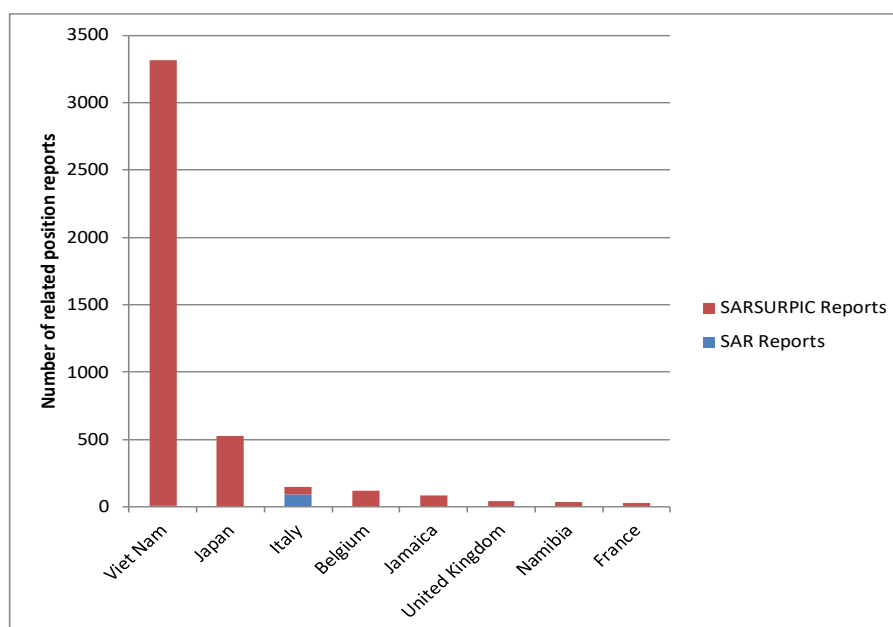


Figure 5 – Number of related position reports received

The SAR SURPIC is a request used by SAR Operators. In Europe, Italy was the biggest users of SAR and SAR SURPIC requests in March. Italy and Belgium also received the highest amount of SAR related positions.

2.5.3. Evolution of messages exchanged

Position requests are around 2314 per month in Q1 2022, which is 8.54% more than Q4 2021.

Position reports are 949,798 on average in Q1 2022, which is 5.53% less than Q4 2021.

Figures showing these data are in 3.4.2 Evolution of Messages exchanged.

2.6. USER ACTIVITY IN THE EU CDC

This chapter details the user activity in the UWI and through the XML interfaces.

2.6.1. User activity in the EU CDC UWI

Table 5 illustrates the user activity in the UWI of the EU CDC during March. An inactive user is a user who has not connected to the EU CDC during this month.

Table 5 – User activities per flag

Participating Countries	Total users	Inactive users	Number of connections
Belgium	53	47	72
Bulgaria	15	12	23
Croatia	15	13	54
Curaçao (Netherlands)	6	6	0
Cyprus	15	6	168
Czech Republic	1	1	0
Denmark	291	286	15
Estonia	6	6	0
Finland	27	25	20
France	20	17	64
Georgia	3	2	16
Germany	28	24	107
Greece	79	69	29
Greenland (Denmark)	8	8	0
Iceland	43	43	0
Ireland	6	5	59
Italy	700	649	1285
Latvia	14	9	84
Lithuania	6	1	61
Luxembourg	14	9	21
Malta	13	11	50
Montenegro	18	12	51
Netherlands	15	10	49
Norway	30	28	24
Poland	16	11	130
Portugal	13	9	82
Romania	7	7	0
Slovakia	1	1	0
Slovenia	28	28	0
Spain	67	62	135
Sweden	29	27	95
Tunisia	3	3	0
TOTAL	1590	1447	2694

Italy is the country making the highest number of connections to the EU CDC UWI. Table 6 summarizes the user activity in the UWI during the quarter.

Table 6 – User activities

	January	February	March
Number of users	1557	1561	1590
Number of user connection	1839	2093	2694
Number of inactive users	1441	1414	1447

During Q1 2022 the number of users slightly increased.

2.6.2. User activity in the XML interfaces

The EU CDC XML interface is based on Web Services (SOAP v. 1.2) and gives the possibility to External Systems (ES) to request and receive LRIT Information in an automatic way through a system-to-system interface.

Currently, eight XML interfaces are implemented with the EU CDC Participating countries:

- LRIT2ES interface allows EU CDC Participating countries ES to receive LRIT information from the EU CDC, typically the 6h mandatory position reports and position reports resulting from a Coastal Standing Order activated.
- ES2LRIT interface allows EU CDC Participating countries ES to receive the above information, but also to request LRIT information, including making specific requests. Belgium, Italy, Montenegro, and Poland implemented this type of interface.

Table 7 – Information exchanged through XML interfaces

Participating Country	Mandatory and polled position reports	Position requests	Ship particulars requests
BELGIUM-ES	35529	0	0
DENMARK-ES	144659	N/A	N/A
GREENLAND-ES	3970	N/A	N/A
IRELAND-ES	42864	N/A	N/A
ITALY-ES	204586	477	0
MONTENEGRO-ES	842	0	0
NORWAY-ES	198123	N/A	N/A
POLAND-ES	5139	0	0

Table 7 shows the countries using XML interfaces, the information received, and the number of requests done through ES2LRIT interfaces during Q1 2022.

2.7. FINANCIAL FIGURES

Figures 6 to 8 highlight the EU CDC Participants' Paid Consumption, the messages provided and sold by the EU CDC per buying Data Centre and the overall business financial balance, during Q1 2022.

This quarter, EMSA covered more than €239K of consumption costs. The remaining costs paid by the EU CDC Participating Countries amounted to more than €12K. The EU CDC sells more than €40K of LRIT messages to other DCs (Figure 6).

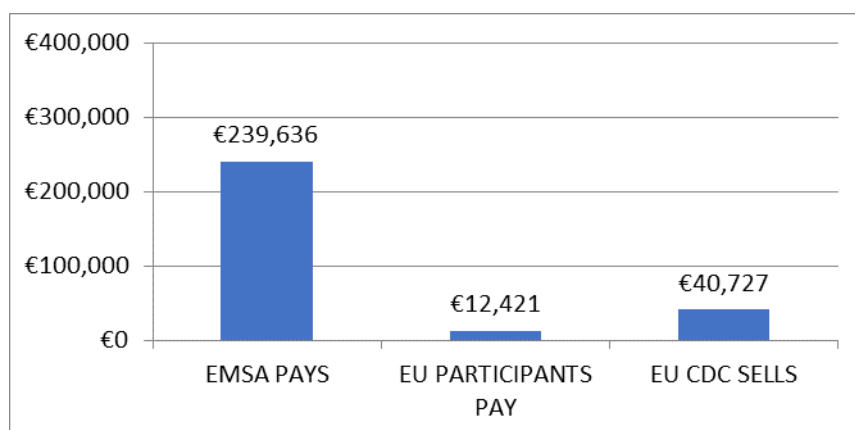


Figure 6 – Overall LRIT Business Financial Monthly Balance

The main buyers of non-mandatory messages were Italy, Norway, and Ireland (Figure 7). To be noted that the increase for Italy is due to the activation of the Automatic Rate Change functionality over their Coastal State Standing Order off the coasts of Tunisia and Libya since June 2019.

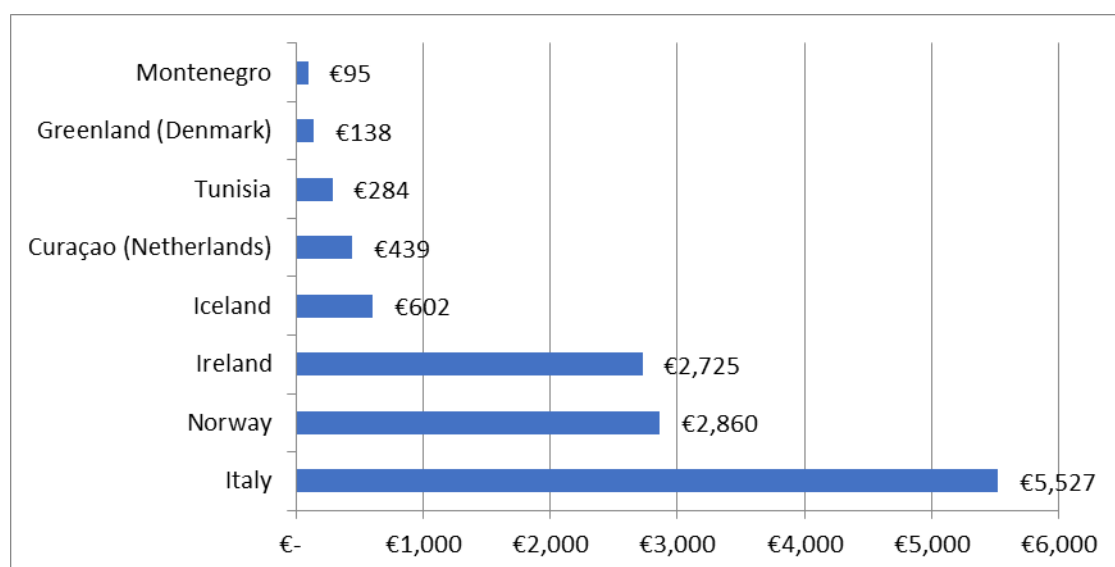
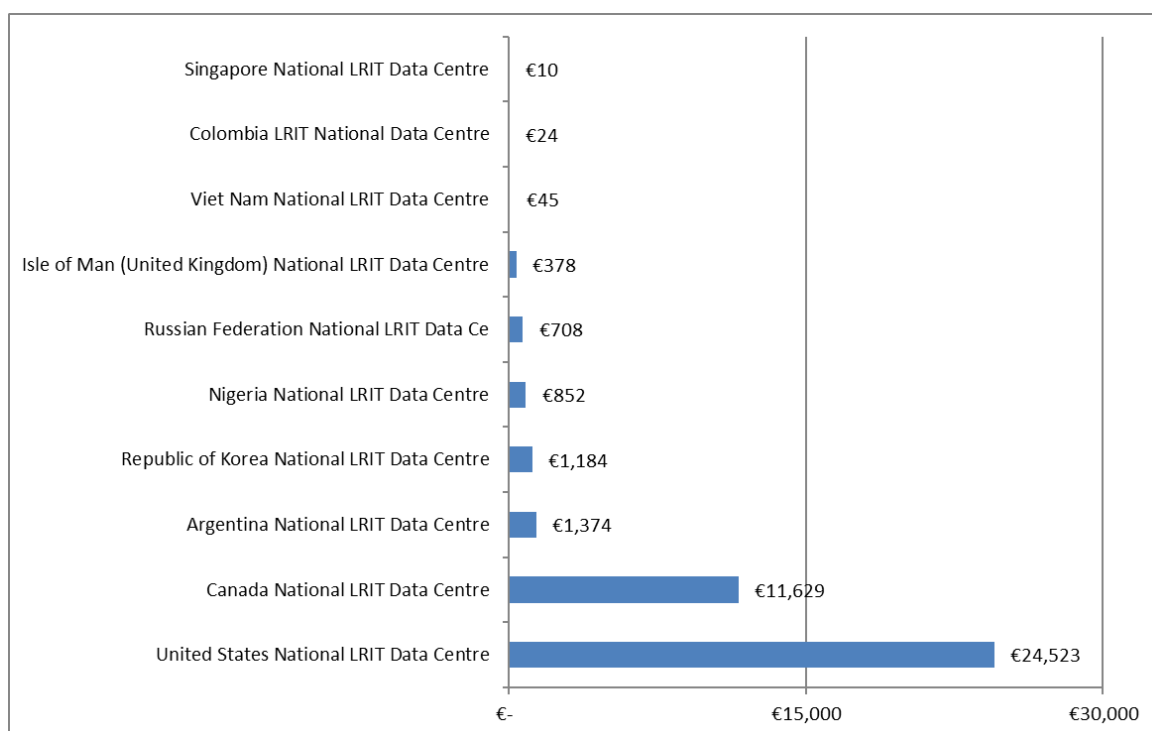


Figure 7 – EU CDC Participants' Paid Consumption

The EU LRIT CDC provided (EU CDC sells) more than €57K of LRIT messages to other DCs. The biggest buyer of EU CDC data was the US LRIT NDC which bought 58.88% of the amount sold, followed by the Canada NDC (Figure 8).



Legend:

- EMSA pays for all costs of mandatory periodic reports (periodic 6-hour reporting from EU-flagged ships), SAR messages and ship integration for EU Member States and EFTA countries.
- EU CDC Participating Countries pay for ship integration and LRIT messages for OCTs and Third Countries, and for all non-mandatory messages (on-demand), including reports from standing orders. This includes messages from other Data Centres through the LRIT IDE and from the ASP (shown in Figure 7).
- EU CDC sells all messages concerning ships belonging to the EU LRIT CDC that are requested by other DCs (shown in Figure 8).

2.8. CONCLUSION

- During Q1 2022 all performance indicators were above the targets set.
- The EU LRIT CDC v3.16 and EU LRIT Ship DB v3.2 will be deployed in production during April 2022.
- Further developments for the integration of EU CDC functionalities in SEG are in progress.
- The process for the integrating Serbia in the EU CDC is on-going.
- The Audit Report no. 13 of the EU CDC is on-going.

3. ANNEXES

3.1. List of acronyms and abbreviations

Table 8 – List of acronyms and abbreviations

Acronyms or abbreviations	Description
ASP	Application Service Provider
CG	Contracting Government
CSP	Communication Service Provider
EMSA	European Maritime Safety Agency
EU LRIT CDC	European Union LRIT Cooperative Data Centre
IDE	International Data Exchange
IMO	International Maritime Organization
LRIT	Long Range Identification and Tracking (of ships)
NCA	National Competent Authority
OCTs	Overseas Countries and Territories
QoS	Quality of Service
SAR	Search and Rescue
EU LRIT Ship DB	European Union LRIT Ship Database
UWI	User Web Interface
N/A	Not Applicable

3.2. Definitions

According to IMO MSC.1/Circ.1259/Rev.8, the definitions of internal routing and Message Types 1 through 6 are:

Table 9 – Definitions

Type	Name	Description/Purpose
N/A	Internal Routing	Regional or Cooperative LRIT Data Centres internally route LRIT information transmitted by ships entitled to fly the flag of the Contracting Governments establishing or participating such centres (LRIT information does not go through the IDE)
1	Periodic position Report	Regular periodic position reports
2	Polled position report	Position report as a result of a one-time poll request
3	SAR position report	Position report as a result of a SAR request
4	Position request	Request by an LRIT user to poll, change the rate of transmission, or request for most recent and archived positions, for a given ship
5	SAR position request	Request by a SAR user to poll or request for most recent and archived positions, for a given ship
6	SURPIC request	Request by a SAR/Coastal user to get the most recent position in a specific geographical area, broadcast via the LRIT IDE to all LRIT DCs

3.3. System performance

This section refers to messages delivered by the EU LRIT CDC and gives further details on the QoS for the quarter.

3.3.1. Global QoS

Figure 9 illustrates the IMO-QoS for Q1 2022, showing that major incidents happened during planned switchovers to and from the BCF, due to changes in the F5 at Lisbon that were not replicated at the BCF site and issues associated to the application server and connectivity with the ASP.

Also the ASP had scheduled a major maintenance of their network infrastructure on March 12th, impacting all operational services causing their unavailability.

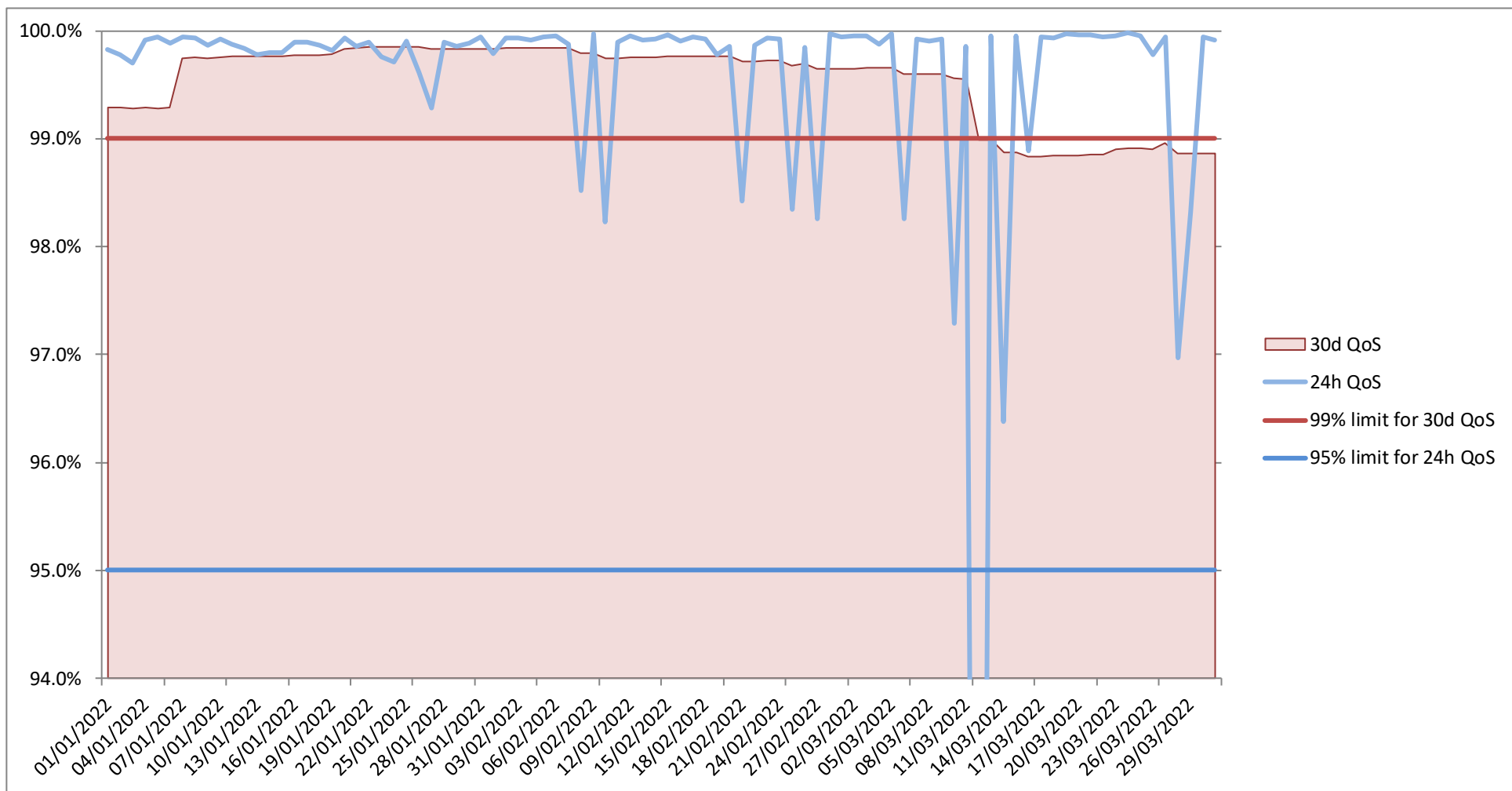


Figure 9 – IMO-24h and 30d QoS

3.3.2. Delivered periodic position reports QoS (Type 1)

Table 10 – Delivered periodic position reports QoS figures

	January	February	March
Monthly IMO-30d QoS (target 99%)	99.83%	99.63%	98.90%
Number of Reports that did not meet the 15 min limit	1,285	2,704	9,047
Percentage of Reports out of the 15 min limit	0.17%	0.37%	1.10%
Total number of Reports	777,295	732,426	819,414
Average Latency in minutes	2.83	2.91	3.89

These are mainly the mandatory position reports, sent every 6 hours.

3.3.3. Delivered on-demand position reports QoS (Type 2 and Type 3)

A poll is the action of sending a position request to a shipborne equipment and waiting for a ship position report or a receipt message. IMO defined that this action should not last more than 30 minutes to receive a position report.

The table below lists only the polls made to EU LRIT CDC ships, in order to measure the EU LRIT CDC QoS on requests. Reports as a result of polls originated by other DCs are not listed here, to avoid measuring the QoS of other DCs. This quarter, 30d Poll QoS was above the target.

Table 11 – Delivered on-demand reports QoS figures

	January	February	March
Monthly IMO-30d Poll QoS (target 99%)	100.00%	100.00%	100.00%
Number of Reports that did not meet the 30 min limit	0	0	0
Percentage of Reports out of the 30 min limit	0.00%	0.00%	0.00%
Total Number of Reports	66	65	135
Average Latency in minutes	2.15	2.36	2.41

3.4. Messages by source

3.4.1. General

The figure below shows the analysis of positions by source, for March.

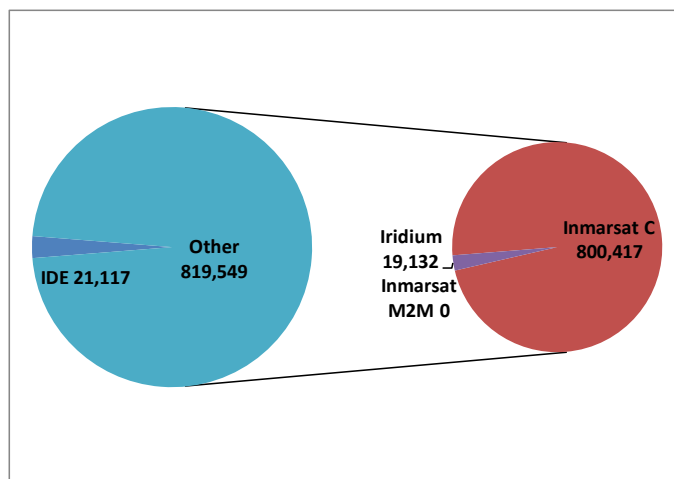


Figure 10 – Position reports by network (Message Type 1, 2 and 3)

The 3 pie charts below show the position requests by source, for March.

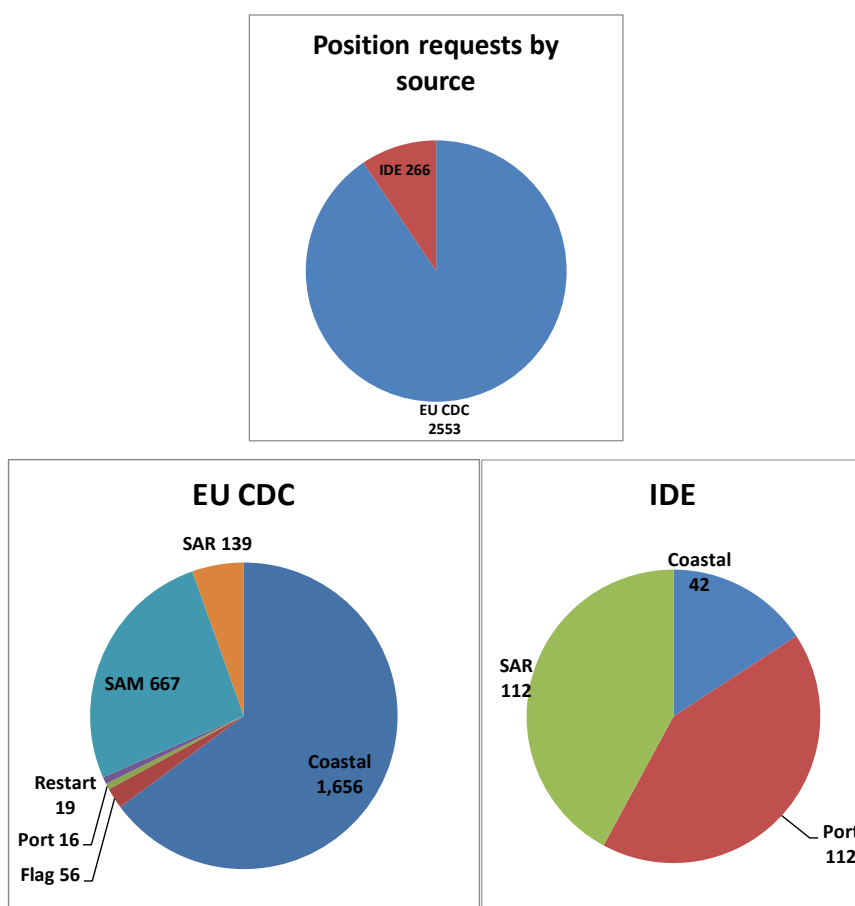


Figure 11 – Position requests by role (Message Type 4, 5 and 6)

3.4.2. Evolution of messages exchanged

This section illustrates the evolution of the message flow of the EU CDC.

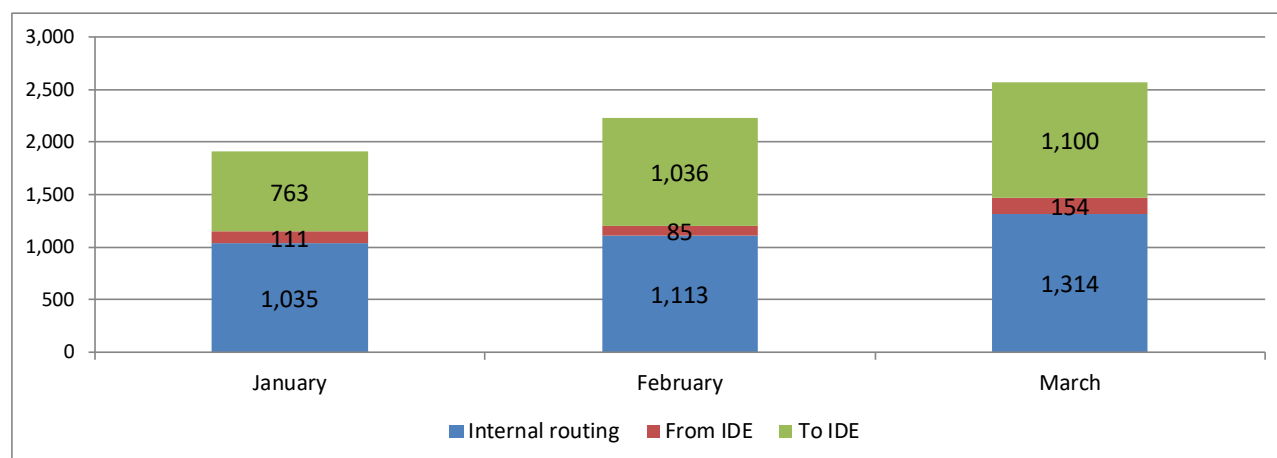


Figure 12 – Number of position requests (Type 4)

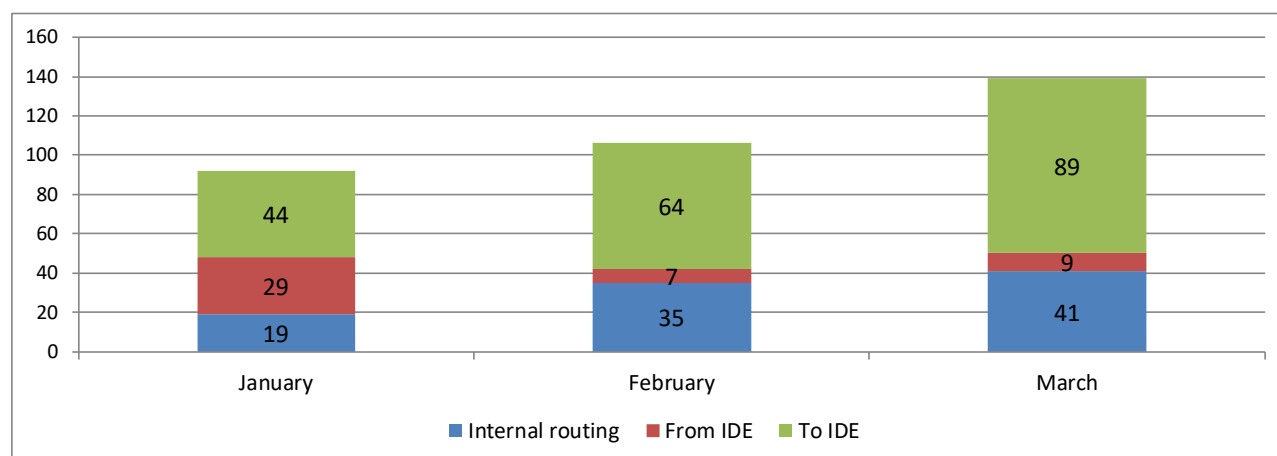


Figure 13 – Number of SAR requests (Type 5)

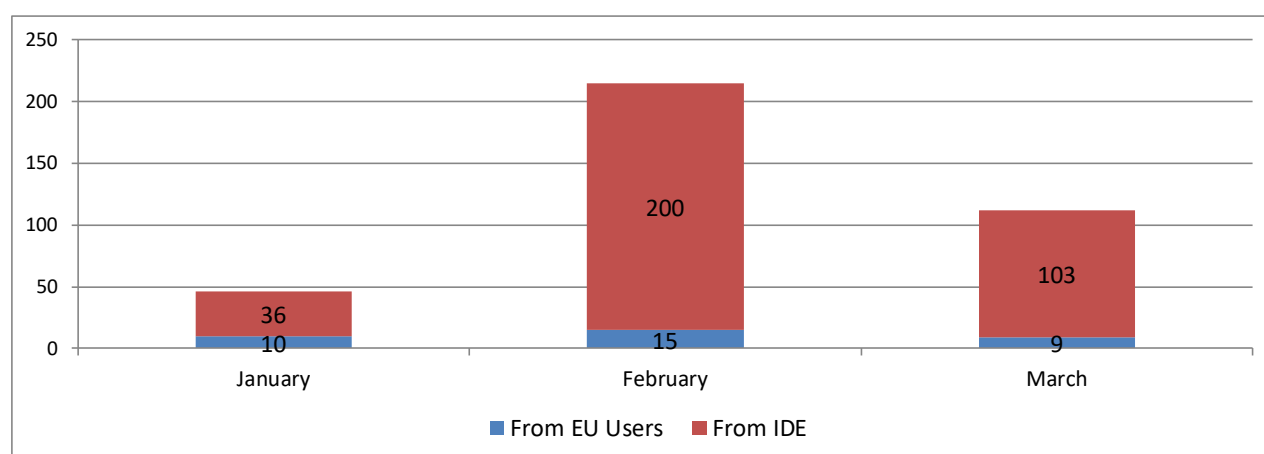


Figure 14 – Number of SAR SURPIC requests (Type 6)

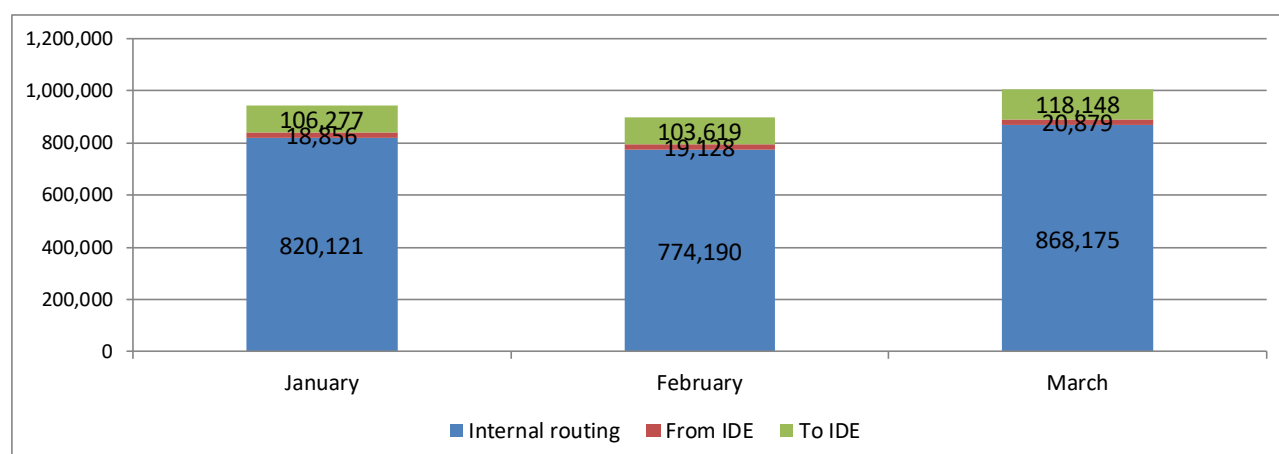


Figure 15 – Number of position reports (Type 1, 2 & 3)

3.5. Incidents and maintenance of the EU CDC

3.5.1. Incident management overview

Incidents in the EU CDC generate tickets in MSS through a monitoring tool called Task Monitor. Calls and emails from EU CDC Participating countries also generate tickets. For these, a new ticketing tool called Jira has been implemented since 14 February 2019.

For Q1 2022 and the previous Q4 2021, Table 12 shows the repartition of the tickets handled by the MSS.

Table 12 – Incident management

	Q4 2021	Q1 2022
Number of LRIT CDC and EU LRIT Ship DB tickets out of total number MSS tickets	250 / 4314 (5.8%)	81 / 4313 (1.88%)
<u>Ticket per type</u>		
Administration and reporting:	28	2
Helpdesk (CGs, ASP...):	68	78
Monitoring and Incident management (Task Monitor...):	219	1

3.5.2. Maintenance of the EU CDC, EU LRIT Ship DC/CCD, and LCT

The EU LRIT CDC v3.16 completed the testing campaign and will be deployed in the production environment in April. This version aims at the integration of LRIT related functionalities into SEG, as well as solving minor issues.

Also, the EU LRIT Ship DB v3.2 completed the testing campaign and will be deployed in the production environment in April. This version aims at correcting minor issues.

New versions of the EU LRIT CDC, EU LRIT Ship DB/CCD, and LCT are planned along 2022 as follows:

Table 13 – Maintenance roadmap

Specific Contract	Remarks
OP/12/2020/SC.1	
EU LRIT CDC v3.16	Development/testing completed. Deployment April 22
EU LRIT Ship DB v3.2	Development/testing completed. Deployment April 22
OP/12/2020/SC.2	
EU LRIT CDC	RFC on going
EU LRIT Ship DB/CCD	Assessment by CAB
LRIT Consumption	Assessment by CAB