

**6<sup>th</sup> Meeting of the LRIT NCA's**  
**Agenda item 7**  
**17 October 2012**

**“Integration and reporting issues with shipborne equipment”**

**Submitted by EMSA**

<i>Action to be taken</i>	Take into consideration the ship integration and reporting issues presented in this paper and EMSA proposals for improvement.
<i>Related documents</i>	<ul style="list-style-type: none"><li>• Conditions of Use to use the EU LRIT DC</li><li>• MSC.1/Circ. 1307 (9 June 2009) – Guidance on the survey and certification of compliance of ships with the requirement to transmit LRIT information, revoking MSC.1/Circ. 1296</li><li>• Technical Note 8 v1.2 “Procedures to improve ship integration and ship reporting” for CGs, ASP and MSS</li></ul>

## **1. INTRODUCTION**

The objective of this paper is to:

- Provide an update on the ship integration and ship reporting activity, and its evolution.
- Present ship integration and ship reporting results/statistics since the beginning of the EU LRIT Cooperative Data Centre (EU CDC) to analyse the cause of some of the problems.
- Suggest possible follow-up by EMSA on behalf of Contracting Governments (CGs) to act on a regular basis with the aim of improving ship integration and ship reporting figures.

## **2. ISSUES & STATISTICS RELATED TO SHIP INTEGRATION**

Ship integration is a laborious and costly process. It consists in establishing the communication network between the shipborne equipment and the Application Service Provider (ASP). The process starts from the time the ship is registered in the LRIT ship database, and is completed once the first Ship position report has been received by the ASP and passed to the EU CDC. It is important to know the main reasons for integration failure in order to, where possible, take appropriate preventive and corrective actions.

## 2.1. Status of ships integrated into the EU Data Centre

Although the number of ships in the EU DC has normally continually increased since the EU DC entered in production (July 2009), recently there has been a slight decrease in the number of ships by about 3% corresponding to 241 ships less registered in the EU Ship DB.

The status of ships integrated in the EU CDC as of end of August, was as follows:

Status	Number of Ships	
Integrated	8,569	98,33%
Waiting first position	1	0,01%
Not Integrated	144	1,65%
<b>Total</b>	<b>8714</b>	<b>100.00%</b>

Table 1: Number of ships registered in the EU CDC (August 2012) per status

Flag	Integrated	Not Integrated	Total	% of ships not integrated
SVN	2	1	3	33.3%
VGB	7	1	8	12.5%
PRT	109	8	117	6.8%
GIB	282	17	300	5.7%
FRA	205	9	214	4.2%
BEL	115	3	118	2.5%
NOR	736	15	751	2.0%
HRV	51	1	52	1.9%
CYP	822	16	838	1.9%
MLT	1701	31	1732	1.8%
GBR	675	12	687	1.7%
GRC	735	13	748	1.7%
SWE	125	2	127	1.6%
ANT	72	1	73	1.4%
NLD	861	9	870	1.0%
ESP	215	2	217	0.9%
LUX	149	1	150	0.7%
DEU	327	1	328	0.3%
ITA	693	1	694	0.1%
BGR	21		21	0.0%
DNK	430		430	0.0%
EST	12		12	0.0%
FIN	115		115	0.0%
FLK	3		3	0.0%
IRL	26		26	0.0%
ISL	2		2	0.0%
LTU	40		40	0.0%
LVA	12		12	0.0%

Flag	Integrated	Not Integrated	Total	% of ships not integrated
POL	24		24	0.0%
ROU	2		2	0.0%
<b>Total</b>	<b>8569</b>	<b>144</b>	<b>8713</b>	<b>1.7%</b>

Table 2: Number of ships registered in the EU CDC (August 2012) per status and Flag

## 2.2. Evolution of Ship Integration failures in the EU CDC

Table 3 below shows the total number of ship integrations which failed and why, over the last few years. These are snap shots at a particular time.

Cause of failure	12/10/10	27/04/11	09/01/12	28/08/12
DNID upload failed	85	61	106	51
Invalid radio ID in LRIT ship DB	12	25	25	18
Shipborne equipment activated after the CTR date of issue	18	27	30	22
Shipborne equipment logged out	18	13	18	20
Shipborne equipment deactivated	1	3	2	3
GPS issue			2	2
Shipborne equipment not responding			22	22
<b>Total</b>	<b>134</b>	<b>129</b>	<b>205</b>	<b>144</b>

Table 3: Total number of ship integrations which failed and cause of failures

## 2.3. Reasons for Ship Integration failure

The Ship Integration process failed mainly due to the following reasons:

- DNID upload failed (Inmarsat C only): 35 % of failures
  - Terminal switched off;
  - Terminal in a noisy zone (e.g., port, etc.);
  - Terminal antenna not in the range of visibility of the satellite;
  - Terminal busy with e-mails, GMDSS, and other functionalities (LRITreporting has no priority over commercial data traffic); and
  - Problem linked with antenna;
- Shipborne equipment activated after the Conformance Test Report (CTR) date of issue : 15 % of failures
  - Wrong CTR; and
  - New CTR to be done after a change of terminal;
- Shipborne equipment not responding : 15 % of failures
  - DNID not enabled into the terminal (Inmarsat C)

- Terminal switched off (Inmarsat D+ and Iridium)
- Terminal antenna not in the range of visibility of the satellite;
- Problem linked with antenna;
- Shipborne equipment logged out : 14 % of failures
  - Terminal switched off;
  - Terminal not correctly switched on;
- Invalid Radio ID in the LRIT Ship DB: 12 % of failures
  - Typing error;
  - No Radio ID in the Ship Database;
  - Radio ID already used by another ship;
  - Change of flag;
  - Change of terminal; and
  - Terminal ID instead of ISN for Inmarsat D+ terminals;

The most common cause of failure is the "DNID upload failed" and this is stable over the years.

#### **2.4. Recommended actions**

The DNID uploading process needs preparatory checks before initiating the upload. It is recommended that Flag Administrations instruct their shipowners to ensure that during the DNID upload process that the equipment is turned on and that the ship is at sea where there is no risk of interferences to compromise the radio transmission. These precautions in addition to a conformance test will ensure that connection is made to the shipborne equipment.

Flag Administrations should also ensure that the highest quality of data is uploaded into the LRIT Ship database.

### **3. ISSUES & STATISTICS RELATED TO SHIP REPORTING**

#### **3.1. Overall Reporting for the EU LRIT CDC**

There are about 17% of ships which do not report correctly on an average day in the EU LRIT CDC. This is due to the fact that many ships have stopped reporting.

This number does not include ships which have been stopped (around 2%) by the ASP or by a Flag Administration due to over-reporting or a ship being in dry dock, etc.

This means that on average on any particular day in the EU LRIT Data Centre around 81% of all the registered ships are reporting normally to the EU CDC.

#### **3.2. Evolution of ship reporting**

Figure 1 below shows the evolution of the reporting rate. The actions taken by the ASP in September 2011 and in August 2012 (following the bug in the LRIT Ship DB and the

actions taken to retrieve the correct reporting statuses in the EU CDC) clearly show that when certain actions are performed and ships are monitored either by the ASP or Flag Administrations, the reporting rate improves.

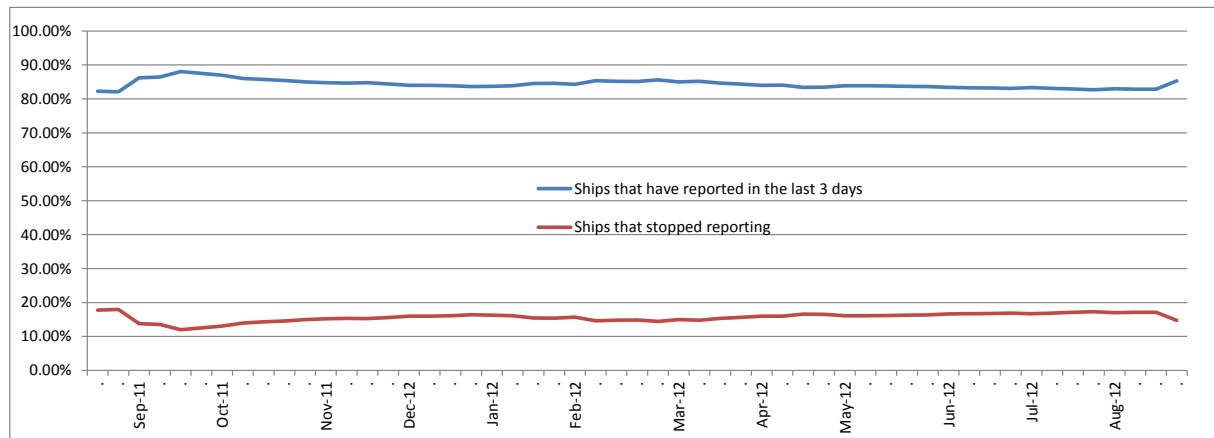


Figure 1 – Evolution of the reporting

The main reasons for having shipborne equipment not reporting are listed in §3.4.

### 3.3. Reporting Status by communication network

Figure 2 shows the total number of shipborne equipment per Communication Network and the evolution along the years. We clearly see that the distribution between the different networks is stable.

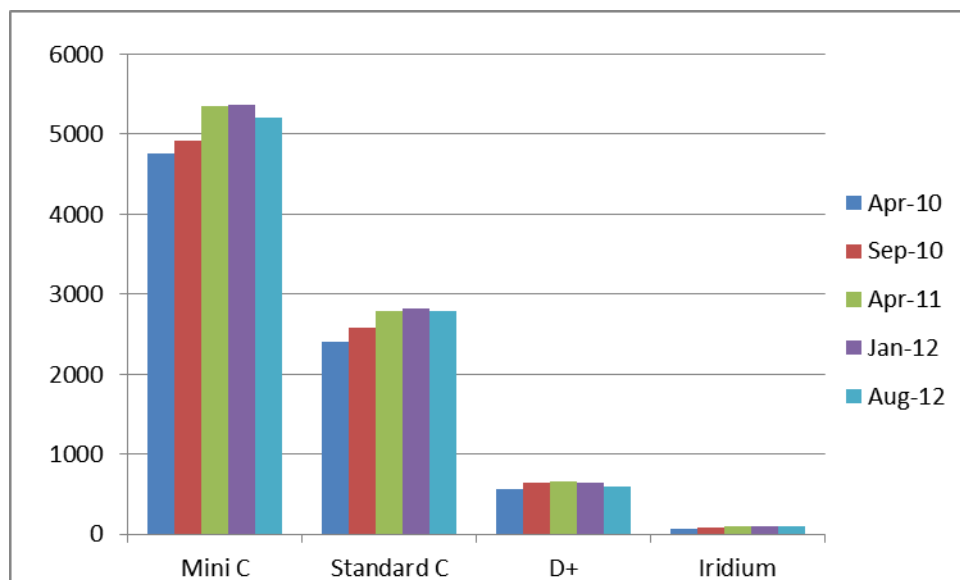


Figure 2: Total number of terminal per communication network

Figure 3 shows the percentage of shipborne equipment reporting per Communication Network and the evolution along the years. We clearly see that the distribution between the different networks is stable, and that as always the Standard C terminals have the lowest average reporting rate.

The increase in the reporting of Standard C terminals in 08/2012 is due to the ASP having performed certain actions (Restart) 2 weeks before extracting these statistics to recover the correct reporting statuses in the EU CDC.

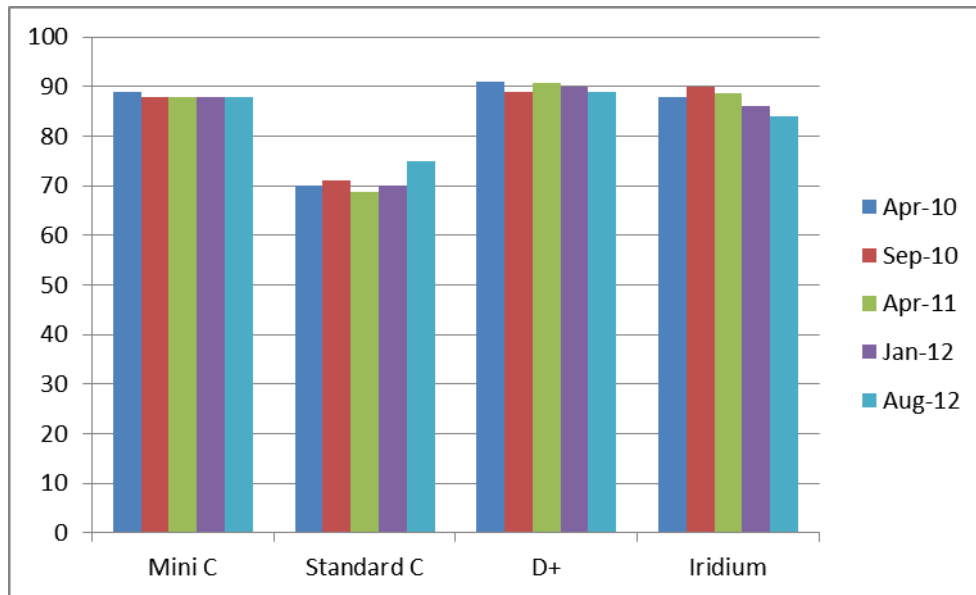


Figure 3: Percentage of reporting terminal per communication network

Table 4 below summarizes these figures.

Network	Not Reporting		Reporting		Stopped		Total
Mini C	537	10%	4520	88%	103	2%	5160
Standard C	634	23%	2051	75%	34	1%	2719
Inmarsat D+	47	8%	521	89%	20	3%	588
Iridium	15	14%	87	84%	2	2%	104
Total	1233	14%	7179	84%	159	2%	8571

Table 4 –number of ships per reporting status and per network, in August 2012

### 3.4. Restart

Restarting a terminal or shipborne equipment which is not reporting is the first step to solve reporting issues, as stated in procedure A-2 from Technical Note 8 v1.2. As an example, table 5 lists all the Restarts which were done by the ASP to correct the reporting statuses following the bug with the LRIT Ship DB. It shows that 26% of the Restart actions led to a terminal reporting normally.

Result	Number of Restart	%
Not successful	969	74%

Successful	336	26%
Total	1305	100%

Table 5 –number of ships per reporting status and per network, in August 2012

### 3.5. DNID uploads

DNID upload is the second step to fix reporting issues, as stated in procedure A-2 from Technical Note 8 v1.2.

The DNID upload action is needed most of the time when a ship is fitted with a Standard C/Mini C equipment and it loses its DNID due to an Ocean Region Change and therefore it stops reporting. This means that the ship was already integrated into the EU CDC but has now lost its DNID or address as to where it needs to send its messages. The cost generated from a DNID upload is currently paid by EMSA.

Figure 3 below shows the number of DNID uploads done by the ASP or NCAs through the UWI, over the past two years. The peak in September 2011 represents the actions done by the ASP for all EU CDC ships with reporting problems to improve the average reporting rate which was 81% in July 2011, and peaked at 87% after the ASP actions. The following 2 peaks in December 2011 and February 2012 are specific actions done by Cyprus which increased the reporting for a number of their ships.

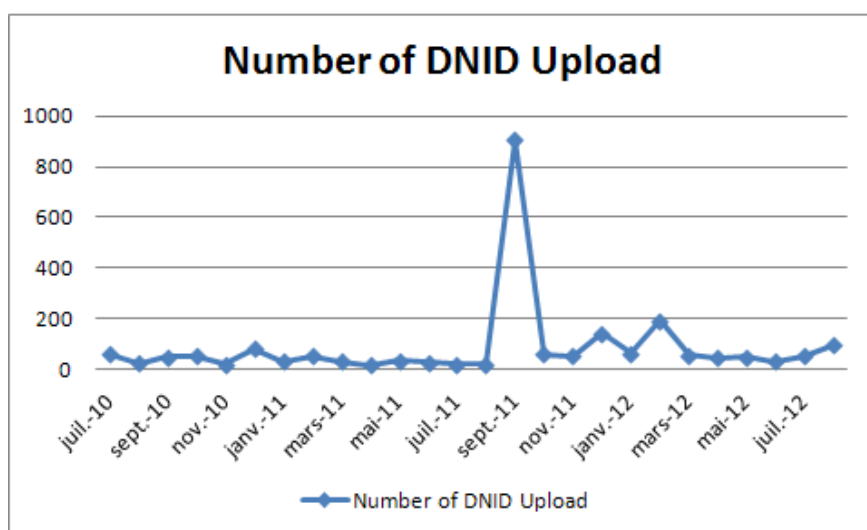


Figure 4 – Number of DNID upload from the UWI

### 3.6. Reporting Problems

The main reasons for having not reporting shipborne equipment are listed below. This is not an exhaustive list but these are the most common problems:

- Terminals not being in the visibility of the satellite: (Inmarsat C and D+):

This happens when a ship is sailing in the northern latitudes (poles), in fjords, in ports, etc. Some shipborne equipment models store and reprocess messages once they are within the range of a satellite (memory mode)

however this is rejected by the ASP (MEM code 70 for TT product in place of MEM code 11) due to the fact the reports are not coming in at a normal reporting rate and/or this can generate over-reporting.

- SSAS Terminals with an SSAS alert: the terminal is no longer transmitting LRIT data reports with MEM code 11 but with other MEM codes which are not LRIT compliant.
- Ocean Region Change (For Inmarsat C): Some terminals do not report properly when they change Ocean Region even if the DNID has been downloaded on all Ocean Regions (i.e ocean region 9) and the first request to set the terminal at 6 hours has been sent. The reasons are difficult to identify but can include terminals which are non MORP terminals, terminals having low storage capacity for DNID's and multiple DNID's, the terminals deleting DNID's when they change ocean region, etc.
- Busy Inmarsat C terminals: As an Inmarsat C terminal can be used for several purposes and as the "Message" functionality has a greater priority than "data reports"/"Polls", when a terminal is busy for emailing or other functionalities based on "messages", the terminal no longer sends data reports or receives polls. This occurs for GMDSS terminals or terminals used for emailing.
- Terminal switched off, change of radio ID (Transfer of Flag or Change of equipment): Some terminals do not report because they are no longer working. GMDSS terminals are often turned off when there is no paper in the printer or because an alert is regularly causing an alarm in the terminal. Other causes include the change of terminal, or the ship's transfer of flag.

There is no troubleshooting tool to fix the not reporting shipborne equipment. Investigations need to be done on a case by case by the ASP, as well as with support and further investigation from Flag Administrations and their shipowners.

Some solutions are suggested such as for example the replacement of the terminal with an Iridium terminal for ships sailing frequently in polar areas. For specific problems with the SSAS terminals, this could be resolved with the new configuration defined by Thrane and Thrane.

For the Ocean Region change problems, Mini C terminals are preferred compared to the use of Standard C terminals because of their greater memory capacity and they seem to better handle "Polls" and "data report" functionalities.

Concerning busy Inmarsat C terminals, GMDSS terminals should not be used for LRIT. The preferred solution would be a dedicated terminal for LRIT, or using the SSAS terminal to transmit both SSAS alerts and LRIT information.

Lastly, for terminals that are switched off, logged out, etc., it is suggested that the terminals should always be switched on and if a ship enters in dry dock, the information should be communicated by the shipowner to the Flag Administration who will set the terminal as Stopped through the UWI of the EU CDC.



#### **4. EMSA RECOMMENDATIONS**

When a shipborne equipment stops reporting, over-reports or under-reports the ship is no longer compliant with the SOLAS Convention. It is therefore the responsibility of the Flag Administration (NCA) to inform the shipowner and to take appropriate action.

EMSA recommends:

- Frequent monitoring (daily) of ships in the "Ship Integration" and "Ship Reporting" tables in the EU CDC User Web Interface. It is important that Flag Administrations detect and investigate with shipowners when ships are not reporting properly;
- That the LRIT NCA recommends to shipowners to use dedicated equipment which has a high level of performance in terms of transmitting LRIT information (Mini C, Inmarsat D+ or Iridium communication networks) so that the terminals are dedicated to transmit only LRIT information, or only LRIT information and SSAS alerts.

EMSA has drafted procedures to assist Flag Administrations and their shipowners for their follow-up actions on all integration and reporting problems. Please refer to Technical Note 8 v1.2 which was sent to all NCAs.

#### **5. EMSA PROPOSAL FOR FURTHER ASSISTANCE**

Some Flag Administrations do not have time nor the human resources to frequently check the "Ship Integration" and "Ship Reporting" tables in the EU CDC UWI and to perform the necessary actions (Restarts, DNID uploads) through the UWI.

EMSA proposes that for such Flag Administrations that do not have the available resources that EMSA could on their behalf (through its ASP), follow up the reporting/integration statuses of their fleet and take the appropriate actions as referred to in Technical note 8. This would then be reported on a regular basis to the Flag Administration.

It is reminded that actions linked with the improvement of integration and reporting (Continue integration, Stop, Restart, DNID upload) are free of charge for all Flag Administrations and therefore any EMSA assistance would be at no cost to the Flag Administration.

It remains the responsibility of the Flag Administration to collect and upload the correct data in the LRIT Ship DB.

#### **6. ACTION REQUIRED**

LRIT NCA's are invited to take note of the information and recommendations reported in this paper and provide their comments during the meeting.

They are also invited to note the proposal by EMSA to assist on the ship reporting monitoring task and to indicate their preference to EMSA either during the LRIT NCA meeting or via email.