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1. DISCLAIMER

The information contained in this document is provided as part of an ongoing consultation and planning process and is subject to change.

The contents of this document should not be used for planning or investment purposes without Inmarsat's prior consent. Inmarsat and Marlink shall not be liable for loss or damage of any kind, including indirect or consequential loss, arising from use of the information in this document and all warranties and conditions, whether express or implied by statute, common law or otherwise, are hereby excluded to the extent permitted by English law.

Despite a very long preparation managed by Marlink’s Engineers and Inmarsat-C experts, Marlink does not guarantee a 100% transparent migration. A vast number of points, potential issues and technical aspects have been reported to Inmarsat in advance.

A dedicated support team will be available during the migration phases to support and help partners in their own migration operations.

As usual Marlink puts its professionalism at the service of its customers and partners!
2. ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMER</td>
<td>Americas Ocean Region – Operated by I-4 satellite located at 98W</td>
</tr>
<tr>
<td>AOR-E</td>
<td>Atlantic Ocean Region East – Operated by I-3 satellite located at 15.5W</td>
</tr>
<tr>
<td>AOR-W</td>
<td>Atlantic Ocean Region West – Operated by I-3 satellite located at 54W</td>
</tr>
<tr>
<td>APAC</td>
<td>Asia/Pacific Ocean Region – Operated by I-4 satellite located at 143.5E</td>
</tr>
<tr>
<td>EGC</td>
<td>Enhanced Group Call (Inmarsat-C)</td>
</tr>
<tr>
<td>EMEA</td>
<td>Europe/Middle East Ocean Region – Operated by I-4 (Alphasat) satellite located at 25E</td>
</tr>
<tr>
<td>ENID</td>
<td>Enhanced Network Identifier (Inmarsat-C EGC)</td>
</tr>
<tr>
<td>GMDSS</td>
<td>Global Maritime Distress Safety System (Inmarsat-C)</td>
</tr>
<tr>
<td>IMO</td>
<td>International Maritime Organization</td>
</tr>
<tr>
<td>IOR</td>
<td>Indian Ocean Region – Operated by I-3 satellite located at 64E</td>
</tr>
<tr>
<td>LES</td>
<td>Land Earth Station</td>
</tr>
<tr>
<td>LESO</td>
<td>Land Earth Station Operator</td>
</tr>
<tr>
<td>MEAS</td>
<td>Middle East/Asia Ocean Region – Operated by I-4 satellite located at 64E</td>
</tr>
<tr>
<td>MES</td>
<td>Mobile Earth Station (Also commonly referred to as a “terminal”)</td>
</tr>
<tr>
<td>NCS</td>
<td>Network Coordination Station</td>
</tr>
<tr>
<td>POR</td>
<td>Pacific Ocean Region – Operated by I-3 satellite located at 178E</td>
</tr>
<tr>
<td>TDM</td>
<td>Time Division Multiplex (typically used as shorthand to refer to the Signalling carriers transmitted by the NCS and the LES)</td>
</tr>
</tbody>
</table>
3. INTRODUCTION

This document describes the steps involved in the migration of Inmarsat-C services from the I-3 satellites to the I-4 satellites. It is intended to serve as a reference document for the entire migration process, from planning to execution and follow-up activities. The E&E service contemplated in this document: Inmarsat-C (only).

For a better understanding of the migration’s phases and to make them more visual please, consult the PowerPoint Presentation available on Marlink’s webpage and the interactive map https://marlink.com/inmarsatc-i4-migration/

3.1 Scope and Assumptions

This document describes the actions required to implement the planned migration of Inmarsat-C services from the I-3 satellites to the I-4 satellites from a technical and operational perspective. It does not address in detail the background to the migration, nor the commercial arrangements that may be needed to manage the migration process.

This document is not a formal procedure for the migration process.

4. BACKGROUND

Inmarsat-C services need to be migrated from the I-3 satellites to the I-4 satellites because the I-3 satellites are approaching their end-of-life dates. Inmarsat has committed to continue the Inmarsat-C services beyond the expected end-of-life dates of the I-3 satellites, therefore, this service must be migrated onto the I-4 satellites.

The I-3 satellites are predicted to reach end-of-life between 2018 and 2020, depending on the individual satellite. In order to perform an orderly migration off the I-3 satellites, it is necessary to start the migration no later than 2018.

5. MIGRATION SEQUENCE

The migration will take place in 4 steps, as listed below.

- Step 1: Move of AOR-W from the 3F5 satellite (54° W) to the 4F3 satellite (98° W).
- Step 2: Move of POR from the 3F3 satellite (78° E,) to the 4F1 satellite (143.5° E).
- Step 3: Move of AOR-E from the 3F2 satellite15.5° W to the 3F5 satellite (54° W)
- Step 4: Move of IOR from the 3F1 satellite (64° E) the AF1 satellite (25° E).

The resulting network configuration will consist of three I-4 satellites (4F1 (APAC), 4F3 (AMER), AF1 (EMEA) and one I-3 satellite 3F5 (AOR-E).

The Ocean Region naming will stay the same for the Inmarsat-C network. Effectively the coverage or footprint of the AOR-W, AOR-E, IOR and POR will move to the west. In addition, the coverage area of the IOR will change, due to the non-standard footprint of the AF1 (AlphaSat) satellite.

The figures below provide a graphical view on the changing footprints of the 4 Ocean Regions. The dashed contour is the footprint before the migration. The solid contour is the footprint after the migration.
Step #1 – AOR-W migration

Step #2 – POR migration
Step #3 – AOR-E migration

Step #4 – IOR migration
6. TIMETABLE

The figure below shows the proposed timetable for implementation of the migration. Each step is expected to require around 3 months to prepare, execute and verify. Note that operational requirements may necessitate changes to this timetable. Any changes will be notified to all concerned parties with as much notice as possible.

The dates or periods displayed in that document might be changed and updated by Inmarsat at any time for technical or any other reasons. Customers and users should consult regularly the Marlink’s website in order to get up-to-date information about the exact planning.
6.1 Target dates

The target dates for each step in the migration are as follows. Note that these dates are subject to change for operational reasons and will be confirmed nearer the planned date of each step. It is strongly recommended to consult Marlink’s website regularly. Inmarsat will provide the exact date of each step approximately 4 weeks before the migration.

For the step #1, the 9th May at 14:00 UTC is the initial date given by Inmarsat. This date can be changed later on by Inmarsat depending of technical and operational constraints.

<table>
<thead>
<tr>
<th>Step</th>
<th>Target date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – AOR-W</td>
<td>09/05/2018 at 14:00 UTC (achieved)</td>
</tr>
<tr>
<td>2 – POR</td>
<td>03/07/2018 at 06:00 UTC</td>
</tr>
<tr>
<td>3 – AOR-E</td>
<td>End Q3 2018</td>
</tr>
<tr>
<td>4 – IOR</td>
<td>End Q4 2018</td>
</tr>
</tbody>
</table>

7. IMPACT ON LAND EARTH STATIONS (LES)

As part of the migration preparation, Inmarsat and Marlink have designed and implemented a new network architecture. The goal is to minimize the impact of the migration on the LES, its interface and the use of them by terrestrial users.

In the new network architecture, LES Operators (LESO) can share the radio equipment (e.g. antennas) located at the Inmarsat Network Coordination Station (NCS). The location (i.e. the LES) at which all the Inmarsat-C messages are processed and where mailboxes reside does not change. The interface that users use to send message to terminals or retrieve messages coming from terminals remains the same. When using the shared radio resources, the LES Ocean Region coverage will automatically move along with the NCS of migrating Ocean Region. The location of the LES (Aussaguel/France and EIK/Norway) and its terrestrial interfaces do not change.

For instance, in the AOR-W migration the NCS will move from Burum (NL) to Laurentides in Canada. In the new network setup, the radio interface towards the satellite of all LESO’s providing services in the AOR-W will move automatically as well.

In the pictures below the old and new network setup is depicted. In the new situation the LESO’s will remotely access the shared radio equipment at the Inmarsat NCS.

The old Inmarsat-C network architecture:
8. NUMBERING & NAMING CONVENTIONS

8.1 Numbering

Many MES models have hard-coded names associated with Ocean Region IDs and these cannot practically be changed. Ideally, the I-4 ocean regions would be numbered to correspond as closely as possible to the geographical location of the I-3 regions.

However, the need to avoid NCS Common Channel overlap for Inmarsat-C means that the I-4 ocean regions cannot correspond exactly to the geographical location of the I-3 regions, giving the following result:

<table>
<thead>
<tr>
<th>Region ID</th>
<th>I-3 Region</th>
<th>I-4 Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>AORW</td>
<td>AMER</td>
</tr>
<tr>
<td>1</td>
<td>AORE</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>POR</td>
<td>APAC</td>
</tr>
<tr>
<td>3</td>
<td>IOR</td>
<td>EMEA</td>
</tr>
</tbody>
</table>

It is not practical to have different Ocean Region numbering for Inmarsat-C, so the Inmarsat-C limitations will determine the final numbering.
8.2 Marlink LES-ID’s

No change in the Marlink LES-ID’s identification. Marlink will continue to provide the same coverage with the same LES-ID’s.

<table>
<thead>
<tr>
<th>Region ID</th>
<th>Region</th>
<th>Aussaguel LES-ID</th>
<th>EIK LES-ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>AORW</td>
<td>021</td>
<td>004</td>
</tr>
<tr>
<td>1</td>
<td>AORE</td>
<td>121</td>
<td>104</td>
</tr>
<tr>
<td>2</td>
<td>POR</td>
<td>221</td>
<td>204</td>
</tr>
<tr>
<td>3</td>
<td>IOR</td>
<td>321</td>
<td>304</td>
</tr>
</tbody>
</table>

9. MIGRATION IMPACT ON INMARSAT C TERMINALS

During normal operation, a terminal is “logged in” to an Ocean Region. When moving into the coverage of another Ocean Region terminals may switch to other region automatically. Due to regulation, GMDSS or SOLAS terminals will provide an alarm when this occurs and require manual intervention to switch Ocean Regions (Log in).

Because of the migration the footprint of the Ocean Region changes. Therefore, a terminal may find itself out of the coverage of the Ocean Region it was originally logged in to. GMDSS terminals will in such cases provide an alarm and require manual intervention.

Note: GMDSS certified terminals will always handle Distress Alerts, even if they are not logged in to an Ocean Region.

Mobile users that reside in the area that will not be covered by the new footprint Ocean Region after migration are encouraged to switch the terminal to another region before the migration occurs.

The figures below provide a graphical overview of the areas that will no longer be covered by the “migrating Ocean Region”. For instance, in the case of the AOR-W migration, the new footprint will no longer cover the crescent shape area depicted below (roughly between 24° east and 20° west on the lower latitudes). These terminals are advised to switch before the migration to the AOR-E regions.

Inmarsat expects that the planned migration to the I-4 satellites will have no significant impact on the operation of Inmarsat-C terminals, due to the simple, omnidirectional nature of the terminals. The operational parameters of the network are not being changed during the migration; only the location of the satellites will be different.

However, we cannot anticipate how the very old Inmarsat-C units (more than 15-years old) will accept the switch and its potential border-effects. Marlink does not guarantee that 100% Inmarsat-C units will continue to work properly after the migration.
Area out of Ocean Region coverage after migration step 1

Area out of Ocean Region coverage after migration step 2

Area out of Ocean Region coverage after migration step 3
Area out of Ocean Region coverage after migration step 4
10. GENERAL PRINCIPLES

The general principles of the migration are as shown below. In all cases, advance notification will have been provided to all LESOs involved, and a user awareness campaign will have been conducted. Note that the maximum practical number of ocean regions that the Inmarsat-C networks can support is four. Above this number, MES reconfiguration becomes necessary for Inmarsat-C. For these reasons, I-4 regions will not be added as additional regions, but will replace the corresponding I-3 regions.

In all steps, the change of the I-3 region and the transition to the corresponding I-4 region will be carried out as quickly as possible to keep the service outage to a minimum.

10.1 Satellite Configuration – Carrier Levels

The I-4 satellites in each region will be configured to match the corresponding I-3 satellite as closely as possible in terms of forward and return gain settings. The objective is to minimize the changes in level that may be required at the LESs and/or may be experienced by the MESs.

10.2 Step 1 – Closure of AOR-W and addition of AMER - Execution

The expected sequence of events will be as follows.

1. LESs in AOR-W block the set-up of new calls.
2. Inmarsat will issue updated Bulletin Boards, replacing AOR-W with AMER. Users in AOR-W will then be able to point to AOR-E or POR to receive the new Bulletin Board, then re-point to AMER if required.
3. Cease transmission of AOR-W carriers from the NCSs.
4. LESs in AOR-W terminate all remaining calls and re-point their antennas to AMER, or connect their LESs to existing AMER antenna feeds.
5. Activate NCSs for AMER region.
6. Activate LESs for AMER region.
7. Perform test calls.
8. Verify that call monitoring and reporting systems are operational.

10.3 Step 2 – Closure of POR and addition of APAC - Execution

The expected sequence of events will be as follows.

1. LESs in POR block the set-up of new calls.
2. Inmarsat will issue updated Bulletin Boards, replacing POR with APAC. Users in POR will then be able to point to IOR or AMER to receive the new Bulletin Board, then re-point to APAC if required.
3. Cease transmission of POR carriers from the NCSs.
4. LESs in POR terminate all remaining calls and re-point their antennas to APAC, or connect their LESs to existing APAC antenna feeds.
5. Activate NCSs for APAC region.
6. Activate LESs for APAC region.
7. Perform test calls.
8. Verify that call monitoring and reporting systems are operational.
10.4 Step 3 – Relocation of AOR-E to 54W - Execution

In this step, the AOR-E region is relocated from 15.5W (3F2) to 54W (3F5). This allows the 3F2 satellite, which has the shortest life expectancy, to be decommissioned. Only minimal changes to the configuration of the AOR-E region will be needed, to reflect the changed location of the satellite.

The expected sequence of events will be as follows.

1. LESs in AOR-E block the set-up of new calls.
2. Inmarsat will issue updated Bulletin Boards, removing LESs no longer in coverage and adding any that are now in coverage and updating the spot-beam map and any changed signaling channels. Users in AOR-E who are outside the coverage of 54W will then need to point to IOR.
3. Cease transmission of AOR-E carriers from the NCSs.
4. LESs in AOR-E terminate all remaining calls and re-point their antennas to 54W, or connect their LESs to existing 54W antenna feeds.
5. AOR-E NCSs are disconnected from 15.5W feeds and connected to 54W feeds.
6. Re-activate NCSs for AOR-E region.
7. Re-activate LESs for AOR-E region.
8. Perform test calls.
9. Verify that call monitoring and reporting systems are operational.
10. Monitor traffic.

10.5 Step 4 - Closure of IOR and addition of EMEA - Execution

The expected sequence of events will be as follows.

1. LESs in IOR block the set-up of new calls.
2. Inmarsat will issue updated Bulletin Boards, replacing IOR with EMEA. Users in IOR will then be able to point to AMER or APAC to receive the new Bulletin Board, then re-point to EMEA if required.
3. Cease transmission of IOR carriers from the NCSs.
4. LESs in IOR terminate all remaining calls and re-point their antennas to EMEA, or connect their LESs to existing EMEA antenna feeds.
5. Activate NCSs for EMEA region.
6. Activate LESs for EMEA region.
7. Perform test calls.
8. Verify that call monitoring and reporting systems are operational.
11. SERVICE-SPECIFIC MIGRATION DETAILS

11.1 Network Configuration

11.2 Common Channels

For Inmarsat-C, four NCS Common Channels are hard-coded into the MES as shown in the table below.

<table>
<thead>
<tr>
<th>Region ID</th>
<th>NCS</th>
<th>ID number</th>
<th>Channel number</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>AORW</td>
<td>044</td>
<td>11080</td>
</tr>
<tr>
<td>1</td>
<td>AORE</td>
<td>144</td>
<td>12580</td>
</tr>
<tr>
<td>2</td>
<td>POR</td>
<td>244</td>
<td>12580</td>
</tr>
<tr>
<td>3</td>
<td>IOR</td>
<td>344</td>
<td>10840</td>
</tr>
</tbody>
</table>

11.3 Carrier Levels

No significant changes to MES carrier levels are foreseen. The received signal levels at the MES will be equal to those provided by the I-3 satellites and no change in MES transmit power will be required.

There are currently no plans to reduce the carrier levels transmitted by the LES/NCS towards the I-4 satellites. This will be reviewed after each migration step has been completed.
12. SERVICES

12.1 Messaging

The standard function of the Inmarsat-C service is the exchange of message between the terminal and the Land Earth Station (LES). The LES will store message for later retrieval or forward the messages immediately to the end destination.

Terminals are designed to work within any Ocean Region and with any LES.

If during the migration a terminal moves out of the footprint of the satellite, it may select the nearest satellite and continue to operate. Mobile users should check if their terminal is logged in to an Ocean Region.

GMDSS certified terminals will provide an alarm and will require manual intervention.

Assuming that the terminal is logged in into an Ocean Region, there is no impact on the terminal side. Mobile users can continue to send messages in the same way as they are used to do. During the migration mobile users might face some delays due to the switch or to the NCS workload.

Mobile users that reside in the area that will not be covered by the footprint of the Ocean Region after migration are encouraged to switch the terminal to another region before the migration occurs. Terminals which don’t change footprint don’t need to take any action.

12.2 Enhanced Group Calling (EGC)

Enhanced Group Calling is an Inmarsat-C service in the fixed-to-mobile direction that allows the sending of a broadcast message to multiple terminals. The EGC service has three distinct types: SafetyNET, FleetNET and System EGC.

The principle of EGC messaging does not change with the planned steps in the migration. Moreover, the logical denomination of the ocean regions (on the I-3 satellites, synonymous with the satellite ‘name’) will not change. Even though in Step 1 the traffic is moved from the ‘AOR-W’ satellite (3F5) to the ‘AMER’ satellite (4F3), in the Inmarsat-C network this will still be ‘AOR-W’ traffic from the customers’ perspective (both mobile and terrestrial customers). This will be the same for the ‘POR’ and ‘IOR’ ocean regions when these move to an I-4 satellite. Commands used for the submission of EGC messages by customers will not change.

What does change, however, is the geographical coverage areas of the logical ocean regions. Effectively, every step in the migration plan results in an approximate shift of 40 degrees westward of the coverage of a logical ocean region. Customers will need to be aware of these changes in satellite footprints throughout the migration steps and ultimately of the disappearance of AOR-E (when 3F5 reaches end of life).

The FleetNet user may need to send its broadcast messages in different Ocean Regions.

12.3 SafetyNET

SafetyNET is the international service for the broadcasting and automatic reception of maritime safety information (MSI) via the Inmarsat EGC system. The capability to receive SafetyNET information is mandatory for ships that need to comply with the provisions of the International Convention for the Safety of Life at Sea, 1974.

Certified Maritime Safety Information Providers (MSIPs) use SafetyNET (II) to broadcast navigational and meteorological warnings, meteorological forecasts, shore-to-ship distress alerts, SAR information and other urgent information. MSIPs can direct a message to a given geographical area. The area may be fixed, as in the case of a NAVAREA/METAREA or coastal warning area; or it may be a user-defined
area (circular or rectangular). Seafarers will receive the MSI messages automatically on their Inmarsat-C or Mini C terminals and always free of charge.

12.4 METAREAs & NAVAREAs

METAREAs are geographical sea regions for coordinating the transmission of meteorological information to mariners on international voyages through international and territorial waters. These regions are part of the Global Maritime Distress Safety System (GMDSS). The regions are identical to NAVAREAs, which are used to coordinate the transmission of navigational hazards to the same mariners.

The geographical boundaries of the METAREAs and NAVAREAs will not change. The migration will not affect seafarers receiving MSI as the Inmarsat-C and Mini C terminals will not be affected. Seafarers can continue to select the NAVAREA and METAREA regions they want to receive MSI from. Under strict supervision of International Mobile Satellite Organization (IMSO), Inmarsat Safety Team will closely monitor the migration ensuring the 99.9% service availability level is met. During the migration of I3 to I4, SafetyNET information providers, such as Maritime Safety Information Providers (MSIPs) and Maritime Rescue Coordination Centres ((M)RCCs) that broadcast EGC messages, may have to make minor changes to ensure all messages are broadcast over the correct satellites to their area of responsibility.

12.5 Distress alerting

The Distress Alerting service will not change and is not impacted by the migration. Alerts will continue to be handled by the Land Earth Stations in each region and automatically routed, with the highest priority, to the associated Maritime Rescue Coordination Centre (RCC).

Please note that GMDSS certified terminals will always handle Distress alerts, even if they are not logged in to an Ocean Region.

12.6 FleetNET

FleetNET is a commercial implementation of the Enhanced Group Call (EGC) ‘broadcast’ service of Inmarsat-C.

Customers who use this service have been assigned an Enhanced Network IDentifier (ENID), which is used to create a closed user group of mobile terminals.

The assigned ENID is unique in the entire Inmarsat-C network; this identifier is assigned to a terrestrial user and in principle is also bound to the Land Earth Station Operator (LESO) that is servicing the customer (LESOs get ENIDs assigned by Inmarsat). The ENID can be used in all ocean regions, the only limitation being the number of ocean regions served by the LESO, although it is possible for LESOs to process EGC traffic for other LESOs’ customers.

The ENID is downloaded (over the satellite channels) into mobile terminals that are part of the closed user group; the mobile terminals store the ENID information in their configuration memory. FleetNET messages that are broadcast on the NCS common TDM channel will be examined by all mobile terminals with EGC capabilities; when a mobile terminal finds an ENID inside the FleetNET message protocol that matches an ENID that it has stored in memory, it will store the message in its memory and take further action as appropriate (e.g. printing). FleetNET messages addressed to closed user groups of which a particular mobile is not a member are ignored.
Operation of FleetNet will not be significantly affected by the migration, however, LESOs will need to ensure that they are able to deliver FleetNet services in all required ocean regions, either via their own infrastructure, or by arrangement with other LESOs.

12.7 User Applications and Devices

Applications and external devices that communicate via Inmarsat-C are outside Marlink’s control. Users should be aware that such applications and/or devices may make assumptions about the Inmarsat-C network that may no longer be valid once the migration to I-4 satellites takes place.

Inmarsat has designed the migration process to make as few changes as possible to the network configuration, however, some changes (e.g. to satellite locations) are inevitable and this may affect the operation of applications and/or devices connected to the Inmarsat-C terminal. Inmarsat and Marlink strongly advise all Service Providers and users to seek advice from their equipment or application providers to ensure that service can be maintained during and after the migration.
12.8 Polling & data reporting

12.8.1 Data Reporting

The Data Reporting service is used for communicating small amounts of data to the shore. All types of data are accepted. In general, this service is used for transferring the position, speed and the direction of a ship to a shipping company or a control/tracking center.

To make it work an Inmarsat-C mobile must have in place in its memory a range of mandatory parameters:

1) A DNID representing the user/customer and having, on the shore-side (LES) the necessary parameters allowing the routing of the data to the destination. A DNID is a suite of 3 to 5 digits.
2) A Member Number representing the rank of the mobile within a fleet under a DNID. 255 Inmarsat-C maximum can be registered under a DNID.
3) An Ocean Region representing the zone where the vessel is sailing and where the DNID is supposed to work
4) An LES-ID representing the Teleport to which the data must be sent to.

If one of these 4 elements are missing or if one of these 4 elements changes, the Data Reporting service does not work.

This description shows you that to make it work globally (around the planet), a DNID and its parameters must be registered 4 times in the memory of the Inmarsat-C mobile (one time per Ocean Region). Except if the customer uses the MORP protocol (Multi-Ocean Reporting) a DNID and its parameters can be downloaded to a mobile only when the mobile is connected to a new Ocean Region (it is not possible to download a DNID which is supposed to work in AOR-E when the mobile is sailing under the POR footprint).

The consequence of this specific procedure is that vessels will stop reporting after the migration because they won’t have in place a DNID operating in the new Ocean Region after the switch.

Is it possible to anticipate avoiding an outage after the switch?

- Yes, you can anticipate to a degree. Before a migration and if your vessel is in an area impacted by the switch (for instance, if your mobile is located between 20° E and 20° W when the AOR-W will be switched), you can force a log-in of the mobile on an adjacent Ocean Region and declare this new Ocean Region as your preferred one (for avoiding the mobile to automatically switch again to the previous Ocean Region). This is a manual and local operation done onboard by the captain.

How to be sure that a mobile will continue to work after the switch?

- To make it work after a switch the DNID must be operational in all Ocean Regions or at least in the new Ocean Region the mobile will operate after the switch. If the DNID has been already recorded in the past on 2, 3 or 4 Ocean Regions, then you are safe! After the switch, the mobile will continue to work on the new Ocean Region and the switch will be transparent. If it is not the case and if the DNID is recorded on one Ocean Region, then you will have to download the DNID and its parameters after the switch.

After a switch a mobile does not report anymore, why?

- The DNID is not recorded on the new Ocean Region ➔ the owner of the DNID must download the DNID on the new Ocean Region or ask Marlink to do it.
- The DNID is recorded on the new Ocean Region but it is not programmed to automatically report ➔ the owner of the DNID must send to the mobile 2 poll commands (one containing the scheduling program and one for making it start).
After a switch, poll commands are not received by mobiles, why?

- After a switch, we might face a situation where the ship’s owner around the globe will try to send poll commands to their ships or their fleet. The massive number of poll commands will generate a long pending queue at the NCS level. Poll commands are treated one by one by the NCS in order of reception. Poll commands might be delayed or lost to avoid a long pending queue at NCS level, customers must be patient because the treatment of poll commands might take time (possibly several hours). To avoid a massive number of waiting poll commands and the creation of loops, it is strongly recommended to stop the usage of automatisms or robots which are programmed to automatically send poll commands if an acknowledgment from the mobile is not received in a pre-defined time-frame.

12.8.2 Polling

Polling is a shore to ship protocol/service allowing a user to “talk” to a mobile or a fleet of mobile. Poll commands are used for:

- Download of a DNID and its parameters into a mobile
- Download of a scheduling program
- Starting the automatic data transmission process
- Stopping the automatic data transmission process
- Removing a DNID and its parameters from a mobile

A poll command is received by a mobile only if the poll command is sent to the Ocean Region where the mobile is sailing (a mobile won’t receive a poll command for AOR-W if it is logged in on the POR).

There is a protocol called “MORP” (Multi Ocean Region Polling) which can be used to send poll commands to the 4 Ocean Regions at the same time. Unfortunately, this protocol is not available on all LES, not compatible with all types of Inmarsat-C devices and not sufficiently reliable.

As already mentioned in this document, a vast number of customers will try to send poll commands just after the switch. This is a situation an operator cannot avoid or prevent. We might face long pending queue at the NCS level after the switch because users are trying to download DNIDs or are trying to register scheduling programs.
13. SATELLITE COVERAGE

Please note that in all the figures below, the satellite coverage footprint is approximate and shows the 10-degree elevation angle coverage contour. More detailed coverage maps are available from Inmarsat on request.

13.1 AMER/AOR-W

![Satellite Coverage Map](image)

**AMER/AOR-W (98W) coverage**

*Phase 1 – AORW – 4-Apr-18*
13.2 APAC/POR

APAC/POR (143.5E) coverage
13.3 AOR-E/AOR-E
13.4 EMEA/IOR

EMEA/IOR (25E) coverage

13.5 Final coverage

Final network coverage
14. NEED SUPPORT?

If you have any questions, please contact your Key Account Manager or Marlink Service Desk:

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