

EGC SafetyNET Matrix

Submitted by Inmarsat

**SUMMARY**

Executive Summary: This document provides a draft SafetyNET Matrix showing the draft revised boundaries for new and existing NAVAREAs and METAREAs

Action to be taken: Paragraph 3

Related documents: CPRNW10/4/4 and SafetyNET Manual Edition 2003

1. Attached is a draft EGC SafetyNET matrix showing modifications of some existing areas and new Arctic areas.
2. In order to implement the matrix into Inmarsat C/mini-C terminals Inmarsat needs to have an approval of all changes done on existing areas and positions of new areas as well including all positions of all new lines (boundaries) that shape every area. This needs to be discussed at CPRNW10.
3. All NAV/METAREA coordinators should consider the proposed solution and give Inmarsat, through CPRNW, their comments. Unless Inmarsat has all positions, Inmarsat will not be able to proceed with the new implementation.

**Draft modifications to the EGC SafetyNET matrix  
for Inmarsat C System Definition Manual**  
(existing and new NAVAREAs/METAREAs' boundaries)

Version 3

**Vladimir Maksimov**  
**Manager, Maritime Safety Operations**  
**Inmarsat Maritime Safety Services**

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## Introduction

This paper identifies operational issues with the existing boundaries of NAVAREAs/METAREAs (called area(s) throughout the text), as defined in the Inmarsat C System Definition Manual (SDM) and implemented into Inmarsat C and mini-C maritime Mobile Earth Stations (MESs), and also defines new Arctic areas.

Operation of the SafetyNET services has shown that boundaries of some areas, as encoded in the MESs' software/firmware, are not accurate and ships navigating in these areas might not receive relevant MSI. There are also some overlap areas where ships (may) receive MSI addressed for an area where ships may never navigate, which causes high volume of unwanted messages and this problem is also addressed in the paper.

Proposed amendments to the existing matrix will bring the areas to the limits approved by International Maritime Organisation (IMO) and close down service gaps in some areas. It will also bring some areas as closer as possible to maritime limits (boundaries) and reserve more land mass to define new areas for inland waterway users, e.g. Lake Victoria in Africa, some Siberian rivers, etc. Another reason for modification is to draft new sub-areas for Black Sea, Caspian Sea and Baltic Sea and to define five new Arctic areas, XVII-XXI as approved by IMO.

Geographical areas for coordinating and promulgating radio-navigational warnings are defined by IMO Resolution A.706(17) and shown on Figure 1. A few geographical points on the map will require additional confirmation since they are not clearly defined by the Resolution, for example, termination points of Northern and Southern edges of area V; separation line between area II and III; and position of the "triangle" between area VI and XV, etc..

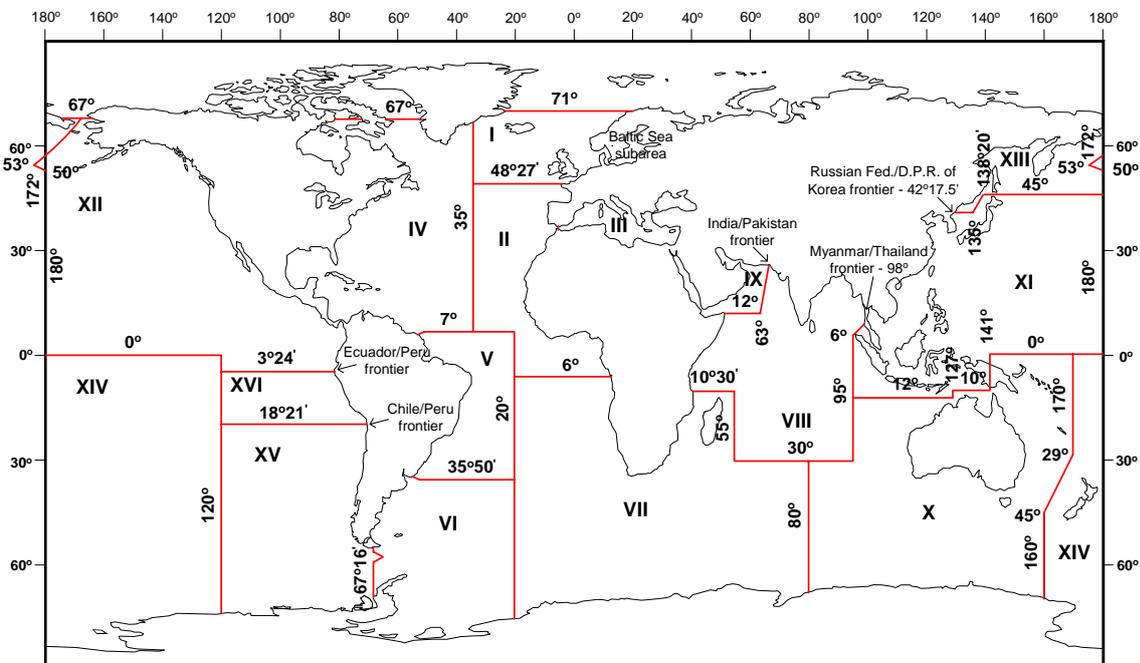


Figure 1. Geographical areas for co-ordinating and promulgating radio-navigational warnings

## 1. Some service “gaps” with operational problems and new area(s)

Existing limits/boundaries of NAV/METAREAs, as encoded in the Inmarsat C and mini-C MESSs’ software, are shown on Figure 2 and the following operational issues are identified with the numerical reference shown on the figure:

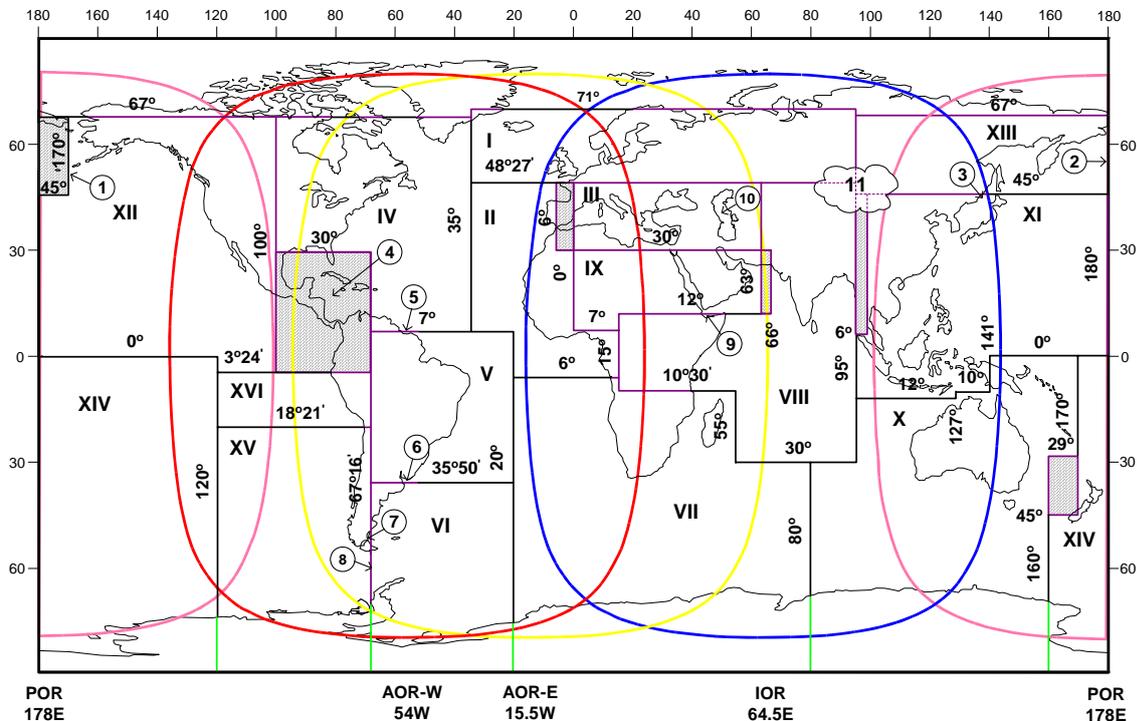


Figure 2. Existing NAV/METAREAs boundaries as in the Inmarsat C System Definition Manual

1. Eastern edge of overlapping area between Area XII and XIII is fixed on longitude  $170^{\circ}$  W. Correct position should be  $169^{\circ}$  W.
2. Western edge of overlapping area between Area XII and XIII is fixed on longitude  $180^{\circ}$  and does not include a “triangle” going into area XIII to longitude  $172^{\circ}$  E. It means that ship inside the “triangle”, which is area XII, will not receive MSI addressed for the area. The whole overlap area should be modified.
3. Southern edge of Area XIII is lying on latitude  $45^{\circ}$  N and does not include a “triangle” on the S-W corner of the area. Ships navigating in the “triangle” will only receive MSI broadcast addressed to area XI. New (small) rectangular overlap areas will be denied.
4. There are complaints from ships operating in the overlap area, in both area IV and XII, that they receive numerous unwanted SafetyNET messages even though ships may never sail in the adjacent area. It is not possible to disable unwanted messages. New boundaries between area IV and XII are defined with a small overlap area.
5. Southern edge of area IV (the same as Northern edge of area V) goes along latitude  $7^{\circ}$  N to the shore line while IMO defines its deviation to Brazil/French Guiana frontier (TBC). It means that ships navigating to the north of F. Guiana coast up to  $7^{\circ}$  N will not be able to receive area IV messages. Instead, ships will be receiving area V broadcast only. A small overlap rectangle is defined to fix the problem.
6. Southern edge of area V (the same as Northern edge of area VI) goes along latitude  $35^{\circ}20'$  S to the shore line while IMO defines its deviation to Brazil/Uruguay frontier (TBC). It means that ships navigating between  $35^{\circ}20'$  S parallel (including waters off Buenos Aires and Montevideo) and Brazil/Uruguay frontier, which is area VI as defined

by IMO, will not be able to receive area VI messages. Instead, ships will be receiving area V broadcast only. A small overlap rectangle is defined to fix the problem.

7. Western edge of area VI (the same as Eastern edge of area XV) goes along longitude  $67^{\circ}16'$  W which makes impossible to receive area VI broadcast for South Eastern (or Southern) Argentinean coastal waters to the west of  $67^{\circ}16'$  W meridian which is area VI. Small rectangle extension is defined to cover coastal waters by area VI broadcast.
8. Boundary between area VI and XV goes along longitude  $67^{\circ}16'$  W that means southern Chilean waters are held in the software as area VI. IMO defines a “triangle” to cover the area as area XV and a small overlap rectangle is defined to fix the problem.
9. Southern edge of area IX goes along  $67^{\circ}$  N parallel which leaves the southern part of Gulf of Aden (south of  $67^{\circ}$  N to the coastal line) including port of Djibouti outside the area. This means that ships navigating in the southern part of the Gulf of Aden will be receiving area VIII broadcast instead of area IX. A new boundary of the area is defined to cover southern part of Gulf of Aden in area IX.
10. New Caspian Sea area is defined as area III sub-area (the same may refer to Black Sea area as well).
11. Existing boundaries of various areas terminate on land mass and making it mandatory for ships on inland waterways to receive MSI addressed to IMO defined NAV/METAREAs.

For example, ships operating in central part of Russia on Siberian rivers receive MSI addressed to area I, III, VIII, XI and XIII. It causes numerous complaints from inland waterway customers, national administrations and puts a limitation on using Inmarsat C system on rivers. The same situation is (may be experienced) in the other areas.

## 2. Proposed solutions

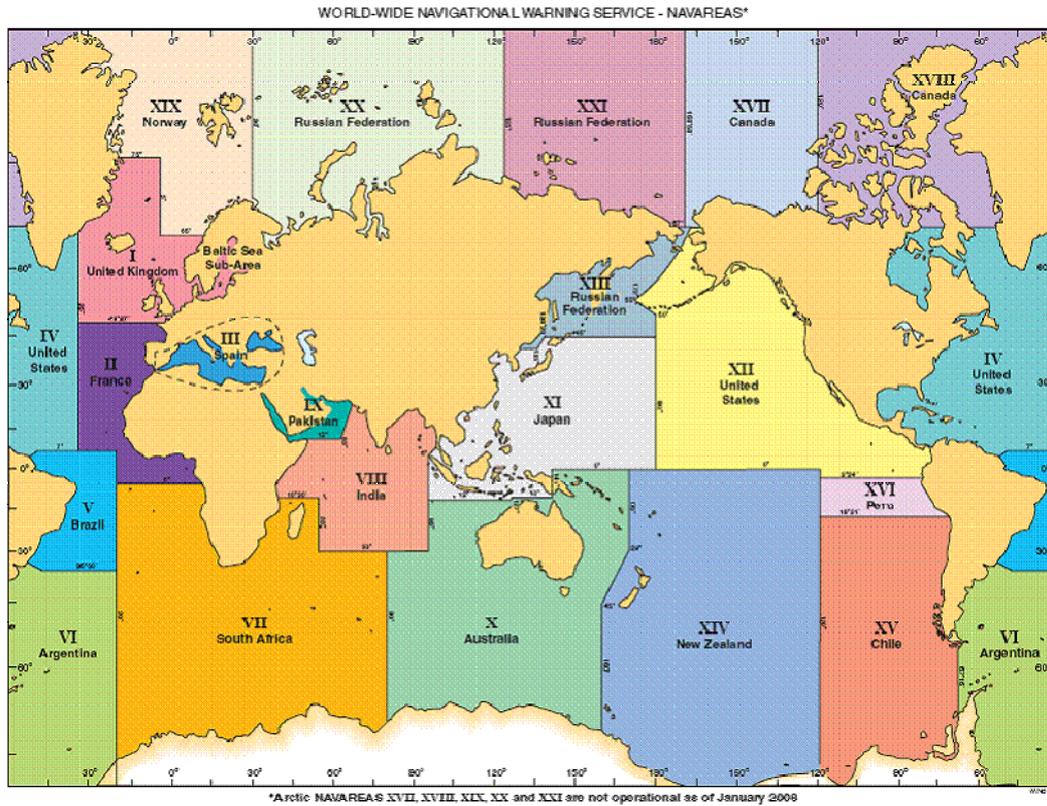


Figure 3. Modifies area I and draft Arctic areas (taken from COMSAR 12/3/2 paper submitted by IHO/IMSO and WMO)

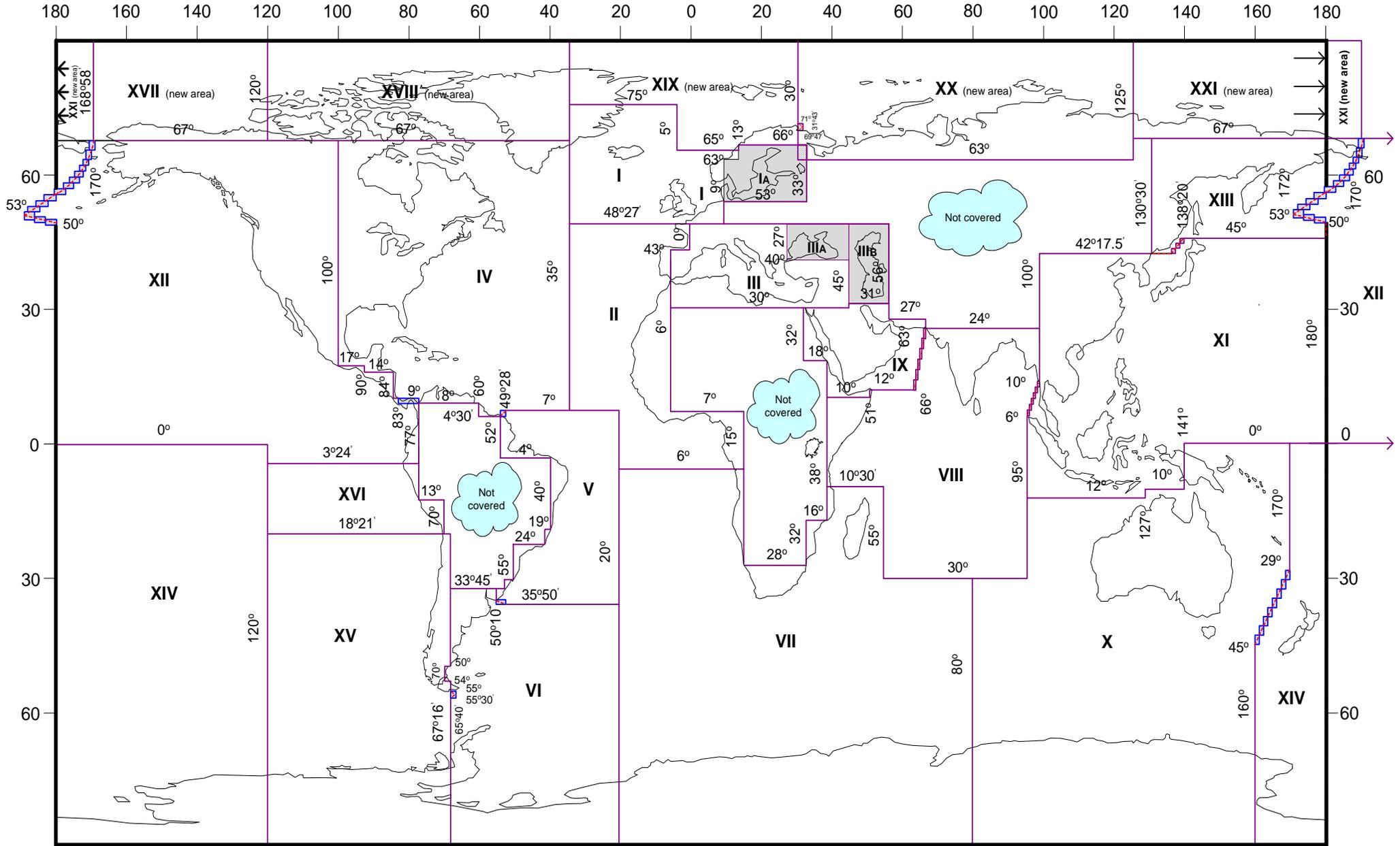
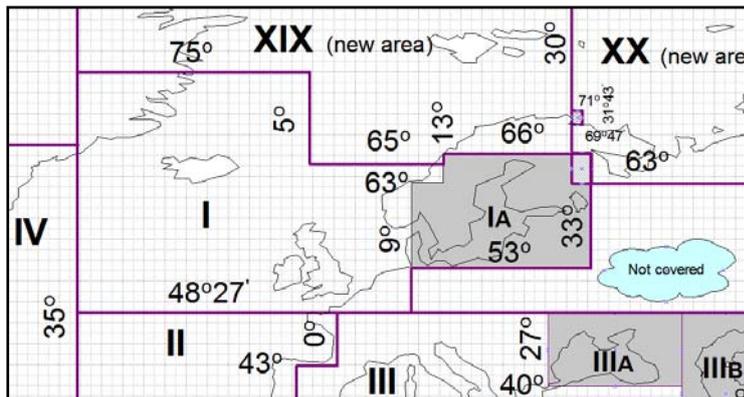


Figure 4. Proposed modifications to existing and Arctic areas

This paragraph gives details of all modifications to the existing areas and defines five new Arctic areas.

**Note: Geographical positions in latitude and longitude of some vertical and horizontal lines are approximate and should be checked and confirmed by National NAV/METAREA coordinators before submitting changes to Inmarsat manufacturers.**

### NAV/METAREA 1.

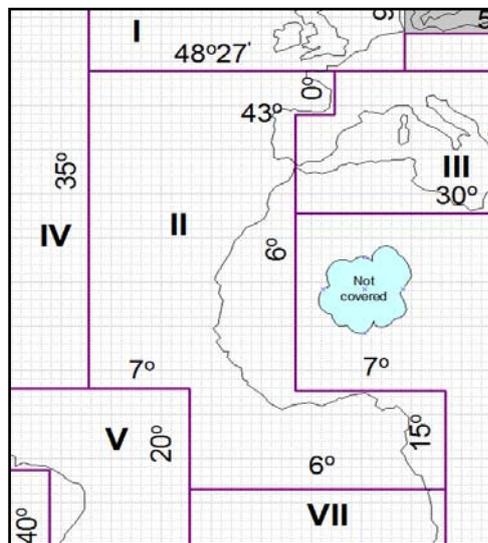


The area will have new northern and eastern boundaries as shown on the figure. In addition a new Baltic Sea sub-area IA is defined, shown as shaded area, and overlaps the area I.

The area between Baltic Sea and area III and to the east of modified area I is shown as “Not covered” and is not part of any

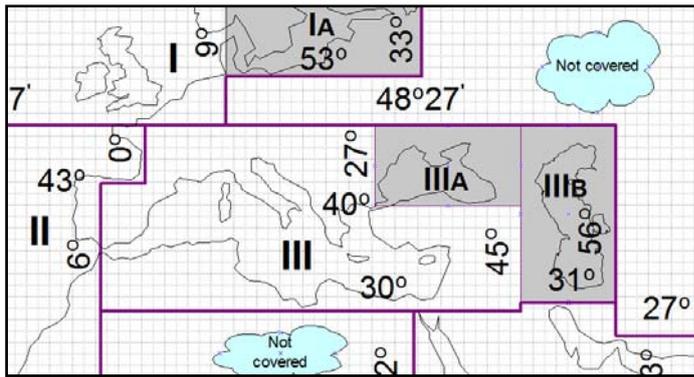
EGC SafetyNET matrix. “Not covered” areas (here and throughout the whole document) are (may be) reserved for future use and can be used for inland waterways.

### NAV/METAREA 2.



An overlap area between area II and III (between 0 and 6 degrees West), which affects ships in western Med and Biscay bay, is removed. Eastern boundary is moved from 0° longitude to 6° West to “enlarge” land mass area in Western Africa shown as “Not covered” by any NAV/METAREA.

### NAV/METAREA 3

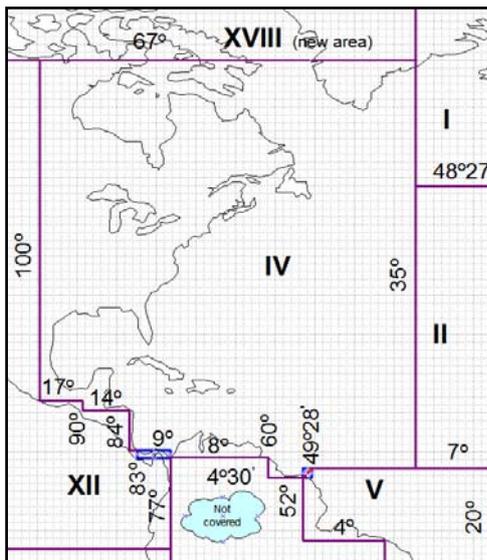


Boundaries of the area remain the same except southern limit above Persian Gulf that is “moved” one degree to the North and overlap area with area II in the western Med is removed.

In addition two adjacent sub-areas are defined, shown as shaded, to cover Black Sea (IIIA) and Caspian Sea (IIIB) and both areas overlap with the

“main” area.

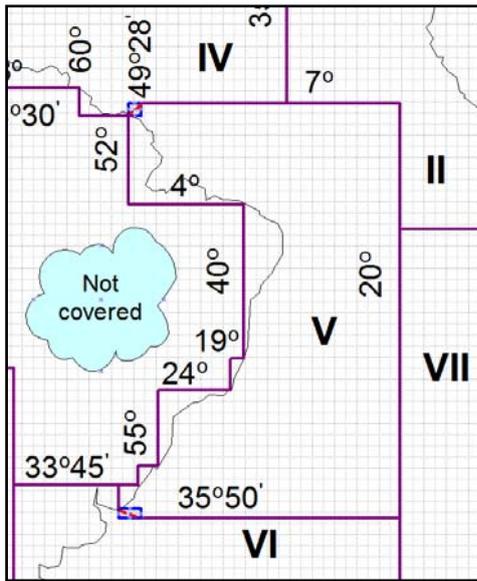
### NAV/METAREA 4.



Southern boundary of the area is modified and large overlap area with area XII is removed by replacing it with a number of small rectangles.

Two small overlap areas are defined to cover the area around Panama Canal and the area at the Brazil/French Guiana frontier.

### NAV/METAREA 5.

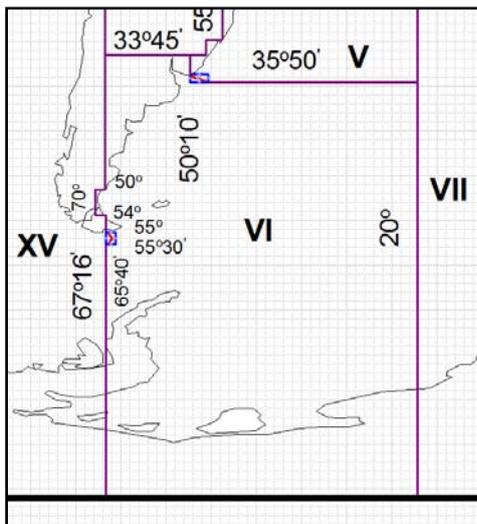


Eastern boundary is completely modified to move it as close as possible to the shore line and to leave land mass outside the SafetyNET coverage.

Two small rectangular overlap areas are defined: between area IV - V and V - VI to cover Brazil/French Guiana frontier area and Brazil/Uruguay frontier area as required by IMO.

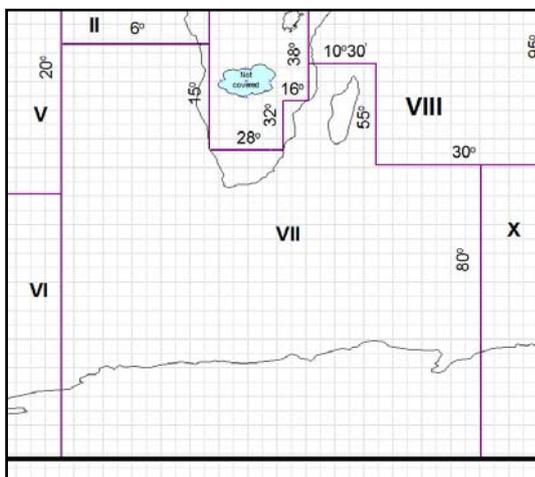
Major part of Southern America is shown as “Not covered” by the EGC SafetyNET matrix.

### NAV/METAREA 6.



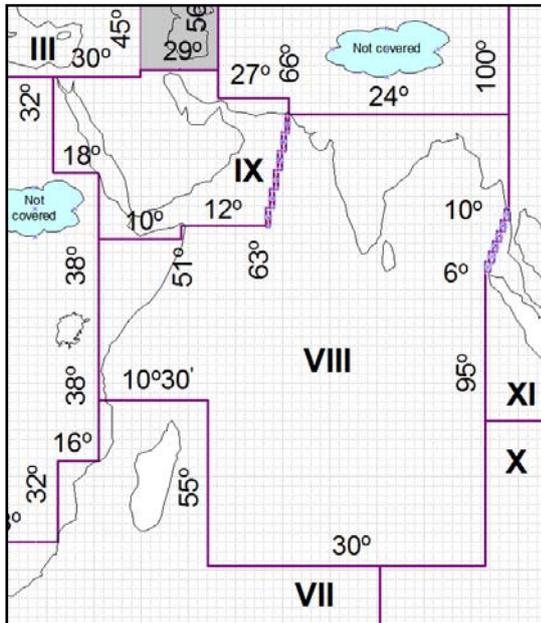
Northern and Western boundaries are modified to cover service gaps on the Brazil/Uruguay frontier area and to cover southern Chilean waters. In addition a rectangular extension was made to cover Argentinean coastal waters.

### NAV/METAREA 7.



No major changes are done except some modifications on the Southern African land mass to exclude the area from the SafetyNET coverage.

## NAV/METAREA 8.

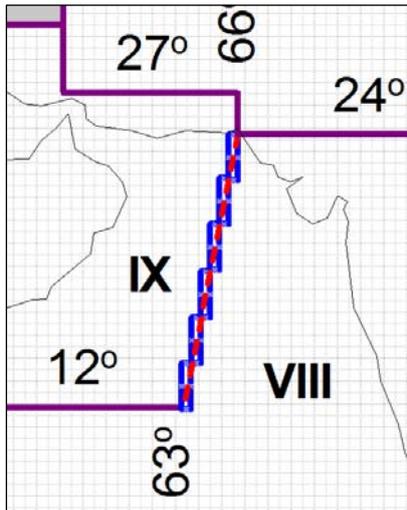


Overlap areas between VIII – IX and VIII – XI are modified to replace them with a number of smaller rectangles covering diagonal separation line.

For example, size of the existing overlap VIII – IX area is 18x3 degrees or 1080x180 miles. If the area is replaced by 6 smaller rectangles, as shown on the figure, the size of each overlap area will be approximately 180x30 miles. Each “small” rectangle does not overlap with the adjacent rectangle. Similar approach applies to overlap VIII-XI area.

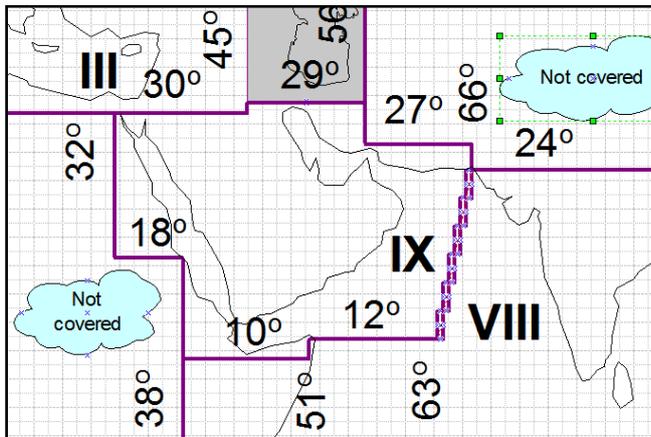
Changes are also done to the northern boundary to move it down and to the horizontal boundary with area IX to exclude southern part of Gulf of Aden from area VIII and include it to area IX.

Red dotted line inside overlap triangles shows IMO defined boundary between adjacent areas.



Red dotted lines inside overlap triangles here and throughout the remaining document show IMO defined boundaries between adjacent areas

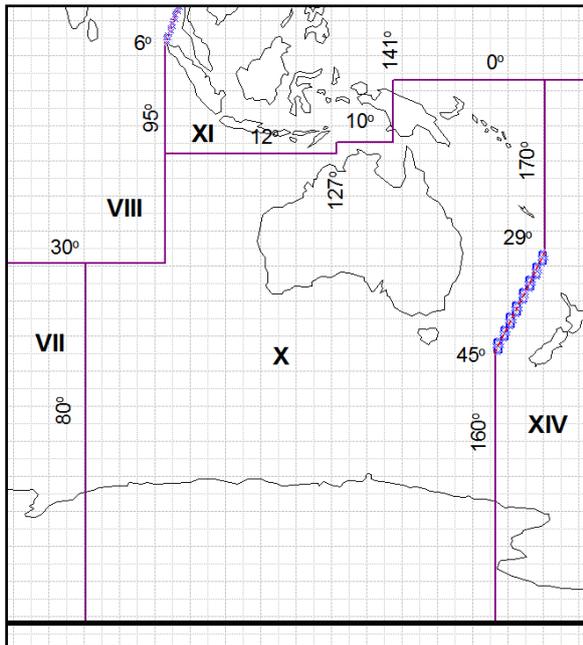
### NAV/METAREA 9.



Changes are done to include northern part of Persian Gulf into area IX by moving part of the northern boundary up from 30° N to 31° N. Another change is done to include southern part of Gulf of Aden from area VIII to area IX by moving part of the southern boundary down from 12° N to 10° N. More changes are done on the western boundary to move it as closer as possible to the shore line and leave more land mass areas outside SafetyNET coverage.

Red dotted line inside overlap triangles shows IMO defined boundary between adjacent areas.

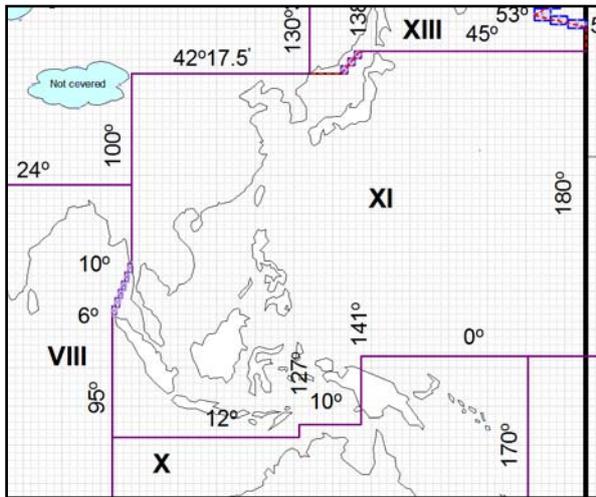
### NAV/METAREA 10.



The only change is on the rectangular overlap X-XIV area, whose size was 16x10 degrees or 960x600 miles. The area was modified by replacing it with 8 smaller areas whose size is 120x75 miles.

Red dotted line inside overlap triangles shows IMO defined boundary between adjacent areas.

## NAV/METAREA 11.



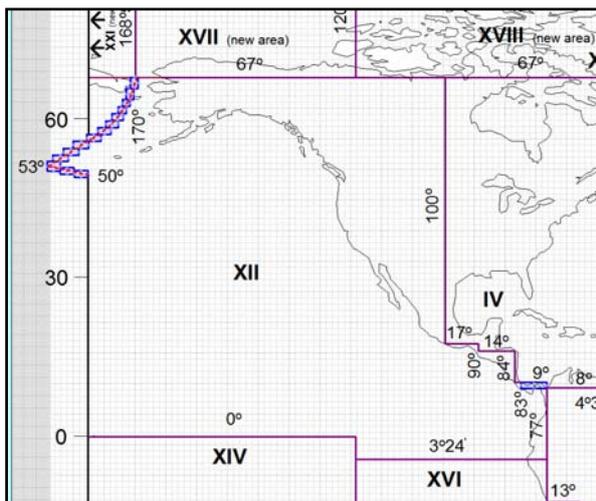
areas.

Modification was done on the overlap VIII-XI area and it is explained in NAV/METAREA 8 chapter above.

Another modification is on the N-W corner of the area to define and insert an overlap area with area XIII. Part of the southern boundary, next to the new overlap area, is moved down from 45° N to 42°17.5' N. In the existing configuration this area is part of area XI.

Red dotted line inside overlap triangles shows IMO defined boundary between adjacent

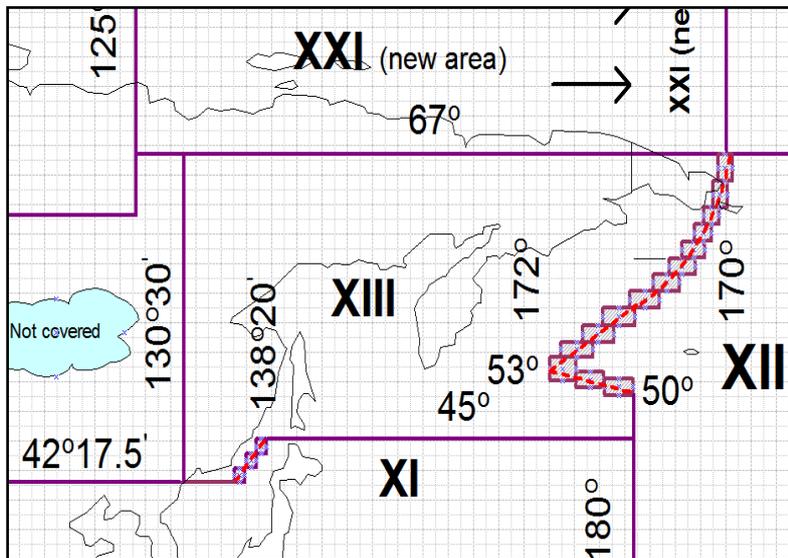
## NAV/METAREA 12.



The main modification is to exclude overlap XII-XIII area, which did not cover part of area XII, and replace it with a number of small overlap rectangles (14 rectangles are drafted). New boundary with area IV is explained in chapter NAV/METAREA 4 above. The existing overlap area is 22x10 degrees or 1320x600 miles. Size of smaller areas will be about 100x40 miles.

Red dotted line inside overlap triangles shows IMO defined boundary between adjacent areas.

### NAV/METAREA 13.

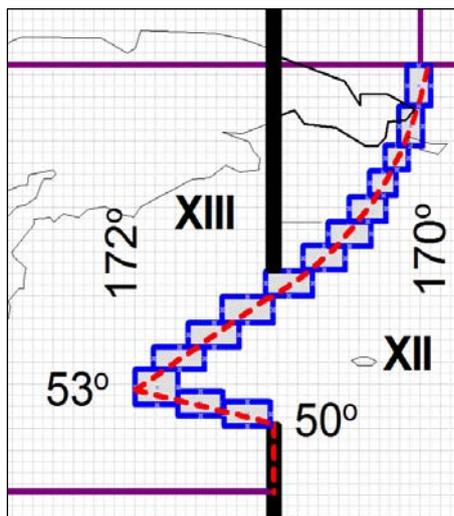


The main modification is to exclude overlap XIII-XII area, which did not cover part of area XII, and replace it with a number of small overlap rectangles (14 areas are drafted) as explained in chapter NAV/METAREA 12.

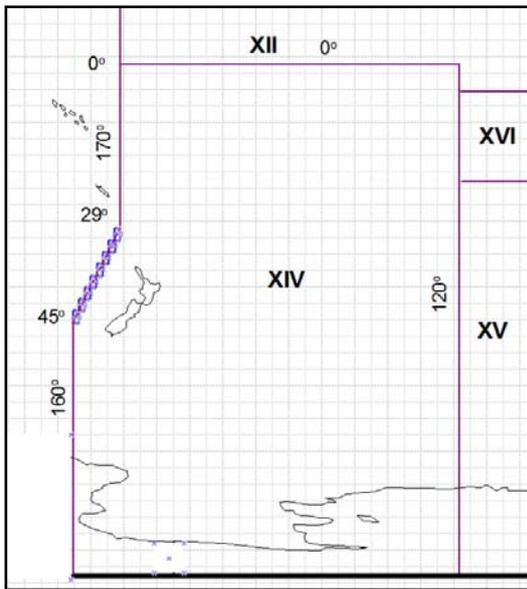
New boundary with area XI is explained in chapter NAV/METAREA 11 above.

Red dotted line inside overlap triangles shows IMO defined boundary between adjacent

areas.



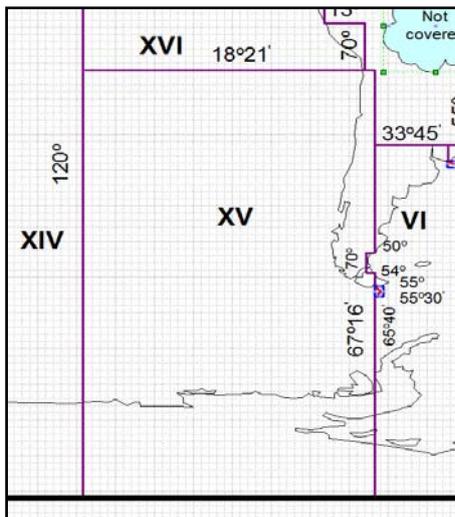
### NAV/METAREA 14.



The only change is to exclude overlap X-XIV area and replace with a series of eight smaller rectangles as explained in chapter 10 above.

Red dotted line inside overlap triangles shows IMO defined boundary between adjacent areas.

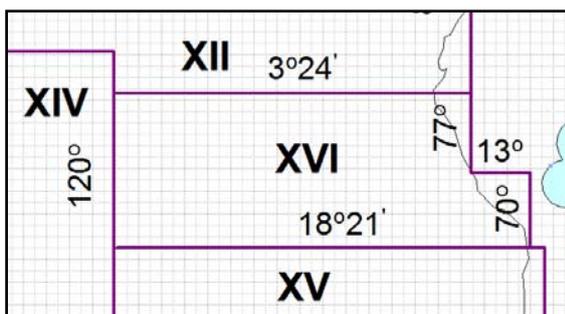
### NAV/METAREA 15.



Modification is done on the eastern boundary of the area and is explained in chapter NAV/METAREA 6.

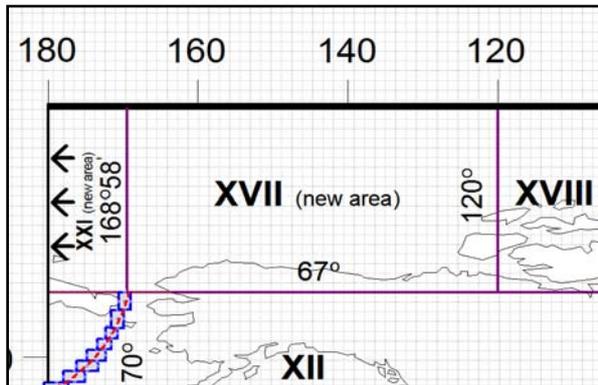
Red dotted line inside overlap triangles shows IMO defined boundary between adjacent areas.

### NAV/METAREA 16.



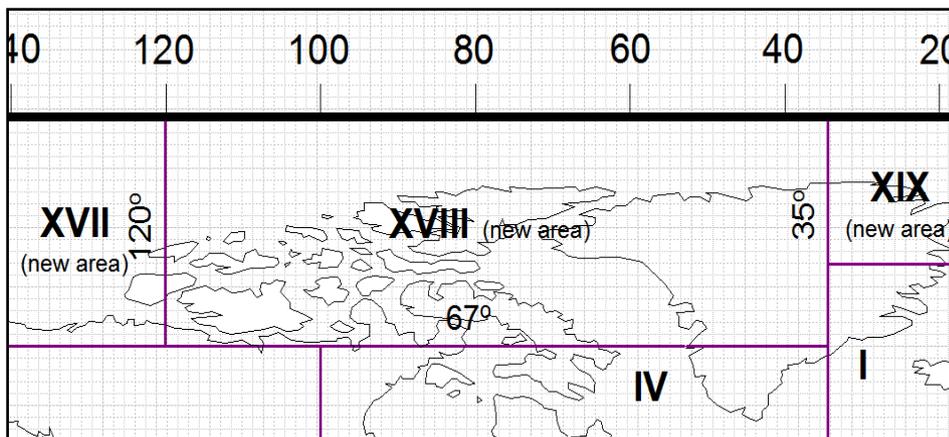
The only modification is on the eastern boundary – to break it to three lines and move it as closer as possible to the shore line.

**NAV/METAREA 17.**



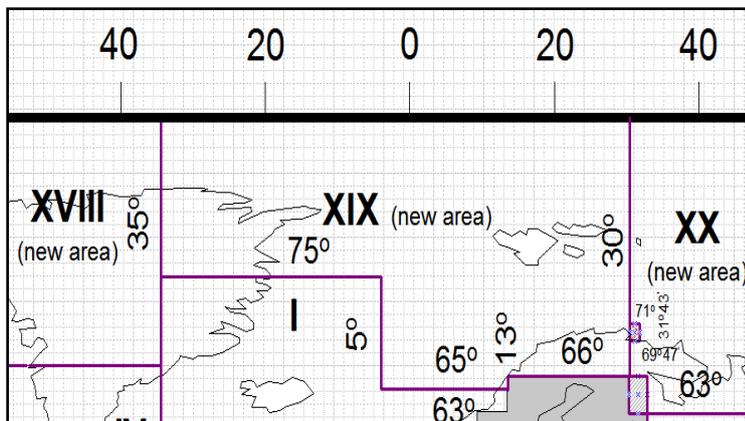
The area is defined as a single rectangle with positions shown on the figure.

**NAV/METAREA 18.**



The area is defined as a single rectangle with positions shown on the figure.

**NAV/METAREA 19.**

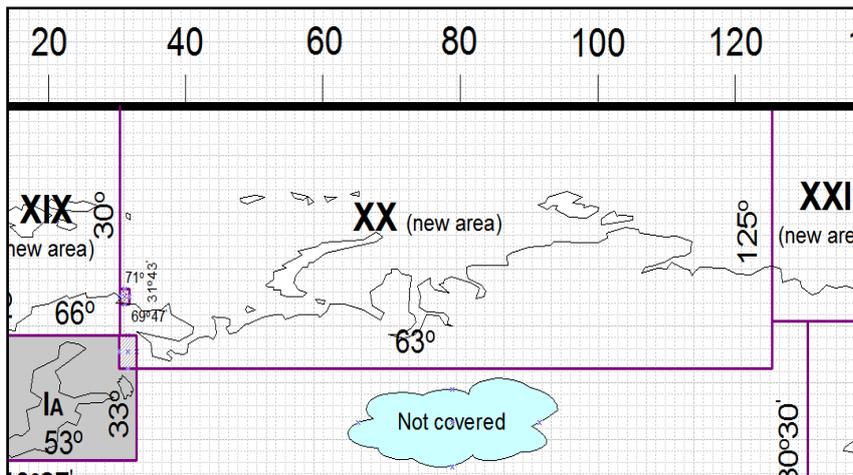


The area is defined as a number of rectangles with a “broken” southern boundary. In addition a small overlap XIX-XX area is defined on the Norwegian – Russian frontier as approved by IMO.

Unless the area is encoded into Inmarsat C software, MSI providers will have to address messages as service code C2=04

to a rectangle with the southern boundary of 65° N (will overlap with area I) and eastern boundary of 30°45' E.

**NAV/METAREA 20, variant 1.**

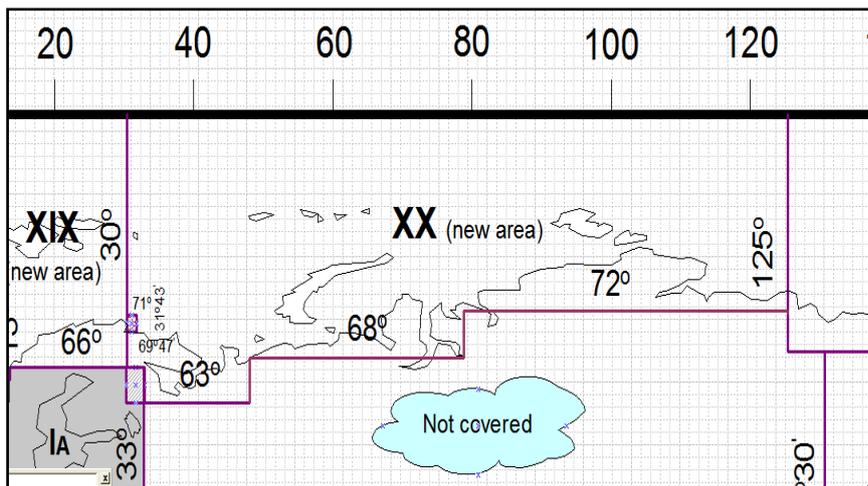


The area is defined as a single rectangle and a small XIX-XX overlap area with positions shown on the figure. Southern boundary is defined at 63°N to cover Belye More (White Sea) area on the S-W corner.

Since the southern boundary is at latitude 63°N, the whole area covers some navigable areas inside the Russian land mass territory and it may be not a practical solution for inland waterway users.

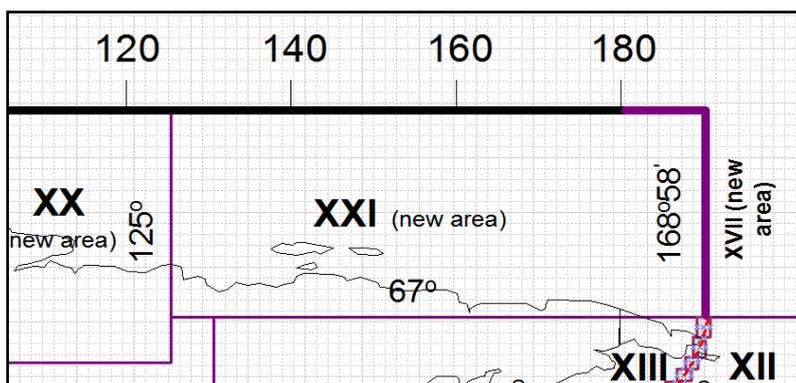
Since the southern boundary is at latitude

**NAV/METAREA 20, variant 2**



Another practical solution is to change southern boundary and move it to the North closer to the shore line. However, unless the area's boundaries are encoded into Inmarsat C software, MSI providers will have to address information to the rectangular area with southern boundary at 63°N.

**NAV/METAREA 21.**



The area is defined as a single rectangle with positions shown on the fig