



Status of EGC SafetyNET, Inmarsat Maritime Safety Services today and tomorrow

**WWNWS-6
Wellington, New Zealand
18-22 August 2014**

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Agenda



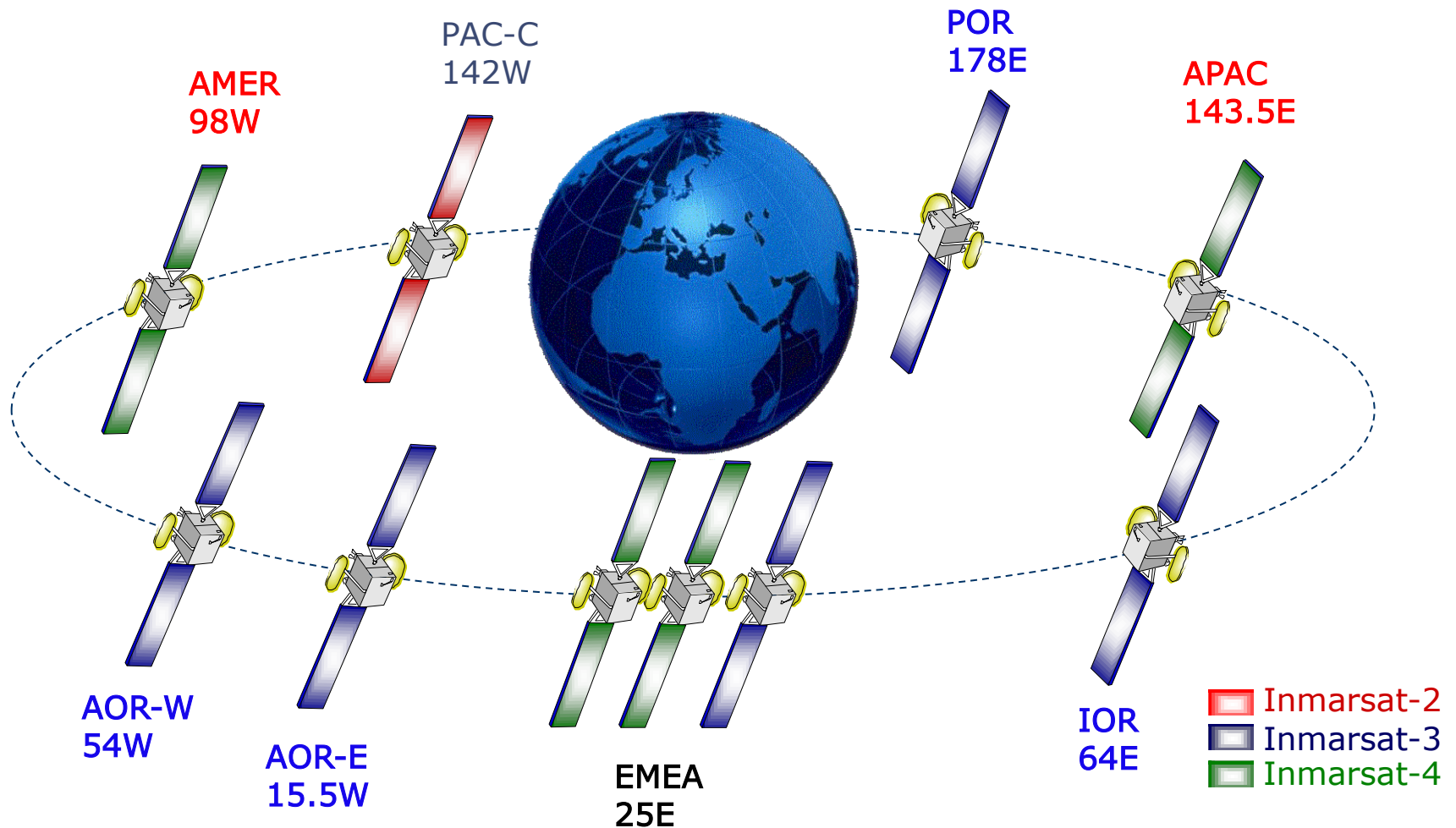
- ➔ Existing Inmarsat Safety Services and EGC SafetyNET Report
 - Maritime Portfolio; Inmarsat satellites and coverage areas; Inmarsat C system characteristics and services; Inmarsat role in the GMDSS; EGC SafetyNET statistics
- ➔ New development on voice and data satellite safety services
 - Inmarsat FleetBroadband (FB) system and specification; safety voice services; MSI submission via Inmarsat-C and FB; Maritime Safety Data Services (MSDS)
- ➔ WWNWS Survey results related to Inmarsat and EGC SafetyNET services

The Core Maritime Safety Portfolio

- ➔ More than 259,000 maritime terminals in use
- ➔ More than 153,000 Inmarsat C/mini-C MESs
- ➔ “505” emergency service on all FleetBroadband terminals – FB500, FB250 and FB150
- ➔ Distress and Urgency voice calls on T&T FB terminals
- ➔ MSDS project for MSI providers - complete Q2 2014 and ready for service
- ➔ **GMDSS compliance**
 - Inmarsat C is the only conventional satellite system required by IMO SOLAS Convention, Chapter IV “Radiocommunications”.
 - Inmarsat B - voice distress, the system will be closed on the 30 December 2016
 - Inmarsat Fleet F77 – voice distress with pre-emption and prioritisation in ship-to-shore and shore-to-ship direction
 - Plans to have FB Distress voice to be approved



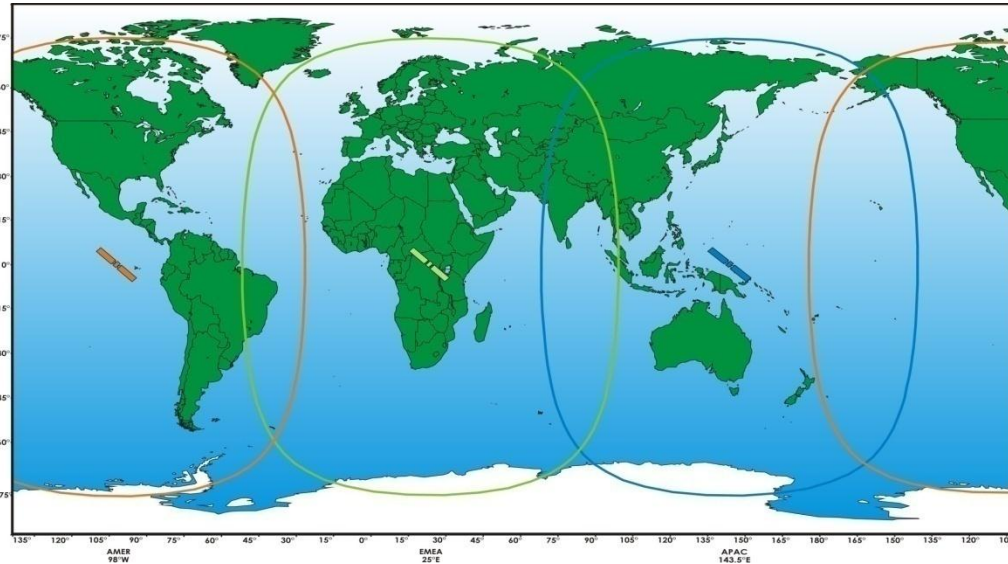
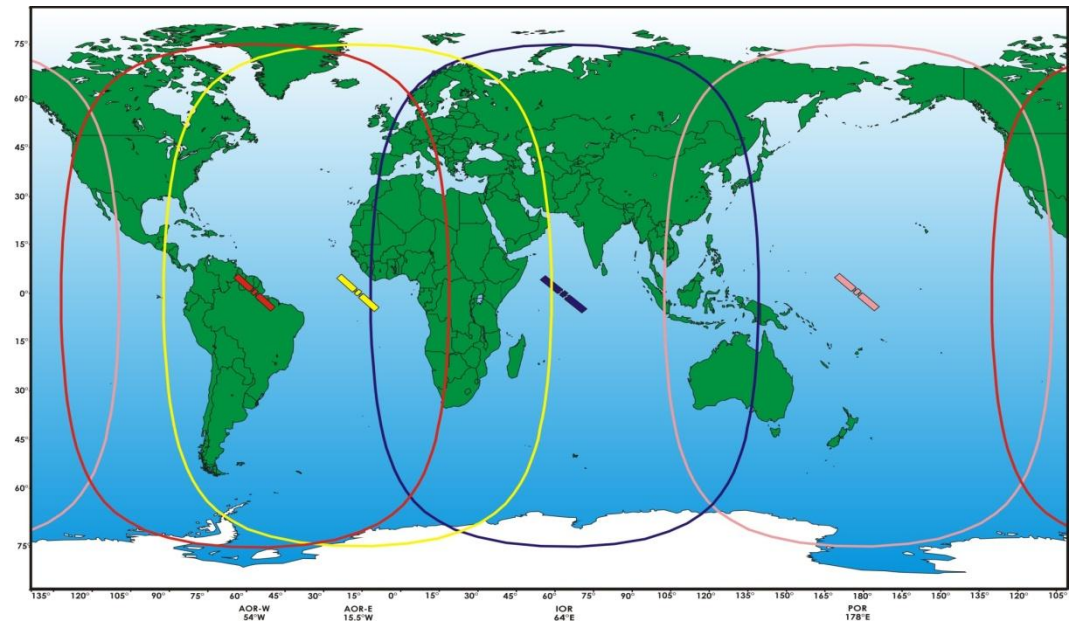
Inmarsat's Satellite Constellation



Inmarsat's I-3 Primary Satellite Constellation

Four ocean regions for Existing and Evolved services incl. GMDSS

AOR-E
AOR-W
IOR
POR



Inmarsat's I-4 Satellite Constellation

Three ocean regions for all Broadband services:

AMER
EMEA
APAC

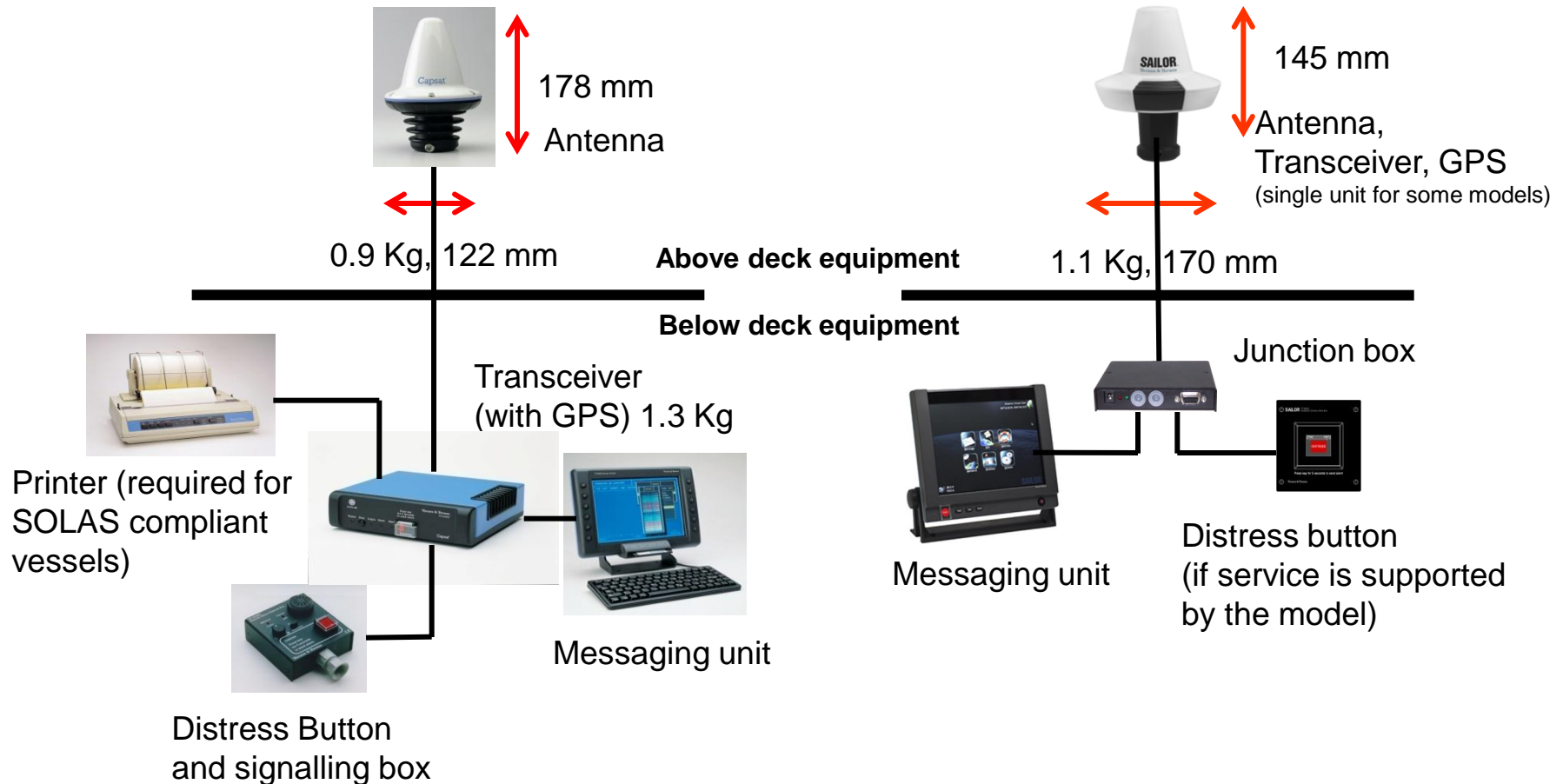
Inmarsat C/Mini-C characteristics and services



Inmarsat C and mini C models of different manufacturers

- ➔ Global coverage (between 76° North and 76° South under 5° and above antenna elevation angle)
- ➔ Store and Forward communication system (ship-to-shore, shore-to-ship and ship-to-ship)
 - messages delivered to e-mail, telex, fax (text, one way only), another mobile, SAC
- ➔ Non-stabilised omnidirectional antenna, small size and weight
- ➔ Low power consumption, compatible with national alphabets
- ➔ Some mini-C models are approved for GMDSS and support Distress Calling and EGC functions
- ➔ More than 89,000 Maritime Inmarsat C and 64,000 Inmarsat mini-C SESs
- ➔ Main part of the GMDSS satellite equipment – required by SOLAS Convention, Chapter IV
 - Distress Calling - distress alerting and distress priority messaging
 - Enhanced Group Calling (EGC) EGC SafetyNET and EGC FleetNET
 - Ship Security Alerting service (SSAS)
 - Data reporting and polling service (position monitoring, tracking, LRIT)

Inmarsat C and Inmarsat mini-C maritime terminals (with Distress capability)



Note: No power supply is shown for both configurations

GMDSS Communication Functions via Satellite

No single piece of equipment can do all functions!!!

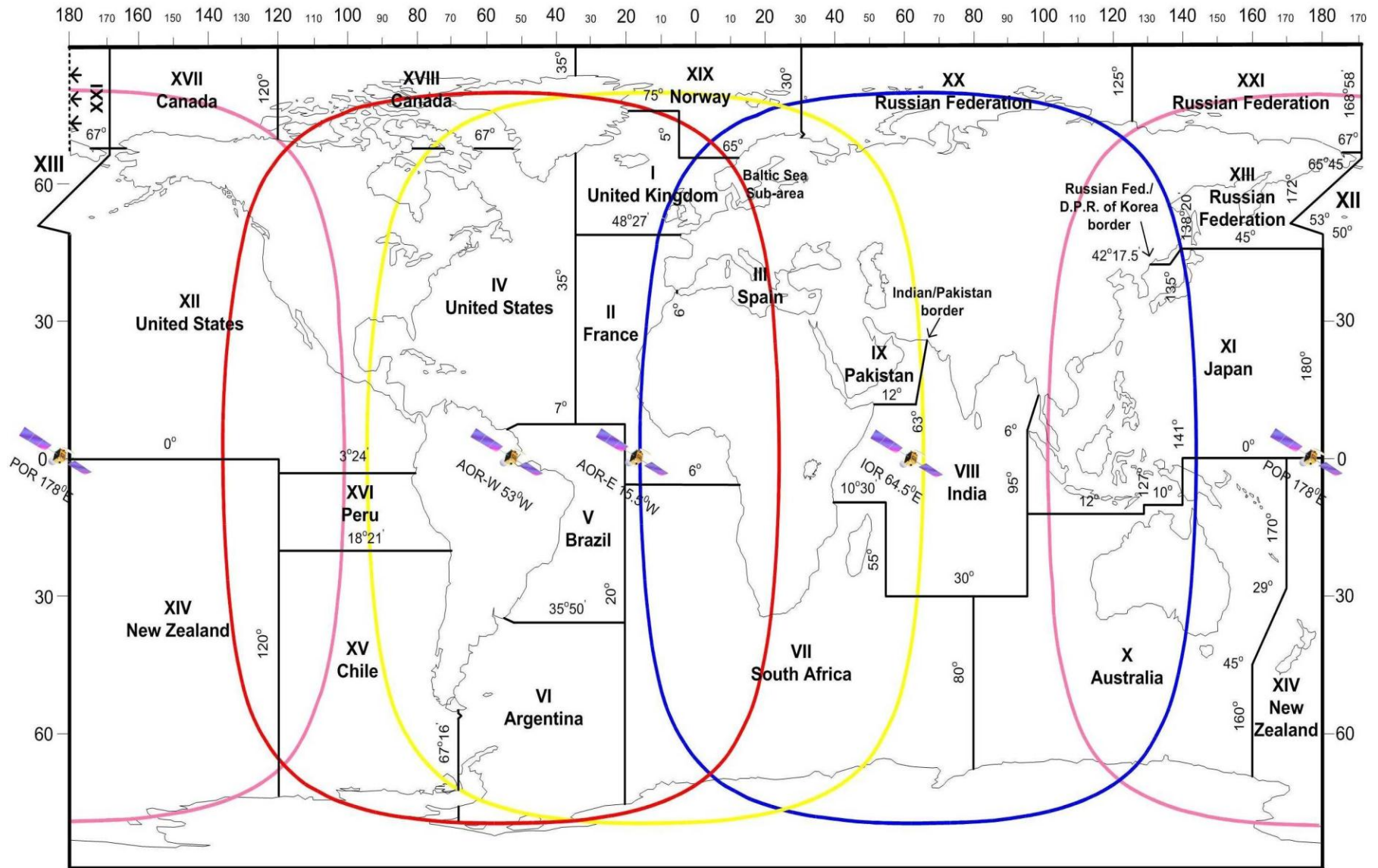
But... where does Inmarsat equipment fit?

GMDSS Functions	Inm-B*	Inm-F77	Inm-C
1. Distress Alerting ship-to-shore	Yes (voice)	Yes (voice)	Yes
2. Distress Alerting shore-to-ship		Yes (voice)	Yes
3. Distress Alerting ship-to-ship			
4. SAR Communications	Yes	Yes	Yes
5. On-scene communications			
6. Tx/Rx of MSI	Yes (Tx)	Yes (Tx)	Yes
7. Locating signals			
8. General communications	Yes	Yes	Yes
9. Bridge-to-Bridge communic.			



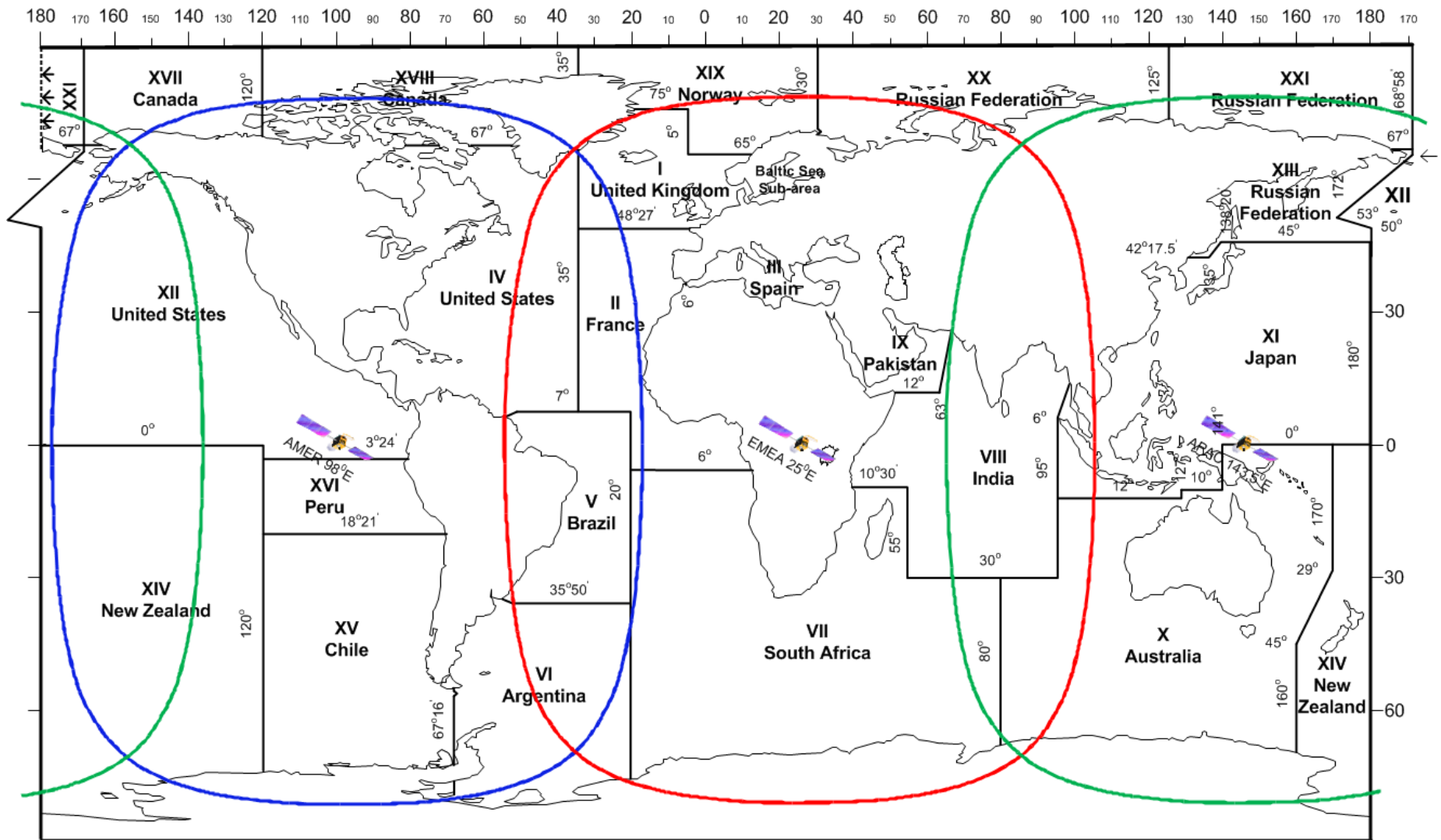
* Inmarsat-B was planned to be closed down in December 2014 but the service is extended until December 2016.

NAVAREAs/METAREAs (with Inmarsat I-3 coverage)



GMDSS NAVAREAs/METAREAs with Inmarsat coverage

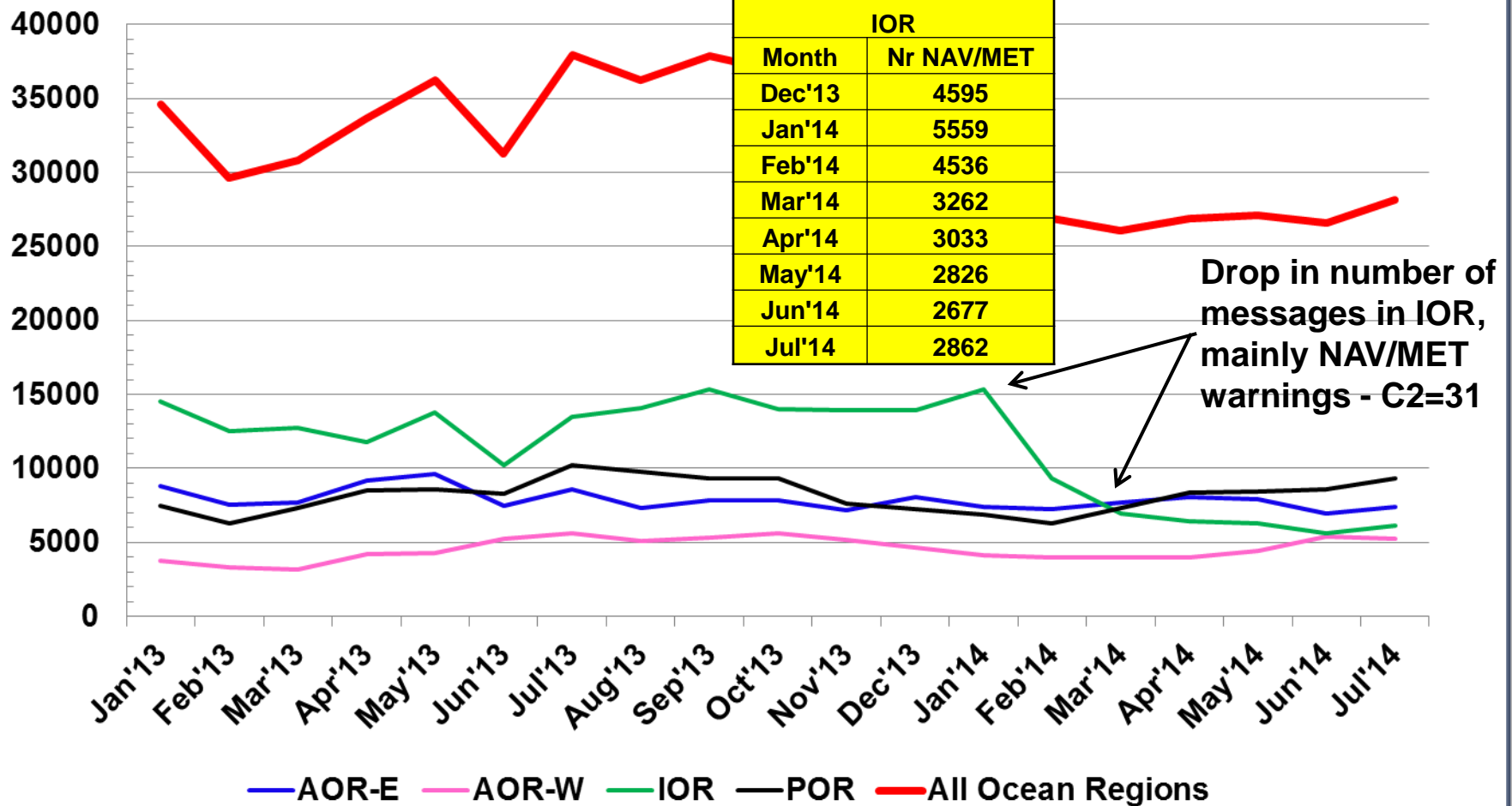
NAVAREAs/METAREAs (with Inmarsat I-4 coverage)



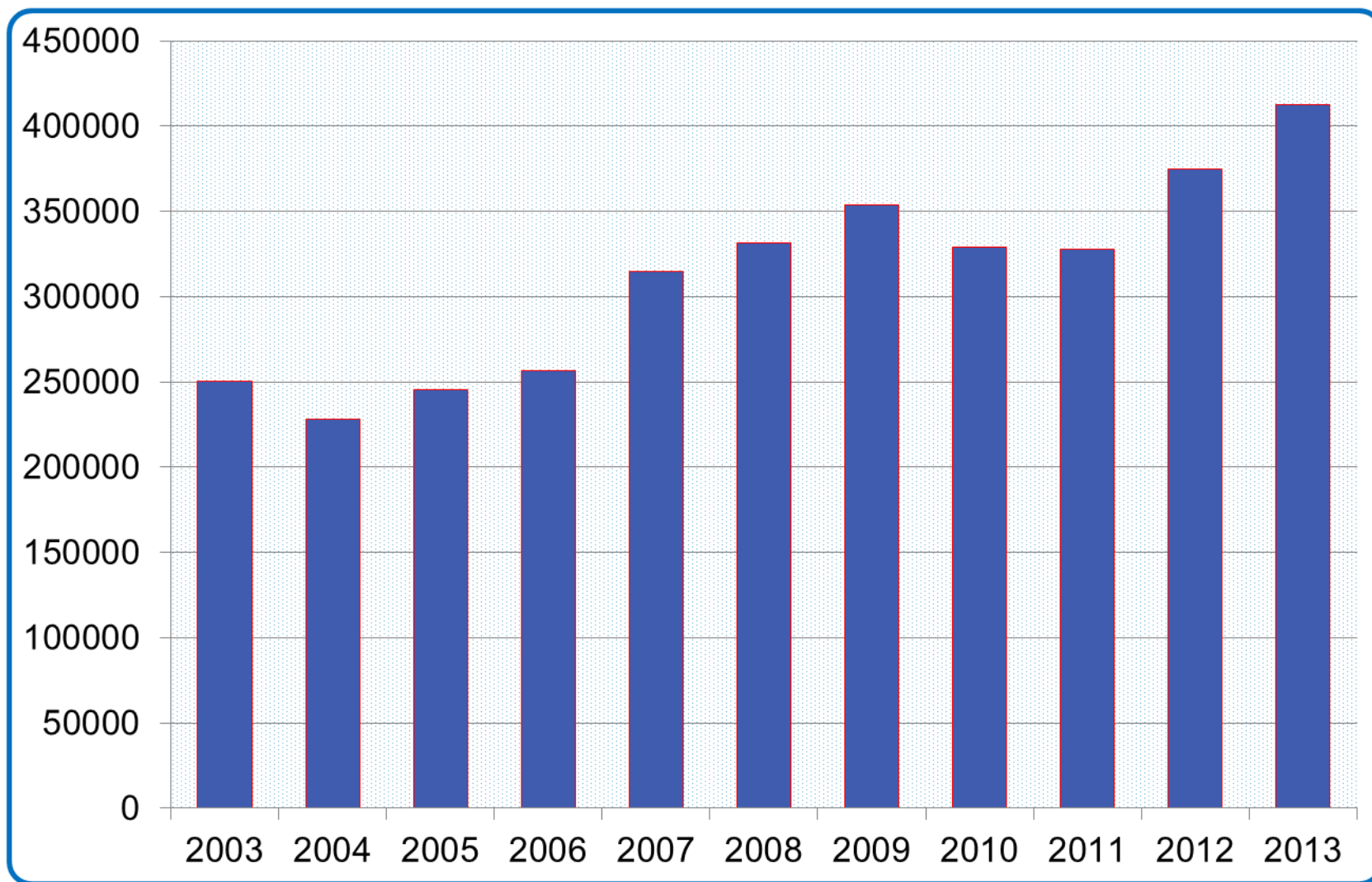
Number of EGC SafetyNET messages per month & OR

Month	AOR-E	AOR-W	IOR	POR	Total
Jan'13	8840	3792	14491	7448	34571
Feb'13	7545	3316	12509	6269	29639
Mar'13	7679	3139	12718	7300	30836
Apr'13	9141	4213	11805	8505	33664
May'13	9611	4271	13779	8582	36243
Jun'13	7469	5259	10218	8284	31230
Jul'13	8581	5647	13456	10243	37927
Aug'13	7357	5075	14060	9736	36228
Sep'13	7833	5336	15359	9328	37856
Oct'13	7866	5603	14036	9299	36804
Nov'13	7160	5183	13922	7603	33868
Dec'13	8051	4648	13948	7280	33927
Jan'14	7396	4164	15323	6911	33794
Feb'14	7232	3976	9349	6313	26870
Mar'14	7708	4003	6978	7343	26032
Apr'14	8050	3997	6424	8387	26858
May'14	7879	4454	6298	8470	27101
Jun'14	6944	5382	5651	8571	26548
Jul'14	7406	5247	6162	9306	28121

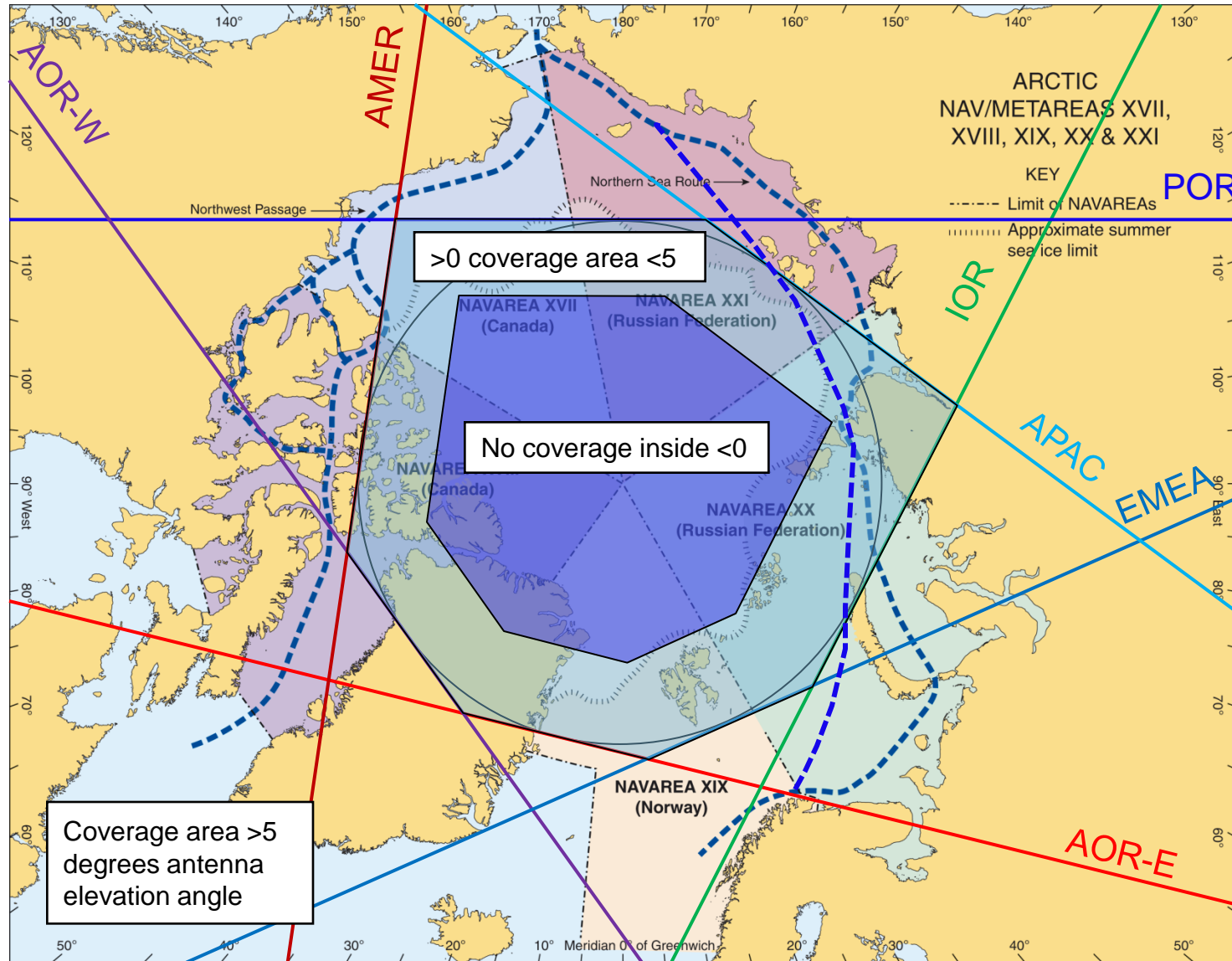
Number of EGC SafetyNET messages per month & OR



Total number of EGC SafetyNET messages per year 2003-2013



Inmarsat I-3 and I-4 coverage in the Arctic



New development on voice and data satellite safety services

FleetBroadband Specification



	FleetBroadband 500	FleetBroadband 250	FleetBroadband 150
Antenna Diameter	55 cm	32 cm	27 cm
Antenna G/T* (at 5° elvn)	-7 dB/K	-15 dB/K	-15 dB/K
Antenna EIRP**	22 dBW	15.1 dBW	15.1 dBW
Antenna Type	Directional/Stabilised	Directional/Stabilised	Directional/Stabilised
Antenna Weight	15-20 kg	3-5 kg	2-3 kg
Voice	4 kbps	4 kbps	4 kbps
Standard IP	Up to 432 kbps	Up to 284 kbps	Up to 150 kbps
ISDN Data	Yes	No	No
IP Streaming	32, 64, 128, 256 kbps	32, 64, 128 kbps	No

* **Gain-to-noise-temperature** (G/T) is a characteristic of antenna performance, where G is the antenna gain in dB at the receive frequency and T is the equivalent noise temperature of the receiving system in K⁰

** **Effective isotropically radiated power** (EIRP) is the amount of power that antenna would emit to produce the peak power density in the direction of maximum antenna gain

505 Emergency Calling service via FleetBroadband

505
for FleetBroadband
In an emergency
call 505. You will
be connected to a
Maritime Rescue
Coordination Centre
inmarsat

- ➔ 505 Emergency Calling developed for FleetBroadband family of equipment – FB150, FB250 and FB500 in advance of GMDSS
- ➔ Three satellite regions give global coverage:
 - Americas @ 98°W
 - Europe/Middle East/Africa @ 25°E
 - Asia Pacific @ 143.5°E
- ➔ Dial 505
 - Short-code dialling to one of 3 strategically located RCCs
 - Automatic routing to RCC Den Helder (the Netherlands), RCC Norfolk (USCG) and RCC Australia
 - 505 Emergency Calling brings increased safety for all mariners using the same satellites as for the GMDSS
- ➔ **No Priority or pre-emption – Not a substitute for the GMDSS**
- ➔ No Charge for the service



Voice distress and urgency on Inmarsat FB



- ➔ Introduced in July 2011 on any T&T (Sailor) FB terminal and meet requirements of IMO A.1001(25) Resolution for priority and pre-emption
 - at present is not compliant with requirements of para 3.6 Restoration and spare satellites
- ➔ Services
 - Distress priority voice (non-SOLAS) ship-to-shore – initiated by pressing “SOS” button
 - automatic connection to one of three RCCs (Norfolk, Canberra, Den Helder)
 - Distress priority voice shore-to-ship – initiated by RCCs via two-stage dialling access and pin code
 - Urgency calls – in ship-to-shore direction and routing agreed with the RCCs
 - 32 – Medical advice
 - 38 – Medical assistance
 - 39 – Maritime assistance
 - Distress test
 - via Distress test mode and pressing SOS button
 - automatic connection to terrestrial network and audio announcement
- ➔ No charge for Distress and Urgency calls

Voice distress on Inmarsat FB



Voice Distress
on
FleetBroadband
is here!

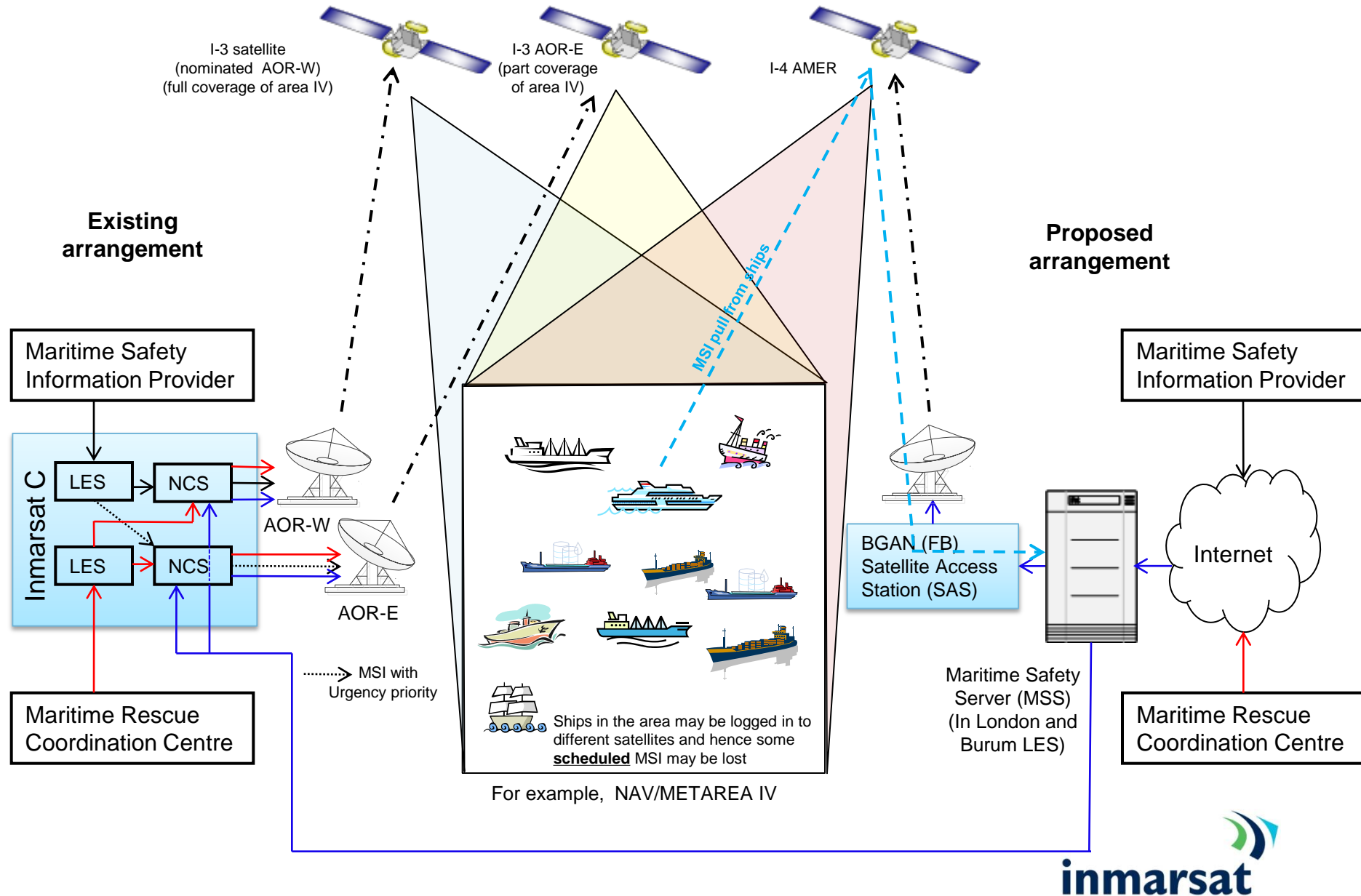
29 July 2011



Why we need new safety data services on FB platform

- ➔ Existing services (text only) defined in late 80s (last century!!!) and never been changed, modified or revised (except Arctic NAV/METAREAs)
- ➔ IMO/IHO/WMO may require new data type safety services (e.g. Weather charts) and new data services
- ➔ All Nav/Met services use the same C2 service codes (except Coastal warnings) and it is not possible to distinguish between these MSI
 - New services (will) use unique service codes (see IHO survey results)
- ➔ Additional addressing is (may be) required (see IHO survey results)
 - Sub-areas and Fixed areas
- ➔ “Pull” archive MSI (NAV/MET services only)
- ➔ Need for “on air” software upgrade for EGC configuration
- ➔ IMO requirement for standard user interface (COMSAR 15/INF.3 “Scoping exercise...”)
- ➔ RCCs may require acknowledgement on reception of P3 & P2 SAR related MSI
- ➔ Distress alert – new data fields for Nature of Distress (MOB), number persons on board and list of RCCs
- ➔ Distress Chat and Surface Picture services for RCCs (SAR services only)

MSI and SAR info submission via Inmarsat C and FB routes



Definition of EGC SafetyNET Service Codes (as in the IMO Manual)

Service Code	Navigational information (5 services)	Meteorological information (4 services)	Search and Rescue (SAR) (4 services)	Piracy countermeasures broadcast (4 services)
00			All ships call	
04	Navigational, Meteorological or Piracy warning to a rectangular area	Navigational, Meteorological or Piracy warning to a rectangular area		Navigational, Meteorological or Piracy warning to a rectangular area
13	Navigational, Meteorological or Piracy coastal warning	Navigational, Meteorological or Piracy coastal warning		Navigational, Meteorological or Piracy coastal warning
14			Shore-to-ship distress alerts to a circular area	
24	Navigational, Meteorological or Piracy warning to a circular area	Navigational, Meteorological or Piracy warning to a circular area		Navigational, Meteorological or Piracy warning to a circular area
31	NAVAREA/METAREA warning, MET forecast or Piracy warning to NAVAREA/METAREA	NAVAREA/METAREA warning, MET forecast or Piracy warning to NAVAREA/METAREA		NAVAREA/METAREA warning, MET forecast or Piracy warning to NAVAREA/METAREA
34			SAR coordination to rectangular area	
44			SAR coordination to circular area	
73	Chart correction service to fixed areas – Not available			

C2 = 04, 13, 24 and 31 are services for NAV, MET and Piracy MSI

MSDS codes and routing to Inmarsat-C MESs

MSI Type	MSDS C2 Service Code	Service Name*	C3 Address <u>(up to MSIPs)</u>	Relevant Inm-C C2 Service Codes
Navigational	51	NAVAREA warnings	2 digits NAVAREA number (01-21)	31
	52	Navigational warnings	Circular, Rectangular, (Sub-area, Fixed area)	24 04
	53	International Ice patrol warnings	Circular, Rectangular	24 04
	54	Piracy and Armed robbery warnings	Circular, Rectangular	24 04
	13	Coastal warnings (type A, C, F, G, H, J, K, L, Z)	Coastal addressing	13
Meteorological	61	METAREA warnings	2-digit METAREA number (01-21)	31
	62	Meteorological warnings	Circular, Rectangular, (Sub-area, Fixed area)	24 04
	63	Storm and Tropical warnings	Circular, Rectangular, (Sub-area, Fixed area)	24 04
	13	Coastal warnings (type B, E, Z)	Coastal addressing	13
SAR	00	All Ships call	00 only	00
	14	Shore-to-Ship Distress alert	Circular	14
	34	SAR coordination to rectangular area	Rectangular	34
	44	SAR coordination to circular area	Circular	44
	13	Coastal warnings (type D, Z)	Coastal addressing	13

* Subject to further changes on the MSDS Mark2

WWNWS survey results related to EGC SafetyNET services and Inmarsat

Wording of the “problem” is as in the survey report

Survey results (1/11)

➔ “Problem”

- NAVAREA I weather warnings cannot be turned off. I am in the North Sea and do not use them yet I receive vast reams of them printed on valuable paper and immediately throw them in the bin without even looking at them. What a waste, what a shameful waste. I use the local UK Metoffice forecast. The NAVAREA I forecast does not even apply to me – SOLAS AHTS.

➔ Comments

- Correct, NAVAREA/METAREA warnings cannot be turned off
- “Safety” priority MSI is not required to be printed automatically and this function can be switched off. MSI will be stored in memory only

➔ Solution

- Addressing for smaller areas may be required, e.g. Sub-areas and more sub-areas may be allocated
- MSDS is designed with an option to use Sub-area addressing and FB MST will have the same option

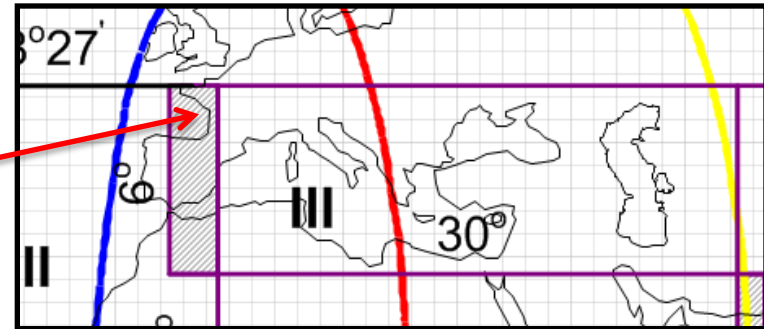
Survey results (2/11)

➔ “Problem”

- I remark a problem about NAVAREA messages received on SAT-C. Even we are in France (Biscay Bay, NAVAREA II) we receive all messages from NAVAREA III (Mediterranean Sea), which are useless for us but it's impossible to reject NAVAREA III because of the automatic selection of the system. So we receive a lot of weather forecast and all warning message that we throw directly. It's also becoming expensive due to the lot of roll paper we have to order –*
SOLAS Cargo

➔ Comments

- Correct regarding Biscay Bay due to original SafetyNET matrix – overlap of area II and III
- “Safety” priority MSI is not required to be printed automatically



➔ Solution

- SafetyNET matrix is changed on new models of mobile terminals and it is impossible to change on some existing models
- Check “EGC setup” screen and disable secondary/additional NAVAREA(s)/METAREA(s) if not required

Survey results (3/11)

➔ “Problem”

- *Sometimes we receive warnings from other area's while not selected in our SES*
 - SOLAS Cargo

➔ Comments

- Disagree with reception of MSI from a secondary area unless:
 - the terminal's position is not valid/OK
 - additional area is selected by the operator
 - ship is in overlap area, e.g. Biscay Bay; area IV and XII; area X and XIV
- “Safety” priority MSI is not required to be printed automatically

➔ Solution

- Check terminal's position and be aware it is valid and updated regularly either manually (on elder models) or automatically from integrated GNSS receiver
- Check “EGC setup” screen and disable secondary/additional NAVAREA(s)/METAREA(s) if it is not required

Survey results (4/11)

➔ “Problem”

- *Would expect more to come through SafetyNET – SOLAS Passenger*

➔ Comments

- GMDSS is under revision and list of MSI remains the same...Can we offer more?
- WWNWS (IHO and WMO) are to discuss the issue and make relevant recommendations (???)

➔ Solution

- Depends on what final GMDSS requirements on MSI will be...

Survey results (5/11)

➔ “Problem”

- *If areas were to be smaller we would receive less information, as at times we may receive too many unnecessary info when we are operating in certain areas and not covering much distance. However the system in general works well and we always receive information that we require – SOLAS Military support and supply*

➔ Comments

- To introduce sub-areas where necessary ???

➔ Solution

- FB will support “Sub-area” function if it is available and used by MSI providers (at the moment there is only one Sub-area - Baltic Sea for NAVAREA/METAREA I.

Survey results (6/11)

➔ “Problem”

- *We operate in NAVAREA IV but continuously receive messages for NAVAREA III. Repeatedly - each NAVAREA III message is received twice. You are killing so many trees needlessly since we cannot turn off our printer – SOLAS Cargo*

➔ Comments

- Already presented

➔ Solution

- Check position status – should be OK or valid
- Check EGC setup and disable unnecessarily messages
- Disable automatic printing for “Safety” priority MSI

Survey results (7/11)

➔ “Problem”

- *Some NAVAREA warnings are useful and necessary for the safety... However these messages are usually masked by hordes of unnecessary low priority messages with no relevance to current voyage. I think GMDSS system in general needs some serious revision. We are in year 2014 yet in shipping we still use equipment that takes "Floppy Disks"? I suggest a system similar to that used for ECDIS updating would probably be better as one can set your voyage parameters and receive only warnings relevant to your passage? I use web site (<http://www1.kaiho.mlit.go.jp/TUHO/nwe.html>) to quickly check for relevant messages for my voyage and it's a great aid as they have a map showing all the current messages for my area of sailing. At a glance and with very little effort I can see exactly which messages I need to pay attention to – SOLAS Cargo PVS*

➔ Comments

- GMDSS is already under revision
- “Floppy disks” are only available on elder MES models and some of them are not supported by manufacturers...

➔ Solution

- ???

Survey Results (7/11)

Hydrographic & Oceanographic Department – Japan Coast Guard

Navigation Warnings

All data display

+1.Japan
 2.North Pacific,Sea of Okhotsk
 3.China,East China Sea,South China Sea
 4.Indian Ocean,Persian Gulf
 5.South Pacific

Notices to Mariners

VISUAL INFORMATION

Weekly Summary

Japanese

Information

Navigation Warnings and Notices to Mariners may not be provided due to system problem.

Navigation Warnings

* This site provides information which was broadcasted for vessels by radio.

* The "Date" on the page which provides the contents of NAVAREA XI Navigation Warnings and NAVTEX Navigation Warnings indicates the time

NAVAREA

2014

Select	Number	Category	Title
<input checked="" type="checkbox"/>	0530	Exercises	NORTH PACIFIC, TAIWAN. GUNNERY. 160400Z TO 160530Z JUL.
<input checked="" type="checkbox"/>	0528	Drifting	NEW GUINEA. IRON OBJECT, ABOUT 3 METRE LONG.
<input checked="" type="checkbox"/>	0524	Research	NORTH PACIFIC, MARIANAS. UNDERWATER RESEARCH WORKS BY SHINKAI
<input checked="" type="checkbox"/>	0518	Other	SOUTH CHINA SEA, SOUTHERN PART. PIRATES INFORMATION.
<input type="checkbox"/>	0511	Research	SOUTH CHINA SEA, NORTHERN PART, PHILIPPINES AND SULU SEA.
<input type="checkbox"/>	0500	Other	SOUTH CHINA SEA, SOUTHERN PART. PIRATES INFORMATION.

140496 SOUTH CHINA SEA, NORTHERN PART. SEISMIC SURVEY WORKS BY WORKING VESSEL

NAVAREA

http://www1.kaiho.mlit.go.jp/TUHO/tuho/cgi/skat/map.cgi?0&1&140496

IE9 Compat View Document Mode: Quirks

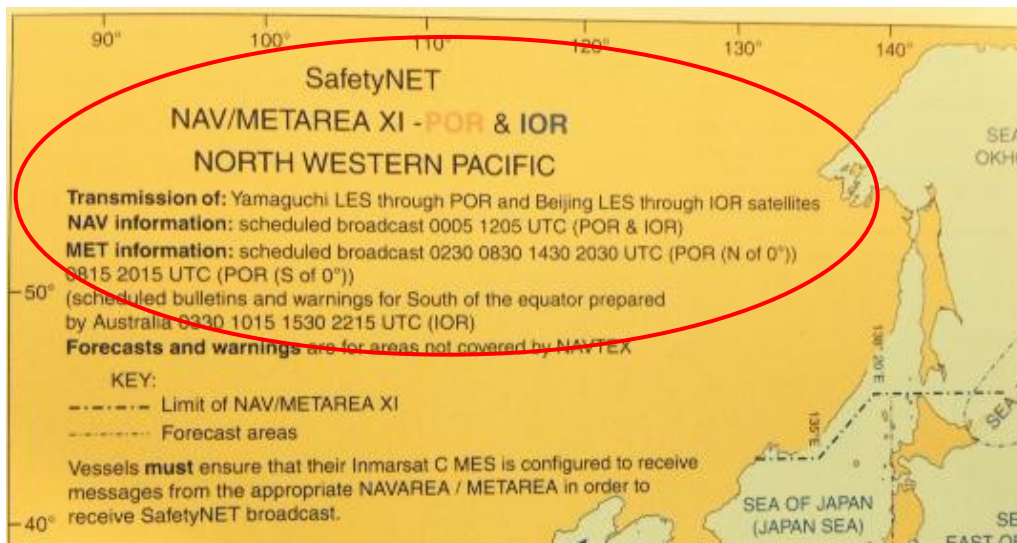
Survey results (8/11)

➔ “Problem”

- *NAVAREA XI is divided between IOR and POR. Most of voyages are concerning both regions at once e.g. routes from Japan to Singapore, Singapore to China. And due to many factors you must switch Inm-C between two regions. But NAVAREA messages are separated mostly between them, so until you switch another region, you will not get part of messages – SOLAS Tanker*

➔ Comments

- Not clear - mainly the issue is for NAVAREA XI coordinator (Japan) to comment, however ALRS, vol.5 indicates that NAVAREA is promulgated via IOR & POR
- Inmarsat-C is able to receive MSI in one (logged-in) ocean region only



Survey results (9/11)

➔ “Problem”

- *Receiving printed warnings from SAT-C are difficult to read when it comes in one giant paragraph. Also should be able to choose not to have routine SafetyNET messages printed as it uses over 30m paper per day – SOLAS Offshore supply*

➔ Comments

- an issue for MSI providers
- it is “education” issue and it is possible to disable a printer for “Safety” priority EGC messages

➔ Solution

- ???

Survey results (10/11)

- ➔ “Problem”
 - Sorry, but I don’t know the difference in SafetyNET/NAVTEX – (!!!) ***most interesting comment from SOLAS Cargo***
- ➔ Comments
 - ???
- ➔ Solution
 - Education/training/certification ???

Survey results (11/11)

➔ “Problem”

- *SafetyNET belong to the museum. It takes too long before a warning is received (items usually fixed before the warning that it's broken comes out). The warnings stay in force long time after the actual problem is gone and the printer prints meter upon meter of spam that makes important things easily overseen– SOLAS Tanker*

➔ Comments

- an Issue for MSI providers
- it is “education” issue and it is possible to disable a printer for “Safety” priority EGC messages

➔ Solution

- ???



Thank you

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