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

WWNWS-5
Monaco

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The Core Maritime Safety Portfolio

- More than 250,000 maritime terminals in use
- More than 150,000 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 in progress – Q1 2014 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’s closure is extended from 30 December 2014 to 30 December 2016
  - Inmarsat Fleet F77 – voice distress with pre-emption and prioritisation in ship-to-shore and shore-to-ship direction

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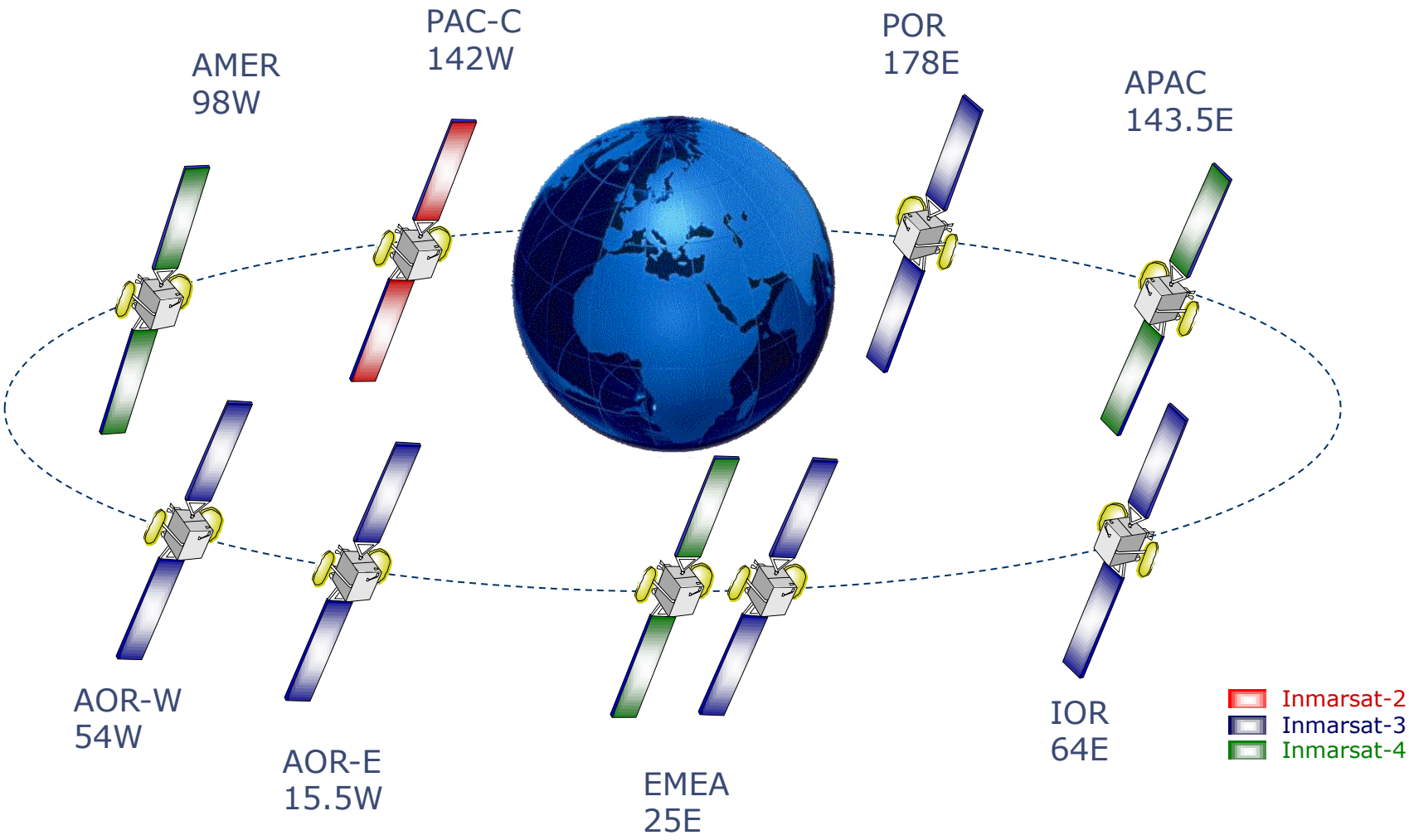
Inmarsat's Satellite Constellation



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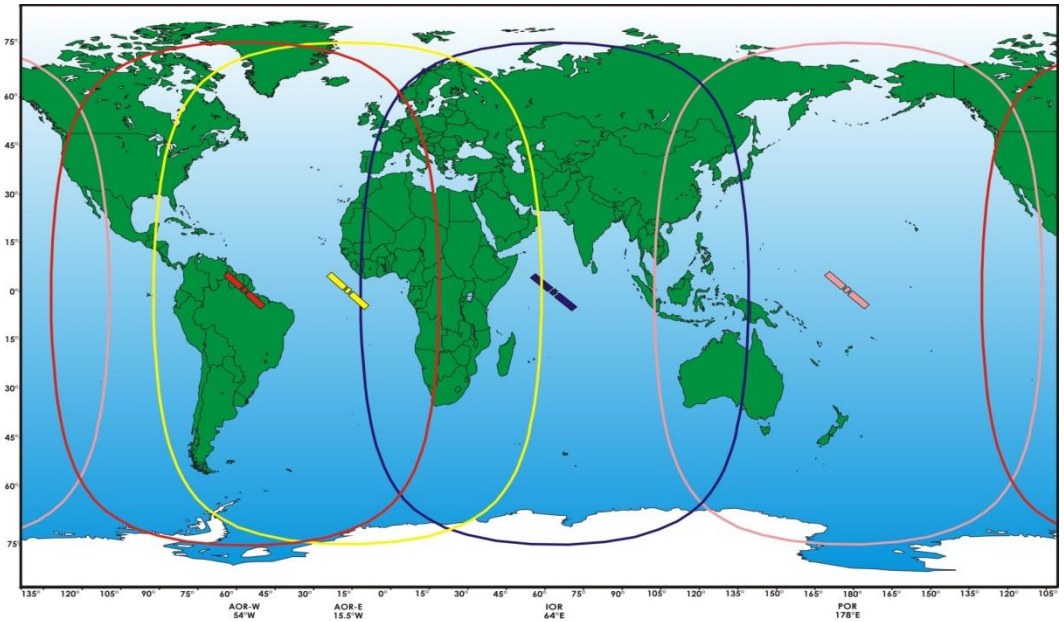
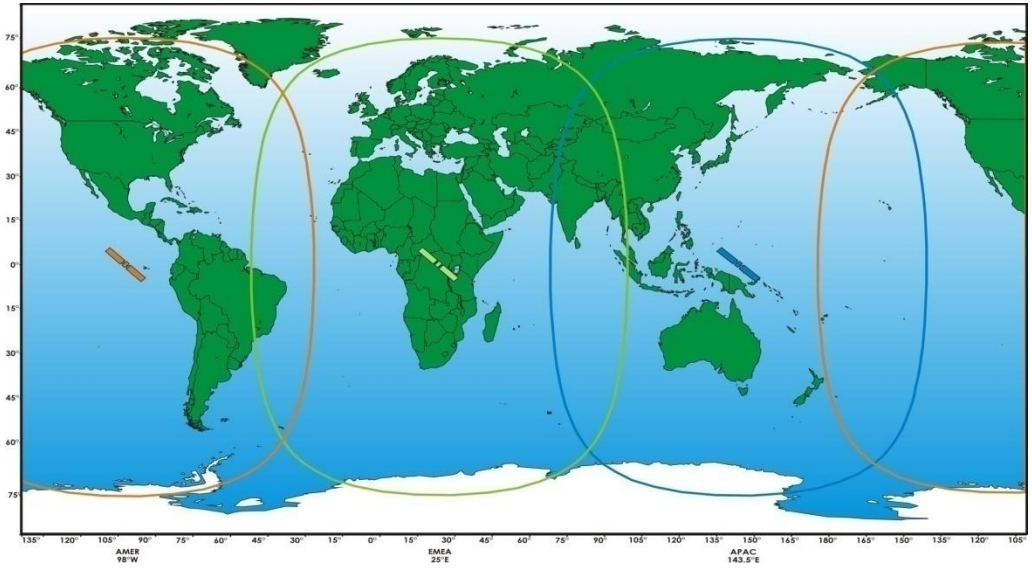
Inmarsat's I-3 Primary Satellite Constellation

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

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Alphasat

L-Band supplement

- Agreement with European Space Agency (ESA) for Inmarsat to become commercial operator
- Satellite built by Astrium, launched July 2013
- Alpha will supplement the I-4 satellite constellation
- Coverage over EMEA
- Future proofing I4 services

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

Note: No power supply is shown for both configurations

Inmarsat C/Mini-C characteristics and services

Antenna Messaging unit Transceiver (with GPS) Distress button Printer

- Global coverage (between 76º North and 76º South under 5º 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 90,000 Maritime Inmarsat C and 60,000 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)

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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.

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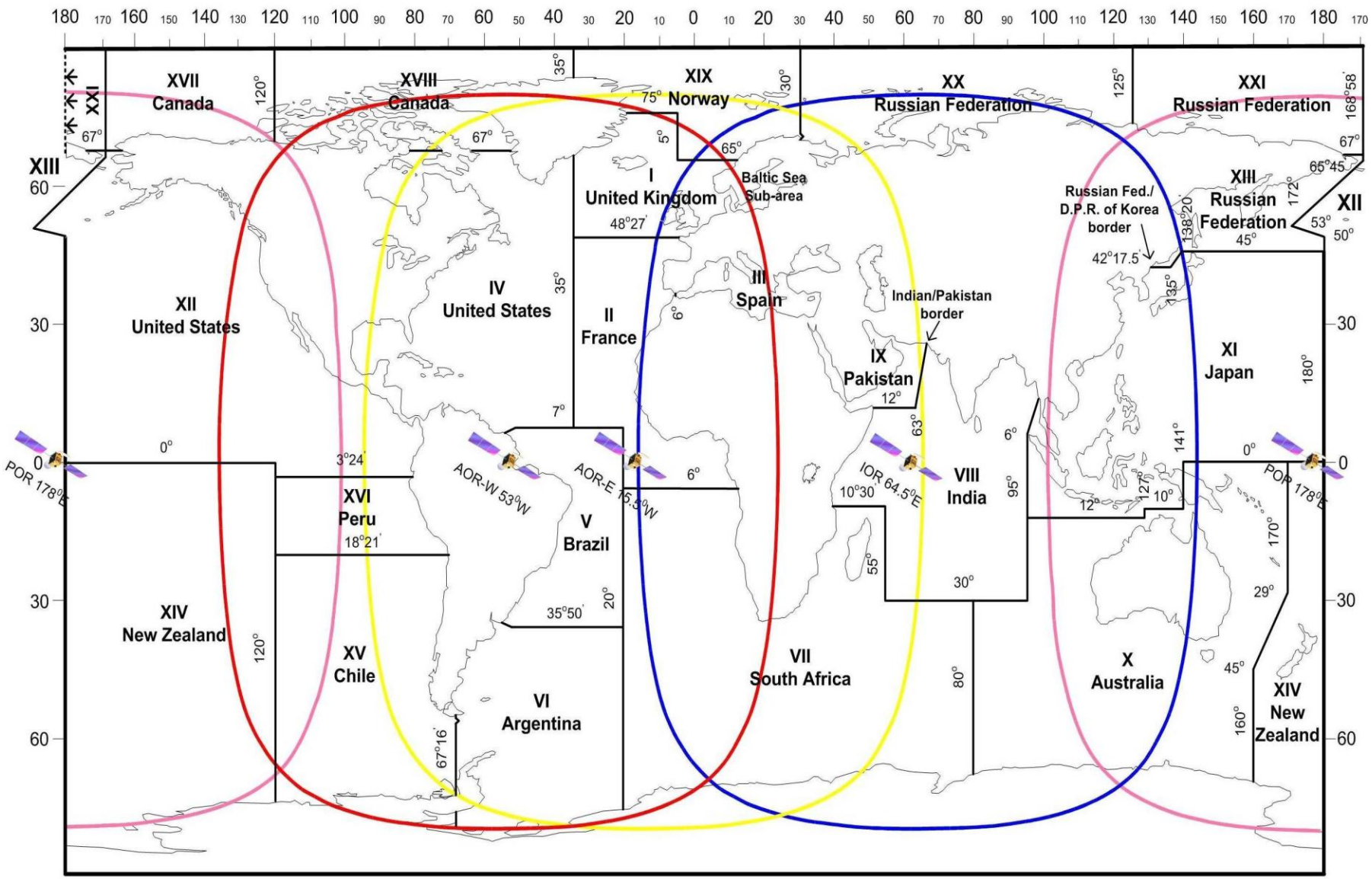
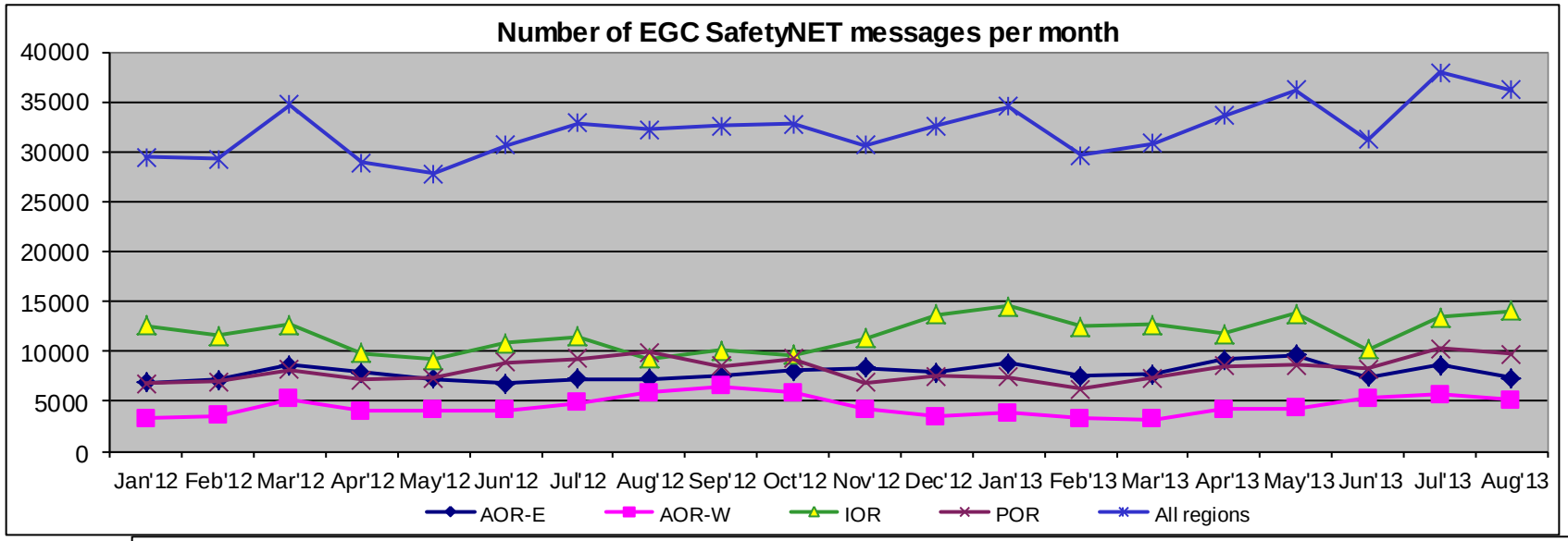
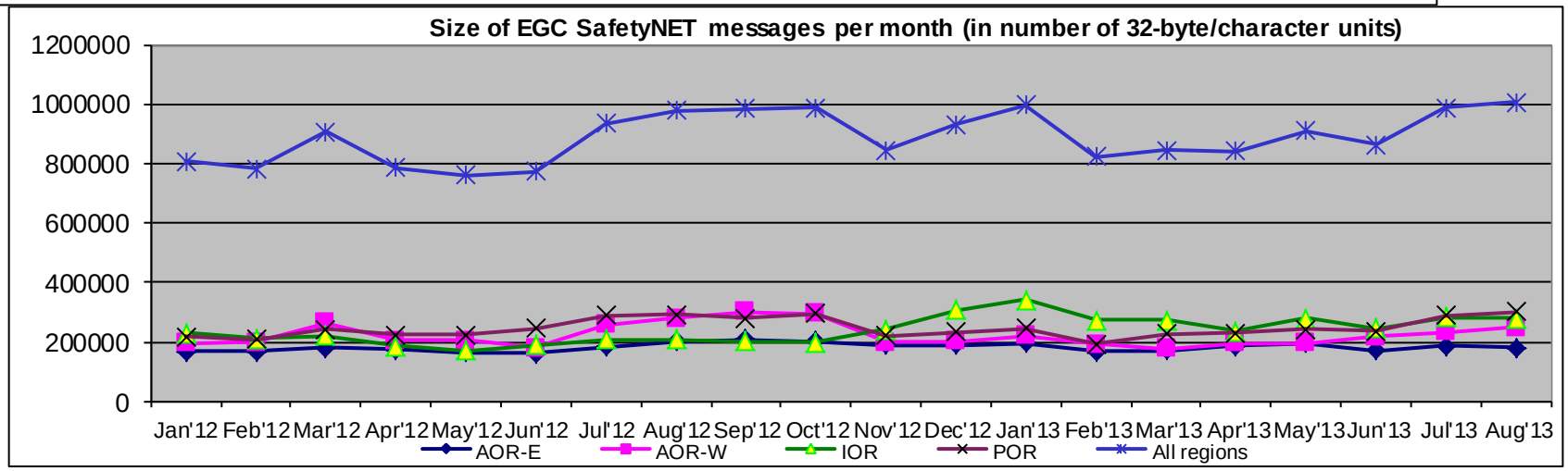
NAVAREAs/METAREAs



GMDSS NAVAREAs/METAREAs with Inmarsat coverage

Number and size of EGC SafetyNET messages





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FleetBroadband – Next generation of maritime services from Inmarsat

FleetBroadband is part of broadband (BGAN) family of services based on 3G network technology and operated over Inmarsat I4 (4th generation) satellites since Nov 2007.

The traffic is grounded at Inmarsat Satellite Access Stations (SASs) – 3 ocean regions

Maritime portfolio – FB500, FB250, FB150

- Standard IP data (up to 432kbps)
- Voice (accessible simultaneously with data via a single terminal) and fax
- Streaming IP with guaranteed data rates on-demand
- ISDN for Voice & Data

Distress and Urgency priority voice on T&T (Sailor) MESs

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FleetBroadband Specification

	FleetBroadband 500	FleetBroadband 250	FleetBroadband 150
Antenna Diameter	55 cm	32 cm	27 cm
Antenna G/T* (at 5^0 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 K^0

**** 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

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505 Emergency Calling service via FleetBroadband

505
for FleetBroadband
In an emergency call 505. You will be connected to a Maritime Rescue Coordination Centre
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- 505 Emergency Calling developed for FleetBroadband family of equipment – FB150, FB250 and FB500 in advance of GMDSS
- Three satellite regions give global coverage:
  - Americas @ 98ºW
  - Europe/Middle East/Africa @ 25ºE
  - Asia Pacific @ 143.5ºE
- Dial 505
  - Short-code dialling to one of 3 strategically located RCCs
    - Automatic routeing 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

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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

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Voice distress on Inmarsat FB

Voice Distress on FleetBroadband is here!

29 July 2011

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Shore-to-Ship Inmarsat FB distress calling
(initiated by RCCs only)

- Only authorised Rescue Co-ordination Centres (RCCs) may make shore-originated distress priority voice calls to Inmarsat mobile terminals
- Procedure to place a distress priority voice call to Inmarsat maritime terminals

- **Dial:** xxxxxx
- **Enter the assigned 7-digit PIN:**
- **Enter:** *the phone number of the Inmarsat terminal, preceded by 870 and followed by # e.g. "870772xxxxxx#"*

- The telephone call will then proceed in the normal manner.
- When the call is disconnected the caller may hear *"Thank you or Goodbye"*

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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 text 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
- RCCs may require acknowledgement on reception of P3 & P2 SAR related MSI
- Additional addressing is (may be) required
  - Sub-areas and Fixed areas
- Need for “on air” software upgrade for EGC configuration
- Distress alert – new data fields for Nature of Distress (MOB), number persons on board and list of RCCs
- IMO requirement for standard user interface (COMSAR 15/INF.3 “Scoping exercise...”)
- Distress Chat and Surface Picture services for RCCs (SAR services only)
- “Pull” archive MSI (NAV/MET services only)
- New (planned) services (where required) will meet all existing IMO performance standards and IEC specs

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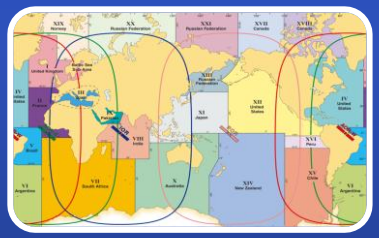
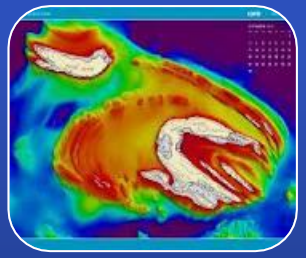
Maritime Safety Data Services (MSDS) Functionalities

Distress Alert

Priority messaging



MSI Broadcast



Maritime Safety Information

Distress Chat

MSIPs/ RCCs

Inmarsat-C

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Maritime Safety Data Services (MSDS)

- Provide
  - Distress alerting and Distress priority messaging (Ship-to-Shore)
  - Promulgation of MSI & SAR related information (D/U/S) – SafetyNET “Mark2”
  - Ship-to-Shore Urgency priority messaging (SAC 32/38/39)
  - Ship-to-Shore Safety priority messaging (SAC 41/42/43)
  - Distress priority “Chat”
  - Retrieval archived MSI by ships
- Testing stage now
  - MSIPs will test registration procedure, promulgation of nav/met information, all service codes, priorities, addresses, repetition codes, validity of information and its cancellation, EGC log, system configuration…
  - RCCs will test the same for SAR information plus reception of distress calls from ships, ships’ surface picture (ships’ database) and distress chat…
  - Some MSIPs and RCCs are invited to participate in tests, no any additional hardware/software is required.
  - Provision of feed-back and comments to Inmarsat, MSDS-2 may follow…
- Service launch – Q1/2 2014

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MSI priorities and new addressing

- Same priorities for new service – allocation and use is regulated by IMO
  - P1 - Safety (85-90% of total traffic)
  - P2 - Urgency
  - P3 - Distress
- MRCCs may require confirmation from each ship for SAR related information and Distress alerts sent with P2 and P3 priorities
- Sub-area
  - is smaller part of NAVAREA/METAREA, e.g. Baltic Sea (sub-area of area I)
  - address format is 3 alphanumeric characters - main area number and letter identifying the sub-area. For Baltic Sea it may be: 01A. More areas may/will be defined in future by IMO (in cooperation with IHO and WMO)
- Fixed area
  - Maybe inland (waterway) area, e.g. Lake Victoria, Amazon Basin, river Danube, etc. used for international shipping/trading and address format is 3 digits in the range of 111-999 (TBC) that will be defined in future by IMO/IHO/WMO or national administrations.
- Other addressing formats remain the same

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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

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MSDS codes and addresses

MSI Type	C2 Service Code	Service Name	C3 Address (up to MSIPs)
Navigational	51	NAVAREA warnings	2 digits NAVAREA number (01-21)
	52	Navigational warnings	Circular, Rectangular, Sub-area, Fixed
	53	International Ice patrol warnings	Circular, Rectangular
	54	Piracy and Armed robbery warnings	Circular, Rectangular
	55	Tsunami warnings	Circular, Rectangular, Sub-area, Fixed
	13	Coastal warnings (type A,C,F,G,H,J,K,L,Z)	Coastal addressing
Meteorological	61	~~METAREA warnings~~ Met-ocean information and warnings	2-digit METAREA number (01-21), Circular, Rectangular, Sub-areas, Fixed areas
	62	~~Meteorological warnings~~ Met-ocean graphical information	2-digit METAREA number (01-99), Circular, Rectangular, Sub-areas, Fixed areas
	~~63~~	~~Storm and Tropical warnings~~	~~Circular, Rectangular, Sub-area, Fixed~~
	~~64~~	~~Weather charts~~	~~METAREA, Rectangular, Sub-area~~
	13	Coastal warnings (type B, E, Z)	Coastal addressing
SAR	00	All Ships call	00 only (all ships in entire ocean area)
	14	Shore-to-Ship Distress alert	Circular
	34	SAR coordination to rectangular area	Rectangular
	44	SAR coordination to circular area	Circular
	13	Coastal warnings (type D. Z)	Coastal addressing
	71	Other urgent safety-related inform.	Address format TBC

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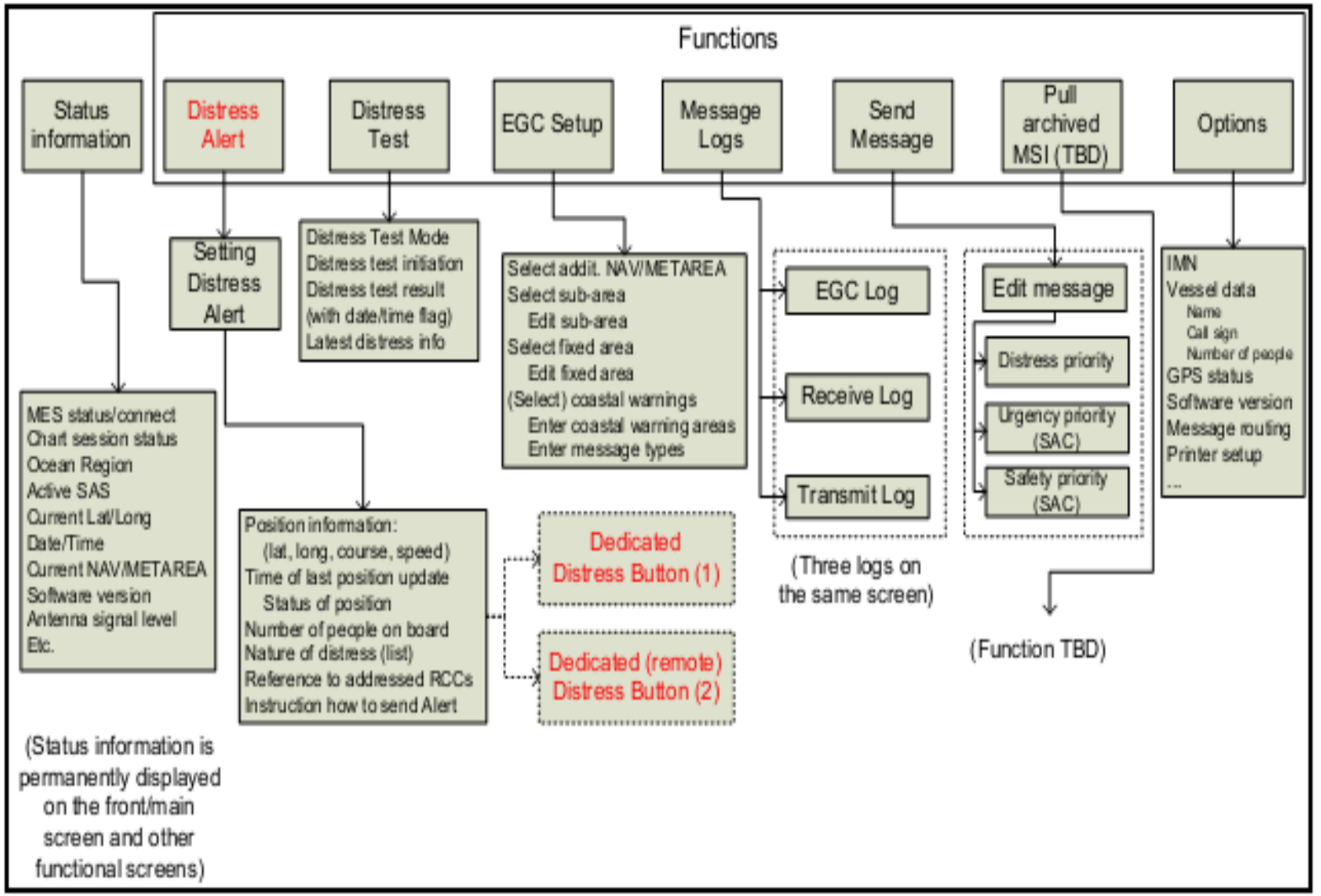
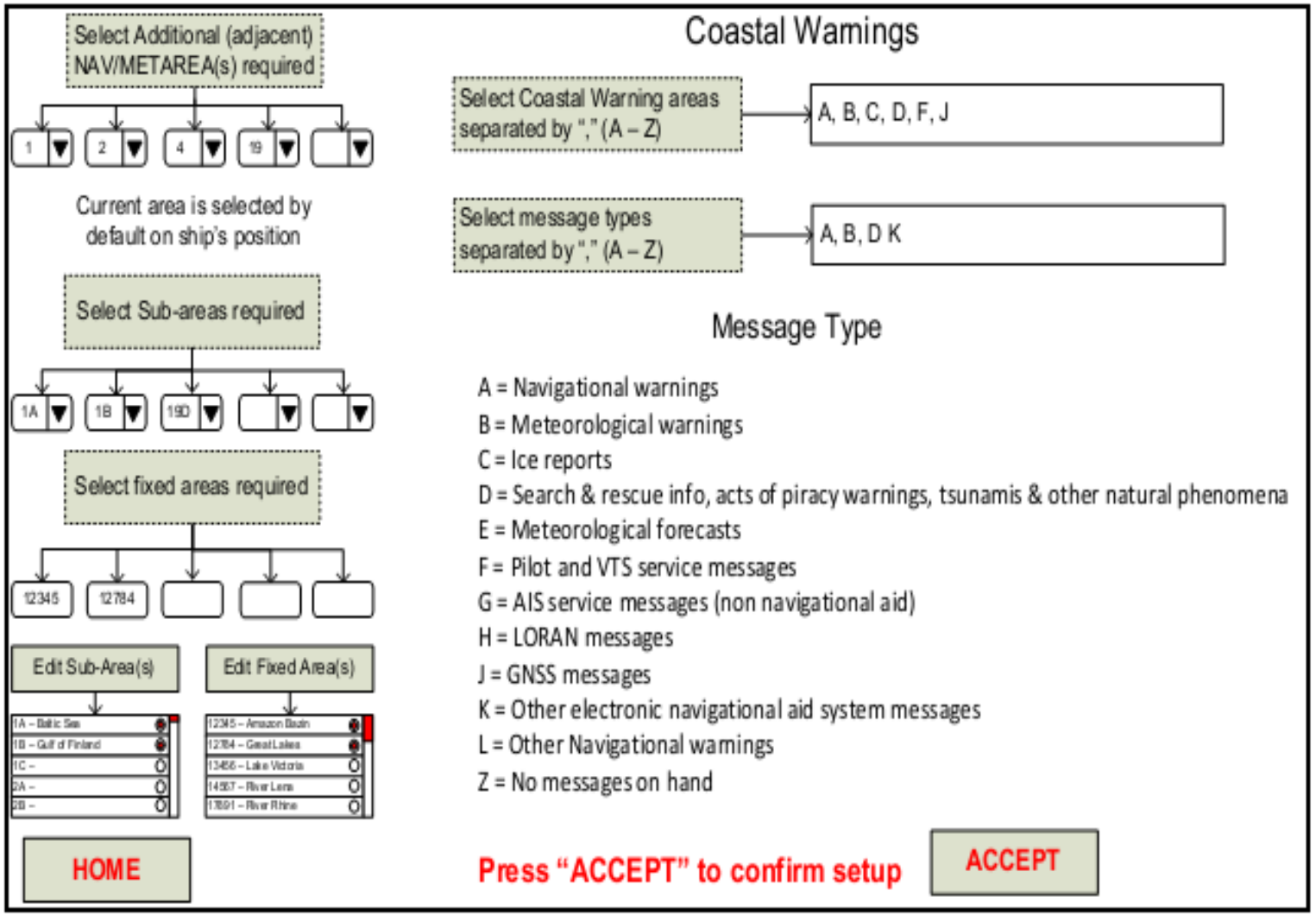
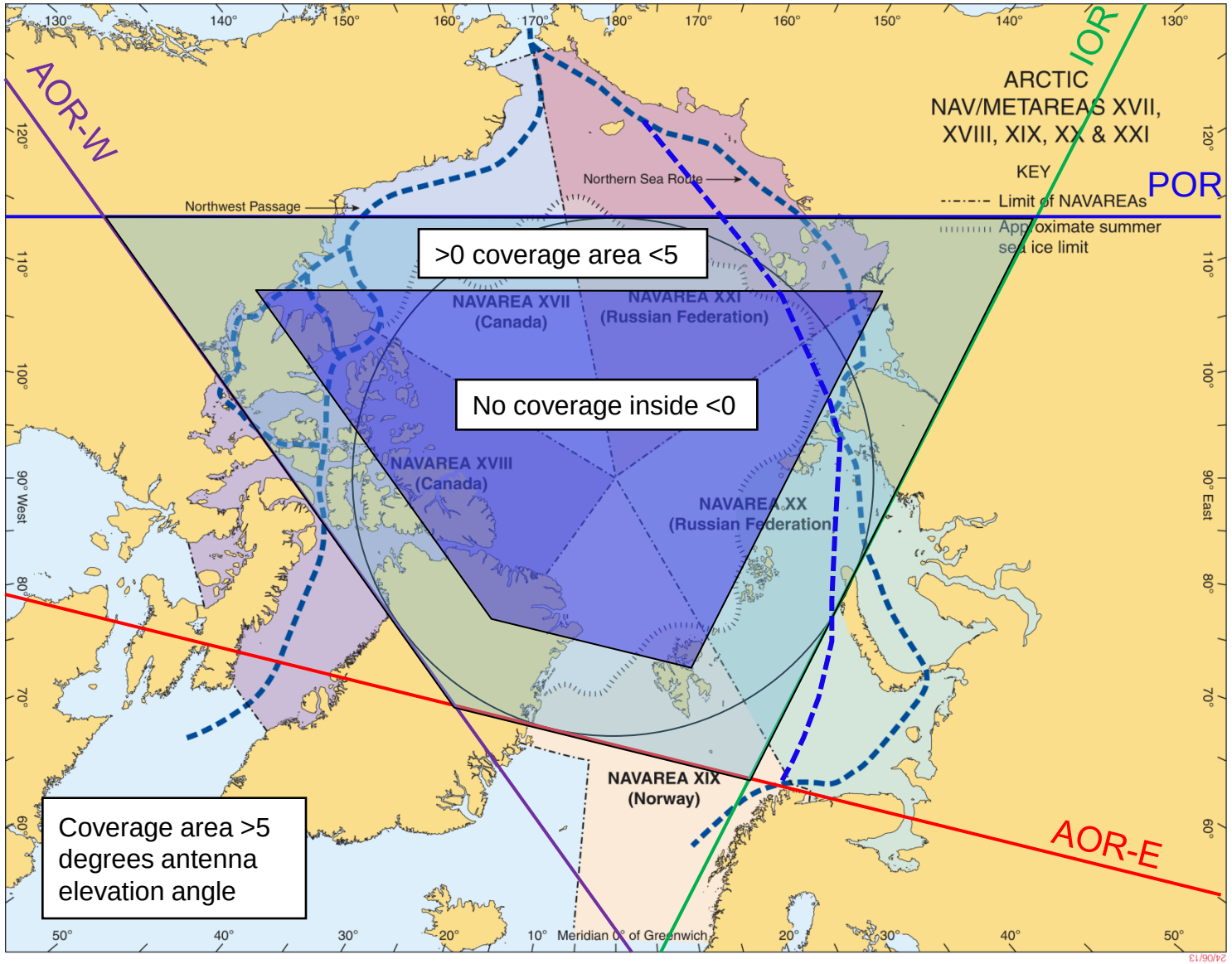
Maritime Safety Terminal Functions



EGC SafetyNET Setup Screen



Inmarsat I-3 coverage in the Arctic



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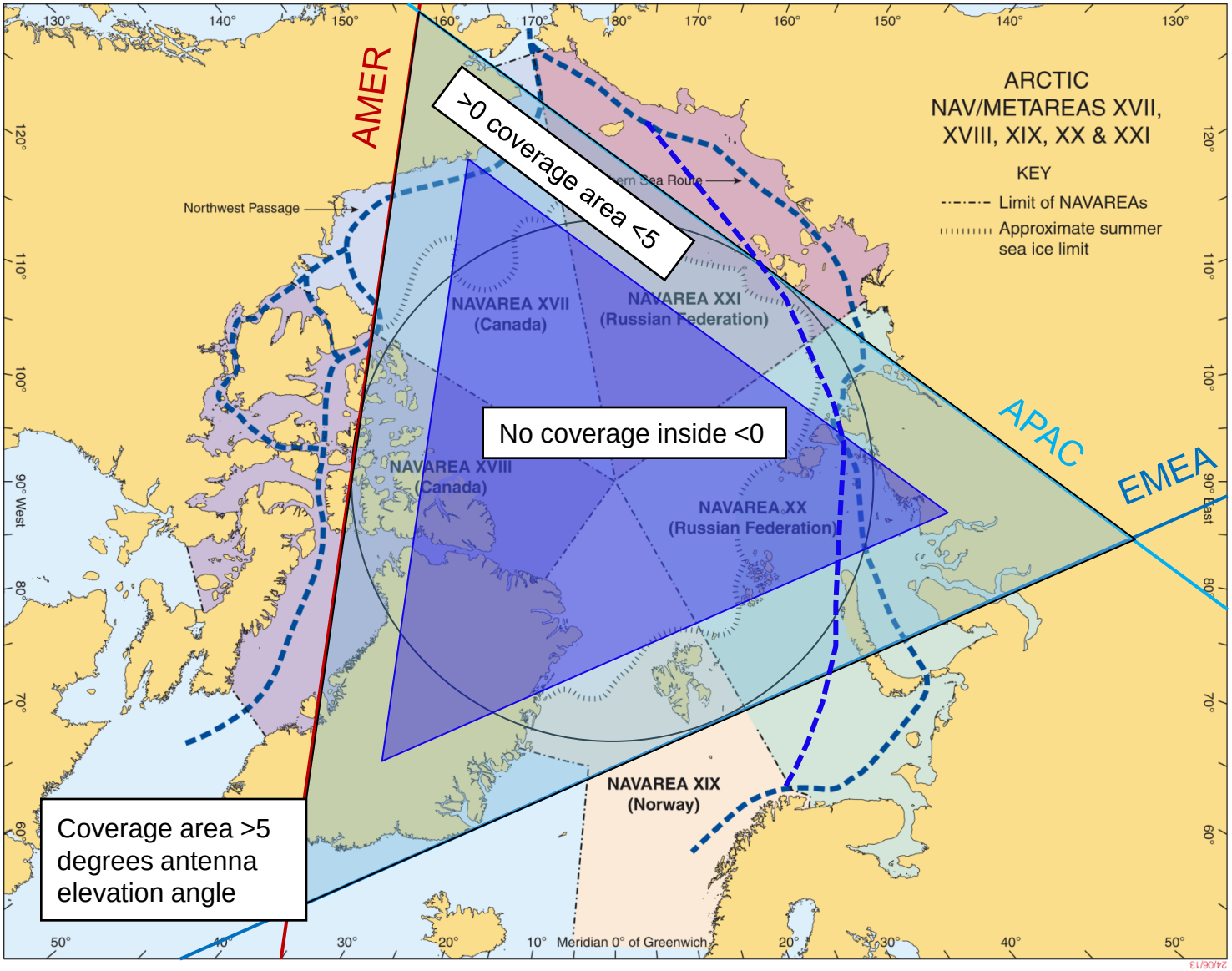
Inmarsat I-4 coverage in the Arctic



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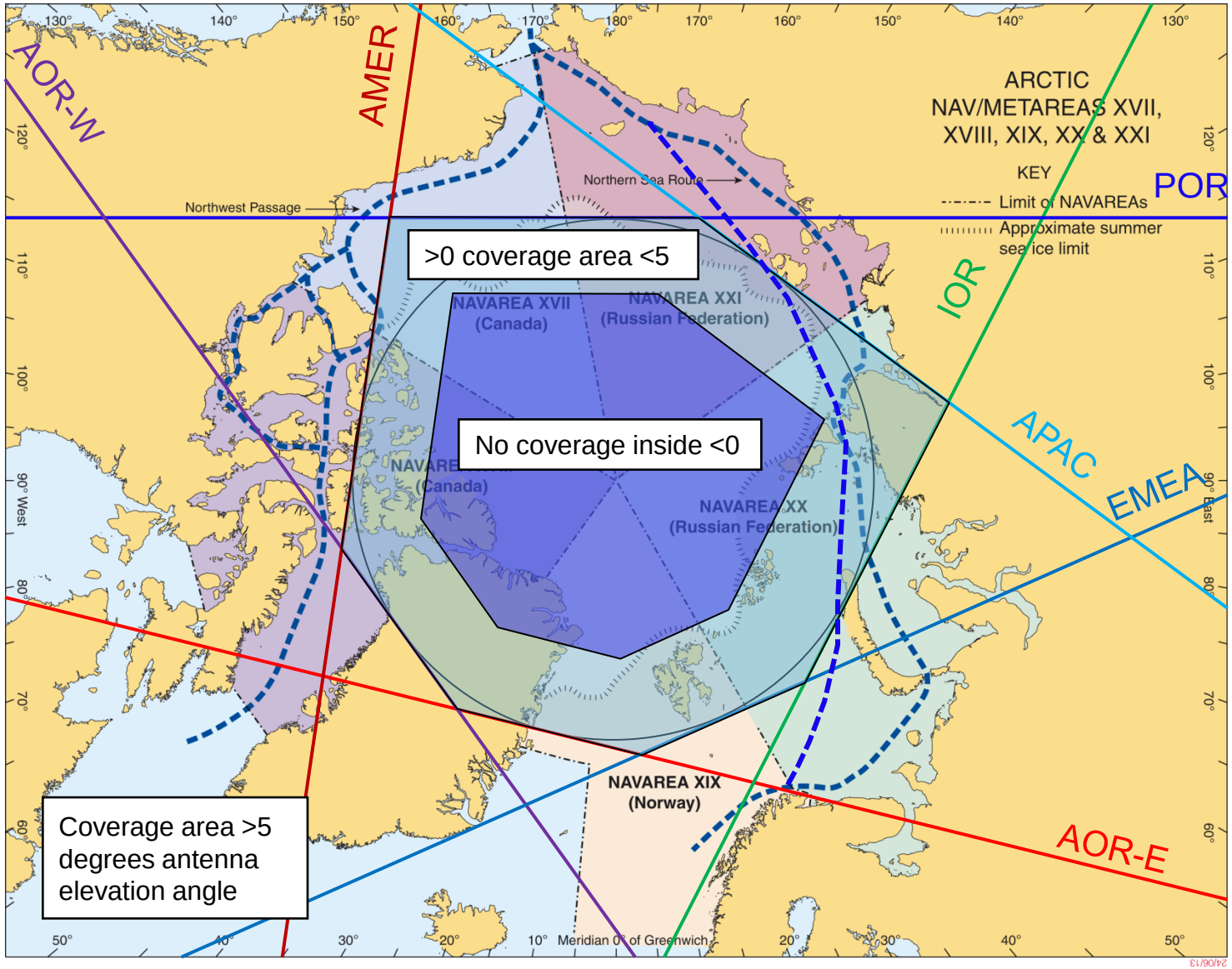
Inmarsat I-3 and I-4 coverage in the Arctic



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Thank you

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