

# Maritime Communications for Search and Rescue

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(IMSO)

# What is IMSO?

- The International Mobile Satellite Organization
- Established by international Convention
- 94 Member States
- Headquarters in London
- Core purposes:
  - ... ensure the provision ... of maritime mobile satellite communications services for the GMDSS.
  - ... assume the functions and/or duties of LRIT Co-ordinator ...



*(IMSO Convention Articles 3 & 4)*

# General SAR System Concept

*“Every State recognizes the great importance of saving lives and the need to be directly involved in rendering aeronautical and maritime search and rescue services (SAR) to persons in distress”*

*(IAMSAR Manual Vol.1 para 1.1.1)*

# Basic SAR System Functions

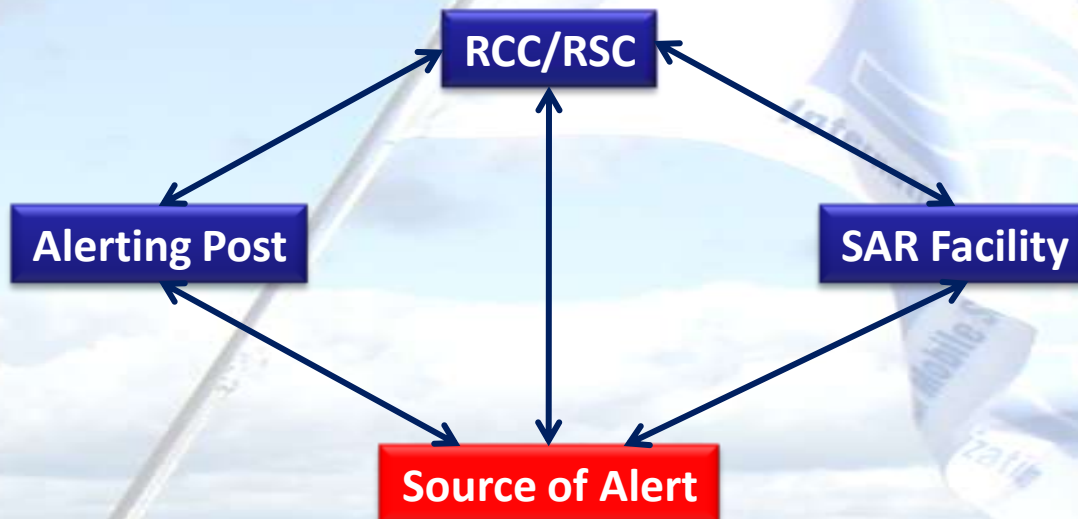
- Receive, acknowledge and relay notifications of Distress;
- Co-ordinate SAR Response; and
- Conduct SAR Operations



All these require effective and efficient  
COMMUNICATIONS

# Good COMMUNICATIONS are essential

## General SAR System communications:



### Main Functions of a SAR Communications System

- receipt of Alerts
- exchange of information
- direction finding and homing

# Key Factors for SAR Communications

- Timely delivery of alerts
- Minimum number of False Alerts
- Priority, Reliability and Availability
- Interoperability
- Identification
- International Co-ordination
- Available technology



# Aeronautical SAR Communications

- Convention on International Civil Aviation (Chicago Convention) Annex 10
- ICAO Regional Air Navigation Plans (RANPs)
- ITU Radio Regulations
- **121.5 MHz Voice and ELTs**



# Safety Comms for Shipping

- **SOLAS** = International Convention for the **S**afety **o**f **L**ife **a**t **S**ea
- Establishes basic requirements for design, construction, operation and safety of ships
- **Chapter IV** deals with Radiocommunications
- **G**lobal **M**aritime **D**istress and **S**afety **S**ystem



# Elements of the GMDSS

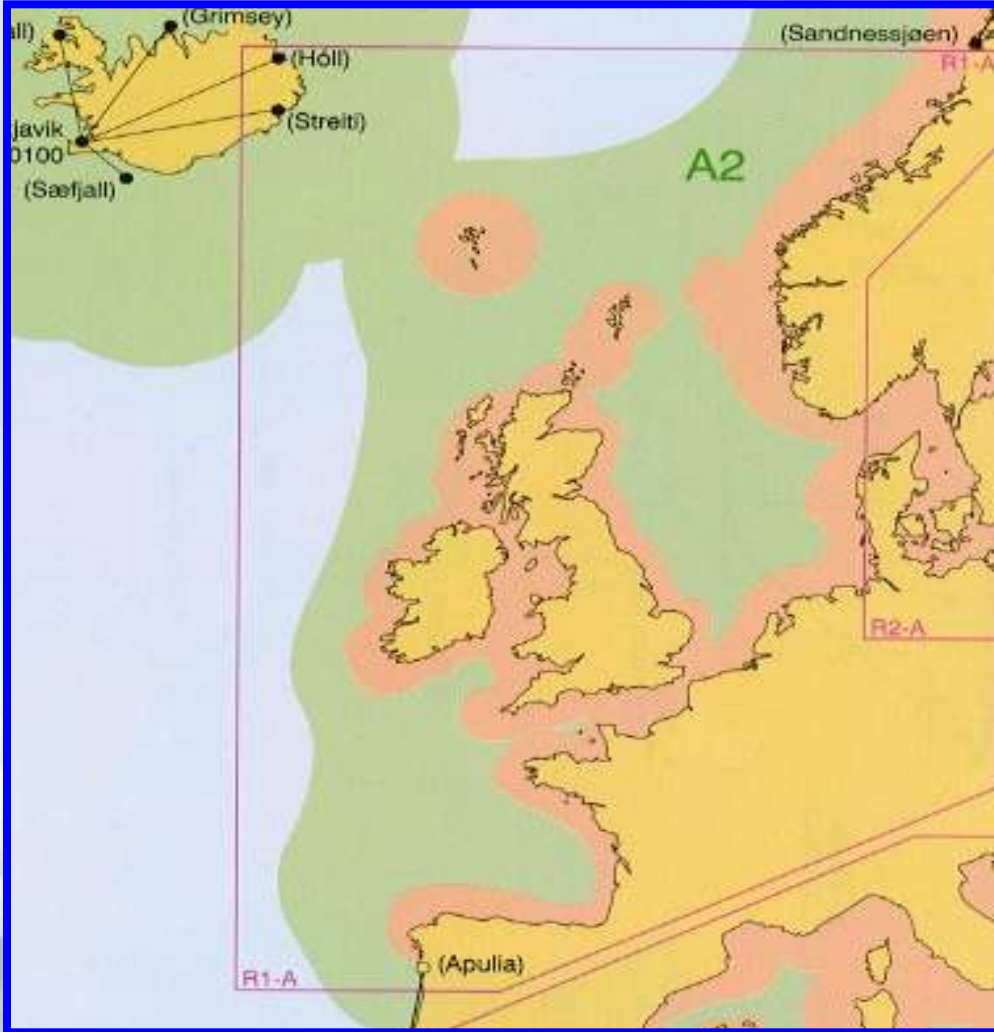
- **All ships** on international voyages >300 GT - except warships!
- Defines **Comms Functions** a ship **MUST** be able to perform
- **Modes of communication** and specific equipment depend on **4 Sea Areas of Operation**

# The GMDSS

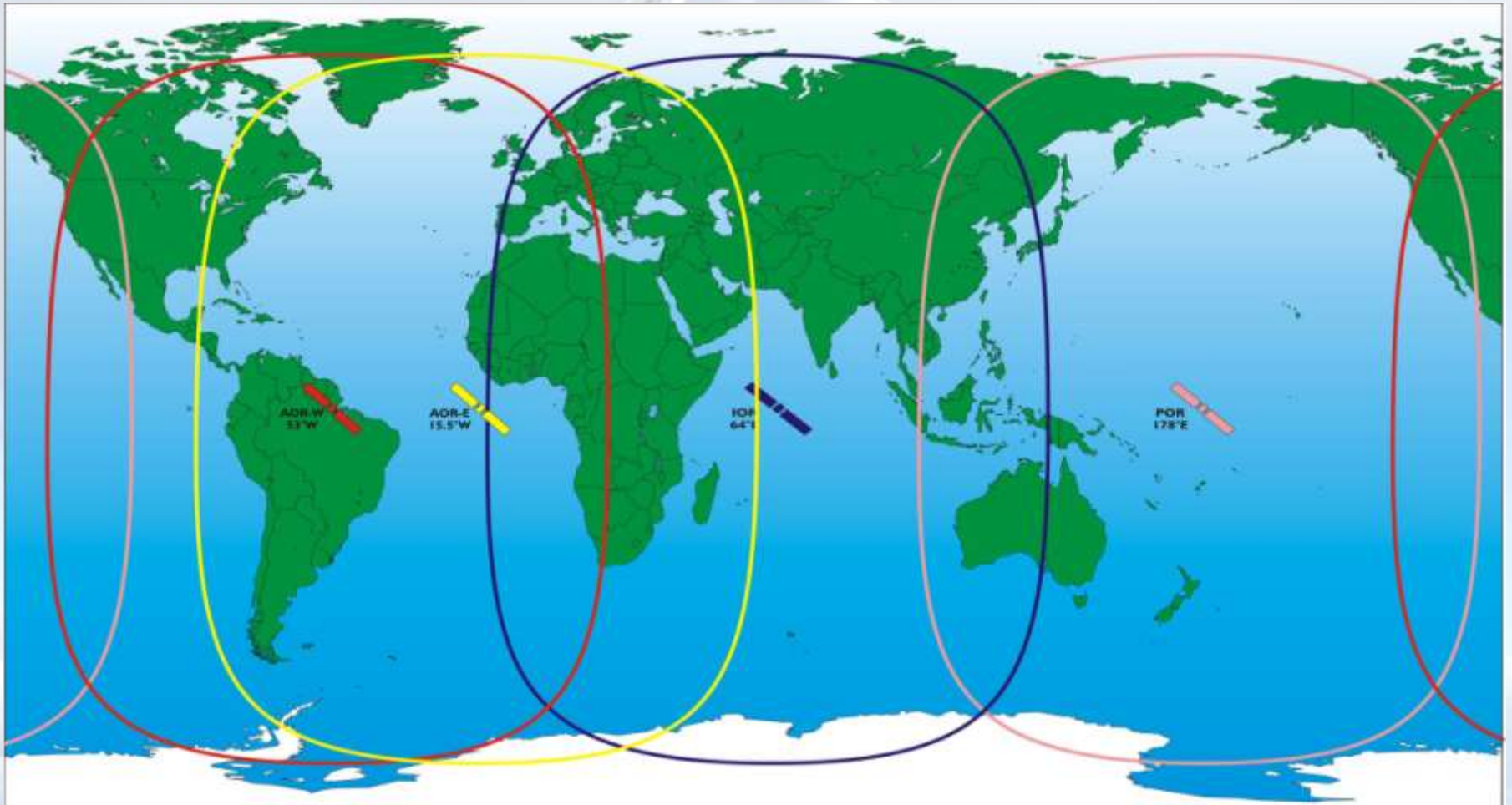
9 Functional Requirements include:



- **Distress Alerts**
- **SAR Co-ordinating comms**
- **On-scene comms**
- **Maritime Safety Information (MSI)**
- **General radiocommunications**



Sea Areas A1  
(pink)  
A2 (green)  
A3 (blue)



**Inmarsat – Four Primary Satellite Ocean Regions AOR-E, AOR-W, IOR and POR (to 75N & S)**

# Typical maritime comms equipment

**VHF DSC**



**EPIRB**



**Inmarsat C**



**NAVTEX**



# GMDSS is for small craft too



# Non-GMDSS Satellite Systems ...

## Iridium

- global coverage
- voice
- data



## Thuraya

- regional
- voice
- data



# SHIP REPORTING SYSTEMS

- AIS
- LRIT
- AIS via Satellite





# Automatic Identification System for Ships (AIS)

- LOCAL VHF broadcast of ship data and position info
- Range – up to 35NM
- Open channel ~ can be received by anyone
- [AISLive.com](http://AISLive.com)



# Long Range Identification and Tracking of Ships

- To obtain regular position reports from *ALL* SOLAS ships on international voyages
- ... and make them available to authorised (government) users
- ... while protecting the commercial security of the data

*(my words!)*

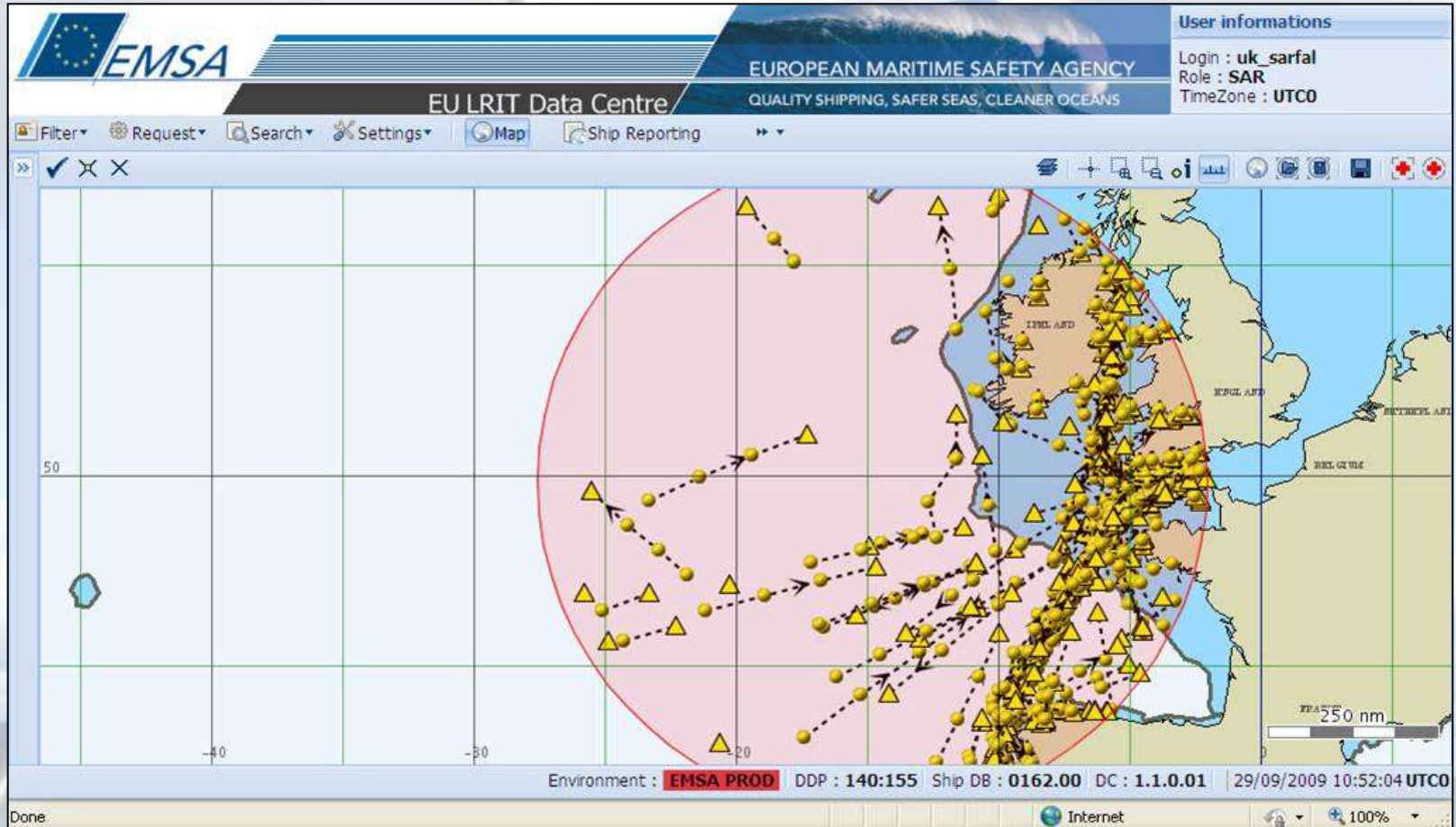


# The Fully-automatic Ship Report

- Sent via *any* means of communication
- Often via Inmarsat C
- Includes:
  - Ship ID
  - Current Position (GPS)
  - Date/Time of Position
- No intervention by Ship's Staff



# LRIT in practice



# Access to LRIT Data

- **FLAG** State
- **COASTAL** State
- **PORT** State
- **SAR** Authorities
- ALL ships in its register
- Any ship within 1000NM of its coast
- Any ship intending to visit that Port
- For SAR ops only

# LRIT Coordinator

- IMSO
- Key role in implementation phase
- Authorises new DCs
- **Audits performance, integrity and security** of operational system annually
- Monitors and reports to MSC





# AIS via Satellite

- Under technical development - not yet mature technology
- 4 commercial offerings - some with Governmental involvement
- VERY expensive
- Not yet viable but possible future system

# Air France Flight 447

- BEA Flight Data Recovery Working Group is studying:
  - How to locate FDRs more efficiently
  - Improved position reporting
  - Possibility of downloading A/C data to the ground as an event develops



# The Sub-Regional Cooperative Concept

- The RCC is an operational facility for:
  - promoting efficient organization of SAR services; and
  - co-ordinating the conduct of SAR operations
- States should consider combining their resources into a joint RCC (JRCC)
- Cooperative arrangements between States could make it unnecessary for some States to have an RCC.

(IAMSAR Manual Vol.1 section 2.3)

# SAR Communications Today

- are essentially trans-border and international in nature
- few countries offer the full range of communication systems and capabilities

*SO ...*

- require global, regional and sub-regional co-operation



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