Maritime Communications for Search and Rescue

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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)*
“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:

- 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 Safety of Life at Sea

• Establishes basic requirements for design, construction, operation and safety of ships

• **Chapter IV** deals with Radiocommunications

• **Global Maritime Distress and Safety System**
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
- NAVTEX
- Inmarsat C

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

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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

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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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