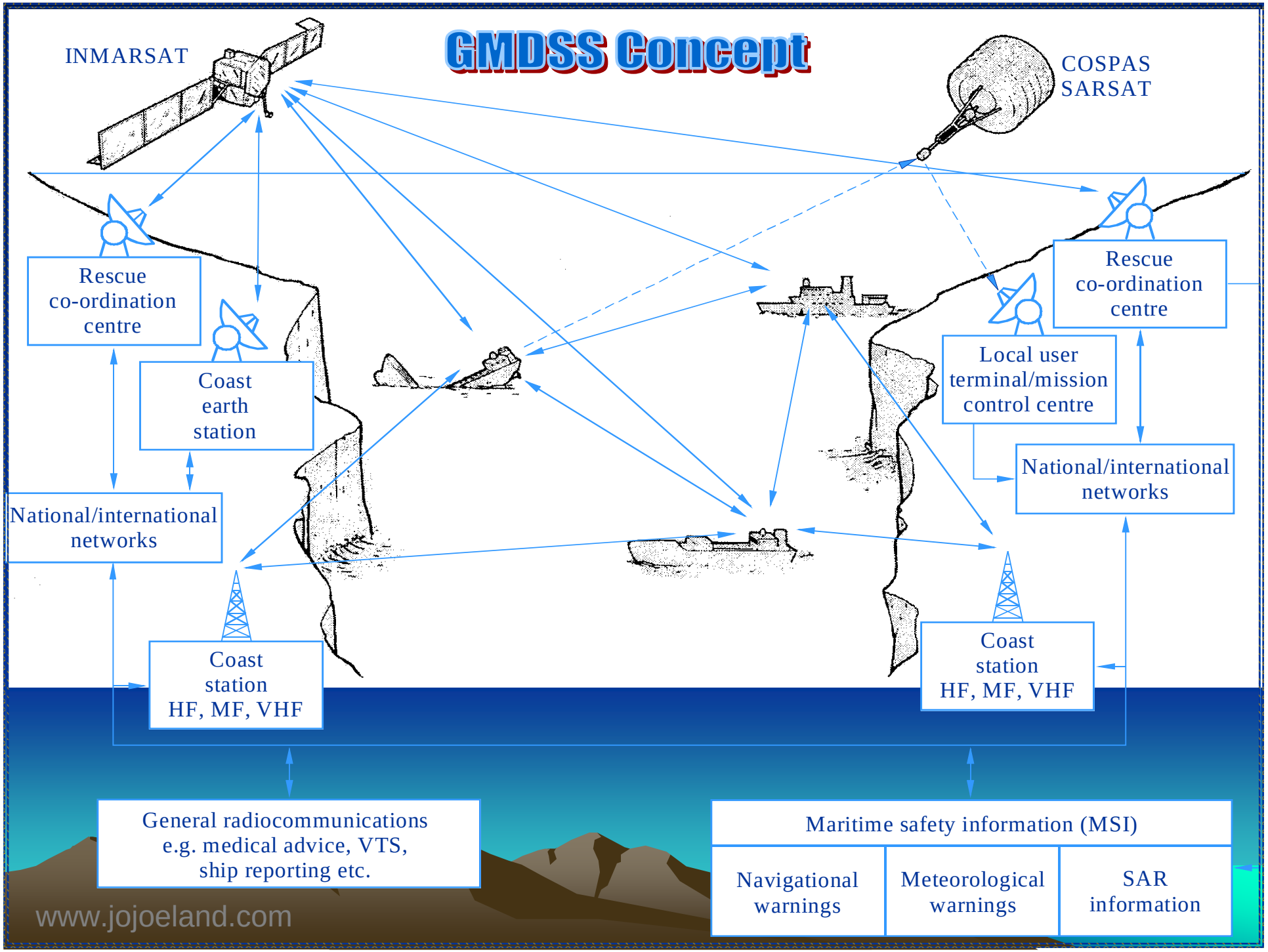
Basic Concept of the GMDSS

The fundamental difference between the old and the new distress system is that the ***new system is shore centred/coordinated and moves emphasis from ship to ship alerting to ship to shore alerting.*** The new system is quicker, simpler and, most importantly, more efficient and reliable than the old manual Morse Code and radiotelephone alerting system. GMDSS is specifically designed to automate a ship's radio distress alerting function, and consequently, remove the requirement for manual (human) watch-keeping on distress channels.

The basic concept of the system is that search and rescue authorities ashore, as well as shipping in the immediate vicinity of the ship in distress, will be rapidly and automatically alerted to a distress situation so that they can assist in a co-coordinated SAR operation with minimum delay. The system also provides for urgency and safety communications, and the promulgation of maritime safety information (MSI) including- navigational and meteorological warnings and forecasts, and other urgent safety information to ships. In other words, every ship, fitted appropriately for GMDSS, is able, irrespective of the area in which it operates, to perform those communication functions, which are essential for the safety of the ship itself and of other ships operating in the same area.


GMDSS Concept
INMARSAT
COSPAS
SARSAT
Rescue co-ordination centre
Coast earth station
National/international networks
Coast station HF, MF, VHF
Rescue co-ordination centre
Local user terminal/mission control centre
National/international networks
Coast station HF, MF, VHF
General radiocommunications e.g. medical advice, VTS, ship reporting etc.
Maritime safety information (MSI)
Navigational warnings
Meteorological warnings
SAR information
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The Communication Functions

1. Distress alerting – Ship to shore

The Global Maritime Distress and Safety System (GMDSS) as described in SOLAS Chapter IV defines the first functional requirement as:

"Every ship, while at sea, shall be capable of transmitting ship-to-shore distess alerts by at least two independent means, each using a different radiocommunication service".

three basic means of transmitting a distress ale

EPIRB

Digital Selective Calling (DSC)

INMARSAT

2. Distress alerting – Shore to ship

"Every ship, while at sea, shall be capable of receiving shore-to-ship distress alerts"

This function may be fulfilled by either of two means.
direct broadcast to vessels from a shore based Rescue Co-ordination Centre (RCC) using Digital Selective calling using the MF, HF or VHF frequency bands

using a broadcast of **Maritime Safety Information (MSI)** using either the ***NAVTEX*** service or the **SafetyNET** service.

3. Distress alerting – Ship to ship

"Every ship, while at sea, shall be capable of transmitting and receiving ship-to-ship distress alerts".

Transmission of ship-to-ship distress alerts can only be accomplished by two methods:

- by VHF Channel 16 (Distress, Safety and calling Channel) or VHF Channel 13 (Bridge-to-Bridge communications channel)
- by using **Digital Selective Calling** on either **MF, HF** or **VHF**

4. Search and Rescue Co-ordinating Communications

"Every ship, while at sea, shall be capable of transmitting and receiving Search and Rescue Co-ordinating Communications".

The purpose of this requirement is to co-ordinate search and rescue (SAR) communications between all vessels and aircraft that may be involved in the incident.

Voice communications would normally be used, although initially promulgation of information through the broadcast of Maritime Safety Information (MSI) may be used by a Rescue Co-ordination Centre (RCC) to ascertain which vessels are in the area of the incident and are in a position to assist.

Thus any of the following methods of communication could be used:

Transmission/reception of **Maritime Safety Information**, **NAVTEX** or **SafetyNET**

Voice communications using **MF/HF** or **VHF** or **Inmarsat**

5. On-Scene Communication

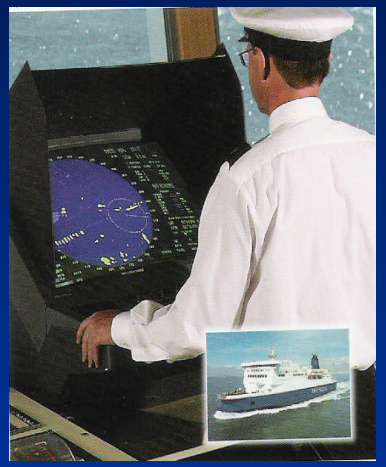
"Every ship, while at sea, shall be capable of transmitting and receiving On-Scene Communications".

The purpose of this requirement is to co-ordinate search and rescue (SAR) and other communications between all vessels and aircraft that may be involved at the scene of the incident.

Voice communications using **MF/HF** or **VHF** would normally be used.

6. Locating

"Every ship, while at sea, shall be capable of transmitting and as required by regulation V/12(g) and (h), receiving signals for locating".



- RADAR (9GHz)– for receiving
- SART(Search and Rescue Radar Transponder) – for transmiting

7. **Transmission/Reception of Maritime Safety Information**

"Every ship, while at sea, shall be capable of transmitting and receiving maritime safety information".

- NAVTEX – reception by terrestrial communication
- SafetyNET – transmission/reception by satellite communication

8. General Radiocommunications

"Every ship, while at sea, shall be capable of transmitting and receiving general radiocommunications to and from shore-based radio systems or networks subject to regulation 15(8)"

General communications may be carried out utilizing the following systems:

Digital Selective Calling to set up a telephone or telex link on MF/HF or VHF

The **Inmarsat network**

9. Bridge-to-Bridge Communications

"Every ship, while at sea, shall be capable of transmitting and receiving bridge-to-bridge communications"

Ships would normally use **VHF** communications to carry out this function. The normal use of this function would be for port operations and pilotage. Occasionally, for longer range **MF/HF** or **Inmarsat** could be used. The setting up of communications using **MF/HF** would be via **Digital Selective Calling**.