

**SAR INFRASTRUCTURE, VESSEL REPORTING SYSTEM  
AND SAR SYSTEM FOR FISHERMEN IN INDIA**

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Prior to coming into force of SAR Convention 1979, the SAR System in India generally comprised of 13 Coast Radio Stations situated all over the Coast for reception of distress alerts in 500 and 2182 Khz. Vessel Reporting System INSPIRES which generally covered the major part of Indian Ocean had very few ships participation. The maritime forces, Indian Coast Guard and Indian Navy rendered all assistance as and when they received the distress alert through some sources at their respective maritime operations centre. Prior to introduction of GMDSS, the maritime distress and safety communications relied primarily on the capability of a ship in distress to alert another ship for assistance. The extent of assistance was restricted to opportune ship in the proximity of the vessel and the role of shore authorities through dedicated rescue coordination centre for coordinating search and rescue operations was activated on need basis.

Today, Maritime Search and Rescue is an international obligation and with the advent of Global SAR concept, and Global maritime distress safety system in the nineties, and the recent accession to SAR '79 has provided momentum for the development of SAR facilities and institutionalize the National SAR System in accordance with the provisions of the International SAR Convention 1979. Before discussing the infrastructure, let us now take a brief look at the events and threat that leads to SAR situation in the seas around India.

### **Environmental Conditions**

The seas of India offers one of the most challenging environmental conditions for maritime transportation. The Arabian Sea and the Bay of Bengal accounts for six percent of the cyclones worldwide and the 1999 Orissa super cyclone rendered a third of the population homeless, the 1998 Gujarat cyclone caused for the disappearance of two bulk carriers and left 60 ships stranded. Severe sea states, gale force winds, cyclonic storms are common on the East Coast, Monsoon storms in the Arabian Sea with wave height of 10 metres and above are not uncommon. During the Spring and Summer months, the fog reduces visibility to near zero.

### **Fishing Boats**

Over 500,000 fishermen from nearly 2500 villages in India are engaged in fishing activities in our coastal waters and in high seas. A large percentage of these fishermen represent the weaker section of the economy and the fishing boats do not carry the basic life saving equipment and SAR alerting device. They are the potential candidates for SAR authorities ashore due to the fact that search planning and rescue assistance need to be coordinated round the clock.

### **Maritime Accidents**

Incidents do occur unexpectedly at sea beyond the control of the men operating them. These include tanker explosion, fire onboard, vessel listing due to instability, flooding, collision and stranding. The accuracy to determine the position of the ship in distress and the reaction time of the SAR personnel is essential. From the analysis of the database of the vessels who were in distress, it was observed that a large percentage of the vessels were unseaworthy and did not carry valid certification and class. The operation of unseaworthy ships in our Indian Search and Rescue Region is another area of concern for us.

## **SAR INFRASTRUCTURE**

### **GMDSS and Digital Selective Calling**

Radio has been the foundation of the distress and safety system used by the ships at sea and in accordance to the ITU regulations for a effective radio based distress and safety system, the Coast Guard has three MRCCs and nine MRSCs fitted with VHF DSC equipment for responding to incidents occurring in sea area A -1. Besides, 5 Coast Guard Stations have been fitted with MF and HF digital selective calling equipment to monitor long range distress alerts. Coast Guard Ships are also fitted with DSC equipment to monitor distress alert on a regular basis. From the above, it is ensured that the distress call made from DSC equipment cannot go unresponded if it is made anywhere inside the Indian Search and Rescue Region and beyond using correct DSC equipment.

### **COSPAS-SARSAT system**

The COSPAS-SARSAT system employs both polar orbit satellites as well as recently introduced geo-stationary satellites one of which is provided by India.

Emergency messages transmitted by the distressed unit are intercepted by the COSPAS-SARSAT satellites and relayed to ground receiving stations. The ground receiving station processes the information received and relay the same to an appropriate SAR authority. Two LUTs of the COSPAS-SARSAT system are operating in India, one co-located at Bangalore with the INMCC and the other at Lucknow.

The INMCC disseminates distress alerts picked-up on the international distress frequencies (121.5 MHz, 243 MHz and 406 MHz) through COSPAS-SARSAT satellites to the four designated Indian RCCs at Mumbai, Delhi, Calcutta and Chennai operated by the Airports Authority of India (AAI) and to the MRCCs of the Coast Guard at Mumbai, Chennai and Port Blair besides CGHQ.

INMCC also provides alert services to nine of our neighbouring countries Viz., Bangladesh, Bhutan, Kenya, Maldives, Nepal, Sri Lanka, Tanzania and Seychelles.

It may be noted that India is the only country in the world, besides the US, to incorporate its INSAT 2A & 2B geo-stationary satellites as the GEOSAR component for Search and Rescue. This compensates for detection delay inherent in the LEOSAR System.

### **INMARSAT system**

To provide continuous high quality global communications, the International Maritime Satellite Organisation (INMARSAT) has placed four geostationary satellites in an equatorial orbit. The four satellite are positioned in the regions above the Atlantic Ocean East (AOR-E), the Pacific Ocean (POR), the Indian Ocean (IOR) and the Atlantic Ocean West (AOR-W) in such a manner that the footprint of each satellite overlaps the footprint of the adjacent satellite. This ensures continuous satellite coverage around the globe between 76 deg N and 76 deg S.

India operates an INMARSAT Land Earth Station at Arvi, Maharashtra, INMARSAT A, C & M facilities are provided through this LES.

All Coast Guard ships and shore stations including the MRCCs/MRSCs are equipped with INMARSAT terminals.

### **Safety Net System**

Safety Net, as we know, is the service of the INMARSAT Enhanced Group Calling (EGC) system which provides an automatic, global method of broadcasting messages to all vessels in both fixed and variable geographical areas or to a predetermined group of ships. In the absence of position reporting

system, this method of alerting ships in the area are widely used by the coordinating MRCC.

### **Vessel Reporting System**

The Position Reporting System forms a key resource for maritime rescue coordination centres for identifying potential ships who are in a position to render assistance to ships in distress at sea. The sea lanes of all major ship lines cross the seas around in India and it is estimated that around 1,000 ships cross the Indian Search and Rescue region everyday. The coverage of the Indian Ocean is scanty with Mozambique Strait reporting system in the west and the Malacca strait vessel reporting system in the east. New Indian Reporting System INDSAR will address the coverage vacuum and the position reporting system will be operated shortly by MRCC Mumbai. The objective of the INDSAR system is to contribute the safety of life at sea by:-

- (a) Limiting the time between loss of a ship and the initiation of search and rescue actions in case no distress signal is sent out.
- (b) Limiting the search area for rescue action.
- (c) Providing upto date information on ship resources available in the area in the event of a SAR emergency at sea. It is fully computerised and supports tracking of vessels worldwide.

Special features of the INDSAR include ship tracking, future plots for SAR, incorporation of search planning tool and continuous monitoring of drifting vessel or vessel in distress and access to vessel databases and ship history. INDSAR provides an additional measure of safety insurance by allowing rescue coordinators to compress the search area in the event of a participating ship is unreported or overdue. INDSAR is a voluntary Ship Reporting System and INDSAR efficiency is related directly to the number of merchant vessels regularly reporting their position. The more ships on the plot greater the chance of a ship being identified near to the position of distress. Ships incur no additional

obligation to respond then already existing under the International Law of the Sea. Since the INDSAR will identify the best ship or ships to respond to a ship in distress, the coordinating MRCC will release all other vessels to continue their voyage, thereby saving fuel, time and pay roll cost. INDSAR will help to track a lost ship or pirated ship. The checks will be made through broadcast to ship and communication with owners, agents and charterers. INDSAR is a fully computersied and is a worldwide system. The participation of ships is voluntary and the information is protected and used in a bonafide emergency and it is toll free for reporting through inmarsat.

### **Need for SAR System for Fishermen**

India ranks sixth among the major fish producing countries in the world and eighth in marine fish production. The Fishery Sector, contributing about 1.3 per cent to the GDP, occupies a very important place in the socio-economic development of the country. It is a powerful income and employment generator and stimulates development of a number of ancillary industries. It is one of the major foreign exchange earning sectors and at the same time, an instrument of livelihood for a large section of economically backward coastal population

### **SAR System for Fishermen**

Ninety per cent of SAR efforts on the Indian Coast Guard are directed towards rescue of fishermen distress at sea. This is attributable to the 500 thousand fishermen actively engaged in fishing at sea with approximately 150 thousand non-mechanised fishing craft of various types of 20,000 small mechanised boats which are not governed by the GMDSS Rules and do not maintain any safety / life saving equipment whatsoever onboard. The Coast Guard, therefore, maintains a close liaison with the Fisheries, Department of the State Governments for implementation of various safety measures of these fishermen. As our fishermen belong to the poorer community, they are not in a position to invest huge amounts of money for carrying EPIRB and PLBs. However, they have been persuaded to carry at least the bare minimum

essentials such as life jackets and portable radio communication equipment. With India's accession to the SAR Convention 1979, the State Governments are being requested to provide EPIRB and PLBs at subsidised rates to ensure safety of the fishermen when in distress.

The Coast Guard is involved, jointly with the Department of Animal Husbandry and Dairying under the Ministry of Agriculture, in the implementation of a Vessel Monitoring System (VMS) for fishing vessels more than 20 metres in length operating in the Indian EEZ.

The Coast Guard is also working closely with an NGO, viz., Bay of Bengal Programme (BOBP) sponsored by the UNDP for implementation of safety measures for the artesanal and small scale fishermen on the east coast of India.

Our ongoing community interaction programme has led to an increased awareness amongst the community.

A low cost mobile satellite service developed by the Indian Space Research Organisation is being studied for communication by fishers in distress. This is a hand held system operated by a battery and incorporates the GPS component in the transponder thus providing a continuous and accurate information of the vessel when activated by the personnel holding the MSS transponder.

### **SAR – Whale Rescue**

Many parts of the world maintain exclusive Ship Reporting System for protection of whales. Although there is no exclusive system existing for protection of whales, the Indian Coast rescued two whales in 2000/2001 thus actively taking part in marine world life protection and their safety.

## **Conclusion**

Despite constraints, the way the global SAR and Coast Guard Maritime search and rescue system has developed represents a considerable achievement. In the long run, the development of new communication system will offer shipping, aviation and even poor fishermen great opportunities. Preventive SAR is another area where the National SAR Board is putting its thrust. The survival education in elementary schools by instruction and field trips will be made to create awareness. A special emergency lane on the internet for SAR emergencies is another area which is expected to be used widely in the maritime rescue operations.

Co-ordination of facilities being the key to success and any successful SAR operations can only be achieved through cohesion of efforts. In other words,

**SAFER SEAS THROUGH CO-OPERATION**  
needs to be adopted as our collective motto.