
A Publication by National Maritime Search and Rescue Board
NATIONAL MARITIME SEARCH AND RESCUE MANUAL

INDIAN COAST GUARD

NATIONAL MARITIME SAR BOARD
1. The manual has been prepared in accordance with the guidelines provided in the International Aeronautical and Maritime Search and Rescue Manual (IAMSAR) and circulated to all NMSAR board members. However, the need for updation of NMSAR manual was felt and the point was discussed during Vth NMSAR board meeting. The Indian Coast Guard (ICG) has the overall responsibility for execution of assigned M-SAR coordinating responsibilities in the Indian Search and Rescue Region (ISRR) and similar responsibility is also shouldered by the resource agencies.

2. This manual provides guidance to all Maritime SAR Board Member Organisations and other resource agencies with regard to implementation of the National Maritime Search and Rescue Plan. The manual which was promulgated on 22 Apr 2003 was to establish standards and provide guidance to all organisations and departments, military and civilian that support civil search and rescue operations, has been revised. This was to incorporate the response for Mass Rescue Operations that involves a need for immediate assistance to large numbers of persons in distress where-in the capabilities normally available to M-SAR authorities are inadequate.

3. The Coast Guard MRCCs develops M-SAR response and Contingency Plans, drawn from the provisions of this Manual. The guidance provided in the Manual must be referred with sound judgment, having due regard for individual situations. Nothing in this manual should be construed as relieving personnel involved in M-SAR of the need for initiative and jurisprudence.


5. The changes are inevitable and the process dynamic which needs documentation. Hence, the recommendations for changes in future be forwarded to the National M-SAR Board Secretariat, Coast Guard Headquarters, New Delhi. Additional M-SAR policies and procedures unique to a single agency should be promulgated by that agency as a separate addendum, with a copy to this office, for promulgation to all concerned.

6. As the Chairman of National Maritime Search and Rescue Board, I feel that, concentrated efforts, cooperating at all levels and coordinated approach will lead to an effective M-SAR regime in our Indian Maritime SRR

(Anil Chopra)
Vice Admiral
Chairman
National SAR Board

27 Aug 2010
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ABBREVIATIONS AND ACRONYMS
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<td>Area Control Centre</td>
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<td>AC</td>
<td>Aircraft Coordinator</td>
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<td>AES</td>
<td>Aeronautical Earth Station</td>
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<tr>
<td>AFN</td>
<td>Aeronautical Fixed Network</td>
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<tr>
<td>AFTN</td>
<td>Aeronautical Fixed Telecommunication Network</td>
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<td>AIP</td>
<td>Aeronautical Information Publication</td>
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<tr>
<td>AMVER</td>
<td>Automated Mutual Assistance Vessel Rescue</td>
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<td>ATC</td>
<td>Air Traffic Control</td>
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<td>ALRS</td>
<td>Admiralty List of Radio Signals</td>
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<td>CES</td>
<td>Coast Earth Station</td>
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<td>CRS</td>
<td>Coast Radio Station</td>
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<td>C/S</td>
<td>Call Sign</td>
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<td>CSP</td>
<td>Commence Search Point</td>
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<td>DME</td>
<td>Distance Measuring Equipment</td>
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<td>DR</td>
<td>Deviation Report</td>
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<td>DSC</td>
<td>Digital Selective Calling</td>
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<td>EGC</td>
<td>Enhanced Group Calling</td>
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<td>ELT</td>
<td>Emergency Locator Transmitter</td>
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<td>ENR</td>
<td>Entry Report</td>
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<td>EPIRB</td>
<td>Emergency Position Indicating Radio Beacon</td>
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<td>ETA</td>
<td>Estimated Time of Arrival</td>
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<td>ETD</td>
<td>Estimated Time of Departure</td>
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<td>EXR</td>
<td>Exit Report</td>
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<tr>
<td>FIC</td>
<td>Flight Information Centre</td>
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<td>FIR</td>
<td>Flight Information Region</td>
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<td>FR</td>
<td>Final Arrival Report</td>
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<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>GMDSS</td>
<td>Global Maritime Distress Safety System</td>
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<td>GPS</td>
<td>Global Positioning System</td>
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<td>ICAO</td>
<td>International Civil Aviation Organisation</td>
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<td>IFR</td>
<td>Instrument Flight Rules</td>
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<td>IMD</td>
<td>International Meteorological Department</td>
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<td>IMO</td>
<td>International Maritime Organisation</td>
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<td>INMARSAT</td>
<td>International Mobile Satellite</td>
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<td>ISRR</td>
<td>Indian Search and Rescue Region</td>
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<td>ITU</td>
<td>International Telecommunication Union</td>
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<td>LEOLUT</td>
<td>Low Earth Orbiting Local User Terminal</td>
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<td>LEOSAR</td>
<td>Low Earth Orbiting Search And Rescue</td>
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<td>LES</td>
<td>Land Earth Station</td>
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<td>LKP</td>
<td>Last Known Position</td>
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<td>LPC</td>
<td>Last Port of Call</td>
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<td>LUT</td>
<td>Local User Terminal</td>
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<td>MCC</td>
<td>Mission Control Centre</td>
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<tr>
<td>MEDEVAC</td>
<td>Medical Evacuation</td>
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<tr>
<td>MEDICO</td>
<td>Medical Advice, usually by radio</td>
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<tr>
<td>MID</td>
<td>Maritime Identification Digit</td>
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<tr>
<td>MMSI</td>
<td>Maritime Mobile Service Identity</td>
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<td>MRCC</td>
<td>Maritime Rescue Coordination Centre</td>
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<tr>
<td>MRSC</td>
<td>Maritime Rescue Sub Centre</td>
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<tr>
<td>MRSSC</td>
<td>Maritime Rescue Sub Sub Centre</td>
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<tr>
<td>MSI</td>
<td>Maritime Safety Information</td>
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<td>NBDP</td>
<td>Narrow Band Direct Printing</td>
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<td>NOTAM</td>
<td>Notices To Mariners</td>
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<td>NPC</td>
<td>Next Port of Call</td>
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OSC  On Scene Coordinator
PLB  Personal Locator Beacon
POB  Persons On Board
PR  Position Report
PRECOM  Preliminary Communication
RANP  Regional Air Navigation Plan
SAR  Search And Rescue
SARSAT  Search And Rescue Satellite Aided Tracking
SART  Search And Rescue Transponder
SC  Search and Rescue Coordinator
SDP  Search and Rescue Data Provider
SES  Ship Earth Station
SITREP  Situation Report
SMC  Search and Rescue Mission Coordinator
SOLAS  Safety Of Life At Sea
SP  Sailing Plan
SPOC  Search and Rescue Point Of Contact
SRR  Search and Rescue Region
SRU  Search and Rescue Unit
UTC  Universal Time Constant
## GLOSSARY

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<th>Term</th>
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<td>Aircraft Coordinator (AC)</td>
<td>A person who coordinates the involvement of multiple aircraft in SAR operations.</td>
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<td>Alert Phase</td>
<td>A situation wherein apprehension exists as to the safety of an aircraft or marine vessel, and of the persons on board.</td>
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<tr>
<td>Alerting Post</td>
<td>Any facility intended to serve as an intermediary between a person reporting an emergency and a rescue coordination centre or rescue sub centre</td>
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<td>Awareness stage</td>
<td>A period during which the SAR system becomes aware of an actual or potential incident</td>
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<tr>
<td>Coast Earth Station</td>
<td>Maritime name for an INMARSAT shore-based station linking ship earth stations with terrestrial communication networks.</td>
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<tr>
<td>Commence Search Point</td>
<td>Point normally specified by the SMC where a SAR facility is to begin its search pattern</td>
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<tr>
<td>Conclusion stage</td>
<td>A period during a SAR incident when SAR facilities return to their regular location and prepare for another mission</td>
</tr>
<tr>
<td>Datum</td>
<td>A geographic point, line, or area used as a reference in search planning</td>
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<tr>
<td>Digital Selective Calling</td>
<td>A technique using digital codes which enables a radio station to establish contact with, and transfer information to another station or group of stations</td>
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<td>Distress Phase</td>
<td>A situation wherein there is reasonable certainty that a vessel or other craft, including all aircraft or a person, is threatened by grave and imminent danger and requires immediate assistance.</td>
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<td>Ditching</td>
<td>The forced landing of an aircraft on water</td>
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<tr>
<td>Drift</td>
<td>The movement of a search object caused by environmental forces</td>
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<tr>
<td><strong>Emergency Phase</strong></td>
<td>A generic term meaning, as the case may be, uncertainty phase, alert phase, or distress phase.</td>
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<td><strong>False Alert</strong></td>
<td>Distress alert received from any source, including communications equipment intended for alerting, when no distress situation actually exists, and a notification of distress should not have resulted.</td>
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<tr>
<td><strong>Global Maritime Distress And Safety System (GMDSS)</strong></td>
<td>A global communications service based upon automated systems, both satellite-based and terrestrial, to provide distress alerting and promulgation of maritime safety information for mariners.</td>
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<tr>
<td><strong>Hypothermia</strong></td>
<td>Abnormal lowering of internal body temperature (heat loss) from exposure to cold air, wind, or water.</td>
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<tr>
<td><strong>Initial Action Stage</strong></td>
<td>A period during which preliminary action is taken to alert SAR facilities and obtain amplifying information</td>
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<td><strong>International Mobile Satellite Organisation (INMARSAT)</strong></td>
<td>A system of geostationary satellite for worldwide mobile communications services and which support the Global Maritime Distress and Safety System and other emergency communications systems</td>
</tr>
<tr>
<td><strong>Instrument Flight Rules</strong></td>
<td>Rules governing the procedures for conducting instrument flight. Also a term used by pilots and controllers to indicate type of flight plan.</td>
</tr>
<tr>
<td><strong>Knot</strong></td>
<td>A unit of speed equal to one nautical mile per hour.</td>
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<tr>
<td><strong>Last Known Position (LKP)</strong></td>
<td>Last witnessed, reported, or computed DR position of a distressed craft.</td>
</tr>
<tr>
<td><strong>Leeway</strong></td>
<td>The movement of a search object through water caused by winds blowing against exposed surfaces.</td>
</tr>
<tr>
<td><strong>Local User Terminal (LUT)</strong></td>
<td>An earth receiving station that receives beacon signals relayed by COSPAS-SARSAT satellites, processes them to determine the location of the beacon, and forwards the signals.</td>
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<tr>
<td>Term</td>
<td>Definition</td>
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<tr>
<td><strong>Maritime Rescue Co-ordination Centre (MRCC)</strong></td>
<td>A unit responsible for promoting efficient organisation of search and rescue services and for coordinating the conduct of search and rescue operations within a search and rescue region</td>
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<td><strong>Maritime Rescue Sub centre (MRSC) / Maritime Rescue Sub Centre (MRSSC)</strong></td>
<td>A unit subordinate to a rescue coordination centre/subcentre, established to complement the latter according to particular provisions of the responsible authorities</td>
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<tr>
<td><strong>MAYDAY</strong></td>
<td>The international radiotelephony distress signal, repeated three times.</td>
</tr>
<tr>
<td><strong>MEDEVAC</strong></td>
<td>Evacuation of a person for medical reasons.</td>
</tr>
<tr>
<td><strong>MEDICO</strong></td>
<td>Medical advice. Exchange of medical information and recommended treatment for sick or injured persons where treatment cannot be administered directly by prescribing medical personnel.</td>
</tr>
<tr>
<td><strong>Mission Control Centre (MCC)</strong></td>
<td>Part of the COSPAS-SARSAT system that accepts alert messages from the local user terminal(s) and other mission control centres to distribute to the appropriate rescue co-ordination centres or other search and rescue points of contact</td>
</tr>
<tr>
<td><strong>Narrow Band Direct Printing</strong></td>
<td>Automated telegraphy, as used by the NAVTEX system and telex-over-radio.</td>
</tr>
<tr>
<td><strong>NAVAREA</strong></td>
<td>One of 16 areas into which the world’s oceans are divided by the International Maritime Organization for dissemination of navigation and meteorological warnings.</td>
</tr>
<tr>
<td><strong>NAVTEX</strong></td>
<td>Telegraphy system for transmission of maritime safety information, navigation and meteorological warnings and urgent information to ships.</td>
</tr>
<tr>
<td><strong>On Scene</strong></td>
<td>The search area or the actual distress site.</td>
</tr>
<tr>
<td><strong>On Scene Coordinator (OSC)</strong></td>
<td>A person designated to co-ordinate search and rescue operations within a specified area</td>
</tr>
</tbody>
</table>
On Scene Endurance
The amount of time a facility may spend at the scene engaged in search and rescue.

Operations Stage
A period during a SAR incident when SAR facilities proceed to the scene, conduct search, rescue survivors, assist distressed craft, provide emergency care for survivors, and deliver survivors to a suitable facility.

Overdue
A situation where a craft has failed to arrive at its intended destination when expected and remains missing.

PAN-PAN
The international radiotelephony urgency signal. When repeated three times, indicates uncertainty or alert, followed by nature of urgency.

Personal Locator Beacon (PLB)
Personal radio distress beacon for alerting and transmitting homing signals.

Pilot in command
The pilot responsible for operation and safety of aircraft during flight time.

Planning Stage
A period during a SAR incident when an effective plan of operations is developed.

Position
A geographical location normally expressed in minutes of latitude and longitude.

Rescue
An operation to retrieve persons in distress, provide for their initial medical or other needs, and deliver them to a place of safety.

Safety Net
Communications service provided via INMARSAT for promulgation of maritime safety information, including shore-to-ship relays of distress alerts and communications for search and rescue coordination.

Search
An operation, normally coordinated by a rescue coordination centre or rescue sub-center, using available personnel and facilities to locate persons in distress.
<table>
<thead>
<tr>
<th><strong>Search Action Plan</strong></th>
<th>Message, normally developed by the SMC, for passing instructions to SAR facilities and agencies participating in a SAR mission.</th>
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<tr>
<td><strong>Search and Rescue Case</strong></td>
<td>Any potential or actual distress about which a facility opens a documentary tile, whether or not SAR resources are dispatched.</td>
</tr>
<tr>
<td><strong>Search and Rescue Coordinator</strong></td>
<td>One or more persons or agencies within an administration with overall responsibility for establishing and providing SAR services, and ensuring that planning for those services is properly coordinated</td>
</tr>
<tr>
<td><strong>Search and Rescue Data Providers</strong></td>
<td>A source for a rescue coordination centre to contact to obtain data to support search and rescue operations, including emergency information from communication equipment registration databases, ship reporting systems, and environmental data systems (e.g., weather or sea current).</td>
</tr>
<tr>
<td><strong>Search and Rescue facility</strong></td>
<td>Any mobile resource, including designated search and rescue units, used to conduct search and rescue operations.</td>
</tr>
<tr>
<td><strong>Search and Rescue incident</strong></td>
<td>Any situation requiring notification and alerting of the SAR system and which may require SAR operations.</td>
</tr>
<tr>
<td><strong>Search and Rescue Mission Coordinator (SMC)</strong></td>
<td>The official temporarily assigned to coordinate response to an actual or apparent distress situation.</td>
</tr>
<tr>
<td><strong>Search and Rescue Plan</strong></td>
<td>A general term used to describe documents which exist at all levels of the national and international search and rescue structure to describe goals, arrangements, and procedures which support the provision of search and rescue services</td>
</tr>
<tr>
<td><strong>SAR Point of Contact (SPOC)</strong></td>
<td>Rescue co-ordination centre and other established and recognized national points of contact which can accept responsibility to receive COSPAS-SARSAT alert data to enable the rescue of persons in distress</td>
</tr>
</tbody>
</table>

(xviii)
<table>
<thead>
<tr>
<th><strong>Search and Rescue Region (SRR)</strong></th>
<th>An area of defined dimensions, associated with rescue coordination centre within which search and rescue services are provided</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Search and Rescue Stage</strong></td>
<td>Typical steps in the orderly progression of SAR missions. These are normally Awareness, Initial Action, Planning, Operations, and Mission Conclusion</td>
</tr>
<tr>
<td><strong>Search and Rescue Unit (SRU)</strong></td>
<td>A unit composed of trained personnel and provided with equipment suitable for the expeditious conduct of search and rescue operations.</td>
</tr>
<tr>
<td><strong>Search Area</strong></td>
<td>The area, determined by the search planner, that is to be searched. This area may be sub-divided into search sub areas for the purpose of assigning specific responsibilities to the available search facilities</td>
</tr>
<tr>
<td><strong>Search Object</strong></td>
<td>A ship, aircraft, or other craft missing or in distress or survivors or related search objects or evidence for which search is conducted.</td>
</tr>
<tr>
<td><strong>Search Pattern</strong></td>
<td>A track line or procedure assigned to an SRU for searching a specified area.</td>
</tr>
<tr>
<td><strong>Situation Reports (SITREP)</strong></td>
<td>Reports from the OSC to the SMC or the SMC to interested agencies, to keep them informed of on scene conditions and mission progress.</td>
</tr>
<tr>
<td><strong>SURPIC (Surface Picture)</strong></td>
<td>A list or graphic display from a ship reporting system of information about vessels in the vicinity of a distress situation that may be called upon to render assistance.</td>
</tr>
<tr>
<td><strong>Sweep width (W)</strong></td>
<td>A measure of the effectiveness with which a particular sensor can detect a particular object under specific environmental conditions.</td>
</tr>
<tr>
<td><strong>Track spacing (S)</strong></td>
<td>The distance between adjacent parallel search tracks.</td>
</tr>
<tr>
<td><strong>Uncertainty Phase</strong></td>
<td>A situation wherein doubt exists as to the safety of an aircraft or a marine vessel, and of the persons on board.</td>
</tr>
</tbody>
</table>
CHAPTER 1

SCOPe AND PURPOSE
CHAPTER - 1

SEARCH AND RESCUE - SCOPE AND PURPOSE

1.1 Introduction

1.1.1 Every country recognizes the great importance of saving lives and property at sea and the need to be directly involved in rendering maritime search and rescue services to the persons in distress. With a focus on the humanitarian nature of the work, the search and rescue if planned well, will certainly help to prevent and cope with distress situations and facilitate coordination on actual contingency and distress situations. To work towards the same, the use of available resources within the service and also from other sources in the country will be essential to assist in saving lives and also in minimizing damage to the property in potential or actual distress.

1.1.2 The development of shipping industry all over the world has resulted in large scale merchant ship traffic between the seaports. A large volume of cargo, crude oil, edible oil, mineral ores, hazardous chemicals and explosives, freight containers and various other items are being transported by the ships across the oceans. This includes transportation of the cargo from and to the countries located in the Indian sub continent, Arabian and South East Asian countries as well as from the countries located in the West to the East and Far East through the Arabian Sea, Bay of Bengal and the Indian Ocean. Therefore, the sea area around India is subjected to many shipping lanes used by majority of the merchant ships. The distress alert can be activated by any of the vessels in the area and Search and Rescue facilities are to be provided at the earliest.

1.2 Aim

1.2.1 The aim of this manual is to assist those who are responsible for establishing, managing, supporting and conducting SAR operations to understand the following:-

(a) Functions and importance of SAR services.
(b) Components and support infrastructure essential for SAR.
(c) Training needed to co-ordinate, conduct and support SAR operations.
(d) Communications functions and requirements for SAR.
(e) Basic principles of managing and improving SAR services to ensure success.

1.3 Objectives

1.3.1 In order to provide expeditious and effective SAR services as per the National
Search and Rescue Plan as provided in Appendix ‘A’, the following objectives are to be considered:

(a) Provide SAR services to meet the domestic and international contingencies in Indian SRR.

(b) Support life saving provisions of International Conventions on Maritime Search and Rescue of IMO and convention on International Civil Aviation of ICAO and other International/Regional agreements to which India is a signatory.

(c) Provide overall plan for coordination of SAR operations, effective use of available resources, mutual assistance and efforts to improve such cooperation in Indian SRR.

(d) Utilise available resources for SAR contingencies into cooperative network for greater protection of life and property so as to ensure greater efficiency and economy.

(e) To achieve humanitarian, national and international SAR related obligations in Indian SRR by thorough coordination.

1.4 Benefits of SAR Services

1.4.1 Besides reduction of loss to life and suffering, by providing rescue services, the national SAR Coordinating Authority and the national SAR Board concern and involvement with SAR may offer other advantages, such as the following.

(a) A safer and more secure environment for aviation and maritime related industries, recreation, tourism, travel and overall economic development.

(b) Availability of SAR resources provides initial response and relief capabilities critical to save lives in distress.

(c) SAR provides an excellent means for promoting co-operation and communication among States and between organizations at local, national and international levels.

(d) The value of property, which can be saved in association with SAR activities, can be high and provide additional justification for SAR services.

(e) Well performed SAR operations can provide positive publicity on successful completion.

(f) The rescue of fishermen in distress by proactive measures and involving all SAR agencies improves the faith on SAR system and will result in better exploitation of marine resources.
CHAPTER 2

SAR SYSTEM COMPONENTS
2.1 SAR System

2.1.1 Search and Rescue (SAR) is the use of available resources to assist persons in potential or actual distress.

2.1.2 The SAR system is an arrangement of components activated, as needed, to efficiently and effectively assist persons in potential or actual Distress.

2.1.3 The above illustration of how the SAR system functions to enable distress alerting and SAR activities.
2.2 Components of SAR System

2.2.1 The SAR system has the following components:

(a) **Organization** - The division of SAR responsibility into geographic areas to provide centralized control, coordination, and effective use of all available SAR facilities, including SAR Coordinators (SCs), Rescue Coordination Centers (RCCs), Rescue Sub Centers (RSCs), SAR Mission Coordinators (SMCs), On Scene Commanders (OSCs) and Search and Rescue Units (SRUs).

(b) **Resources**. The personnel and equipment that undertake one or more stages of the SAR system.

(c) **Communications**. The media through which early detection, alerting, control, support and coordination are maintained throughout the SAR system.

(d) **Emergency Care**. Emergency medical treatment at the distress scene and life support enroute to a medical facility.

(e) **Documentation**. The collection and analysis of SAR case information.

2.3 SAR Mission Organisation

2.3.1 The SAR coordinator mandates SAR mission organization, assigning the responsibilities and inter-relationships of the SMC, OSC and SRUs for any mission.

2.3.2 The following figure shows the typical SAR mission Organisation.
2.4  SAR Coordinator

2.4.1 The SAR Coordinator (SC) is the top level SAR manager who has overall responsibility for establishing, staffing, equipping and managing SAR system with thorough coordination and using the available SAR resources. The SAR Coordinator is not normally involved in the conduct of the SAR operations. The SAR Coordinator should ensure that the MRCC/MRSC/MRSSC is familiar with the capabilities of all the facilities available for SAR in its SRR. Collectively, these facilities are the means by which the MRCC/MRSC/MRSSC conducts its operations. Some of these facilities will be immediately suitable for use. Others may have to be enhanced by changing organisational relationships or supplying extra equipment and training. If the facilities available in certain parts of Indian SRR cannot provide adequate assistance, arrangements should be made to provide additional facilities. The major duties of the SAR Coordinator include the following:-

(a) Identification of SRU/SAR resources that may be used within the area.
(b) Establishing close liaison and agreements with other services/agencies/organisations having SAR potential.
(c) Liaison with SAR authorities of neighbouring nations and ensure mutual cooperation and coordination.
(d) Preparation and distribution of current, comprehensive area SAR plans.
(e) Coordination of SAR resources within the region of responsibility and MRSC for the areas where MRCC cannot exercise direct and effective coordination.
(f) Conduct SAR, assign SMC and SRUs until assistance is no longer required or rescue has been affected.
(g) Coordination of SAR training and developing SAR policies.
(h) Suspend SAR cases when there is no longer reasonable chance of success and report results to parent operating command.
(j) Provide appropriate legal and funding support.

2.5  SAR Mission Coordinator

2.5.1 An SMC should be designated for each specific SAR operation. Every mission is conducted under guidance of SMC and for the duration of that particular mission. While the overall responsibility of the mission is with the SAR Coordinator (SC), the SMC plans, coordinates including transit of SAR facilities to the scene and controls SAR missions with the available resources for the time assigned till conclusion of each mission. The SMC must use good judgment to modify, combine or bypass SAR stages and adopt the
procedures to cope with unique, unusual or with the development of the ongoing SAR mission. SMC should use readily available facilities and request additional units when required during the operation.

2.5.2 The SAR operation may continue over a prolonged period of time. Therefore, the SMC remains in charge of a SAR operation until the rescue has been effected or until it has become apparent that further efforts would be of no avail. The MRCC plan of operations should give the SMC freedom to employ any facility, to request additional ones and to accept or reject any suggestions made during the operation.

2.5.3 The SMC should be thoroughly familiar with SAR plans and competently gather information about distress situation, develop accurate and workable action plan and dispatch SRUs for effective conduct of SAR mission. The guidelines for SMC duties include the following:

(a) Obtain evaluate and convey all data regarding person or unit in distress to OSC and SRUs.

(b) Ascertain type of emergency, equipment carried by the distressed / missing craft.

(c) Obtain and update prevailing environmental conditions.

(d) Ascertain movement and location of vessels in the area for alerting traffic in search area.

(e) Maintain radio watch on appropriate frequencies for enabling communication with SAR facilities and designate frequencies for on scene communication.

(f) Plot search area and decide methods / search facilities to be used.

(g) Develop search action plan, allocate search area, designate OSC and dispatch SAR facilities.

(h) Coordinate operations with adjacent MRCC when appropriate

(j) Arrange briefing/debriefing of personnel involved in SAR mission.

(k) Evaluate reports and modify search action plan as necessary.

(l) Arrange logistics/supplies including accommodation for personnel and fuelling for aircraft.

(m) SMC to inform progress of all proceedings to SAR Co-ordinator and respective administrative authority.
(n) Recommend/decide on abandoning/suspension of search.
(p) Release SAR facilities when no longer required.
(q) Notify accident investigation authorities and parent organisation regarding the incident.
(r) Prepare final report on results of the operation.
(s) Intimate search result to next of kin of person in distress.
(t) Press management

2.6 On Scene Coordinator

2.6.1 The On Scene Coordinator (OSC) is designated by the SMC when two or more SAR units are working together on the same mission to enable better coordination of the activities amongst the participating units on the scene. The OSC may be the person in charge of the SRU, ship or aircraft participating in the search or someone at another nearby facility capable of handling OSC duties. However, if an OSC is not designated, the first SRU to arrive at the scene will normally assume the functions of OSC to advice SMC, until the SMC directs the unit/person to be relieved by another. The OSC retains responsibilities from the time of designation until relieved or mission is completed. An OSC need not be a SRU. An advance-staging base with all facilities may also serve as an OSC to relieve SRU of that burden.

2.6.2 The OSC should be most eligible unit for conduct of SAR mission considering the proficiency in coordination of SAR capability, communications facilities and the endurance. Frequent changes of OSC should be avoided to enable continuous and proper coordination on scene. To provide continuity of command, any SRU arriving on scene who is senior to the OSC should not normally assume command unless ordered to do so by the SMC. The duties of OSC include the following:-

(a) Assume operational authority of SMC coordinate operations and control of all SAR facilities on scene.
(b) Ensure adequate manning and equipment for the SAR mission.
(c) Receive and familiarise search action plan from SMC.
(d) Modify search plan based on prevailing environmental conditions.
(e) Consult and advise SMC regarding any changes to the plan.
(f) Provide relevant information to other SRUs on scene.
(g) Advise SMC for relieving any SRU on scene and request for dispatch &
suitable relief to maintain OSC resources.

(h) Implement search action plan promulgated by SMC.

(j) Monitor performance of other units participating in the search.

(k) Coordinate safety of flight for SAR aircraft.

(l) Develop and implement rescue plan if required.

(m) Consolidate reports obtained from other SRUs and dispatch to SMC.

2.7 Aircraft Coordinator (ACO)

2.7.1. The SMC shall designate an area for aerial search with height of the airspace required and intimate the same to the relevant FIC for promulgation. He shall intimate the same to the OSC as well as the ACO for safe flying. When two or more SAR facilities including aircraft are working together on the same mission, SMC designates one unit as Aircraft Coordinator (ACO) for coordinating air traffic, in addition to the OSC. Preferably, OSC and ACO should be different units. If it is not practicable, then OSC itself acts as ACO. The OSC may designate this responsibility to another unit also, with SMC concurrence. ACO is responsible to SMC and coordinates closely with OSC. However, the overall charge remains with SMC/OSC. The primary concern of ACO is the flight safety of SAR aircraft.

2.7.2 The ACO may be a fixed wing aircraft, helicopter, ship or a fixed structure such as an offshore platform/appropriate shore based unit. The SMC is to consider the availability of the radio, radar equipment, trained personnel and capabilities of the facilities involved before delegating the responsibility to ACO. The duties of ACO are as follows:-

(a) Maintain flight safety.

(b) Maintain safe horizontal and vertical separation between the aircraft in the area and transit.

(c) Ensure common pressure settings on altimeters.

(d) Determine aircraft entry and departure points, altitudes.

(e) Ensure frequency used is in accordance with the COMPLAN.

(f) Coordinate communications and ensure minimum radio traffic between other SRUs and aircraft.

(g) Coordinate with adjacent airfields / ATS / Area Control.

(h) Advise SMC/OSC on the weather implications on scene.
(j) Prioritize / allocate task and direct the aircraft as per SAR plan.
(k) Monitor and report SMC/OSC on search area coverage.
(l) Identify emerging task on scene and direct aircraft accordingly.
(m) Coordinate and supervise effectiveness of search with respect to changing factors on scene.
(n) Coordinate aircraft refuelling.
(p) Render SITREPS of SAR aircraft to SMC/OSC.

2.8 Search and Rescue Units

2.8.1 The Search and Rescue Units (SRUs) are used as a resource for performing search, rescue or similar operations. It may have SAR as primary duty or it may be available for SAR mission made available by the parent agency not having primary SAR duty. It is composed of trained personnel proficient in SAR skills and equipment suitable for the expeditious and efficient conduct of the operation. The unit can be an aircraft or a ship. Normally SRUs having SAR as primary duty are used first. In Indian context, the Indian Coast Guard assets are used as the primary SRUs.

2.8.2 The identified SRUs of the resource agencies must have rapid and reliable means of communication with OSC / SMC and the distressed persons. The SRU must have supplies and survival equipment adapted to the manner of delivery and in waterproof, buoyant and strong containers with label & self explanatory symbols. They are also to have at disposal maps, charts and plotting equipment and information relevant to area in which it is likely to operate.

2.8.3. If the SRUs is alone on the scene, it performs the OSC duties and keeps SMC advised. Facilities selected as SRUs should be able to reach the scene of distress quickly and in particular be suitable for one or more of the following operations:-

(a) Provide assistance to prevent or reduce the severity of the accident and hardship of the survivor.
(b) Conduct the search in the area designated as per the SAR action plans and reports to the OSC the area searched.
(c) Advise OSC on sighting of survivors with position and current environmental conditions.
(d) Signal to survivors and keep them in sight and effect rescue if within capabilities. If rescue is not possible, advise OSC on accurate position of the survivor and depart area.
(e) Deliver supplies and survival equipment to the scene.

(f) Rescue of Survivors.

(g) Provide food, medical or other initial needs of survivors.

(h) Transfer survivor to place of safety.

(j) Advice OSC on sighting of wreckage, debris, life boat/rafts, oil slick, dye marker, flare, smoke or any other unusual object facilitating further in the SAR operations.

(k) Advise OSC on interception of any radio, radar or emergency signal with position and time whenever possible.
CHAPTER 3

National Maritime SAR Organisation
CHAPTER - 3

NATIONAL MARITIME SAR ORGANISATION

3.1 International Conventions and Treaties on SAR

3.1.1 India is signatory to a number of International Conventions that oblige it to provide search and rescue services. The Conventions are:

*International Convention for the Safety of Life at Sea 1974 (SOLAS), which requires signatories to:*

“...Ensure that any arrangements are made for coast watching and for the rescue of persons in distress at sea around its coasts. These arrangements should include the establishment, operation and maintenance of such maritime safety facilities as deemed practicable and necessary having regard to the density of the seagoing traffic and the navigational dangers, and should, so far as possible, afford adequate means of locating and rescuing such persons”.

*The International Convention on Maritime Search and Rescue 1979, which requires signatories to:*

“...Participate in the development of search and rescue services to ensure that assistance is rendered to any person in distress at sea”.


“Every coastal state shall promote the establishment, operation and maintenance of an adequate and effective search and rescue service regarding safety on and over the sea and, where circumstances so require, by way of mutual regional arrangements co-operate with neighboring States for this purpose”.

3.2 Indian Coast Guard and SAR Responsibilities

3.2.1 Indian Coast Guard is an Armed Force of the Indian Union and has been entrusted with the duties of providing search and rescue assistance to mariners and protection to fishermen including assistance to them at sea while in distress and safety of life and property at sea vide section 14(2) (b) and 14 (2) (t) respectively of Coast Guard Act 1978.
3.2.2 Related to SAR, the Coast Guard charter of duties includes:

(a) Providing protection to fishermen including assistance to them at sea when in distress.

(b) Safety of life and property at sea

(c) Search and Rescue at sea

(d) Enforcement of Maritime laws at Sea.

3.3 SAR Definition

3.3.1 Search and Rescue comprises, the search for, and the provision of aid to, persons, ships or other craft, which are, or are feared to be, in distress or imminent danger. The Indian Coast Guard is responsible for coordinating Search and Rescue in the Indian Maritime Search and Rescue Region. With a focus on the humanitarian nature of work, the Indian Coast Guard cooperates with other agencies to develop and sponsor vital standards and recommendations to provide all types of assistance to the maritime distress situation and coordination on a daily basis.

3.4 Maritime Search and Rescue - CG Mission

3.4.1 The mission of the Indian Coast Guard Maritime Search and Rescue (SAR) Programme is “to save and protect lives in the maritime environment of the Indian Search and Rescue Region”.

3.4.2 To fulfill the mission, the Coast Guard objectives are to:

(a) Make all efforts to ensure maximum saving of life.

(b) Minimize the loss of life, injury, property damage and risk to the environment.

(c) Maintain highest professional standards.

(d) Provide national leadership and effective SAR Program Management.

(e) Provide international SAR leadership.

(f) Maximize SAR system efficiency through innovation.

(g) Increase awareness of SAR Program.

(h) Foster co-operative SAR agreements.

(j) Provide humanitarian aid and civil assistance wherever possible.
(k) Detailed contingency planning.
(l) Identification, training and review of resources.
(m) Improve communication capabilities.
(n) Reduce reaction time of ICG resources by appropriate basing, equipping and staffing.
(p) Review and improve SAR coordination through interaction with resource agencies.
(q) Encourage INDSAR for the purpose of M-SAR.

3.4.3 These objectives will help to provide an effective SAR service for all those at risk in the marine environment in India.

3.5 National SAR Board

3.5.1. To coordinate national SAR objectives in accordance to the provisions of the international conventions, The National Search and Rescue Board was constituted with following composition vide Ministry of Shipping, GOI, resolution number SW- MIC/27/77/MD/AG dated 28 Jan 2002 with the Director General Coast Guard as the National Maritime Search and Rescue Coordinating Authority (NMSARCA). This board was formed subsequent to India’s accession to SAR 79 Convention in May 2002. The formed subsequent to India’s accession to Convention in May 2002. The Constitution of the national SAR Board is as follows:

<table>
<thead>
<tr>
<th>(a)</th>
<th>Director General of Coast Guard</th>
<th>Chairman</th>
</tr>
</thead>
<tbody>
<tr>
<td>(b)</td>
<td>Representative of DG (Shipping)</td>
<td>Member</td>
</tr>
<tr>
<td>(c)</td>
<td>Representative of Indian Navy</td>
<td>Member</td>
</tr>
<tr>
<td>(d)</td>
<td>Representative of Indian Air Force</td>
<td>Member</td>
</tr>
<tr>
<td>(e)</td>
<td>Chief Hydrographer, Government of India</td>
<td>Member</td>
</tr>
<tr>
<td>(f)</td>
<td>Representative of Airports Authority of India</td>
<td>Member</td>
</tr>
<tr>
<td>(g)</td>
<td>Representative of Department of Telecommunication</td>
<td>Member</td>
</tr>
<tr>
<td>(h)</td>
<td>Representative of Department of Space</td>
<td>Member</td>
</tr>
<tr>
<td>(j)</td>
<td>Representative of Central Board of Customs and Excise</td>
<td>Member</td>
</tr>
<tr>
<td>(k)</td>
<td>Representative of Meteorological Department</td>
<td>Member</td>
</tr>
<tr>
<td>(l)</td>
<td>Representative of Major Ports (To be nominated by Ministry of Shipping)</td>
<td>Member</td>
</tr>
<tr>
<td>(m)</td>
<td>Representative of Shipping industry (To be nominated by Ministry of Shipping)</td>
<td>Member</td>
</tr>
<tr>
<td>(n)</td>
<td>Representative of three Coastal States (On rotational basis-every two years in alphabetical order)</td>
<td>Member</td>
</tr>
<tr>
<td>(p)</td>
<td>Representative of fishing community (To be nominated by Ministry of Agriculture and Department of Animal Husbandry and Dairy)</td>
<td>Member</td>
</tr>
<tr>
<td>(q)</td>
<td>Representative of Sailing Vessels Operators (To be nominated by Ministry of Shipping)</td>
<td>Member</td>
</tr>
<tr>
<td>(r)</td>
<td>Representative of Directorate of Civil Aviation (Nominated by Ministry of Shipping)</td>
<td>Member</td>
</tr>
<tr>
<td>(s)</td>
<td>Representative of Immigration (Nominated by Ministry of Shipping)</td>
<td>Member</td>
</tr>
</tbody>
</table>

### 3.6 Terms and Reference of National SAR Board

#### 3.6.1 The terms and reference of National SAR Board are as follows.

(a) Formulation and promulgation of National SAR plan including its review and updating.

(b) Define functions to perform by participating agencies.

(c) Coordinate measures to be adapted by participating agencies and formulation of contingency plan.

(d) Attending to matters relating to SAR as per IMO requirements in consultation with Ministry of Shipping.
3.7 Resource Agencies

3.7.1 In addition to the resources available with National SAR Coordinator, ships/aircraft/crafts/shore based facilities with following agencies be requisitioned for carrying out SAR operations. These resources can be requisitioned by the SAR coordinator.

| (a) | Indian Navy |
| (b) | Indian Air Force |
| (c) | Port Authorities |
| (d) | Shipping Corporation of India |
| (e) | Director General Civil Aviation. |
| (t) | States/Central Fisheries Authorities. |
| (g) | States/Central Customs Authorities. |
| (h) | Merchant Ships operating close to position of distress. |
| (J) | Civil Authorities. |
| (k) | Indian Meteorological Department. |
| (l) | INMCC, Bangalore |
| (m) | Department of Telecommunications. |
| (n) | DG (Shipping) |
| (p) | NIOT |

3.8 Responsibilities of Resource Agencies

3.8.1 The ships/aircraft/crafts/shore based facilities of the resource agencies are to assist and facilitate the coordinating MRCC and MRSC in accordance to the provisions of the National SAR Plan and National SAR manual. The agencies are to provide resources at the disposal of SAR Coordinator till completion of SAR operation or on confirmation by the SAR Coordinator that requirement no longer exists.

3.9 Point of Contact of SAR Board Members

3.9.1 The points of contacts of the resource agencies and SAR Board members for SAR requirements are placed at Appendix “B” and Appendix “C” respectively.
3.10 National Search and Rescue Plan

3.10.1 The Search and Rescue system in the Indian Search and Rescue Region is implemented by the National Search and Rescue Plan to enable greater protection to life and ensure efficient and effective SAR response to any distress situation occurring in the Indian SRR. The purpose of this plan is also to facilitate the development of international integrated and coordinated maritime SAR plan within Indian SRR. The National Maritime Search and Rescue Plan provides the general guidelines for the inter agency cooperation. This manual supplements the National SAR Plan by drawing the provisions of IAMSAR manuals to effectively conduct SAR missions and for the activation of the components in stages as needed. The SAR Plan is placed at Appendix “A”.

3.11 National SAR Manual

3.11.1 Every endeavour has been made to ensure that the application of the National Search and Rescue manual in Indian SRR does not conflict with the SAR responsibilities agreed to the Conventions on International Maritime Organisation pertaining to maritime Search and Rescue and the Conventions on International Civil Aviation Organisation (ICAO) or any other International Agency. This manual is intended to provide guidelines and instructions to all participating agencies/units for effective conduct of SAR operations.

3.11.2 Also, no provision of National SAR manual and any other supporting plan is to be construed so as to contravene responsibilities and the authorities of any participant as defined by the guidelines or executive orders or international agreements or of established responsibilities of other agencies and organisation which assist persons and property in distress resulting from any incident.

3.12 Search and Rescue Regions

3.12.1 An SRR is an area of defined dimensions associated with an MRCC within which SAR services are provided. The Regional Air Navigation Plans (RANPs) promulgated by ICAO depict aeronautical SRRs and global SAR Plan promulgated by IMO, delineates maritime SRR. The countries have agreed to accept SAR responsibility for an area, which is composed of one or more aeronautical SRRs. Any SAR facility within the SRR should respond to all distress situations whenever and wherever it is capable of doing so.

3.12.2 The purpose of establishing an SRR is to clearly define who has primary responsibility for coordinating responses to distress situations in every area of the world and to enable rapid distribution of distress alerts to the proper MRCC. It is also to ensure SAR services are provided at the earliest for the geographic area assumed by that country.

3.12.3 The maritime SRR is generally harmonised with aeronautical SRR in most areas, which therefore minimises confusion over which authority is to be alerted when a distress situation arises at and over a specific geographic position.
3.13 Indian SRR and SAR Organisation

3.13.1 On accession to the International Convention on Maritime Search and Rescue 1979, Indian Government has assumed the responsibility of providing SAR cover in Indian SRR with Director General Indian Coast Guard designated as National Maritime SAR Coordinating Authority (NMSARCA). Three geographic areas/regions are established in Indian SRR for coordinating responses to both maritime and aviation related distress incidents. The SRR (West) covers the SAR operations in Western Seaboard. The SRR (East) covers Bay of Bengal including portions of Palk Bay and Gulf of Mannar. The SRR (A&N) covers the area adjacent to Andaman and Nicobar Islands.

3.13.2 There are three Maritime Rescue Coordination Centres (MRCCs) defined in INSRR. The MRCC located at Mumbai covers the entire western seaboard of Indian SRR. The eastern seaboard is covered by MRCCs located at Chennai and Port Blair.

3.14 Maritime Rescue Coordination Centre in ISRR

3.14.1 The Maritime Rescue Coordination Centre (MRCC) is an operational facility responsible for promoting efficient organisation of SAR services, and for coordinating the conduct of SAR operation within the SRR. The MRCC only coordinates and does not necessarily provide SAR facilities in the applicable SRR. Aeronautical SAR responsibility is to be met by Airports Authority of India and the Aeronautical SAR coordination is performed from aeronautical RCC.
3.14.2 There are three Maritime Rescue Coordination Centres (MRCCs) defined in ISRR. The MRCC located at Mumbai covers the entire western seaboard of Indian SRR. The eastern seaboard is covered by MRCCs located at Chennai and Port Blair). The coordinates of the Indian SRRs associated with the respective MRCCs are as follows.

(a) **MRCC Mumbai.** The Indian SRR (West) area covered by the MRCC Mumbai is defined by the line joining the following coordinates and IBL:

| (i) | 21 00 N 068 15 E | (ii) | 12 00 N 063 00 E |
| (iii) | 12 00 N 060 00 E | (iv) | 06 00 S 060 00 E |
| (v) | 06 00 S 068 00 E | (vi) | 00 00 S 068 00 E |
| (vii) | 08 00 N 073 00 E | (viii) | 06 10 N 077 20 E |
| (ix) | 08 08 N 077 20 E | |

(b) **MRCC Chennai.** The Indian SRR (East) area covered by the MRCC Chennai is defined by the line joining the following coordinates and IBL:

| (i) | 08 08 N 077 20 E | (ii) | 06 10 N 077 20 E |
| (iii) | 06 00 N 078 00 E | (iv) | 10 00 N 080 00 E |
| (v) | 10 00 N 082 00 E | (vi) | 07 15 N 088 30 E |
| (vii) | 15 20 N 088 30 E | (viii) | Coastal border between India and Bangladesh |

(c) **MRCC Port Blair.** The Indian SRR (A&N) area covered by the MRCC Port Blair is defined by the line joining the following coordinates and IBL:

| (i) | Coastal border between India and Bangladesh | (ii) | 15 20 N 088 30 E |
| (iii) | 07 15 N 088 30 E | (iv) | 06 00 N 092 00 E |
| (v) | 06 00 N 097 32 E | (vi) | Northwards of position of serial (v) given above and covering the areas outside limits of the designated areas of other littoral countries |
3.15 Maritime Rescue Sub Centre (MRSC) and Maritime Rescue Sub Sub Centre (MRSSC) in ISRR.

3.15.1 In order to enable MRCCs exercise direct and effective control over SAR facilities in an area within its SRR, Maritime Rescue Sub Centres (MRSC) and Maritime Rescue Sub Sub Centres (MRSSC) are established. This is so done wherein communication facilities in a portion of SRR are not adequate for closer coordination between MRCC and SAR facilities or where local control of SAR operations will be more effective.

3.15.2 In the Indian SRR, ten Maritime Rescue Sub Centres (MRSC) have been activated. These are co-located with District Headquarters of Indian Coast Guard for carrying out the duties within their geographical regions. The respective areas of the Maritime Rescue Sub Centre (MRSC) and their location are as follows.

<table>
<thead>
<tr>
<th>Sl</th>
<th>Area</th>
<th>MRSC</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>Gujarat</td>
<td>Porbandar</td>
</tr>
<tr>
<td>(b)</td>
<td>Karnataka</td>
<td>New Mangalore</td>
</tr>
<tr>
<td>(c)</td>
<td>Kerala &amp; Lakshadweep Islands</td>
<td>Kochi</td>
</tr>
<tr>
<td>(d)</td>
<td>Tamil Nadu (Gulf of Mannar)</td>
<td>Tuticorin</td>
</tr>
<tr>
<td>(e)</td>
<td>Andhra Pradesh</td>
<td>Vishakapatnam</td>
</tr>
<tr>
<td>(f)</td>
<td>Orissa</td>
<td>Paradeep</td>
</tr>
<tr>
<td>(g)</td>
<td>West Bengal</td>
<td>Haldia</td>
</tr>
<tr>
<td>(h)</td>
<td>Andaman Islands</td>
<td>Diglipur</td>
</tr>
<tr>
<td>(j)</td>
<td>Nicobar Islands</td>
<td>Campbell Bay</td>
</tr>
<tr>
<td>(k)</td>
<td>Goa</td>
<td>Marmagao</td>
</tr>
</tbody>
</table>

3.15.3 The MRSSCs are located at following places.

<table>
<thead>
<tr>
<th>Sl</th>
<th>Area</th>
<th>MRSSC</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>Gulf of Kutchh</td>
<td>Okha and Vadinar</td>
</tr>
<tr>
<td>(b)</td>
<td>Palk Bay</td>
<td>Mandapam</td>
</tr>
</tbody>
</table>
3.16 Facilities and Equipment

3.16.1 The MRCC/MRSC/MRSSC is located where they can effectively perform their functions within their SRR. In addition, the MRCC/MRSC/MRSSC has the communications facilities and general office equipment, desks, plotting space, charts for performance of SAR tasks.

(a) **Communications.** Communication needs are met by fixed communication networks, GMDSS equipment, ATS channels, Digital Selective Calling (DSC) and through INMARSAT earth station.

(b) **SAR Distress Telephone Number.** A toll free SAR distress telephone number 1554 is installed at all MRCCs and MRSCs and the number is widely publicized to the fishermen and seamen community.

(c) **Information.** Ready access to operational information is available at all MRCC and MRSC to help the SMC take immediate and appropriate action in an emergency. Much of this information is derived from the National SAR Manual, MRCC plan for operations and SAR databases. The SRR chart and the local maps showing areas adjacent to the SRR are available at MRCC and MRSCs.

(d) **Publications and Supplies.** The following publications and supplies are available at the MRCC

   (i) SAR publications of ICAO, IMO, and the National SAR Manual.
   (ii) Air Navigation Regulations and Notices to Mariners
   (iii) Communications publications.
   (iv) ITU publications.
   (v) Index and names, addresses, telephone, facsimile numbers and e-mail addresses of all resource agencies and other important authorities.
   (vi) Relevant check lists and forms.

3.17 Staffing

3.17.1 MRCCs perform administrative and operational duties. Administrative duties are concerned with maintaining the MRCC in a continuous state of preparedness. The Officer-in-charge MRCC carries out the duties of the MRCC Chief. The operational duties are concerned with the efficient conduct of a SAR operation or exercise and are thus of a temporary character. They are the responsibility of the SMC and are functions, which may be performed by the MRCC chief or by other trained staff of the MRCC. It may include temporary personnel from the other military services also, for facilitating the coordination of specific incidents, if need arises. The MRCC is prepared to undertake and continue operational duties through out twenty four hours of the day.
1. **MRCC/MRSC Chief.** The MRCC/MRSC Chief is the senior most Officer in the MRCC/MRSC organisation. He makes appropriate preparations, plans and arrangements as well as oversee & the daily operations of the MRCC, to ensure that when an incident occurs the SAR operation can be promptly performed.

2. **MRCC / MRSC Staff.** The MRCC/ MRSC staff consists of personnel who are capable of planning and coordinating SAR operations. They mainly include GMDSS operator, communicator and plotter.

3. **Adjacent SRRs**

3.18 The SRR of neighboring countries namely Pakistan, Maldives, Sri Lanka, Seychelles, Mauritius, Indonesia, Malaysia, Myanmar and Bangladesh share the boundary with Indian SRR. These SRRs are established in cooperation with the neighboring nations which are internationally recognised and described in the pertinent documents of IMO and Admiralty List of Radio Signals (ALRS) Vol. 5. The coordinating authorities of the respective SRRs along with contact details are as follows.

   (a) **Pakistan SRR**

   Ports and Shipping wing of Ministry of Communications is responsible for coordinating search and rescue operations. MRCC (Pakistan Maritime Security Agency) is located at Karachi. The ICG and PMSA have established MoU for coordination and conduct of Maritime Search and Rescue operations as per international Maritime Organisation Conventions /treaties/ instructions in vogue.

   - Telephone : 00 92 2199214624, 00 92 2199214964
   - Mobile : 03204305194
   - Telex : 008227040 MRSEC PK, 27692 MRSCC PK
   - Fax : 00 92 2199214625, 00 92 2199214621
   - E-mail : mrccpmsa@cyber.net.pk

   (b) **Maldives SRR.** Maldives Coast Guard is the national SAR agency. MRCC is located at Male.

   - Telephone : 00 960 3325981, 3338898
   - Telex : 00 896 66056 AMAN MF
   - Fax : 00 960 3310054
   - E-mail : maldivescoastguard@defence.gov.mv
(c) **Sri Lanka SRR.** SAR operations are coordinated with Sri Lankan Navy, Air Force and Port authorities under Deputy Director Merchant Shipping. MRCC is located at Colombo.

   Telephone : 00 94 11 2421151  
   Telex : 00 803 23277 CLORDO CE  
   Fax : 00 94 11 2441454  
   E-mail : nhqdno@navy.lk

(d) **Seychelles SRR.** Port and Marine Services Department and Seychelles Coast Guard coordinate the SAR operations. The MRCC is located at Mahe.

   Telephone : 00 248 224411, 224616  
   Telex : 00 965 2316 SEYCS SZ  
   Fax : 00 248 224665, 323288  
   E-mail : seycoast@seychelles.net

(e) **Mauritius SRR.** SAR operations in the SRR are coordinated by National Coast Guard. MRCC is located at Port Louis.

   Telephone : 00 230 2088317, 2083935  
   Telex : 00 9664896  
   Fax : 00 230 2122757  
   E-mail : 

(f) **Indonesia SRR.** Baden SAR national is the national SAR agency.

   Telephone : 00 62 21 5501512  
   Telex : 0044025 SARNAS IA  
   Fax : 00 62 21 5501513  
   E-mail : basarnas@basarnas.go.id
(g) **Malaysian SRR.** Marine Department Malaysia is responsible for SAR operations in their SRR. MRCC Malaysia is located at Port Klang.

- Telephone : 00 60 0389413140
- Telex : 00 8439748 LAUT MA
- Fax : 00 60 0389413129
- E-mail : mrccputrazaya@mmea.gov.my

(h) **Myanmar SRR.** Myanmar Air Force, Navy and Dept. of Civil Aviation and Marine Administration coordinate SAR operation. MRCC is located at Rangoon.

- Telephone : 00 84 437 333664
- Telex : 00 831 21201 TELEBOX
- Fax : 00 84 437 333845
- E-mail : vmrcc@fpt.vn

(j) **Bangladesh SRR.** The Department of Shipping is responsible for coordinating SAR operations. MRCC Bangladesh is located at Dhaka.

- Telephone : 00 880 29555128, 29553584
- Fax : 00 880 27168363
CHAPTER 4

MARITIME SAR COMMUNICATION
CHAPTER - 4

MARITIME SAR COMMUNICATION

4.1 SAR Communication

4.1.1 The communication consists of a sender passing information to a receiver by various means. The SAR communication is the most important and often the weakest link in the SAR system. The SAR communications occur between the distressed unit/survivor and SAR system and also the components and facilities of the SAR system. It is very vital to ensure that the message received is treated crucial so as to enable the successful accomplishment of the SAR system. Therefore, it is of paramount importance to provide the essential communications elements to receive distress alerts and enable further communication, as required. The necessary communication for SAR system includes telephones, radios operating on international distress frequencies, long range terrestrial and satellite systems and other equipment depending upon the capabilities of the facilities and the factors affecting the ability of persons to contact each other.

4.2 GMDSS Sea Areas

4.2.1 The GMDSS is based on the concept of using marine communication sea areas to determine the operational, maintenance and personnel requirements of maritime radio communications. The four sea areas are described as follows.

(a) Sea Area A1. Within the radiotelephone coverage of at least one VHF coast station in which continuous DSC alerting is available. Such an area could extend typically 30 -50 nautical miles from the coast station.

(b) Sea Area A2. An Area, excluding sea area A1, within the radiotelephone coverage of at least one MF coast station in which continuous DSC alerting is available. For planning purposes this area typically extends to up to 150 nm offshore, but would exclude any A1 designated areas. In practice, satisfactory coverage may often be achieved out to around 250 nautical miles offshore.

(c) Sea Area A3. An area, excluding sea areas A1 and A2, within the coverage of an INMARSAT geo stationary satellite in which continuous alerting is available. This area lies between about latitude 70° North and South, but excludes A1 and A2 designated areas.

(d) Sea Area A4. An area outside sea areas A1, A2 and A3. This is essentially the Polar Regions, North and South of about 70 deg of latitude, but excludes any other areas.
4.3 **MRCC and MRSC Radio Requirements**

4.3.1 MRCC and MRSC are to be provided with GMDSS compliant communications equipment so as to satisfy following functional requirements.

(a) Receive ship to shore distress alert by at least two independent means.
(b) Relay shore to ship distress alert.
(c) Transmitting and receiving SAR coordinating communication.
(d) Transmitting and receiving On Scene communication.
(e) Transmitting MSI.
(f) Transmitting and receiving general radio communications.

4.3.2 The carriage requirement of MRCC and MRSC in order to satisfy above functional requirements are as listed below.

<table>
<thead>
<tr>
<th>(a)</th>
<th>VHF, MF and HF RT</th>
</tr>
</thead>
<tbody>
<tr>
<td>(b)</td>
<td>VHF, MF and HF DSC.</td>
</tr>
<tr>
<td>(c)</td>
<td>MF or HF radio telex.</td>
</tr>
<tr>
<td>(d)</td>
<td>HF NBDP.</td>
</tr>
<tr>
<td>(e)</td>
<td>EGC receiver.</td>
</tr>
<tr>
<td>(f)</td>
<td>INMARSAT terminal (A, B or C).</td>
</tr>
<tr>
<td>(g)</td>
<td>AFTN.</td>
</tr>
</tbody>
</table>

4.4 **Vessels/Ships Radio Requirement**

4.4.1 The following radio equipments are to be essentially carried onboard all sea going ships for GMDSS compliance.

(a) VHF radio installations capable to transmit / receive DSC distress alerts on Channel 70 and Radio telephony on Channel 06, 13, 16.

(b) VHF radio installations to maintain continuous DSC watch on CH 70 (Note: (a) and (b) can be combined together).

(c) SART 9 GHz Minimum two

(d) NAVTEX receiver
(e) In area with no NAVTEX, either an INMARSAT EGC receiver facility or HFNBDP receiver (if service is provided).

(f) EPIRB transmits distress alerts either on 406 MHz or through INMARSAT geo-stationary satellite services (when operating in INMARSAT coverage area).

(g) VHF (waterproof) walkie-talkies as per the ships gross tonnage.
   - Ships 300-500 gross tons : Minimum two
   - Ships over 500 gross tons : Minimum three

4.4.2. In addition ships are to carry following equipment when operating in various GMDSS Sea Areas.

(a) **Sea Area A1**
   
   (i) Means to transmit ship-to-shore distress alerts either on VHF DSC or EPIRB, on 406 MHz or MF DSC (if near CRS using MF DSC).
   
   (ii) VHF radio capable to transmit and receive general radio telecommunications using radiotelephony.
   
   (iii) An EPIRB on VHF DSC, Ch 70 with SART 9 GHz attached in lieu of EPIRB, which transmit distress alerts either on 406 MHz or through INMARSAT.

(b) **Sea Area A1 and A2**.
   
   (i) MF/HF radio installation able to transmit/receive, for distress and safety purposes on 2187.5 KHz using DSC and 2182 KHz using radiotelephony.
   
   (ii) Radio installations to maintain continuous DSC watch on 2187.5 KHz. (Note: (i) and (ii) can be combined together)
   
   (iii) Means to transmit ship-to-shore distress alerts either on EPIRB, on 406 MHz or HF using DSC or an INMARSAT SES or the INMARSAT EPIRB.
   
   (iv) Transmit/receive general radio communication, either on radio communications in bands between 1605 KHz and 4000 KHz or between 4000 KHz and 27000 KHz or through an INMARSAT SES.

(c) **Sea Area At A2 and A3**.
   
   (i) An INMARSAT SES able to transmit/receive distress and safety communications, distress priority calls, general radio communications and maintains shore-to-ship watch for distress alerts.
(ii) MF radio installations able to transmit/receive for distress and safety purposes on 2187.5 KHz using DSC and 2182 KHz using radiotelephony.

(iii) Radio installations to maintain continuous DSC watch on 2187.5 KHz. (Note: (ii) and (iii) can be combined together).

(iv) Means to transmit ship-to-shore distress alerts either on EPIRB on 406 MHz or HF using DSC or an additional INMARSAT SES or the INMARSAT EPIRB.

(OR)

(i) MF/HF radio installations able to transmit/receive, for distress and safety purposes. On all distress and safety frequencies in bands between 1605 KHz and 4000 KHz or between 4000 KHz and 27000 KHz using DSC, radiotelephony and NBDP.

(ii) Radio installations to maintain DSC watch on 2187.5 KHz and 8414.5 KHz and on at least one of 4207.5 KHz, 6312 KHz, 12577 KHz or 16804.5 KHz. (Note: (i) and (ii) can be combined together).

(iii) Means to transmit ship-to-shore distress alerts either on EPIRB, on 406 MHz.

(iv) Transmit/receive general radio communications, on MF/HF in bands between 1605 KHz and 4000 KHz and between 4000 KHz and 27000 KHz, using radiotelephony or NBDP. [Note: (i) and (ii) can be added to (iv)]

(d) Sea Areas A2, A3 and A4.

(i) MF/HF radio installations able to transmit/receive, for distress and safety purposes. On all distress and safety frequencies in bands between 1605 KHz and 4000 KHz or between 4000 KHz and 27000 KHz using DSC, radiotelephony and NBDP.

(ii) Radio installations to maintain DSC watch on 2187.5 KHz and 8414.5 KHz and on at least one of 4207.5 KHz, 6312 KHz, 12577 KHz or 16804.5 KHz. (Note: (i) and (ii) can be combined together).

(iii) Means to transmit ship-to-shore distress alerts either on EPIRB, on 406 MHz.

(iv) Transmit/receive general radio communications, on MF/HF in bands between 1605 KHz and 4000 KHz and between 4000 KHz and 27000 KHz, using radiotelephony or NBDP. [Note: (i) and (ii) can be added to (iv)]
4.5 Distress Alerting

4.5.1 The distress alerts may arrive at MRCCs from a variety of equipment sources and via a variety of alerting posts which includes Coast Radio Stations (CRS), Local User Terminals (LUTs) and Mission Control Centres (MCCs) of the COSPAS-SARSAT System, Land Earth Stations (LESs) of the INMARSAT System, Air Traffic Services (ATS) units, Police and Fire departments and vessels, aircraft or other persons or facilities which may receive and relay such alerts. Alerting posts are any intermediary facilities, which relay distress alert between their source and the responsible MRCC and may even include other MRCCs. Therefore the aircraft or vessels in distress may use any of the aforesaid means available to attract attention, make their positions known and obtain help.

4.5.2. The distress alert can be activated through terrestrial and satellite based systems.

(a) Terrestrial Systems.
   (i) VHF, MF, HF R/T.
   (ii) VHF, MF, HF DSC.
   (iii) VHF EPIRB (CH 70).

(b) Satellite Based Systems.
   (i) COSPAS- SARSAT system.
   (ii) INMARSAT system.

4.6 VHF, MF, HF RT

4.6.1 The ships / crafts in distress announce the nature of distress and assistance required on RT on following international distress, urgency and safety RT frequencies.

(a) VHF - Channel 16
(b) MF- 2182 KHz.
(c) HF- 4125 KHz, 6215 KHz, 8291 KHz, 12290 KHz and 16420 KHz.

4.7 Digital Selective Calling

4.7.1 Digital Selective Calling (DSC) is used for calling and replying and for transmitting, acknowledging and relaying distress alerts. It allows a specific station to be contacted and made aware that the calling station wishes to communicate with it and to indicate how to reply or what station to listen to for subsequent distress traffic. It also can make “all ships” calls. Follow-up communications are made on an appropriate non-DSC
frequency. DSC radio users need to understand the basic operation of the radio, how DSC acts as an automated watch and the importance of registering the radio and keeping it on and tuned to the DSC channel. Channel 70 is used as a digital selective calling (DSC) channel in the maritime mobile service for distress, safety, calling and reply.

4.7.2 The relevant information in a DSC message is displayed at the receiving equipment and may be printed out if a printer is connected. The DSC system may be used to remotely operate a transceiver on board a ship if this equipment is designated for automated operation. Before the DSC routine call is transmitted it shall be verified that the frequency is free. On VHF this is done automatically by the equipment, which prevents transmitting until the frequency is free for other calls then distress and safety.

4.7.3 SOLAS ships sailing beyond range of a VHF DSC coast radio station must also have a MF DSC (2187.5 KHz) transmitter and watch receiver. In MF band frequency 2177 KHz is assigned for ship-to-ship DSC calling. The ship may call another ship on any routine DSC calling frequency in MF /HF bands. If sailing beyond range of an MF DSC coast radio station, they must have an INMARSAT Ship Earth Station (SES) or an MF/HF DSC transmitter and watch; receiver including narrow-band direct printing (NBDP). If operating outside INMARSAT coverage (i.e., in the polar areas), they must have the MF/HF DSC capability.

4.7.4 One of the duties of the bridge watch keeper is to ensure that the VHF DSC is keeping automatic watch on Ch 70 and that the MF/HF DSC is programmed to scan at least three of the six MF/HF distress and safety frequencies; that is the 2 MHz, 8 MHz bands and one other frequency deemed to be suitable at the time.

4.7.5 If the distress alert is sent by DSC subsequent communications are always carried out on the distress frequency in the same band. The DSC also provides for urgency and safety category calls, which are sent on the appropriate distress and safety frequencies.

4.7.6 The distress activated through DSC contains MMSI number of ship in distress, nature of distress and subsequent mode of communication. The position in DSC can be fed automatically from GPS at regular intervals or updated manually in every watch. In case the position is not updated, the last position in DSC equipment will be transmitted. The alerts activated through DSC can be received by the DSC equipment fitted in other ships or shore stations. The stations on receipt of distress relay information to MRCC for coordination. The two types of distresses that can be activated by the ship craft are as follows.

(a) **Designated Distress.** When unit in distress has time, then the present position, nature of distress and subsequent mode of communication can be inserted before activating distress.
Undesignated Distress. When unit in distress has no time to insert present position and nature of distress, undesignated distress can be activated by pressing distress button provided on the equipment. The message so transmitted contains MMSI number of vessel and last updated position.

4.8 COSPAS SARSAT System

4.8.1 The aircraft and ship carries Emergency Locator Transmitter (ELT) and Emergency Position Indicating Radio Beacon (EPIRB) respectively. These beacons are capable of being activated manually or automatically in case of a disaster. The alert signals are detected by the COSPAS SARSAT satellite and are relayed to the ground stations called Local User Terminal (LUT). The LUT processes the signal and passes the information to the Mission Control Centre (MCC) for transmission to SAR Point of Contact (SPOC).

4.8.2. Space Segment. The space segment consists of low earth orbiting SAR satellites (LEOSAR constellation) and geo stationary earth orbiting SAR satellites (GEOSAR constellation). LEOSAR constellation consists of four SARSAT (Search And Rescue satellite Aided Tracking) satellites provided by the USA with 99 degrees inclination placed in sun synchronous near polar orbits at about 850 km altitude) and three COSPAS (Cosmicheskaya Sistyema Poiska Avariynych Sudov - which means Space System for Search of Distressed Vessels) satellites provided by Russia with 83 degrees inclination placed near polar orbits of 700 and 1000 km altitude). GEOSAR constellation consists of three satellites - GOES EAST and GOES WEST provided by the USA and INSAT 2A provided by India. INSAT 2B is placed in orbit as a spare.

4.8.3. Ground Segment (LUT and INMCC). The ground segment of COSPAS SARSAT system in India consists of one GEOLUT at Lucknow, one LEOLUT at Bangalore and one Mission Control Centre (MCC) at Bangalore called Indian Mission Control Centre (INMCC). LEOLUT and INMCC are co-located with ISTRAC, Bangalore.

4.8.4. Interpretation of COSPAS SARSAT alert. The salient features of interpretation of COSPAS-SARSAT alert are as follows.

(a) COSPAS-SARSAT position information is determined using a Doppler plot resulting from relative motion between the ELT or EPIRB or PLB signal source and the orbiting satellites. Alert messages provide two positions an equal distance on each side of the satellite Track and a confidence level to help in assessing which one is the correct one. Some initial ELT and EPIRB alerts may also have integral Global Positioning System (GPS) capabilities. MRCCs should consult the appropriate COSPAS-SARSAT documentation for more information.

(b) MRCCs use the message country codes to direct them to the appropriate countries where information can be obtained about the distressed craft from
databases at INMCC, if the owners of coded 406 MHz ELTs and EPIRBs properly register the beacons. The country codes directly correspond to the ITU Maritime Identity Digits (Mills) used to identify flag States.

(c) Signals from 406 MHz ELTs and EPIRBs can be stored aboard a satellite and relayed to ground later if no LUT receiver is immediately within view of the satellite, enabling the system to operate in a global mode with fewer LUTs required.

4.9 INMARSAT System

4.9.1. The INMARSAT sets onboard SES is provided with a distress button. The distress is activated by pressing the button. The distress so activated is received at LES Pune, which in turn relays the message to the concerned MRCC for coordination.

4.10 Radio Communications Frequencies

4.10.1 The frequency bands allocated by ITV for the aeronautical mobile service include some in the High Frequency (HF) spectrum (3000 to 30000 KHz), the Very High Frequency (VHF) spectrum (30 to 300 MHz) and the Ultra-High Frequency (UHF) spectrum (300 to 3000 MHz). Initial transmissions of aeronautical distress messages normally are on the frequency being used for enroute communications with the aeronautical stations. SAR facilities proceeding to assist aircraft should establish communications on that frequency. The mode of communication between SAR facilities and the MRCC or MRSC can be included in the SAR local plan or SAR action plan maintained at MRCC/MRSC and when a SRU is within radio range of distressed aircraft or vessel may establish the communication as per the plan.

4.10.2 Distress traffic includes all messages relating to immediate assistance required by persons, aircraft or marine craft in distress, including medical assistance. Distress traffic may also include SAR communications and on-scene communications. Distress calls take absolute priority over all other transmissions. Anyone receiving a distress call must immediately cease any transmissions, which may interfere with the call and listen on the frequency used for the call.

4.11 MF Communications

4.11.1 Medium frequencies (MF – 300 to 3000 KHz), seldom used by aircraft, are commonly used for maritime services. 500 KHz is used for morse code distress, safety and calling transmissions. Silence periods on this frequency are observed for three minutes twice an hour, beginning at 15 and 45 minutes past each hour, to facilitate reception of distress calls and in the last 15 seconds of each period to announce distress, urgency or safety broadcasts.
4.11.2 The frequency 2182 KHz, an international maritime voice distress, safety and calling frequency, is also available in designated SAR aircraft. Silence periods on this frequency are observed for three minutes twice an hour, beginning on the hour and at 30 minutes past each hour, to facilitate reception of distress calls.

4.11.3 **MF Radio Alarms.** A number of coast and ship stations are equipped to transmit the radio alarm signal on 500 KHz radiotelegraphy or 2182 KHz radiotelephony by means of an automatic signal-generating device. The signal actuates automatic devices giving an alarm to attract attention of operators not maintaining an aural watch and is followed by the Morse Signal “SOS SOS SOS” on 500 KHz radio telegraphy and the spoken words “MAYDAY MAYDAY MAYDAY” on 2182 KHz.

(a) The radiotelegraphy distress alarm consists of a series of twelve dashes sent in one minute, the duration of each dash being four seconds and the duration of the interval between consecutive dashes being one second.

(b) The radiotelephony alarm consists of two audio-frequency tones transmitted alternately. It is sent continuously for a period lasting from 30 seconds to one minute. A long continuous tone at the end of the alarm signifies that the signal originated from a coast station and not a ship station.

(c) Radio alarms may only be used to announce following.

(i) That a distress call or message is about to follow.

(ii) The transmission of an urgent meteorological warning.

(iii) The loss of a person overboard, when help of other vessels is required and cannot be satisfactorily obtained by use of the urgency signal only.

(d) Tests of radio alarms are prohibited.

4.12 **HF Communications**

4.12.1 The frequencies 3023 KHz, 4125 KHz and 5680 KHz may be used for on-scene and SAR coordination communications when range dictates need for high frequencies. A wide range of maritime HF frequencies are allocated and subdivided for radiotelephony and radiotelegraphy. In certain areas radiotelephone frequencies 4125 KHz and 6215 KHz are designated to supplement the frequency 2182 KHz for distress and safety purposes.

4.12.2 **HF Telex.** Interconnecting ship stations or ship stations and coast stations by Narrow Band Direct Printing in the maritime mobile service is used for following :-

(a) Telex and/or telegraph service between a ship station and a subscriber of the telex network.
(b) Telegraph service between a ship station and a coast station or between two ship stations.

(c) Telegraph service between a ship station and an extended station (ship owner) via a coast station.

(d) Telegraph service in a broadcast mode from a coast station, or a ship station, to one or more ship stations.

4.13 VHF Communications

4.13.1 The 121.5 MHz VHF AM aeronautical emergency frequencies normally used for calling or for emergencies. Where VHF is needed for a common VHF channel between aircraft and between aircraft and surface services involved in SAR operations, 123.1 MHz should be used when possible and 121.5 MHz used if an additional frequency is needed. An ELT or EPIRB transmitting on 121.5 MHz may make the use of this frequency impractical for communications. 121.5 MHz services are normally available at any aeronautical facility where needed to ensure immediate reception of distress calls. The frequency 156.8 MHz FM (Channel 16) is the international VHF maritime voice distress, safety and calling frequency. The frequency 156.3 MHz (Channel 06) may be used on-scene.

4.14 On Scene Communications

4.14.1 During a SAR operation for effective communication and co-ordination exclusive on scene communication channels are used between SRUs and the OSC. The SMC should specify an on scene communications channel for use by all the SRUs based on the equipment carried by the SRUs. If an on scene radio frequency for communications between air and surface facilities is involved in a SAR operation, distress and on scene frequencies may be used. Designated SAR aircraft operating in maritime areas must be equipped with a frequency for communicating with vessels during SAR operations. The SAR facilities both aircraft and ship are to be mandatory equipped to communicate on the following frequencies.

(a) 2182 Khz International Voice Distress, Safety and Calling

(b) 3023 Khz International Voice / CW SAR on scene

(c) 4125 Khz International Voice Distress, Safety and Calling back up frequency

(d) 5680 Khz International Voice / CW SAR on scene

(e) 121.5 Mhz International Voice Aeronautical emergency
(f) 406 Mhz ELTs and EPIRBs
(g) 123.1 Mhz International Voice SAR on scene
(h) 156.8 Mhz MMB CH-16 VHF FM International Voice Distress and International Voice Safety and calling
(j) 156.3 Mhz MMB CH-06 VHF FM merchant ship and Coast Guard SAR on scene
(k) 243.0 Mhz Joint / Combine military voice aeronautical emergency and international survival craft and ELTs and EPIRBs
(l) 282.8 Mhz Joint / Combined on scene and DF

4.14.2. The SAR authorities may also provide other communication equipment on scene as under :-

(a) SART compatible 9 GHz radar to SAR facilities.
(b) Disposable droppable radios operating on 123.1 MHz VHF / M1 which can be dropped for survivors to use in communicating with SAR aircraft or SAR vessels on scene.
(c) Radio installation onboard SAR facility, which will actuate radiotelephone alarms aboard vessels in the vicinity to help establish communications with them more directly.

4.15 SAR Communication for Fishing Vessels

4.15.1 The State government should ensure that the fishing boats are equipped with at least one VHF set. The boats operating beyond the visual range of land are to operate in groups of five to ten and at least one boat to carry one HF set. The frequency is to be promulgated and communication guard is to be provided by local fisheries office and the coordinating MRSC/MRSSC.

4.16 International SafetyNet System

4.16.1 The International Safety NET provides an automatic, global method of broadcasting SAR messages to vessels in both fixed and variable geographic areas. The Safety NET broadcasts can be received by the vessels equipped either with SafetyNET receivers or INMARSAT-C CESs configured to perform Enhanced Group Calling (EGC) receiver functions. The Safety NET Users manual published by INMARSAT prescribes the procedures and exact coding which must be followed for preparing Safety NET broadcasts, including SAR broadcasts.
4.16.2 The International Maritime Satellite Organisation (INMARSAT) has authorised Indian Coast Guard for broadcasting Maritime Safety Information (MSI) through International Safety Net Service required for coordinating SAR operation vide IMO certificate no. 68 dated 23 Jun 2000. Accordingly, MRCCs in Indian SRR located at Mumbai, Chennai and Port Blair are having adequate infrastructure to relay any distress messages to the ships in area. MSI can be transmitted to a particular ship or a group of ships or all ships in a particular area in which SAR operation is being coordinated. The message format for transmission through International Safety NET System is placed at Appendix “E”. MSI can be transmitted in following ways.

(a) **MSI through Internet.** The MSI can be transmitted by logging on to VSNL web site on Internet and inserting the allotted PIN. The message is routed through Land Earth Station (LES) Pune for broadcast through satellite.

(b) **MSI through Telex.** The MSI can be transmitted through telex at MRCC (Mumbai), MRCC (Chennai) and MRCC (Port Blair). PIN numbers are allotted for each MRCC against respective telex numbers. The message can be transmitted by dialing the telex number of LES Pune followed by PIN number.

(c) **MSI through INMARSAT London.** In case of failure of satellite system in the area of interest, request for transmission of MSI can be routed through INMARSAT London. INMARSAT London has allotted PIN for all MRCCs against respective telex numbers. Message can be transmitted by dialing INMARSAT London telex number followed by respective PIN.

(d) **MSI through LES Pune.** In case of failure to transmit MSI through Internet or Telex, request for transmission of MSI can be faxed to LES Pune.

4.17 NAVTEX

4.17.1 The NAVTEX is used to promulgate navigation and meteorological warnings and other safety related information to vessels. SAR personnel for SAR related broadcasts might use this facility. The types - of warnings, which SAR personnel may send over NAVTEX, include distress alerts and information about overdue or missing aircraft or vessels.

4.17.2 All SOLAS ships and vessels sailing within NAVTEX coverage areas are expected to carry 518 KHz NAVTEX receivers. Some may carry equipment to receive MSI over Safety NET in addition to NAVTEX. Therefore, it is appropriate and advisable to promulgate safety information over both NAVTEX and Safety NET. Normally, the most practical way to handle SAR broadcasts over Safety NET is to send them to all vessels within a desired radius of a specified position.
4.17.3 The NAVTEX messages may be sent via satellite or terrestrial radio. It is also called as Narrow Band Direct Printing (NBDP) and MRCCs and MRSCs use this channel for shore-to-ship distress traffic. NAVTEX is used for notifying distress information in coastal areas only.

4.18 NAVAREA VIII Coordinator

4.18.1 The MSI for SAR purposes can also be promulgated to the ships in the concerned area through NAVAREA VIII Coordinator. These types of alerts are in addition to the regular warnings of hazards to navigation. The MSI thus transmitted will be covering the entire area under NAVAREA VIII irrespective of position of distress. MRCC/MRSC/MRSSC to notify NAVAREA VIII coordinator required details of vessel, crew, position, type of distress, assistance required and instructions to Mariners. The request for cancellation of Navarea should also to be sent to Navarea VIII coordinator on completion of SAR case or on receipt of information from vessel that no more assistance required.

4.19 EPIRBs and ELTs

4.19.1 EPIRBs and ELTs are another means of alerting by using the Global Maritime Distress Safety System (GMDSS). This is used when other available means of alerting are inadequate. An EPIRB/ELT transmits a signal using satellite automatically along with an updated position by the onboard GPS, which alerts SAR authorities and allows rescue facilities to home onto the distressed vessel directly. It is activated automatically upon exposure to the sea or manually. The types of maritime satellite EPIRBs are as follows.

(a) 406 Mhz satellite EPIRBs whose signals are relayed via COSPAS SARSAT satellites, Local User Terminals (LUTs) LOCATED AT Lucknow and Bangalore and Mission Control Centers (MCCs) to MRCCs or SAR Point of Contact (SPOC).

(b) INMARSAT EPIRBs whose signals are relayed via INMARSAT satellites and INMARSAT CESs to MRCCs. The INMARSAT-E EPIRBs transmit messages via INMARSAT geo stationary satellites and CESs to MRCCs. These beacons have registered coded signal identities. The position information from INMARSAT-E EPIRBs is derived either from integral equipment such as GPS or via interfaces with shipboard navigation equipment. The positions from shipboard equipment cannot be updated after the EPIRB floats free. INMARSAT-E EPIRBs operate only within INMARSAT’s coverage area, generally between 70 Deg latitude North and South.

(c) Non-satellite VHF EPIRBs on channel 70, which are used close to shore in lieu of, satellite EPIRBs where receiving stations are available.
Most of the civil aircraft carry one or two types of ELT to alert SAR authorities to a distress situation. The 406 MHz satellite ELT and 406 MHz satellite Personal Locator Beacons (PLBs) are intended for use with COSPAS-SARSAT satellites.

4.19.2 Most ELTs and EPIRBs provide homing signals on 121.5 MHz. Some also use 243 MHz and some EPIRBs may also integrate SARTs into their designs. Most EPIRBs and all ELTs are designed to activate automatically when a vessel sinks or an aircraft crashes. PLBs are manually activated. The EPIRB alerts tell whether the beacon was activated automatically or manually. Some ELTs and EPIRBs may also have integral GPS capabilities. Some PLB users may carry the devices for use aboard aircraft or vessels, though they are not designed to be equivalent to, nor suitable for use as, EPIRBs or ELTs.

4.20 Maritime Identification Digits

4.20.1 Every country has been allotted with a unique three digit number called Maritime Identification Digit (MID). The MID forms a part of the Maritime Mobile Service Identity (MMSI) number and is useful to the SAR Coordinator for identifying the flag of the vessel. The MID for the Indian flags is 419.

4.21 Maritime Mobile Service Identity

4.21.1 Every vessel and coast station has been assigned a unique nine digit number called Maritime Mobile Service Identity (MMSI) number for easy identification.

(a) Ship Stations. Every ship has been provided with a unique MMSI number. The MID of the flag of the vessel forms the first three digits of the number. The MMSI number with two trailing “0”s indicates that the vessel can have direct access through regional/national communication network. The MMSI number with three trailing “0”s indicates that the vessel can direct access through international communication network.

(b) Group of Ship Stations. In case of group of ships, the MMSI number begins with “0” followed by three digits MID number of the country.

(c) Coast Stations. The MMSI number of coast stations begin with two “0”s followed by the MID number of the country.
CHAPTER 5

MARITIME AND AERONAUTICAL DISTRESS
CHAPTER - 5

MARITIME AND AERONAUTICAL DISTRESS

5.1 General Maritime and Aeronautical Distress

5.1.1 The Masters of the ships and the Pilots-in-command of the aircraft should not delay notifying the MRCC/MRSC/MRSSC/ATS unit, if a problem is or may be, developing which could involve need for assistance. This allows the MRCC/MRSC/MRSSC/ARSSC to carry out preliminary and contingency planning that could make the critical difference if the situation worsens.

5.2 Sources of Distress Input

5.2.1 The distress message input can be received from any of the following sources:-

(a) Ship in distress directly.
(b) INMCC, Bangalore as relay.
(c) Other MRCC relays of EPIRB, HF DSC, and INMARSAT - C.
(d) LES, Pune INMARSAT- C relay.
(e) MRSC/MRSSC.
(t) MOC, Indian Navy.
(g) Agents/Owner of the ship.
(h) Ships passing nearby the area.
(j) Aircraft over flying nearby the area.
(k) ATS/FIC/ADIZ authorities.
(l) Local fishing association/authorities.
(m) State/Local administration/Police authorities.
(n) International SAR authorities/ MRCCs of other nations picking up distress in Indian SRR through INMARSAT/MF/HFDSC/EPIRB etc.
(p) DGCOM Centre (DG Shipping Communication Centre).

5.3 Emergency Phases

5.3.1 Emergency phases are based on the level of concern for the safety of persons
or craft, which may be in danger. Upon initial notification, a SAR incident is classified by
the respective MRCC/MRSC/MRSSC or air traffic services (ATS) unit as being in one of
three emergency phases, namely Uncertainty, Alert or Distress. The emergency phase
may be reclassified by the SMC as the situation develops. The current emergency phase
should be used in all communications about the SAR incident as a means of informing all
interested parties of the current level of concern for the safety of persons or craft which
may be in need of assistance.

5.4 Uncertainty Phase

5.4.1 An Uncertainty phase is said to exist when there is knowledge of a situation that
may need to be monitored or to have more information gathered, but that does not require
dispatching of resources. When there is doubt about the safety of an aircraft, ship or other
craft or persons on board or it is overdue, the situation should be investigated and
information gathered. A communications search may begin during this phase. An
Uncertainty phase is declared when there is doubt regarding the safety of an aircraft, ship
or other craft or persons on board.

5.4.2 For an aircraft, the Uncertainty phase is declared as follows :-

(a) No communication has been received from an aircraft within a period of
thirty minutes after the time a communication should have been received or from
the time an unsuccessful attempt to establish communication with such aircraft
was first made, whichever is the earlier.

(b) An aircraft fails to arrive within thirty minutes of the last estimated time
of arrival (ETA) last notified to or estimated by air traffic services (ATS) units,
whichever is the later, except when no doubt exists as to the safety of the aircraft
and its occupants.

5.4.3 For ships or other craft, an Uncertainty phase is declared as follows :-

(a) Been reported overdue at its intended destination.

(b) Failed to make an expected position safety report.

5.5 Alert Phase

5.5.1 An Alert phase exists when an aircraft, ship or other craft or persons on board
are having some difficulty and may need assistance, but are not in immediate danger.
Apprehension is usually associated with the Alert phase, but there is no known threat
requiring immediate action. SRUs may be dispatched or other SAR facilities diverted to
provide assistance if it is believed that the conditions might worsen or that SAR facilities
might not be available or able to provide assistance if conditions worsens at a later time.
5.5.2 For overdue craft, the Alert phase is considered when there is a continued lack of information concerning the progress or position of the craft. SAR resources should begin or continue communication searches and despatch of SRUs to investigate high probability location or overtly the craft’s intended route. Vessels and aircraft passing through the area where the concerned craft might be located should be asked to maintain a sharp lookout, report all sightings and render assistance, if needed. An Alert phase is declared as follows:

(a) Following the Uncertainty phase, subsequent attempts to establish communication with the aircraft, ship or other craft are failed or inquiries to other relevant sources have failed to reveal any news of that craft.

(b) An aircraft has been cleared to land and fails to land within five minutes of the estimated time of landing and communication has not been re-established with the aircraft.

(c) Information has been received which indicates that the operating efficiency of the aircraft, ship or other craft has been impaired, but not to the extent that a forced landing or distress situation is likely, except when evidence exists the safety of that aircraft and its occupants is in doubt.

(d) An aircraft is known or believed to be the subject of unlawful interference.

(e) A ship is under attack or threat of attack from pirates or armed robbers.

5.6 Distress Phase

5.6.1 The Distress phase exists when there is reasonable certainty that an aircraft, ship or other craft or persons on board is in danger and requires immediate assistance. For overdue craft, a distress exists when communications searches and other forms of investigation have not succeeded in locating the craft or revising its ETA so that it is no longer considered overdue. If there is sufficient concern for the safety of a craft and the persons aboard to justify search operations, the incident should be classified as being in the Distress phase. For aircraft, a distress phase is declared as follows:

(a) Following the Alert phase, the further unsuccessful attempts to establish communication with the aircraft and more widespread unsuccessful inquiries point to the probability that the aircraft is in distress.

(b) The fuel on board is considered to be exhausted or to be insufficient to enable the aircraft to reach safely.

(c) Information is received which indicates that the operating efficiency of the aircraft has been impaired to the extent that a forced landing/ditching is likely.

(d) Information is received or it is reasonably certain that the aircraft is about to make or has made a forced landing/ditching, except when there is reasonable
certainty that the aircraft and its occupants do not require immediate assistance.

(e) A ditched aircraft debris is inadvertently located as the result of a sighting or of homing on an ELT transmission.

5.6.2 For ships or other craft, the distress phase is declared as under.

(a) Positive information is received that a ship or other craft or a person on board is in danger and needs immediate assistance.

(b) Following the alert phase, further unsuccessful attempts to establish contact with the ship or other craft and more widespread unsuccessful inquiries point to the probability that the ship or craft is in distress.

(c) Information is received which indicates that the operating efficiency of the ship or other craft has been impaired to the extent that a distress situation is likely.

5.7 Distress Alert from a Vessel

5.7.1 In addition to facilities onboard for distress notification, 2182 kHz (Radio Telephony) and 156.8 MHz (VHF Channel 16) are used to transmit a distress alert from a vessel. In remote oceans areas, the distress call should also be transmitted on a ‘ship-to-shore’ HF circuits and INMARSAT terminals to the MRCC/MRSC/MRSSC/CRS, especially when distress calls on 2182 kHz or Channel 16 are not replied by other stations.

5.7.2 If there is a doubt concerning the reception of the distress message, it should also be transmitted on any frequency available on which attention might be attracted such as an inter-ship frequency which may be in use in local areas. Before changing frequency, adequate time should be allowed for reply. In the event of failure of the ship’s radio station, it may be possible to transmit a message using portable equipment, provided for use in survival craft.

5.8 Distress Alert from an Aircraft

5.8.1 The aircraft would normally notify an ATS unit, which should notify the concerned MRCC/MRSC/MRSSC. SAR efforts for incident in the FIR are but outside the SRR will be provided after mutual discussion between the adjoining MRCCs. Aircraft would transmit blind on 121.5 MHz, if there were no response on the assigned enroute frequency. It may also set transponder to 7700 if facility is available. An aircraft in distress may use any means at its disposal to attract attention, make known its position and obtain help.
5.9 Vessel Distress Message

5.9.1 The initial distress message should comprise of as much information as possible. The timing of subsequent transmissions will be governed by the prevailing circumstances. In general, if time allows, a series of short messages will be preferable to one or two long ones. Important components of the distress message include the following:

(a) Identification of the vessel including IMO and MMSI Number.
(b) Position of the vessel.
(c) Nature of distress and type of assistance required.
(d) Weather in immediate vicinity, wind direction, sea and swell, visibility.
(e) Time of abandoning ship.
(f) Number of crew remaining on board.
(g) Number and type of survival craft launched.
(h) Emergency location aids in survival craft or in the sea.
(j) Number of personnel injured seriously.
(k) INMARSAT numbers etc.
(l) Details of Agent/owner with telephone no.

5.10 Additional Equipment

5.10.1 SOLAS ship requirements include two-way VHF radiotelephone apparatus and also survival craft Search and Rescue Radar Transponder (SART) to be placed on each side of the vessel, in a position ready to be taken on board a survival craft. The SART, after being switched on manually, is activated automatically by receiving radar pulses. It automatically sends out a series of pulses, which are displayed on the radar screen as a series of elongated blips, similar to a radar responder beacon (Racon) blip.

5.11 Methods of Distress Alert Notification/Signals

5.11.1 The following are the spoken Emergency Signals and Procedural Words used by aircraft and vessels in distress. The signal is usually repeated three times at the beginning of the message.

(a) Distress Signal. MAYDAY (pronounced M’ AIDER) is used to indicate that a mobile craft is in imminent danger and requests immediate assistance - for example, when a vessel has a person overboard and a master considers that further
help is necessary. It has priority over all other communications.

(b) **Urgency Signal.** PAN-PAN (pronounced PAHN-PAHN) is used when the safety of a mobile craft is in jeopardy. The urgency signal PAN-PAN should be used when an unsafe situation exists that may eventually involve a need for assistance. It has priority over all except distress traffic.

(c) **Safety Signal.** SECURITY (pronounced SAY CURITAY) is used for messages concerning safety of navigation or giving important meteorological warnings. Any message headed by one of these signals has precedence over routine messages.

5.12 **Overdue Vessel/Aircraft**

5.12.1 SAR procedures should be initiated if an aircraft or vessel becomes overdue or fails to make a report. For aircraft, this is usually accomplished through an ATS unit or the flight plan system. However, if radar communications are unexpectedly lost with an Instrument Flight Rules (IFR) or Visual Flight Rules (VFR) aircraft, SAR procedures may be initiated.

5.12.2 On receipt of the information from the appropriate agency that the vessel aircraft is overdue alert the SRUs available immediately. Complete preliminary communication (PRECOM) and execute extended communications (EXCOM) and gather maximum information possible including the following :-

(a) Date, time, point of departure, planned routes/area of operations, speed of advance, ETA and point of destination.

(b) Possible route deviation.

(c) Weather history and forecast along the proposed route/ area.

(d) Information’s from other sources like friends, relatives, associates and agents/agencies.

(e) Date/time of initial report/Last known position (LKP).

(f) Other pertinent information like vessel’s history of timely reporting/arrival.

5.12.3 If the vessel is not located by the completion of EXCOM, when the situation deteriorates or when the unit or person is considered to be in grave or imminent danger the case is to be advanced to Distress phase. The other agencies and SAR authorities, which are capable of rendering assistance by providing SAR facilities also, be alerted regarding the overdue vessel distress phase.
5.12.4 SAR Co-ordinator is to designate SMC, to Prepare search plan to dispatch SRU for initial search. Broadcast information on vessel overdue on radio channels and through ISN. Promulgate notices to mariners through Navarea VIII coordinator. If the overdue vessel is located later, close the case and cancel broadcast notices and Navarea. Notify the information to all concerned.

5.13 MEDICO/Medical Assistance

5.13.1 MEDICO messages are request or transmit medical advice from and to a vessel at sea. Each MEDICO message may be addressed to MRCC/MRSC/MRSSC or communications facilities from ships at sea. The messages should be prefixed MEDICO so that communications personnel know to handle them as MEDICO messages. These messages are normally delivered only to hospitals or other facilities with which SAR authorities or the communications facility has made prior arrangements. SAR services may provide medical advice either with their own doctors or via arrangements with doctors outside the SAR organisation. There are several commercial enterprises that provide international subscription and pay per use medical advises to vessels at sea. Replies to messages should indicate the medical facility that provided the medical information.

5.13.2 If medical evacuations are being considered, the benefits must be weighed against the inherent dangers of such operations to both the person needing assistance and to the rescue personnel. When medical assistance is required, the MRCC/MRSC/MRSSC should obtain the following information, which may be considered necessary according to specific cases:

(a) Name of the vessel and radio call sign including IMO/MMSI No.
(b) Position of the vessel, port of destination.
(c) Estimated time of arrival, course and speed
(d) Patient’s name, age, gender, nationality and language
(e) Patient’s respiration, pulse rate, temperature and blood pressure.
(f) Location of pain.
(g) Nature of illness/injury, including apparent cause and related history.
(h) Symptoms.
(j) Type, time, form and amounts of all medications given.
(k) Time of last food consumption.
(l) Ability to eat, drink, walk or be moved.
(m) With accident cases, how the accident occurred
(n) Whether the vessel has a medicine chest.
(p) Whether a physician or other medically trained person is onboard.
(q) Whether a suitable area is available for helicopter, winch operations / landings particulars / dimensions of deck.
(r) Name, address and phone number of vessel’s agent.
(s) Last port of call, next port of call and ETA to next port of call.
(t) Communications and homing signal available.
(u) Additional patient remarks.

5.13.3 During medical evacuation operations, the vessel must be directed to be ready in all respects for embarking the casualty well before the arrival of the helicopter. Also the vessel must be advised on the following :-

(a) The patient is to be moved as close to the helicopter pick up area, depending on the patient’s condition.
(b) Ensure that the patient is tagged to show details of any medication, which has been administered.
(c) The patient’s seaman’s papers, passport, medical record and other necessary documents are to be prepared in a package ready for transfer with the patient.
(d) Ensure that personnel are prepared as necessary to move the patient to the special stretcher (lowered by the helicopter) as quickly as possible.
(e) The patient should be strapped in the stretcher with face up and with lifejacket if condition permits.

5.14 Mass Casualties

5.14.1 The shipboard disasters and aircraft crashes may require major medical response. The logistics of rescuing large number of victims, providing first aid and transportation of survivors to appropriate medical facilities are very demanding especially when rescue is undertaken at sea. Therefore, SMC should respond by involving all means available and provision as quickly as possible. SMC should also ensure availability of ambulance and hospital facilities ready and ensure that survivors are not left alone after the rescue particularly if injured or showing signs of hypothermia or physical / mental exhaustion. When medical assistance or advice is required the SRU should provide the basic medical assistance. The medical information on the mass casualties provided by the SRU to the
SMC should include the following:

(a) Name of the SRU and its available means of communications.
(b) Position of SRU, destination, ETA, course and speed.
(c) Name, gender, age of patients/survivors, Nationality and language known.
(d) Information concerning respiration, pulse, temperature, blood pressure and symptoms, if possible.
(e) Nature of illness/ injury, location of pain, apparent cause and relevant history.
(f) Type, time, form and amount of all medication given.
(g) Time of last food consumption.
(h) Ability of casualties to eat, drinks, walk or be moved.
(j) Availability of medical kit/professional with the SRU and SAR facilities in company.
(k) Availability of area for helicopter landing / Winch operations with specification / dimension of deck.
(l) Name and point of contact of personnel having further details of distress vessel and its occupants.
(m) Identification of deceased casualties in coordination with OSC/SMC to facilitate handing over to local authorities.
(n) Precautions taken for not exposing the rescuers and the other casualties to the deceased casualties.

5.14.2 The MRCC/MRSC/MRSSC should make arrangements to obtain competent medical advice on twenty four hour basis and when possible take medical advice from personnel familiar with risks peculiar to the environment of SRR and with the inherent risk involved with medical casualties. The MRCC/MRSC/MRSSC should maintain list of resources that can provide medical advice and facilities. The factors to be considered by MRCC/MRSC/MRSSC during mass casualties are as follows:

(a) Condition of survivors.
(b) Capability of SRU to reach the survivors in shortest possible time and effect rescue.
(c) Medical training, qualifications and operation capabilities of the personnel onboard SRU.
5.15 False Alerts

5.15.1 False alerts are any alerts received by the SAR system, which indicate an actual or potential distress situation, when no such situation actually exists. Some causes of false alerts include equipment malfunctions, interference, testing and inadvertent human error. A false alert transmitted deliberately is called a hoax.

5.15.2 With the advent of better and more alerting equipment, which transmits automatic pre formatted data messages, the tendency for the numbers of false alerts received to increase is inevitable. If counter measures are not developed, this will place increasing strain on the SAR system, unnecessary deployment of SRUs, bring increasing risk to SAR personnel and harm the credibility of alerting systems needed to inform the SAR system when help is needed. This will also involve waste of government exchequer.

5.15.3 Despite the above, it is essential that SAR personnel treat every distress alert as genuine one until they know for certain it is not an actual case of distress alert. For a false alert or an unnecessary SAR alert, a message should be sent by the MRCC/MRSC/MRSSC to the appropriate authorities for follow up to prevent reoccurrence of similar false alerts. The follow up should include the person or persons responsible for the false alert and may include information such as the effort expended by the SAR organisation in response to the false alert.

5.16 Preventing False Alerts

5.16.1 SAR authorities should take all possible measures to prevent any activation of false alerts. The following steps are suggested to ensure prevention of the same:

(a) Inform aircraft and vessel owners and operators about implications of the rising number of false distress alerts.
(b) Provision for the vessels to register all communications equipment related to SAR, and to ensure that this registration data is readily available to MRCCs/ MRSCs/ MRSSCs.

(c) Follow up on unnecessary SAR messages.

(d) Consider establishing or using enforcement measures to prosecute those who inadvertently transmit a false distress alert without proper cancellation, or who fail to respond to a distress acknowledgement, due to misuse or negligence or separately transmit false alerts and deliberately transmit false alerts.

(e) Use the ITU violation reporting process for false distress alerts.

(f) Communications equipment operators are to be well informed on how to operate their equipment, the importance of avoiding false alerts and steps to be taken to prevent transmitting false alerts.

(g) Inform equipment approval authorities of false alert problems to draw their attention to testing and alerting functions of radio equipment during the type approval process.

(h) Urge companies installing radio equipment to train the users to ensure they become familiar with operation of the installed equipment.

(j) Investigate the cause when a specific model of communications equipment repeatedly transmits unwanted alerts and inform appropriate organisations.

(k) Surveyors and inspectors are to be informed about communications equipment and particularly how to operate and test it without transmitting a false alert.

(l) The operators are appropriately certificated for installed communications equipment.

(m) Manufacturers, suppliers, and installers of communications equipment are to be urged to provide clear and precise operating instructions that are easy to understand.

(n) The equipment is to be designed for distress alerting so that it will be impossible to transmit an alert unintentionally.

(p) The panel for emergency operation is separated from the one for normal operation, is fitted with a cover, and has colour coded switches, with standardised arrangements of control panels and standard operational procedures.

(q) Design test features so that the testing of equipment will not result in false distress alerts.
(r) When any communications equipment has been installed, necessary instructions are to be given to users, specifically pointing out the operating procedures.

(s) Any distress alert activation is to be indicated visually and/oraurally, showing that the equipment is transmitting a distress alert, until manually deactivated.

(t) Implement any appropriate technical and operational measures to avoid unwanted transmission of alerts.

(u) Ensure that the ELT or EPIRB handling procedures and installations, including the location on board the aircraft or vessel and the release and activation mechanisms, preclude unwanted activation.

(v) Design EPIRBs so that when they are out of their brackets they must also be immersed in water to activate automatically and when operated manually, a two-step activation procedure should be required.

(w) Consider ELT and EPIRB installation locations for new aircraft and vessels at early stages of the craft design and construction.

(y) Educate users of communications equipment and their employers to ensure the following :-

(i) All personnel responsible for sending a distress alert are to be instructed and are competent to operate all radio equipment aboard the aircraft or vessel.

(ii) Only persons responsible for communications are to operate the equipment during distress incidents.

(iii) Give necessary instructions and information to all crewmembers on how to send a distress alert.

(iv) The equipment testing is to be undertaken only under supervision of the person responsible for communications during distress incidents.

(v) The equipment testing or drills are never to be allowed to cause false distress alerts.

(vi) The encoded identities of satellite ELTs and EPIRBs, which are used by SAR personnel responding to emergencies, are to be properly registered in a database accessible 24 hours a day or automatically provided to SAR authorities.
(vii) The aircraft and vessel operators should confirm that their beacons have been registered with such a database to help SAR services to identify the unit in the event of distress and to rapidly obtain other information to help them respond.

(viii) Immediately update ELT, EPIRB, INMARSAT and DSC registration data. If necessary, reprogram the equipment codes of the aircraft or vessel change of ownership, name, flag, or similar information.

(ix) Install and maintain satellite ELTs and EPIRBs carefully in accordance with manufacturers instructions and using qualified personnel.

(x) Avoid activating EPIRBs if help is already available.

(xi) Once an EPIRB is switched on, whether accidentally or intentionally, the vessel should make every reasonable attempt to communicate with SAR authorities by other means to advise them of the situation before turning the EPIRB off.

(xii) After emergency use, if possible, retrieve and deactivate the EPIRB. When an ELT or EPIRB is damaged and needs to be disposed of or if an aircraft or vessel is sold for scrap or for any other reason a beacon will no longer be used, it is to be made inoperable by removing its battery if possible and returning it to the manufacturer or demolishing it.

(xiii) Take measures, such as wrapping the ELT or EPIRB in tin foil, to prevent transmission of signals during shipment to the manufacturer for any reason and when the ELT or EPIRB is destroyed or demolished, ensure that the beacon is removed from registration lists.

(xiv) DG Shipping may initiate appropriate action against Indian Registered vessels activating repeated false alert.

(xv) DGCA may initiate appropriate action against Indian Registered aircrafts activating repeated false alert.
SAR Coordination
CHAPTER - 6

SAR COORDINATION

6.1 SAR System

6.1.1 The SAR system is an arrangement of components activated, as needed, to efficiently and effectively assist persons in potential or actual distress. The SAR system has the five components as discussed in earlier chapters. The distressed unit or the witness element functions as the alerting agency. The Coast Radio Stations, Coast Earth Stations or any other alerting facility, ships and aircraft on the scene or the other SAR resources functions as the relaying agency or responding agency. The SAR authority and the Maritime Rescue Coordination Centre or Maritime Rescue Sub Centre or Maritime Rescue Sub Sub Centre coordinates the entire operations in respective SRR.

6.2 SAR Stages

6.2.1 The designated SAR stages define the nature of SAR assistance provided at any particular time. A specific mission may not necessarily include each and every stage. In some cases, the stages may overlap. The stages of the SAR are as follows.

(a) **Awareness.** Knowledge by any person or agency that an emergency situation may exist.

(b) **Initial Action.** Preliminary action taken to alert SAR facilities and obtain amplifying information. This stage may include evaluation and classification of the information, alerting of SAR facilities, preliminary communication checks and extended communication checks and in urgent cases, immediate action from other stages.

(c) **Planning.** The development of operational plans, including plans for search, rescue and final delivery.

(d) **Operations.** Sending SRUs to the scene, conducting searches, rescuing survivors, assisting distressed craft, providing necessary emergency care for survivors and delivering casualties to medical facilities

(e) **Mission Conclusion.** Return of SRUs to a location where they are finally debriefed, refuelled, replenished, remanded and prepared for other missions and compilation of documentation of the SAR mission by all SAR facilities.
6.3 Awareness Stage

6.3.1 The first notification of the SAR system on an actual or potential SAR incident initiates the Awareness stage. Persons or craft in difficulty may report a problem, alerting posts may receive information, nearby personnel may observe an incident or an uncertainty may exist due to lack of communication or due to non-arrival. Anyone who becomes aware of an actual or potential SAR incident should report it immediately to the appropriate MRCC/MRSC/MRSSC, if known or to the nearest MRCC/MRSC/MRSSC, otherwise. If an SRU receives the information, it should also respond to the incident as appropriate.

6.3.2 All reports concerning an incident which are received before and during a SAR operation must be carefully evaluated to determine their validity, the urgency for action and the extent of the operation required. The evaluation must be thorough, decisions must be made and action taken as quickly as possible. If confirmation of uncertain information cannot be obtained without undue delay, the MRCC/MRSC/MRSSC should act on a doubtful message rather than wait for verification. Reports of overdue craft present particular evaluation challenges as follows.

(a) **Communication Delays.** In some areas of the world, communication delays may prevent timely reports of positions and arrivals. Trends in delays should be kept in mind by the MRCC or MRSC when estimating the significance of a report to prevent unnecessary alerts of the SAR services.

(b) **Weather Conditions.** Adverse weather may contribute to communication delays or deviations from flight or voyage plans.

(c) **Habits of Pilot or Captain.** Some pilots-in-command or Masters of the vessels are known to react in a certain manner in certain circumstances. Knowledge of their habits, including preferred routings, may provide guidance in the evaluation of an incident and the subsequent planning and execution of search operations.

6.3.3 **Air Traffic Services Units.** ATS units receive information on most aircraft flights and are periodically in contact with them. Most of this information will come from aircraft reporting directly to ATS units. An aircraft emergency and its development is therefore likely to come to their notice first. It is for these reasons that each ATS unit provides alerting services to all aircraft flights known to it and Area Control Centres (ACC) and Flight Information Centres serve as a collecting point for all information concerning an aircraft emergency within its Flight Information Region (FIR). An ATS unit will usually notify its associated MRCC/MRSC/MRSSC when an aircraft is actually or likely to be in a state of emergency. However, when the nature of the emergency is such that local rescue facilities can deal with it, such as when an incident occurs at or near an aerodrome and in land areas, the MRCC/MRSC/MRSSC may not be informed. The notification from an ATS
unit to an MRCC/MRSC/MRSSC will contain information, if available, in the order listed below.

(a) UNCERTAINTY, ALERT or DISTRESS as appropriate to the phase of emergency.
(b) Agency and person calling.
(c) Nature of the emergency and type of assistance required.
(d) Significant information from the flight plan.
(e) Unit, which made last contact, time and frequency used.
(f) Last position report and how the position was determined.
(g) Colour and distinctive marks of the aircraft in difficulty.
(h) Time of communication with the ship or craft.
(j) Position or last known position of the ship or craft.
(k) Description of the ship or craft.
(l) Intentions of the captain.
(m) Number of POB if known.
(n) Any other information.

6.4 Notification by Other Sources

6.4.1 All persons are encouraged to report any abnormal occurrence they have witnessed or heard about. Notification that an aircraft has crashed or an aircraft, ship or other craft is overdue or in a state of emergency, may therefore reach an MRCC/MRSC/MRSSC from any source, either directly or relayed through an alerting post. The following points are to be kept in mind when notification of distress is received from other sources.

(a) A record of events should be maintained by the MRCC/MRSC/MRSSC. A separate log is to be maintained for each incident to record all information as it is received. This could be either in full or by reference to other permanent records such as separate reports, forms, folders, charts, telegrams, recorded radio frequencies and telephones and recorded radar data.

(b) The initial notification should be entered on a standard Incident Processing form. This form should be available at MRCC, MRSC, MRSSC, ATS units and other alerting posts as necessary. It is used to obtain the important information at first contact since it may be impossible or too time-consuming to obtain such
information later. Its use will prevent the loss of details. The form lists the address of the reporting source to help assess the reliability of the report and for obtaining additional information.

(c) After evaluating all available information and if an emergency phase is declared, the MRCC/MRSC/MRSSC should immediately inform all appropriate authorities, centers, services or facilities.

(d) When more than one MRCC may have received the distress alert, the concerned MRCCs should quickly coordinate and each should advise the other of the action it has taken on the alert. This can be done by any practical means, including INMARSAT Fleet NET and INMARSAT-C service or ICAO’s AFTN through ATS. This especially applies to an initial COSPAS SARSAT alert where the A and B positions can be in different SRRs.

6.5 Initial Action Stage

6.5.1 The Initial Action stage is when the SAR system begins response, although some activities, such as evaluation, may begin during the preceding Awareness stage and continue through all stages. Initial action may include SMC designation, incident evaluation, emergency phase classification, SAR resources alert and communication searches. Since no two SAR operations follow exactly the same pattern, it is not possible to develop comprehensive procedures that apply at all times. INDSAR surface Picture may be obtained from MRCC (MB). INDSAR SURPIC request format is placed at Appendix “J”. Basic procedures, as outlined below, may be adopted for each phase of emergency. These procedures should be interpreted with flexibility as many of the actions described may be performed simultaneously or in a different order to suit specific circumstances.

6.6 Uncertainty Phase Initial Actions

6.6.1 When an Uncertainty phase has been declared by the MRCC/MRSC/MRSSC or ATS unit, the following actions are to be taken.

(a) SAR Coordinator is to immediately appoint SMC and inform appropriate SAR authorities, centres, services and facilities of this action. The identity of the MRCC or MRSC or MRSSC where SMC functions are being performed for an incident should never be in doubt. One MRCC or MRSC or MRSSC may request another to assume the role of SMC, whenever such a change will aid the response effort.

(b) Verify the information received, if necessary and if it does not cause any undue delay.

(c) When no flight plan has been filed or, in the case of ships or other craft, no information is available on the intentions of the captain, attempt to obtain
information from which the route and times of departures and arrivals of the aircraft, ship or other craft may be reconstructed.

(d) Maintain close liaison with the appropriate ATS or CRS facility, so that, new information, such as that obtained through a communication search, verification of flight plan or review of weather information passed to the pilot before and during the flight will be available immediately for evaluation, plotting, decision making. This is also to avoid duplication of action.

(e) Plot the actual track of the craft involved, as far as it is known and the intended or estimated track beyond that point, making use of all relevant information.

(f) Conduct a communication search.

(g) For ships or other craft, send Urgency broadcast via NAVTEX and Safety NET requesting ships to keep a lookout by all means available for missing or overdue ships or other craft. Promulgate NAVAREA by notifying NAVAREA VIII coordinator.

6.6.2 Communication Search. The communication search can be conducted by two primary methods and the procedures/actions are as follows.

(a) Attempt to communicate with the aircraft, ship or other craft by radio on all appropriate frequencies.

(b) Determine its most probable location by making inquiries at aerodromes (including the aerodrome of departure) and other locations where an aircraft might have landed or at locations where a ship or other craft might have stopped or caned (including the point of port of departure) and also by contacting other appropriate sources, e.g., aircraft known or believed to be on the same route or within communication range, vessels at sea which may have sighted the ship or craft, ship reporting systems that may provide SURPICs and other persons who have knowledge of the intentions of the pilot-in-command or ship’s Captain, such as the craft’s operating authority.

(c) When the communication search or other information received indicates that the aircraft, ship or other craft is not in distress, the MRCC/MRSC/MRSSC will close the incident and immediately inform the operating agency, the reporting source and any alerted authorities, centres, services or facilities. However, if apprehension regarding the safety of the aircraft and its occupants continues, the Uncertainty phase should progress to the Alert phase.
6.7 Alert Phase Initial Actions

6.7.1 An Alert phase may be declared by a MRCC/MRSC/MRSSC or ATS unit. In case of an aircraft in distress, it can pose added difficulties. If SAR operation by aircraft is probable, the MRCC/MRSC/MRSSC may need to give an earlier alert to SAR resources or advise MRCCs along its intended route or despatch an escort aircraft, whenever possible. Upon the declaration of an Alert phase for aircraft, ships, other craft or persons, recommended MRCC/MRSC/MRSSC actions are described below.

(a) Initiate or continue any appropriate or incomplete actions normally performed during the uncertainty phase. It must be ensured by SAR Coordinator that an SMC has been appointed and that all interested parties have been informed of this action by SMC.

(b) Enter all the incoming information and progress reports, details of actions and subsequent developments in the diary of events.

(c) Verify the information received.

(d) Obtain information about the aircraft, ship or other craft from sources not previously contacted such as communication stations associated with radio navigation aids, radar facilities, direction finding stations and any other communication stations which might have received transmissions from the aircraft, ship or other craft. Request these facilities to guard the specified radio channels. Also contact all possible landing or stopping points along the intended route and other agencies and facilities included in the flight or voyage plan, which may be capable of providing additional information or verifying information on hand.

(e) Maintain close liaison with associated ATS units, CRS and similar alerting posts so that any new information obtained from other aircraft and ships will be made available immediately for evaluation, plotting and decision making and so that duplication of effort can be avoided.

(f) Plot relevant details obtained through the actions described above on an appropriate map or chart to determine the probable position of the aircraft, ship or craft and its maximum range of action from its last known position and plot the positions of any ship or craft known to be operating in the vicinity.

(g) As appropriate, initiate search planning and report any action taken to the associated ATS unit or CRS.

(h) Whenever possible, communicate all information received and action taken to the craft’s operating agency, owner or agent.

(j) Thoroughly evaluate the craft’s intended route, weather, terrain, possible
communication delays, last known position, last radio communication and operator’s qualification.

(k) For aviation incidents, estimate fuel exhaustion time and note the aircraft’s performance under adverse conditions.

(l) Request assistance from ATS or CRS facilities that may assist by passing instructions and information to the distressed craft or to the craft reporting the distress. The craft operating in the vicinity of the distress can also be informed of the nature of the emergency. Also monitor and keep the MRCC/MRSC/MRSSC informed on the progress of any craft of which the operating efficiency has been impaired to the extent that a distress is likely.

(m) When information received indicates that the aircraft, ship or other craft is not in distress, the MRCC/MRSC/MRSSC will close the incident and immediately inform the operating agency, that: reporting source and any alerted authorities, centres, services or facilities.

(n) If the craft has not been located when all efforts have been completed or if the time of an aircraft’s estimated fuel exhaustion has been reached, whichever occurs first, the craft and its occupants should be considered to be in grave and imminent danger. The alert phase should then progress to the distress phase. The decision to declare the distress phase should be taken without any undue delay and on the basis of past experience with similar situations.

6.8 Distress Phase Initial Actions

6.8.1 A distress phase may be declared by an ATS unit MRCC/MRSC/MRSSC. The SAR system may be able to respond quickly by dispatching SAR facilities and effecting the rescue. If a search is required and upon the declaration of the distress phase the MRCC/MRSC/MRSSC should take the following actions.

(a) Initiate or continue any appropriate or incomplete actions normally performed during the uncertainty and alert phase. In particular, ensure that SMC has been appointed and that interested parties have been informed of this action.

(b) Examine the detailed plans of operations for the conduct of the SAR operations in the area.

(c) Determine the availability of the SAR facilities to conduct SAR operations and attempt to obtain more facilities, if the need for them is anticipated.

(d) Estimate the position of the distressed craft, the degree of uncertainty of this position and the extent of the area to be searched.

(e) Develop a search action plan or rescue planning as appropriate, for the
conduct of the SAR operation and communicate the plan to the appropriate authorities.

(f) Initiate the action and pass relevant details of the plan to the ATS unit or CRS, for transmission to the distressed craft or to the craft reporting the distress or to the SAR resources. Also inform all the MRCCs and MRSCs along the intended route of the distressed craft as well as those whose SRRs are within the maximum radius of action as determined from the last known position (the possibility area).

(g) Amend the plan as the operation develops.

(h) Notify the State of registry of the aircraft or the owner or agent of a ship or other craft.

(j) Notify the appropriate accident investigation authorities.

(k) Request at an early stage such aircraft, vessels, CRSs or other services not specifically included among SRUs, if in a position to do so, to maintain a listening watch for transmission from the distressed craft, from survival radio equipment or from an ELT or EPIRB. Also direct them to assist the distressed craft as far as practicable and inform the MRCC/MRSC/MRSSC of any developments.

(l) Notify the distressed craft’s operating agency and keep it informed of developments.

(m) When the distressed craft has been located and the survivors rescued, the MRCC/MRSC/MRSSC will terminate the SAR operation, close the case and immediately advise the operating agency, the reporting source and any alerted authorities, centres, services or facilities as applicable.

6.9 SAR Planning Stage

6.9.1 Search planning is necessary when the location of the distressed craft is not known or significant time has elapsed since the last known position of the search object. The planning is undertaken for each search effort and repeated until either the survivors are located and rescued or evaluation of the situation indicates that further searching would be futile.

6.9.2 The SMC is responsible for developing and updating the search plan. The plan may involve a single or multiple SRUs searching for several days depending upon the updated information. Many factors influence the movement of the search objects. The SMC ascertains the impact of these factors to determine the area to search and the methods to be used, evaluates the numbers and capabilities of the available SRUs and determines the compromise between the search area size and search effectiveness as necessary. The success of the search plan depends upon the planner’s ability and judgment capabilities
and the effectiveness of the SRU. The planning involves the following steps.

(a) Evaluation of the situation, including the results of any previous searches.
(b) Estimation of the distress incident location and probable error of that estimate.
(c) Estimation of the survivors’ movements after the distress notification and probable error of that estimate.
(e) Use of these results to estimate the most probable location (datum) of the survivors and the uncertainty of that position including the probable error of that position.
(f) Determinations of the best way to use the available search facilities so as to maximise the chances of finding the survivors.
(g) Determination of search sub areas and search patterns for assignment to specific SRUs.
(h) Providing a search action plan, which includes the current description of the situation, search object description, specific search responsibilities to each SRU, on scene coordination instruction and search facilities reporting requirements.
(j) Weather forecast and period of forecast.
(k) SAR facilities on scene.

6.10 Operations Stage

6.10.1 The SAR operations stage encompasses all activities that involves the search for the distress vessel / craft / person, providing assistance and transferring to safe place on effective conduct of rescue. During this stage the SMC assumes monitoring and guidance role so as to ensure the search plan is received, understood and complied by the SAR facilities. The MRCC/MRSC/MRSSC staff will be spending most of this stage in planning searches and subsequent searches based on the updated information from the scene and on assumption the present search will be unsuccessful.

6.11 Conclusion Stage

6.11.1 SAR operations enter conclusion stage when anyone of the following occurs.

(a) The information is received that the vessel/craft/aircraft or persons reported in distress/subject to SAR incident are not in distress any longer.
The vessel/aircraft/person for whom SAR facilities were searching have been located and the survivors rescued during the operation.

During the distress phase the SMC determines that further search would be of no avail because the area has been adequately searched and all the probability areas have been thoroughly investigated or when there is no longer any reasonable probability of survivor being located.

6.12 Responsibilities of MRCC/MRSC/MRSSC

6.12.1 Typically, an MRCC/MRSC/MRSSC will receive a distress alert and assume responsibility for SAR co-ordination for that incident. However, there may be times when the first MRCC/MRSC/MRSSC to receive the distress alert will not be the responsible MRCC/MRSC/MRSSC, such as when the distress is in another SRR. There should be no undue delay in initiating action while determining the responsible MRCC/MRSC/MRSSC. The following paragraphs provide guidance on the responsibilities of that MRCC/MRSC/MRSSC.

6.12.2 When Position of Aircraft, Ship or Craft is Known. Any MRCC/MRSC/MRSSC receiving an alert should assume responsibility until coordination with other MRCC/MRSC/MRSSC takes. Place and the appropriate MRCC/MRSC/MRSSC assume the responsibility. When the position of the distressed craft is known, the responsibility for initiation of a SAR operation will be that of the MRCC or MRSC or MRSSC in whose area of jurisdiction the craft is located. When the MRCC or MRSC or MRSSC recognises that the distressed craft is continuing its flight or voyage and may leave the SRR for which he/it is responsible, it should take the following actions.

(a) Alert the concerned MRCCs/MRSC/MRSSC associated with the planned or intended route of the distressed craft and pass on all information.

(b) Continue coordination of the SAR operation until it has been notified or confirmed by the adjacent MRCC or MRSC or MRSSC that the distressed craft has entered its SRR and that it is assuming responsibility. When transferring the SAR operation to another MRCC or MRSC or MRSSC, the transfer should be documented in the MRCC/MRSC/MRSSC Diary of events and Operations log book.

(c) Remain ready to assist until informed that assistance is no longer required.

6.12.3 Position of Ship, Other Craft or Aircraft is not Known. When the position of the distressed craft is unknown, the MRCC or MRSC or MRSSC, should assume responsibility for SAR operation and consult MRCCs/MRSC/MRSSC along the route of the craft concerning which MRCC/MRSC/MRSSC will assume primary responsibility and concerned SAR coordinator will designate an SMC. Unless otherwise agreed among the
MRCCs or MRSCs/ MRSSCs concerned, the MRCC or MRSC or MRSSC assuming responsibility should be determined as follows.

(a) If the last reported position of the distressed craft falls within an SRR, the MRCC or MRSC or MRSSC responsible for that SRR should assume responsibility for coordinating the response and the SAR operation.

(b) If the last reported position falls on the line separating two adjacent SRRs, the MRCC or MRSC or MRSSC responsible for the SRR towards which the distressed craft was proceeding should assume SAR coordination responsibilities.

(c) If the craft was not equipped with or not under obligation to maintain two-way radio communication, the MRCC or MRSC or MRSSC responsible for the SRR containing distress craft intended destination should assume coordination responsibilities.

6.13 Training, Qualification and Certification

6.13.1 Training and experience are crucial to proper SAR response and effective conduct of the operations. Officer-in-Charge (Oi/c) MRCC/SMCs and MRCC/MRSC/ MRSSC staffs need specific training in watch keeping, coordination of assorted resources, search planning and rescue planning. SAR co-ordinator have the responsibility to ensure that the overall training programme is effective. It wills normally be the responsibility of the Officer-in-Charge (Oi/c) MRCC to ensure that all SAR service personnel reach and maintain the required level of competence. Training in itself can provide only basic knowledge and skills. Qualification and certification processes are to be ensured, so that, sufficient experience, maturity and judgments are gained. During a qualification process, the individual must, by demonstration of abilities, show mental and physical competence to perform as part of a team.

6.14 Position of Distress outside Indian SRR

6.14.1 When the MRCC / MRSC / MRSSC receives distress information and on plotting if it is continued outside Indian SRR, it should be immediately notified to the appropriate SAR authority of that country / MRCC or MRSC or MRSSC and should take all necessary actions to coordinate the response until the appropriate MRCC / SAR authority of that country assumes the responsibility. The procedures to transfer SMC responsibilities to another MRCC of concerned country should include the following.

(a) Person to person discussion between the SMCs of both MRCCs/SAR authorities concerned is essential.

(b) The initiating MRCC/SAR coordinating authority may invite the concerned MRCC / SAR authorities to take over the responsibility or the other MRCC/SAR
authority may offer to take over responsibility.

(c) Responsibility is retained by the initiating MRCC /SAR coordinating authority until the other MRCC /SAR authority formally accepts responsibility.

(d) Full details of action taken are to be passed between two MRCCs/SAR authorities.

(e) Relay distress to concerned MRCC/SAR authority with copy to vessel distress/company/owner for coordinating further SAR operation.

(f) The distress relay to contain all available details of vessel.

(g) In case of aircraft in distress the same is to be intimated to the appropriate ATS/ FIR authorities also.

(h) Transfer of SMC responsibility recorded by both SMCs in the MRCC operations log and diary of events and all involved SAR facilities are advised of the transfer.

(j) In case of aircraft in distress the same is to be intimated to the appropriate ATS/ FIR authorities also.
CHAPTER 7

SAR PLANNING
CHAPTER – 7

SAR PLANNING

7.1 Plans of Operation

7.1.1 Each MRCC/MRSC/MRSSC is responsible for preparing comprehensive plans for the conduct of SAR in its SRR and for coordinated actions within adjacent SRRs. Plans are intended to be valuable aids for time, critical search planning and SAR coordination processes. Each MRCC/MRSC/MRSSC has plans that meet the requirements of applicable international SAR manuals. It covers all the emergency scenarios likely to occur within the SRR. These plans are reviewed and updated regularly. The International Aeronautical and Maritime Search and Rescue Manual for Mission Coordination contain an outline of plans of operation.

7.2 Search Planning (SP)

7.2.1 Search Planning is necessary when the location of a distress is not known, or sufficient time has passed since the search object’s position was last known: The SMC is responsible for developing and updating an effective search plan. The plan may involve single SRU or many SRUs searching for several days.

7.2.2 Search Planning consists of determining datum (the most probable location of the search object corrected for drift) and search area, developing an attainable search plan, selecting search patterns, planning on scene coordination, transmitting the search plan to OSC/SRUs and reviewing the search plan.

7.3 Search Planning Methods

7.3.1 Methods used in search planning depend on incident complexity and available planning capabilities. For complex incidents, sophisticated computer programmes can aid in data analysis, and are preferred if initial information is incomplete or conflicting, many variables exist, or searching continues for, more than one day. For less complex cases, or if computer aids are not available, a manual method can be used.

7.4 Datum

7.4.1 The most probable location of the search object, corrected for movement over time, is known as datum. Determining datum begins with the reported position of the incident. Unless a distressed craft or individual immobilized, as in a boat grounding or a debilitating physical injury, the actual position of the target during the search may be substantially different form the initial position. Therefore, possible movement of the
search object should be accounted for when calculating datum. Datum should be recomputed periodically as drift forces continue to affect the position of the target. Recomputed datum are usually labeled sequentially (e.g. Datum1, Datum2, Datum3 etc) with time of calculation noted. The following factors should be considered.

(a) Reported position and time of SAR incident
(b) Time interval between the incident and arrival of SAR facilities.
(c) Any supplementary information such as DG bearings or sightings.
(d) Estimated surface movements of distressed crafts catering for drift (leeway and water current)
(e) Drift direction and speed is the vector sum of leeway and total water current.

7.5 Initial Position

7.5.1 The location where the initial position occurred is called the initial position. To compute datum, the time and the location of the search object’s last reliable position are first considered. This will determine the type of datum to be computed. One of the three situations usually exists, based on the initial information

(a) Position Known. The incident is witnessed or reported by craft in distress or CRS or other craft or position is computed from a previously reliable position. If the position of the craft is known, drift is determined and datum is computed.
(b) Track Known. The intended track is known but the position along the track is unknown, or a single line of position, such as a DF bearing, is obtained. If only the proposed track is known, a datum line, a known proposed track corrected for drift, can be established.
(c) General Area Known. Neither the position nor the intended track is known, but the general area the target was probably in, such as lake, a military exercise area, or an offshore fishing ground, is known. In this case, a datum area is developed. Datum area computations depend on many factors, such as fuel endurance, natural boundaries, and known or suspected areas of occupancy.

7.6 Computation of Datum

7.6.1 Drift is movement of a search object caused by external forces. Datum is calculated by determining which drift forces will affect the search object, selecting the most appropriate ones and calculating a vector for each.
7.6.2 The SMC should determine which environmental forces affected the search object during and after the incident:

(a) For marine incidents, currents and winds
(b) For aircraft, primarily wind
(c) For lost persons, terrain and met conditions

7.6.3 The SMC should attempt to quantify each force affecting the drift, which is best done by vector, with bearing and length of the vector representing target direction and speed respectively. Surface drift forces that act on the target are plotted as shown in the figure below.

7.7 Aerospace Drift

7.7.1 Aircraft Glide. The maximum ground distance that an aircraft could cover during descent, should be determined if the position and altitude of an aircraft engine failure are known and crew bailout is doubtful. Aircraft glide ratio and rate of descent should be obtained from the parent agency or aircraft performance manual. The SMC can then determine maximum ground distance covered during descent and establish the possible area of impact after adjusting for wind’s.

7.7.2 Parachute Drift. Parachute drift (dp) is the combination of parachute glide ratio and displacement due to winds aloft. Opening altitude, parachute type, and glide ratio, as well as average winds aloft and terrain height, should be considered when computing dp. The figure below shows a vector solution to a wind aloft problem where bailout and parachute opening altitude are 8000 ft and the landing is at sea level. Wind values for 2000, 4000, and 6000 feet are used twice for winds from 7000 to 5000 feet, to 3000 feet and to 1000 feet respectively. Next the parachute drift due to average wind is determined, using the parachute drift distance, which is plotted to determine the surface position.
### 7.8 Maritime Drift

#### 7.8.1 Leeway (LW)

Leeway (LW) is the movement through water caused by winds blowing against the exposed surfaces of the search object. The pushing force of the wind is countered by water drag on the underwater surface. Most marine craft have a portion of the hull and superstructure (sail area) exposed above the water. The more sail-area the search object has, the greater the wind force on the object. Completely submerged objects and persons floating in the water are assumed to have no leeway. The SMC should get information on the physical characteristics of the search object to determine the amount of leeway.

#### 7.8.2 Leeway Direction

Leeway direction is subject to large variations. It is usually assumed to be downwind, with divergence compensated for by extending the search areas to the right and left of downwind.

(a) The maximum angles off downwind are 45 deg for craft with moderate to deep draft, 60 deg for craft with a relatively shallow draft, and 35 deg for rubber rafts.

(b) Circular rafts with underwater portions symmetrical about vertical axes through the center of the raft are considered a special category with a maximum leeway angle about 15 deg either side of downwind. Circular rafts with a deep ballast system fall into this category, while rafts with asymmetrical ballast pockets to not. The category should not be assumed if doubt about raft type exists.

#### 7.8.3 Sea Current

Sea Current is the residual current when currents caused by tides and local winds are subtracted from local current. It is the main large-scale flow of ocean waters.

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### A. Winds Aloft Data

<table>
<thead>
<tr>
<th>Specified Altitude</th>
<th>Effective Range</th>
<th>Direction / Velocity</th>
<th>Vector Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>8000</td>
<td>5000</td>
<td>270/30</td>
<td>090/30</td>
</tr>
<tr>
<td>6000</td>
<td>7000</td>
<td>300/25</td>
<td>120/50</td>
</tr>
<tr>
<td>4000</td>
<td>5000</td>
<td>330/25</td>
<td>150/50</td>
</tr>
<tr>
<td>2000</td>
<td>1000</td>
<td>000/23</td>
<td>180/46</td>
</tr>
<tr>
<td>Sea Level</td>
<td>5000</td>
<td>045/44</td>
<td>225/44</td>
</tr>
</tbody>
</table>

*Note: The vector values for 6000, 4000 and 2000 represent a range of 2000 feet each. Therefore, the total number of vectors for 1000 feet intervals.*

### B. Vector

- **Resultant Vector:**
  - 335/160 Knots
  - Average Wind Direction: 335
  - Average Wind Velocity: 160
- **Vector Solution:** 335/20 Knots

### C. Parachute Drift

- **Parachute Opening Position:**
  - 150 Knot. 50 Nautical M.
Near shore or in shallow waters, sea current is usually less important than the tidal current or the local wind-driven current. The strongest sea currents exist near the edge of the continental shelf and are usually referred to as boundary currents. Sea currents are driven by the energy of large-scale wind systems and the interaction of ocean water masses of different densities.

7.8.4 **Wind Current** or wind-driven current is generated by the wind acting on the water surface over a period of time. As a wind blows over water, it causes horizontal water movement that grows with wind speed and duration. Two methods can be used to calculate the wind current vector. The first uses the wind history and forecasts for the incident area. The second uses historical data or local knowledge of wind currents. Wind currents need not be computed for coastal, lake, river, or harbour areas, but should be determined for water depths greater than 100 feet (30 meters) and distances greater than 20 miles (32 Kilometers) from shore.

**7.9 Other Water Current**

7.9.1 Other water Currents affecting search objects are usually difficult to calculate

7.9.2 **Lake current** (LC) information usually comes from the local knowledge, charts, or computer models

7.9.3 **River current** (RC) information can usually be obtained from published data, local knowledge or direct observation. Current data is published for most large rivers.

7.9.4 **Bottom Current** (BC) should be considered in underwater incidents. BC is usually not strong enough to move a sunken object, including a body.

7.9.5 **Swell/Wave Currents** (SWC) may, in the absence of winds, affects rafts and other small marine craft. SWC is usually slight and is generally discarded.

7.9.6 **Total Water Current** (TWC) TWC is the vector sum of currents affecting the search object. The best information on total water current is usually obtained from a Datum Marker Buoy (DMB)

**7.10 Minimax Solution**

7.10.1 When one or more of the drift variables cannot be accurately determined; the minimax solution can be used. It is usually used in ocean search planning when drift time or speed of the object is unknown.
7.10.2 A minimax solution might be used if there is any doubt about the following information

For aircraft:
(a) Altitude of parachute opening
(b) Point along a DR track

For Maritime Situations:
(a) Time a craft has been adrift
(b) Time local winds shifted
(c) Direction or speed of a drifting object.
(d) Only known factor is the direction of a flare sighting

---

7.11 Search Area

7.11.1 The search area is the geographic area determined by the SMC as most likely to contain the search object. The amount of error inherent in the drift calculations and the navigational capabilities of the distressed craft and SRU are used to calculate a search Radius (R), cantered about datum, for the search area. The radius is normally limited by the maximum distance the search object could travel after the incident.

7.11.2 For areas such as large lakes, rivers, sounds, bays, or other coastal areas, the search area may depend on physical restrictions and time required to respond.
(a) When response times are short, the SMC may use a standard radius, adjusted for physical surroundings. In areas where a search can begin in less than 6 hours, a radius of 6 nautical miles is usually large enough to include most targets.
Expanding the area based on drift calculations may place a large part of the area ashore or move datum into the ocean. If the SMC determines the target probably has moved into Open Ocean, and the standard radius may not apply, additional planning may be needed.

7.12 Total Probable Error

7.12.1 Total Probable Error (E) is a mathematical tool for determining search area based on the probable errors in estimation of drift (D), initial position of the incident (X), and navigational capability of the SRU (Y).

7.12.2 Total Drift Error (D) accounts for errors in estimating drift and is used when determining E. It is the arithmetic sum of the individual drift errors from the time of the incident until datum.

(a) Individual. Drift Error (d) should be computed for each datum and is assumed to be three-tenths of total drift. Errors less than one mile are disregarded. When the first datum is computed, 0 equals d on the first search plan. However, as the mission progresses, 0 becomes d1, plus d2, etc.

(b) Drift Errors for datum minimax calculations are determined by graphical or algebraic solutions.
7.13 Search Radius

7.13.1 The search radius \( r \) is the radius of a circle centered on a datum, having a length equal to \( E \) plus an additional safety length to help ensure that the target is in the search area. For ground and underwater searches, \( R \) is measured in yards. On other searches, \( R \) is measured in nautical miles. \( R \) is usually increased after successive searches to increase the chance of the target being in the search areas. Table below lists Safety Factors (fs) used sequentially to gradually enlarge the search area.

<table>
<thead>
<tr>
<th>E</th>
<th>Rs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>1.1</td>
</tr>
<tr>
<td>2nd</td>
<td>1.6</td>
</tr>
<tr>
<td>3rd</td>
<td>2.0</td>
</tr>
<tr>
<td>4th</td>
<td>2.3</td>
</tr>
<tr>
<td>5th</td>
<td>2.5</td>
</tr>
<tr>
<td>Subsequent Searches</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Search Radius Safety Factors

7.14 Search Area Development

7.14.1 Theoretically, the best search area is a circle centered on datum. However, few search patterns are adaptable to circular search areas. For most patterns, a square or rectangular search area is more. The ends of the area are squared off with tangent lines as illustrated in Figure below.

![Diagram of search area development](image)

**Notes:**
1. **DRIFT IS EXAGGERATED**
2. **POINTS a, b, c, d ARE DATUM POINTS FOR DR Positions CORRECTED FOR DRIFT**

7.14.2 For a search with little or not drift, search area is constructed around a stationary datum. It the target is not found, the areas may be expanded for subsequent searches. Therefore, the area around datum, which continues to be the most probable location, is searched repeatedly.
7.14.3 For maritime incidents, datum will normally move during the search, as Figure below illustrates.

7.13.4 The enlargement of the search area for a moving datum is the same as for a stationary datum, but the area is centered on a new datum so that the water surface is re-searched where survivors are most likely to be.

7.15 Planning and Conduct of Search

7.15.1 The selection and orientation, of a search pattern are very important and all pertinent factors should be considered before a selection is made. Search patterns and their directional orientations should meet the criteria listed below.

(a) They should be appropriate for the following.
   (i) Degree of uncertainty in the search object’s position.
   (ii) Navigational capabilities of each search facility.
   (iii) Type of sensors being employed.
   (iv) Primary type of search objects or signals the search facility in attempting to detect and locate.
   (v) Environmental conditions.
   (vi) Direction and rate of the search object’s predicted movement during the search.
   (vii) Time limits imposed by the survivors’ expected survival time, search facility endurance and availability of daylight.

(b) It should be within the operational capability of each available SRUs so as to accurately and safely complete their assigned search pattern.
(c) The expected result should be worth the estimated time and effort.

(d) The selected search patterns should minimise the risk of collision with other SRUs in the area, allow adequate fuel reserves and avoid navigation hazards, wherever practicable.

(e) Close attention should be paid to air traffic in the area of the search. Normally more than one aircraft should not be assigned to the same search sub area simultaneously. Multiple aircraft operating together in the same search sub area distracts aircrew attention from the search and decreases the flexibility to respond to sighting of survivor/wreckage or drop markers, flares, rafts, etc. This does not preclude an electronic search from taking place at high altitude, while a visual search is done at a lower level. In fact, the pilot-in-command of an aircraft doing an electronic search may be an excellent choice for On Scene Coordinator or may be assigned as Aircraft Coordinator when multiple aircraft are involved.

(f) It is likely that an EPIRB/ELT may be available in the distressed craft or survival craft or being carried in person by the survivor. In such a case an electronic search using an appropriate pattern should be carried out by a fast aircraft flying at a high level, while a visual search can be carried out at a lower level or on the surface.

(g) Search patterns coordinated between air and surface facilities offer a number of advantages. For example, the surface facility can act as an excellent navigational and reference datum for the search aircraft, particularly during maritime searches far offshore. The airborne SRUs can be directed towards the survivors as soon as they are located. The surface SRUs can keep the aircraft informed of weather and other conditions at the scene and may relay progress reports for the aircraft. The surface SRUs can assist the crew of the search aircraft, should a forced landing be necessary.

7.16 Search Action Plan

7.16.1 After an attainable search plan is developed; a search action plan is formulated for accomplishment by the OSC and SRUs on scene in form of search action message. The message should include the situation, summary of the incident, search areas, search facility assigned including the description of the search object. The message can be modified and amended later depending upon the receipt of further information. The essential components of the search action plan should have the following details.

(a) **Situation.** This includes brief description of incident, position and time, details of the search object, number of persons onboard, primary and secondary search objects, if any, number and type of survival equipment, weather on scene, forecast and period of forecast and SRUs on scene with endurance.

(b) **Search area.** This portion gives the corner points of the area established
and other associated data including sub areas. The OSC may be authorised by the SMC to alter the search action plan based on scene consideration.

(c) **Execution.** This section gives the details of the type and number of search facilities on scene, parent agency, pattern of search, creep direction, commence search point and altitude for aircraft SRUs.

(d) **Coordination.** This includes the details of designated SMC and OSC, SRUs, track spacing and desired coverage factor, special instructions for OSC, airspace reservations, aircraft, safety instructions, change of operational control of SRUs if required, parent agency relief instructions and authorisation of non SAR aircraft in the area.

(e) **Communication.** This describes assigned frequencies for the mission, on scene channels, frequencies to be monitored and methods of identification of OSC and SRUs.

(f) **Reports.** Requirements/periodicity of OSC/SRU report, report of on scene weather and progress of the mission, any other SITREP information, details of sorties/hours flown by the aircraft and area searched with result are included in this section. The designed SMC must give periodical records to NMSARCA and keep updating Director (SAR)/ SAR Coordinator on development of situation.

### 7.17 Situation Reports (SITREPS)

7.17.1 Situation Reports (SITREPS) are used to pass information about a particular SAR incident. MRCCs shall use them to keep CGHQ, other MRCCs, MRSCs, MRSSCs and appropriate agencies informed of cases which are of immediate or potential interest. The On Scene Co-ordinator (OSC) shall use SITREPS to keep the co-ordinating MRCC aware of mission events. Search facilities use SITREPs to keep the OSC informed of mission progress. The following procedures may be adopted for SITREPS :-

(a) The OSC shall address SITREPs only to the Co-Ordinating MRCC unless otherwise directed.

(b) The Co-ordinating MRCC shall address SITREPs to as many agencies as necessary, including CGHQ, MRCCs and MRSCs to keep them informed. SITREPs prepared by an co-ordinating MRCC should include a summary of information received from OSCs.

(c) A short SITREP may be used to provide the earliest notice of an causality or to pass urgent details when requesting assistance. Complete SITREP will be used to pass amplifying information during SAR Operations. Initial SITREP will be used to pass amplifying information during SAR operations. Initial SITREP
should not be transmitted as soon as details of an incident become clear and should not be delayed unnecessarily for confirmation of all details.

7.17.2 The initial SITREP should be transmitted by the SMC to SAR coordinator and NMSARCA as soon as details of incident become clear enough on the SAR system involvement and when information is received from OSC/SRUs. It is not to be delayed unnecessarily for confirmation of all the details. The subsequent SITREPs are released when important new developments occur and at least once a day or as directed. The complete SITREP format is used to pass information in amplified manner or to pass information to the authorities of the craft in distress. A short SITREP can also used to provide earliest notice of a casualty or to pass urgent details when requesting assistance. The SITREP format should be as per the policy letters promulgated by NMSARCA / SAR coordinator on this subject. However, the SITREP message should generally contain the following information.

(a) **Identification.** This section contains the subject, SITREP number, and identification of the distressed vessel/craft and brief description of the emergency. The SITREP should be sequentially numbered throughout the entire case during an operation. When the OSC is relieved on the scene the new OSC continues the SITREP numbering sequence.

(b) **Situation.** This part covers the description of the case, the conditions that affect the case including on scene weather, any amplifying information as required. After the first SITREP, only changes to the original reported situation need to be included.

(c) **Action Taken.** This portion comprises a complete report of all actions taken since last report, including the results of such actions, number of sorties/hours flown by the aircraft during the search and compilation of the search efforts by all SRUs. In addition, when the search is unsuccessful, the report should also include the areas searched.

(d) **Future Plans.** This section contains descriptions of the actions planned for future execution, including any recommendations and if necessary, request for additional SRUs/any other assistance.

(e) **Case Status.** This is used only on the final SITREP message whenever the case is closed or when active case is suspended pending further developments or when suspended. SMC should recommend to SAR coordinator on suspension of SAR ops when there is no longer reasonable chance of success. On receipt of recommendation from SMC, SAR coordinator may suspend SAR case or direct to SMC to continue SAR efforts depending on prevailing situations.

7.17.3 The SITREP format which is being adopted internationally and intended for use is placed at Appendix “N”.

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CHAPTER 8

SEARCH TECHNIQUES AND OPERATIONS
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SEARCH TECHNIQUES AND OPERATIONS

8.1 Search Techniques

8.1.1 The search patterns described below are arranged in the three general categories namely visual search patterns, electronic search patterns and night search patterns. The most commonly used search patterns are generally carried aboard all merchant vessels. It is imperative that a record of the areas searched be kept safe for future analysis. The crew of search facilities should plot actual search coverage as tracks are flown or covered. The method of doing this is to shade or cross hatch the areas searched and to outline the areas not searched on the chart of the appropriate scale. This information must be reported back to the SMC so that the search may be evaluated, probability charts and probabilities of success updated and the next search be planned.

8.2 Visual Search Patterns

8.2.1. The various types of visual search patterns include sector search, expanding square search, track line search, parallel sweep search, creeping line search, creeping line coordinated search and shoreline search. The details of the visual search patterns are given in succeeding paragraphs. The height of the SRU aircraft is also a considering factor while planning the search. The other factors affecting the visual range are given below.

(a) Condition of light.
(b) Colour, aspect, size and speed of the object.
(c) Sea state and weather in the area.

8.2.2 Sector Search. Sector searches are most effective when the position of the search object is accurately known and the search area is small. Examples of this situation include a crewmember seeing another crewmember fall overboard from a ship or a reported distress position from a craft known to have very accurate navigational capability. Sector searches are used to search a circular area centered on a datum point. They are easy to navigate and provide intensive coverage of the area near the centre, where the search object is most likely to be found. Due to the small area involved, sector search must not be used simultaneously by multiple aircraft at the same or similar altitudes or by multiple vessels. An aircraft and a vessel may be used together to perform independent sector searches of the same area.
8.2.3 A suitable marker (for example, a smoke float or a radio beacon) may be dropped at the datum position and used as a reference or navigational aid marking the centre of the pattern. Each search leg should then pass the marker at close range or directly overhead. When the sector search is used over a marker at sea, adjustment for the effects of total water current on the search object’s motion during the search is automatic. This makes such sector search patterns an excellent choice for search objects, such as persons in the water, which have little or no leeway. For aircraft, the search pattern radius usually lies between 5 NM and 20 NM. The angle between successive search legs will depend on the radius used and the maximum track spacing at the ends of the search legs. For vessels, the search pattern radius is usually between 2 NM and 5 NM and each turn is 120°. Normally, all turns in a sector search are made to starboard. If the search object is not located by the time the sector search pattern has been completed one time, it should be rotated and repeated with the second set of search legs, falling half-way between the search legs followed during the first search, as indicated by the dashed search legs in the above figure.

8.2.4 Expanding square Search. The expanding square search pattern is also most effective when the location of the search object is known within relatively close limits. The Commence Search Point (CSP) for this pattern is always the datum position. The pattern then expands outward in concentric squares as shown in the figure, providing nearly uniform coverage of the area around the datum. If the datum is a short line instead of a point, the pattern may be changed to an expanding rectangle. Due to the small area involved, the same cautions about the use of multiple SRUs as previously mentioned for the sector search also apply to the expanding square pattern. The pattern of the expanding square
Expanding Square Search

8.2.5 The expanding square pattern is a precise pattern and requires accurate navigation. To minimize navigational errors, the first leg is usually oriented directly into the wind. The lengths of the first two legs are equal to the track spacing and the lengths every succeeding pair of legs is increased by another track spacing. For successive searches in the same area, the direction of the search legs should be changed by 45 degrees as shown in the figure below.

8.2.6 Expanding square patterns are often appropriate for vessels or small boats to use when searching for persons in the water or other search objects with little or no leeway as compared to the magnitude of the total water current. In such cases, it may be appropriate for the vessel or small boat to navigate the pattern by careful dead reckoning rather than by precise electronic or visual navigation. Just as a sector search pattern automatically compensates for total water current when using a floating marker as a navigational reference, a vessel’s DR navigation of an expanding square also automatically compensates for the effects of total water current.
8.2.7 **Track Line Search.** The track line search pattern is normally employed when an aircraft or vessel has disappeared without a trace while en route from one point to another. It is based on the assumption that the distressed aircraft has crashed, made a forced landing or in distress on or near the intended route and concentrates the search effort near this datum line. It is usually assumed that the survivors are capable of attracting the search facility’s attention at a considerable range by some means such as a signalling minor or coloured smoke by day, flares, flashing light or signal fire by night or electronic beacon by day or night.

8.2.8 The track line search consists of a rapid and reasonably thorough search along the intended route of the distressed craft. The search facility may search along one side of the track line and return in the opposite direction as shown in the figure. It may also search along the intended track and once on either side, then continue on its way and not return, as shown in the figure. Due to their high speed, aircraft are frequently employed
for track line searches, normally at a height of 1000 ft to 2000 ft above the surface during daylight or at 2000 ft to 3000 ft at night. This pattern is often used as an initial search effort because it requires relatively little planning and can be quickly implemented. If the track line search fails to locate the survivors, then a more intensive search over a wider area should be undertaken.

![Track of Search, Return (TSR)](image)

8.2.9 Aircraft and ships planned to follow the same or a similar route, as that of the missing craft should be asked to divert to assist in the search. This will mean diverting to follow the distressed craft’s most probable route or a nearby Parallel course. When multiple facilities are requested to assist in this manner and especially if they are moving in opposite directions, the search planner must ensure that all facilities are aware of the presence of the others. The OSC must also ensure that the SAR facilities moving in opposite directions should not follow exactly the same track on opposite headings.

8.2.10 For an aircraft SRU, track line searches should be regarded as additional to searches by SAR facilities with trained crew. While planning an en route aircraft, it must be remembered that the aircraft may not have sufficient endurance and would be operating at higher levels/speeds and also above clouds rather than at optimum search heights and speeds.

8.2.11 **Parallel Sweep Search.** The parallel sweep search pattern is normally used when the uncertainty in the survivor’s location is large, requiring a large area to be searched with a uniform coverage. A parallel sweep search pattern covers a rectangular area. It is almost and always used when a large search area must be divided into sub-areas for
assignment to individual search facilities, which will be on scene at the same time and is most effective when used over water.

8.2.12 To perform a parallel search pattern, the search facility proceeds to the CSP in one corner of its assigned sub-area. The CSP is always one-half track space inside the rectangle from each of the two sides fanning the corner. The search legs are parallel to the long sides of the rectangle. The first leg is set at a distance equal to one-half the track spacing from the long side nearest the CSP. Successive legs are maintained parallel to each other and one-track spacing apart as shown in the figure.

8.2.13 A parallel sweep search covering a single sub area is normally performed by a single SRU aircraft. The use of multiple aircraft working together in the same search sub area at similar altitudes is discouraged. However, there are cases where multiple facilities may be used to great advantage. Similarly, en route aircraft may be asked, via the appropriate ATS unit, to divert through the search area along parallel tracks while listening for signals from an emergency beacon. However, for safety reasons, use of enroute light aircraft on VFR flight plans for visual search as in the case of vessels is not recommended.

8.2.14 Ships, fishing vessels, etc., which may be passing through or near the search area may be asked to divert along specific parallel tracks passing through the search area, as shown in the figure, while maintaining a sharp lookout for the survivors. This type of search can be both effective and efficient.
8.2.15 **Parallel Sweep Search Based on Distance Measuring Equipment.** The parallel sweep search can be undertaken based on Distance Measuring Equipment if available onboard the aircraft SRU. This pattern of search can be flown only within close radius and limited range of the airfield preferably located along the coastline, which is equipped with DME station. The pattern of the search is as shown in the figure.

8.2.16 **Creeping Line Search.** The creeping line search pattern is basically the same as a parallel sweep search except that the search legs are parallel to the short sides of the rectangle instead of the long sides. Because the creeping search pattern requires many more turns to cover the same area, it is usually not as efficient as the parallel search pattern, unless it is used by an aircraft working in coordination with a vessel.
8.2.17 **Coordinated Creeping Line Search.** A coordinated air maritime creeping line search is usually accomplished by coordinating the movement of an aircraft flying a creeping line search with those of a vessel moving along the major axis of the search area in the direction of the aircrafts creep. The aircraft’s search legs are flown at right angles to the vessel’s track. The vessel’s speed, the aircraft’s speed, the length of the aircraft’s search legs and the track spacing are all planned so that the aircraft’s advance in the direction of creep equals the speed of the surface facility. When correctly performed, the aircraft should pass directly over the vessel at the centre of each search leg, as shown in the figure. If the fixed wing aircraft is used as SRU, the length of the long legs covered by aircraft SRU will be more to compensate with the surface SRU, which has limited speed. Therefore, it is recommended to use a helicopter as an aircraft SRU for coordinated creeping line search, which has less speed compared to fixed wing aircraft, so that the length of long legs are limited.
8.2.18. The relationship among the speed of the surface facility, the aircraft’s speed, the track spacing and the length of the search legs is defined by the following equation.

\[ V_s = \frac{8 \times V_a}{L + 8}, \]

Vs is the speed of the surface facility in knots, S is the track spacing in nautical miles, Va is the aircraft’s true air speed (TAS) in knots and L is the length of the aircraft’s search leg in nautical miles.

8.2.19 Shoreline Search. Shoreline search is carried out by using small vessels or aircraft capable of safely flying at low altitudes and speeds. They are normally used in order to pass close enough to the shoreline to permit careful inspection, which cannot be undertaken by surface SR Us due to limitations of depth. Vessels engaged in shoreline searches must be aware of navigational constraints and any limitations imposed by sea conditions. SAR personnel on scene should consider the possibility of survivors clinging to navigational aids such as buoys or to rocks offshore. Survivors may make their way ashore if they drift close enough. Survivors may also anchor their boat or raft or tie it to an offshore navigational aid if they drift into shallow water but still cannot see land or believe that they cannot make it to shore unaided. Search facilities should pay special attention to any such possible places in their sub areas where the survivors may have succeeded in arresting their drift.

8.3 Electronic Search Patterns

8.3.1 The types of the electronic search patterns include the EPIRB/ELT search and radar search. These patterns are briefed in the succeeding paragraphs.

8.3.2 EPIRB/ELT Search. When it is known or believed that an aircraft vessel or persons in distress are equipped with an EPIRB/ELT, an electronic search at high level should be initiated immediately, whether or not any message has been received via the COSPAS-SARSAT system. In addition to EPIRBs operated by survivors, many aircraft carry ELTs that start operating when the G-forces reach a certain level, such as in a crash. The electronic search should not preclude the initiation of a visual search at lower levels since the success of an electronic search depends on the ability of the survival beacon to transmit a signal.
8.3.3 The sweep width in an electronic search should be estimated based on horizon range for the level chosen for the search, since most emergency beacons operate on frequencies that may be received only by line-of-sight. However, if the probable detection range is known and is less than the horizon range, it should be used instead. When the probable detection range of a survival beacon is not known, the estimated sweep width over the sea should be about one-half of the horizon range.

8.3.4 Normally, a parallel sweep or creeping line pattern should be employed for EPIRB/ELT searches. The detection profiles for electronic searches are likely to be different from those of visual search. If the initial search of an area does not locate the beacon, the area should be searched again with the search legs of the second pattern oriented at right angles to those of the first pattern. If the beacon remains unlocated but confidence is high that it is in the area and working, a third search with search legs parallel to those of the first search but offset by one-half of the track spacing may be considered. One of the following procedures may be used to locate an EPIRB/ELT once it has been detected.

(a) For search facilities with homing capability, the search facility homes on the survival beacon as soon as the signal is detected. The EPIRB/ELT signal may be picked up quickly if the SRU proceeds towards the datum point where the search object location probability density is the highest. If this is unsuccessful, a systematic search of the area will have to be made, using the sector, expanding square, parallel sweep or creeping line search pattern with a track spacing based on the optimal value for the available search effort.

(b) For aerial electronic search by a facility without homing capability, a radio frequency signal from a survival beacon is detected and converted electronically to an audible sound which at least one member of the search facility crew can hear via a speaker or earphones. The following procedures are normally used only by the SRU aircraft.

(i) In a map assisted aerial electronic search, the aircraft flies a “boxing in” pattern on the assumption that the area of equal radio signals strength is circular. The position of the aircraft is plotted on an appropriate map or chart as soon as the signal is heard for the first time. The pilot continues on the same heading for a short distance, then turns 90 degrees left or right and proceeds until the signal fades. This position is noted. The aircraft now turns 180 degrees and once again the positions of where the signal is heard and where it fades are plotted. The approximate position of the survival beacon can now be found by drawing lines between each set of “signal heard” and “signal faded” positions, then drawing the perpendicular bisectors of each line and noting the position where they intersect. The aircraft can then proceed to that position and descend to a suitable altitude.
for visual search. The construction of such a plot is shown in the figure below.

Map assisted aerial Search

(ii) With the time assisted aerial electronic search, the time when the signal is first heard is noted. But the aircraft continues on the same heading until the signal fades, when the time is noted again and the length of time during which the signal was heard is computed as the difference between the two. The aircraft then performs a 180 degrees procedure turn and returns along its original track in the opposite direction for half the amount of time just computed. At that point, the aircraft turns 90 degrees right or left and continues until; the signal fades. The aircraft then makes another 180 degrees procedure turn and the time when the signal is heard again is noted. The aircraft continues on that heading until the signal again fades, noting the time and computing the signal’s duration as the difference between the two times. The aircraft then performs a third 180 degrees
procedure turn and proceeds in that direction for one half of the last computed signal duration. It then descends to an appropriate altitude for visual search.

An en route aircraft may be very helpful and should be requested to listen on the survival beacon’s 121.5 MHz alerting or homing frequency and report the positions where the signal is first heard and where it fades. The figure illustrates the geometry of this procedure.

8.3.5 Radar Searches. Radar is primarily used in maritime search. The sweep width considered in computing the optimal search area will depend on the type of radar, height of the antenna, amount of environmental clutter and noise, radar cross section of the search object, radar beam refraction due to atmospheric conditions and operator ability. It should be noted that when the wave height increases to above one to three-six feet, the probability of detecting a small search object rapidly decreases for most radar and, consequently, so does the sweep width. For an aircraft, the search altitude used should normally range between 1000 ft and 3000 ft for small search objects. The altitude used for large search objects should not exceed 4000 ft. The factors affecting the radar detection are as under.

(a) Size, aspect and material composition of the object.
(b) Sea state and weather.
(c) Height of the aircraft.
(d) Efficiency of radar operator.

8.4 Night Search Patterns

8.4.1 Detection of survivors at night is unlikely, if they have no night signalling devices such as flairs or lights. However, the search patterns used along with visual night distress signals from the distressed craft are briefed as under.

8.4.2 Parachute Flare Searches. The use of aircraft parachute flares does not appreciably increase the chance of detection during the night. Therefore, this type of illumination has very limited potential in searches for anything other than large objects located in well defined search areas at sea. Parachute flares are normally dropped from fixed wing aircraft flying above and ahead of the search facilities. In this type of search, vessels and helicopters are the most efficient search facilities.

8.4.3 Fixed wing aircraft will normally be less effective, Parachute flares should not be dropped in such a way that casings or other material could fall on a search facility. It is essential to ensure flight separation between helicopters and fixed wing aircraft in these situations. If the flare is of the type, which falls free after burn out, the flare must be dropped in such a way that it does not burn out over a search facility. Flares must be handled with care by the crew familiar with their use.
8.4.4 When helicopters are used as primary search facilities, it is essential to ensure a safe separation between them and the illuminating aircraft. Care must be exercised to ensure neither the flares nor debris from them collides with the searching helicopter. The searching helicopter normally flies into the wind or downwind at a height of 500ft and the illuminating aircraft drops the flare at a height, which permits flare burn out below helicopter height. The flare should be dropped well ahead and well above, the helicopter at the two 0' clock or ten 0' clock position, so that the observers can search for silhouettes and shadows in addition to searching the area directly illuminated by the flare. The distance between successive flares should be calculated so as to ensure that the area is thoroughly covered. The aircraft dropping flares should be carefully positioned so that it is in position to drop the next flare before the previous flare has burned out. The helicopter pilot should be able to see the flare or flare dropping aircraft when the flare is dropped. This technique is illustrated in the figure.

Parachute Flare Search Using a Helicopter

8.4.5 When a fixed wing aircraft is the primary search facility, the chances of success are small even if the search object is large and conspicuous. Fixed wing aircraft should be used only in extreme emergencies, when no other type of search facility is available. The search is carried out in a way similar to that for helicopters.

8.4.6 When a single surface craft is the primary search facility, the search is carried out by having the aircraft drop flares in a systematic pattern. Only large search objects on or near the surface facility’s course win have a reasonably good chance of detection. The aircraft should drop the flare upwind of the vessel, off the bow. Flare burn out should occur on the opposite quarter of the vessel. Illumination may be on one or both sides of
the vessel. The figure shows this pattern.

8.4.7 When several surface search facilities are available, this procedure is used with a line-abreast formation. The spacing between the surface facilities depends on the size of the search object and on scene conditions. The aircraft flies a race track pattern over the formation, dropping a set of flares upwind so that they are over the formation during the middle of the burning period and a new set is dropped as the previous set burns out. The number of flares to be dropped will depend on the length of the line of surface facilities. This pattern is shown in the figure.

Parachute flare search using several surface facilities
8.5 Night Vision Goggles

8.5.1 Use of night vision goggles (NVGs) can be effective in searches carried out by helicopters, fixed-wing aircraft, rescue vessels and other marine crafts involved in SAR operation. The following factors may influence the effectiveness of NVGs for searching.

(a) NVG quality.
(b) Crew training and experience.
(c) Environmental conditions (meteorological visibility, moisture, moonlight, cloud coverage, precipitation, etc.).
(d) Level and glare effects of ambient light (including natural light like moonlight and star light and artificial light like illumination from search, navigation and other lights, inside and outside the search facility).
(e) Whether the light sources are within the NVG user’s field of view.
(f) SRU speed.
(g) Height of the observer above the surface.
(h) Sea state and presence of surf on the surface.
(j) Size, illumination and reflectivity of the search object (reflective tape on survivors or their craft can significantly improve the chances of detection with NVGs).
(k) Types of survival equipment or light sources (like signaling devices and pyrotechnics) used by the survivors.

8.5.2 Glare should be minimized as much as possible within the facility’s environment where the NVG users are stationed. This may involve opening or removing windows where practicable. Also, proper scanning techniques are important for reducing the adverse effects of moonlight or artificial light sources like light houses, offshore rigs, ships, anti-collision lights, etc.

8.5.3 Visible moonlight can significantly improve detection of unlighted search objects when using NVGs. Search object light sources, like strobe or similar lights or even cigarettes, can greatly improve detection even in poor visibility conditions. MRCC staffs should be aware that sweep width estimates should take into account local conditions and the advice of the facility on scene.
8.6  

**SAR Briefing**

8.6.1 A thorough briefing by SMC must be undertaken to all SRUs and personnel involved in SAR operations well before departure of the SRUs. All SAR personnel should be given the relevant details of the distress and all instructions regarding the conduct of SAR operations. Whenever time permitting this must be undertaken by issuing a search operation briefing/tasking form to the crew involved, giving as much information as possible. When the SAR facility is enroute to the scene, situation update as available must also be provided. If any other additional pertinent information is received by the SMC after the briefing, the information must be passed to the facilities at the earliest.

8.6.2 Aircraft are the most capable facilities for searching a large area quickly. As each aircraft has its operating and technical limitations, the urgency of the situation should never cause an aircraft to be used beyond these limits for which it is not suitable. Reliable communications facilities must be ensured between the aircraft and the controlling agency on surface to keep all SRUs aware of the progress of the search. Therefore, through briefing must be undertaken for the aircraft SRUs exclusively which should include all items and important information as under.

(a) Full description and nature of distress.
(b) Details of search areas and description of clues that may indicate the presence of search objects including distress signals, visual signal codes, wreckage, dye markers, oil slicks, smoke, colored/white objects, reflections from metal/glass.
(c) Suggested type/method of search and methods to record the area searched to optimise the search efforts.
(d) Details of other SAR facilities engaged and their search areas.
(e) Communications procedures and frequencies to be used.
(f) Frequencies to be guarded for monitoring transmission from the survivors.
(g) Special instructions pertaining to the flight to and from the search area including routes, levels and flight separation.
(h) Details of droppable supplies to be carried and any special dropping procedures.
(j) Action to be taken on sighting search objects.
(k) Precautions to be taken while dropping pyrotechnics.
Present and forecast weather conditions to, from, in the search area and at the destination alternate aerodromes.

Designation of OSC.

8.6.3 Briefing for the ships proceeding as SRUs should also cover all the instructions similar to that of aircraft SRU briefing. However, more emphasis should be given to the matters of interest pertaining to surface facilities. The surface SRUs must be briefed on extensive use of radio communication within the units on the scene for exchange of information during search operations in order to ensure effective coordination of surface search.

8.7 SAR Debriefing

8.7.1 Timely and comprehensive debriefing by SMC/SAR coordinator must be undertaken for all personnel involved in the search operations including all SRUs. This is as important as briefing prior operation, because careful debriefing and evaluation of the reports of every person involved in the operation is necessary for an accurate evaluation of search activities and remedial actions for shortcomings / improvements, if any. This evaluation in turn will determine whether further search is to be undertaken if the previous efforts were unsuccessful.

8.7.2 All relevant information obtained during debrief must be plotted on the chart showing the search area. The careful study of this data will enable the SMC to update probability of containment, probability of success and cumulative probability of success values and use them together with other information to determine whether an area has been sufficiently searched.
CHAPTER 9

RESCUE PLANNING AND OPERATIONS
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9.1 Rescue Planning

9.1.1 When the search object has been located, the SMC, OSC or master or pilot in-command of the SAR facility must decide on the method of rescue to be followed and the facilities to be used. The following factors should be considered.

(a) Action taken by the sighting craft and the SAR action, which can be taken by other craft on scene.
(b) Location and disposition of the survivors.
(c) Condition of survivors and medical considerations.
(d) Number of persons reported to be on board the distressed craft and the number who have been located.
(e) Environmental conditions observed and forecasted.
(f) Available SAR facilities and their state of readiness (to reduce delay, the SAR facilities which are likely to be used should be alerted and deployed to a suitable location while the search is in progress).
(g) Effect of weather conditions on SAR operations.
(h) Time of day (remaining daylight) and other factors relating to visibility.
(j) Any risks to SAR personnel, such as hazardous materials.

9.2 Sighting and Subsequent Procedures

9.2.1 When the search object has been located, it must be remembered that rescue of survivors by the SRU on scene may be even more difficult than the search. The SRU should indicate to the survivors that they have been sighted by any of the following procedures.

(a) Flashing a signalling lamp or a searchlight.
(b) Firing two signal flares, preferably between, a few seconds apart.
(c) If SRU is an aircraft, fly low over the survivors with landing lights on or rocking the wings.
9.2.2 If the SRU is unable to effect an immediate rescue, it may consider any of the following steps for assisting rescue.

(a) Drop communications and survival equipment.

(b) Keep the survivors in distress scene in sight at all times, thoroughly surveying the scene and accurately plotting the location and marking it with a dye marker, smoke float or floating radio beacons.

(c) Report the sighting to the SMC with the available information on the following.

(i) Time of sighting.

(ii) Position of the search object.

(iii) Description of the distress scene.

(iv) Number of sighted survivors and their apparent condition.

(v) Apparent condition of the distressed craft. Take photograph and E-mail to SMC/SAR coordinator if feasible

(vi) Logistics supplies and survival equipment required.

(vii) Supplies of water and food required.

(viii) All messages, including radio transmissions, received from survivors.

(ix) Weather and sea conditions.

(x) Type and location of nearby surface craft, if any.

(xi) Action taken or assistance already given and future actions required.

(xii) Remaining fuel and on scene endurance of SRU making the report.

(xiii) Apparent risks involved in the rescue including hazardous materials, if any.

9.2.3 The SMC may also request the search facility to establish the location and the nearest land suitable for use by aircraft especially helicopters so that, other rescue facilities and aircraft can be directed to the distress scene. If the SRU is an aircraft, then it must be directed to take photographs or undertake video photography of the distressed craft, if possible, from normal search heights and directions, from a low level and from an angle to enable better appreciation during analysis. The SRU should remain on scene until PLE or relieved by another SRU or forced to return to the base; due to endurance limit or rescue has been effected.
9.2.4 **Delivery of Rescue Personnel and Equipment.** The maritime SRUs are a reliable means of delivering supplies, equipment and personnel to the scene of distress. Equipment may include bilge pumps, towing equipment, fire-fighting equipment and medical supplies. Personnel delivery is usually limited to medical personnel, damage control/repair and salvage parties.

9.2.5 **Supplies and Survival Equipment.** The supplies and survival equipment are carried by air and maritime, SAR facilities to aid survivors and facilitate their rescue. The type and number to be carried depend upon the circumstances on scene. Maritime facilities and helicopters generally can deliver this equipment directly to survivor. Fixed wing aircraft can deliver supplies to survivors if suitable landing areas exist nearby or if the supplies can be dropped at the scene. The packing of supplies and survival equipment should be adapted to the manner of delivery. Packs of supplies and survival equipment ‘must be adapted to the circumstances of the SRR in which they are used.

9.2.6 **Droppable Life Rafts.** Life rafts packed for dropping should be available for use when survival craft have not been launched successfully or have been damaged in launching or survival craft have become unserviceable. It should also be dropped when the survivors are overcrowded in the survival craft in use or survivors are in the water. Life rafts, supplies and equipment may be dropped together in a chain, ideally with life rafts at each end.

9.2.7 An airborne droppable inflatable lifeboat may contribute to the rescue, but the need for a particular type of aircraft, handling and dropping procedures makes it an item, which can only be used by specialized aircraft SRUs, if available.

9.2.8 The supplies and survival equipment carried on rescue boats and other inshore crafts need not be extensive when medical attention, blankets, clothing, hot drinks, etc., are available ashore. Additional equipment should be taken if the rescue boats are limited in number or the climate is severe. Hot liquids, covering for survivors and insulating blankets for hypothermic survivors should always be carried. Rescue vessels likely to operate some distance offshore should carry an adequate quantity of the items and equipment for artificial respiration; first aid and advanced life support to the extent of the crew training.

9.2.9 **Medical Personnel.** In formulating any rescue plan, the SMC should consider establishing a forward medical base to enable appropriate treatment by competent medical staff according to the priority. Once the search object has been sighted, the SMC must consider whether to send medical personnel to the scene. Another consideration is ‘the’ mental trauma that both survivors and rescuers may undergo. Plans and procedures should be developed for post traumatic stress syndrome debriefings.
9.3 Rescue by Aircraft

9.3.1 In some cases aircraft may be used for rescue. Each aircraft has operational and technical limitations and should not be used on operations for which it is not suitable. Whenever possible, a rescue operation by aircraft should be backed up by a surface SRU, particularly for a large number of survivors.

9.3.2 Fixed wing aircraft may drop equipment to survivors and direct rescue facilities. They can mark the position as long as they can remain on scene, by serving as a radio and radar beacon, showing lights, dropping flares and providing radio signals for direction finding and homing by other rescue facilities.

9.3.3 Helicopters can be used to rescue survivors by winching or by landing on a ship if a suitable location exists. Due to their unique flying capabilities, they should be used whenever possible. They are particularly suitable for rescues in heavy seas or at locations where surface SRUs are unable to operate. However, the special concerns of which the SMC must be aware are as follows.

(a) Operations by surface parties may be hampered by the noise and rotor wash produced by helicopters. To facilitate the coordination between helicopters and surface rescue facilities and to minimize the risk of collision associated with helicopters operating in a confined space, their operations should be coordinated by a facility in communication with them and preferably by the OSC.

(b) Recovery by landing of the helicopter creates additional concerns. Factors like turbulence, level of the ground, clearing the loose debris, altitude and landing and take off paths must be considered when selecting a landing site. Operations in a high altitude environment will reduce helicopter performance and severely affect hovering capability. When conditions are marginal, landings should be carried out only as a last resort.

(c) A typical recovery is carried out by hovering over the survivors and taking them aboard using a winch with a sling, rescue net or rescue stretcher. Selection of the site is the same as for recovery by landing. However, the cable and rescue device being lowered may have a large static electricity charge. No one should touch the cable or rescue device until it has made contact with the surroundings.

9.4 Rescue by Maritime Facilities

9.4.1 When both maritime rescue facilities and helicopters are dispatched to the scene, it may be advisable to transfer survivors to the helicopters for a more rapid delivery to medical facilities. All surface SRUs should be equipped to lift survivors from the water without any assistance by the survivors themselves, as they may be injured, exhausted or
suffering from hypothermia. When hoisting a person suffering from hypothermia, especially after immersion in water using rescue strop, adequate care must be exercised, as hoisting of such persons is a vertical position may cause severe shock or even cardiac arrest.

9.4.2 Rescue boats typically are designated SRUs but may include any craft near the scene of the distress. Designated rescue boats are generally small and may not be able to carry many survivors. It may be necessary to send a number of boats to the distress scene if they are available. Each boat should carry additional lifesaving appliances to enable survivors who cannot be rescued immediately to remain afloat while awaiting the arrival of another boat.

9.4.3 As soon as the distress scene is located, an attempt should be made to account for all occupants of the distressed craft. The search must continue until all of the occupants have been found, otherwise accounted for or there is no significant chance of locating additional survivors. Meanwhile, those survivors who have been located must be rescued as soon as possible. The duties of an OSC at a distress scene include the following.

(a) Giving first aid.
(b) Evacuating survivors by whatever means available.
(c) Collecting and preserving medical and technical data to support investigations.
(d) Establishing identities of casualties/survivors.
(e) Making a preliminary examination of the wreckage and reporting to the SMC.

9.5 Special Requirements at Aircraft Crash Sites

9.5.1 Many military aircraft are fitted with ejection seats and other hazardous material, e.g., bombs or chemicals. When a pilot has to be removed from an aircraft so fitted, extreme care should be taken to avoid triggering such mechanism. The activating handles are normally indicated by red or yellow and black colouring.

9.5.2 While undertaking rescue operations at the aircraft crash site; the wreckage and its surroundings should not be disturbed except to assist in the recovery of survivors. Not only does the wreckage pose dangers, but also the position of flight controls, the location of debris and other factors are important to the accident investigation. Control of the access to the crash site should also be established at the earliest. Photographs of the crash site and wreckage should be taken at the earliest, which may help in accident investigation.
9.5.3 The SAR personnel must ensure that the aircraft is not accidentally set on fire. If it is necessary to cut into the aircraft to remove survivors, no tools, which are likely to cause sparks, should be used and fire extinguishers should be kept standby. Composite material construction of the aircraft and the possible presence of hazardous material pose additional safety hazards to the survivors and rescue personnel.

9.5.4 Measures to preserve as much medical evidence as possible includes photography of bodies before moving them, shielding of bodies by the best means available to avoid decomposition, notation of the position of immobilized survivors and maintenance of a medical log for each survivor. Except for compelling reasons, human remains should not be moved without authorization from the SMC who should, in turn, obtain authorization from an appropriate authority.

9.6. **Ditching Assistance**

9.6.1 The MRCC on receipt of information about an aircraft ditching in the SRR should plan to render assistance as follows.

(a) Obtain the latest position of the aircraft by any means available, e.g., from the aircraft, from its escort (if applicable), by direction finding or by radar.

(b) Alert vessels in the vicinity of the distressed aircraft, asking them to keep a listening watch on frequencies 4125 kHz and/or on 3023 kHz.

(c) Provide the aircraft with the position of the nearest ship, the information on sea condition and ditching heading, if possible.

(d) Request the distressed aircraft to communicate with the selected vessel on 4125 kHz or any other suitable frequency. Act as a relay station if required.

(e) If time permits, inform the ship on how she can assist the aircraft.

9.6.2 Assistance provided by ships for ditching depends on the capabilities of the ship. The nearest vessel to the ditching aircraft will often be a merchant ship. The ship may be limited to the assistance arranged by the MRCC, but she can also rescue survivors. The most suitable vessels are SRUs equipped for two way radio communications with the aircraft and with crew trained and equipped for SAR incidents including ditching. Assistance to the ditching aircraft that can be rendered by the vessels includes the following.

(a) Locating the aircraft by radar.

(b) Providing navigation and homing aids.
(c) Furnishing weather and sea information
(d) Directing the aircraft to the vessel
(e) Assisting the aircraft by marking a sea-lane and providing the illumination
(f) Effecting rescue after the ditching.

9.6.3 Escort aircraft if available can render assistance to the ditching aircraft by providing the following.

(a) Guiding the distress aircraft to the vessel alongside which it plans to ditch.
(b) Giving advice on ditching procedures.
(c) Evaluating sea conditions and recommending ditching heading.
(d) Informing the vessel on how it can assist the ditching aircraft.
(e) Rescue of persons from inside damaged, capsized or ditched aircraft.
(f) Dropping of survival and emergency equipment.
(g) Informing SMC the location of ditching
(h) Directing other vessels to the scene.
(j) Providing illumination for night ditching if it is planned away from the vessel or when the vessel cannot provide.

9.7 Rescue of Persons from Damaged, Capsized or Ditched Craft

9.7.1 The rescue of persons from inside damaged, capsized or ditched craft is typically dangerous and should normally be attempted only with suitable facilities, equipment and specially trained personnel. There is always the risk of the craft sinking or shifting. Diving may be required to reduce this risk and for the rescue operation. Therefore, these operations must be conducted promptly according to a prudent plan. Such operations are generally carried out in three stages, namely investigation of the situation, prevention of sinking and lifesaving, which are discussed in detail in the succeeding paragraphs.

9.8 Investigation of Situation

9.8.1 Rescue personnel must conduct an initial investigation and accurately assess the condition of the emergency. A reasonable work plan should then be developed based on the investigation. The following items should be considered and investigated.
(a) **Distress Area Considerations.**

(i) Incident position and depth of water at that location.

(ii) Meteorological and sea conditions (weather, wind direction and velocity, air temperature, sea current direction and velocity, water temperature, visibility both above and below the water surface, waves, swells, etc.).

(iii) Existence of fishing nets or other obstructions.

(iv) Leakage of hazardous material.

(v) Conditions of other vessels in the vicinity.

(vi) Existence of sharks or other dangerous marine life.

(b) **Rescue Forces Considerations.**

(i) Size and number of boats and aircraft.

(ii) Number of divers available.

(iii) Availability of floating cranes, tugboats, fishing boats, etc.

(iv) Medical assistance.

(v) Transport for rescue personnel and survivors.

(c) **Missing Persons Considerations.**

(i) Number of persons missing.

(ii) Position of crew when the accident occurred.

(iii) Existence of survivors inside (determined by tapping or other reaction tests).

(iv) Need for emergency measures to sustain survivors trapped inside (i.e. supply of air into the craft, etc.).

(d) **Investigation Procedures.** The following investigation procedures should normally be used in various situations.

(i) **Conditions on Scene.** While approaching the wreck, rescuers should observe circumstances such as meteorological conditions, sea phenomena, conditions of other vessels in the vicinity and so on. They should also check to see if there is any debris in and under the water.
(ii) **Investigation of Craft.** The average waterline, list and leakage of air should be observed at appropriate intervals with video or instant cameras to quickly verify any change of condition. If at least one meter of a floating craft is exposed and the list is insignificant, investigators may consider climbing onto the craft to check for air leakage from the doors, stem tube, etc.

(iii) **Existence of Survivors.** Investigators may hit the craft with hammers or other items and then listen for any reaction suggesting the existence of survivors. To hear weak signals from the survivors, silence among the rescuers is essential. A loudspeaker may be used in an attempt to talk to persons inside. Inboard voices may be audible when the ear is put against the outside of the craft, thus making it possible to talk with survivors inside. If it is difficult to lower a work boat or for investigators to move from a work boat on to the distressed craft due to stormy weather or other hazards, investigating divers should arrive from the leeward side of the craft to reach underneath and hit it with knife grips or similar objects, to see if there is any reaction from persons inside. At this point, it is normally premature and too dangerous to actually swim beneath or enter the craft.

(e) **Other considerations.** Additional matters, which are also to be considered during the investigation, are listed below.

(i) When a fishing boat has capsized, there are often fishing nets adrift in the nearby sea area, so caution is needed in manoeuvring vessels and carrying out the rescue operation.

(ii) The craft may be less likely to sink if floating on an even keel, not listing, existing waterline is one-fifth to one-half the normal draught, no opening in the hull leaks air or floating for more than one hour in the same condition.

(iii) Even if there was no reaction when the craft was tapped the first time, it is necessary to tap it three or four times at appropriate intervals.

(iv) Unless it is known that there are no survivors, work should be performed with the assumption that survivors remain inside.

### 9.9 Prevention of Sinking

9.9.1 The measures that could be taken, where practicable, to prevent the vessel/craft from sinking during rescue operations include the following.
(a) **Preventing Air Leakage.** This can be accomplished by closing of the openings such as doors, ventilators, hatches, pipe, stem tube etc. and plugging cracks with wooden or metallic wedges.

(b) **Supply of Air into Craft.** Air may be introduced into the craft from a lower opening or by using special tools, e.g., striking a drive pin and attaching an air hose.

(c) **Fitting of Floats.** Attaching floats is effective when it is not practical or safe to supply air to the inside. However, floats may not fully compensate for the lost buoyancy of the craft and should be considered mainly to minimise the leakage of air and prevent sinking by correcting list or trim. Typical methods of fitting floats are as follows.

(i) **Looping Method.** A wire or cable is looped around the lower part of the craft and both ends are fitted to floats.

(ii) **Fitting Wires to Fixed object.** One end of a wire or cable is fitted to a bollard or some other fixed object and the other end to a float.

(d) **Holding Alongside.** This can be accomplished by using one or two vessels with wires or cables by supporting the craft. The wires or cables may be taken off or cut off immediately as the situation demands.

(i) **Alongside Support by Two Rescue Vessels.** Two vessels move into position on opposite sides of the craft, but at an appropriate distance from it. Wires or cables are then stretched under, the craft between both vessels.

(ii) **Alongside Support by One Rescue Vessel.** A single vessel may be used to limit list or to support one end of the craft.

(f) **Floating Crane.** This method is most effective in preventing the sinking of a damaged vessel if available on the scene. It is therefore necessary to immediately arrange use of a floating crane and tugs.

(g) **Stranding in a Shallow Place.** The craft may be gently grounded in nearby shallow water, if the situation permits and if it appears safer than the present situation.

9.9.2. Other important factors to be considered to prevent a distressed, damaged or capsized craft from sinking are listed below.

(a) Supplying air into a craft provides buoyancy, but the air should be introduced into an area where it will improve rather than worsen the craft’s stability.
(b) Keeping the craft level improves the chances for survivors and helps to prevent sinking.

(c) Maintaining buoyancy with air and correcting list with side support or floats decreases the possibility of sinking.

(d) A capsized vessel may turn sideways if more than half of its hull comes out of the water.

(e) Alongside support may lead to the sinking or damage of the craft if manoeuvring is done incorrectly, especially in stormy weather.

(f) Supplying fresh air to the subdivisions where survivors are located may be necessary.

9.10 Lifesaving

9.10.1 Survivors can be expected to be in state of a panic or shock and in complete darkness. Rapid rescue is necessary due to the lack of food, water and fresh air in a capsized craft. Survivors may be rescued either through an opening made above the waterline or from under water. The method that has the greatest chance for success must be selected, taking into account that making an opening can threaten the air pocket into the vessel and survivors may panic if they have to dive under water.

9.10.2 The lives of the survivors may be prolonged by periodic tapping on the craft by the rescue personnel, which may reveal the existence of the survivors and provide encouragement by keeping them informed of the progress of the rescue operation. Air hoses and air tanks for divers may be used to feed fresh air to the compartments with the survivors. If survivors are accessible by divers, fresh water and food can be provided until the survivors are rescued.

9.11 Rescue Action Plan

9.11.1 A rescue action plan is normally prepared along with the search action plan by the SMC for implementation by the OSC and other facilities on scene. This may be provided to them in form of a rescue action message for implementation in the operation. The essential components of the message are listed below :-

(a) **Situation.** This section has the description of the following :-

(i) Brief description of the incident.

(ii) Number of persons requiring rescue.

(iii) Extent of injuries.
(iv) Amount and type of survival equipment.
(v) Weather forecast and period for forecast.
(vi) SAR facilities on scene

(b) **Rescue area.** The rescue area section describes the following :-
   (i) Position of the incident.
   (ii) Access routes to be followed by SAR facilities, if applicable.

(c) **Execution.** The execution part covers the following points :-
   (i) SAR facilities assigned, including facilities call signs and parent agencies providing them.
   (ii) Rescue method to be attempted.
   (iii) Supplies or equipment to be delivered in the area.

(d) **Coordination.** The coordination portion covers the following details :-
   (i) Designated SMC and OSC.
   (ii) On scene endurance of SAR facilities.
   (iii) Change of operational coordination.
   (iv) Coordinating instructions from SMC to OSC/ SRUs.
   (v) Parent agency relief instructions.
   (vi) Temporary flight restrictions.
   (vii) Authorisation for non-SAR aircraft in the area

(e) **Communications.** The communication prescribes the following points :-
   (i) Coordination procedure and on scene channels.
   (ii) Call signs of aircraft assigned and other surface units.
   (iii) Other special instructions and relevant communications information.

(f) **Reports.** The report component describes the following :-
   (i) OSC to SMC report format.
   (ii) Reporting interval.
   (iii) Parent activity reports.
9.12 SAR for Fishing Boats

9.12.1 There are numerous fishing villages located along the coastline of India operating various kinds of fishing crafts/boats. Generally these boats sail without communication sets necessary to effect distress notification. Also these boats do not carry the required survival equipment onboard. As a result, the distress alert raised by the fishing boats very common in Indian SRR. The poor knowledge of the fishermen in respect of the requirement of communication sets, fishing groups or in company and monitoring meteorological forecast aggravates the situation further. The delay in response to these situations may lead to the drifting of the vessel into mid sea making the search further complicated and time consuming. This may also involve loss of life due non-availability of adequate food and water onboard. The non-availability of communication sets onboard and less radar cross sectional area makes the coordination of search difficult. Therefore this arena needs quick and concerted efforts by all concerned so as to effect the search and rescue with minimal delay. In order to avoid frequently raised alerts by fishing community, the planning should involve the participation of the fishing community itself, local fishing organisation, State/Central fishing authorities and concerned MRCC/MRSC/MRSSC.

9.12.2 Responsibility of Fishing Community. The contribution of the fishing community in coordinating SAR by MRCC/MRSC/MRSSC plays a vital role in making the search and rescue mission successful. The MRCC/MRSC/MRSSC through periodic community interaction programs with the fishing villages should educate fishermen on the following aspects as a preventive measure:-

(a) The boats are to be equipped with VHF communication sets for reporting distress if any to the other vessels in the area and seek assistance.
(b) The fishing boats are to carry survival equipment like rafts, lifebuoys and lifejackets onboard.
(c) The fishing boats are to intimate area of operation with likely time schedule to the local fishing authority/fishermen association prior departure and operate only in that area and period.
(d) The fishing boats are to intimate the appropriate association/authority regarding change in area of operation, time schedule, unscheduled arrivals in any harbour.
(e) The boats going out of the visual range of the coastline are to operate in groups of five to ten each. Such groups are to operate in the vicinity of each other.
(f) At least one boat in the group is to carry GPS and charts of the area along with HF communication sets. The frequency of communication for fishing boats for distress notification should be promulgated.
(g) The fishing community should develop own SAR system by deploying boats belonging to the community for first aid response activities till arrival of SRUs on the scene.

9.12.3 **Responsibilities of Local Fishing Association/Authority.** The local fishing association/authority is to carefully evaluate the existence of a distress situation before notifying the same to MRCC/MRSC as it involves alerting of the SAR facilities and may result in diversion of SAR facilities engaged in other missions. The local fishing association/authorities are to consider the following points before alerting the appropriate MRSC and also during the SAR mission :-

(a) Consultation with other fishing associations nearby to rule out the probability of return of the vessel to those fishing harbour.

(b) If distress situation exists, notify the same to the appropriate MRCC/MRSC and commence the search using local assets.

(c) Communication maintained with MRCC/MRSC in order to establish two-way communications round the clock and exchange of developments.

(d) Report to the MRCC/MRSC at the earliest, when the missing fishing boat reaches the harbour.

(e) The distress notification to MRCC/MRSC should include the following :-

   (i) Name, port of registration, registration number and colour of the boat.

   (ii) Length, height and structure.

   (iii) Nature of distress and assistance required.

   (iv) Position/area of operation, ETD and planned ETA with harbour.

   (v) Communication sets available onboard and frequency manned.

   (vi) Survival equipment onboard.

   (vii) Number of crew.

   (viii) Name, address and telephone number of the owner.

   (ix) Contact person, address and telephone number for round the clock exchange of information.

   (x) Details of search undertaken with area.

   (xi) Fuel, food and water onboard.
9.12.4 **Planning by MRCC/MRSC/MRSSC.** The MRCC/MRSC/MRSSC on receipt of distress notification of fishing boat should evaluate the situation so as to ascertain the existence of the distress and establish the communication with the local fishing association/authorities to collect above information. As in most of the cases, the missing fishing boats returns to the nearby fishing harbour and there involves considerable time delay in cancellation of the distress, the MRCC/MRSC/MRSSC is to ascertain the existence of distress prior deploying the SRU. The following include the actions to be taken by the MRCC/MRSC/MRSSC for SAR of fishing boats:

(a) Careful evaluation of distress situation
(b) Maintain the record of the contact details of the fishing authorities, associations and harbour in their jurisdiction.
(c) Ensure round the clock communication with appropriate local authorities during distress period.
(d) Notify the distress to the vessels operating in the area through ISN.
(e) Notify the distress to NAVAREA VIII coordinator for Navarea promulgation.
(f) Alert the rescue facilities to remain standby for deployment
(g) Carry out search by aircraft. Drop locating aids like EPIRB, SART to aid the rescue facilities to home on.
(h) On locating despatch surface units for assistance. If required, drop food and water through aircraft.

9.13 **Mass Rescue Operations**

9.13.1 **Mass Rescue Operations Overview.** A Mass Rescue Operation (MRO) is one that involves a need for immediate assistance to large numbers of persons in distress such that capabilities normally to SAR authorities are inadequate.

9.13.2 MROs are relatively rare low-probability high-consequence events compared to normal SAR operations, but major incidents leading to the need for MROs have not been infrequent on a world-wide basis, and can occur anywhere at any time. The nature of such operations may be poorly understood due to limited chances to gain experience with major incidents involving MROs.

9.13.3 Flooding, earthquakes, terrorism, causalities in the offshore oil industry and accident involving release of hazardous materials are examples which, because of their magnitude, may require the application of the same resources as required for mass maritime or aeronautical rescue operations.
9.13.4 The sequence of priority in major multi-mission incident must be lifesaving first, generally followed by environmental protection, and then protection of property. Moral and legal obligations and public and political expectations require preparedness to carry out MROs safely and effectively should they become necessary. Since the need for MROs is relatively rare, it is difficult to gain practical experience to help deal with them. Types of potential MRO scenarios vary, but there are certain general principles that can be followed based on lessons of history.

9.13.5 Effective response to such major incidents requires immediate, well-planned and closely co-ordinated large-scale actions and use of resources from multiple organisations. The following are typical MRO demands:

(a) Intense and sustained high priority lifesaving efforts may need to be carried out at the time and place as major efforts to save the environment and property;

(b) Huge amounts of information needs to be readily available at the right times and places to support the response efforts and meet the needs of the media, public and families of the person in distress, which may number in the hundreds or thousands;

(c) Many means of communications need to be available and interlinked amongst organisations at various levels to handle huge amounts of information reliably for the duration of the response;

(d) A surge in the numbers of competent staffing in all key organisations must be made available immediately and be sustainable for up to weeks at a time;

(e) Equipment and logistics demands jump to unprecedented levels; and

(f) Successful MROs depend on the advance provision of flexible and all-level contingency plans. Intense integrated planning and operational efforts must also be carried out in real time throughout actual rescue efforts.

9.13.6 All involved in the overall multi-agency, multi-jurisdiction, multi-mission and possibly international response to major incidents must clearly understand who is in charge, the respective roles of all involve, and how to interact with each other. SAR authorities may be responsible for all or part of the MRO functions, and must be able to co-ordinate their efforts seamlessly with other responders under the overall direction of another authority within or outside agency.

9.13.7 The broader response environment may involve activities such as:

(a) Hazards mitigation;

(b) Damage control and salvage operations;
(c) Pollution control;
(d) Complex traffic management;
(e) Large-scale logistics efforts;
(f) Medical and coroner functions;
(g) Accident-incident investigation; and
(h) Intense public and political attention.

9.13.8 MRO plans need to be part of and compatible with overall response plans for major incidents, plans must typically allow for command, control and communications structures that can accommodate simultaneous air, sea and land operations.

9.13.9 The consequences of poor preparations for MROs in terms of loss of life and other adverse results may be disastrous. Major incidents may involve hundreds or thousands of persons in distress in remote and hostile environments. A large passenger ship collision, a downed aircraft, or a terrorist incident could, for example, call for the immediate rescue of large numbers of passengers and crew in poor environmental conditions, with many of the survivors having little ability to help themselves.

9.13.10 Preparedness to mount an extraordinarily large and rapid response in critical to preventing large-scale loss of lives, such preparedness often on strong and visionary leadership and unusual levels of co-operation to achieve.

9.13.11 There will often be resistance to paying the high price in terms of time, efforts and founding that preparedness for major incidents entails, particularly as they are rare events. The required levels of co-operation, co-ordination, planning, resources and exercises required for preparedness are challenging and do not happen without the requisite commitment of SAR authorities, regulatory authorities, transportation companies, sources of military and commercial assistance and others.

9.13.12 MRO planning, preparations and exercises are essential since opportunities to handle actual incidents involving mass rescues are rare. Therefore the exercising of MRO plans is particularly important.

**General Guidance for MROs**

9.13.13 For a situation involving large numbers or persons in distress, on-scene responsibilities for the safety of passengers and crew will be shared by the OSC and the craft’s pilot-in-command or master, with the pilot or master assuming as much of this responsibility as possible before or after the aircraft or ship is abandoned.
9.13.14 Pilots and masters are responsible for manoeuvring the aircraft or ship as feasible and appropriate and also have overall responsibility for safety, medical care, communications, fire and damage control, maintaining order and providing general direction.

9.13.15 Unless a ship appears to be in imminent danger of sinking, it is usually advisable for passengers and crew to remain onboard as long as it is safe to do so.

9.13.16 In the case of downed aircraft, whether passengers would be safer onboard should be assessed for each situation. Usually they should promptly evacuate the aircraft at sea. On land, this decision must take into account the conditions of the aircraft and the environment, expected time to rescue survivors or repair the aircraft, and whether required passenger care can be best provided inside the aircraft.

9.13.17 The OSC will normally be designated by an SMC. An OSC may be able to handle certain communications on scene and with appropriate remote authorities to help free the pilot or master to retain the integrity of his or her craft. However, these persons are themselves in need of assistance, and anything the OSC can do to help them should be considered, bearing in mind that the OSC’s main duty is co-ordinating SAR facilities and rescue efforts under the SMC’s general direction.

9.13.18 Unnecessary communications with the master of a ship or pilot in command of an aircraft in distress must be minimized, and this should be taken into account in advance planning.

9.13.19 Exchanges of information during joint planning by use of SAR Plans of Co-operation for passenger ships and other means will reduce the need to ask the pilot or master for this information one or more times during a crisis. Persons or organizations that want this information should be directed to a source ashore or on the ground that is prepared to handle many potential requests.

9.13.20 High priority should be given to tracking and accounting for all persons onboard and all lifeboats and rafts, and efforts to keep them together will help in this regard. Availability of accurate manifests and accounting is critical.

9.13.21 The need to relocate survival craft and check for persons in them can waste valuable resources. One option is to sink survival craft once the persons in them have been rescued; however, the potential that other survivors may find and need the craft should be assisted.
9.13.22 Navy ships and large passenger ships are often better equipped than other vessels for retrieving people who have abandoned a ship or aircraft; use of any such ships should be considered. Ship reporting systems for SAR may help identify commercial ships available to assist.

9.13.23 Helicopter capabilities should be used if available, especially for retrieval of weak or immobile survivors. Lifeboat crews should be trained in helicopter hoist operations. Lowering a rescue person from the helicopter to assist survivors may be visible.

9.13.24 Ship companies should be encouraged to equip large passenger ships and possibly other types of vessels with helicopter landing areas, clearly marked hoist-winch areas, and onboard helicopters to facilitate more direct transfers of numerous persons.

9.13.25 If a ship with a large freeboard cannot safely retrieve survivors from the water or survival craft, it may be possible to first retrieve them onto small vessels, and then transfer them to progressively larger ones.

9.13.26 Depending on the circumstances, it may be safer to tow survival craft to shore without removing the occupants at sea. Lifeboats could be designed to support passengers for longer periods of time, and to be able to reach shore on their own from longer distances offshore.

9.13.27 To be extent practicable, MROs should be co-ordinated by an SMC in an RCC. However, depending on the magnitude, nature and complexity of an incident, the rescue efforts may be better co-ordinated by an appropriate operations centre higher within the SAR agency or another Government agency.

(a) Extensive rescue support by organization other than those commonly used for SAR.

(b) Need for heavy international diplomatic support; and

(c) Serious problems in addition to potential loss of lives, such as environmental threats, terrorist actions, or national security issues.

9.13.28 The following factors should be considered in MRO planning:

(a) Use of the Incident Command System (ICS) discussed below, or other effective means of handing multi-agency, multi-jurisdiction, multi-mission scenarios;

(b) Identification of situations within the SRR that could potentially lead to the need for MROs, including scenarios that might involve cascading causalities or outages;
(c) Mobilization and co-ordination of necessary SAR facilities, including those not normally available for SAR services;
(d) Ability to activate plans immediately;
(e) Call up procedures for needed personnel;
(f) Need for supplemental communications capabilities, possibly including the need for interpreters;
(g) Dispatching of liaison officers;
(h) Activation of additional staff to augment, replace or sustain needed staffing levels;
(j) Recovery and transport of large numbers of survivors (including those unfit, injured or incapable, recovery of bodies, if necessary), accounting for survivors with suspected injuries, guarding against and caring for person with hypothermia, etc.;
(k) A means of reliably accounting for everyone involved, including responders, survivors, crew, etc.;
(l) Care, assistance and further transfer of survivors once delivered to a place of safety and further transfer of bodies beyond their initial delivery point;
(m) Activation of plans for notifying, managing and assisting the media and families in large numbers;
(n) Control of access to the RCC and other sensitive facilities and locations;
(p) RCC backup and relocation plans, as appropriate; and
(q) Ready availability to all potential users of plans, checklists and flowcharts.

9.13.29 The ability of an RCC to continue to effectively co-ordinate the MRO and still handle its other SAR responsibilities may become overwhelmed, and another RCC or a higher authority may need to assume responsibility for their other responsibilities.

9.13.30 With these possibilities in mind, MRO plans should provide for various degrees of response, along with criteria for determining which degree of response will be implemented. For example, as local SAR resources are exhausted (or from the outset), SAR resources may need to be obtained from distant national or international sources.

9.13.31 Experiences in responding to major incidents have resulted in the following practical guidance. Authorities should :-
(a) Plan how any agency receiving notification of an actual or potential mass rescue event can immediately alert and conference call other authorities that will potentially be involved, brief them, and enable immediate actions to be taken by all concerned (this will require identification of entities in each agency that can be contacted on a 24-hour basis, and that have authority to immediately initiate actions and commit resources);

(b) Exercise the above plans;

(c) Co-ordinate all rescue operations effectively from the very beginning;

(d) Begin quickly with a high level of effort stand down as appropriate rather than begin too late with too little effort;

(e) Use capable resources like cruise ships for taking large numbers of survivors onboard;

(f) Ensure that MRO emergency plans address communications interoperability or interlinking;

(g) Retrieve and protect debris as evidence for follow on investigation;

(h) Put security plans in place to limit access to the RCC;

(j) Arrange in advance to involve the Red Cross, chaplains, critical incident experts and other such support for human needs;

(k) Identify senior agency spokespersons to protect the time of workers directly involved in the response and designate a senior official to provide information to families;

(l) Clearly identify the point at which the SAR response (lifesaving) has ended and the focus shifts to investigation and recovery;

(m) Be prepared to use an Incident Command System (ICS) when appropriate;

(n) Ensure that air traffic and air space can be and is controlled on scene;

(p) Assign additional liaison personnel on-scene, as required;

(q) Anticipate development and needs and act early;

(r) Ensure that the scope of SAR plans and other emergency or disaster response plans are co-ordinated to reduce gaps, overlaps and confusion about the person in charge and the procedure to be followed at various time and places;

(s) Control access to the scene, including access by the media;

(t) Determine in advance how private resources can be appropriately used to supplement other SAR resources;
(u) Ensure that SAR plans provide for logistics support for large numbers of rescuers and survivors including pre-arranged accommodations, if possible, and availability of food, medical care and transportation;

(v) Consider requesting assistance from airlines and shipping companies other than the one whose aircraft or ship is involved in the incident, and know the types of assistance that such organizations might provide;

(w) Consider use of bar coded bracelets as an effective means of identifying children before, during and after the emergency;

(x) Attempt to reduce the burden on a pilot or master and crews; if safe and appropriate to do so, place a marine casualty officer onboard to assist the master and SAR personnel; and

(y) Share capabilities, expertise and assets among Government and industry to take maximum advantage of the strengths of each.

Communications for Mass Rescue Operations

9.13.32 Communication plans must provide for a heavy volume of communication use as a major incident will normally involve many responding organizations that need to communicate effectively with each other from the beginning.

9.13.33 As necessary, advance arrangements should be made to link means of interagency communications that are not inherently interoperable.

9.13.34 Interagency communications must be based on terminology understood by all involved.

Major Incident Co-ordination

9.13.35 Regardless of the magnitude and priority of the life-saving efforts involved in responding to a major incident, if any other functions are being carried out concurrently on scene by other than SAR personnel, the overall response involving SAR and the other functions, e.g fire fighting, should be well co-ordinated.

9.13.36 If certain basic concepts and terms are recognized and understood by all emergency responders, they will be much better prepared to co-ordinate joint efforts.

9.13.37 Standard SAR procedure should typically be followed for the SAR part of the response, but these procedures will be largely independent of other efforts. Companies or authorities handling other aspects of the response will follow command, control and communication procedures developed for their respective organization and duties.
9.13.38 The SAR system can function in its normal manner or use modified SAR procedure established to account for special demands of mass rescues, but it should be appropriately linked and subjected to a scheme for management of the overall incident response.

9.13.39 For major incidents, crisis management for the overall response may also be needed. The Incident Command System (ICS) is one simple and effective means of meeting this need. ICS can be used where no equivalent means of overall incident management is in place. SAR and transportation authorities are likely to encounter use of the ICS within emergency response communities.

9.13.40 The ICS works best with some advance familiarization and exercising.

Industry Planning and Response

9.13.41 SAR authorities should co-ordinate MRO plans with companies that operate ships and aircraft designed to carry large numbers of persons, such companies should share in preparations to minimize the chances that MROs will be needed, and to ensures success if they become necessary.

9.13.42 For passenger ships, SAR Plans of Co-operation required by the safety of Life at Sea Convention and developed by SAR authorities and shipping companies are part of MRO plans.

Public and Media Relations for MRO

9.13.43 Good public and media relations become very demanding and quite important during MROs.

9.13.44 What the media reports may matter more than what SAR services do for shaping public opinion about MROs. The role of the media may be critical in shaping the actions of the public and of those directly involved in the distress situation in a way that contributes to safety, success and panic control. There should be no unwarranted delays in providing information to the media.

9.13.45 Information should be readily available, clear, accurate, consistent and freely exchanged among emergency responders and others concerned, such as the public and families of person on board.

9.13.46 Designate the person who will speak to the public and the media and develop press releases, and outline what they will say, staying factual. If SAR services do not provide a public spokesperson and information for a major incident, the media likely will,
thus denying the Authorities the opportunity to manage the information and emphasize the appropriate points.

9.13.47 A single spokesperson not directly involved in the incident can be valuable in relieving the incident Commander and SMC of the duty.

9.13.48 Spokespersons should be cautious about speculating on causes of accidents and ensure that the media understands that the main focus of current operations is on saving lives.

9.13.49 Ensure that the media knows who is in charge of co-ordinating rescue operations.

9.13.50 Interviews should be live if possible.

9.13.51 Many entities are involved in a response to a major incident, including ships, companies and SAR services, Co-ordination is required to ensure that there is one message with many messengers.

9.13.52 Prompt establishment of a joint information centre at a location distant from the SMC will help to achieve this goal. The centre can establish proper procedures for establishing what messages will be released to the public and how those messages will be released. Since the messages may be sensitive, it is critical that everyone communicates the same information. The centre can be responsible for co-ordinating information made available via the internet and perhaps establishing and maintaining a public website.

9.13.53 The media is a 24-hour global market, and its news is broadcast worldwide. The media will find a way to get to the scene for first hand information, picture and video. By providing transportation to the scene and controlling media access, safety and the information the media reports can be better managed.

9.13.54 Media outlets often have more resource to mobilize on scene than do SAR authorities, and RCC operating plans should account for how to deal with such situation.

9.13.55 Information should be provided to the public on the SAR facilities being used and, if possible, a web address or list of contact phone numbers should be provided for families, media and others to contact for more information.

9.13.56 Preparations should be made so that large numbers of callers can be accommodated without saturating the phone system or crashing the computer server.
9.13.57 Advance preparation of standby web pages by transportation companies and SAR authorities can help in responding to floods of requests for information. These pages can be quickly posted to provide general information for media use. Web information should be timely and accurate.

9.13.58 Once posted, these pages can be easily updated with the status of the incident and could also include:

(a) Contact information;
(b) Basic Government or industry fact;
(c) Industry and SAR definitions;
(d) Photographs and statistics of aircraft, ships and SAR facilities;
(e) Answers to frequently asked questions;
(f) Links to other key sites;
(g) Information on passenger capacity, crew size, vessel plans and fire-fighting capabilities; and
(h) Library footage of a vessel inspection or of the crew performing lifesaving drills.

9.13.59 Besides the media, families and other organisations will also want this information.

**MRO follow up actions**

9.13.60 It is very important to develop and share lessons learned from actual MRO operations and exercises. However, concerns about legal liability (often excessive), may discourage staff from highlighting matters that could have been improved.

9.13.61 Since lessons learned can help prevent recurring serious mistakes, agreement should be reached among principal participants on how lessons learned can be depersonalized and made widely available. Lessons learned from MROs should be shared not just locally, but internationally.

9.13.62 Careful accounting for survivors after they have been delivered to a place of safety remains important. They need to be kept informed about plans for them and about the ongoing response operations. With large numbers of persons often staying in different places, keeping track of and working with them can be difficult.
9.13.63 Transportation companies are often best suited to handle and assist survivors during this time.

9.13.64 Crewmembers may be placed at various locations to record passenger names and locations. Another possibility is for airlines or passenger ships to attach plastic cards to life vests to give passengers phone numbers for contacting the company. Some companies use bar coded bracelets to track children who are passengers.

9.13.65 Communicating with passengers is more difficult in remote areas where phone service may be inadequate or lacking. If phone do exist, calling the airline or shipping company may be the best way to check in and find out information. In more populated areas, local agencies may have an emergency evacuation plan or other useful plan that can be implemented.

9.13.66 To protect passengers from harassment by interviewers and cameras, survivors may be placed in hotels or other places of refuge. However, triage and landing locations must be established and publicized to all rescue personnel and good Samaritans.
CHAPTER 10

Rendering Assistance
CHAPTER - 10

RENDERING ASSISTANCE

10.1 Action by SRU on locating Search Object

10.1.1 The SRU if successful in locating the search object, is to notify the same to the OSC/SMC, and proceed to render assistance. The OSC/SMC in turn reports the sighting of the distressed craft to the MRCC/MRSC/MRSSC, for further coordination with shore based facilities for rescue operation. The OSC employs the required number of SRUs in the rescue operation and others are kept standby in the vicinity for further assistance or directs to continue the search or release to return to the base depending on the situation. The OSC should retain only the required number of SRUs on the scene as presence of too many units may hamper the rescue operation. The MRCCIMRSCMRSSC alerts the rescue facilities ashore to remain standby to meet further requirements.

10.2 Initial Action by Assisting Craft

10.2.1 The ships while on passage at sea must be ready in all respects for undertaking SAR operations. The ship may also expect to receive distress message, which may be communicated by any of the following methods :-

   (a) An alarm signal or distress calls from another vessel at sea, either directly or by relay.

   (b) A distress calls or message from aircraft, which is generally relayed by CRS.

   (c) Alert sent from a vessel’s alerting equipment and then relayed shore-to-ship.

   (d) Visual signals or sound signals from a nearby distressed craft.

10.2.2. Any ship receiving a distress message should take the following actions immediately :-

   (a) Acknowledge receipt of message.

   (b) Gather the following information from the craft in distress, if possible.

       (i) Position, course and speed of distressed craft.

       (ii) Length, breadth and colour of the ship.
(iii) Distressed craft’s identity, port of registration, call sign, MMSI number and name.

(iv) Telephone, fax and telex number of the ship, owner and agent.

(v) Communication frequency manned by the vessel.

(vi) Number of personnel on board and nationality.

(vii) Nature of the distress or casualty.

(viii) Type of assistance required.

(ix) Number of casualties, if any.

(x) Facilities for helicopter operation and any obstruction for helicopter landing or winch operation.

(xi) Type and quantity of cargo including fuel, chemical, explosives and hazardous material.

(xii) Any other pertinent information that might facilitate the rescue.

(c) Proceed to render assistance.

(d) Relay distress and pass above information to the appropriate MRCC/MRSC.

10.2.3 The MRCC/MRSC/MRSSC coordinates the operation and the SAR coordinator dispatches the SRUs to the scene for rendering assistance. The ships on passage and the SRUs are to take the following additional actions.

(a) Maintain a continuous watch on the following international frequencies, if equipped to do so:

(i) 2182 kHz (radiotelephony).

(ii) DSC 2187.5 kHz.

(iii) 156.8 MHz FM (Channel 16, radiotelephony) for vessel distress.

(iv) DSC VHF Channel 70

(v) 121.5 MHz AM (radiotelephony) for aircraft distress.

(b) Vessels subject to the SOLAS Convention must comply with applicable equipment carriage and monitoring requirements and Global Maritime Distress and Safety System (GMDSS) equipment.
(c) Any vessel carrying GMDSS compatible equipment should use it as intended and must be prepared at a time to receive distress alerts with it.

(d) Vessels should maintain communications with the distressed craft while attempting to advise the SAR system of the situation. The following information should be communicated to the distressed craft :-

(i) Own vessel identity, call sign and name

(ii) Own vessel position.

(iii) Own vessel speed and estimated time of arrival (ETA) to distressed craft site.

(iv) Distressed craft true bearing and distance from ship.

(e) The ships are to use all available means to remain aware of the location of distressed craft (such as radar plotting, chart plots, Global Positioning system (GPS)). When in close proximity, post extra lookouts to keep distressed craft in sight.

(f) The ship or CRS coordinating distress traffic should establish contact with the SMC and pass on all available information, updating as necessary.

(g) On proceeding to the area of distress the ships are to establish a traffic coordinating system among vessels proceeding to the same area of distress. The ships are also to maintain active radar plots on vessels in the general vicinity. Estimate the ETAs of other assisting vessels to the distress site. Assess the distress situation to prepare for SAR operations on-scene.

10.3 Onboard Preparation

10.3.1 A vessel enroute to assist a distressed craft, including the SRU should have the following equipment ready for possible use :-

(a) Life-saving and rescue equipment :-

(i) Lifeboat.

(ii) Inflatable life raft.

(iii) Lifejackets

(iv) Survival suits for the crew

(v) Lifebuoys

(vi) Portable VHF radios for communication with the ship and boats deployed.
(vii) Line-throwing apparatus.
(viii) Buoyant lifelines.
(ix) Hauling ropes.
(x) Non-sparking boat hooks or grappling hooks.
(xi) Rescue baskets.
(xii) Pilot ladders.
(xiii) Scrambling nets.
(xv) Radio equipment operating on MF/HF and/or VHF/UHF and capable of communicating with the SMC and rescue facilities and with a facility for direction finding (DF).
(xvi) Supplies and survival equipment, as required.
(xvii) Fire-fighting equipment.
(xviii) Portable ejector pumps.
(xix) Binoculars.
(xx) Cameras.
(xxi) Bailers and oars.

(b) Signalling equipment :-
(i) Signalling lamps.
(ii) Searchlight
(iii) Torches
(iv) Flare pistol with colour-coded signal flares.
(v) Buoyant VHF/UHF marker beacons.
(vi) Floating lights.
(vii) Smoke markers.
(viii) Flame and smoke floats.
(ix) Fluorescent dye markers.
(x) Loud hailer.
(c) **Equipment for Medical Assistance.** In addition to the general preparation for rendering medical assistance, the availability of the following is to be ensured:

(i) Stretchers
(ii) Blankets
(iii) Medical supplies and medicines
(iv) Clothing
(v) Food
(vi) Shelter

(d) **Miscellaneous equipment**

(i) If fitted, a gantry crane for hoisting on each side of ship with cargo net for recovery of survivors.
(ii) Line running from bow to stem at the water line on both sides for boats and craft to secure alongside.
(iii) On the lowest weather deck, pilot ladders and manropes to be rigged to assist survivors boarding the vessel.
(iv) Vessel’s lifeboats ready for use as a boarding station.
(v) Line throwing apparatus ready for making connection with either ship in distress or survival craft.
(vi) Floodlights set in appropriate locations, if recovery at night.

10.3.2 During night the ship is to place extra lookouts on the bows as far forward and as low to the waterline as possible, to hear any calls for help and to establish the best night vision. Factors affecting observer/lookouts effectiveness include weather conditions and visibility, type of search craft (vessel, aircraft, life raft or person), state of the sea (calm, choppy or rough), daytime or nighttimes and lookout fatigue.

**10.4 Vessels not Involved in Rendering Assistance**

10.4.1 The master of the vessel deciding not to proceed to the scene of a distress due to sailing time involved and in the knowledge that a rescue operation is under way should take following actions:

(a) Make an appropriate entry in the ship’s logbook.
(b) If the master had previously acknowledged and responded to the alert, he must report his decision to the MRCC/MRSC/OSC regarding the same.

(c) The master may consider the reports unnecessary, if no contact has been made with any of the SAR services. However, he must reconsider the decision of not proceeding for assistance nor reporting to the SAR services, when the vessel in distress is far from land or in an area where density of shipping is low.

10.5 Rescue Planning on scene

10.5.1 Efficient and effective rescue planning is critical in saving lives in a SAR operation. Planning involves evaluating survival location, condition, selecting an appropriate rescue method and facilities - devising a rescue plan, selecting a delivery point and means of transportation. The SRUs, Rescue units (RUs) and all personnel involved in SAR operations are to be briefed to carry out this rescue plan.

10.5.2 The Rescue units are such facilities involved in mission, which are designed and equipped primarily for rescue. Such units may or may not be useful as search platforms. The safety of the RU and the survivor is a primary concern. Therefore, OSC/RU commander determines the actual method to be used for rescue, based on the conditions on scene and the RU capabilities.

10.5.3 Rescue planning also involves dispatching or diverting RUs to the scene for rescue of personnel and property in distress. However, SRUs at the distress scene, if able, should rescue without any delay. If they are unable, rescue planning may be necessary to effect a successful rescue operation. Rescue plan also should have the following logical sequence.

(a) Evaluation of Survivability Conditions. When evaluating rescue response, the survival time of the personnel should be considered the foremost. The SMC should also consider injuries or other medical conditions that right require special rescue response, such as the need for quick recovery using specialised rescue equipment. The factors to be considered should include the following:

(i) The number of survivors.

(ii) The condition of survivors. If not known, it must be assumed that urgent medical attention is required. If known, other detailed description of injuries including the need for stretchers, oxygen, intravenous fluids and other medical supplies are to be obtained.

(iii) The medical action taken by survivors or other SAR facilities at the scene.

(iv) Hazardous environmental conditions.
(b) **Evaluation of Environmental Conditions.** The environmental conditions may vary and the points to be considered are as follows :-

(i) Nature of environment like cold, ocean or swampy.

(ii) Location of survivors within the environment particularly survivors trapped in hazardous areas.

(iii) Weather conditions and potential effects on rescue operations and life expectancy of the survivor.

(iv) Time of the day, particularly, how darkness may affect rescue attempt.

(v) Environmental constraints on use of RUs such as boat drift lack of landing/hoisting areas etc.

(c) **Selection of Rescue Method.** Selecting the rescue method usually depends on environment on scene and the number of survivors and their conditions. It is sometimes left to the discretion of the OSC or SRU. However, the SMC usually develops the rescue plan and coordinates its execution with other SAR facilities, if required.

(d) **Selection of Rescue Facilities.** The SMC should consult the parent agencies to determine capabilities and limitations of RUs to rescue and transport survivors. The time delay in reaching the scene and schedule of availability in the area are also to be considered. If possible, at least one RU should be selected that can do both search for survivors and rescue them, if found. The nature of incident also influences the selection of RUs. The additional factors that are to be considered are as follows :-

(i) If the survivors are known or suspected to be injured, the positioning of trained medical personnel on scene is very important. Also helicopter transportation, if possible, is the most ideal method of evacuating survivors from the scene. When helicopters operations are not feasible for any reason, suitable SRU with qualified and trained medical personnel are very essential.

(ii) Special equipment required like for fire fighting, hoisting, etc.

(iii) Transport required for survivors.

(iv) Communication capabilities.

(v) Special rescue techniques/personnel required.
(e) **Optimum Rescue Plan.** Rescue plan may not be necessary for all SAR missions. However, while developing an optimum rescue plan on requirement, the SMC should consider the type of incident/casualty, the urgency/magnitude of the situation, the results of the aerial survey and the time required for reaching the RUs on scene. The route chosen for the RUs should take the least enroute time while providing adequate safety and navigational references. The SMC is to determine RUs availability, allocate specific tasks for each RU with rescue methods for the circumstances, subject to the approval of the RU commander. The aerial delivery of supplies, supporting equipment and other assistance to the rest of SRUs on scene are also to be considered.

(f) **Attainable Rescue Plan.** Having developed an optimum rescue plan, the SMC should coordinate with parent agencies providing RUs for executing the plan. If original conditions of the plan change, the SMC is to alter the optimum rescue plan to meet the changing conditions. He is also to inform other participating SRUs/agencies regarding the final rescue plan.
CHAPTER 11

HELICOPTER OPERATIONS
CHAPTER – 11

HELICOPTER OPERATIONS

11.1   Advantages of Helicopter

11.1.1  Helicopters can be effectively used during SAR operations especially in the final stages of rescue at sea. It is an ideal SRU because of its slow speed and hovering capabilities particularly for search of small targets at sea. The ability to land in confined areas and to operate from ships enables the helicopter to aid survivors long before surface SRUs can arrive on scene. They are also suitable for rescues in heavy seas or at locations where surface facilities are unable to access and operate. Due to these unique capabilities, helicopters should be used whenever possible.

11.2   Resources

11.2.1  Presently, Indian Coast Guard has Chetak single engine helicopter based at Daman, Mumbai, Goa, Chennai and Port Blair and Advanced Light helicopter (ALH) based at Goa, Porbandar. The Chetak helicopters are capable of operating from the decks of Offshore Patrol Vessels and Advanced Offshore Patrol vessels. The Chetak is capable of operating from other ships of Indian Navy also. Advanced Light Helicopter, which has twin engine and enhanced capabilities in terms of endurance and other operating factors, can operate from the decks of AOPV. In addition to these, Indian Navy has also helicopter placed at Mumbai, Kochi, Goa, Visakhapatnam and Arkakonam operating twin-engine helicopters namely Sea King, Kamov and Chetaks.

11.3   Capabilities

11.3.1  The helicopters are excellent resources for search, maneuverability and rescue. They are excellent platforms capable of recovering personnel from wide variety of distress situations and from barely accessible areas. The helicopters have the following capabilities :-

   (a)  Sustained hover operations.
   (b)  Hoisting and lowering operations.
   (c)  Transfer of personnel by rescue hoist.
   (d)  Transfer of submersible pump for de-flooding operations.
   (e)  Under slung operations effecting logistics and material transfer.
   (f)  Deploying aircrew diver for rescue operations.
(g) Transfer of medical personnel for medical requirements.

11.4 Considerations by SMC

11.4.1 The pilot of the helicopter is the final judge of the capability of the aircraft for the mission. However, the SMC should consider the following before deploying the helicopter for the SAR mission:

(a) Small/light helicopters are usually limited to visual flight and some may be restricted to daylight flying only.

(b) While some helicopters are instrumented for both inclement and night flying, they may be prohibited from night hovering and night navigation capabilities.

(c) Turbulence, gusting winds or poor visibility conditions may limit helicopter use.

(d) Operations by surface SRUs may be hampered by noise and rotor down wash produced by the helicopters.

(e) Number of survivors who can be rescued by helicopter taken onboard each trip is limited depending upon the size of the helicopter and endurance onboard.

(f) It may be necessary to reduce all up weight by removing non-essential equipment or undertake operation with less fuel/endurance.

(g) The fuel onboard at scene may be reduced by use of helicopter capable ships as staging/refueling platforms or operation from shore base nearby with refueling capabilities.

(h) It may be advantageous to despatch a fixed wing aircraft in advance to confirm the suitability of weather enroute/on scene for helicopter operations.

(j) Recovery by landing of the helicopter at an ashore facility needs additional concern like rotor down wash, turbulence, level/nature of ground, loose debris / FOD in area and landing/takeoff path clearance.

(k) Operations in high altitude environment will reduce helicopter performance and severely affect hovering capabilities.

(l) Discharge of static electricity during hoist operations.

(m) While operating from deck, when conditions are marginal, landing should be carried only as a last resort.
11.5 Communication

11.5.1 It is important that adequate information is exchanged between the helicopter and the vessel and they are thoroughly understood. This would be possible only when a direct radio link is established between the ship and helicopter. This is usually accomplished with the helicopter equipped with the marine VHF FM radio able to transmit and receive on at least Channel 16 and preferably on two other two working channels. Unless other arrangements have been agreed upon in advance, the ship should monitor VHF Channel 16 or pre-designated SAR frequency for the arrival of the helicopter.

11.6 Evacuation

11.6.1 Evacuation by Helicopter is undertaken depending upon the nature of casualty, the prevailing condition and the availability of the space onboard for winch operations and landing. The mission also depends upon the capabilities and limitations of the helicopter. The safety and efficiency of the helicopter operations is greatly enhanced if the crew of the vessel, the ground party at the rescue scene and the aircrew are thoroughly briefed in advance on what is required/expected of the operations.

11.6.2 The helicopter operations include landing and winching on land, water and oil rigs/offshore installations or on the deck of the ships at sea. Landings on vessels and oilrigs at sea will normally be done on well-equipped and trained craft. Though winching by helicopter can be hazardous to the persons being hoisted/lowered, the rescue facility and others on the scene of winching, the operations if coordinated and conducted well will certainly save lives of the casualties or personnel in distress. However, the final decision about whether it is safe to conduct the winching is subject to agreement of the pilots of the helicopter, personnel at the scene and the person in command of the rescue facility.

11.6.3 When arranging for the evacuation of a patient by helicopter or any other helicopter operations with the vessel, the following points should be considered by MRCC/MRSC/MRSSC :-

(a) Whether the ship has requested appropriate MRCC/MRSC/MRSSC for helicopter assistance.

(b) Rendezvous position to be indicated as soon as possible.

(c) If the vessel is beyond helicopter range, it must be diverted to facilitate operation.

(d) Obtain as much medical information as possible from the vessel, particularly about the patient’s mobility.
(e) Advise vessel to intimate immediately of any changes in the condition of the patient

11.6.4 The vessel must be advised to be ready with the following information for exchange between the ‘helicopter and the vessel’ to enable helicopter operations for the evacuation of the casualty :-

(a) Position of the ship.
(b) Course and speed to the rendezvous position.
(c) Local weather situation.
(d) Details of the ship for easy identification from the air (such as flags orange smoke signals, spotlights or daylight signalling lamps).
CHAPTER 12

SAR MISSION

CONCLUSION
Chapter 12

SAR Mission Conclusion

12.1 Mission Conclusion

12.1.1 Mission conclusion is the final stage of the SAR operation. The conclusion is successful when the search objects have been located and recovered. The conclusion is unsuccessful when the search objects have not been located and search has been suspended due to any specific reason or want of the essential data.

12.2 Mission Suspension

12.2.1 Each SAR case must be considered on its own circumstances and care is taken that the mission is not suspended prematurely. The decision to suspend an ongoing SAR mission is quite difficult. Prior recommending SAR mission to a suspension by SMC, a thorough review of the case is to be undertaken. The decision to suspend by SAR coordinator should be based on the probability of the search object surviving the initial incident, the probability of survival after the incident and probability of the victim was within the computed search area, the quality of search effort and consensus of the search planners. To enable further analysis, in future the reason for suspension is to be clearly recorded.

12.3 Review of a Case

12.3.1 The following are to be considered for the review of a SAR case.

(a) Examination of the assumptions and planning scenario during the search planning process and the decision was taken for the operation.
(b) Reconfirmation of the initial position and drift factors used in the determination of the search area.
(c) Re-evaluation of the significant clues and leads that was available for the planning.
(d) Review of the datum computations.
(e) Review of the search plan for ensuring that the search areas were as assigned and compensation for search degradation due to weather, navigational, mechanical or other difficulties.
(f) Determination of the survivability of the search object considering the time elapsed since the incident, environmental conditions, physical condition of the survivor, survival equipment available, survivors experience and their will to survive etc.

12.4 Extended Search Operations

12.4.1 Some SAR operations are extended beyond the normal time when they would
ordinarily be suspended because of the lack of reasonable probability of locating the survivors. Extended searches may be conducted considering the humanitarian factors, number of persons involved in distress or when the search conditions improve significantly. The SRUs must not be hazarded in the extended search operations to the same extent as during normal search operations or when the probability of saving the life is minimal or when their deployment precludes their availability for other missions.

12.5 Reopening a Suspended Mission

12.5.1 Reopening a suspended mission should always be considered by SMC/SAR coordinator if significant information or clues are received with the development of the scenario. It must also be considered that reopening a suspended case without good reason may lead to unnecessary use of SAR resources and risk of injury to the SAR personnel and also possible inability to respond to other distress incidents.

12.6 SRU Deployment and Diversion

12.6.1 The SMC must consider the limitations like time required for the SRU to return to base, refueling, maintenance of the SRU, replenishment of logistics, crew fatigue and remaining operating time etc., when the projecting the SAR capability for the same or any other SAR mission. This is more essential when a mission involves extended large-scale search operations. Anticipating and planning for these time requirements can alleviate much of the frustration caused by delays in the SRU return to the scene again. These factors must be considered by obtaining the details from the parent agencies if required. The SRU normally returns to its operational base and it could also be turned around from another port for the same or another SAR mission, depending upon the situation. If an SRU is diverted or despatched on a new mission, the details of the operation must be notified to the parent agency or operational base.

12.7 SRU Return and Dealtering

12.7.1 The SRUs are limited in the number and the endurance they can operate safely and efficiently is of paramount importance. The SMC should establish these limitations with the advice of the agencies providing them and deploy them judiciously. When long missions are envisaged, additional SRU and crew should be made available for augmentation. The SAR mission is not considered complete until the last SRU has returned to its operational base and all participating agencies are dealerted.

12.8 Notifying Relatives

12.8.1 If a SAR mission is suspended or concluded the SMC must make necessary notification to the relatives of the distressed or missing persons regarding the same. During the search the SMC must maintain contact with the relatives to provide information on the search effort and outline of future plans so that they can follow the progress of the search. Notice may also be given to them prior suspension of the operations. This will enable the relatives to accept the decision to suspend the operation.
CHAPTER 13

SAR RESOURCES
CHAPTER - 13

SAR RESOURCES

13.1 Resources

13.1.1 The primary responsibility of SAR coordinator is to effect search operation in minimum time and call out the rescue successfully. The time is the only deciding factor to deploy the forces available with the SAR coordinator or it requires mobilisation of facilities with other resource agencies. If MRCC feels the facilities available with other agencies will accomplish the mission with minimal time delay, the appropriate authorities are to be requested to extend the services of the assets at their disposal for mission accomplishment. The Resources available with Indian Coast Guard, Indian Navy, Indian Air Force and other resource agencies are given in the succeeding paragraphs.

13.2 Indian Coast Guard

13.2.1 The following include the assets available with the Indian Coast Guard for undertaking SAR mission.

(a) **AOPV.** Advanced Offshore Patrol Vessel (AOPV) built by Goa Shipyard Limited having length of 102 Meters with 2000 tons GRT capable of achieving 22 knots. The ship has endurance of 7000 NM and can accommodate 115 personnel including 12 officers. This vessel is designed to carry Advanced Light Helicopter (ALH) being built by HAL. Presently Coast Guard has four such vessels and fifth is under construction at Goa Shipyard Limited.

(b) **OPV.** Offshore Patrol Vessel (OPV) is having length of 74 Mtrs and GRT of 1220 tons and can achieve 22 Knots of speed. This class of ship has endurance of 8500 nm and can accommodate 100 personnel including 11 officers. The ship is capable to operate Chetak helicopters. The Coast Guard is in possession of eight such vessels in its arm. The newly inducted OPV is of 93.9 mtrs length and 02 more are likely to be inducted in the Service as replacement.

(c) **FPV.** Fast Patrol Vessel (FPV) having length of 46 Mtrs and 306 GRT and can achieve 23 knots of speed. The ship has endurance of 2800 NM and can accommodate 23 personnel including 8 officers. Presently coast guard is having 8 FPV under its arm.

(d) **XFPV.** X Fast Patrol Vessel (XFPV) having length of 48 Mtrs and 306 GRT and can achieve 35 knots of speed. The ship has endurance of 1500 NM and can accommodate 35 personnel including 8 officers. Presently coast guard is having 7 XFPV under its arm.
(e) **IPV.** Inshore Patrol Vessel (love) is having length of 45 m and GRT of 236 tons with endurance of 2375 nm. The vessel can accommodate 34 personnel including 7 officers. Presently Coast Guard is having 13 such vessels operating under different regions/locations.

(f) **Air Cushion Vehicle.** Coast Guard Hovercraft 8000TD(M) is an amphibious hovercraft powered by two MTU 12V183TB32 water cooled diesel engines each driving both a variable pitch propeller running in a duct and a centrifugal lift fan. Overall length of ACV is 19.85 Mtrs with beam - main structure of 8.70 Mtrs. The Aces all up weight is 25 tons and can achieve 50 knots and operate in swampy and marshy lands. It can accommodate 14 crew; presently Coast Guard is having six such vessels operating under different regions/locations.

(g) **Interceptor Boats (IB).** IBs is having length of 20 Mtrs and GRT of 32 tons with endurance of 600 NM. The vessel can accommodate 11 personnel including 01 officer. Presently coast Guard is having 12 such vessels operating under, different Regions/locations.

(h) **Dorniers.** The Dornier 228-100 turbo prop twin engine is a new generation commuter and utility aircraft incorporating advance technology in design and manufacture. It is high performance aircraft with short take off and landing during day or night and fly -by-wire features. It has a long flying endurance, usually up to five hours, all at unusually low operating cost. With a maximum speed of 472 km/hr and a service ceiling of 28,000 ft. -It has range of 2445 km. Presently Coast Guard is operating 24 such aircraft.

(j) **Chetaks.** As the standard search and rescue helicopter due to its vastly proven safety record. The HAL built Chetak is a light weight multi role helicopter capable of carrying 750 kg load under slung in case of emergency. The Chetak has a flight endurance of approx 540 km (290 nm) or 2 hours 30 min over land or sea with a maximum speed of 113 knots. This helicopter is also capable of embarking on all the Adopts and Opts presently in service in the Coast Guard for search and rescue and utility services. The Coast Guard is presently operating 17 Chetaks at different locations.

(k) **Advanced Light Helicopters (ALH).** The Advanced Light Helicopter (ALH) is designed as a multi-role helicopter for both military and civilian use. The helicopter used by the Coast Guard is fitted with surveillance radar, a Forward Looking Infer Red (FLIR), troop seats and a life raft along other for various requirements. It is powered by two TM 333-2B2 turbo shaft engines that generate a maximum speed of 290 km/hr and a cruising speed of 253 km/hr. The ALH is capable of carrying an external load of 1500 kg over a distance of 216 run. The Coast Guard is presently operating 04 ALH at different locations.
13.2.2 **Requisition of CG Assets.** The Coordinating MRCC/MRSC/MRSSC should requisition CG assets to the respective regional Commanders and District /Station Commanders keeping CGHQ informed in the format given in Appendix “F”.

13.3 **Indian Navy**

13.3.1 The facilities of the Indian Navy that can be requested for SAR Operations include the following.

(i) Crafts available with Dockyard.
(ii) Offshore Patrol Vessels.
(iii) Survey vessels.
(iv) Fast Attack Crafts
(v) Other classes of war ships depending upon the requirement.
(vi) Helicopters: Single engine - Chetak, Twin engine - Sea King and Kamov
(vii) Fixed wing aircraft Dornier, Islander and other types of long-range aircraft namely IL-38 and TU-142 depending upon the requirement.

13.3.2 **Requisition of IN Assets.** The requisition of assets or for diversion of IN assets for to be projected to respective IN operational authority by concerned MRCC/MRSC/MRSSC as per Appendix “F”.

13.4 **Indian Air Force**

13.4.1 The following assets available with Indian Air Force can be requisitioned for SAR operations by concerned MRCC as per Appendix “F”.

(i) Helicopters: Single engine - Chetak and Cheetah, Twin engine - MI - 8 and MI - 17.
(ii) Fixed wing aircraft: Dornier, Avro, and AN - 32 and other long-range aircraft depending upon the requirement.

13.4.2 **Area of Operation.** The area of operation of IAF Assets over maritime areas will be coordinated by the MRCC/MRSC/MRSSC

13.4.3 **Requisition of IAF Assets.** The Coordinating MRCC/MRSC/MRSSC should requisition services of IAF assets, if other assets are not available in the search area to local IAF authority keeping SAR co-ordinators and NMSARCA informed.

13.4.4 **Mission Result.** IN and IAF authorities will be required to forward mission result on completion of mission as per format placed at Appendix “G”.
13.5 National Hydrographic Office

13.5.1 Chief Hydrographer to Govt of India shall assist concerned MRCC/MRSC/MRSSC by timely promulgation of navigational warnings through NAVAREA and other measures.

13.5.2 The Navarea VIII coordinator should promulgate the NAVAREA VIII messages for SAR when the coordinating MRCC requests the same under following circumstances:-

(a) When the aircraft or vessel in distress in maritime area and need immediate assistance
(b) When an aircraft or vessel is lost or overdue and require assistance
(c) Whenever there is a man overboard from a vessel at sea
(d) When a vessel is in distress and the position is not known
(e) When requesting passing ships to lookout for vessel/fishing boats
(f) When requesting ships to report weather
(g) Any other situations as decided by the SMC to aid SAR response

13.6 Indian Space Research Organisation

13.6.1 Department of Space (DoS) shall provide satellite “alert” services for detection and location of aircraft, ships or individuals in potential distress situation that carry distress beacons as per IMO and ICAO regulations. As a mandatory requirement for the users, the DoS also maintains beacon registration data base containing unique identity of the beacon, vessel/aircraft type, owner and emergency contact details and distributes to concerned rescue co-ordination centre for SAR mission planning.

13.7 India Meteorological Department

13.7.1 Meteorological Department shall support SAR operations through timely input of weather messages, marine environment forecasts and warnings for the coastal and high seas and provide weather information on demand to coordinator and coordinating agency. The coordinating MRCC/MRSC/MRSSC may request whether update from IMD for effective SAR coordination.

13.8 Major Ports and Minor Ports

13.8.1 The terms of reference and the co-ordination with MRCC/MRSC/MRSSC needs to be established and incorporated.
13.9 **Sailing Vessels**

13.9.1 The terms of reference and the co-ordination with MRCC/MRSC/MRSSC needs to be established.

13.10 **Other Resource Agencies**

13.10.1 The following assets available with other resource agencies can also be requested for SAR operation depending on the requirement.

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<td>(i)</td>
<td>Oil and Natural Gas Commission</td>
<td>Off shore Supply Vessels, Tugs and helicopters</td>
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<td>(ii)</td>
<td>Port authorities</td>
<td>Tugs and other crafts</td>
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<td>(iii)</td>
<td>Shipping Corporation of India</td>
<td>Ships enroute can be requested to assist in the on going Search and Rescue operation</td>
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<td>(iv)</td>
<td>Transport Corporation of India</td>
<td>Ships enroute can be requested to assist in the on going Search and Rescue operation</td>
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<td>(v)</td>
<td>Dredging Corporations of India</td>
<td>Ships enroute can be requested to assist in the on going Search and Rescue operation</td>
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<td>(vi)</td>
<td>Fishing authorities</td>
<td>Crafts and Vessels</td>
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<td>(vii)</td>
<td>Customs authorities</td>
<td>Crafts and Vessels</td>
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<td>(viii)</td>
<td>State Government/Administration</td>
<td>Crafts and Vessels and also helicopters and aircraft, as available.</td>
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<td>(ix)</td>
<td>Indian Army</td>
<td>Helicopters - Chetak and Cheetah.</td>
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<td>(x)</td>
<td>Pawan Hans Helicopters Limited</td>
<td>Helicopters - Dauphin.</td>
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13.10.2 **Requisition for Assets from other resource agencies.** Depending on the nature of SAR operation, the requirement of assets available with other resource agencies will be requisitioned by the MRCC/ CG RHQ/ DHQ to the organisation through general request. The resource agencies are to provide the contact points to the closest MRCC/ MRSC/MRSSC so as to avail the resources during mass casualty evacuation situations or during other emergencies occurring at sea.
CHAPTER 14

AIR OPERATIONS
CHAPTER – 14

AIR OPERATIONS

14.1 Aircraft Intercepts

14.1.1 The aircraft intercepts are based on the capability of SAR aircraft to establish visual/electronic contact with an aircraft in distress, provide in flight assistance and escort it to a safe landing. Escort service will nominally be provided to the nearest suitable airport. Should the escorted aircraft continue on another destination after reaching safe airport or decide not to divert to the nearest safe airport, further escort is discretionary.

14.1.2 Occasion to Intercept. The SMC in coordination with AAI & IAF may intercept and escort an aircraft when an alert phase exists and should intercept and escort when distress phase exists or when a pilot requests an intercept. The following incidents require aircraft intercepts.

(a) When aircraft is unable to maintain altitude.
(b) When aircraft has suffered structural damage.
(c) When pilot in control of an aircraft is impaired.
(d) Uncertainty exists on the position of the aircraft.
(e) Uncertainty exists on the endurance of the aircraft to reach a safe airport.
(f) When one of the engines is inoperative.
(g) When the aircraft is in other before and imminent danger.

14.1.3 Types of Intercepts. The methods selected for aircraft intercept will be determined whenever radar vectors to intercept the aircraft are not available. It is depending upon the nature of the emergency, the track of the distress aircraft and the relative position of the SAR aircraft. The aircraft intercept can be accomplished by using a direct, offset or maximum rescue coverage procedure and the conditions for the same are described below.

(a) Direct Intercept. The direct or head on intercept is used when the distress aircraft is inbound to the SAR aircraft base. The distress aircraft should not be asked to change its heading for the intercept unless the aircraft is lost, requires minor heading changes to correct for navigation error or when it is in imminent danger and cannot reach the airfield safely.
Offset Intercept. The offset intercept is used when the distress aircraft is making a good track to a landing area and the SAR aircraft is to one side of the track. The SAR aircraft intercepts the track of the distressed aircraft. When the distressed aircraft has greater ground speed, the SAR aircraft has to be closest to the point of intended landing.

(c) Maximum Rescue Coverage Intercept. This procedure is to intercept and escort the high-speed aircraft with low speed SAR aircraft. Because of the speed difference it may be necessary for the SAR aircraft to turn short of the interception point on the distressed aircraft to provide maximum rescue coverage over the remaining distance to be flown.

14.1.4 Aircrew Duties. In order to provide maximum service to the distressed aircraft, the SAR aircraft crew requires thorough coordination amongst themselves and also between the distressed aircraft including the assisting air/ground facilities. To ensure this coordination, the duties of SAR aircraft aircrew include the following.

(a) The pilots maintain communication with the distressed aircraft and other assisting facilities on the appropriate frequencies.

(b) The observer maintains pertinent HF communications and keeps the pilots informed.

(c) The transmissions and conversations between the aircrew should be kept to minimum so as to enable exchange of information between the aircraft.

(d) In addition to navigation, the observer should plot the progress of both the aircraft. The accuracy of position report received from the distressed aircraft should be carefully evaluated and verified by other checks as soon as possible.

(e) The observer should compute an intercept at the earliest and advice the pilots and also the concerned MRCC/MRSC/MRSSC, if required.

(f) If the calculation is not completed prior take off, the salient information like the initial heading, approximate distance and estimated time of intercept should be provided to the pilot.

(g) The observer should be prepared to complete the navigational visual intercept if communications/electronic contact with the distressed aircraft is lost.

14.1.5 Actions During Intercept. The SAR aircraft should choose an altitude so as to enhance the capabilities of primary methods of interception, whether visual or electronic. The SAR aircraft should be flown at 1000 ft below or above the distressed aircraft to silhouette the latter against the sky and achieve maximum sighting distance. During night intercept additional vertical separation is recommended. To ensure safe vertical separation,
it is imperative that altimeter settings of the both the aircraft be compared and coordinated prior to intercept. To enable best utilisation of the radar and to clear lower altitudes in case the distressed aircraft is unable to hold an assigned altitude, it is recommended that the SAR aircraft be flown at 1000 feet above the distressed aircraft.

14.1.6 **Intercept Communications.** The positive two way communication between the SAR aircraft and the distressed aircraft plays a vital role in establishing visual/electronic contact with the latter and provide assistance. To ensure this following points are to be ensured.

(a) Good communications between the aircraft instil confidence in the crew of the aircraft in distress. The crew must transmit messages in clear and concise form and provide information at periodic intervals to assure the distress crew that contact is being maintained. The distressed aircraft crew must not be burdened with unnecessary information.

(b) The SAR aircraft should establish direct communication on the enroute frequency, emergency VHF/UHF frequency, with the distressed aircraft and other frequency as promulgated, at the earliest.

(c) The SAR aircraft must be prepared for any communications failure with the distressed as they may be forced to bailout, ditch or crash land at any moment depending upon the nature of emergency.

(d) If efforts to contact the distressed aircraft fails or communications is lost, the SAR aircraft must transmit information and instructions in blind under assumption that the distressed aircraft is receiving but is unable to acknowledge.

14.1.7 **Post Intercept Actions.** The following actions are to be taken by the SAR aircraft on intercepting the distressed aircraft.

(a) Provide initial data like SAR aircraft identification, mission, present frequency, and secondary frequency to the distressed aircraft.

(b) Maintain listening watch on VHF/UHF emergency frequencies must also as standby.

(c) Obtain and verify essential data like nature of emergency and intentions, true course, altitude, ground speed, flight conditions, endurance, persons on board must be by the SAR aircraft.

(d) Advise the distressed aircraft pilot regarding the location of closest suitable airfield for precautionary landing, type and length of runway, surface details, elevations, landing aids and weather.
(e) Confirm any further change in the plans of distressed aircraft. Notify the airfield simultaneously regarding position and time of intercept. Advise the airfield for services of crash and salvage facilities on landing.

(t) Reconfirm the altimeter setting with the distressed aircraft and advice on the minimum safe altitude enroute.

(g) Once the SAR aircraft is in escort position after the intercept, provide position, heading and ETA to the destination. Ensure that the distressed aircraft can arrive at the destination airport.

(h) Confirm any fuel jettisoning would be essential prior landing. Take position accordingly well clear of the distressed aircraft during fuel jettisoning.

(j) Obtain the latest weather from the airfield and advice the distressed aircraft also. Once the distressed aircraft has the airfield in sight, obtain landing instructions for the distressed aircraft and remain overhead until distressed aircraft lands.

(k) If runway is clear for landing, the SAR aircraft can land at the same airfield or proceed to base, if endurance permits.

14.2 Aircraft Ditching

14.2.1 An aircraft ditching would set transponder to 7700 for distress, if available onboard. It would have also notified the appropriate AIS regarding the emergency situation, position and ditching intentions. Normally this would be done on the enroute air traffic control frequency or 121.5/243.0 MHz. If two way communications are not established, then the aircraft would have transmit in blind. If the aircraft is equipped with HF radio, ATS would have been apprised to have SAR authorities alert ships in the vicinity and have those ships attempt communications with the aircraft on 4125 kHz to assist ditching and rescue. If the aircraft has to ditch or the crew bailout over water, the most advantageous place near a surface craft preferably alongside or slightly ahead.

14.2.2 The different maritime and aeronautical bands make direct communication between vessels especially merchant vessels and aircraft difficult. However, most civil aircraft flying over ocean are equipped with VHF/AM radio 118-136 MHz and HF SSB radios 3-20 MHz. Military aircraft normally have UHF radio 225-399.9 MHz and HF SSB radio 3-30 MHz. Both military and civil aircraft with ATS units on HF while over ocean areas.

14.2.3 Merchants ships are ordinarily informed of aircraft distress situation by broadcast messages by CRSs on international distress 2182 kHz or 156.8 MHz (VHF Channel 16). Only few aircraft can operate on this frequency. However, emergency communications are usually established with the aircraft on 4125 kHz or 5680 kHz. Communications
between aircraft and a vessel often may have to be relayed via an SAR aircraft, military vessel of ground station.

14.2.4 While there is no standard emergency signal to indicate ditching, an aircraft in distress can use any means to attract attention, make its position known and obtain help. Lowering landing gear and flashing landing lights on and off may be used by the aircraft to signal ditching intentions.

14.3 Assistance from Ships during Ditching

14.3.1 Assistance that may be provided in a ditching situation can be rendered only after establishing communication or locating the aircraft. The ship may establish and maintain communications with the distressed aircraft by direct voice channel. The ship may use its radar to locate the aircraft by identifying the transponder code 7700 if appropriately equipped. In case this is not possible the pilot may be able to make 90 degree identification turn and hold the new course for three minutes and then return to the base course.

14.3.2 Homing. The ship can also send homing signals on a frequency compatible with aircraft’s automatic direction finder and the pilot may be able to provide the reciprocal bearing for homing. Also with the position, other associated navigation data and unusual weather conditions received from the aircraft, the vessel the ship can home on to the distressed aircraft at the earliest. The ship may assist aircraft by providing the course to steer based on radar and DF bearing from the ship. Also during the daylight the ship can make black smoke, cruise at high speeds to form a wake or use other means to attract attention visually. During night the star shells, searchlights, pyro techniques, deck lights or the ship can use water lights.

14.3.3 Weather and Surface Data Although the final determination of ditching site is responsibility of the pilot, the ship can provide useful surface data, sea/swell information, weather update and recommend ditching heading. The ship is also to mark the sea lane along the selected ditching heading for easy identification by using fire extinguisher during day light with relatively calm sea conditions. During night or low visibility period a series of floating lights can be laid.

14.3.4 Rescue and Medical Assistance. Rescue of personnel from a ditched aircraft may be undertaken by small boats or the ship itself. The survivors in the water or aircraft should usually be rescued first and those safe in the rafts last. If there are seriously injured personnel ship/ OSC may render first aid and request SMC for medical arrangements to evacuate. An aircraft ditching must be responded to immediately since an aircraft will float for only a very limited time.
CHAPTER 15

SHIP REPORTING SYSTEMS
CHAPTER - 15

SHIP REPORTING SYSTEMS

15.1 Need for Ship Reporting System

15.1.1 The ship reporting system contributes to the safety of life at sea, safety and efficiency of navigation and protection of marine environment. The system plays an important role in developing a database of potential assisting ships based on real time inputs from merchant ships transiting through the area of interest. As an obligation to the GMDSS requirements, Master of each ship reports sailing plan, arrival plan, deviation report and periodic position/course/speed report to the organisation maintaining the system. All above details are maintained on a plot along with SAR capabilities of the vessel. In case of distress, details of vessel along with present predicted position are made available to SMC for coordination. The transiting ships are key SAR resources for MRCC but request for them to assist must be weighed against the considerable cause to shipping companies on diversion/deployment in search / rescue operation. MRCC is to identify the capable vessel, which will be least harmed by diversion and request the same for operation.

15.1.2 Valuable information on vessel characteristics for determining the SAR capabilities can also be entered into the database from available sources of information, which can be provided to the SAR agencies within the area of interest for use during emergency. The predicted location and other information are disclosed only for reasons connected with maritime safety. Decision on diverting the merchant ships in response to a SAR operation is the responsibility of the SMC based on careful consideration of all available information. It must be remembered that the ships participate voluntarily in the SAR system and are usually on tight logistical schedule and therefore diversions for SAR operation will be costly for the shipping companies.

15.1.3 Merchant vessels are valuable rescue facilities and should be called upon to assist whenever necessary to respond to life threatening situations only and after having weighed against use of other available resources. The ships can however be used along their track to help verify the distress information and keep a sharp lookout for survivors if any. They can also be used to assist in searches but should be sparingly used for extended searches due to their relatively low speeds, small sweep width and high costs involved. The ships diverted for the search must be released as soon as possible, consistent with the situation and their apparent importance to the SAR case.

15.1.4 The INDSAR ship reporting systems covering Indian SRR is already in force. The details of the same are given in succeeding paragraphs.
15.2 Ship Reporting System for SAR (INDSAR)

15.2.1 To invite-participation of foreign flag ships passing through Indian SRR, a supplementary ship position reporting system known as INDSAR is brought into effect from 01 Feb 2003. This system is fully computerised and is operated at MRCC Mumbai. The ships incur no cost for transmitting ship reports to the MRCC Mumbai through Inmarsat. The information sent to INDSAR is protected and used only in a bonafide maritime emergency. INDSAR provides an additional measure of safety “Insurance” by allowing rescue coordinators to compress the search area in the event a participating ship is unreported or overdue.

(a) **Objective.** The main objective of the INDSAR system is to provide quick and efficient SAR services to the vessels or persons in distress.

(b) **Area of Applicability.** The vessels entering the Indian Search and Rescue Region are to provide information as enumerated in succeeding paragraphs.

(c) **Operating Authority.** The MRCC Mumbai will coordinate the INDSAR with support from Indian Navy and LES Pune for receiving ships position for SAR operations.

(d) **INDSAR Reports.** The basic format for INDSAR reports follows the International Maritime Organisation (IMO) standards. The first line in every report begins with INDSAR followed by a slash (I), the report type (SP, PR, DR, FR) and ends with a double slash (II). Each remaining line begins with a specified letter followed by a slash (I) to identify the line type. The remainder of each line contains one or more data fields separated by single slash (I). Each line ends with a double slash (II). All reports should end with a “Z” which indicates end of report line. The details and procedures of the reports are given in the succeeding paragraphs. The standard format for INDSAR report is given in Appendix “H”.

(i) **Sailing Plans (SP) or Entry Report (ENR).** This report contains the complete routing information and should be sent within a few hours before departure, upon departure, within a few hours after departure or on entry into Indian SRR. It must contain enough information to predict the vessel’s actual position within 25 nautical miles at any time during the voyage, assuming that the sailing plan is followed exactly. The sailing plans require A, B, C, E, F, G, I, M and Z lines. The L, V and X lines are optional.

(ii) **Position Reporting (PR).** This report should be sent within 24 hours of departing port or entry into ISRR and at least once every 24 hours thereafter. The destination should be included (at least in the first few reports) in case INDSAR has not received the sailing plan or Entry Report. Position Reports require A, B, C, E, F and M lines. The I line is strongly recommended. The M and X lines are optional.
(iii) **Deviation Report (DR).** This report should be sent as soon as any changes take place on the voyage information provided, which could affect INDSAR’s ability to accurately predict the vessel’s position. Changes in course or speed due to weather, change in destination, diverting to evacuate a sick or injured crewmember, diverting to assist another vessel or any other deviation from the original Sailing Plan should be reported as soon as possible. Deviation Reports require the A, B, C, E and F lines. The I and L lines are required if destination or route changes. The I line is always strongly recommended, even when not required. The M and X lines are optional.

(iv) **Final Arrival Report (FR) or Exit Report (EXR).** This report should be sent upon arrival at the port of destination or an exiting the ISRR. This report properly terminates the voyage in INDSAR’s computer and ensures the vessel will not appear on an INDSAR SURPIC until its next voyage. It also allows the number of days on plot to be correctly updated. Final Arrival Reports require the A and K lines. The X line is optional.

(e) **Contact Details.** All the reports are to be prefixed INDSAR and transmitted to the MRCC Mumbai by any of the following method.

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i)</td>
<td>Telephone</td>
<td>+91-22-24388605</td>
</tr>
<tr>
<td>(ii)</td>
<td>Fax</td>
<td>+91-22-24316558</td>
</tr>
<tr>
<td>(iii)</td>
<td>INMARSAT ‘C’</td>
<td>441922594</td>
</tr>
<tr>
<td>(iv)</td>
<td>E-mail</td>
<td><a href="mailto:icgmrcc_mumbai@mtnl.net">icgmrcc_mumbai@mtnl.net</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td><a href="mailto:inindsar@vsnl.net">inindsar@vsnl.net</a></td>
</tr>
</tbody>
</table>
CHAPTER 16

VESSEL IDENTIFICATION SYSTEM
CHAPTER - 16

VESSEL IDENTIFICATION SYSTEM

16.1 Need for Vessel Identification System

16.1.1 The detailed information about the vessel in distress plays a vital role in coordinating and rendering assistance in minimum possible time. Depending upon the nature of distress onboard, the situation changes within seconds. Therefore, rendering necessary assistance to the distressed vessel within the required time frame is of paramount importance and is to be borne in mind at all times by the SAR Coordinator. The following are the vessel identification systems available to the SAR Coordinator for obtaining information about the vessel within the shortest possible time.

16.2 INMARSAT Database

16.2.1 The name of the vessel, call sign and ID number in respect of all vessels equipped with INMARSAT terminals are listed in INMARSAT directory. In addition, the details of owner and accounting authority of the vessels are available with Land Earth Station (LES), Pune. In case of any requirement the details can be obtained from the same station. The MRCC Mumbai has been provided access for obtaining INMARSAT data of the vessels through Internet (https://esas.inmarsat.com/ESAS2000/Logon.asp). The other MRCCs Chennai and Port Blair are to contact MRCC Mumbai, in case any requirement of data regarding the merchant ships.

16.3 DG (Shipping) Database

16.3.1 The database containing name of the vessel, call sign, MMSI number, name and address of the owner in respect of all Indian vessels registered with Director General (Shipping) is available in database and held in their associated offices. The MRCC is to ensure that the respective offices of DG (Shipping) provide the details on regular basis. In addition, a web site (http://mmd.gov.in/shipregistered.php) containing details of vessels is to be launched and be updated by DG (Shipping) as and when change occurs.

16.4 INMCC Database

16.4.1 The database containing name of the vessel, call sign, MMSI number, name and address of the owner in respect of all Indian vessels is also available with INMCC Bangalore and the details can be obtained on request. The details of vessels are automatically included in the distress information sheet in case alert is activated through COSPAS-SARSAT system before relaying to MRCC/ SPOC. In addition, a web site (http://inmcc.istrac.org/login.jsp#) containing details of registered EPIRB/ELT/PLB are to be launched and be updated by
16.4.2 International 406 MHz Beacon Registration Database (IBRD), available online and free of charge at www.406registration.com. IBRD is maintained by COSPAS-SARSAT Programme. Several countries have opted to register their beacon with IBRD. National and International SAR authorities can have access to this database for Search and Rescue. The access is controlled by username and password.

16.5 **ITU Publications**

16.5.1 The List of Ship Stations and the List of Call signs and Numerical identities published by International Telecommunication Union (http://www.itu.int/cgi-bin/htsh/mars/ship_search.sh) contains the name of the vessel, call sign, name of the owner, MMSI number, communication facilities onboard and rescue equipment which can be referred on requirement.

16.6 **MEREP Database**

16.6.1 The details of vessels intercepted by Coast Guard units while on patrol are to be maintained at MRCC Mumbai. All CG Units and other MRCC and MRSC are to pass the MEREP reports by fastest means to MRCC Mumbai for maintaining ship plot in INDSAR and for co-relating the ships position. This may provide some information regarding the vessel in distress.

16.7 **Fishing Vessel Database**

16.7.1 The details of Distress Alert Transmitter fitted onboard fishing boats were readily available with all MRCCs.

16.8 **Internet Web Sites**

16.8.1 The following web sites are available on Internet, which also contains the details of the vessels.

(a) www.cospas_sarsat.org
(b) www.fairplay.co.uk
(c) www.seasearcher.com
(d) http/195.224.35.21/ships
(e) www.tankerworld.com/vesse
(f) www.equasis.org
16.9 Other Sources

16.9.1 The details of vessels required for coordination of SAR operation can also be obtained from sources as listed below.

(a) MRCC and registration authorities of the country to which vessel belongs (Contact details available in ALRS Vol 5).

(b) Port authorities/agents at LPC/NPC

(c) Lloyds Registry
   Lloyd’s Register of Shipping
   100 Leadenhall Street London
   EC3A 3BP, United Kingdom
   Telephone: 004420 77099166
   Fax: 004420 77884796
   Telex: 888379

(d) Fair Play Registry
   20 Ullswater Crescent Ullswater Business Park Coulsdon
   Surrey CR5 2HR, UK
   Telephone: 004420 8645 2800
   Fax: 004420 8660 2824

(e) Piracy Reporting Centre (PRC) Kuala Lampur.
   Telephone: 00603238 5763
   Fax: 0060 3238 5769
   Telex: MA 31880
CHAPTER 17

INTER AGENCY COORDINATION
17.1 SAR Co-ordination

17.1.1 The effective coordination of SAR operation very often demands mobilisation of SAR facilities with other resource agencies. If the involvement of the other agencies is felt, the requirement is to be projected without any hesitation. This would be possible only when there is thorough interaction between all the agencies involved in the conduct of a SAR operation. The SAR Coordinator on receipt of the distress notification coordinates with other agencies having SAR facilities. The availability of required type of facilities with the coordinator in time makes the job of the SMC easier in effecting a successful operation. The MRCC / MRSC / MRSSC is to maintain a contact liaison with the resource agencies within its area of jurisdiction through periodic meetings and seminars. The contact details of the agencies need to be updated at regular intervals to avoid any in delay in projecting the requirements.

17.1.2 The facilities with the following agencies can be requisitioned by the SAR Coordinator for any SAR mission.

(a) Indian Navy.
(b) Indian Air Force.
(c) Directorate General Shipping.
(d) Chief Hydrographer of India.
(e) Airports Authority of India.
(f) Department of Telecommunication and Local Authorities.
(g) Department of Space and Local Authorities.
(h) Customs Authorities.
(j) Fishing Authorities.
(k) Port Control Authorities.
(l) Ministry of Shipping and Local Authorities.
(m) State Government / Local Administration authorities.
(n) Police Authorities.
(p) Oil and Natural Gas Commission and Local Authorities.
(q) Transport Corporation of India
(r) Dredging Corporation of India
17.2 Inter Agency Exercises

17.2.1 The requirement of a SAR mission is called for without any prior notice or appointment. The agencies likely to be involved in the SAR operations are to be geared up in all respects so as to be ready to render assistance if required. Also the procedures involved in undertaking such an operation with various agencies on the scene is to be very well known to the agencies and also to all the personnel of all faculties. Therefore, to ensure that everyone is prepared in all respects and work in cohesion, SAR training and exercises involving all the agencies will be conducted periodically simulating a SAR scenario. This will enhance the capabilities of the SAR system further and allow every agency to evaluate their capabilities to respond to any actual SAR requirement.

17.3 Safe Waters

17.3.1 Dissemination of Information A bi-annual SAR newsletter SAFE WATERS is published in March and September of every year. Various efforts of the National SAR Coordination agency and other agencies related to SAR are projected for obtaining views and recommendations for improvement of the SAR system. This journal also carries SAR cases undertaken and also contains articles to educate people by the lesson learnt during the operation, refresh the knowledge on the SAR operation and also keep abreast on the latest development and technologies on the SAR operation.

17.4 Inter Agency Liaison

17.4.1 All personnel involved in the SAR operations should maintain constant liaison with the MRCC and the coordinating MRCC should in turn maintain constant touch with the military authorities providing SRUs and other SAR agencies involved in the operation to help coordinate the activities, provide briefing and debriefing and keep SMC informed on the SRU availability. Adequate background information must be provided so as to develop a picture on, what actions might have been taken by the missing craft and provide expertise about the craft to aid in search planning during all joint operations. This will also enable to conduct coordinated studies, review procedures and equipment and recommend better method of operation. Any development in this regard should be informed to the SMC in an ongoing operation.

17.4.2 The inter agency liaison will enable review of SAR matters affecting more that one agency, including recommendations of participating agencies for revision and amendment of the plan. This will also encourage all the agencies involved to develop equipment and procedures to enhance the national SAR capability and promote coordinated development of all national SAR resources.
CHAPTER 18

DOCUMENTATION
CHAPTER - 18

DOCUMENTATION

18.1 Case Title and Numbering

18.1.1 The proper documentation of SAR cases handled by MRCC/MRSC/MRSSC develops the backbone of the SAR system so as to guide the future evolutions to achieve the desired aim. The documentation promotes operational efficiency and creates statistical data and develops database for SAR case studies. The documentation consists of SAR folder, proper numbering of SAR cases, maintenance of dairy of events, filing of relevant document received/developed or despatched in chronological order and rendering report in the desired format.

18.1.2 On reporting of every SAR incident, the MRCC/MRSC/MRSSC is to allocate a running serial number from 001 commencing 01 Jan each year. In addition, National Maritime SAR Coordinating Authority (NMSARCA) is also to allocate a running serial number starting from 001 commencing 01 January every year for all cases responded by all MRCC/MRSC. The SAR case numbers are maintained primarily for statistical purposes. The case title is to indicate the name of the vessel and type of emergency onboard. The detailed procedure for numbering is placed at Appendix “K”.

18.2 SAR Folder

18.2.1 A separate SAR folder is maintained for each SAR case and is numbered as discussed in the above paragraph. The diary of events pertaining to the case is developed in chronological order with the progress of the case and is stapled/pasted to the inner side of the front cover of the folder. All messages received/despatched are to be placed in the folder in chronological order. All messages pertaining to ship/air operation and coordination are to be filed in the folder only. The creation of sub files/folders in a case should be avoided. The interim reports on the progress of the SAR case and the final report on conclusion of the case are to form part of the SAR folder. The SAR folder should carry the serial of the case as given in SAR operation logbook, case number and case title.

18.3 Master SAR Folder

18.3.1 All SAR folders are to be tagged in Master SAR folder maintained for the current year as per the serial number given in SAR operations Logbook. A separate Master SAR folder is to be maintained for each year.
18.4 Diary of Events

18.4.1 The diary of events of the SAR case is to contain chronological entries of date and time of mission opening, phone call summary with details of the message, all messages received/dispatched, movement of SRUs, requisition of resources from other agencies, including merchant ships transiting through the area, activation of ISN, SAR case summary etc. It should contain each and every minute details of the operation undertaken, so that the subsequent case studies, preparation of case summary and rendition of the final report will be done without referring to the messages filed in the folder. The diary of the events should be recorded in the following format

<table>
<thead>
<tr>
<th>SAR CASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASE TITLE</td>
</tr>
<tr>
<td>DATE AND TIME</td>
</tr>
</tbody>
</table>

18.4.2 Photography The SAR folder is to carry a pouch on the inner back cover for placing the photographs pertaining to the events. Concerted efforts are to be made to take photographs of each and every event. The video photography of the incident, if possible, should also be taken and preserved for first hand information and future requirements.

18.5 SAR Operations Log Book

18.5.1 The SAR cases undertaken by the MRCC/MRSC/MRSSC are to be serially numbered and recorded in the SAR operations logbook in a chronological narrative manner for the cases responded as per the given format.

<table>
<thead>
<tr>
<th>Sl.</th>
<th>Date</th>
<th>Case Sl. No. and title</th>
<th>Brief of incident</th>
<th>Remarks</th>
</tr>
</thead>
</table>

18.6 SAR Incident Processing Forms

18.6.1 On initiation of any SAR mission, the SMC is to forward the completed SAR incident processing form to the NMSARCA and the respective MRCC. The format is to be initiated within two hours of the initiation of the incident. The format of the processing format is placed at Appendix “L”

18.7 SAR Case Summary

18.7.1 On completion of the SAR mission, the SAR case summary is to be prepared by the SMC and forwarded to the MRSC, MRCC and NMSARCA and SAR coordinator. A copy of the same is also to be retained in the SAR folder. The format for the SAR case summary is placed at Appendix “M”
18.8 SAR Charts

18.8.1 The tracings of the charts used for the SAR operation depicting all incidents including the track and speed made good, search pattern undertaken by the ships / aircraft and other related data required for the evaluation of the SAR mission are to be prepared. The SAR chart should also include the projected track line of the missing craft, last known position, estimated position, search areas, mission number and title, SRUs and search area assignments. The SRUs involved in the operation are to forward the same covering the respective part of the operation to SMC for compilation of the SAR charts. The SMC is to submit the SAR chart to the respective MRCCs, SAR coordinator and NMSARCA. This should also form part of the SAR folder.

18.9 Computer Database

18.9.1 All the aforesaid documents are to be stored in digital database in compact disc. This should also contain the still photographs, video photography and charts whenever possible. This will facilitate the availability of the data during future requirements of analysis and case studies.

18.10 Case Studies

18.10.1 The SAR coordinator should always consider SAR case studies for the betterment and enhancement of the SAR system. This would be possible on the examination of the search efforts after the recovery of the survivors, which, win provide information for the improvement of the SAR techniques and procedures. This would enable passing the experienced gained to other SAR Coordinators and personnel engaged in SAR operations.

18.10.2 The SAR case studies should also be undertaken when a search has failed to locate the target and the same was subsequently found or a mission has failed to locate a target resulting in loss of life. Also when a SAR mission is believed to be of unusual interest due to the use of new methods or procedures or when unusual experience is gained on completion.

18.10.3 The SAR case studies should deal with only factors considered contributory to the purpose of the study along with the recommendations for improving the SAR system. The factors to be considered include initial error in position of the distressed craft, drift computations compared with actual drift, search area determination, thoroughness of the area covered, search pattern used, use or lack of detection aids, communication difficulties, reason for failure to locate the target, efficiency/quantity/quality of the SRU deployed etc.
CHAPTER 19

PUBLIC RELATIONS
CHAPTER – 19

PUBLIC RELATIONS

19.1 News Media

19.1.1 The information policy for SAR missions must be such that it provides the details to the public, within the limits of security of SAR system actions. News releases must be made to the media periodically to keep the public updated on the progress of the ongoing mission. Early release of information may lead to situation involving unnecessary use of SAR resources and which may also demand providing more information to the news media. A final press release must also be made by SAR coordinator/Officer authorized by SAR coordinator when the case is concluded which summarises the entire mission.

19.1.2 Information concerning a SAR mission should provide to the interested media agencies and their representatives by the Public Relations Officer with the progress of the mission. The details of the mission may however be restricted to the prevailing directives on the security aspects. It must be ensured that the information release to the media does not hamper the ongoing SAR operation in any manner. If an officer is not designated/available for this interaction with the media the SMC may brief regarding the operation. The various points to be considered by the SMC / Public Relations Officer prior release are as follows.

(a) The officer releasing the information should have thorough knowledge of the ongoing SAR operation and the salient aspects of presenting information to the public.

(b) Prior approval of the higher authority/SAR coordinator must be obtained before release of the information.

(c) The details for the press information release are to be obtained from the SMC, MRCC Operations Logbook, Diary)’ of Events and personal interview with the rescued personnel.

(d) Adequate information must also be collected on the techniques used and stage of the SAR operation at any particular time for the preparation of the statement.

(e) Photographs of the MRCC actions, SRU in action on the scene and other relevant mission activities that are suitable for release must be collected.

(f) Details of the assistance provided by the other agencies, local resources must be collected to give credit in the news information.
(g) News releases should be written in text preferably in the format of “who, what, when, why and how” prior to meeting the press representatives. It should be easily understood, factual and news worthy.

19.2 Public Assistance

19.2.1 Assistance from the public may be sought through the news media, which may benefit the SAR mission. The information thus received may provide valuable clues to the SAR planners to modify the search action plan. The general information that can be useful for cross verification includes the last sighting of the vessel or craft, unusual occurrences, reporting method etc.

19.3 Release of Names

19.3.1 The officer releasing the information to the press regarding the deceased casualties should reconfirm the identity of the individual and use good judgement in doing so. Every reasonable effort should be made to inform the next of kin as soon as possible. Names of the military casualties should be conveyed to the parent service and should be released only by the parent service of the individual. Names of the survivors of the incident can also be released simultaneously after positive identification. The survivors should be assisted in contacting their families as soon as possible.
CHAPTER 20

COMPUTER RESOURCES
CHAPTER - 20

COMPUTER RESOURCES

20.1 Computers and Related Features

20.1.1 The preservation of the data related to various methods and stages of distress notification, search planning and successful rescue operation is essential for the post operation analysis, improvement of the SAR system and staff training. The method of preservation of data in digital form in compact disc and compact floppies proves to be more effective for quick retrieval of stored information and easy dissemination to various SAR facilities ashore or afloat. With the advent of the science and information technology numerous user-friendly computer aided tools are available to ease the task of SAR coordination. These include two way digital communication system to ascertain the emergency onboard, mobilising potential assisting ships around the position of distress through ship reporting system and ISN and effecting a successful search and rescue operation. Every MRCC/MRSC/MRSSC is to be equipped with such facilities to aid and enable a SAR operation successful.

20.1.2 Every MRCC/MRSC/MRSSC is to be provided with latest version of computers and associated software tools. The exclusive Internet connection should be provided in all these set up for down loading details of vessel from the web sites required for SAR operation. A number of web sites are available on the Internet having vessel details which can be obtained if name or call sign or MMSI number of the vessel is known. The computers at MRCC/MRSC/MRSSC are to be connected through LAN for easy transfer of data for real time analysis so as to enhance coordination, online modification of search action plan and rescue action plan depending upon the continuously changing on scene conditions. The computers are also to be upgraded to the latest versions and soft ware tools available on periodic basis.

20.2 Electronic Data Transfer

20.2.1 All MRCC/MRSC/MRSSC are to be inter linked by electronic methods for enabling data transfer on the developing scenarios, for enabling the concerned SAR authorities to arrive at the appropriate decision. This will also provide adequate online exposure to other MRCC/MRSC/MRSSC staff, who can analyse the operation and provide expert opinion/advise based on their experience on similar situations. In addition to the text message, still and video photographs are also to be exchanged for first hand information and also to aid better analysis and appreciate/modify the method of operation in real time.
20.3 Computer Database

20.3.1 All MRCC/MRSC/MRSSC should be in possession of details of all Indian flag vessels on computer and details of vessels reported through MEREP/INSPIRES/ NDSAR and also ships patrolling in the area. The contact details of port authorities, local fishing associations, State/Central/Local administration authorities related to SAR should be available with all coordination centre and updated in the database regularly.

20.4 Preservation of SAR Data

20.4.1 The following details regarding each SAR operation, including case studies if undertaken is to be preserved in digital form for quick retrieval and easy analysis whenever required.

(a) Alert notification and subsequent communication.
(b) Details of the vessel obtained from various sources.
(c) Coordination details to conduct search and effect rescue Including the SRUs deployed.
(d) Details of modification of Search action plan and Rescue action plan on evaluation of condition on scene.
(e) Involvement of other agencies with details of SRUs deployed.
(f) Still photographs taken and record of video photography.
(g) Result of the SAR operation and post operation analysis.
(h) Legal aspects.
(j) Lessons learnt and recommendations for improvement of SAR system.

20.5 Computer Training

20.5.1 All MRCC/MRSC/MRSSC staff is to be proficiently trained in the handling of the computer software and associated tools so as muster the required information and undertake the coordination independently, without depending on anybody else. This will enable quick assimilation, appreciation of the available information; enhance the planning strategies and mobilisation of the SAR resources so as to conduct any SAR operation efficiently and successfully.
CHAPTER 21

CHECK OFF LISTS
CHAPTER - 21
CHECK OFF LISTS

21.1 SAR Incident Data

21.1.1 Ascertain nature of emergency (e.g. fire, collision, man overboard, disabled, MEDICO/MEDEVAC, overdue, lost person, bailout, crash etc.)

21.1.2 Find out the position and time of emergency (latitude/ longitude or bearing/ distance from known point or last reported position and next reporting position), including the following.

   (a) Heading / speed / altitude.

   (b) For ships and boats, echo sounder readings, GPS fix, ranges and bearing with respect to prominent land feature, aids to navigation, and other vessels in the area or recently seen.

21.1.3 Obtain the details of the initial reporter \ name/telephone or address if person, name/call sign if craft, A IS unit, parent agency.

21.1.4 Find out the following in respect of the vessel/craft.

   (a) Distressed craft name or type/call sign/registration, description

   (b) Last known position and time.

   (c) Sighting of survivors or parachutes

   (d) Persons on board.

   (e) Craft description (size, type, craft number, hull colour, cabin colour, deck colour, funnel description, rigging, fuselage colour, tail colour, wingtip colour, aircraft tail number, vessel number, sail number, etc.).

   (f) Secondary search objects.

   (g) Radio frequencies in use, monitored, or scheduled.

   (h) Emergency radio equipment and frequencies include EPIRB

   (j) Fuel on board/available endurance

   (k) Navigation equipment.

   (l) Survival equipment/life rafts available.
21.1.5 Record the date/time of initial report.

21.1.6 Find out other pertinent information, such as a craft’s history of timely reporting and arrivals.

21.1.7 Collect supplementary data for air or marine craft overdue incident data.

21.1.8 Find out date, time, and point of departure, planned route, speed made good, ETA, and point of destination.

21.1.9 Ascertain possible route deviations.

21.1.10 Weather history and forecast along the proposed route.

21.1.11 Find out details from other information sources like friends, relatives, associates, agents and agency.

21.1.12 Obtain on scene weather and sea conditions

21.2 Person Overboard

21.2.1 Find out the date, time and present position of the vessel.

21.2.2 Find out the craft course, speed and destination.

21.2.3 Ascertain the date, time of man overboard including position.

21.2.4 Find out the details of the initial reporting source, radio station, name and call sign of craft, owner and agent.

21.2.5 Obtain the estimated weather data including the following.

(a) Visibility and any obscuration such as fog, smoke, or haze.

(b) Sea state.

(c) Wind direction and velocity.

(d) Cloud amount and ceiling

(e) Estimated temperature of sea water.

(f) Barometric reading
(g) Whether it is/was raining
(h) Whether thunderstorm activities exists

21.2.6 Find out the name, age and gender of the person overboard.
21.2.7 Ascertain the physical condition and swimming capability of the person.
21.2.8 Find out the details of the persons clothing and colour, including life jacket, life buoy, if any.
21.2.9 Examine the area searched and pattern used, if already undertaken by the vessel.
21.2.10 Find out further intentions of vessel/craft.
21.2.11 Check if any assistance is already being received.
21.2.12 Other pertinent information, if any.
21.2.13 Notify the ship in area by ISN and Navarea VIII coordinator for promulgation of Navarea.

21.3 **Drowning Near Shore/River**

21.3.1 Plot position. Find out distance from the nearest Harbour/CG Air Station.
21.3.2 Inform concerned MRCC/MRSC/MRSSC authorities.
21.3.3 Inform following personnel
   (a) Collector.
   (b) Police Commissioner.
   (c) Fishermen associations near the drowning position.
21.3.4 Request fishermen association to deploy fishing boats for search and rescue and advise fishing crafts in area to keep a look out.
21.3.5 Deploy helicopter in SAR configuration for aerial search.
21.3.6 If area is large and the probability of drifting into mid sea is high undertake following actions.
   (a) Launch Dornier in SAR configuration for search.
   (b) Promulgate message through ISN broadcast, requesting merchant ships to keep look out.
21.3.7 Deploy IBs/ICs/Ships for surface search.
21.4 Medical Evacuation

21.4.1 Plot the position of the ship. Find out distance from nearest port/air field (for evacuation by helicopter)

21.4.2 Maintain narrative of events.

21.4.3 Ascertain nature of casualty and symptoms

21.4.4 Ascertain treatment provided/required.

21.4.5 Inform concerned authorities of MRCC/MRSC/MRSSC and RMO/DMO.

21.4.6 Obtain medical advice from RMO/DMO and relay to the ship. Direct ship to contact RMO/DMO for medical advice, if required.

21.4.7 Obtain following details of ship.

(a) Names of vessel, present position, course and speed.
(b) Call sign, IMO number and MMSI number.
(c) Telex/Telephone/Fax number.
(d) Port of registration.
(e) LPC with date.
(f) NPC with date.
(g) Cargo.
(h) Name and nationality of Captain.
(j) Number of crew and nationality
(k) Name of patient, nationality, age, gender, passport number, treatment provided and present condition.
(l) Availability of doctor onboard.
(m) Draught, length, width and tonnage of ship (for berthing requirement).
(n) Facility for helicopter landing/space for winching patient.
(p) Provision of accommodation ladder.
(q) Name of company with contact details.
(r) Name of agent with contact details.
(s) Sea state, wind, sea state, roll and pitch
21.4.8 Make signal to NMSARCA and forward periodic SITREPs.

21.4.9 Decide the port at which medical evacuation is to be carried out and inform concerned MRSC.

21.4.10 Direct the vessel to obtain regular medical advice from CIRM, ROMA and KNRM, Holland before evacuation.

21.4.11 Inform owner and agent of the casualty and direct owner/agent to appoint a doctor for continuous medical advice. Advise the ship to contact the doctor directly, if possible.

21.4.12 Ensure evacuation/dismounting of the casualty is done only after obtaining the advice and clearance of the doctor appointed by the agent.

21.4.13 Keep one ship/helicopter with MO/MA with first aid kit and stretcher standby for evacuation. CG/IN ship at sea be diverted to intercept the vessel, if available in the area.

21.4.14 Direct ship to head for port for evacuation/shape course for early interception, if required.

21.4.15 Inform owner and agent of the vessel at point of evacuation.

21.4.16 Promulgate HF primary and secondary frequency. Intimate assisting ship and vessel requiring assistance INMARSAT number to each other for two way communication.

21.4.17 Explore the possibility of diverting the merchant vessel to any Island nearby with airfield facility, for further evacuation by CG/IN Dornier.

21.4.18 Examine if IN Sea King is to be deployed for evacuation.

21.4.19 Examine requirement of specialist medical team. Team to be arranged by owner/agent. Team to be disembarked to merchant vessel by CG/IN ship/helicopter. Obtain undertaking from team against any damage/loss of life.

21.4.20 If doctor is not onboard the merchant ship requiring assistance, broadcast message through ISN requesting all vessels having medical officer and operating in area to provide assistance. Message, to include the telephone/fax/telex number of ship requiring assistance.

21.4.21 Inform agent to arrange following.

(a) Berth, if vessel is coming alongside.
(b) Ambulance with medical team.
(c) Arrange hospitalisation.

21.4.22 Inform the following.
(a) Local police.
(b) Local immigration authorities, if patient is a foreigner.

21.4.23 Inform ship to forward following documents.
(a) Personal property list of the patient.
(b) Passport details and CDC book.
(c) See to doctor form.
(d) Letter to owner/agent seeking permission to disembark at that port for hospitalisation.
(e) Medical history document.
(f) Medical report from master with brief on incident/casualty and treatment provided.
(g) International certificate of vaccination.

21.4.24 Carry out photography during evacuation.
21.4.25 Inform press.
21.4.26 Forward consolidated report to MRCC/NMSARCA.
21.4.27 If medical evacuation is being considered, the benefits must be weighed against the inherent dangers of such operations to both the person needing assistance and to the rescue personnel.

21.5 Mass Casualties
21.5.1 Collect the following information on the incident.
(a) Date and time of report.
(b) Reporting source.
(c) Nature of distress.
(d) Aircraft crash / shipboard fire/ explosion/ other incident
(e) Description of incident (type of craft, amount of damage, cause)
(f) Date and time of incident
(g) Position (latitude and longitude)
(h) Geographic reference
(j) On scene weather:
   (i) Wind ______ / ______ Kts
   (ii) Sea State ____________
   (iii) Visibility ____________
   (iv) Clouds _____________
(k) Number of persons onboard:
   (Male__________, Female________, Children___)
(l) Medical condition of POB:

21.5.2 Designate SMC and OSC.
21.5.3 Despatch SAR resources.
21.5.4 Notify appropriate Air Stations, maritime and various land based facilities.
21.5.5 Designate OSC or ACO for SAR operations on scene.

21.6 Cyclonic Storm
21.6.2 Monitor INMARSAT, DSC equipment and VHF/MF/HF International maritime distress/ urgency and safety frequencies with extra attention for any distress.
21.6.3 Make signal to Coast Guard Air Stations having meteorological equipment to report three hourly SITREPS.
21.6.4 Plot position of cyclone along with “T” number.
21.6.5 Check CG/IN ships at sea and their position with respect to cyclone.
21.6.6 Check position of merchant ships in Indian SRR through INDSAR, INSPIRES, RIT and other vessel monitoring system monitor their movements.
21.6.7 Advise ships to be in real time communication with the Operational Authorities.

21.6.8 Check all met SITREP have been received by the ships at sea. If in doubt pass all SITREP.

21.6.9 Promulgate HF R/T primary and secondary frequency to be manned by ships at sea.

21.6.10 Weather enroute to ships at sea to a safe harbour through ISN.

21.6.11 Nominate one shore station to remain standby to coordinate the operation In case cyclone likely to pass over/near Headquarters coordinating operation.

21.6.12 Make general message with information to NAMSARCA stating following.

(a) Keep Coast Guard units on high alert.
(b) Activate CG cyclone cell at Operations Centre and man round the clock.
(c) Constitute disaster management and medical team each for any eventualities.
(d) Man MI rooms round the clock.
(e) Take preventive and precautionary measures to minimise any damage to government and personal assets.
(f) Maintain close liaison with local administration.
(g) Monitor cyclone through periodic met forecasts.
(h) Advise MRSC/MRSSC to liaise with state administration, fisheries Commissioner and fishing associations not to allow fishermen to venture into sea and recall fishermen already at sea.

21.6.13 Inform State Chief Secretary, Fisheries Commissioner and local fishing associations to advise fishermen not to venture into sea and recall fishermen already at sea.

21.6.14 Plan Dornier sorties along the coast to recall/alert fishermen.

21.6.15 Request AIR to broadcast cyclone warning at regular intervals.

21.6.16 Keep one helicopter each at all air bases standby and maintain duty SAR crew from dawn to dusk for duration of cyclone for launch at short notice.

21.6.17 Keep Dornier standby for short notice deployment.
21.6.18 Keep CG ships at short notice for motoring for post cyclone SAR requirements.

21.6.19 Request Naval/Air Force authorities for requirements of ships/aircraft for SAR operations.

21.6.20 Take measures to shift personnel/families not involved in duties to a safer place/home town.

21.6.21 Request Naval/Air Force/Civil airport authorities for airfield facilities and extension of watch hours, if required round the clock.

21.6.22 Advise fishing authorities/local administration to beach smaller crafts to avoid damage.

21.6.23 Advise CG/Navy/Air Force Air Stations and helicopter squadrons and Civil airport authorities to monitor cyclonic storm movement and shift aircraft to a safer place in case cyclone likely to inflict damage to the air base.

21.6.24 Signal SITREP to MRSC/MRCC/NMSARCA daily.

21.6.25 Forward consolidated report on cyclone to MRSC/MRCC/NMSARCA.

21.6.26 Give press release stating actions taken and SAR operations undertaken,

21.7 **Stranded/Aground Vessel**

21.7.1 Inform MRSC/MRSSC/NMSARCA.

21.7.2 Plot position with time of grounding. Find out the following details.

(a) Date and time of grounding.

(b) Position of grounding (Latitude and Longitude, range and bearing from the conspicuous landmark).

(c) Phase of moon.

(d) Height of tide at the time of grounding.

(e) Tidal stream and Current.

(f) Sea state, Swell, Wind and Atmospheric pressure.

(g) Next highest high water with date and time.

21.7.3 Details of incident leading to the grounding.
21.7.4 Find out the following details of vessel.

(a) Name, Call Sign, IMO number and MMSI number.
(b) Telex / Fax / Telephone number of vessel.
(c) Flag state
(d) LPC and NPC with date.
(e) Name, contact number (phone, fax, telex number) and address of company/owner.
(f) Name, contact number (phone, fax, telex number) and address of agent at LPC and NPC.
(g) Length, breadth, draught and height.
(h) Gross Registered Tonnage.
(j) Type and quantity of cargo.
(k) Number of holds.
(l) Number of fuel, Lub oil, water and ballast tanks.
(m) Quantity of fuel, Lub oil, chemicals and other pollutants/hazardous material onboard.
(n) Availability of electricity onboard.
(p) Number of submersible pumps onboard with capacity of discharge per hour.
(q) Number of lifeboats available.
(r) Availability of accommodation ladder, fenders and towing ropes onboard.
(s) State of anchors and cable.
(t) Number and state of cranes with capacity.
(u) Communication equipment with frequencies.
(v) State of propulsion.
(w) Space for helicopter landing/winching operations.

21.7.5 Name of Master, number of crew and nationality

21.7.6 Examine probability of refloating the vessel with time and date

21.7.7 Assess threat of oil pollution in the area.
21.7.8 Deploy ship/launch helicopter to rescue crew if required.

21.7.9 Activate ISN requesting vessels nearby to render assistance and rescue if required. Also, vessels to remain clear of grounded vessel.

21.7.10 Promulgate message through NAVAREA.

21.7.11 Divert CG ships at sea for assistance for rescue of crew.

21.7.12 Plan Dornier sortie for assessment of situation and oil spillage.

21.7.13 Check aspect/list/trim of vessel and signs of oil spillage.

21.7.14 Inform Immigration and Police authorities if crew are foreigners.

21.7.15 Initiate NOS-DCP procedure if oil pollution is confirmed.

21.7.16 Obtain signature of master/owner in Lloyds form if salvage assistance for claiming capitation charges.

21.7.17 Inform MRCC/MRSC/NMSARCA on the following.
   (a) Brief on incident.
   (b) Brief on vessel and crew.
   (c) Threat of oil pollution and details of pollutants onboard.
   (d) Rescue of crew.
   (e) Details of refloating.
   (f) Plan of action.

21.7.18 Issue press brief.

21.7.19 Inform the following for future assistance if required.
   (a) Indian Navy.
   (b) Owner.
   (c) Agents.
   (d) Port control authorities.
   (e) Collector.
   (f) Ministry of Surface Transport.
   (g) Director General (Shipping).
21.8 **Hijacked Vessel**

21.8.1 Inform MRCC/MRSC/MRSSC/NMSARCA

21.8.2 Plot position with time, indicate course and speed and establish DR.

(a) Find out if vessel is in Indian SRR.

   (i) If yes, how far inside the Indian SRR.

   (ii) If not, how far from limit of Indian SRR.

(b) Find out time at which the vessel will enter Indian SRR or find out time at which the vessel will be out of Indian SRR if moving away.

21.8.3 Find out details of CG ship (Naval ship if available) at sea. Find out bearing and range of the hijacked vessel from last reported position of ships.

21.8.4 Find out details of CG aircraft (Naval aircraft if available) operating in area. Find out bearing and range of hijacked vessel from area of operation.

21.8.5 Find out details of ready duty ships at all ports, status and flying programme of aircraft.

21.8.6 Make signal to all ships at sea to indicate present position, course and speed.

21.8.7 Find out bearing and range of hijacked vessel from present position of ships.

21.8.8 If vessel is to be recovered and escorted obtain following.

(a) Owner to appoint P&I Club member and agent/salver.

(b) Request letter from owner to recover vessel and escort to preferably Mumbai/Chennai/Kochi and payment of operational charges through P and I club.

(c) Request letter from P and I Club to recover and escort the vessel stating payment of operational charges.
21.8.9 Find out following details of the ship from Internet/owner/agent at LPC/NPC and MRCC of country to which vessel belongs/MMD in case of Indian vessel.

(a) Name of ship.
(b) IMO number.
(c) MMSI number.
(d) Call sign.
(e) Type of vessel.
(f) Flag.
(g) LPC with date.
(h) NPC with date.
(j) Cargo.
(k) Quantity and type of fuel, lub oil, chemicals, other pollutants and explosive/hazardous material onboard.
(l) Telex, Fax and Telephone number of vessel.
(m) Name of master and nationality.
(n) Number of crew and nationality.
(p) Name and contact number of agent at LPC/NPC and in India.
(q) Name and contact number of company/owner/manager.

21.8.10 Write a letter to agent/owner for details of the vessel indicating layout (compartment wise drawing sketch).

21.8.11 Find out the following details of stowaways/hijackers.

(a) Place of boarding with country.
(b) Date and time of boarding.
(c) Nationality.
(d) Time spent in country of boarding.
(e) Intended port of destination.
(f) Intended final destination (if different).
(g) Date and time found on board.
(h) Compartment/position in which stowaways/hijackers are present.
(j) Intention for boarding the ship.
(k) Weapons/explosives in possession of stowaways/hijackers.

21.8.12 Assess probable threat of pollution from vessel.

21.8.13 Make signal to MRCC/MRSC/NMSARCA stating the following and after every development by a daily SITREP at the end of the day:

(a) Brief of incident.
(b) Brief on vessel.
(c) Brief on stowaways/hijackers.
(d) Threat of pollution if any.
(e) Intended plan of action.

21.8.14 Give code name to the operation and promulgate detailed operation orders.

21.8.15 Deploy ships (with helicopter embarked if possible) to intercept with specific instruction (in order to materialise plan of action) with the following instructions.

(a) Aim of mission.
(b) Communication.
(c) Use of force.
(d) Shadowing.
(e) Photographs.
(f) Safe distance.
(g) Plan Dornier sortie, if required.

21.8.16 The ship deployed for the operation should have the following.

(a) Diving team with diving sets and compressor.
(b) Maximum number of submersible pumps and diesel driven pumps.
(c) Fire fighting appliances (portable and fixed). Also carry adequate number of hose, nozzles, CABA sets etc.
(d) Trained Damage Control party and sufficient number of Damage Control items including DC torch, ELSA sets, leak stopping devices etc.

(e) Towing gears.

(f) Pollution control team with PR equipment, if required.

21.8.17 Send a message to Piracy Reporting Centre.

21.8.18 Promulgate the incident through International Safety Net and NAVAREA if situation demands. Request merchant traffic transiting through area to remain clear of vessel.

21.8.19 Persuade hijackers to cooperate and allow master to steer vessel towards port.

21.8.20 If hijackers do not cooperate, plan operation to isolate hijackers. If required take help of Naval/Army commandos.

21.8.21 Inform ministry of defence, ministry of home, ministry of external affairs and consulates of countries to which vessel/hijackers belong.

21.8.22 After apprehension inform following and also inform them on every development.

   (a) IMO and Piracy Reporting Centre.

   (b) Indian Navy.

   (c) Police authorities.

   (d) Central Bureau of Investigation.

   (e) Intelligence Bureau.

   (f) Customs authorities.

   (g) Directorate of Revenue Intelligence.

   (h) Mercantile Marine Department.

   (j) Director General Shipping.

   (k) Ministry of Surface Transport.

   (l) Port Trust.

   (m) Owner.

   (n) Agent.

   (p) Immigration authorities.
21.8.23 Escort vessel to an Indian port (preferably Mumbai/Chennai/Kochi).


21.8.25 Inform port control regarding arrival details to arrange suitable berth/anchorage (preferably anchorage) and another nearby anchorage for escorting ship.

21.8.26 Nominate CG boarding party to board the vessel on arrival. Boarding party to be guided by CGBR 691. Status regarding issue of arms and ammunitions and photograph. Issue detailed orders.

21.8.27 No person is to be permitted to embark/disembark without prior approval of RHQ. All apprehended crew are to be kept in isolation and no interviews permitted.

21.8.28 On arrival, arrange for the security of vessel till handed over to police/owner and also ensure the following:

   (a) Keep one ship at anchorage near the vessel.
   (b) Continuous patrol by IB/ICs.
   (c) Keep armed personnel on board the patrol vessels.
   (d) Request police authorities to provide police team onboard.

21.8.29 Lodge FIR in designated police station along with following details.

   (a) List of charts, items compartment wise, costly items, navigation publications, navigational and communication equipment and ship’s documents.
   (b) Particulars of ship.
   (c) List of items confiscated.
   (d) Statement of detainees and master (typed and manuscript).
   (e) Boarding clearance certificate by master of apprehended vessel.
   (f) Passport of detainees and crew.
   (g) Details of Oil/fuel/provisions/fresh water.
   (h) Certificate of transfer of physical custody of detainees/crew.
21.8.30 Raise a signal to Naval Headquarters keeping informed NAI, NAD, College of Naval Warfare, Karanja to depute suitable team to study damages caused by firing or caused by stowaways/hijackers if any.

21.8.31 Boarding party is to board the vessel only if situation permits Specific tasks, if any are to be mentioned.

21.8.32 Write a letter to immigration authorities for issue of temporary visa at airport, if anybody from abroad is to come to India to deal with the case.

21.8.33 Write a letter to Police Commissioner to provide bomb disposal squad if required.

21.8.34 Write a letter to Navy, Police, CBI, IB, customs and DRI for joint interrogation of hijackers. Project requirement of interpreter, if required.

21.8.35 Nominate CG joint interrogation team and designate coordinator.

21.8.36 Arrange embarkation of joint interrogation team by IB/any other boat.

21.8.37 Inform MRCC/MRSC/NMSARCA, IB, CBI, DR I, Customs, Navy, MOST, DG Shipping, Port trust, agent and owner the result of boarding party, bomb disposal squad and joint interrogation team.

21.8.38 Plan repatriation of hijackers or handing over to police and obtain certificate of transfer of physical custody. Involve immigration authorities.

21.8.39 Write letter to P and I vessel to owner/agent P and I club and owner for payment of operational charges and hand over I club after getting operational charges/securities for payment.

21.8.40 Prepare detailed report and inform the following.

(a) MRCCIMRSC/NMSARCA.

(b) Piracy Reporting Centre.

(c) IMO.

21.9 Vessel in Distress

21.9.1 Plot the position and find out the SRR in which the position of distress lies.

21.9.2 Inform MRSC/MRCC/NMSARCA. (If Position is in Indian SRR)

21.9.3 Find out the following details of vessel/company/owner from the sources as discussed in vessel identification system.

(a) Name, Call sign, MMSI number and IMO number.
(b) Position, course and speed.
(c) Port of registration.
(d) Nature of distress and assistance required.
(e) Name of Captain and nationality.
(f) Number of crew and nationality.
(g) Life saving appliances onboard. (number of life boats and life rafts)
(h) Facility for helicopter landing and winch operations.
(j) Length, breadth and draught of the ship.
(k) Contact details (telephone/fax/telex numbers) of the vessel.
(l) Contact details (telephone/fax/telex numbers) of company / owner and agent in India.
(m) Quantity and type of fuel, Lub oil cargo, chemicals, explosive and hazardous materials onboard.
(n) Brief on incident leading to distress.

21.9.4 Find out bearing and range of CG ships/Naval ships (if available) at sea from position of distress.

21.9.5 Find out bearing and range of CG Dornier/Naval Dornier (if available) operating at sea from position of distress.

21.9.6 Divert ships at sea/Dornier in area for investigation and rendering assistance.

21.9.7 Promulgate HF R/T primary and alternate frequency to be manned by ships.

21.9.8 Activate International Safety Net (ISN) broadcast requesting merchant ships in area to proceed for assistance.

21.9.9 Deploy CG ship/Dornier for search operation. if required.

21.9.10 Examine requirement of rescue of crew by CG/IN helicopter, including IN Sea King/Kamov.

21.9.11 Inform Navarea VIII coordinator for Navarea promulgation.
21.9.12 Inform MOST, MMD and DG shipping regarding the distress and also subsequent developments.

21.9.13 Access threat of pollution.

21.9.14 Coordinate rescue operation by Coast Guard, Naval and merchant ships.

21.9.15 Issue press release. (If Position is not in Indian SRR)

21.9.16 Find out contact details of MRCC responsible for coordinating SAR in SRR in which position of distress lies.

21.9.17 Relay distress to MRCC with copy to vessel in distress/company/owner for coordinating SAR operation. MRCC to assume responsibility and acknowledge receipt of distress relay. The distress relay to contain available details of vessel.

21.10 Aircraft in Distress

21.10.1 Plot position of the aircraft in distress and find out in which FIR/SRR the position of distress lies. Notify appropriate ATS/FIC authorities, if message received from other sources.

21.10.2 Inform MRCC/MRSC/NMSARCA as applicable. (If Position is within Indian SRR)

21.10.3 Find out following details of aircraft/company/owner/operator from the FIC/ATS authorities.

- (a) Type of aircraft, Call sign.
- (b) Number of persons on board.
- (c) Nature of distress and assistance required.
- (d) Confirm state of crew/passengers if possible.
- (e) Details of life saving appliances onboard, including number of life rafts.
- (f) Endurance remaining onboard.
- (g) Confirm the intentions whether carrying precautionary force landing or ditching.
- (h) Request ATS authority to impose radio silence on the frequency in use and advise all the aircraft to monitor the distress frequency.
(j) Request ATS authorities to make arrangement at the nearest airfield for landing or emergency landing of the aircraft.

(k) Request ATS authorities to direct the nearby traffic to fly over the distressed aircraft and obtain first hand information and about condition of Survivors.

21.10.4 Find out bearing and range of CG ships/Naval ships (if available) at sea from the position of distress.

21.10.5 Find out bearing and range of CG Dornier/Naval aircraft (if available) operating at sea from the position of distress.

21.10.6 Divert ships at sea/Dornier in area for investigation and rendering assistance if possible.

21.10.7 Promulgate HF R/T primary and alternate frequency to be manned by ships.

21.10.8 Activate International Safety Net (ISN) broadcast requesting merchant ships in area to proceed for assistance.

21.10.9 Deploy CG ship/Dornier for rescue operation.

21.10.10 Examine requirement of rescue of crew by CG/ IN helicopter including IN Sea King/Kamov.

21.10.11 Inform NMSARCA, AAI, MMD and DG shipping regarding the distress situation and also subsequent developments.

21.10.12 Coordinate rescue operation by Coast Guard, Naval and merchant ships.

21.10.13 Issue press release. (If Position is not in Indian SRR)

21.10.14 Find out contact details of MRCC responsible for coordinating SAR in SRR in which position of distress.

21.10.15 Relay distress to MRCC/FIC/ATS for coordinating SAR operation. Maintain SAR coordination until the concerned MRCC acknowledge receipt of distress relay and assumes responsibility. The distress relay to contain available details of vessel. (In case of False/Inadvertent Distress Activation)

21.10.16 Ascertain reasons of activation.
21.10.17 Obtain information from the concerned ATS/FIC authorities regarding the safety of the aircraft.

21.10.18 Request ATS/FIC authorities to take appropriate action against the aircraft for inadvertent activation.

21.11 **SAR for Fishing Boat**

21.11.1 Plot the last known position of fishing boat or establish area of operation.

21.11.2 Find out bearing and range from nearest harbour and Coast Guard ships operating at sea.

21.11.3 Find out the following details from source reporting incident/other agencies.

(a) Name, registration number, Port of registration, length, height, colour of the boat (both cabin and hull).

(b) Number of crew onboard.

(c) Last known position/area of operation.

(d) Nature of distress and assistance required.

(e) Estimated time of departure and planned ETA at the harbour.

(f) Name and contact details of owner.

(g) Contact details of fishing association of the area and fisheries authorities.

(h) A telephone/mobile number for round the clock exchange of information.

(i) Contact details of nearby fishing harbour and association to check arrival of the boat at that harbour.

(k) Food, water and fuel available on board.

(l) Communication / life saving equipment onboard and frequency manned

21.11.4 Ask fishing community to deploy local fishing boats for first aid response activities and report result to MRCC/MRSC/MRSSC.

21.11.5 If the probability of drifting of boat to mid sea is high, promulgate the incident through ISN broadcast. Request vessels operating/passing through area to maintain lookout.
21.11.6 Alert Coast Guard ships for deployment.

21.11.7 If search by local fishing boats fails, establish search area and deploy Dornier in SAR configuration.

21.11.8 If required, direct Dornier to drop food and water packets.

21.11.9 On locating the boat, sail/divert Coast Guard units for assistance. Indian Naval Ships operating nearby may be diverted, if possible.

21.11.10 If required promulgate message through ISN broadcast requesting ships nearby to render assistance.

21.11.11 Inform Navarea VIII Coordinator for Navarea promulgation

21.11.12 Examine probability of drifting of boat to adjacent SRR. If so, notify the incident to the appropriate MRCC.
APPENDICES
Appendix “A”
(Refers to Para 3.10.1)

NATIONAL MARITIME SEARCH AND RESCUE PLAN - 2003

POLICY

1. It is the policy of the signatory agencies to provide a national plan for coordinating Maritime Search and Rescue (M-SAR) services to meet the national needs as well as regional and international commitments. Guidance for implementing this plan is amplified in the national maritime SAR manual, International Aeronautical and Maritime Search and Rescue (IAMSAR) manual and other relevant directives of the agencies to this plan.

PURPOSE

2. This plan construes by inter-agency agreement, the effective use of all available resources and facilities to assist persons and property in potential or actual distress at sea within the Indian Search and Rescue Region (ISRR) regardless of the nationality or circumstances in which that person is found.

TERMS AND DEFINITIONS

3. Following are the terms and definitions based on International Maritime Organization usage for M-SAR.

(a) **SAR Coordinator.** A person or agency with overall responsibility for establishing and providing SAR services within the SRR and ensuring that planning for those services is properly co-ordinated for which India is obliged under Maritime SAR Convention 1979.

(b) **Search and Rescue Region (SRR).** An area of defined dimensions recognized by IMO and ICAO or other cognizant international body and associated with a rescue co-ordination Centre, within which SAR services are provided.

(c) **Search and Rescue Sub-region (SRS).** A specified area within a SRR associated with a rescue sub-centre.

(d) **SAR Services.** The performance of distress monitoring, communication, coordination and SAR functions, including provision of medical advice, initial medical assistance or medical evacuation, through the use of public and private resources including co-operating aircraft, vessels and other craft and installations.
(e) **Maritime Rescue Co-ordination Centre MRCC**. A unit responsible for promoting efficient organisation of SAR services at sea and coordinating the conduct of maritime SAR operations within a SRR.

(f) **Maritime Rescue Sub-Centre (MRSC)**. A unit subordinate to a MRCC established to complement the latter according to particular provisions of the responsible authorities.

(g) **Search and Rescue Unit (SRU)**. A unit composed of trained personnel and provided with equipment suitable for the expeditious conduct of search and rescue operations.

(h) **On-scene Coordinator (OSC)**. A person designated to co-ordinate SAR operations within a specified area.

(j) **SAR Mission Coordinator (SMC)**. An official temporarily assigned to co-ordinate response to an actual or apparent distress situation.

**OBJECTIVES**

4. Having known the obligations under several international conventions, agreements and instruments to render assistance to persons in distress at sea and to the establishment of effective SAR services, the participating agencies to this plan recognise the need for co-operation and co-ordination of activities regarding safety on and over the sea and desire to:

   (a) Provide a national plan for coordinating SAR services, effective use of all available resources, mutual assistance and efforts to improve such co-operation and services for greater protection of life and property with economy of effort.

   (b) Support in implementing the provisions of International Maritime SAR Convention 1979 of IMO and other conventions to which India is or may become a party.

**SCOPE**

5. This plan is solely intended to provide an internal guidance to all signatory agencies. No provisions of this plan or any supporting plan are to be construed in any way to contravene responsibilities and authorities of any participant as defined by statute, executive orders or international agreements or of established responsibilities of other agencies and organisations, which regularly assist persons and property in distress resulting from incidents. The participating members by signing this National Maritime SAR Plan, are obliged to fully extend all possible support and co-operation for effective conduct of SAR operations at sea.
PARTICIPATING AGENCIES

6. The participating agencies to this plan are :-

(a) Ministry of Shipping carries out broad responsibility w.r.t. Navigation and Port State Control of vessels and transportation safety. The Director General of Shipping, implementing agency for international conventions on maritime matters, shall promulgate all SAR preventive programmes on advise from the National Maritime SAR Board for commercial vessels operating in the Indian waters. They also maintain database of Maritime Mobile Service Identity (MMSI) numbers of all vessels registered with them.

(b) Coast Guard has been designated as the national coordinator for the conduct of maritime SAR operations on and over the sea areas of the Indian SRR. Towards this, the Coast Guard develops, establishes, maintains and operates SAR facilities for maritime SAR operations. The operation is coordinated through three MRCCs and ten MRSCs located in maritime states of India.

(c) Indian Navy has facilities and resources that are used to support their own operations. These facilities may be used for maritime SAR needs on a not-to-interfere basis with military missions.

(d) Indian Air Force has SAR facilities for their own operations over land and sea. These facilities may be used for maritime SAR needs on a not-to-interfere basis with military missions.

(e) Shipping industry operates a fleet of merchant ships for national use and promote a safe merchant marine, which should assist and support when called upon in maritime SAR operations, in accordance with the national and international conventions and provisions.

(f) Airports Authority of India undertakes air traffic control and maintains flight service facilities and shall provide information to assist in maritime SAR operations.

(g) Meteorological Department shall support SAR operations through timely input of weather messages, marine environment forecasts and warnings for the coastal and high seas and provide weather information on demand to coordinator and coordinating agency.

(h) Department of Space (DoS) shall provide satellite “alert” services for detection and location of aircraft, ships or individuals in potential distress situation that carry distress locator as per IMO and ICAO regulations. As a mandatory requirement for the users, the DoS also maintains beacon registration data base containing unique identity of the beacon, vessel/aircraft type, owner
and emergency contact details and distributes to concerned rescue co-ordination centre for SAR mission planning.

(j) Chief Hydrographer to Govt of India shall assist the maritime SAR agencies by timely promulgation of navigational warnings through NAVAREA and other measures.

(k) Customs and Excise provide rescue facility assistance, immigration and equipment clearance during SAR operation involving foreign crew / passengers.

(l) Major Ports provide rescue facility assistance to the SAR agencies during SAR operations occurring near ports and offshore areas. The major ports also to provide berthing, towing, tug assistance to SAR agencies when requested.

(m) Department of Telecommunication (DoT) on advice from the coordinating agency, promulgates rules and regulations for non-government use of wireless and radio facilities for promoting safety of life and property and co-operation in SAR operations by relaying inputs obtained from Coast Radio Stations.

(n) Coastal State Government shall provide assets, emergency medical and other facilities that would contribute to the effective SAR operations when requested by the coordinating agencies.

(p) Fishing Community representing fisher folk and operating around our coasts shall provide assets to the coordinating agencies when requested to augment SAR effort.

(q) Sailing vessel operators sailing vessels operating around our coasts for commercial purposes shall provide assistance to the coordinating agencies when requested to augment SAR effort.

**INDIAN SEARCH AND RESCUE REGION (ISRR)**

7. SRR is established by a country solely to ensure the primary responsibility for coordinating or providing effective SAR services, communication network and routing of distress alerts to RCC responsible for that geographic area. SRR should as far as possible be contiguous and not overlap.

8. India’s maritime and aeronautical SRR will be harmonised with each other to the extent practicable, recognising that the lines separating SRR must be agreed by the countries having neighbouring SRRs. The delimitation of SRR is not related to and shall not prejudice the delimitation of any maritime boundary between neighbouring countries. The Indian SRR limits need to be resolved with the neighbouring countries for publishing in the documents of the IMO and ICAO.
9. SRR may be sub-divided into sub-regions as long as delimitation coincides with relevant SRR limits. Where this is not practicable, changes to the international limits should be taken up with the appropriate international organisation through proper channel by the maritime SAR Coordinator -

10. Each SRR is to be associated with a Maritime RCC. The MRCC is responsible for coordinating the conduct of SAR operations within a SRR. The standards and guidance for the MRCC has been developed by the IMO and can be found in international conventions and IAMSAR manual. They are to be kept in the MRCCs for reference.

PARTICIPANT RESPONSIBILITIES

Primary Responsibility

11. SAR coordinator is responsible for arranging SAR services and establishing the MRCCs within the SRR. The system established should meet International standards and to facilitate integration into the global maritime SAR system support outside Indian Search and Rescue Region.

12. SAR coordinator may support maritime SAR operations outside the Indian SRR, when requested, consistent with the expertise, capabilities and legal authority. This is in keeping with India’s concern for safety of life at sea and the humanitarian nature of SAR and the advantages of national and international co-operation.

13. The Rescue Co-ordination Centre compatible with their capabilities and expertise will support maritime SAR operations in the neighbouring States territorial and international waters beyond Indian SRR when requested, in accordance with the international laws. In such cases, SAR operations shall, as far as practicable, be coordinated by the RCC, which has authorised entry, or such other authority designated by the State concerned.

14. In carrying out maritime SAR support functions with other nations, such as training, exercises, and liaison, each Participant will co-ordinate its activities with other Participants having maritime SAR expertise with respect to the support concerned.

15. While it is appropriate, that the Participants have the authority to do so, to cooperate and maintain liaison with maritime SAR authorities of other nations, such support should be dealt in co-ordination with the maritime SAR Coordinator and neighbouring SAR authorities. Such co-ordination will normally include Coast Guard Headquarters, Director of Operations, New Delhi, to ensure consistency with India’s obligations under international agreements to which the India is a Party, and compliance with the IAMSAR Manual and other relevant international guidance relevant to implementing such agreements.
16. Participants should not accept SAR Coordinator or RCC role for maritime SAR operations of SRRs for which other nations are responsible. However, the Participants may provide and support maritime SAR operations in such areas when:

(a) Assistance is requested (normally this should be in accordance with RCC-to-RCC procedures prescribed in the IAMSAR Manual).

(b) Indian citizens are involved or Indian facilities become aware of a distress situation to which no other suitable facilities are responding, or where other available SAR services appear to be inadequate.

17. When assisting maritime SAR authorities of other nations, or agencies or organisations supporting these authorities, Participants to this Plan should ensure that: -

(a) Have expertise and appropriate agreement to do so.

(b) Provisions of conventions or agreements to which India is Party are not violated.

(c) Relevant procedures set forth in the IAMSAR manual, National Maritime SAR manual and other relevant directives are known and complied.

(d) Such efforts are carried out in consultation with Participants to this Plan.

(e) Authorities assisted in that country is responsible for the SAR functions.

18. Policies on rendering assistance in neighbouring States’ territorial waters must have the objective of balancing concerns for saving Lives, for sovereignty, and for national security. Provisions for territorial entry should be addressed in international SAR agreements as discussed below, and care should be taken to ensure that such agreements are compatible with the national policies.

19. Participants to this Plan if addressing maritime SAR-related inquiries or proposals from other nations or organisations outside India, or when hosting or attending international meetings on maritime SAR, care should be taken that interested Indian agencies, organizations, or persons are consulted and involved as appropriate.

MARITIME SAR AGREEMENTS

20. Bilateral or multilateral SAR agreements with other Participating agencies or organizations, or with authorities of other nations, is of practical value to improve or simplify maritime SAR operations, and beneficial for purposes including:-

(a) Helping to fulfill national or international obligations and needs.

(b) Enabling more effective use of all available national resources.
(c) Integration of Indian maritime SAR services with the global SAR system.

(d) Identifying types of co-operative matters and efforts to build commitments that may enhance or support maritime SAR operations, such as access to medical or fuelling facilities; training and exercises; meetings; information exchanges and use of communications capabilities.

21. Negotiation and conclusion of such agreements should consider:

(a) Which authorities of the governments, agencies, or organizations concerned are the appropriate ones to be entered with the agreement.

(b) Which types of SAR operations (e.g., aeronautical, maritime) or SAR support functions should be included within the scope of the agreement.

(c) Congenial with international and national maritime SAR policies.

(d) Establishment of lines separating SRRs if relevant.

(e) Whether other treaties, agreements, etc. exist which should be superseded or included for in preparation of a new agreement.

(f) Relevant guidance of the IAMSAR manual and National maritime SAR manual.

22. Any such international agreement may not be signed or concluded without prior consultation with the Chairman, National SAR Board / MoS.

NATIONAL SEARCH AND RESCUE BOARD

23. The National Search and Rescue Board is the patron of this Plan. The Board, consistent with applicable laws and executive orders is to:

(a) Formulate and promulgate national SAR Plan.

(b) Co-ordinate measures to be adopted by Participating agencies and formulate contingency plan.

(c) Review and update matters relating to the Plan affecting more than one Participant, including recommendations for Plan revision or amendment.

(d) Define functions to be performed by participating agencies.

(e) Attending to matters relating to Maritime SAR as per IMO requirements in consultation with Ministry of Shipping.
24. The Board in particular, is intended to accomplish the following:-

(a) Oversee this Plan, and develop and maintain national maritime SAR manual.

(b) Provide a standing national forum for co-ordination of administrative and operational maritime SAR matters.

(c) Provide an interface with other national, regional, and international organisations involved with providing or supporting maritime SAR services.

(d) Develop and maintain suitable guidance for implementation of this Plan, such as a National maritime SAR manual, supplement to the IAMSAR Manual.

(e) Promote effective use of all available national resources for support of M-SAR.

(f) Promote close co-operation and co-ordination with Armed Forces and other SAR communities for provision of effective maritime SAR services.

(g) Improve co-operation among Maritime and Aeronautical SAR communities for the provision of effective Maritime SAR services.

(h) Determine other ways to enhance the overall effectiveness and efficiency of M-SAR services, and to standardize procedures, equipment, and personnel training where practicable.

MARITIME SAR SERVICES

25. This Plan covers maritime SAR operations such as :-

(a) Provision of initial assistance at or near the scene of a distress situation. (e.g., initial medical assistance or advice, medical evacuations, provision of needed food or clothing to survivors, etc)

(b) Delivery of survivors to place of safety or where further assistance can be provided.

(c) Saving of property when it can be done in conjunction with saving lives.

26. Maritime SAR does not include operations such as :-

(a) Air ambulance services, which did not result from a rescue or recovery operation.

(b) Military operations, such as combat SAR or other types of recovery by military operations to remove military or civilian personnel.
(c) Salvage operations.
(d) Overall response to natural or man-made disasters or terrorist incidents.

MUTUAL ASSISTANCE

27. The Participants agree to co-operate:

(a) Support each other by pooling relevant facilities and resources as appropriate for M-SAR operations within the SRR.

(b) Make, and respond to, requests for operational assistance between the designated RCCs, RSCs, of the Participants as capabilities permit.

(c) Develop procedures, communications, and databases appropriate for co-ordination of facilities responding to distress incidents, and for co-ordination between the RCCs, RSCs of the Participants.

(d) Follow applicable guidance of the IMO or other relevant international laws regarding M-SAR operational procedures and communications.

CHARGING FOR M-SAR SERVICES

28. In accordance with customary international laws, when a nation requests help from another nation to assist a person(s) in danger or distress, if such help is provided, it will be done voluntarily, and India will neither request nor pay reimbursement of cost for such assistance.

29. Participants agree that maritime SAR services they provide to persons in danger or distress will be without subsequent cost-recovery from the person(s) assisted.

30. Participants are to fund their own activities in relation to this Plan unless otherwise arranged by the Participants in advance, and will not allow a matter of reimbursement of cost among them to delay response to any person in danger or distress.

PRINCIPLES ACCEPTED BY THE PARTICIPANTS

General

31. Participants coordinating operations should, consistent with applicable laws and executive orders, organise existing agencies and their facilities through suitable agreements into a basic network to assist military and non-military persons and property in actual or potential danger or distress, and to carry out obligations under customary international laws and instruments to which India is or may become a Party.
32. Participants will seek to keep political, economic, jurisdictional, or other such factors as secondary when dealing with lifesaving matters, i.e., where possible, what is best for lifesaving will govern their decisions.

33. Consistency and harmonisation will be fostered wherever practicable among plans, procedures, equipment, agreements, training, terminology, etc., for the various types of lifesaving and recovery operations, taking into account terms and definitions adopted internationally as much as possible.

34. If a distress situation appears to exist or may exist, rescue or similar recovery efforts will be based on the assumption that a distress situation does actually exist until it is known differently.

35. Assistance will always be provided to persons in distress without regard to their nationality, status, or circumstances.

36. Generally, cost-effective safety, regulatory, or diplomatic measures that tend to minimize the need for M-SAR services will be supported.

37. Recognising the importance of reduced response time to the successful rescue and similar recovery efforts, a continual focus will be maintained on developing and implementing measures to reduce the time required for :-

(a) Receiving alerts and information associated with distress situations.
(b) Planning and coordinating operations.
(c) Facility transits and searches.
(d) Rescues or recoveries.
(e) Providing immediate assistance, such as medical assistance, food and cloth to survivors as appropriate.

Maritime Search and Rescue (M-SAR)

38. Personnel associated with the SAR activities should be familiar with the International Convention on Maritime Search and Rescue, IAMSAR manual, National maritime SAR manual and other information applicable to M-SAR.

39. SAR principles and procedures of relevant customary international Conventions and IAMSAR Manual will serve as guidelines for co-ordination and conduct of SAR operations especially when dealing with other countries, organisations or jurisdictions.
National maritime SAR manual and the SAR plan will be consistent with these international provisions to the extent practicable.

40. Indian Coast Guard will operate and maintain a ship reporting system (INDSAR) exclusively for maritime SAR operations, which is voluntary for ships transiting the Indian SRR. The information collated would enable identify potential ship in area to quickly respond to distress situation. The ships send their data through the INMARSAT on entering SRR and every 24 hours thereafter and prior exiting the SRR. (This system will be used only for SAR with its information being treated as “commercial proprietary” as promised to the ships reporting).

41. Operational responsibilities for maritime SAR will generally be associated with internationally recognised geographic maritime SRR. Indian Coast Guard has been” assigned the responsibility for coordinating M-SAR operations in Indian SRR with other agencies and organisations providing support as appropriate.

42. Distress situations involving airborne aircraft ditching in sea, will be handled by the maritime SAR authorities (i.e. Coast Guard) in co-ordination with the aeronautical SAR authorities.

43. Agencies responsible for SAR operations under this Plan will:

(a) Keep information readily available on the status and availability of key SAR facilities or other resources, which may be needed for SAR operations.

(b) Keep each other fully and promptly informed of operations of mutual interest, or which may involve use of facilities of another Participant.

44. SAR Coordinator will delegate to their RCCs the authority to:

(a) Request assistance via the RCC/RSC of other nations, and to provide all pertinent information on the distress situation and the scope of assistance needed.

(b) Promptly respond to requests for assistance from other RCC/RSC, including those of other nations.

(c) Grant permission for entry into Indian waters for SAR facilities of other nations if need arises.

(d) Make arrangements with customs, immigration, health or other authorities to expedite entry of foreign SAR facilities as appropriate.
45. SAR Coordinator will authorise the RCCs to arrange promptly or in advance for entry of foreign rescue units into India should it ever become necessary. Such arrangements should involve appropriate authorities in India as well as proper authorities of the nation or SAR facility involved with the entry. Such entry may include over flight or landing of SAR aircraft, and similar for surface SAR units as circumstances dictate for fuelling, medical, or other appropriate and available operational support, or delivery of survivors. It could also be in response to a request made by the Indian RCC to the RCC of another nation for assistance of those facilities.

46. Operations of SAR facilities committed to any SAR mission normally should be coordinated, and directed, by an appropriate RCC or RSC consistent with the provisions of this plan.

47. On-scene co-ordination may be delegated to any appropriate unit participating in a particular incident by the SAR mission coordinator of a RCC.

48. No provision of this Plan or any supporting plan is to be construed as an obstruction to prompt an effective action by any agency or individual to relieve distress whenever and wherever found.

49. SAR Coordinator shall arrange for the receipt of distress alerts originating from within SRR for which they are responsible, and ensure that every RCC and RSC can communicate with persons in distress, with SAR facilities, and with other RCCs/RSCs. Armed Forces -Civilian Relationships.

50. Arrangements between Armed Forces and civilian agencies should provide for co-operation among themselves, consistent with statutory responsibilities and assigned SAR functions.

51. Co-operative arrangements involving Navy, Air force and Coast Guard commands should provide for the effective use of their facilities for maritime SAR on a not-to-interfere basis with military missions, consistent with statutory responsibilities and assigned agency functions.

52. Participants with operational responsibilities should develop plans and procedures for effective use of all available SAR facilities, and for contingencies to continue maritime SAR operations if military forces are withdrawn because of another emergency or a change in military missions.

53. Navy and Air force responsibilities under this Plan include support of maritime SAR on a not-to-interfere basis with primary military duties, in accordance with applicable national directives, plans, guidelines, agreements, etc.
54. To optimise delivery of efficient and effective SAR services, and, where practicable and consistent with agency authorities, provide the organisations and persons interested in supporting these services the opportunity to do so, all available resources will be used for maritime SAR. Certain state and local governments, civil and volunteer organisations, and private enterprises have facilities, which contribute to the effectiveness of the over-all SAR network, although they are not Participants to this Plan.

55. To help identity, locate and quantify primary SAR facilities, Navy, Air force and Coast Guard commands may designate facilities which meet international standards for equipment and personnel training as “SAR units” (SRUs). (Such facilities need not be dedicated exclusively to the associated type of operations, and this designation is not intended to preclude use of other resources).

56. Recognising the critical role of communication in receiving information about distress Situations and co-coordinating responses, and noting that such responses sometimes involve multiple organisations and jurisdictions, the Participants will work aggressively to develop suitable SAR provisions for :-

(a) Interoperability.
(b) Means of sending and receiving alerting.
(c) Means of identification.
(d) Effective provisions for equipment registration and continual access to registration data by SAR authorities.
(e) Rapid, automatic, and direct routing of emergency communications.
(f) High system reliability.
(g) Pre-emptive or priority processing of distress communications.

57. Maritime SAR operations shall normally continue until all reasonable hope of rescuing survivors or victims has lapsed.

58. The responsible RCC/RSC concerned shall decide when to discontinue these operations. If no such centre is involved in coordinating the operations, the OSC may take this decision. If there is no OSC involved, the decision will be made at appropriate level of the chain-of-command of the SAR facility conducting the operations.
59. When a RCC/RSC or an appropriate authority considers, on the basis of reliable information that a rescue or recovery operation has been successful, or that the emergency no longer exists, it shall terminate the SAR operations. The authority terminating should inform the authority, facility or service which has been activated or notified.

60. If an operation on scene becomes impracticable and the RCC/RSC or an appropriate authority concludes that survivors might still be alive, it may temporarily suspend the on-scene activities pending further developments. They should promptly inform the authority, facility or service which has been activated or notified. Information subsequently received shall be evaluated and operations resumed when justified based on the information.

ENTRY INTO FORCE AMENDMENT OR TERMINATION

61. This Plan :-

(a) Shall enter into force effective from 01 September 2003.

(b) May be amended by written agreement among the Participants.

(c) May be terminated or superseded by a new Plan or by written agreement among the Participant.
### CONTACT DETAILS OF RESOURCE AGENCIES

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16. **Customs**

|   | Commissioner of Customs - Mumbai | 022 22620631 | 022 22612474 |
| (a) |   |   |   |
| (b) | Commissioner of Customs - Chennai | 044 25221918-1936 | 044 25246800 |
| (c) | Commissioner of Customs - Kolkatta | 033 22304197 | 033 22105102 |
|     |   | 033 22304337 |   |
|     |   | 033 22304048 | #358 |

17. **ONGC**

|   | Head Office- Dehradun | 0135 2759561-9567 |
| (a) |   | 01352752161-2165 |
| (b) | Regional Office – Vadodara | 0265 2641266 | 0265 2641566 |
|     | 0265 2641366 | 0265 2641316 |
| (c) | Regional Office – Mumbai | 022 26562000 | 022 26563000 |
| (d) | Regional Office-Chennai | 044 28535110 | 044 26520150 |
| (e) | Regional Office-Kolkata | 033 22887544 | 033 22881936 |
|     |   | 033 22887476 | 033 22885632 |

18. **Pawan Hans**

|   | 011 24602596 | 011 24602596 |
|   |   |   |

19. **Dredging Corporation of India**

|   | 0891 2871230 | 0891 2871278 |
|   |   |   |
**Appendix ‘C’**
(Refers to Para 3.9.1)

**POINT OF CONTACT OF NATIONAL SAR BOARD MEMBERS**

<table>
<thead>
<tr>
<th>Address</th>
<th>Tele/Fax</th>
</tr>
</thead>
</table>
| The Director General  
The Directorate General of Shipping  
Jahaz Bhavan  
Walchand Hirachand Marg  
Mumbai | Tele : 022 22613651  
022 22613652  
Fax : 022 22613655  
E-mail : dgship@dgshipping.com |
| The Principal Director  
Naval Operations  
Integrated Headquarters  
Ministry of Headquarters  
Room No.186, South Block  
New Delhi-110 001 | Tele : 011 23014526  
Fax : 011 23792007  
E-mail : indo2003@yahoo.com |
| The Director Operations (Navigation)  
Room No. 547  
Directorate of Ops (T&H)  
Air Headquarters  
Vayu Bhavan, Rafi Marg  
New Delhi-110 001 | Tele : 011 23010217  
Fax : 011 23016354 |
| The Chief Hydrographer  
(for Joint Chief Hydrographer)  
National Hydrographic Office  
Post Box No. 75  
107 A Rajpur Road  
Dehradun-248 | Tele : 0135 2747365  
Fax : 0135 2749373  
E-mail : |
| The Executive Director (ATM)  
AAI Headquarters  
Rajive Gandhi Bhavan  
Safdarjung Airport  
New Delhi | Tele : 011 24631684  
Fax : 011 22461078  
E-mail : aaiedatm@ndf.vsnl.net.in |
<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>Contact Information</th>
</tr>
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<tbody>
<tr>
<td>The Director (SU-I)</td>
<td>Department of Telecommunication</td>
<td>Tele: 011 23310217</td>
</tr>
<tr>
<td></td>
<td>Room No.1106, Sanchor Bhavan, 10, Asoka Road</td>
<td>Fax: 011 23710143</td>
</tr>
<tr>
<td></td>
<td>New Delhi</td>
<td>E-mail: <a href="mailto:dosuiv@gmail.com">dosuiv@gmail.com</a></td>
</tr>
<tr>
<td>The Deputy Director</td>
<td>ISRO Headquarters</td>
<td>Tele: 080 28094581</td>
</tr>
<tr>
<td></td>
<td>Antariksh Bhavan</td>
<td>Fax: 080 28094515</td>
</tr>
<tr>
<td></td>
<td>New BEL Road, Bangalore</td>
<td>E-mail: <a href="mailto:director@istrac.org">director@istrac.org</a>, <a href="mailto:inmcc@istrac.org">inmcc@istrac.org</a></td>
</tr>
<tr>
<td>The Commissioner of Customs (Prev)</td>
<td>Rummaging Section</td>
<td>Tele: 022 22620631</td>
</tr>
<tr>
<td></td>
<td>Clock Tower Building</td>
<td>Fax: 022 22612474</td>
</tr>
<tr>
<td></td>
<td>2nd Floor Masjid (E), P&amp;V Docks, Mumbai-400 009</td>
<td>E-mail: <a href="mailto:ccpmumbai@redifmail.com">ccpmumbai@redifmail.com</a></td>
</tr>
<tr>
<td>The Deputy Director General</td>
<td>Directorate General of Meteorology</td>
<td>Tele: 011 24611068</td>
</tr>
<tr>
<td></td>
<td>Mausam Bhavan</td>
<td>Fax: 011 23328549, 24699216</td>
</tr>
<tr>
<td></td>
<td>Lodhi Road, New Delhi-110003</td>
<td>E-mail:</td>
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<tr>
<td>The Deputy Secretary (Port Operations)</td>
<td>Ministry of Shipping</td>
<td>Tele: 011 23716619, 23714938</td>
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<td>Fax: 011 23328549, 23716656</td>
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<td>The Director</td>
<td>Technical &amp; Offshore Services</td>
<td>Tele: 022 22853556</td>
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<tr>
<td></td>
<td>Shipping Corporation of India Ltd</td>
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<tr>
<td>Chief Port Administrator</td>
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<td>11 Block, 2nd Floor, New Sachivalaya, Gandhinagar-382010, Gujarat</td>
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<tr>
<td>(for Secretary to Government) Fishery &amp; Ports (E) Department Thiruvananthapuram Kerala</td>
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<tr>
<td>Ports and Inland Waterways</td>
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<tr>
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<tr>
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<tr>
<td>13/2 Pitrusmruti,</td>
<td>E-mail : <a href="mailto:nffcal@cal3.vsnl.net.in">nffcal@cal3.vsnl.net.in</a></td>
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<tr>
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<tr>
<td>Federation of All Indian</td>
<td>Fax : 0288 2558491</td>
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<tr>
<td>Sailing Vessel Industry Association</td>
<td>E-mail : <a href="mailto:sikkawala@sancharnet.in">sikkawala@sancharnet.in</a></td>
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<td>C/O Hotel President</td>
<td></td>
</tr>
<tr>
<td>Teen Batti,</td>
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<tr>
<td>Near Town Hall</td>
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<td>Jam Nagar-361001</td>
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| The Deputy Director General   | Tele : 011 24641435  |
| C/O Directorate of Civil Aviation | Fax : 011 24641435  |
| Technical Centre,             | E-mail : dfa@dgca.nic.in |
| Opp Safdarjung Airport        |                      |
| New Delhi-110 003             |                      |

| The Director                  | Tele : 011 23389286  |
| Bureau of Immigration         | Fax : 011 23383888, 23385081 |
| C/O Ministry of Home Affairs  | E-mail : boihq@mha.nic.in |
| New Delhi-110003              |                      |
### SAR COMMUNICATION FREQUENCIES

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<tr>
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<td>International voice distress, safety and calling</td>
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<tr>
<td>(B)</td>
<td>3023 kHz</td>
<td>International voice ICW SAR on scene</td>
</tr>
<tr>
<td>(C)</td>
<td>4125 kHz</td>
<td>International voice distress safety, distress and calling back up frequency</td>
</tr>
<tr>
<td>(D)</td>
<td>5680 kHz</td>
<td>International voice ICW SAR on scene</td>
</tr>
<tr>
<td>(E)</td>
<td>121.5 MHz</td>
<td>International voice aeronautical emergency, ELTs and EPIRBs</td>
</tr>
<tr>
<td>(F)</td>
<td>123.1 MHz</td>
<td>International voice SAR on scene</td>
</tr>
<tr>
<td>(G)</td>
<td>156.8 MHz</td>
<td>Channel 16 - VHF FM international voice distress and international voice safety and calling</td>
</tr>
<tr>
<td>(H)</td>
<td>156.3 MHz</td>
<td>Channel 06 - VHF FM merchant ship and Coast Guard SAR on scene</td>
</tr>
<tr>
<td>(J)</td>
<td>243.0 MHz</td>
<td>Joint / combined military voice aeronautical emergency and international survival craft and ELTs and EPIRBs</td>
</tr>
<tr>
<td>(K)</td>
<td>282.8 MHz</td>
<td>Joint / combined on scene and DF</td>
</tr>
</tbody>
</table>
MESSAGE FORMAT FOR INTERNATIONAL SAFETY NET SERVICE

1. THE VESSEL _________________________ CALL SIGN _________________________
2. MMSI NUMBER _______________________ FLAG _________________________
3. SATCOM ID A/B/C TERMINAL NO. _______ MANNING FREQUENCY _______
4. POSITION ________N/S____________ E/W_______ COURSE/ SPEED _______ AT ______ HRS (UTC) IS IN DISTRESS _____________ (NATURE OF DISTRESS) AND IS IN NEED OF ASSISTANCE.
5. VESSELS IN VICINITY ARE REQUESTED TO CONTACT MRCC/ MRSC ___________ ON TELEPHONE ________________ FAX ________ INMARSAT ‘C’ __________ E-MAIL _______________________ WITH FOLLOWING DETAILS FOR COORDINATION.
   (A) NAME, C/S, FLAG AND MMSI NUMBER
   (B) SATCOM ID NUMBER AND COMMUNICATION FREQUENCY
   (C) POSITION, COURSE AND SPEED WITH TIME (UTC)
   (D) ETA DISTRESS POSITION
   (E) SAR/MEDICAL CAPABILITIES AVAILABLE ONBOARD
   (F) ANY OTHER RELEVANT INFORMATION

REGARDS.

DUTY OFFICER
MRCC/MRSC
Appendix “F”
(Refers to Para 13.3.2 & 13.4.1)

FORMAT FOR REQUISITION OF RESOURCES

FROM  MRCC _______________  OPS IMMEDIATE
TO    CG/IN/IAF AUTHORITIES (as applicable)  UNCLAS
INFO  NMSARCA MRSC/MRSSC IN/IAF authorities as applicable)

= SARREQ (.) MISSION TASK (.)

(A) TYPE OF MISSION/MISSION TASK NUMBER/DATE.
(B) BRIEF OF THE INCIDENT WITH POSITION AND TIME.
(C) NATURE OF EMERGENCY, ASSISTANCE REQUIRED INCLUDING NUMBER OF POB TO BE RESCUED.
(D) NAME AND DESCRIPTION OF VESSEL/CRAFT/AIRCRAFT IN DISTRESS.
(E) NUMBER AND TYPE OF SRUs REQUIRED.
(F) TIME ON TASK AND DURATION OF OPERATION.
(G) AREA OF OPERATION.
(H) DATUM AND TYPE/PATTERN OF SEARCH.
(J) PRIMARY SEARCH OBJECT.
(K) SECONDARY SEARCH OBJECT.
(L) SRU SHIP/ AIRCRAFT IN THE AREA WITH CALL SIGN.
(M) COMPLAN.
(N) WEATHER IN AREA.
(P) ANY OTHER RELEVANT INFORMATION.
## FORMAT FOR MISSION RESULT

<table>
<thead>
<tr>
<th>FROM</th>
<th>IN/IAF AUTHORITIES (as applicable)</th>
<th>OPS IMMEDIATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TO</td>
<td>OSC/SMC/MRCC ________ (as applicable)</td>
<td>UNCLAS</td>
</tr>
<tr>
<td>INFO</td>
<td>NMSARCA MRSC/MRSSC IN/IAF AUTHORITIES (as applicable)</td>
<td></td>
</tr>
</tbody>
</table>

= SARREQ (.) MISSION RESULT (.)

- **(A)** MISSION RESULT NUMBER/DATE
- **(B)** MISSION TASK NUMBER/DATE
- **(C)** SRU TYPE/ CALL SIGN
- **(D)** TIME ON TASK/TIME OFF TASK
- **(E)** AREA OF OPERATION
- **(F)** DETAILS OF VESSEL/CRAFT IN DISTRESS SIGHTED
- **(G)** DETAILS OF ASSISTANCE PROVIDED/SURVIVORS RESCUED OBJECTS RECOVERED
- **(H)** DETAILS OF OTHER SRU IN AREA
- **(J)** WEATHER IN AREA
- **(K)** RECOMMENDATIONS
- **(L)** ANY OTHER RELEVANT INFORMATION
## STANDARD INDSAR REPORTING FORMAT AND PROCEDURES

<table>
<thead>
<tr>
<th>SL</th>
<th>Abbreviation</th>
<th>Types of Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>SP / ENR</td>
<td>Sailing Plan / Entering Report</td>
</tr>
<tr>
<td>(b)</td>
<td>PR</td>
<td>Position Report</td>
</tr>
<tr>
<td>(c)</td>
<td>DR</td>
<td>Deviation Report</td>
</tr>
<tr>
<td>(d)</td>
<td>FR / EXR</td>
<td>Final Report / Exit Report</td>
</tr>
</tbody>
</table>

### Alphabetic Function Information required Indicator

<table>
<thead>
<tr>
<th>Alphabetic</th>
<th>Function</th>
<th>Information required Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Ship’s name and Call sign</td>
<td>Ship’s name and call sign of ships station identity and nine digit MMSI number</td>
</tr>
<tr>
<td>B</td>
<td>Date and time</td>
<td>A six digit group giving day of Months of event (first two digits) hours and min UTC (last four digits)</td>
</tr>
<tr>
<td>C</td>
<td>Position</td>
<td>A four digit group giving Latitude in Degrees and minutes suffixed with N/S and a four digit group giving Longitude in degree and minutes suffixed with E/ W.</td>
</tr>
<tr>
<td>E</td>
<td>True course</td>
<td>A three digit group</td>
</tr>
<tr>
<td>F</td>
<td>Speed</td>
<td>A three digit group in knots and Tenths of knots</td>
</tr>
<tr>
<td>G</td>
<td>Port of departure</td>
<td>Name of last port of call</td>
</tr>
<tr>
<td>Column</td>
<td>Description</td>
<td>Details</td>
</tr>
<tr>
<td>--------</td>
<td>-------------</td>
<td>---------</td>
</tr>
<tr>
<td>I</td>
<td>Destination and ETA</td>
<td>Name of port and date time group Expressed as in (B)</td>
</tr>
<tr>
<td>K</td>
<td>Port of arrival</td>
<td>Latitude and Longitude and ETA</td>
</tr>
<tr>
<td>L</td>
<td>Route information</td>
<td>Route information (See Note)</td>
</tr>
<tr>
<td>M</td>
<td>Radio communication</td>
<td>INMARSAT A/C number</td>
</tr>
<tr>
<td>P</td>
<td>Cargo</td>
<td>Cargo and brief details of any Dangerous cargo</td>
</tr>
<tr>
<td>S</td>
<td>Weather</td>
<td>Brief details (cyclonic conditions only)</td>
</tr>
<tr>
<td>V</td>
<td>Medical personnel</td>
<td>Doctor, Physician’s assistant, Nurse, number of medical personnel</td>
</tr>
<tr>
<td>X</td>
<td>Remarks</td>
<td>Any other information in brief details</td>
</tr>
<tr>
<td>Y</td>
<td>Relay instruction</td>
<td>The same report to be forwarded by INDSAR to other indicated reporting System</td>
</tr>
<tr>
<td>Z</td>
<td>End of report</td>
<td></td>
</tr>
</tbody>
</table>

**Note**

1. For route information latitude and longitude should be given for each turn point, expressed as in C above, together in type of intended track between these points, e.g. RL (Rumb-Line), GC (Great circle) or coast or in the case of coastal sailing the estimated date of passing significant point expressed by a digit group as in (B) above.

2. The International Code of Signal should be used detailed information whenever language problems may exist. When the international Code is used the appropriate indicator should be inserted after the alphabetical index in the text.
## INDSAR SURPIC REQUEST FORMAT

<table>
<thead>
<tr>
<th>TO</th>
<th>MRCC MUMBAI</th>
<th>TEL :</th>
<th>FAX :</th>
</tr>
</thead>
<tbody>
<tr>
<td>FROM</td>
<td>MRCC/MRSC</td>
<td>TEL :</td>
<td>FAX :</td>
</tr>
<tr>
<td>FILE NO</td>
<td>DATE :</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAR CASE NO</td>
<td>DATE :</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUBJECT</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. THE VESSEL ________________ CALL SIGN ________________ MMSI ________________ NUMBER IS IN DISTRESS IN POSITION________ N/S ________________ E/W AT ________ HRS (UTC).

2. PLEASE FORWARD FOLLOWING DETAILS OF VESSELS OPERATING NEAR THE POSITION OF DISTRESS.

   (A) NAME, C/S, FLAG AND MMSI NUMBER
   (B) POSITION, COURSE AND SPEED
   (C) TELEPHONE, TELEX AND FAX NUMBER
   (D) SAR AND MEDICAL CAPABILITY
   (E) ANY OTHER RELEVANT INFORMATION

REGARDS.

DUTY OFFICER

MRCC/MRSC_________

Appendix “J”
(Refers to Para 6.5.1)
GUIDELINES FOR ALLOCATION OF SAR INCIDENT NUMBER

1. On commencement, every SAR incident responded to by the MRCC or MRSC will be allocated a running serial number from 001 commencing 01 Jan for each year as follows:

<table>
<thead>
<tr>
<th>SEA BOARD</th>
<th>DISTRICT</th>
<th>SL.NO.</th>
<th>YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MV ________________

2. (a) **Seaboard**
   (i) North West: NW
   (ii) West: W
   (iii) East: E
   (iv) A and N: A

   (b) **District Codes**
   (i) MRCC Mumbai, Chennai, Port Blair: 00
   (ii) District/ MRSC: Respective District No. (in two digits)

   (c) **Example:**
   E 08 012 2001 MV LUCNAM
   12th SAR mission in year 2001 executed on the eastern seaboard by MRSC Haldia.
**INDIAN COAST GUARD**

**SAR INCIDENT PROCESSING FORM**

*(To be filled by SMC / Ops Room In-charge on receipt of SAR information)*

<table>
<thead>
<tr>
<th>Seaboard</th>
<th>District</th>
<th>Sl. No.</th>
<th>Year</th>
<th>Name of Vessel</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRCC/MRSC</td>
<td>SAR Case No.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. **Nature of Emergency**
   *(Please tick)*
   - Fire
   - Collision
   - Grounding
   - Man Over Board
   - Disabled
   - Overdue
   - Air crash
   - Bail out

2. **Position & Time**
   - Latitude
   - Longitude
   - Time
   - Bearing
   -(From prominent landmark / passing vessel)
   - Course
   - Speed
   - Altitude (for Aircraft)
   - Sounding (for boats)

3. **Informer / SAR Reporter**
   - Name
   - Telephone Nos.
   - Address
   - Contact No.
   - Call Sign (if in vessel)
   - Frequency

---

Appendix “L”

*(Refers to Para 18.6.1)*

SAR SL No.

(For CGHQ use only)
<table>
<thead>
<tr>
<th>4. Distressed Vessel</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type</td>
</tr>
<tr>
<td></td>
<td>Call Sign</td>
</tr>
<tr>
<td>5. Person onboard / Condition</td>
<td>POB</td>
</tr>
<tr>
<td></td>
<td>Condition</td>
</tr>
<tr>
<td>6. Sighting Location</td>
<td>Description</td>
</tr>
<tr>
<td></td>
<td>Survivors</td>
</tr>
<tr>
<td></td>
<td>Parachute</td>
</tr>
<tr>
<td></td>
<td>Life boat</td>
</tr>
<tr>
<td></td>
<td>Life raft</td>
</tr>
<tr>
<td></td>
<td>Life buoy</td>
</tr>
<tr>
<td>7. Distressed craft description</td>
<td>Size</td>
</tr>
<tr>
<td></td>
<td>Regn. No.</td>
</tr>
<tr>
<td></td>
<td>Cabin</td>
</tr>
<tr>
<td></td>
<td>Mast</td>
</tr>
<tr>
<td>8. Secondary Search Objects</td>
<td>Catamaran</td>
</tr>
<tr>
<td></td>
<td>Life raft</td>
</tr>
<tr>
<td></td>
<td>Life buoy</td>
</tr>
<tr>
<td></td>
<td>Empty drum</td>
</tr>
<tr>
<td></td>
<td>Jerry can</td>
</tr>
<tr>
<td>9. Radio Frequency Equipment</td>
<td>Used</td>
</tr>
<tr>
<td></td>
<td>Monitored</td>
</tr>
<tr>
<td></td>
<td>Scheduled</td>
</tr>
<tr>
<td>10. Emergency Radio</td>
<td>Frequency</td>
</tr>
<tr>
<td></td>
<td>EPIRB</td>
</tr>
<tr>
<td>11. On-Scene weather</td>
<td>Visibility</td>
</tr>
<tr>
<td></td>
<td>Sea State</td>
</tr>
<tr>
<td></td>
<td>BMP</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>12.</td>
<td>Assistance desired</td>
</tr>
<tr>
<td></td>
<td>Received / Extended</td>
</tr>
<tr>
<td>13.</td>
<td>Fuel onboard (KL)</td>
</tr>
<tr>
<td>14.</td>
<td>Navigation equipment held</td>
</tr>
<tr>
<td>15.</td>
<td>Survival equipment held</td>
</tr>
<tr>
<td></td>
<td>Life buoy</td>
</tr>
<tr>
<td></td>
<td>Life raft</td>
</tr>
<tr>
<td></td>
<td>Any other</td>
</tr>
<tr>
<td>16.</td>
<td>Fresh water / food held (No. of days survived)</td>
</tr>
<tr>
<td>17.</td>
<td>First information received</td>
</tr>
<tr>
<td></td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td>Time</td>
</tr>
<tr>
<td></td>
<td>Mode</td>
</tr>
<tr>
<td>18.</td>
<td>Local agent (in case of M/V)</td>
</tr>
<tr>
<td></td>
<td>Name</td>
</tr>
<tr>
<td></td>
<td>Telephone</td>
</tr>
<tr>
<td></td>
<td>Address</td>
</tr>
<tr>
<td>19.</td>
<td>Any other information</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Signature)

(SMC / Incident Recording Officer)
### SAR CASE SUMMARY

<table>
<thead>
<tr>
<th>SEA BOARD</th>
<th>DISTRICT</th>
<th>SL.NO.</th>
<th>YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MV ________________**

1. **DETAILS OF DISTRESS**

<table>
<thead>
<tr>
<th>A) NATURE</th>
<th>B) MMSI NO.</th>
<th>C) DATE &amp; TIME</th>
<th>D) POSITION</th>
<th>E) AREA</th>
<th>F) TX MODE</th>
<th>G) RELAY BY</th>
<th>H) ANY OTHER INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. **DETAILS OF VESSEL**

<table>
<thead>
<tr>
<th>A) INMARSAT TEL/FAX NO.</th>
<th>B) FLAG</th>
<th>C) OWNER</th>
<th>D) TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(E) CREW / NATIONALITY</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(F) CARGO / TONNAGE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(G) LPC / DATE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(H) NPC / DATE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(J) ANY OTHER INFO</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DURATION**

<table>
<thead>
<tr>
<th>3.</th>
<th>CG SAR UNITS</th>
<th>UNIT</th>
<th>FROM</th>
<th>TO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(A) SURFACE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(B) AIR</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4.</th>
<th>EXTERNAL RESOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(A) IN SHIPS</td>
</tr>
<tr>
<td></td>
<td>(B) IN AIRCRAFT</td>
</tr>
<tr>
<td></td>
<td>(C) AIR FORCE</td>
</tr>
<tr>
<td></td>
<td>(D) MERCHANT VESSELS</td>
</tr>
<tr>
<td></td>
<td>(E) DRI / CUSTOMS</td>
</tr>
<tr>
<td></td>
<td>(F) FISHING BOATS</td>
</tr>
<tr>
<td></td>
<td>(G) OTHERS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.</th>
<th>MET DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(A) SEA STATE</td>
</tr>
<tr>
<td></td>
<td>(B) SWELL</td>
</tr>
<tr>
<td></td>
<td>(C) WIND</td>
</tr>
<tr>
<td></td>
<td>(D) VISIBILITY</td>
</tr>
</tbody>
</table>
6. MISSION RESULT

<table>
<thead>
<tr>
<th>Action</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Casualties Evacuated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(B) Lives Saved</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(C) Fire Fighting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(D) Damage Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(E) Any Other Information</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. MISSION ANALYSIS

<table>
<thead>
<tr>
<th>Event</th>
<th>Date &amp; Time</th>
<th>Time Lapse Since Distress Occurred</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Distress Occurred</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(B) Distress Received</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(C) Authentication Checks (If Any)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(D) Unit Sailed / Deployed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(E) Unit Arrived Datum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(F) Lives Rescued</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(G) Personnel Shifted To Shore Hospital (If Any)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. MISSION SUMMARY (IN BRIEF)

9. CONCLUSION

10. RECOMMENDATIONS

   Date: Mission Co-ordinator

   (Signature)
Appendix “N”
(Refer to Para 17.17.3)

SITUATION REPORT (SITREP)

1. The SITREPs rendered during the progress of the SAR operations (numbered serially commencing 01) will be prefixed as follows.
   SAR No. / Name / SITREP No. (.)

   **Example:** E 08/012/MV LUCNAM/21. SITREP No.21 on SAR mission No.12 by MRSC Haldia on the eastern seaboard.

   **Note:** The year is not to be mentioned in SITREP.

2. On completion, a SITREP is to be raised with the following text.
   SAR No. / Name / SITREP No (.) Case closed.

   **(a) Short SITREP.** To pass urgent essential details when requesting assistance, or to provide the earliest notice of casualty, the following information should be provided.

   | TRANSMISSION | (Procedure/Security Classification) |
   | DTG          | (UTC or Local Time Group)            |
   | FROM         | (Originating MRCC/MRSC)              |

   **SAR SITREP NUMBER** (As promulgated vide CGHQ letter OP/0815/Policy date 01 Aug 01)

   | A | IDENTITY OF CASUALITY | (Name/Call Sign/Flag State) |
   | B | POSITION             | (Latitude/Longitude)        |
   | C | SITUATION            | (Type of message, e.g., Distress/Urgency/Date/Time/Nature of Distress/Urgency, e.g Fire, Collision, MEDICO) |
   | D | NUMBER OF PERSONS    |                            |
   | E | ASSISTANCE REQUIRED  |                            |
   | F | CO-ORDINATING MRCC   |                            |

   **(b) Normal SITREP.** To pass amplifying or updating information during SAR Operations, the following additional sections should be used as necessary.

<p>| G | DESCRIPTION OF CASUALITY | (Physical description, owner/charter, cargo carried, passage from/to, life saving equipment carried) |
| H | WEATHER ON SCENE         | (Wind, sea state/swell, air/sea temperature, visibility, cloud cover/ceiling, barometric pressure) |</p>
<table>
<thead>
<tr>
<th>J</th>
<th>INITIAL ACTION TAKEN</th>
<th>(By casualty and MRCC/MRSC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>SEARCH AREA</td>
<td>(As planned by MRCC/MRSC)</td>
</tr>
<tr>
<td>L</td>
<td>CO-ORDINATING INSTRUCTIONS</td>
<td>(OSC designated, units participating communications)</td>
</tr>
<tr>
<td>M</td>
<td>FUTURE PLANS</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>ADDITIONAL INFORMATION</td>
<td>(Include time SAR operation terminated)</td>
</tr>
</tbody>
</table>

**Notes:**

1. Each SITREP concerning the same casualty should be numbered sequentially.
2. If help is required from the addressee, the first SITREP should be issued in short from if remaining information is not readily available.
3. When time permits, the full form may be used for the first SITREP, or to amplify it.
4. Further SITREPs should be issued as soon as other relevant information has been obtained already passed should not be repeated.
5. During the prolonged operations, ‘no change’ SITREPs, when appropriate, should be issued at intervals of about 3 hours to reassure recipients that nothing has been missed.
6. When the incident is conducted, a final prescribed SITREP is to be issued as confirmation of conclusion of SAR mission.

**Example:**

DTG 231000/Nov 10
FROM MRCC PORT BLAIR
TO NMSARCA (NATIONAL MARITIME SEARCH AND RESCUE COORDINATING AUTHORITY VIZ CGHQ)

DIG (.). A00 002/MV FRONT LORD/002(.)
(A) MV FRONT LORD/ SINGAPORE/ S6MU
(B) 06 00 N 090 02 E
(C) DISTRESS / EXPLOSION IN ER / CASEVAC
(D) 02
(E) IMMEDIATE CASEVAC
(F) MRCC PORT BLAIR
(G) 02 ENGINEERS BADLY BURNT
(H) SEA 3 SWELL LOW LONG SW VIS MODERATE BMP 1002
(J) BKC SAILED 230300/DO 764 LAUNCHED 0730/ ESTB COMM 0925/SHIP NUC /INJURED STABLE
(K) TARASSA DIVERSION REQUESTED / EXPECTED R/V 232300.

= 231000/NOV 10

219
Coast Guard Headquarters
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New Delhi - 110 001, INDIA

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Fax : +91 11-2338 3196
E-mail : vprotect@bol.net.in
www.indiancoastguard.nic.in

For Search and Rescue Incident
CALL 1554
AT SEA : INMARSAT ‘C’ Code 43 (TOLL FREE)