1999

The development of maritime search and rescue in the Republic of Fiji

David W. Alexander
World Maritime University

WORLD MARITIME UNIVERSITY
Malmo, Sweden

THE DEVELOPMENT OF MARITIME SEARCH AND RESCUE IN THE REPUBLIC OF FIJI

By

DAVID W ALEXANDER

The Republic of Fiji

A Dissertation submitted to the World Maritime University in partial fulfillment of the requirements for the award of the degree of

MASTER OF SCIENCE

in

MARITIME EDUCATION AND TRAINING
(Nautical)

Year of graduation
1999

DECLARATION

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has been conferred on me.

The contents of this dissertation reflect my own personal views, and are not necessary endorsed by the University.

…… (signature)

…… (date)

Supervised by:

Name: Captain Bertil Wagner

Office: Lecturer,

World Maritime University

Assessor:

Name: Captain S Borth

Officer: German Search and Rescue Organisation (DGzRS),

Bremen, Germany

Co-assessor:

Name: Professor P Muirhead

Office: Course Professor Maritime Education and Training,

World Maritime University

Acknowledgments

First of all, I wish to thank the Lord God Almighty for his grace and protection upon me and my family. the Government of Fiji and the Fiji Institute of Technology for giving me this opportunity to study at the World Maritime University in Malmo, Sweden.

I wish to express my profound gratitude and sincere appreciation to the Global Foundation for Research and Scholarship (GFRS) for its generosity and kindness in sponsoring my study at the University.

My sincere thanks to Professor Peter Muirhead, Captain Bertil Wagner, Captain Sven-Ake Wernhult and Captain Borth for their guidance and support. Also to the many persons and organisations who contributed in various ways to my studies at the World Maritime University during my seventeen months of study.

I wish to thank all the library staff and the Maritime Education and Training staff for their support. I am also grateful to the University staff who are not mentioned here for their assistance and support.

My sincere thanks to my colleagues at the university and friends for their friendship and support.

This Dissertation would not be possible without the patience and co-operation of my dearest wife Dorothy Francis Alexander, my children John, Julie, Braye, Mazie, and Dorothy for their love, prayers, encouragement and support.

Abstract

Title of Dissertation: The Development of a Search and Rescue and Ship Reporting System in the Republic of Fiji.

Degree: Master of Science in Education and Training.

The dissertation is a study of the maritime search and rescue service in Fiji, with a view to improving the management and operations of search and rescue in Fiji, so as to enable more efficient and effective search and rescue operations in Fiji waters and its neighboring countries. The Republic of Fiji has not ratified the 1979 SAR Convention due to the requirements to set up SAR installations around the Fiji coast.

A brief look is taken into the background of the maritime situation in Fiji, and maritime incidents. The International Maritime Organisation's structure for an integrated SAR plan for the entire Pacific Ocean, and provisional delimitation of search and rescue responsibilities. In addition, general information about the Republic of Fiji. The Fiji maritime shipping sector and the Maritime Safety Administration is discussed in Chapter Two. Chapter Three analyses the present situation of maritime radio communications, and the maritime Search and Rescue organisation in Fiji. A brief look is taken into the search and rescue organisations of Germany and Australia.

The International Conventions relating to Search and Rescue is examined in Chapter Four. In addition, the revised International Aeronautical Maritime Search and Rescue Convention (IAMSAR), which will enter into force 0n 1 January 2000 and the IAMSAR manual is described.

The roles of satellite communications in SAR operations are investigated in Chapter Five. The chapter examines the Global Maritime Distress and Safety Systems and its regulations, requirements and functions. The Inmarsat and COSPAS-SARSAT are also included.

Chapter Six examines the SAR organisation in Fiji and gives Proposals for improving maritime search and rescue in Fiji. These proposals consist of institutional framework, SAR Legislation and a National SAR Organisation, National SAR Committee, National SAR Plan, training and monitoring, and development and operational procedures.

The concluding chapter examines the results and gives recommendations for improving the maritime search and rescue environment in Fiji.

KEYWORDS: Fiji, Search and Rescue (SAR), INMARSAT,GMDSS, IAMSAR.

Table of Contents

Chapter Three : SAR In Fiji, Germany And Australia

Chapter Four : International Conventions and Standard Related to SAR and Ship Reporting System

Chapter Five : The Global Maritime Distress and Safety System

List of Figures

List of Tables

List of Abbreviations

AMVER	Automated Mutual Assistance Vessel Rescue System
AMSA	Australian Maritime Safety Authority
AUSREP	Australian Ship Reporting System
AUSSAR	Australian Search and Rescue Organisation
CES	Coastal Earth Station
COSPAS-SARSAT	Space System for Search of Distress Vessels- Search and Rescue Satellite Aided Tracking
CRS	Coastal Radio Station
DSC	Digital Selective Calling
EGC	Enhanced Group Calling
EPIRB	Emergency Position Indicating Radio Beacon
GMDSS	Global Maritime Distress and Safety System
HF	High Frequency
IAMSAR	International Aeronautical and Maritime Search and Rescue Manual
ICAO	International Civil Aviation Organisation
IMO	International Maritime Organisation
IMOSAR	IMO Search and Rescue Manual
INMARSAT	International Mobil Satellite Organisation
LUT	Local User Terminal
MCC	Mission Control Center
MERSAR	Merchant Ship Search and Rescue Manual
MF	Medium Frequency
MRCC	Maritime Rescue Co-ordinating Center
MRSC	Maritime Rescue Sub-Center
MSC	Maritime Surveillance Center
MSRR	Maritime Search and Rescue Region
Navtex	Transmission of Maritime Safety Information

OSC	On Scene Commander
RCC	Rescue Co-ordinating Center
RSC	Rescue Sub-Center
SAR	Search and Rescue
SES	Ship Earth Station
SART	Search and Rescue Transponder
SOLAS	International Convention on Safety of Life at Sea
SRR	Search and Rescue Region
UHF	Ultra High Frequency
UNCLOS	United Nations Convention on the Law of the Sea
VHF	Very High Frequency

CHAPTER ONE : INTRODUCTION

1. Background To The Problem

The Republic of Fiji is a country with a great maritime calling as may be appreciated from its geographical position and territorial make up. Fiji is made up of 401 islands, not including the tiny islets. The highly developed tourism and longline fishing industry linked with its extensive exclusive economic zone and its reliance on external trades with its developed neighbours accordingly means a continuous reliance on shipping.

The increase in trade with Fiji's neighbours, growth in the commercial fishing industry and popularity of leisure activities on the water during the recent years has intensified problems of safety in Fiji waters inshore and offshore. As these vessels are less than 15 metres in length, they are vulnerable to the elements in adverse weather conditions. In addition, their occupants normally have limited resources for survival if their boats founder.

The above factors coupled with the high incidents of maritime tragedy justify the existence of a highly developed Search and Rescue Organisation and the implementation Global Maritime Distress and Safety System (GMDSS). Combined with a small craft and ship reporting system, the objectives of the International Convention on Maritime Search and Rescue 1979 will be fulfilled.

The Republic of Fiji is not a signatory to the 1979 Search and Rescue Convention. This is due to the obligations imposed to set up shore installations around its coast. The implementation of GMDSS and a Ship Reporting System will facilitate Search and Rescue, thus reducing the number of lives lost at sea. Subsequently, this can be

supported by the high incidents of maritime search and rescue operations and the high cost incurred in carrying out these operations.

1.1 Search and Rescue Incidents

The incidents below were related to:

- Commercial fishing vessels less than 15 metres in length
- Open ferries used by villages for transport to the main land, less than 10 metres in length.
- Open fishing boats operated by self employed fisherman, less than 10 metres in length.

The more serious casualties tend to show similar characteristics:

- Engine failure
- Failure to send out distress call due to insufficient battery power
- Failure to take appropriate precautions during bad weather and approaching storms.
- No Radio Communication equipment available
- No Life saving appliance on board

Surveillance Flights

Royal Australian Air Force (RAAF) and Royal New Zealand Air Force (RNZAF) carried out a total number of twenty-two (22) flights through 1996.

Foreign Yachts

During 1998, a total number of five hundred and twenty one (521) yachts entered and three hundred and forty three departed Fiji waters.

The Maritime Surveillance Center (MSC) in Fiji co-ordinated the following distress incidents.

Table 1.1 : Distress Incidents in 1996

1996	Incident	Case	Persons Involved	Dead
A	**Overdue**	32	147	0
B	**Aground**	7	29	0
C	**Drifting**	14	71	0
D	**Capsized**	6	47	5
E	**Flare Sighting**	5	0	0
F	**Fire**	2	0	0
G	**Missing**	2	3	0
Total		**68**	**297**	**5**

(Source : Fiji Maritime Surveillance Center)

Table 1.2 : Maritime SAR Incidents for the year 1997 in Fiji waters (EEZ)

	Incident	Case	Persons	Loss of Life
A	**Overdue**	38	170	0
B	**Flooding**	1	7	0
C	**Distress Signal**	3	0	0
D	**Engine Breakdown**	5	133	0
E	**Capsized**	4	17	1
F	**Sinking**	3	23	11
G	**Drifting**	3	6	2
H	**Missing**	3	3	3
I	**Lost Rudder**	1	3	0
J	**Mayday**	1	21	0
K	**Aground**	2	5	0
L	**Flare Sighting**	1	0	0
TOTAL		**65**	**388**	**17**

(Source : Fiji maritime Surveillance Center)

In the year ending 1998, the total number of maritime incidents was forty-four in which one hundred and eighty-eight persons were involved, resulting in two deaths.

Table 1.3 : Summarized Report for the Year beginning 1990 to the Year ending 1998

Year	Cost	Incidents	Persons Involved	Loss of Life
1990	22,450.00	45	218	7
1991	39,200.00	51	151	1
1992	112,201.00	43	377	14
1993	40,042.07	52	344	10
1994	28,955.68	74	288	5
1995	39,027.83	54	235	23
1996	38,267.96	41	195	7
1997	45,361.83	65	388	17
1998	No Figures	44	188	2
TOTAL	**F$365,506.37**	**469**	**2,384**	**86**

(Source : Fiji Maritime Surveillance Center)

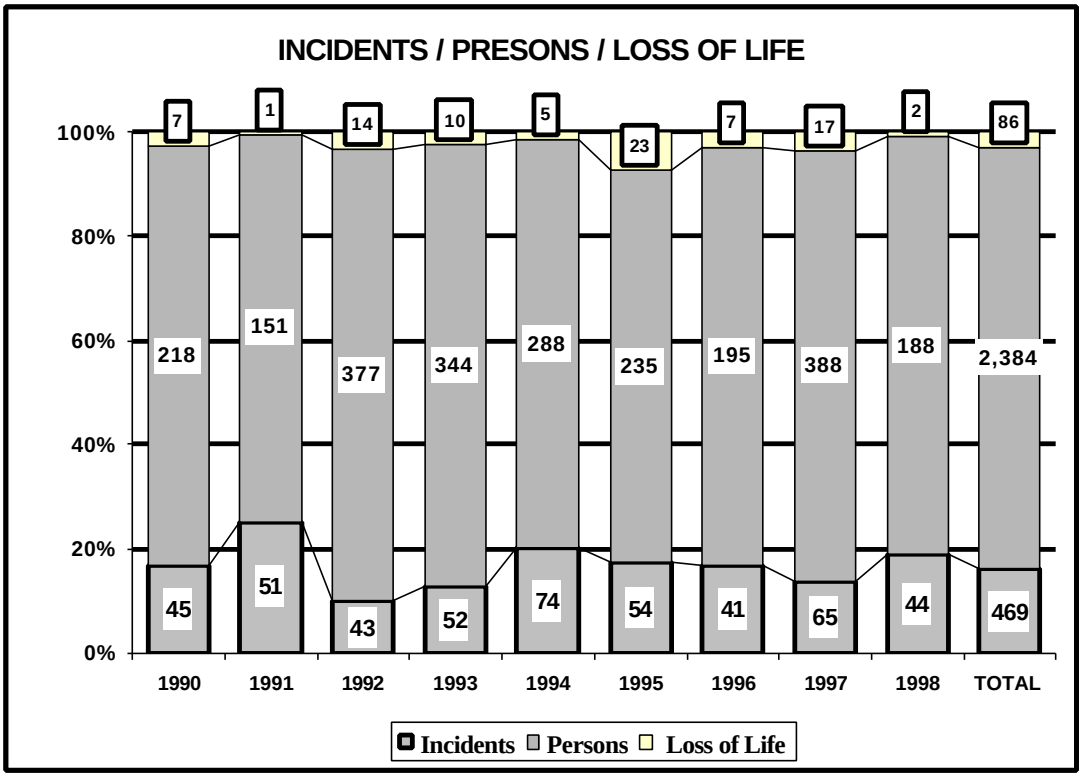
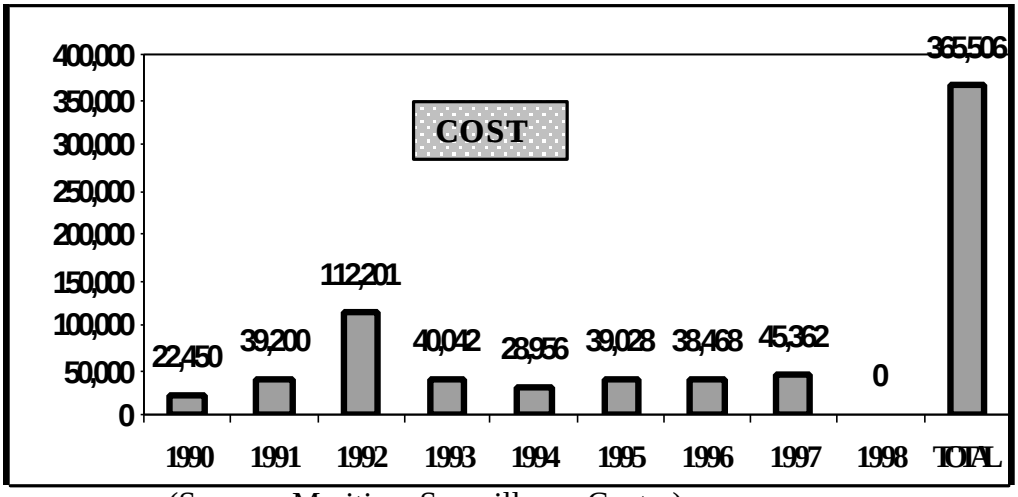


Figure 1.1 : Cost of SAR Incidents in Fiji for the Year 1990 to 1997.



(Source : Maritime Surveillance Center)

1.2 Establishment and Provisions of the Search and Rescue Services

The Republic of Fiji is a signatory to the United Nations Convention on the Law of the Sea (UNCLOS).

> **Article 98 (2) states:** ***"Every coastal state shall promote the establishment, operations and maintenance of an adequate and effective search and rescue service regarding on and over the sea and where circumstances so require, by way of the mutual regional arrangements co-operate with regional states for this purpose"***

As a signatory to this Convention Fiji has an obligation to:

1. Promote the establishment and maintenance of an effective and efficient search and rescue service regarding safety on land and over sea.

2. Provide search and rescue assistance for aviation purposes within the Fiji search and rescue region.

The two operations search and rescue may vary in form and complexity depending on the nature of the operation and capability of the available personnel, equipment and facilities. It is therefore necessary that available resources are efficiently and competently organised and co-ordinated in order to effectively and expeditiously conduct search and rescue operations.

1.3 Objectives of the Research

The objective of this research is to improve search and rescue in Fiji, with a purpose that the country adopts the relevant international conventions and standards for an efficient and effective SAR organisation. The current situation in Fiji regarding SAR and the Global Maritime Distress and Safety System will be investigated, whereby international requirements, models and guidelines covering SAR, GMDSS and ship reporting will be examined and proposals made accordingly. Deficiencies and shortcomings in the present Fiji SAR system will be investigated, Hence recommendations for improving and upgrading search and rescue and implementing GMDSS will be made. In addition, the writer will make proposals on the implementation of an appropriate national search and rescue committee, SAR organisation structure, national SAR plan, operational procedures and training and certification of SAR personnel. A summary of the dissertation objects is as follows:

1. To analyze the current situation in Fiji regarding SAR and Ship reporting system.

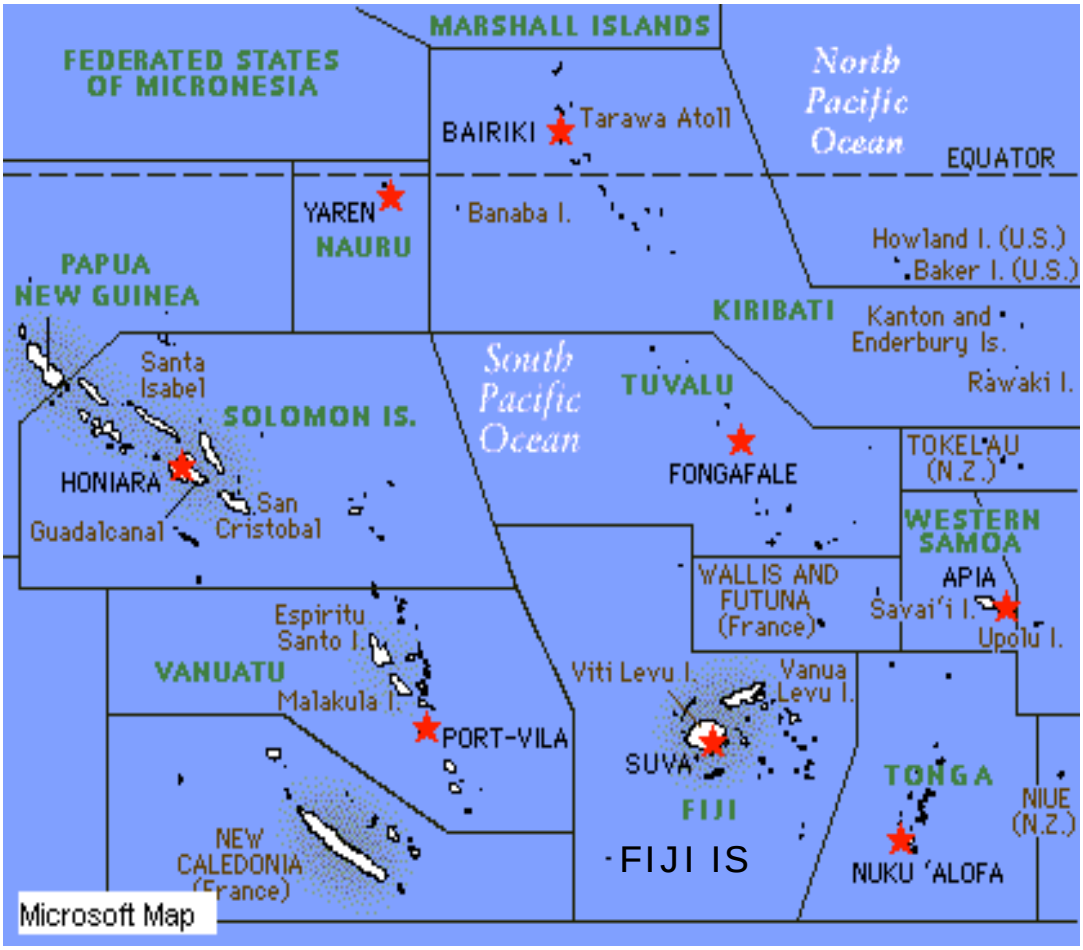
2. To examine international requirements, and guidelines covering SAR and the Global Maritime Distress and Safety System.

3. To identify deficiencies and shortcomings in the present Fiji system and make recommendations for the implementation, improvement and upgrading of SAR, GMDSS and ship reporting system.

1.4 Study Methodology

The objectives of this dissertation will be attained through the examination of international conventions relating to SAR and GMDSS. The study of the German, Australian and Swedish SAR organisations related to, legislation, management, administration and operational procedures. A study of the IMO Global SAR plan with emphasis on the integrated SAR plan for the entire Pacific Ocean and co-operation and co-ordination of regional SAR resources.

Figure 1.2 : Map of the South Pacific



(Source : Microsoft Encarta 98)

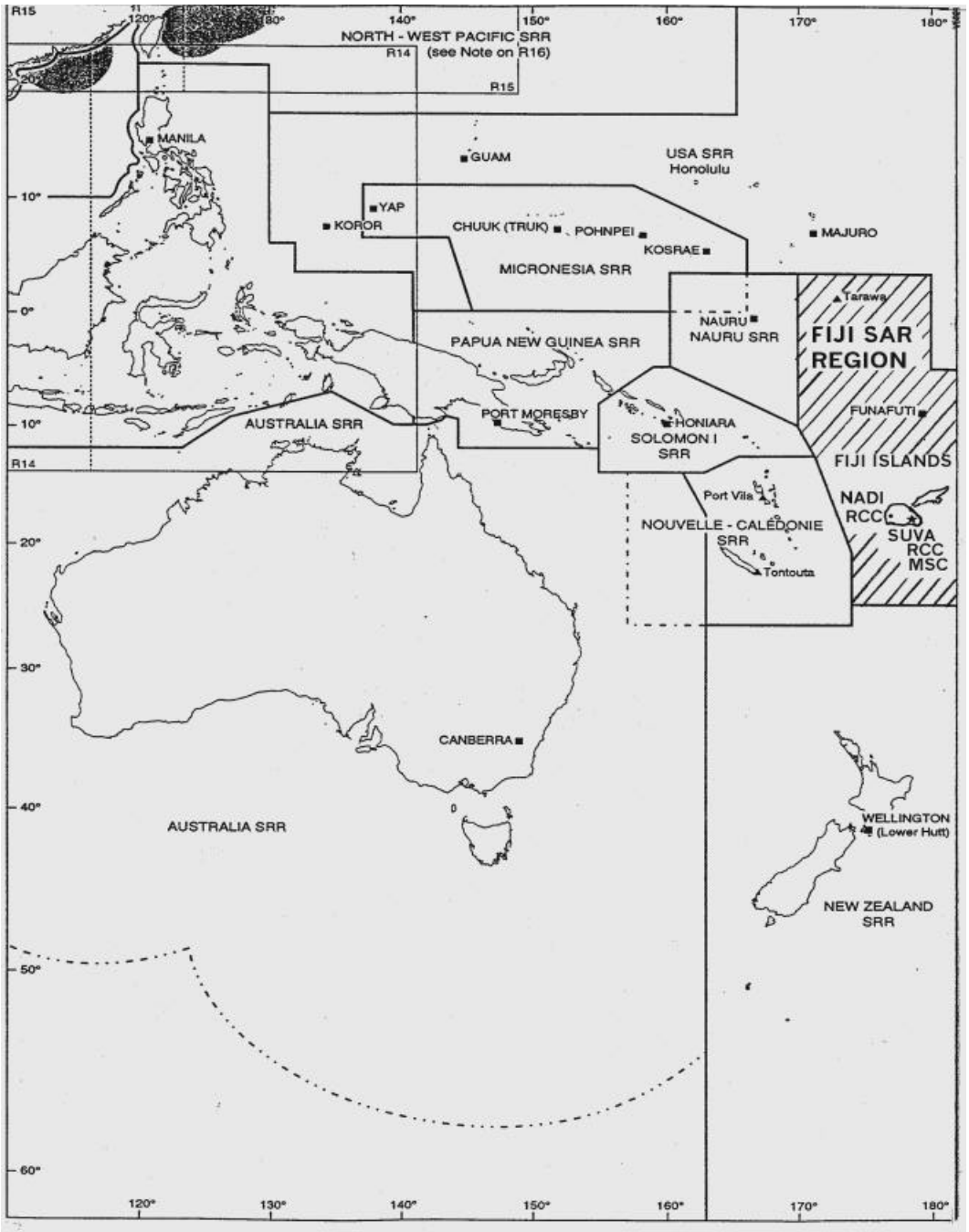
The International Maritime Organisation (IMO) Pacific Ocean Conference on Maritime Search and Rescue (SAR) and the Global Maritime Distress and Safety System (GMDSS), was held in Seoul, Republic of Korea from 7 to 11 April, 1997. This was to facilitate the IMO integrated SAR plan for the entire Pacific Ocean. Consequently, it was decided that the Republic of Fiji's provisional delimitation of SAR responsibilities is within the area bounded by a line connecting the following geographical positions (see Figure 1.3):

1.	**05° 00' S,**	**160° 00' W**	**7.**	**21° 00' S**	**174° 00' E**
2.	**13° 50' S,**	**169° 04' W**	**8.**	**12° 30' S**	**171° 10' E**
3.	**15° 52' S**	**170° 00' W**	**9.**	**10° 00' S**	**170° 00' E**
4.	**18° 35' S**	**169° 00' W**	**10.**	**03° 03' N**	**170° 00' E**
5.	**25° 00' S**	**174° 00' W**	**11.**	**03° 30' N**	**180° 00'**
6.	**25° 00' S**	**174° 00' E**	**12.**	**05° 00' N**	**180° 00'**

The basic principle behind Fiji's Search and Rescue Region (SRR) is that Fiji will be responsible for this (SRR) which may included coast and territorial seas of other Pacific Island Countries, depending upon the agreements made. The Global Search and Rescue Plan requires that the FIJI Rescue Co-ordinating Center (RCC) take charge of reception and centralization of all alerts in its Search and Rescue Region.

In addition the Rescue Co-ordinating Center is responsible for the co-ordination of search and rescue operations. The writer cannot justify how this will help other regions without the availability of a fully operational GMDSS and Ship Reporting System in the Republic of FIJI. The Republic of Fiji is the designated Maritime Rescue Co-ordinating center for the area shown in figure 1.3.

Figure 1.3 : Map of the South Pacific Maritime SAR Region (MSRR)



(Source : IMO Report on the Pacific Ocean Conference, 1997)

CHAPTER TWO : FIJI AND THE MARITIME SECTOR

Introduction

The purpose of this chapter is to give a brief background about the Fiji Islands. The scattered inhabited islands and there geographic location coupled with the climatic conditions are factors which contribute to SAR incidents and the efficiency of SAR operations. The maritime sector is described as this is directly related to the availability of vessels, that are able to assist in distress situations and search and rescue incidents. As shown in figure 2.2, 5,765 ships docked at different ports in Fiji. This justifies a ship reporting system to aid search and rescue operations and, prevent maritime pollution and the transfer of unwanted aquatic organism and pathogens.

2.1 Fiji – Background Information

Fiji attained its independence in 1970, after 96 years of British Rule and subsequently became a Republic in 1987. Fiji is situated between 12º South and 22º South and between 174º East and 178º West, straddling the 180º Meridian (see figure 2.1). The Republic has a total area of 18,272 square kilometers which spreads over an Exclusive Economic Zone (EEZ) area of 1.286 million square kilometers.

2.1.1 Geographical Information

The largest islands of the country are mountainous with several peaks above 1000 meters. The interior of the largest islands is dominated by a mountain range which runs in a North- South direction, creating distinct climate zones to the East and West of the main island. The capital of the country is Suva on the island of Viti Levu.

There are five main towns:

- Labasa
- Lautoka
- Nadi
- Sigatoka
- Levuka

2.1.2 Climate

Fiji has a tropical climate influenced by the cooling South-easterly Trade Winds. December to April are the hotter months with temperatures averaging 32°C. These are also the wetter months, in which the cyclone season occurs. Over the past decade, cyclones have caused considerable damage to both the domestic and industrial sectors. May to November is the drier and cooler period with temperatures commonly down to around 20°C.

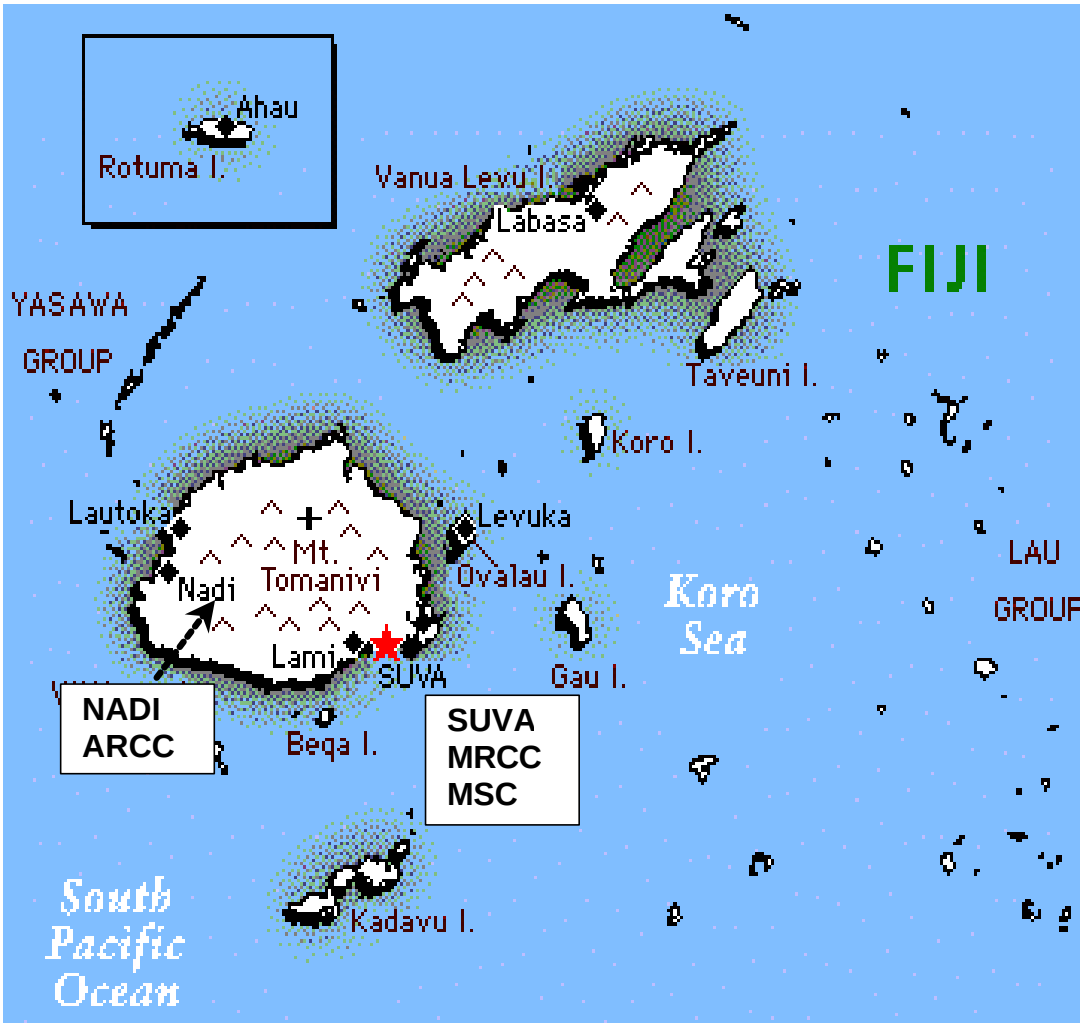
2.1.3 Demography

The total population of Fiji is 750,000 according to the last census in 1998.
The population of the capital cities and main towns are shown in table 2.1:
(Source : Ministry of Information Fiji)

Table 2.1 : City/Town and Population

*City/Town	Population
*Suva	72,000
Labasa	11,600
*Lautoka	10,500
Nadi	7,500
Sigatoka	2,700
Levuka	1,500

Figure 2.1 : Map of the Fiji Islands



(Source : Microsoft Encarta 98)

2.1.4 Main Economic Activities

a. Agriculture is the most important sector of the economy, earning over 70% of export revenues. By far the most important crop is sugar cane. Other crops include paddy rice, copra, ginger and bananas.

b. The natural resources include timber, gold, fish and copper.

c. The major industries are those of sugar and tourism, dominating the country's economy. There are also other growing industries such as food processing (preserved fish), beverages, cement and flour.

d. Fishing is an important economic activity. Private companies that operate a large fleet of tuna boats carry out large-scale commercial fishing. A big cannery exists in Levuka, which is the center of the fishing industry. High quality tuna, mother-of-pearl, troches shell and shark fin are exported to Japan and the USA.

2.1.5 Sources of National Income

1.	Sugar	30%
2.	Tourism	35%
3.	Fishing	15%
4.	Minerals	10%
5.	Others	10%

2.1.6 Energy

Energy is supplied from both the hydroelectric barrages and the diesel generated stations. The distribution network reaches some 40% of the population. The installations are fairly new and dependable, although interruptions during the rainy season are unavoidable.

(Source: Ministry of Information, Fiji.)

2.2 Port and Shipping Activities

2.2.1 Main Ports

The main harbours, in decreasing order of size, are:

1. Suva
2. Lautoka
3. Levuka
4. Labasa
5. Vuda

Table 2.2 : Port Traffic

P0RT	1996	1997	1998
1. Suva	1507	1600	1650
2. Lautoka	1120	1125	1135
3. Levuka	1000	1000	1080
4. Labasa	800	900	1000
5. Vuda	700	800	900
TOTAL	**5127**	**5425**	**5765**

(Source : Ministry of Information Fiji)

2.2.2 National Shipping Fleet

The following data are for 1998.

1. BELOW 300 TONS GROSS:
   80 ships (25 freighters, 1 passenger ship and 54 fishing boats)
2. BETWEEN 300 AND 1600 TONS GROSS:
   10 ships (9 freighters and 1 passenger ship)
3. ABOVE 1600 TONS GROSS:
   7 ship (6 freighters and 1 passenger ship)

2.2.3 Coastal Shipping

There is no reliable data on the exact number of ships that navigate along the coast to other destinations. Last year, Suva Radio recorded that 305 ships contacted it for traffic purposes. The Government intends to implement the GMDSS to improve SAR and the safety of the fishing vessels and freighters transporting goods and passengers among the hundreds of islands in the country's EEZ.
(Source: Ministry or Information Fiji.)

2.3 The Maritime Safety Administration

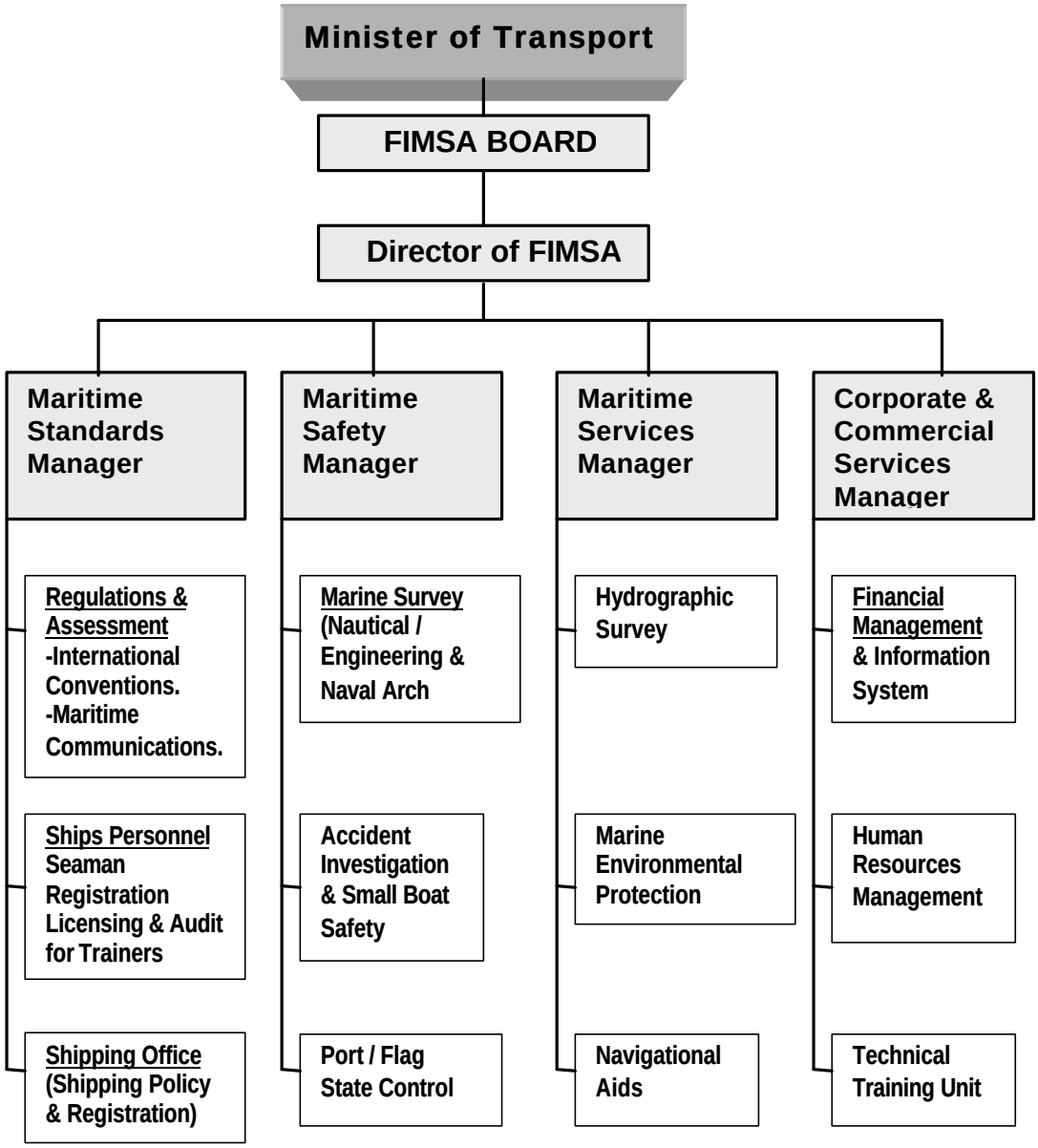
The Minister of Transport, Works and Energy is responsible for Maritime Affairs in Fiji. The Minister is empowered under the Fiji Marine Act, 1986, to make regulations for the safety of Life at Sea and the Prevention of Maritime Pollution. The Fiji Maritime Safety Authority is the specialized arm of the maritime government. Its main function is to implement and enforce the regulations embodied in the 1986 Marine Act.

The Marine Spaces Act has provisions for the demarcation of marine spaces relating to Fiji, as well as declaring its rights in relation to its marine spaces and for regulating the exploitation of resources and the control of fishing. The Republic of Fiji has ratified the following International Conventions:

1. International Maritime Organisation, (IMO 1948).
2. Facilitation of International Maritime Traffic, (FAL 1965).
3. International Load Lines, (LL 1969).
4. Intervention on the High Seas in Cases of Oil Pollution, (Intervention 1969).
5. Civil liability for Oil Pollution Damage, (CLC 1969).
6. Tonnage Measurement of Ships, (Tonnage 1969).
7. International Fund for Compensation for Oil Pollution Damage, (Fund 1971).

8. Regulations for Preventing Collisions at Sea, (COLREGS 1972).
9. Standards of Training and Certification of Watchkeeping, (STCW 1978).
10. Safety of Life at Sea, (SOLAS 1974).
11. Law of the Sea, (UNCLOS 1982).

Figure 2.2 The Fiji Maritime Safety Administration (FIMSA) Organizational Chart



(Source : Fiji Maritime Safety Administration)

CHAPTER THREE : SAR In Fiji, Germany And Australia

3.1 Maritime Radio Communications in Fiji

Suva Radio is the only existing coast station. The station is inefficient owing to the manual operation of the services it provides. In addition, VHF coverage is very limited. Fiji has no INMARSAT land earth station and Local User Terminal (LUT) of the COSPAS_SARSAT System. Suva Radio is open to public correspondence and to distress and safety. It is also a radio station of Fixed Service, providing public correspondence to the country's many remote islands. It provides the following services:

- MF Morse Radiotelegraphy
- HF Morse Radiotelegraphy
- MHF Radiotelegraphy
- HF Radiotelephony
- VHF Radiotelephony

The services are all manually operated. MHF and HF radiotelephony and are offered to the inter-island Fixed Service. MF/HF Morse Radiotelegraphy will cease once the Global Maritime Distress and Safety System (GMDSS) is fully implemented. Suva Radio Keeps continuous manual watch on the following Distress Frequencies:

- 500 KHz
- 501 KHz
- 6215 KHz

3.1.1 Operating Positions

Suva Radio has the following operating positions:

Maritime Mobile Service

- MF/HF Morse Radiotelegraphy Operating Position
- MHF/HF Radiotelephony Calling Operating Position
- MHF/HF Radiotelephony Traffic Operating Position
- VHF Radiotelephony Operating Position

Fixed Service

During normal working hours there are ten (10) operators, i.e. one for each position. Outside these hours, there are only five operators, i.e. two for the Maritime Mobile Service positions and three for the Fixed Service positions. To ensure the availability of these operators, the Operating Center has thirty operators. The Transmitting Center which is not fully remotely operated and tele-supervised is manned by five technicians. Therefore, Suva Radio currently has a total of thirty-five operators, i.e. thirty in the Operating Center and five in the Transmitting Center.

3.1.2 Watch and Calling Channels

Watch Channels:

SUVA RADIO keeps continuous manual watch (DSC is not available) on 500 KHz, by the MF/HF Morse Radiotelegraphy Operating Position, and on 2182 KHz and 6215 KHz, with dedicated receivers, by the MHF/HF Radiotelephony Calling Operating Position.

Calling Channels:

- Continuous watch on 500 KHz, 2812 KHz and 6215 KHz using the same receivers for commercial purposes, in addition to distress and safety. When 500 KHz is occupied, the frequency 468 KHz is used to answer the calls.
- Watch on VHF channel 26 by the VHF Radiotelephony Operating Position. The watch is 24-hours, although the receiver is not dedicated.

- Watch (not 24 hours) on the Morse calling channels 5 and 6 for both the 8 and 12 frequency bands, with dedicated receivers, by the MF/HF Morse Radiotelegraphy Operating Position. This will be discontinued once GMDSS is fully implemented.

3.1.3 Traffic Channels

Suva Radio can operate simultaneously the following number of traffic channels (commercial, distress and safety):

- MF/HF Morse radiotelegraphy: 1
- MHF/H radiotelephone: 2
- VHF radiotelephone: 1

The following frequencies used to handle the traffic:

- MF Morse radiotelegraph : 521 KHz
- HF Morse radiotelegraphy : 8690 KHz and 12700 KHz
- MHF radiotelephony : 2111 KHz
- HF radiotelephony : channels 602, 810,1202
- VHF radiotelephony : channel 26

For the Fixed Service, Suva Radio uses frequencies allocated for that service in the 4,6,8 and 12 MHz bands. Calling and Traffic frequencies are the same. Each of the

six operating positions is equipped to handle one radiotelephone call at a time. The calls are manually connected to the Post and telecommunications network.

Table 3.1 : Suva Coastal Radio Traffic

Service	1997		1998	
	Call/ Message	**Minute/ word**	**Call/ message**	**Minute/ word**
MF/HF Morse Radiotelegraphy	25	636	80	1517
MHF/HF(*) Radiotelephony	2643	7929	2578	7573
VHF Radiotelephony	172	516	128	384

(*)The Fixed Service traffic represents around 70% of the total MHF/HF radiotelephony traffic. (Source Ministry of Communications Fiji)

3.2 Global Maritime Distress and Safety System (GMDSS)

FIJI has no GMDSS Sea Area A1 or A2. Suva Radio is equipped to provide HF radiotelephone distress traffic to the GMDSS Sea Area A3. There are no operational agreements with other countries to share their Inmarsat Land Earth Station. It is therefore not possible to route traffic to vessels at sea. The Government is convinced of the need to modernise and expand both the fixed and the maritime radio communication services. In particular, they intend to investigate the introduction of fully automated ('direct dial') MHF/ HF/ VHF systems.

3.3 Deficiencies of the existing services

The following reasons serve to justify the implementation of the Global Maritime Distress and Safety System (GMDSS) in Fiji:

- No elements of the GMDSS are yet established in Fiji.

- There are only two ports out of five that are served by public correspondence on VHF. The other three ports are outside VHF coverage of the existing coast station.

- Several equipment elements are deficient, resulting in frequent malfunctions and breakdowns. Generally, the equipment is so old that maintenance is difficult and repair impossible.

- National and International shipping has difficulties communicating with land-based subscribers or with other countries through Fiji's land based network.

- Foreign fishing vessels can enter the national waters of Fiji in the absence of any watch of reporting system that can control the fish catches.

- Without modern communication facilities it is very difficult to organize preventive action against pollution and to implement countermeasures in the event of maritime ecological accidents.

3.4 National Search And Rescue Organisation

The Fiji Search and Rescue Organisation is made up of representatives of relevant government departments and private agencies formed under the direction of a National Search and Rescue Committee. Unfortunately, the functions of this National SAR Organisation is not documented, thus is not transparent. Furthermore, the existing national SAR Manual is out of date and requires a review to ensure that it relates to the current SAR/GMDSS agreements and arrangements made at the IMO Pacific Ocean Conference on Maritime SAR/GMDSS held in Seoul, the Republic of Korea, 7 to 11 April 1997.

3.4.1 Classes Of Search

As described in the SAR Convention the Class of Search are as follows:

Class I Search :

Search and Rescue Action on land, rivers and close to shore, within harbour limits where assistance may be rendered from immediately available resources is a police (RSC Suva) responsibility except when an aircraft is missing or in distress.

Class II Search:

Search and Rescue action for any missing or distressed vessel or person at sea within Fiji's domestic search and rescue area, other than instances close to shore to which assistance may be rendered from immediately available local resources, is the responsibility of the Maritime Surveillance Center (MSC Suva).

Class III Search:

Search and Rescue action for any aircraft missing or in distress or overdue within the Fiji Search and Rescue region, is the responsibility of the Civil Aviation Authority of Fiji, (RCC Nadi). This may require RCC Suva to be activated in support. Even though the primary responsibilities of the three SAR agencies mentioned are clear on paper, the existing practice when a SAR is activated still lacks a comprehensive co-ordination of the three agencies.

3.4.2 Development Of The Maritime Surveillance Center (MSC) Suva

The Maritime Surveillance Center (MSC) was established in 1982 to monitor and co-ordinate search and rescue requirements and operations and also to co-ordinate fisheries protection, pollution control and the general law enforcement duties, which encompass all governmental maritime policies. Naval personnel of the communication branch man the center.

3.4.3 Maritime Surveillance Center Equipment

The Navy provided for all the equipment at the center. Consequently, the MSC moved to its present location, and the Australian Government through the Defense Co-operation Program provided a grant of $95,000 specifically for MSC monitoring and communications equipment. The MSC is currently funded through the much-debated parliamentary military budget, thus, if the Opposition push for a cut to the military budget succeeds, then this will certainly affect the operation and efficiency of the Center.

3.5 Republic of Fiji Navy SAR Operations

The Republic of Fiji Navy took over the role and responsibility of Search and Rescue Operations from the Marine Department in 1989. Since then, the Navy has been the sole Maritime Search and Rescue Management Agency for the Country.

All Search and Rescue requirement within this boundary is under the responsibility of the Fiji Navy and co-ordinated by the MSC. The Fiji Navy over the years has carried out Search and Rescue operations with its patrol boats equipped for such requirements.

3.6 Current Search And Rescue Operational System

When a distress of any sort is received at the MSC, the following actions are taken:

1. MSC starts with the preliminary investigation, a case is opened and the chronology of actions taken is noted.

2. All other agencies - Police and RCC Nadi are notified.

3. The Commander of Fiji Navy, Support commander, Maritime commander and Commander of Duty and Standby ships are notified.

4. The decision for a ship to be deployed for the distress is then received from the Navy command.

5. MSC then continues with the preliminary investigation

6. The decision to cancel any SAR rests when it is deemed that all avenues for a rescue had been looked into.

7. When there is a need for a local aerial search, the Permanent Secretary for Home Affairs is contacted for approval for the hire of a local aircraft. So far, aerial searches have been conducted using Air Fiji and Sunflower Airline aircraft and the Pacific Crown Aviation helicopters. Requests for the RAAF, RNZAF and the French Navy Aircraft assistance in aerial search are organised by the RCC Nadi upon recommendation from the MSC.

Under the Fiji SAR Manual, the Commander of the Fiji Navy is responsible for Maritime SAR within Fiji's domestic SAR area of approximately 1.3 million square kilometres, which extends from the Internal Waters to the Exclusive Economic Zone

(EEZ). The Navy Commander is responsible to the Director for Co-ordination and the conduct of Maritime SAR Operations (Permanent Secretary for the Ministry of Home Affairs).

3.7 Communications Equipment Used In SAR

The Fiji Navy is equipped with communication equipment that is capable of supporting the operations of the Fiji Navy with regard to SAR operations within Fiji's EEZ. The Naval communication shore station is located at the Royal Fiji Navy Base, Suva. The Maritime Surveillance Center callsign is 3DZ and is manned 24 hours. It is the Net Control Station, controlling all communication within the Navy and continuously monitors all maritime calling channels.

3.7.1 Maritime Surveillance Center

The following equipment is maintained within the center and manned 24 hours:

- Telephone Switchboard – T/P # 312803, 312584, 307983
- Direct Line – Capable of International Direct Dialling (IDD) 315380 (MSC)
- Fax Machine - # 314783
- Weather fax machine (MF/HF – Global)
- HF Transceivers (3-30 MHz)
- VHF Transceivers (156-174 MHz) Maritime Mobile channels
- MF Distress watchkeeping receiver (2182 KHz)
- MF/HF DSC Transceiver (GMDSS System)
- Multi-Frequency Scanner receiver – (HF/VHF/UHF)

3.7.2 Boats used in SAR Operations

Pacific Patrol Boat Class (PPB) ***"Kula", "Kikau" and "Kiro"***

- MF/HF DSC Transceiver (GMDSS)
- MF Distress Watchkeeping Receiver (2182 KHz)
- VHF Transceiver (156-174 MHz) Maritime Mobile channels
- VHF Transceiver (118-136.975 MHz) Aeronautical
- MF/HF Radio Direction Finder (200 KHz–18 MHz/100 KHz – 29.999 MHz receiver)
- VHF Direction Finder (155.5-163.275 MHz) Distress (121.5 MHz)

"L" Class Patrol Boats ***"Levuka" and "Lautoka"***

- HF Transceiver (3-30 MHz)
- VHF Transceiver (156-174 KHz) Maritime Mobile channels

Dabour Class Patrol Boats ***"Vai", "Ogo", "Saku" and "Saqa"***

- HF Transceiver (3-30 MHz)
- VHF Transceiver (156-174 KHz) Maritime Mobile channels

3.8 Search and rescue service of the Federal Republic of Germany

In 1865, 120 delegates from small local rescue groups around Germany met at Kiel, and founded the Deutsche Gesellschaft zur Rettung Schiffbrüchiger (DGzRS, German Sea Rescue Service). The DGRS is made up of 56 modern SAR vessels and is funded by private donations without any financial aid from the Government. The Federal Republic of Germany ratified the 1979 SAR Convention in March, 1982 and it came into force on June 22, 1985. In March 1982, an agreement between the

Ministry of Transport and the German Sea Rescue Service (DGZRS) was signed. Thus, the execution and co-ordination of maritime SAR within Search and Rescue Region (SRR) of the Federal Republic of Germany was handed over to the DGZRS. It was also stated that the status of the DGZRS will remain unchanged, i.e. a private, independent organisation of public service. (See figure 3.1 : German Sea Rescue Service)

The duties of the DGZRS are:

1. To rescue persons from distress at sea.
2. To search for missing persons and vessels.
3. To transport sick and injured persons, rendering first aid.
4. To assist ships and aircraft in case of distress at sea.
5. To prevent impending accidents and emergencies at sea.
6. To co-ordinate search and rescue missions.

3.8.1 Maritime Rescue Co-ordination Center (MRCC) of Germany

The German MRCC is situated in Bremen. It is a part of the SAR Department in the head office. In cases of maritime distress within the German SRR, the MRCC Bremen is responsible for planning, co-ordination, control and documentation until the operation is completed.

All SAR units are in constant VHF contact with MRCC Bremen, using the DGZRS's own SAR Communication System (SARCOM). The MRCC is also connected to 17 SAR Posts along the German coast. In cases of aeronautical distress the co-ordinating agency is the German Navy's, Aeronautical Rescue Co-ordination Center (ARCC) in Glücksburg,

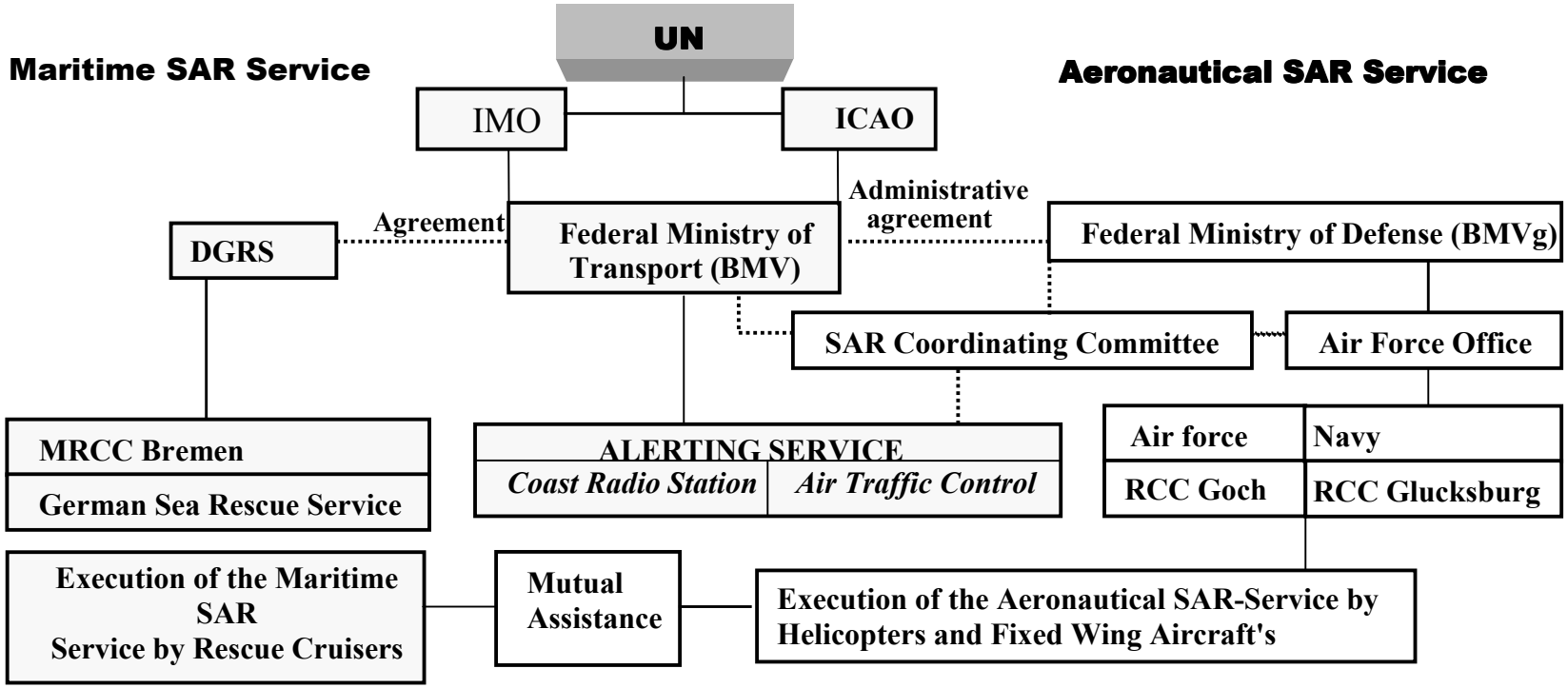
Direct and independent telephone lines connect the rescue centers. All maritime SAR activities carried out in accordance with the SAR operation plans prepared by the DGZRS. The plan contains detailed information relating to the maritime SAR service in the German search and rescue region. In addition, there is close co-operation and co-ordination between the MRCC Bremen and the MRCCs of other neighbouring countries. Regular staff exchange with the MRCCs in neighbouring countries, is common practice.

3.8.2 Search and rescue units of the German Sea Rescue Service (DGZRS)

The fleet of the DGZRS consists of 56 SAR units, 21 rescue cruisers with daughter boats and 35 rescue boats, 23 of the rescue units are stationed in the North Sea, and 33 in the Baltic Sea. Four of the rescue boats are kept on trailers to be prepared for mobile operation. There is a total of 51 rescue stations of which three is located at the Western Baltic Sea. In addition, each rescue cruiser is manned with a full-time paid crew, and is ready for immediate action 24 hours a day. The rescue boats operated by volunteers are equipped with the last technology and have self-righting capabilities.

To conclude, all the MRCC Bremen controllers retain the German Merchant Marine Master's Licence (the highest grade) and frequently participate in SAR courses held by the United Kingdom Coastguard Agency (HMCG), the United States Coastguard, and in special training aboard the rescue vessels. In addition all crewmembers of the rescue cruisers are frequently trained in medical aid, ship safety, On Scene Commander (OSC) tasks, and SAR operational techniques. They also attend regular training courses, offered by different hospitals to become familiar with the treatment of injured and sick persons and the handling of the medical equipment onboard. This equipment includes a telemetric device which is able to transmit a patient's Electro Cardio Gram (EGC) to hospitals, which is reliable information for the doctor when giving radio medical aid.

Figure 3.1 : The German Sea Rescue Service (Source : German Sea Rescue Service)



3.9 Search And Rescue In Australia

Introduction

Australia, as a signatory to the International Civil Aviation Convention 1944, the International Safety of Life at Sea Convention 1974, and the International Search and Rescue convention 1979 is responsible for search and rescue over a vast area made up of the East Indian, South-west Pacific and Southern oceans. The internationally agreed Australian Search and Rescue Region covers 47 million square kilometres - over one ninth of the earth's surface. In January 1991 the Australian Maritime Safety Authority (AMSA) was established under the Australian Maritime Safety Authority Act 1990 as a Government Business Enterprise. In July 1995 the government Changed AMSA into a Commonwealth Authority

The arrangements for search and rescue in Australia have been influenced by the physical size of the island continent. Australia has developed a SAR organisation to direct, co-ordinate and control search and rescue operations within the Australian Search and Rescue Region (SRR) and to provided the organisational basis for co-operation between different SAR authorities. This is due to the political system involving a federation of States and Territories, and the particular SAR responsibilities assumed by the Defence Forces.

3.9.1 The Australian National Search and Rescue Center (AUSSAR)

The Federal Government of Australia has set up a national centralised search and rescue co-ordinating center in Canberra, Australian Capital Territory. This organisation is responsible for directing, controlling and co-ordinating maritime and aeronautical civil search rescue activities within the Australian Search and Rescue Region (SRR). The Australian Maritime Safety Authority is part of this set up and is responsible for national maritime search and rescue. The Maritime Rescue Co-ordinating Center (MRCC) is a section under AMSA.

To enhance search and rescue activities, the center co-ordinates a wide range of Federal, State and Territory agencies including the Defence and Police Forces as well as industry and volunteer rescue groups.

3.9.2 The Maritime Rescue Co-ordinating Center (MRCC)

The principal function of the MRCC is the co-ordination of maritime search and rescue activities within the Australian SRR. The MRCC is equipped to receive and evaluate information transmitted by Emergency Position Indicating Radio Beacons (EPIRBS) of the 406 MHz COSPAS-SARSAT system. Highly qualified maritime and aeronautical staff who has specialised knowledge of search and rescue procedures and operations operates the MRCC on a 24 hour basis. The facilities of the MRCC are available to all seafarers whether they are private boating enthusiasts, commercial fisherman or professional seaman. In addition the MRCC is also the section of AMSA responsible for:

- Co-ordination and delivery of Maritime Safety Information NAVAREA X warnings, which includes Australian Coastal Navigation Warnings (AUSCOAST).
- Operation of the Licensed Foreign Fishing Vessel Reporting System in the 200 nautical mile Fishing Zone.

3.9.3 National Search and Rescue Plan

Australia's National Search and Rescue Plan is derived from International and Domestic agreements between the different government and non-government authorities sharing a common interest. The SAR Plan has detailed policy and procedures for transferring a search and rescue incident if the scale of the incident is beyond local resources. The Australian Defence Force long-range aeronautical units are utilised for search and rescue incidents that are a great distance from the Australian coast.

3.9.4 Australian Ship Reporting System (AUSREP)

An important part of the SAR framework is the Australian Ship Reporting System, established in accordance with the International Convention for the Safety of Life at Sea, 1974. The system which was introduced in December 1973 on a voluntary basis. In 1981 legislation was passed making AUSREP compulsory for all Australian Flag vessels. On voyages where it is not compulsory, ships are encouraged to participate whenever there are in the AUSREP area to ensure the safety of their ships and that of others operating in the Australian Search and Rescue Region. The Objectives of AUSREP are:

1. to limit the time between the loss of a vessel and the initiation of search and rescue action, in cases where no distress is sent out;
2. to limit the search area for a rescue action;
3. to provide up to date information on shipping resources available in the area, in the event of a search and rescue incident.

The Australian Maritime Safety Authority has an efficient and effective maritime safety, search and rescue and marine environmental protection service. This was achieved by applying the latest in management techniques, organisation systems, technology and the continuous monitoring and training to fulfil the objectives of the organisation and the needs of the country. Australia has continually helped the Fiji SAR organisation with equipment and SAR training. In the near future the Fiji Government and in particular the Fiji Maritime Safety Authority (FIMSA) will benefit if advice and consultation is sort from AMSA. This is to help legislate, organise, co-ordinate and develop clear policy objectives, were all assets are employed in the development of FIMSA and the Fiji SAR organisation. This will improve the overall organisation, operation and co-ordination of the maritime safety organisations in Fiji.

CHAPTER FOUR : INTERNATIONAL CONVENTIONS AND STANDARDS RELATED TO SAR AND SHIP REPORTING SYSTEMS

Introduction

In times of imminent danger at sea, assistance to any vessel or person in distress has always been recorgnised by mariners as a normal practice, and a traditional moral obligation. This moral obligation was given legal status when it was incorporated in international maritime law. Today, international treaties contain provisions requiring mariners and maritime search and rescue organisations to render assistance to persons in distress at sea.

4.1 The United Nations Convention on the Law of the Sea 1882 (UNCLOS)

The provisions for search and rescue in the SOLAS Convention are entrenched by Article 98 of the Law of the Sea Convention "Duty to render assistance", which states:

1. Every state shall require the master of a ship flying its flag, in so far as he can do so without serious danger to the ship, the crew or the passengers:

(a) to render assistance to any person found at sea in danger of being lost;

(b) to proceed with all possible speed to the rescue of persons in distress, if informed of their need of assistance, in so far as such action may be reasonably expected of him;

(c) after a collision, to render assistance to the other ship, its crew and its passengers and, where possible, to inform the other ship of the name of his own ship, its port of registry and the nearest port at which it will call.

2. 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.

4.2 The International Convention on Maritime Search and Rescue, 1979

The Assembly of the International Maritime Consultative (IMCO) by resolution A.406(X) of 17 November 1977, resolved to convene an international conference to consider the adoption of a convention on Maritime Search and Rescue (SAR). Consequently, the Convention was adopted on 27 April 1979 in Hamburg, and subsequently entered into force on 22 June 1985. The Republic of Fiji has not ratified the Convention due to the substantial obligations imposed on the country to set up shore installations.

The main purpose of the convention is to facilitate co-operation between Governments and between those participating in search and rescue out at sea. Consequently, the world oceans have been divided into 13 SAR areas to facilitate, establish and develop the international SAR plans and provide the framework for search and rescue operations. The two associated manuals, resolutions and recommendations ensure that the SAR operations are conducted with maximum speed, efficiency and effectiveness. The technical provisions of the Convention are contained in an annex consisting of six chapters:

Chapter 1- Terms and Definitions

Chapter 2- Organisation and Co-ordination

This chapter deals with how National SAR services should be organised and how parties are required to establish rescue co-ordinating centers which are to be manned on a 24 hour basis with staff having an English working knowledge.

Chapter 3- Co-operation between States

In addition to co-ordinating their own SAR organisation, parties are recommended to co-ordinate search and rescue operations with neighboring States.

Chapter 4- Operating Procedures

This chapter deals with the preparatory measures to be taken by Rescue Co-ordinating Centers (RCC) and Rescue Sub Centers (RSCs) and the state of preparedness of search and rescue units. The operational procedures and guidelines for the three emergency phases, uncertainty phase, alert phase and distress phase are also detailed in this chapter.

Chapter 5- Ships Reporting Systems

Parties are also required to establish a Ship Reporting System within its search and rescue region for which it is responsible and where it considered necessary and practical for search and rescue purposes.

4.3 The Merchant Ship Search and Rescue Manual 1993 (MERSAR)

The Merchant Ship Search and Rescue Manual was introduced and adopted in the seventh IMO Assembly in 1971 before the adoption of the SAR Convention 1979. The purpose of this Manual is to provide guidance to the master of a vessel who might be called upon to conduct search and rescue operations for persons in distress. The Manual is divided into eight chapters which deal with SAR co-ordination, action by ship in distress, action by the assisting ship, assistance by SAR aircraft, planning and conducting the search, conclusion of search, communications and aircraft casualties at sea.

4.4 IMO Search and Rescue Manual 1993 (IMOSAR Manual)

The prime purpose of the IMO Search and Rescue Manual is to assist governments in implementing the objectives of the International Convention on Maritime Search and Rescue and of Article 12(2) of the Convention of the High Seas, 1958. The two conventions require every coastal state to promote the establishment 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.

The IMOSAR manual was Adopted by the Maritime Safety Committee in 1978. It provides guidelines for a common maritime search and rescue policy, encouraging all coastal states to develop their organisations along similar lines and enabling adjacent States to co-operate and provide mutual assistance. The IMOSAR manual has been aligned as closely as possible with the International Civil Aviation Organisation (ICAO) Search and Rescue Manual to ensure common policy and to facilitate consultation of the two manuals. This is due to frequent common objectives. The IMOSAR Manual is divided into two parts.

a) Part 1 deals with the search and rescue organisation. It also deals with matters relating to the organisation of existing services, establishment of additional services and facilities which are necessary to provide practical and economical search and rescue coverage of a given area.

b) Part 2 deals with the search and rescue procedures and contains materials designed to assist all personnel who are to participate in search and rescue operations and exercises.

4.5 International Convention for the Safety of Life at Sea (SOLAS 1974/78)

Regulation 10 of Chapter V of the SOLAS 1974 expresses the obligations placed upon the master of a vessel who receives a distress message. The master of the vessel is bound to proceed with all speed to the assistance of the persons in distress. If the master is unable to do so, he must note the reasons in the ship's logbook.

Regulation 2 of Chapter V requires the master to broadcast warning messages to other vessels in the vicinity.

Regulation 15 of Chapter V states the obligations of Governments regarding search and rescue:

> "Each contracting government undertakes to ensure that any necessary arrangements are made for coast watching and for the rescue of persons in distress at sea around its coasts. This arrangement should include establishment, operation and maintenance of such maritime safety facilities as are deemed practicable and necessary having regard to the density of seagoing traffic and the navigational dangers and should, so far as possible, afford adequate means of locating and rescuing such persons. In addition each Contracting Government undertakes to make available information concerning its existing rescue facilities and the plans for changes therein, if any".

On 1 July 1997 the SOLAS regulation V/15 (c) entered into force, which requires that:

> "Passenger ships to which chapter 1 applies, trading on fixed routes, shall have on board a plan for co-operation with appropriate search and rescue services in event of an emergency. The plan shall be developed in co-operation between the ship and the search and rescue services and be approved by the administration. The plan shall include provisions for the periodic exercises to be undertaken as agreed by the passenger ship and the search and rescue organisation concerned, to test its effectiveness.

The guidelines for preparing plans for co-operation between passengers ships and SAR services in accordance with SOLAS regulation V/15 (c), and plans for co-operation between search and rescue services and passenger ships on fixed routes, are shown in appendix 1.

4.6 The International Aeronautical and Maritime SAR Manual (IAMSAR)

The draft text prepared by the COMSAR sub-committee was approved at the 68th MSC session in May 1997 and the new SAR Convention was adopted at the 69th MSC session in May 1998. The new SAR Convention emphasises the co-ordination of maritime and aeronautical search and rescue operations.

The International Maritime Organisation (IMO) and the International Civil Aviation Organisation (ICAO) established a joint working group on the harmonisation of Aeronautical and Maritime Search and Rescue operations. Consequently, at its fifth meeting in October 1997 in the USA, the IAMSAR Manual was developed. The primary purpose of the Manual is to help States meet their obligations under the SAR, Civil Aviation and the SOLAS Convention.

The revised SAR Convention, which will enter into force on 1 January 2000, clarifies the responsibilities of Governments and puts greater emphasis on the regional approach and co-ordination between maritime and aeronautical SAR operations. It is hoped the revised Convention will be more acceptable to those states which have not yet ratified the 1979 SAR Convention – as of 1 May 1998, the SAR Convention had been ratified by only 57 countries, whose combined merchant fleets represents less than 50% of the world tonnage.

The revision applies to the main body of the convention, contained in an Annex, which is divided into Chapters. The terms and definitions contained in Chapter 1 have been updated and Chapter 2, which deals with Organisation and Co-ordination, has been re-drafted to make the responsibilities of Governments clear.

The new text requires Parties, either individually or in co-operation with other states, to establish basic elements of a search and rescue service, and describes how SAR services should be arranged and national capabilities be developed. Parties are required to establish rescue co-ordination centers and to operate them on 24- hour basis with trained staff having a working knowledge of English.

Under the revised Chapter 2, Parties are required to “ensure the closest practicable co-ordination between maritime and aeronautical services”. Other Chapters in the revised SAR Convention deal with co-operation between States (Chapter 3) and Operating Procedures (Chapter 4), which incorporates the previous Chapter 4 (Preparatory Measures) and Chapter 5 (Operating Procedures).

Chapter 4 gives procedures to be followed, such as during initial action, emergency phases, initiation of search and rescue operations when the position of the search object is unknown and co-ordination of SAR activities.

The revised Chapter 4 says that "Search and rescue operations shall continue, when practicable, until all reasonable hope of rescuing survivors has passed".

The original Chapter 6 (Ship Reporting Systems) has been updated and renumbered as Chapter 5. It says that ship reporting systems should provide up-to-date information on the movements of vessels in the event of a distress incident to help the SAR activities.

4.7 The Brussels Convention on Assistance and Salvage 1910/1967 Protocol

> Article 11 of the convention states 'Every master is bound, so far as he can do so without serious danger to his vessel, her crew and passengers, to render assistance to everybody, even though an enemy, found at sea in danger of being lost'.
>
> Article 14 of the convention states 'The provision of this convention shall also apply to assistance or salvage services rendered by or to a ship of war or any other ship owned, operated or chartered by a state or Public Authority….'.

That means the duty to rescue even extends to rescuing enemies during wartime. The obligation to provide assistance to persons in distress at sea has been embodied in SOLAS and other international treaties as mentioned earlier.

4.8 The International Convention on Salvage (1989)

> Article 10 states 'Every master is bound so far as he can do so without serious danger to his vessel and persons thereon, to render assistance to any person in danger of being lost at sea..'

The ancient maritime law of salvage provided compensation for saving property at sea but not lives. However, it has been modified by international conventions and case law, so saving lives may expect a reward in most cases.

4.9 The IMO Requirements and Guidelines for Ship Reporting System Resolution A.648(16)

IMO Adopted Resolution A.648(16) on the 19 October 1989: "General Principles For Ship Reporting Systems and Ship Reporting Requirements, Including Guidelines For Reporting Incidents Involving Dangerous Goods, Harmful Substances and/or Marine Pollutants".

IMO in accordance with Resolution 3 of the International Conference on Maritime Search and Rescue 1979, facilitated the need for an internationally agreed format and procedure for ship reporting systems and requirements to be used to provide, gather or exchange information through radio reports. This information is to be used to provide data for search and rescue, vessel traffic service, weather forecasting, and the prevention of marine pollution. (See Appendix 2)

Conclusion

During the last few years, a major effort has been made to improve the implementation of the SAR convention. One by one the gaps in the 13 SAR areas have been filled, a decisive moment came in September 1997 when coastal states agreed on provisional SAR plans for the Mediterranean and Black Seas. The development of SAR plans in all the world's sea areas is important not only to the success of the SAR Convention, but also to the implementation of the Global Maritime Distress and Safety System which came into force on the 1 February 1999.

The SAR Convention is designed to provide a response to emergencies and the GMDSS was established to provide it with the efficient communication support needed. Both the GMDSS and SAR are crucial to the future of maritime safety, to expeditiously and effectively respond to distress calls.

CHAPTER FIVE : THE GLOBAL MARITIME DISTRESS AND SAFETY SYSTEM

5.1 GMDSS - An Introduction

To facilitate the plans for worldwide maritime satellite communications, the IMO formed the International Maritime Satellite Organisation (INMARSAT) to provide satellites for the space segment. INMARSAT is an inter-governmental organisation consisting of 84 governments, established in 1979. In 1982 INMARSAT began providing service to ships and at the same time GMDSS was in its development stage, thus, IMO and INMARSAT worked closely together developing the new system. Form January 1990 INMARSAT became a private entity and has changed its name to International Mobile Satellite Organisation.

The requirements of the GMDSS are laid down in Chapter IV of the International Convention for the Safety of Life at Sea 1974. The basic concept of the GMDSS is that search and rescue authorities ashore, as well as shipping in the immediate vicinity of the ship in distress will be rapidly alerted to a distress incident, so that they can assist in a co-ordinated SAR operation with minimum delay.

The system also provides for urgency and safety communications and the promulgation of maritime safety information (MSI) – navigational and meteorological warnings and forecasts and other urgent safety information to ships. In other words, every ship is able, irrespective of the area in which it operates, to perform those communication functions, which are essential for the safety of the ship itself and of other ships operating in the same area. (See Figure 4: General concepts of the GMDSS system)

GMDSS will apply to all ships of more than 300 gross tonnage and all passenger ships on international voyages. Transition period for installing GMDSS equipment on ships is as follows:

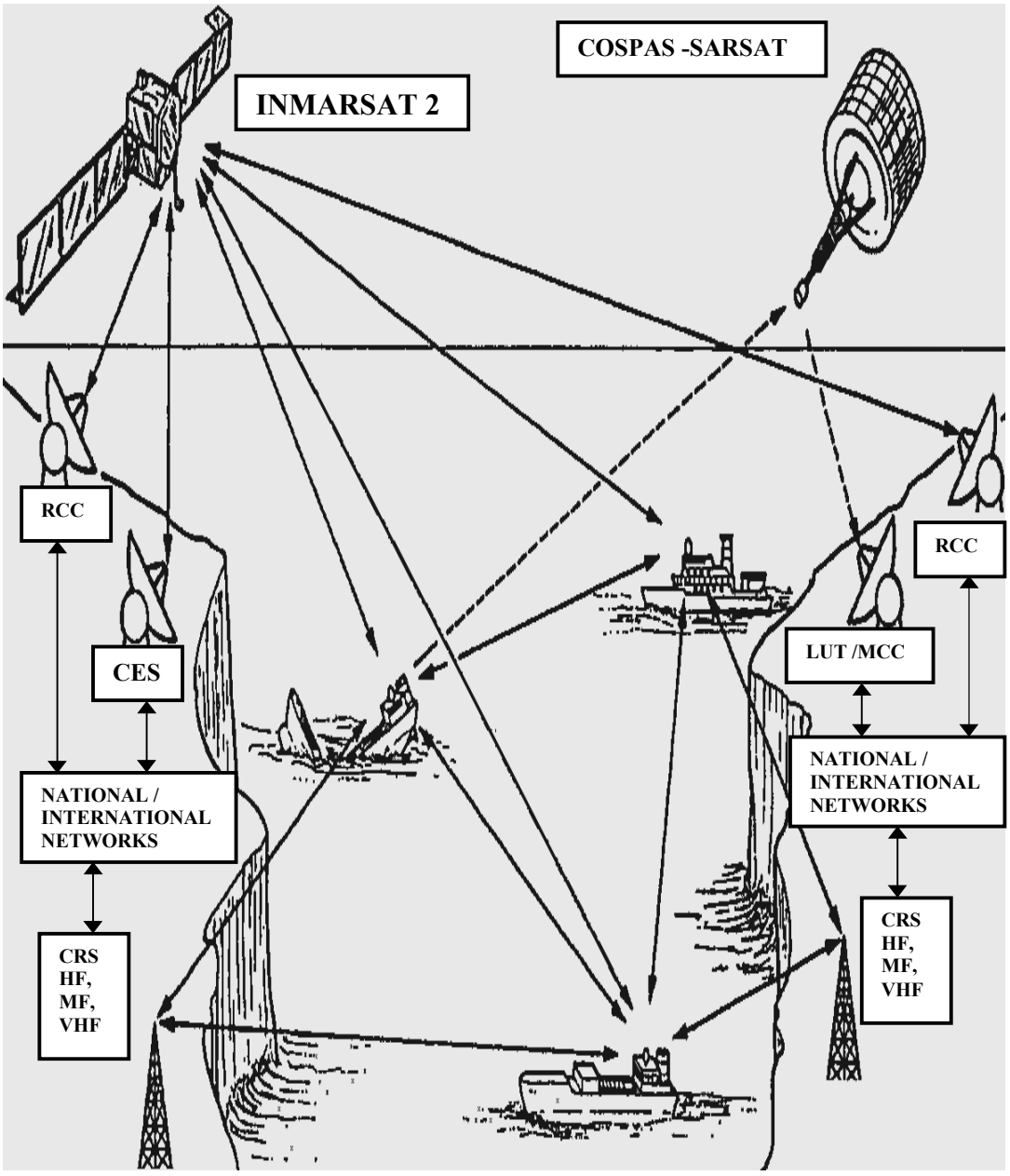
- Between February 1, 1992 and February 1, 1999, existing ships can comply with the existing Chapter IV of SOLAS or the GMDSS requirements.

- All ships must carry NAVTEX (transmission of maritime safety information) receiver and satellite EPIRBs (emergency position-indicating radio beacons) by August 1, 1993.

- All new vessels completed on or after February 1, 1995, must comply with all applicable GMDSS requirements**.**

- From 1 February 1999 all passenger ships and all cargo ships of 300 gross tonnage and upward on international voyages must comply with the GMDSS.

Figure 5.1 : General Concepts of the GMDSS



RCC - Rescue Coordinating Center	CES - Coastal Earth Station
LUT - Local User Terminal	MCC - Maritime Coordinating Center
CRS - Coastal Radio Station	HF - High Frequency
MF - Medium Frequency	VHF - Very High Frequency

(Source : Calcutt, D and Tetley, L, 1994)

5.1.1 The sea areas and ship carriage requirements for communication within the GMDSS

Although GMDSS is a totally global system, it is not necessary for all ships to carry the full range of GMDSS communications equipment. The radio equipment to be carried is determined by the declared geographical area of operation of a vessel within the GMDSS radionet. The operational area are designated as follows:

- Area A1 – within the range of shore based VHF radio, approximately 20-30 Nautical miles from land
- Area A2 – excluding area A1, within the range of shore based MF radio. Typically, the radio range is about 100 nautical miles
- Area A3 – excluding Area A1 and A2, within the range of services provided by the Inmarsat geostationary satellite. This covers the whole surface area of the world between roughly 70°N and 70°S.
- Area A4 – all other remaining areas, sea around the North Pole and South Pole is mostly land, outside the Inmarsat satellite coverage area.

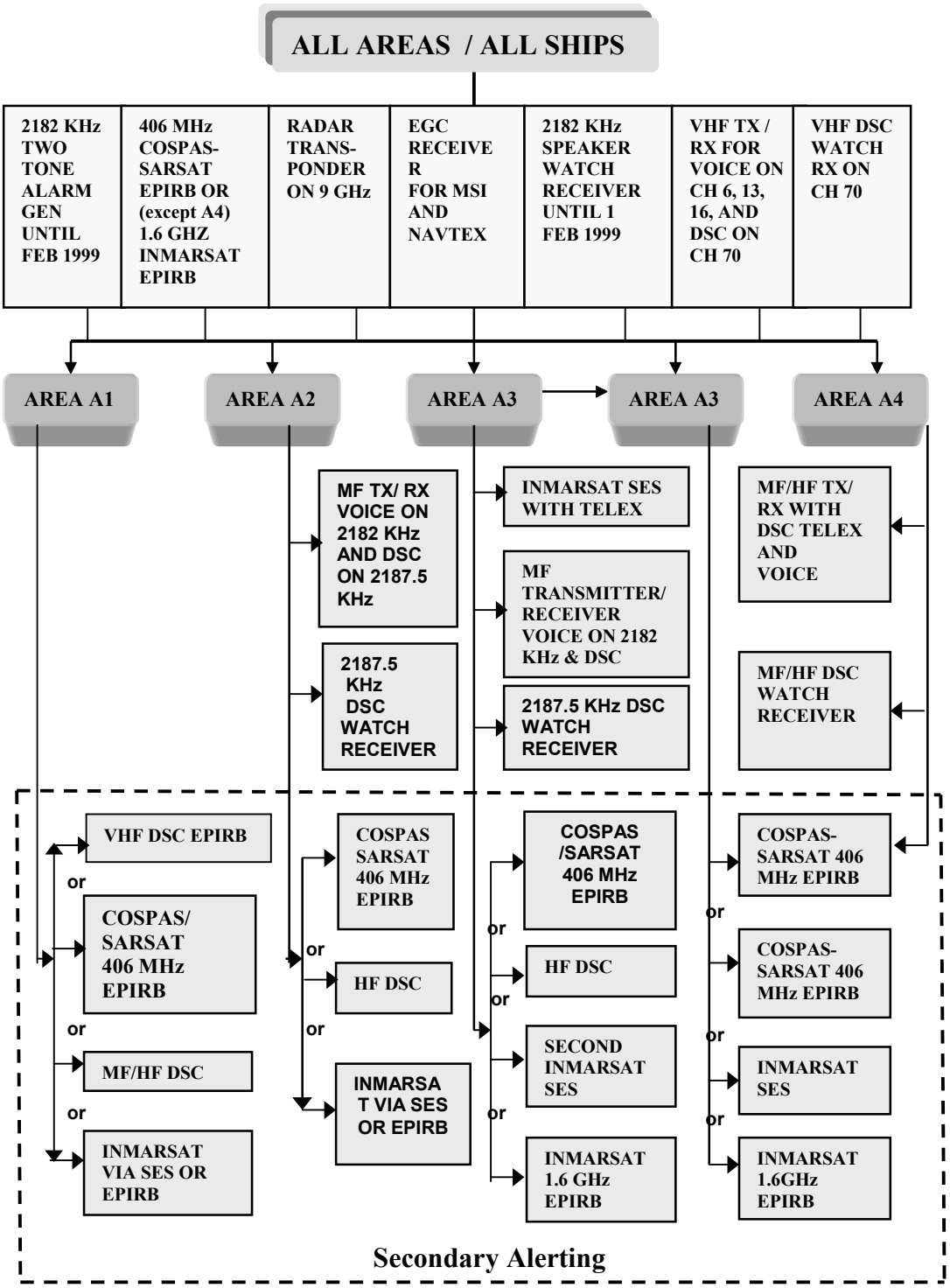
(Focus on IMO, February 1998, pg. 9)

The chart in Figure 5.1 shows the ship carriage requirements for each sea area.

5.12 Communication Functions in the GMDSS

The GMDSS comprises the following communications functions as required by regulation IV/4. These functions are individually performed by the radio subsystems set out in part 3.

Figure 5.2 : Ship carriage requirement for each sea area chart



(Source : Calcutt, D And Tetley, L, 1994)

5.2.1 Distress Alerting

Distress alerting is the rapid and successful reporting of a distress incident to a RCC or another ship in the vicinity, which can provide or co-ordinate assistance. When an alert is received by an RCC, normally via a coast station or coast earth station, the RCC will relay the alert to SAR units and to ships in the vicinity of the distress incident. A distress alert should indicate the ship's identification and the position of the distress and, where practicable, its nature and other information, which could be used for rescue operations. The GMDSS comprises the following communications functions as required by the International Telecommunication Union (ITU).

1. The communication arrangements under the GMDSS are designed to enable distress alerting to be performed in all three directions – ship-to-shore, ship-to-ship and shore-to-ship – in all sea areas (Regulation IV/4.1.1-4.1.3). The alerting function is based on both satellite and terrestrial means and the initial distress alert is primarily transmitted in the ship-to-shore direction.

2. A distress alert is normally initiated manually and all distress alerts are acknowledged manually. When a ship sinks, a float-free satellite emergency position indicating radio beacon (EPIRB) is automatically activated. Ships operating exclusively in sea area A1 may, instead of satellite EPIRBs use VHF EPIRBs on channel 70.

3. The relaying of a distress alert from an RCC to ships in the vicinity of a distress incident is made by satellite communication or by terrestrial communication using appropriate frequencies. In either case, to avoid all ships in a large sea area being alerted, an "area call" is normally transmitted so that only those ships in the vicinity of the distress incident are alerted.

5.14 SAR Co-ordinating Communications

1. In general these are the communications necessary for the co-ordination of ships and aircraft participating in a search and rescue operation following a distress alert and include communications between RCCs and any “On-Scene Commander” (OSC) or “Co-ordinator Surface Search” (CSS) in the area of the distress incident.

2. For SAR operations messages are transmitted in both directions, as distinct from “alerting”, which is generally the transmission of a specific message in one direction only.

3. The techniques which are available for SAR co-ordinating communications are radiotelephony or direct-printing telegraphy or both. These communications can be carried out by terrestrial or satellite means, dependent upon the equipment fitted on the ship and the sea are in which the incident occurs. (See Figure 5.3 : IMO GMDSS Guidance for Masters of Ships in Distress Situations)

5.15 On- Scene Communications

On-scene communications normally take place in the MF and VHF bands on frequencies designated for distress and safety traffic:

- VHF DSC Channel 70
- DSC Frequency 2175 KHz fitted with MF Radio installation
- 2187.5 KHz, 8414.5 KHz and on at least one of the four distress and safety
- Digital Selective Calling (DSC) frequencies of 4207.5 KHz, 6312 KHz, 12577 KHz or 16804.5 KHz if fitted with MF/HF Radio installation.

For satellite shore-to-ship distress alerts if fitted with INMARSAT ship earth station. When aircraft are involved frequencies of 3023 KHz, 4125 KHz, 5680 KHz. In addition SAR aircraft may be provided with equipment to communicate on 2182 KHz or 156.8 MHz or both, as well as on any other maritime mobile frequencies.

5.16 Locating By SART And EPIRB

Locating is the finding of a ship/aircraft in distress or its survival aircraft or survivors. In the GMDSS this function is performed by means of 9 GHz SAR radar transponders (SARTs) by the ship in distress or its survivors, whose position is indicated when the SART is interrogated by the searching units 9 GHz radar. Use of the frequency 121.5 MHz in most satellite EPIRBs is provided for homing by aeronautical SAR units.

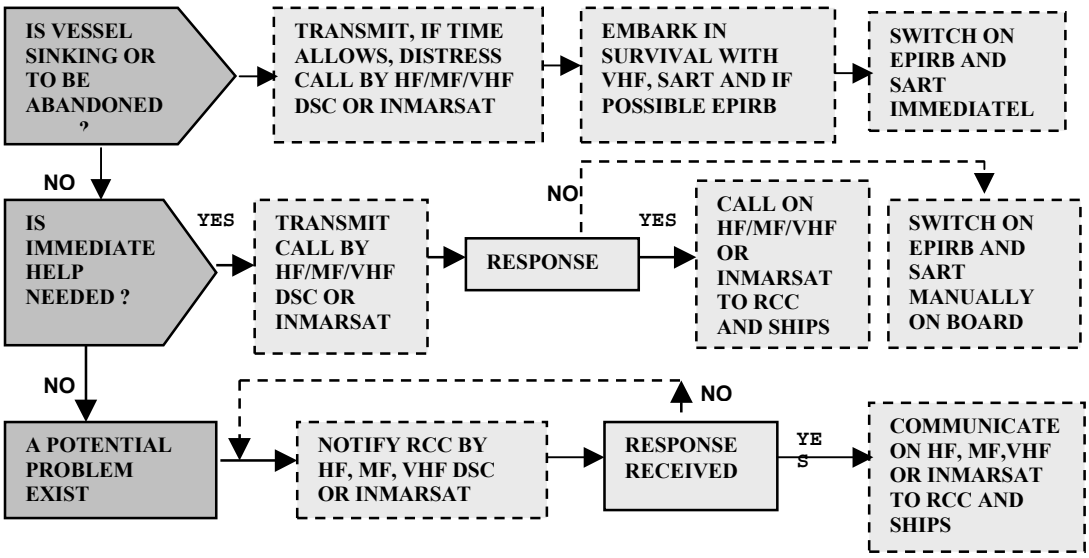
5.17 Promulgation Of Maritime Safety Information (MSI)

Ships need to be provided with up-to-date navigational and meteorological warnings and forecasts and other urgent safety information (MSI). MSI is made available by narrow-band direct-printing telegraphy broadcasts. For the ships that navigate beyond the NAVTEX coverage, the Inmarsat enhanced group call (EGC) system is available (known as the international SafetyNET system).

5.18 General Radiocommunications

General radiocommunications in the GMDSS are those communications between ship stations and shore-based communication networks which concern the management and operations of the ship and may have an impact on its safety. These communications can be conducted on any appropriate channel, including those for public correspondence. Examples are orders for pilot and tug services, chart replacement, repairs etc.

Figure 5.3 : GMDSS Operating Guidance for Masters of Ships in Distress



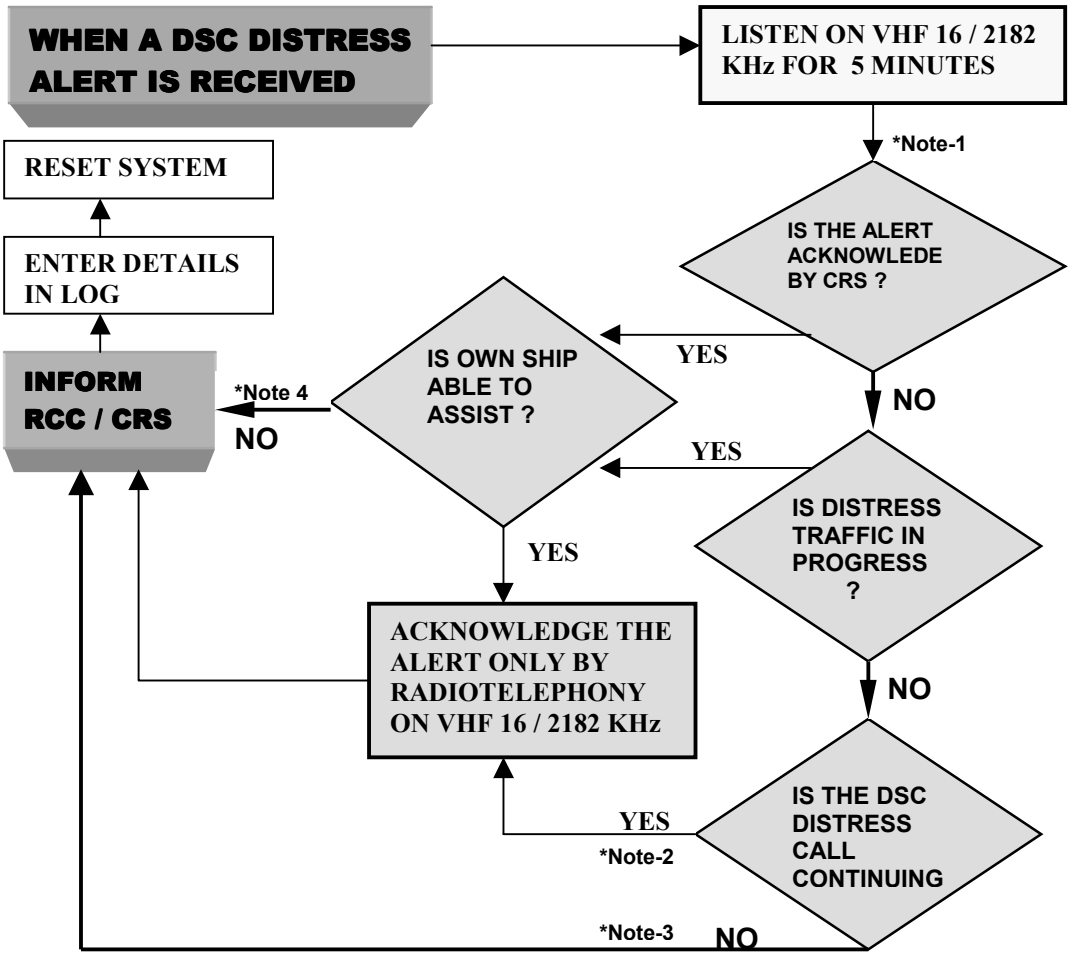
RADIO DISTRESS COMMUNICATIONS			
	DSC	RADIOTELEPHONE	RADIOTELEX
VHF	CHANNEL 70	CH 16	
MF	2187.5 KHz	2182 KHz	2174.5 KHz
HF4	4207.5 KHz	4125 KHz	4177.5 KHz
HF6	6312 KHz	6215 KHZ	6268 KHz
HF8	8414.5 KHz	8291 KHz	8376.5 KHz
HF12	12577 KHz	12290 KHZ	12520 KHz
HF16	16804.5 KHz	16420 KHZ	16695 KHZ

(Source : IMO GMDSS Guidance for Masters of Ships in Distress)

5.3 Actions Upon Reception Of VHF / MF DSC Distress Alert

Rescue Co-ordinating Centers (RCCs) have faced problems where ships have acknowledge a received Digital Selective Calling (DSC) distress alert, which has caused the alert to be terminated and the DSC system to be exposed to unnecessary work load. At the North Sea Regional GMDSS conference (NRC-9) which was held in Amsterdam in June 1998, a revised flowchart was tabled and accepted. It was also decided that it be brought to the attention of IMO at COMSAR 4.

Figure 5.4 : Actions Upon Reception of VHF / MF DSC Distress Alert



(Source : IMO COMSAR 4/316, 14 May 1999**)**

REMARKS:

<u>* Note-1:</u> Do Not Send A DSC Acknowledgement, since Coast Stations normally make DSC acknowledgements only. Listen for subsequent distress communication. It can be assumed that the DSC distress alert has been received and acknowledged by a Coast Station whose transmission may be out of range of your own ship.

*** Note- 2:** If the DSC distress alert continues or there is no doubt that a ship or persons are in distress, and your ship is in position to render assistance, the DSC distress alert shall be acknowledged by RADIOTELEPHONY, and NOT by DSC.

*** Note- 3:** Appropriate or relevant (M) RCC and/or the actual Coast Station should be informed accordingly. If the DSC distress alert continues to be transmitted from the same ship, and there is no doubt that the ship is within reach of your ship, a DSC acknowledgement may – after consultation with an (M) RCC or a Coast Station – be sent in order to terminate the distress alert.

*** Note- 4:** If your ship is not in the position to render assistance all radiocommunications which may interfere with SAR activities should be avoided.

5.4 The Inmarsat System

The INMARSAT organisation provides satellites for world-wide mobile communications services. The companies nominated by the member states of IMO provide commercial satellite communications service to customers through the INMARSAT satellites. The companies invest a share of the organisation's capital and accept policy and operational control of the INMARSAT directorate through the INMARSAT Council. As INMARSAT was originally created to provide a global, international maritime communications system based on sea areas, consequently, INMARSAT's services for maritime distress and safety have generally been designed and developed to meet the requirements of the Global Maritime Distress and Safety System.

Inmarsat has three major components: the space segment provided by Inmarsat, the coast earth station (CESs) provided by Inmarsat signatories and the ship earth stations (SESs). The nerve centre of the system is the operations control centre (OCC), located at Inmarsat's headquarters in the United Kingdom. The OCC is responsible for controlling the Inmarsat system operation as a whole. Operating 24 hours a day, it co-ordinates a wide range of activities. The OCC also arranges the commissioning of SESs upon application by the shipowner.

5.4.1 Space segments

The Inmarsat system utilises four satellites in geostationary orbit 36,000 km above the equator, covering four ocean regions, namely:

1. Atlantic Ocean Region (East) AOR-E
2. Atlantic Ocean Region (West)AOR-W
3. Indian Ocean Region IOR
4. Pacific Ocean Region POR

The International Mobile Satellite Organisation is vital to the GMDSS. Four Satellites in geostationary orbit of 36,000 Km above the Equator cover four ocean regions and provide near global coverage (geostationary satellites cannot reach above 70º N or below 70º S).

5.4.2 Coastal Earth Stations (CESs)

The coastal earth stations provide the link between the satellite and the terrestrial telecommunications networks. Currently, all coastal earth stations are owned and operated by telecommunications carriers. The technical side of a typical coastal earth station consists of three main features: the parabolic antenna, the radiocommunications electronics and the baseband signal processing system. The

services offered include automatic calls for telephony and telex, manual operator services, directory enquiries, technical assistance, collect and credit-card calls, telegram service, store and forward services, group calls and data communications. It is also able to provide value added service relating to health, navigation and other data.

5.4.3 Ship Earth Stations (SES)

Inmarsat-A: The Inmarsat-A ship earth station consists of a parabolic antenna mounted on the ship's superstructure connected to telephone and telex equipment on the bridge. Computers and visual display units (VDUs) are optional to the system. The system provides two-way direct dial telephone, facsimile, telex, electronic-mail and data communications.

Inmarsat-B: Inmarsat-B is a global communications system which extends the advantage of modern digital technology to the field of mobile satellite communications. The system provides automatic, direct dialling telephone, facsimile and high-speed data service and telex.

Inmarsat-C: This system does not provide voice communications. The system provides two-way data or message based communications for telex and distress messages. The typical Inmarsat-C mobile earth station (MES) has a small omni directional antenna which because of its lightweight and simplicity is ideal for small craft. The system has been accepted as an alternative to Inmarsat-A or HF radio installation for all SOLAS ships operating in GMDSS sea area A3.

Inmarsat-D/D+: Inmarsat-D offers a one-way messaging service. Inmarsat-D+ provides two-way global data communications utilising equipment no bigger than a personal CD player. Complete with integrated GPS, the system is ideally suited for tracking, tracing and supervisory control and data acquisition (SCADA).

Inmarsat-E: The system provides global maritime distress alerting services via Inmarsat satellites. Distress alerts transmitted from Inmarsat-E Emergency Position Indicating Radio Beacons (EPIRBs) are relayed through Inmarsat satellites to the four dedicated Coastal Earth Stations (CESs): Raisting, Germany (T-Mobil); Niles Canyon, USA (Stratos); Perth, Australia (Telstra); and BT Atlantic, UK (BT).

Inmarsat-M: The system provides mobile satellite communications system for telephone and low-speed facsimile services (2.4 kbit) with coverage anywhere in the world except the poles.

5.5 COSPAS-SARSAT SYSTEM (COSMICHESKAYA SISTYEMA POISKA AVARIYNICH SUDOV – SEARCH AND RESCUE SATELLITE AIDED TRACKING)

The COSPAS-SARSAT (Space system for search of distress vessels - Search and Rescue Satellite-aided tracking), is a satellite-aided search and rescue system designed to locate distress beacons transmitting on the frequencies 121.5 and 406 MHz. It is intended to serve all organisations in the world responsible for search and rescue operations. The system was established by Canada, France, United States and Russia to locate Emergency Positioning Indicating Radio Beacons (EPIRBs) transmitting on 121.5 and 406 MHz. There are three types of beacons: Emergency Locator Transmitter (ELT) for airborne use, EPIRBs for maritime use and Personal Locator Beacons (PLBs).

5.5.1 Space Segment

The Search and Rescue (SAR) instrument on board the COSPAS-SARSAT satellite operates in the following modes:

- Real-time transmission mode: 121.5 MHz repeater

- Real-time mode: 406 MHz data processing and downlink
- Global coverage mode: 406 MHz stored data transmission

The on board satellite equipment consists of the following basic sub-assemblies:

- 121.5 MHz receiver
- 406 MHz receiver/process and memory unit
- 155.4 MHz transmitter

5.5.2 Local User Terminal (LUT)

Local User Terminal (LUT) functions include:

- Receive Distress Signals/Data from Satellites
- Process Signals/Data Received during each Satellite Pass
- Locate Transmitting Distress Beacons
- Generate Cospas-Sarsat Alert Data:
- 121.5 MHz: location only
- 406 MHz: location + beacon identification + additional beacon information

5.5.3 Mission Control Centre (MCC) functions include:

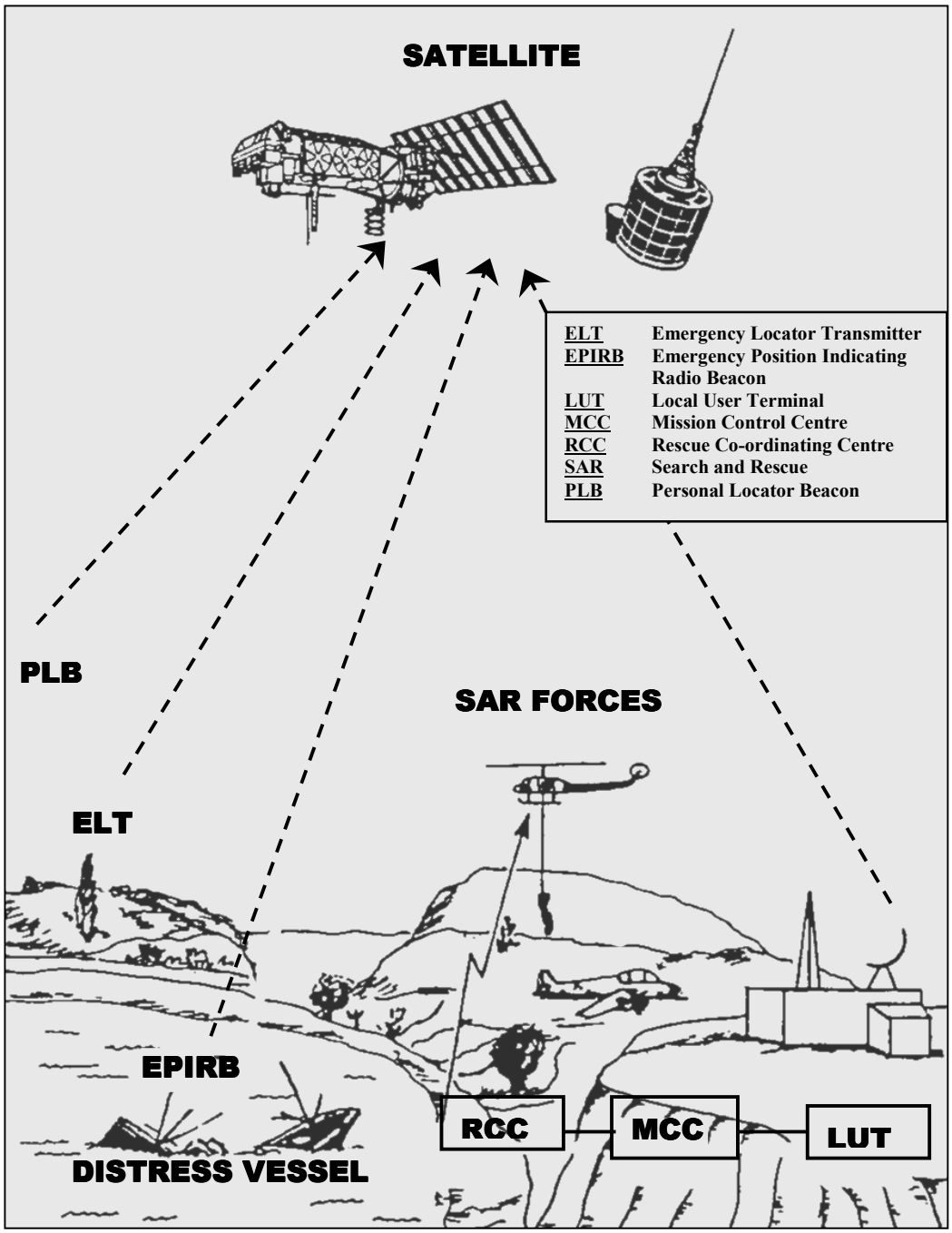
- Receive Alert Data from LUT(s)
- Receive Alert Messages from other MCCs
- Filter out redundant Alert Messages
- Forward Alert Messages to:
- National Rescue Co-ordination Centres (RCCs)
- Other Mission Control Centres (MCCs)
- Receive and Forward COSPAS-SARSAT System Information

- From/to associated LUTs and MCCs

5.5.4 Mission Control Centres (MCCs) Service Area:

- Each MCC is responsible for distributing COSPAS-SARSAT alert data in its service area
- Service area includes:
- MCCs National Search & Rescue Region (Aero/Maritime SRRs)
- Other countries SRRs (By agreement with other countries and co-ordination with other MCC Operators)

Figure 5.5 : The Basic Concept of COSPAS-SARSAT System



(Source : IMO GMDSS Guidance)

CHAPTER SIX : PROPOSALS FOR IMPROVEMENT OF MARITIME SEARCH AND RESCUE IN FIJI

6.1 Deficiencies In SAR Operations

Although the individual responsibilities of the Fiji Search And Rescue Organisation and the Departmental Agencies are outlined in the current Fiji Search and Rescue Manual, there are short-falls that need to be addressed before the overall management and efficiency of SAR in Fiji can be improved. Hence, there is a need for the full co-ordination and co-operation of departments, agencies and individuals involved.

Foremost, there is an immediate need for Search and Rescue Legislation to facilitate the SAR Organisation's duties and responsibilities and to ensure the accessibility, implementation and execution of the search and rescue operations. Consequently, Search and Rescue Legislation will strengthen and enhance the mobility, flexibility and efficiency of the Maritime Surveillance Center's (MSC) to expeditiously exercise its authority on the relevant agencies in co-ordinating their resources for SAR operations.

Secondly, the implementation of a ship reporting system in compliance with IMO resolution A.648(16) to facilitate SAR and enable the search to be taken out of the rescue as soon as possible. Consequently, ships in the vicinity can be easily requested to help. Furthermore all coastal vessels must give an outbound report once they have left a port anywhere in Fiji. This is to enable the SAR authorities to have a clear picture of the location, movement and availability of vessels throughout its Territorial Waters and Exclusive Economic Zone (EEZ).

6.2 Legislation

Fiji's primary maritime legislation is contained in the *Marine Act 1986.* This legislation is comprehensive, and contains eight schedules which incorporate some of the conventions to which Fiji is a State party. There are also comprehensive regulations, but sadly none concerning maritime search and rescue. The Fiji Government must facilitate and support SAR with appropriate legislation with full consideration to the basic provisions of the SAR Conventions and SAR related instruments.

The Fiji Marine Act 1986 was based in part on the provisions of the Australian maritime legislation, which in turn was based in part on the British Merchant Shipping Acts. The Act comprises 13 Parts, dealing with National Colours, the Registration of Vessels, Safety Convention and Tonnage Measurements Convention, and Limitation of Liabilities Convention, which are imbedded into the laws of Fiji. Other sections deal with seamen, their certification and employment, various procedures for discipline, the requirement of crew lists and employment record books.

In May 1992, the Fiji Cabinet approved a procedure where all departments wishing to introduce new bills or any amendment *(s)*, have to forward their proposal before the end of every year to a Cabinet Sub-Committee on Legislations. The Cabinet Sub-Committee will then determine a legislative programme for the whole year in order of priority. The initiating Ministry is then required to prepare a Cabinet Memorandum for its approval in principle to the new bill. The Ministry then prepares the drafting instructions for the Attorney General's office which drafts the legislation. Once the Ministry is satisfied with the draft bill, it is submitted to the Cabinet Legislative Sub-Committee for vetting.

The above system is called the *Dualistic System*, which makes the legislative system in Fiji complex, as some form of legislation is required for the implementation of an international convention following its ratification. The *Dualistic System* is contrary to the *Monistic Method* of implementing international conventions. Where provided by domestic constitution law, an international convention can become part of Fiji's domestic law simply by ratification or accession, i.e. practically no legislative action is required for implementation.

6.3 National Search And Rescue Committee

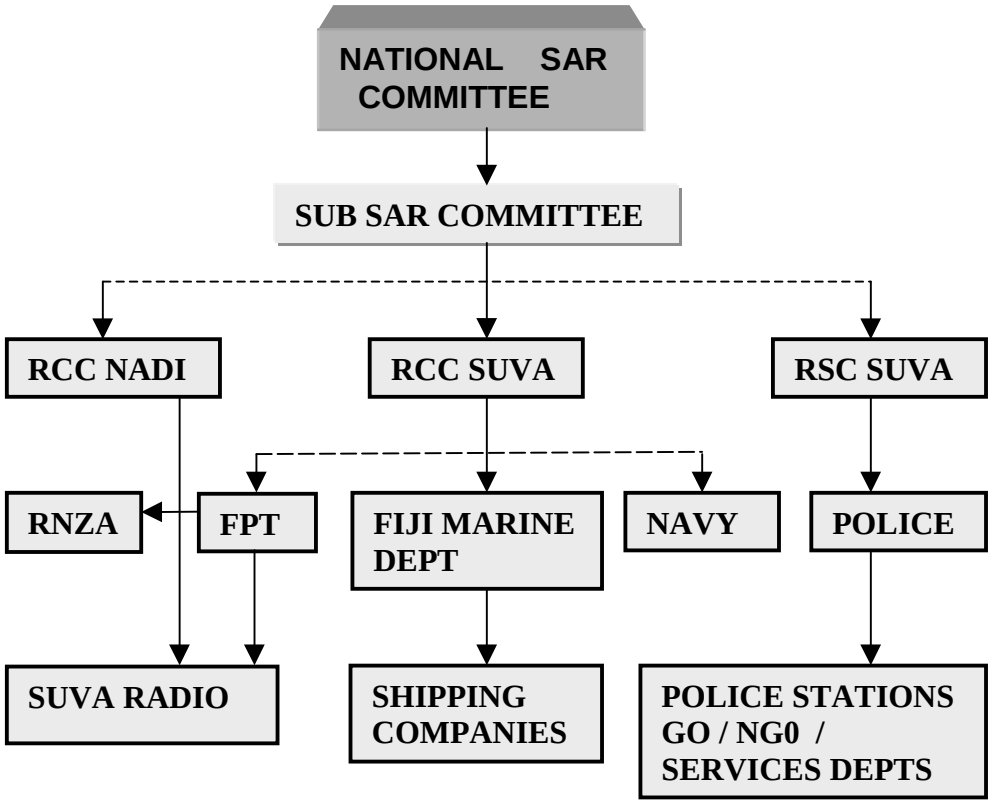
The Fiji Search and Rescue Organisation should be made up of representatives of relevant government departments and private agencies formed under the direction of a National Search and Rescue Committee. (see Figure 6.1)

6.3.1 Objectives of the National Search and Rescue Committee

This committee is at present non-existent. The committee should be brought back into life and enlarged with professional competent people, in order to accomplish IMO's SAR and GMDSS global plan and strategies. Priority should be given to the development and promotion of regional integrated SAR plan and co-ordination and co-operation of SAR operations in the Pacific.

The SAR plan should describe how search and rescue services will be provided, organised, and supported. The Search and Rescue Co-ordinators (SCs) should oversee and implement these documents. SAR plans should be signed by all government agencies that can provide or support search and rescue services. These agencies should all be represented on the Search and Rescue Co-ordinating Committee (SCC), which oversees these plans.

Figure 6.1 : National Search and Rescue Committee



FPT-	**Fiji Post And Telecommunications Dept**
RCC-	**Regional Co-ordinating Center**
RSC-	**Regional Sub Center**
NGO-	**Non Government Organisations**
GO-	**Government Organisations**
RNZAF-	**Royal New Zealand Air Force**

6.3.2 Proposed Fiji Search And Rescue Organisation Structure

Figure 6.2 : Proposed SAR Organisation Structure

The Director of Search and Rescue is the Permanent Secretary for Home Affairs. The Deputy Director is the Deputy Secretary of Home Affairs. The Senior Maritime Controller (SMC) is the SAR Mission Controller designated by the SAR Co-ordinator.

6.3.3 Composition Of The National Search And Rescue Committee

1. The Permanent Secretary for Home Affairs (Chairman)
2. The Commissioner of Police
3. The Director of the Maritime Safety Administration
4. The Managing Director of Telecom Fiji Limited
5. The Chief Executive of the Civil Aviation Authority of Fiji
6. The Commander of the Fiji Navy
7. The Commander of the Fiji Military Forces
8. The Permanent Secretary for Regional Development

6.3.4 The Role Of The National Search And Rescue Committee

The National Search and Rescue Committee is to:

1. Formulate overall policy and the utilization of facilities.
2. Keep the National Search and Rescue Manual under review and to ensure that it relates to current circumstances.
3. Advise the Minister of Home Affairs on the Financial Policy for Search and Rescue Training and Operations.

The National Search and Rescue Committee is assisted by the Search and Rescue Operations Sub Committee with representation from the:

- Ministry of Home Affairs
- Telecom Fiji Limited
- Fiji Police Force
- Marine Department
- Republic of Fiji Navy
- Civil Aviation Authority of Fiji

The Sub Committee is to be responsible for:

1. The co-ordination and direction of search and rescue action.
2. The effective use of all available resources for all types of co-operations recommendations on matters of policy to the National Search and Rescue Committee.
3. Recommendations on matters of policy to the National Search and Rescue Committee.

6.4 National SAR Plan

The Fiji National SAR Plan should be a single document that includes Fiji's Search and Rescue Region (SRR), Regional Co-ordinating Centers (RCCs) and search and rescue related functions for which Fiji is responsible. Principles of operational co-ordination must be covered in this plan, which serves as a basis for more detailed provisions in the search and rescue manual and operational plans. The Fiji SAR plan should be backed up with the following:

- legislation to ensure that SAR is recognised in as an official function which will be supported by the state and facilitate the SAR managers efforts to obtain support.
- description of Fiji's SRR
- description of the available facilities, personnel, and equipment
- documented duties and responsibilities of all agencies which will provide or support the search and rescue services and the use of all available resources
- written agreements with neighbouring RCCs and regional co-operation and co-ordination of resources
- implementation of GMDSS
- appropriate direct communication links

- education, training and certification of RCC, MSC, Teleom Suva Radio staff and SAR personnel.
- documented updated SAR Plan and SAR Manual

The National SAR committee should:

1. Enhance safety through the provisions of a maritime distress and safety communications network appropriate to the needs of the Global Maritime Distress and Safety Systems (GMDSS).
2. Develop and provided a correlation between other relevant national and international organisations involved in SAR.
3. Develop and implement a national SAR plan and a national SAR manual in accordance with international conventions.
4. Implement procedures and guidelines for efficient and effective use of all available SAR facilities.
5. Promote close co-operation and co-ordination between civilian and military aeronautical and maritime organisations, for the provision of effective SAR operations.
6. Develop and provided competency-based training and certification for Fiji SAR Personnel.
7. Promote and organise regional training and exercise.
8. Develop a maritime small boat safety programme and promote public awareness.
9. Develop, implement, and monitor a vessel reporting system for local and international Vessels entering Fiji's EEZ

Guidance on implementing the plans can be found in the following SAR manuals which have been replaced by the International Aeronautical Maritime Search and Rescue Manual (IAMSAR Manual).

Figure 6.3 : Search and Rescue Manuals

6.4.1 Development and Operation of Suva RCC

The Suva Rescue Co-ordinating Center is responsible for directing search and rescue operations and therefore, requires the following:

1. A detailed plan formulating the basis of search and rescue operations;
2. Communications center for centralising information and having rapid means of communications (GMDSS) internally and externally with neighbouring SAR organisations and briefing facilities;
3. Trained staff capable of directing and co-ordinating SAR operations;
4. Equipment for the efficient conduct of SAR operations.

6.4.2 Operational Procedures to be included in the RCC detailed operations plan:

1. The procedure and guidelines for operations in the Maritime Search and Rescue Region (MRCC);
2. The procedures and guidelines for the conduct of joint operations with neighbouring RCCs;
3. The procedures for the joint use of SAR facilities;
4. The procedures and guidelines for co-ordination of SAR operations and functions to be performed including emergency procedures;
5. Procedures and methods for alerting vessels at sea and aircraft on-route, including the broadcast of information by the coast radio station Suva;
6. Details of agreements with the Royal New Zealand and Royal Australian Air Force;
7. Arrangements for servicing and refuelling aircraft, vessels, and vehicles used in SAR operations, including redeployment;

8. Responsibilities and duties of personnel assigned to SAR operations;
9. Details and organisation of communications likely to be used in SAR operations, including location, vessel identities (call signs) and frequencies;
10. Methods of obtaining essential information of vessels in the vicinity (AMVER, AUSREP), weather reports and forecasts;
11. Establishment of training programmes internally and with neighbouring organisations;

6.4.3 Emergency Phases

There are three emergency phases into which most SAR incidents and subsequent SAR operations are classified. These emergency phases are, in order of precedence: Uncertainty, Alert, Distress. Suva RCC should evaluate the distress information as soon as it is received and determine the phase of emergency and type of action required.

AS Describe in the 1979 SAR Convention for operational purposes the phases of emergency should be as follows:

“UNCERTAINTY PHASE”:

The uncertainty phase is assigned anytime doubt exists as to the safety of the craft(s) or person(s) because of the lack of information concerning the progress and position or the vessel is reported overdue.

“ALERT PHASE”:

The alert phase is assigned anytime apprehension exists for the safety of craft(s) or person(s) because of continued scarcity of information, concerning progress and position and/or information has been received

indicating that the operational efficiency of a ship is impaired but not to the extent that may lead to a distress situation.

"DISTRESS PHASE":

The distress phase is assigned whenever immediate assistance is required by craft(s) or person(s) threatened by grave or imminent danger or when following the alert phase unsuccessful injuries and attempts to contact the vessel points to the probability that the vessel is in distress, or information received indicates that the operational efficiency is impaired and that a distress situation is likely.

(Source : IMO SAR Convention ,1979)

6.4.4 Recommended action by RCC Suva during the phases of emergency

- Soon after an uncertainty phase has been declared RCC Suva should commence inquiries regarding the safety of the vessel or declare an alert phase.
- After declaring an alert phase Suva RCC should broaden the scope of its inquiries regarding the safety of the vessel and/or declare a distress phase.
- After declaring a distress phase, the rescue co-ordination center, shall proceed as prescribed in its operation plans.

The following actions should be taken once a distress phase is declared:

- Where appropriate, the degree of uncertainty is estimated of the vessels position and the extent of the area to be searched is determined.
- The owner or agent is notified and kept informed.
- RCC Nadi (air search) and other rescue co-ordination centers are informed.

- Request for assistance from aircraft and/or other ships.
- A general plan for the conduct of the search and rescue operations is made for the available information.

It has been discovered that in most cases where Search and Rescue Operations were activated, there was delay in the actual activation time. All efforts should be co-ordinated in order to expeditiously activate and execute search and rescue operations. The following recommendations and guidelines will improve SAR Operations:

6.4.5 Naval Operational Command

The Naval Operations is to:

- Provide a Duty and Stand-by Ships roster. The period of duty should not to exceed one week and ships are not **to** be rostered for duty one week prior to patrol.
- Prepare the ship rostered for duty for immediate departure for SAR operations.
- Prepare the Stand-by Ship for 12 hours' notice to proceed to sea.
- Maintain updated emergency contact address of all seamen and pick-up plan for all ship personnel rostered on the stand-by ship.

6.4.6 Naval Support Command

The Naval Support Command is to:

- Ensure the Duty and Stand-by Ships are refuelled and free of defects.
- Ensure that seven-day extra rations is available on Duty and Stand-by Ships.
- Ensure that at least two vehicles be available at all times for pick-up of crewmembers.
- Arrange for logistic support if needed.

6.4.7 Maritime Surveillance Center (MSC) Procedures

Upon receipt of a distress, the following actions are to be carried out immediately:

- Record chronology of search and rescue incident
- Prepare Situation Report (SITREP) for the Director of Maritime Surveillance Center (DMSC) and the Search and Rescue Mission Controller (SMC)
- Inform the Commander of the Fiji Navy
- Inform Regional Co-ordinating Center (RCC), Nadi
- Inform Minister of Home Affairs
- Brief Duty Officers on Duty Ship and Stand-by Ship
- Conduct Preliminary Investigations
- Confirm Distress from source
- Inform Police Command Center
- Direct 3DP Suva Radio to issue warnings to vessels in the SAR vicinity
- Contact the Fiji Marine Department and other local shipping companies for disposition of their vessels to the SAR area, if needed.

Upon departure of Duty Ship for SAR area

- Continue to monitor and co-ordinate search and rescue
- Arrange for search aircraft, if required
- Prepare appropriate charts of the area
- Continue monitoring progress and review Search Datum and Search Patterns

6.4.8 Activation of Search and Rescue Operations

When resources (i.e. ships and aircraft) are needed:

The Duty Officer on receipt of assignment is to:

- Brief Duty and Stand-by ships officers
- Muster and brief base duty watch of distress
- Ensure that the duty drivers proceed to pick-up Stand-by Ships crew
- Prepare base duty watch personnel to substitute for Duty Ships crew, if necessary.
- Duty Officer on Duty Ship, upon receipt of tasking, the Duty Officer is to:
- Brief ship's company and order duty engineer to start up ship's generator and disconnect shore power
- Prepare ship for immediate departure

Duty Officer on Stand-by Ship

Upon receipt of assignment, the Duty Officer is to:

- Muster and brief ship's company of distress
- Prepare ship for departure if needed

Duty Ship

- When rostered for Duty Ship, the Commanding Officer is to check ships check-off list, (equipment, fuel, rations and manpower)
- No leave is to be granted to the ship’s crew when on duty
- Ensure state of readiness to proceed to sea

Stand-by Ship

When rostered as Stand-by Ship, the following procedure is to be followed:

- Prepare check-off list (equipment, fuel, rations and manpower)
- Have readily available quick contact address and pick-up of ship's crew
- Ship is on 12 hours' notice to proceed to sea

6.5 Multi-tasked SAR Vessels

The strategic location of Multi-tasked SAR vessels around the coast can also be used to monitor pollution and prevent illegal fishing in its area of operation. They have to remain within a specific SAR area while they are Multi-tasked to the SAR program and maintain all SAR operational standards. Multi-tasked vessels increase efficiency, reduce cost to the government and stand in for primary SAR vessels when necessary.

6.6 Pacific Ocean SAR Plan

In conclusion, there is a need for the National SAR Service to complement and enhance the role of the current National SAR Organisation and consequently, the development of the Maritime Surveillance Center to cater for GMDSS equipped foreign trading vessels. Furthermore, at the International Maritime Organisation (IMO) Pacific Ocean Conference on Maritime Search and Rescue and the Global Maritime Distress and Safety System (GMDSS). Which was held in Seoul, Republic of Korea, from 7 to 11 April 1997, efforts were made to facilitate the IMO plan for an integrated SAR plan for the entire Pacific Ocean.

The objectives of the conference were to:

- Develop one provisional integrated SAR plan for the entire Pacific Ocean, thus, maximising co-ordination and cost efficiency for SAR operations;
- Provide coverage for areas in the Pacific Ocean identified as lacking the necessary arrangements for SAR purposes;
- Ensure the adequacy of GMDSS shore based facilities on both sides of the Pacific Ocean and on its island States;
- Develop training needs for SAR and the GMDSS and any other relevant issues;

6.7 Training, Qualification, Certification, and Exercises

Training

An essential element of an efficient and effective SAR organisation is the training of its personnel to meet SAR system objectives by training and developing SAR specialists. The head of the SAR service will be responsible for ensuring that SAR personnel reach and maintain a high level of competency by establishing adequate training programmes, to save those in distress when it can and reduce risks to its own personnel and equipment. The head of each section will be responsible for the training of personnel in the specialized techniques and procedures assigned to them.

Qualification

The purpose of qualification is to validate an individual's ability to perform certain duties. Thus, the qualification procedures demonstrate the capability to perform specific tasks. Therefore, the qualification program should cover fundamental knowledge necessary for the duties of that position and testing of individuals on the systems they will be required to operate or maintain.

Certification

The purpose of certification is to authorize an individual to serve in a stated capacity. As training provides basic knowledge and skills, qualification and certification processes are used to ensure that sufficient experience, maturity and judgment are gained.

Exercises

Exercises are, conducted on a realistic basis help to achieve the following:

- Test and improve operational plans
- Provide learning experience
- Improve liaison and co-ordinating skills
- Demonstrate and assess the true effectiveness of training, operational efficiency and competence
- Reveal deficiencies that may exist in the organisation and enable them to be improved

Successful exercises require planning, execution and evaluation. Exercises are carried out for training, to evaluate established plans and procedures, and to test new concepts.

Success of an exercise can be measured by:

- How many problems are discovered
- How much is learned
- How much the operating plans have improved
- How few mistakes are repeated during the next exercise

According to the IMOSAR Manual training programmes should comprise:

- Formal training – study of and training in the application of SAR procedures, techniques and equipment through lectures, practical demonstrations, films, SAR manuals and journals;

- Applied training – assistance in, and observation of, actual operations;

- Synthetic training – participation in exercises arranged to illustrate SAR operations in which apply personnel exercise the lessons on techniques and procedures that they have been taught;

- Formal and applied training provide personnel with fundamental knowledge of SAR; synthetic training enables them to become skilled in the use of their acquired knowledge.

6.8 Safety Management and Safety Audit

The aim of safety management is to control the level of risk within the organisation and therefore should be an integral part of the overall operations. Safety overlaps with quality management systems, environmental issues and problem solving and effects the overall efficiency of the SAR organisation. Safety management involves the structured assessment of risks and the setting up of a system of control that identifies the causes of unwanted events and their consequences. Safety management should be based on the following principles:

- Know what the minimum requirements are
- Know what needs to be done
- Know how to achieve it

- Achieve it and continue to achieve it.

6.8.1 Monitoring

Monitoring is an important aspect of managing safety and should be aimed at all levels of the Fiji search and rescue organisation, from the boardroom to basic operations. Without effective monitoring, it is difficult to compare 'how it should be done' to how it is actually done'. In Fiji there is legislation known as the "Occupation Health and Safety Act" which is aimed at ensuring the health, safety and welfare of people at work. Therefore, to constructively audit safety, the employees, and people involved in decision making need to understand and know:

- What the current situation is, i.e. where there are
- What they want to achieve within a specified time, i.e. where they want to go
- How they intend to achieve their documented objectives, i.e. how they intend to get there.

6.8.2 Auditing

Auditing should be carried out by the SAR Co-ordinator (SC) with the full support of top management and involve employees at all levels, and anyone involved in assisting the SAR operations. This is to identify the root of the problem and thus, take corrective action to prevent reoccurrence. The auditing process should be:

- Documented
- Systematic
- Constructive
- Objective
- Unbiased
- Planned

- Regular
- Process and not people orientated

As the purpose of the audit is to expose any deficiency in the safety policy and operations of the Fiji SAR organisation, and the results of the audit are to reported in a clear and concise form to the Fiji SAR management, who are to review the safety and operational efficiency of the organisation and inform people at all levels.

6.8.3 Audit Plan

The audit plan should include all the processes to be reviewed and should commence with a checklist relating to activities and documented procedures relating to those activities. The checklist should be used as a guide to the questions that need to be asked during the audit. The audit should direct itself exclusively to the process and procedures being examined.

Useful information can be collected through observation and discussion, which can make the effectiveness of the safety policy clear. Procedures can be monitored and improved upon, during and after the exercise. Debriefing after an exercise is an opportune time to review and evaluate plans, policies, procedures, and standards and training requirements for search and rescue efficiency, co-operation and co-ordination.

6.9 Maximizing System Effectiveness

The Fiji Search and Rescue Managers should ensure compliance with the provisions of the IMO and ICAO SAR conventions, and develop SAR policies and procedures. They also have the overall responsibility for establishing, organising, staffing, equipping, and controlling the SAR system, they should also provide for legal and

funding support for the Fiji SAR service to acquire maximum effectiveness and efficiency, SAR managers must ensure the following activities take place:

1) The organisation must always be ready to receive and respond to distress alerts. All SAR equipment and communication links are to be inspected and tested frequently to ensure proper working order when an emergency arises.
2) To allow early detection and correction of procedural and equipment problems, periodic training and exercise must be conducted with the various SAR system components. This is to maintain proficiency and safety.
3) Preventive SAR activities such as public awareness campaigns and open shows are some of the ways to help prevent SAR incidents. Volunteer organisations can assist in these activities.
4) SAR managers must foster, promote and focus on the continuous improvement of the SAR system.
5) Use legislation to designate specific agencies with organising and co-ordinating SAR services.
5) Ensure that those assigned to SAR operations have maturity and competency appropriate to their particular duties.
6) Implement and use international recognised procedures, facilities and equipment.
7) Avoid policies that hinder SAR operations to be carried out expeditiously.
8) Ensure that MSC and RCC personnel are properly prepared to receive, collect, assess, use, preserve, and provide information related to a distress situation or to SAR co-ordination activities.
9) Ensure that persons involved in SAR operations are trained to continuously work as a team and avoid risks that may cause injury or death to those in distress.
10) Ensure that directives, policies, regulations, plans and manuals are documented for SAR guidance and requirements.
11) Adopt measures that promote the safe design, construction, maintenance, and operation of vessels and aircraft.

CHAPTER SEVEN : CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

1. SAR Program

Safety at sea is a personal responsibility. Thus, if all other methods of preventing an accident are unsuccessful, then the search and rescue system should be available as a last resort. Consequently, there is a great need for regulations and standards to cover the construction, equipping, crewing and operations of small craft in Fiji, so as to reduce the number of incidents and loss of life in Fiji waters.

The Suva RCC/MRSC is responsible for the planning, co-ordination, conduct, and control of SAR operations. To do this successfully they require highly trained staff, detailed operational plans and an effective communications system. The SAR co-ordinators should be trained to evaluate various situations and dispatch the most effective resources to deal with a particular incident.

The Fiji Maritime SAR organisations main goal is to reduce the loss of life in the marine environment. In large searches involving many resources, an On-Scene Co-ordinator (OSC) for the incident may be chosen by the SAR Co-ordinator. The OSC is the local contact for the SAR Co-ordinator. The OSC gives direction to the resources involved on where and how to search and regular progress reports.

Management and Monitoring

The goal of management and monitoring is to ensure that the SAR program operates at maximum efficiency. This is accomplished by ensuring that SAR coverage requirements are adjusted to meet changing needs and that specialised primary SAR units are deployed as required. SAR managers are therefore required to co-operate with other department and program managers in the deployment of Multi-tasked and secondary resources to further enhance response capabilities. These combined efforts ensure that the emergency services will be readily available when and where they are most likely to be needed.

Prevention

The purpose of the SAR Prevention Program is to minimise loss of life and decrease the rate of incidents, thereby reducing SAR resource expenditure and risk to the public. Prevention activities should focus on those most commonly involved in SAR incidents.

2. Policy Objectives

The Fiji Maritime SAR organisation by applying the latest in management techniques, organisation systems and technology with clear policy objectives that dictate the general management and operations of the SAR organisation will improve its overall efficiency. In addition, the enforcement and monitoring of vessel seaworthiness and safety equipment by the Maritime Safety Administration and continuous improvement culture by the different organisations will improve the safety of life at sea. Particularly if the different government and non-government organisations work closely together in sincere co-operation and consultation. Consequently, this will cause a decline in

maritime SAR incidents and enable the SAR organisation to providing efficient and cost effective maritime search and rescue services.

Ship Reporting System

Incidents have frequently occurred in Fiji waters when the Rescue Co-ordinating Centre (RCC) has had very little information about the vessel in distress or presumed to be in distress. Particularly due to very bad weather conditions (cyclones) and the position of the vessel in distress was so remote from the SAR bases. These factors make an adequate response by the SAR unit impossible or are seriously delayed. Consequently, vessels in the vicinity whose estimated positions are known will be able to provide assistance to the vessel in distress. In order to over-come these hurdles, save lives and cut costs. Having direct contacts with AMVER and AUSREP will help to facilitate the national reporting system. The implementation of a ship reporting system will also help combat marine pollution and prevent the transfer of unwanted harmful aquatic organisms and pathogens.

7.2 Recommendations

As a result of this study, it is recommended that the following actions be taken.

- Legislation be enacted to give Suva RCC formal authorisation to command and control the necessary resources of other government and non-government agencies in times of emergency.

- Development of a national SAR master plan including the presently available units such as boats, aircrafts and equipment. In addition, the existing resources, which

are divided among the different government agencies, must be documented and made available in cases of emergency.

- Development of regional master plans. These should include list of available vessels and equipment, communication means, contact persons and addresses, and allocation of equipment.

- Documented agreements with neighbouring states concerning co-operation in SAR operations and exercises. The government should enter into agreements with other neighbouring states, whereby operational plans and arrangements for SAR co-operation and co-ordination are pursued.

- The Fiji SAR organisation should establish national procedures for overall development, co-ordination, and improvement of search and rescue services. This is to ensure the co-ordinated use of available facilities and establishing close co-operation between participating authorities, with the prospect of improving the SAR services in areas such as operations, planning, training, exercises and research and development.

- Extend operative relationships between different Administrations, Departments and Institutions, both public and private, that have material and human resources at sea,

As prevention is better than cure, it is very important that the Maritime Safety Authority take immediate steps to resolve this problem. Firstly, the Maritime Safety Authority must ensure that these vessels are properly constructed and equipped with safety equipment. Secondly, use the mass media and booklets to procure public safety awareness programs to educate the public of the perils of the sea. Finally, implement a district and national vessel reporting system to ensure the nearest district authorities

(police stations, village chief and family members) know, who has gone out to sea? where they have gone? and when they are due?. Subsequently, this information will enable the SAR authorities to take the search out of the rescue, thus reducing the number of incidents, loss of life and operating costs. Volunteer assistance is a key element in maximising the efficiency of SAR operations, prevention and safety related activities**.**

Operations

Operations, which include search, rescue and incident co-ordination, form the heart of Suva RCC/MSC. SAR units must be capable of responding to the vast majority of maritime SAR challenges found in the Fiji environment. This high level capability should be delivered by skilled, full-time, professional crews using specialised vessels and equipment. Frequent operational exercises will ensure a high level of readiness and proficiency.

- The Fiji Maritime Safety Authority should take regulatory responsibility for recreational vessels, which should include safety equipment and the development of constructional standards for these vessels.

- The Fiji SAR services should promote and support all forms of volunteer activity and resources relating to maritime search and rescue.

- The authorities should establish a ship reporting system within the Fiji Search and Rescue Region (SRR) and implement GMDSS.

Bibliography

Calcutt, D. and Tetley, L (1994). *Understanding GMDSS: the global maritime distress and safety system*. London: Edward Arnold.

Compuship (1998). 'Acceleration required'. *COMPUSHIP*, June, pp 11-14.

International Maritime Organisation (1997). *Pacific Ocean Conference on Maritime Search and Rescue (SAR) and the Global Maritime Distress and Safety System (GMDSS)* (7-11 April 1997). Seoul, Republic of Korea: IMO.

International Maritime Organisation (1979). International Convention on Maritime Search and Rescue, 1979. London: IMO.

International Maritime Organisation (1993). *Merchant Ship Search and Rescue Manual (MERSAR).* London: IMO.

International Maritime Organisation (1994). *'Search and Rescue at Sea'*. *Focus on IMO, March*, pp 1.

International Maritime Organisation (1997). *The International Convention for the Safety of Life at Sea, (SOLAS 74/78).* Consolidated Edition. London, IMO.

International Maritime Organisation (1998). *'Adoption of the Amendments to the International Convention on Maritime Search and Rescue'*, 1979. May 1998. London: IMO (MSC 70 (69)).

International Maritime Organisation (1998). '*Draft ICAO/IMO Search and Rescue (IAMSAR) manual'*. *IMO News*, No 2, pp 10-12.

International Maritime Organisation (1998). 'Maritime Search and Rescue (SAR) and the GMDSS'. *Focus on* IMO. http://www.imo.org/focus/gmdss (04/09/98).

Ocean Voice (1992). '*GMDSS: An Ocean Voice special report'*. Ocean Voice, January, pp 1-8.

Wortham, C. (1998). 'Maritime Satellite Communication'. *Maritime Communications Seminar*. Handout. World Maritime University, Malmoe, Sweden.

Appendix 1

INTERNATIONAL MARITIME ORGANIZATION

COMSAR 3/9/14
28 November 1997
Original: ENGLISH

IMO

SUB-COMMITTEE ON
RADIOCOMMUNICATIONS AND SEARCH
AND RESCUE
3rd session
Agenda item 9.2

MATTERS CONCERNING SEARCH AND RESCUE, INCLUDING THOSE RELATED TO THE 1975 SAR CONFERENCE AND THE INTRODUCTION OF THE GMDSS

Co-operation between passenger ships and SAR services

Note by Denmark, Finland, France, Germany, Iceland, the Netherlands, Norway, the Russian Federation, Sweden and the United Kingdom

SUMMARY

Executive summary:	Draft guidelines for preparing plans for co-operation between passenger ships and SAR services in accordance with SOLAS regulation V/15 (c)
Action to be taken:	Paragraph 7
Related documents:	COMSAR 2/13, MSC 68/23

1 On 1 July 1997 the new SOLAS regulation V/I 5(c) entered into force which requires that

> "Passenger ships to which chapter I applies, trading on fixed routes, shall have on board a plan for co-operation with appropriate search and rescue services in event of an emergency. The plan shall be developed in co-operation between the ship and the search and rescue services and be approved by the Administration. The plan shall include provisions for periodic exercises to be undertaken as agreed by the passenger ship and the search and rescue services concerned to test its effectiveness."

2 The Sub-Committee, at its second session (COMSAR 2/13, paragraph 12.9) agreed that there is a need to develop guidelines for preparing plans for co-operation between passenger ships and SAR services. At the same time it invited the Maritime Safety Committee to authorise it accordingly; members were requested to consider the mailer and to submit comments and proposals on it.

3 The Maritime Safety Committee, at its sixty-eighth session (MSC 68/23, paragraph 20.38) authorised the Sub-Committee to develop, on a low priority basis, guidelines for co-operation between passenger ships and SAR services.

ANNEX

DRAFT GUIDELINES FOR PREPARING PLANS FOR CO-OPERATION BETWEEN PASSENGER SHIPS AND SAR SERVICES IN ACCORDANCE WITH SOLAS REGULATION V/15 (C)

1 Introduction

1.1 The purpose of these Guidelines is to provide a uniform basis for the establishment and introduction of plans for co-operation between passenger ships and SAR services in accordance with SOLAS regulation V/I *5(c)*.

1.2 These Guidelines are recommended to be applied on all passenger ships to which SOLAS chapter 1 applies and which are trading on fixed routes. Their relevance in the frame of the safety management system (SMS) to be maintained in accordance with the International Safety Management (ISM) Code could also be taken into consideration for passenger ships on fixed routes in the domestic trade.

1.3 The Guidelines serve the overall aim to have the triangular emergency response network of ship, company and SAR service in place and work instantaneously in an emergency.

2 Legal basis

2.1 After the adoption, on 28 November 1995 of a new paragraph (c) SOLAS chapter V Regulation 15 reads:

"Search and Rescue

(a) Each Contracting Government undertakes to ensure that any necessary 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 facilities as are deemed practicable and necessary having regard to the density of seagoing traffic and the navigational dangers and should, so far as possible, afford adequate means of locating and rescuing such persons.

(b) Each Contracting Government undertakes to make available information concerning its existing rescue facilities and the plans for changes therein, if any.

(c) Passenger ships to which chapter 1 applies, trading on fixed routes, shall have on board a plan for co-operation with appropriate' search and rescue services in event of an emergency. The plan shall be developed in co-operation between the ship and the search and rescue services and be approved by the Administration. The plan shall include provisions for periodic exercises to be undertaken as agreed by the passenger ship and the search and rescue services concerned to test its effectiveness."

2.2 Article 12(2) of the Convention of the High Seas, 1958 reads:

"Every coastal State shall promote the establishment 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 neighbouring States for this purpose.
2.3 The International Safety Management (ISM) Code reads:

Preamble; paragraphs 3 and 4:

"The Assembly... recognised the need for appropriate organisation of management to enable it to respond to the need of those on board ships to achieve and maintain high standards of safety and environmental protection.

Recognising that no two shipping companies or shipowners are the same, and that ships operate under a wide range of different conditions, the Code is based on general principles and objectives."

Chapter 1; paragraph 1.4.5:

"Every Company should develop, implement and maintain a safety-management-system (SMS) which includes... procedures to prepare for and respond to emergency situations..."

Chapter 8 (emergency preparedness); paragraphs 8.1 to 8.3;

".1 The Company should establish procedures to identify, describe and respond to potential emergency shipboard situations.

.2 The Company should establish programmes for drills and exercises to prepare for emergency actions.

.3 The SMS should provide for measures ensuring that the Company's organisation can respond at any time to hazards, accidents and emergency situations involving its ships."

Chapter 12; paragraph 12.2:

"The Company should periodically evaluate the efficiency of and, when needed, review the SMS in accordance with the procedures established by the Company."

2.4 The High Speed Craft (HSC) Code reads:

Chapter 1 (General requirements); paragraph 1.2.7:

in the intended area of operation there will be suitable rescue facilities readily available..."
Chapter 18 (Operational requirements); paragraphs 18.1.3.15, 18.1.3.18.3 and 18,1.3.19:

- "The Administration should issue a Permit to Operate High Speed Craft when it is satisfied that the operator has made adequate provisions from the point of view of safety generally, including...

- communication arrangements between craft, coast radio stations, base ports radio stations, emergency services and other ships, including radio frequencies to be used and watch to be kept...

- the existence and use of adequate instructions regarding... action in the event of reasonable foreseeable emergencies; and

- provision of contingency plans by operators for foreseeable incidents including all landbased activities for each scenario The plans shall provide operating crews with information regarding SAR authorities and local administrations and organisations which may complement the tasks undertaken by crews with the equipment available to them."

3 General requirements

The plans aim at providing in advance to all involved in a probable emergency situation identical detailed information on the ship, the company's emergency response team and the SAR services along the route. This will enhance mutual understanding, reduce the risk of confusion and save valuable time in any emergency situation.

4 Operational requirements

To safeguard an optimum of passenger safety in the way of emergency preparedness and to keep the logistic burden on ships' commands, ship operators and SAR services as low as possible the following guidelines may assist in arriving at a plan as set out in the appendix.

4.1 The plan should be as concise, brief and user-friendly as possible, otherwise its application in emergency situations will result in undue loss of time and might give reason for confusion among those involved in solving an emergency situation.

4.2 Therefore the plan should be of harmonised format and layout. It should be of modular build-up. Any module, once established will fit into any plan; readers will immediately know where to trace the information required and what information the counterpart already knows of which will obviously result in an enhanced efficiency of any missions carried out around an emergency situation.

5 Administrative requirements

5.1 Plans, as far as they have been approved by a competent Administration, should be reciprocally recognised. Thus the approving 'Administration' for a passenger ship's plan should be the flag state only. SAR service modules should be approved by the Administration of the relevant port state. In the case of flag states outside the search and rescue regions transited by the route the SAR services concerned would jointly approach their Administrations for approval of relevant plans.

5.2 The originator of a module (the company or the SAR service as appropriate) should be responsible for its updating. whereas major procedural changes should always require re-approval of a plan by the relevant Administration, minor changes should be viewed as acceptable routine updates not requiring formal re-approval.

5.3 The plan should be made up in

- the on-board working language(s) of the vessel, and
- the English language, or a language commonly agreed by the vessel (or the company), the SAR services and the Administration.

6 Periodical exercises

SOLAS regulation V/I 5(c) also requires periodic exercises to test the effectiveness of the plan.

6.1 Various farms of 'live', 'paper' and 'tabletop' exercises should be acceptable. Exercises should be co-ordinated between all parties involved in a route to ensure efficient use of all available resources; this includes the of role of an assisting passenger ship, whose participation in any exercise should be deemed to be an exercise as required by SO LAS regulation V/I 5(c).

6.2 The frequency and type of exercises to be held by individual ships and SAR services should be decided locally on the basis of co-operational agreements between the SAR services and passenger ships involved and as approved by the relevant Administration(s).

6.3 Search and rescue seminars and refresher seminars for key personnel on board and in companies ashore are highly recommended to further the awareness around shipboard emergencies and to create the desirable minimum educational level in search and rescue matters. Liaison visits of SAR personnel on passenger ships and vice versa are a valuable tool and should be promoted.

Appendix 2

MSC 69/WP,7

ANNEX

AMENDMENTS TO THE INTERNATIONAL CONVENTION ON MARITIME SEARCH AND RESCUE, 1979

The existing text of the Annex to the Convention, except paragraphs 2.1.4,2.1.5,2.1.7, 1.10, 3.1.2 and 3.1.3* is replaced by the following:

CHAPTER 1

TERMS AND DEFINITIONS

1.1 "Shall" is used in the Annex to indicate a provision, the uniform application of which by all Parties is required in the interest of safety of life at sea.

1.2 "Should" is used in the Annex to indicate a provision, the uniform application of which by all Parties is recommended in the interest of safety of life at sea.

1.3 The terms listed below are used in the Annex with the following meanings:

.1 "Search". An operation, normally co-ordinated by a rescue co-ordination centre or rescue sub-centre, using available personnel and facilities to locate persons in distress;

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

.3 "Search and rescue service". The performance of distress monitoring, communication, co-ordination and search and rescue 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;

.4 "Search and rescue region". M area of defined dimensions associated with a rescue co-ordination centre within which search and rescue services are provided;

.5 "Rescue co-ordination centre". A unit responsible for promoting efficient organization of search and rescue services and for co-ordinating the conduct of search and rescue operations within a search and rescue region;

.6 "Rescue sub-centre". A unit subordinate to a rescue co-ordination centre established to complement the latter according to particular provisions of the responsible authorities;

---

* The existing text of these paragraphs is included in this document for reference purpose only and will not appear in the authentic text.

.7 "Search and Rescue facility". Any mobile resource, including designated search and rescue units, used to conduct search and rescue operations;

.8 "Search and rescue unit". A unit composed of trained personnel and provided with equipment suitable for the expeditious conduct of search and rescue operations;

.9 "Alerting post". Any facility intended to serve as an intermediary between a person reporting an emergency and a rescue co-ordination centre or rescue sub-centre;

.10 "Emergency phase". A generic term meaning, as the case may be, uncertainty phase, alert phase or distress phase;

.11 "Uncertainty phase". A situation wherein uncertainty exists as to the safety of a person, a vessel or other craft;

.12 "Alert phase". A situation wherein apprehension exists as to the safety of a person, a vessel or other craft;

.13 "Distress phase". A situation wherein there is a reasonable certainty that a person, a vessel or other craft is threatened by grave and imminent danger and requires immediate assistance;

.14 "On-scene co-ordinator". A person designated to co-ordinate search and rescue operations within a specified area;

.15 "Secretary-General". The Secretary-General of the International Maritime Organization".

CHAPTER 2

ORGANIZATION AND CO-ORDINATION

2.1 Arrangements for provision and co-ordination of search and rescue services

2.1.1 Parties shall, as they are able to do so individually or in co-operation with other States and, as appropriate, with the Organization, participate in the development of search and rescue services to ensure that assistance is rendered to any person in distress at sea. On receiving information that any person is, or appears to be, in distress at sea, the responsible authorities of a Party shall take urgent steps to ensure that the necessary assistance is provided.

2.1.2 Parties shall, either individually or, if appropriate, in co-operation with other States, establish the following basic elements of a search and rescue service:

.1 legal framework;

.2 assignment of a responsible authority;

.3 organisation of available resources;

.4 communication facilities;

.5 co-ordination and operational functions; and

.6 processes to improve the service including planning, domestic and international co-operative relationships and training.

Parties shall, as far as practicable, follow relevant minimum standards and guidelines developed by the Organization.

2.1.3 To help ensure the provision of adequate shore-based communication infrastructure, efficient distress alert routeing, and proper operational co-ordination to effectively support search and rescue services, Parties shall, individually or in co-operation with other States, ensure that sufficient search and rescue regions are established within each sea area in accordance with paragraphs 2.1.4 and 2.1.5. Such regions should be contiguous and, as far as practicable, not overlap.

2.1.4 Each search and rescue region shall be established by agreement among Parties concerned. The Secretary-General shall be notified of such agreements.

2.1.5 In case agreement on the exact dimensions of a search and rescue region is not reached by the Parties concerned, those Parties shall use their best endeavours to reach agreement upon appropriate arrangements under which the equivalent overall co-ordination of search and rescue services is provided in the area. The Secretary-General shall be notified of such arrangements.

2.1.6 Agreement on the regions or arrangements referred to in paragraphs 2.1.4 and 2.1.5 shall be recorded by the Parties concerned, or in written plans accepted by the Parties.

2.1.7 The delimitation of search and rescue regions is not related to and shall not prejudice the delimitation of any boundary between States.

2.1.8 Parties should seek to promote consistency, where applicable, between their maritime and aeronautical search and rescue services while considering the establishment of maritime search and rescue regions which shall be established by agreement in accordance with paragraph 2.1.4 or the reaching of agreement upon appropriate arrangements in accordance with paragraph 2.1.5.

2.1.9 Parties having accepted responsibility to provide search and rescue services for a specified area shall use search and rescue units and other available facilities for providing assistance to a person who is, or appears to be, in distress at sea.

2.1.10 Parties shall ensure that assistance be provided to any person in distress at sea. They shall do so regardless of the nationality or status of such a person or the circumstances in which that person is found.

2.1.11 Parties shall forward to the Secretary-General information on their search and rescue service, including the:

1 national authority responsible for the maritime search and rescue services;

.2 location of the established rescue co-ordination centres or other centres providing search and rescue co-ordination, for the search and rescue region or regions and communications therein;

.3 limits of their search and rescue region or regions and the coverage provided by their shore based distress and safety communication facilities; and

.4 principal types of available search and rescue units.

Parties shall with priority, update the information provided with respect to any alterations of importance. The Secretary-General shall transmit to all Parties the information received.

2.1.12 The Secretary-General shall notify all Parties of the agreements or arrangements referred to in paragraphs 2.1.4 and *2.1.5*.

2.2 **Development of national search and rescue services**

2.2.1 Parties shall establish appropriate national procedures for overall development, co-ordination, and improvement of search and rescue services.

2.2.2 To support efficient search and rescue operations, Parties shall:

.1 ensure the co-ordinated use of available facilities; and

.2 establish close co-operation between services and organizations which may contribute to improve the search and rescue service in areas such as operations, planning, training, exercises and research and development.

2.3 **Establishment of rescue co-ordination centres and rescue sub-centres**

2.3.1 To meet the requirements of paragraph 2.2, Parties shall individually or in co-operation with other States establish rescue co-ordination centres for their search and rescue services and such rescue sub-centres as they consider appropriate.

2.3.2 Each rescue co-ordination centre and rescue sub-centre, established in accordance with paragraph 2.3.1, shall arrange for the receipt of distress alerts originating from within its search and rescue region. Every such centre shall also arrange for communications with persons in distress, with search and rescue facilities, and with other rescue co-ordination centres or rescue sub-centres.

2.3.3 Each rescue co-ordination centre shall be operational on a 24-hour basis and be constantly staffed by trained personnel having a working knowledge of the English language**.

** Refer to the Search and Rescue section of the IMO Standard Marine Communication Phrases (MSC/Circ.794).

2.4 **Co-ordination with aeronautical services**

2.4.1 Parties shall ensure the closest practicable co-ordination between maritime and aeronautical services so as to provide for the most effective and efficient search and rescue services in and over their search and rescue regions.

2.4.2 Whenever practicable, each Party should establish joint rescue co-ordination centres and rescue sub-centres to serve both maritime and aeronautical purposes.

2.4.3 Whenever separate maritime and aeronautical rescue co-ordination centres or rescue sub-centres are established to serve the same area, the Party concerned shall ensure the closest practicable co-ordination between the centres or sub-centres.

2.4.4 Parties shall ensure as far as is possible the use of common procedures by search and rescue units established for maritime purposes and those established for aeronautical purposes.

2.5 **Designation of search and rescue facilities**

Parties shall identify all facilities able to participate in search and rescue operations, and may designate suitable facilities as search and rescue units.

2.6 **Equipment of search and rescue units**

2.6.1 Each search and rescue unit shall be provided with equipment appropriate to its task.

2.6.2 Containers and packages containing survival equipment for dropping to survivors should have the general nature of their contents indicated by markings in accordance with standards adopted by the Organization.

CHAPTER 3

CO-OPERATION BETWEEN STATES

3.1 **Co-operation between States**

3.1.1 Parties shall co-ordinate their search and rescue organizations and should, whenever necessary, co-ordinate search and rescue operations with those of neighbouring States.

3.1.2 Unless otherwise agreed between the States concerned, a Party should authorize, subject to applicable national laws, rules and regulations, immediate entry into or over its territorial sea or territory of rescue units of other Parties solely for the purpose of searching for the position of maritime casualties and rescuing the survivors of such casualties. In such cases, search and rescue operations shall, as far as practicable, be co-ordinated by the appropriate rescue co-ordination centre of the Party which has authorized entry, or such other authority as has been designated by that Party.

by way of mutual regional arrangements co-operate with neighbouring States for this purpose.
2.3 The International Safety Management (ISM) Code reads:

Preamble; paragraphs 3 and 4:

"The Assembly... recognised the need for appropriate organisation of management to enable it to respond to the need of those on board ships to achieve and maintain high standards of safety and environmental protection.

Recognising that no two shipping companies or shipowners are the same, and that ships operate under a wide range of different conditions, the Code is based on general principles and objectives."

Chapter 1; paragraph 1.4.5:

"Every Company should develop, implement and maintain a safety-management-system (SMS) which includes... procedures to prepare for and respond to emergency situations..."

Chapter 8 (emergency preparedness); paragraphs 8.1 to 8.3;

".1 The Company should establish procedures to identify, describe and respond to potential emergency shipboard situations.

.2 The Company should establish programmes for drills and exercises to prepare for emergency actions.

.3 The SMS should provide for measures ensuring that the Company's organisation can respond at any time to hazards, accidents and emergency situations involving its ships."

Chapter 12; paragraph 12.2:

"The Company should periodically evaluate the efficiency of and, when needed, review the SMS in accordance with the procedures established by the Company."

2.4 The High Speed Craft (HSC) Code reads:

Chapter 1 (General requirements); paragraph 1.2.7:

in the intended area of operation there will be suitable rescue facilities readily available..."
Chapter 18 (Operational requirements); paragraphs 18.1.3.15, 18.1.3.18.3 and 18,1.3.19:

- "The Administration should issue a Permit to Operate High Speed Craft when it is satisfied that the operator has made adequate provisions from the point of view of safety generally, including...

- communication arrangements between craft, coast radio stations, base ports radio stations, emergency services and other ships, including radio frequencies to be used and watch to be kept...

- the existence and use of adequate instructions regarding... action in the event of reasonable foreseeable emergencies; and

3.1.3 Unless otherwise agreed between the States concerned, the authorities of a Party which wishes its rescue units to enter into or over the territorial sea or territory of another Party solely for the purpose of searching for the position of maritime casualties and rescuing the survivors of such casualties, shall transmit a request, giving full details of the projected mission and the need for it, to the rescue co-ordination centre of that other Party, or to such other authority as has been designated by that Party.

3.1.4 The responsible authorities of Parties shall:

.1 immediately acknowledge the receipt of such a request; and

.2 as soon as possible indicate the conditions, if any, under which the projected mission may be undertaken.

3.1.5 Parties should enter into agreements with neighbouring States setting forth the conditions for entry of each other's search and rescue units into or over their respective territorial sea or territory. These agreements should also provide for expediting entry of such units with the least possible formalities.

3.1.6 Each Party should authorize its rescue co-ordination centres:

.1 to request from other rescue co-ordination centres such assistance, including vessels, aircraft, personnel or equipment, as may be needed;

.2 to grant any necessary permission for the entry of such vessels, aircraft, personnel or equipment into or over its territorial sea or territory; and

.3 to make the necessary arrangements with the appropriate customs, immigration, health or other authorities with a view to expediting such entry.

3.1.7 Each Party shall ensure that its rescue co-ordination centres provide, when requested, assistance to other rescue co-ordination centres, including assistance in the form of vessels, aircraft, personnel or equipment.

3.1.8 Parties should enter into agreements with other States, where appropriate, to strengthen search and rescue co-operation and co-ordination. Parties shall authorize their responsible authority to make operational plans and arrangements for search and rescue co-operation and co-ordination with responsible authorities of other States.

CHAPTER 4

OPERATING PROCEDURES

4.1 Preparatory measures

4.1.1 Each rescue co-ordination centre and rescue sub-centre shall have available up-to-date information especially concerning search and rescue facilities and available communications relevant to search and rescue operations in its area.

4.1.2 Each rescue co-ordination centre and rescue sub-centre should have ready access to information regarding the position, course, and speed of vessels within its area which may be able to provide assistance to persons, vessels or other craft in distress at sea, and regarding how to contact them. This information should either be kept in the rescue co-ordination centre, or readily obtain when necessary.

4.1.3 Each rescue co-ordination centre and rescue sub-centre shall have detailed plans of operational for the conduct of search and rescue operations. Where appropriate, these plans shall be developed jointly with the representatives of those who may assist in providing, or who may benefit from, the search and rescue services.

4.1.4 Rescue co-ordination centre or sub-centre shall be kept informed of the state of preparedness of search and rescue units.

4.2 **Information concerning emergencies**

4.2.1 Parties, either individually or in co-operation with other States shall ensure that they are capable on a 24-hour basis of promptly and reliably receiving distress alerts from equipment used for this purpose within their search and rescue regions. Any alerting post receiving a distress alert shall:

.1 immediately relay the alert to the appropriate rescue co-ordination centre or sub-centre, and then assist with search and rescue communications as appropriate: and

.2 if practicable acknowledge the alert.

4.2.2 Parties shall, where appropriate, ensure that effective arrangements are in place for the registration of communication equipment and for responding to emergencies, to enable any rescue co-ordination centre or sub-centre to access pertinent registration information quickly.

4.2.3 Any authority or element of the search and rescue service having reason to believe that a person, a vessel or other craft is in a state of emergency shall forward as soon as possible all available information to the rescue co-ordination centre or rescue sub-centre concerned.

4.2.4 Rescue co-ordination centres and rescue sub-centre shall, immediately upon receipt of information concerning a person, a vessel, or other craft in a state of emergency, evaluate such information and determine the phase of emergency in accordance with paragraph 4.4, and the extent of operations required.

4.3 **Initial action**

Any search and rescue unit receiving information of a distress incident shall initially take immediate action if in the position to assist and shall, in any case without delay, notify the rescue co-ordination centre or rescue sub-centre in whose area the incident has occurred.

4.4 **Emergency phases**

To assist in determining the appropriate operating procedures, the following emergency phases shall be distinguished by the rescue co-ordination centre or sub-centre concerned:

.1 Uncertainty phase:

.1.1 when a person has been reported as missing, or a vessel or other craft is overdue; or

.1.2 when a person, a vessel or other craft has failed to make an expected position or safety report.

.2 Alert phase:

.2.1 when, following the uncertainty phase, attempts to establish contact with a person, a vessel or other craft have failed and inquiries addressed to other appropriate sources have been unsuccessful; or

.2.2 when information has been received indicating that the operating efficiency of a vessel or other craft is impaired, but not to the extent that a distress situation is likely.

.3 Distress phase:

.3.1 when positive information is received that a person, a vessel or other craft is in danger and in need of immediate assistance; or

.3.2 when, following the alert phase, further unsuccessful attempts to establish contact with a person, a vessel or other craft and more widespread unsuccessful inquiries point to the probability that a distress situation exists; or

.3.3 when information is received which indicates that the operating efficiency of a vessel or other craft has been impaired to the extent that a distress situation is likely.

4.5 **Procedures to be followed by rescue co-ordination centres and rescue sub-centres during emergency phases**

4.5.1 Upon the declaration of the uncertainty phase, the rescue co-ordination centre or rescue sub-centre, as appropriate, shall initiate inquiries to determine the safety of a person, a vessel or other craft, or shall declare the alert phase.

4.5.2 Upon the declaration of the alert phase, the rescue co-ordination centre or rescue sub-centre, as appropriate, shall extend the inquiries for the missing person, vessel or other craft, alert appropriate search and rescue services and initiate such action, as is necessary in the light of the circumstances of the particular case.

4.5.3 Upon the declaration of the distress phase, the rescue co-ordination centre or rescue sub-centre, as appropriate, shall proceed as prescribed in its plans of operation, as required by paragraph 4.1.

4.5.4 **Initiation of search and rescue operations when the position of the search object is unknown.**

In the event of an emergency phase being declared for a search object whose position is unknown, the following shall apply:

.1 when an emergency phase exists, a rescue co-ordination centre or rescue sub-centre shall, unless it is aware that other centres are taking action, assume responsibility for initiating suitable action and confer with other centres with the objective of designating one centre to assume responsibility;

.2 unless otherwise decided by agreement between the centres concerned, the centre to be designated shall be the centre responsible for the area in which the search object was according to its last reported position; and

.3 after the declaration of the distress phase, the centre co-ordinating the search and rescue operations shall, as appropriate, inform other centres of all the circumstances of the emergency and of all subsequent developments.

4.5.5 **Passing information to persons, vessels, or other craft for which an emergency phase has been declared**

Whenever possible, the rescue co-ordination centre or rescue sub-centre responsible for search and rescue operations shall forward to the person, a vessel or other craft for which an emergency phase has been declared, information on the search and rescue operations it has initiated.

4.6 **Co-ordination when two or more Parties are involved**

For search and rescue operations involving more than one Party, each Party shall take appropriate action in accordance with the plans of operation referred to in paragraph 4.1 when so requested by the rescue co-ordination centre of the region.

4.7 **On-scene co-ordination of search and rescue activities**

4.7.1 The activities of search and rescue units and other facilities engaged in search and rescue operations shall be co-ordinated on-scene to ensure the most effective results.

4.7.2 When multiple facilities are about to engage in search and rescue operations, and the rescue co-ordination centre or rescue sub-centre considers it necessary, the most capable person should be designated as on-scene co-ordinator as early as practicable and preferably before the facilities arrive within the specified area of operation. Specific responsibilities shall be assigned to the on-scene co-ordinator taking into account the apparent capabilities of the on-scene co-ordinator and operational requirements.

4.7.3 If there is no responsible rescue co-ordination centre or, for any reason, the responsible rescue co-ordination centre is unable to co-ordinate the search and rescue mission, the facilities involved should designate an on-scene co-ordinator by mutual agreement.

by way of mutual regional arrangements co-operate with neighbouring States for this purpose.
2.3 The International Safety Management (ISM) Code reads:

Preamble; paragraphs 3 and 4:

"The Assembly... recognised the need for appropriate organisation of management to enable it to respond to the need of those on board ships to achieve and maintain high standards of safety and environmental protection.

Recognising that no two shipping companies or shipowners are the same, and that ships operate under a wide range of different conditions, the Code is based on general principles and objectives."

Chapter 1; paragraph 1.4.5:

"Every Company should develop, implement and maintain a safety-management-system (SMS) which includes... procedures to prepare for and respond to emergency situations..."

Chapter 8 (emergency preparedness); paragraphs 8.1 to 8.3;

".1 The Company should establish procedures to identify, describe and respond to potential emergency shipboard situations.

.2 The Company should establish programmes for drills and exercises to prepare for emergency actions.

.3 The SMS should provide for measures ensuring that the Company's organisation can respond at any time to hazards, accidents and emergency situations involving its ships."

Chapter 12; paragraph 12.2:

"The Company should periodically evaluate the efficiency of and, when needed, review the SMS in accordance with the procedures established by the Company."

2.4 The High Speed Craft (HSC) Code reads:

Chapter 1 (General requirements); paragraph 1.2.7:

in the intended area of operation there will be suitable rescue facilities readily available..."
Chapter 18 (Operational requirements); paragraphs 18.1.3.15, 18.1.3.18.3 and 18,1.3.19:

- "The Administration should issue a Permit to Operate High Speed Craft when it is satisfied that the operator has made adequate provisions from the point of view of safety generally, including...

- communication arrangements between craft, coast radio stations, base ports radio stations, emergency services and other ships, including radio frequencies to be used and watch to be kept...

- the existence and use of adequate instructions regarding... action in the event of reasonable foreseeable emergencies; and