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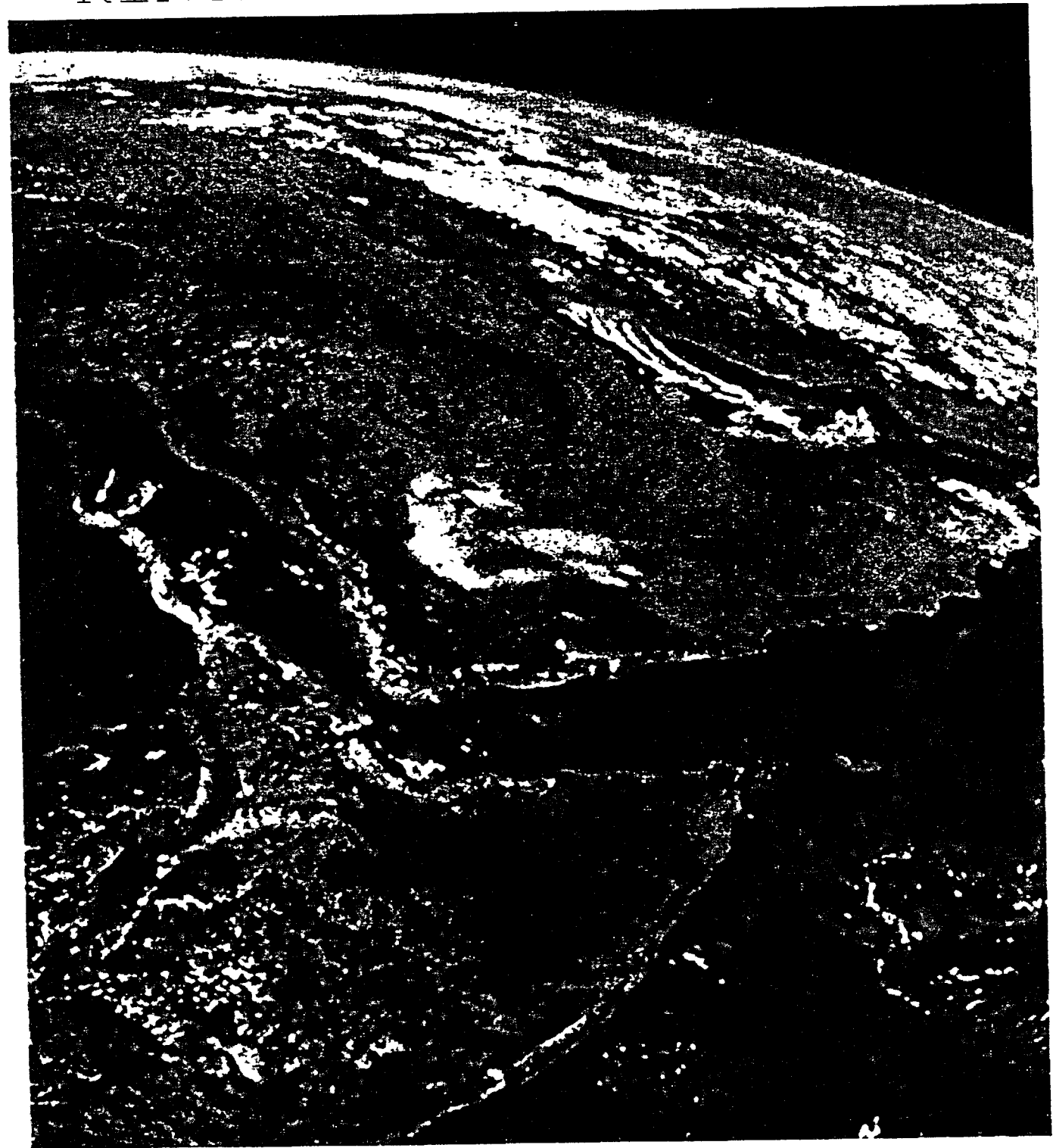
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WMU



GUIDELINES FOR THE
ESTABLISHMENT OF A SEARCH
AND RESCUE SERVICE IN THE
KINGDOM OF SAUDI ARABIA



BY/ MAR. ENG. SALEM H. CHANDOURAH

(1987)



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IMO

GUIDELINES FOR THE ESTABLISHMENT OF A SEARCH AND RESCUE SERVICE IN THE KINGDOM OF SAUDI ARABIA

BY

SALEM H. GHANDOURAH, MAR. ENGR.

SAUDI ARABIA

A Paper submitted to the Faculty of the World Maritime University
in partial satisfaction of the requirements for the award of a

MASTER OF SCIENCE DEGREE

in

MARITIME SAFETY ADMINISTRATION (MARINE ENGINEERING)

The contents of this Paper reflect my personal views and are not
necessarily endorsed by the University.

Signature: _____

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DEDICATION

I dedicate this project to:

- My country, Saudi Arabia, as a gratitude to the favours with the hope that full use can be made of this work.

- My loved one, Faryola, my loving parents, my sisters and brothers for their everlasting moral support during my two years in Malmö, Sweden.

A B B R E V I A T I O N S

ACSC	Australian Coastal Surveillance Centre
AD	Anno Domini
AH	Anno Hegirae
AMTA	Arab Maritime Transport Academy
AMVER	Automated Mutual Assistance Vessel Rescue System
ARCC	Aeronautical rescue Co-ordination Centre
AUSREP	Australian Ship Reporting System
BDE	Above Deck Equipment
CCIR	International Radio Consultative Committee
CCG	Canadian Coast Guard
CESS	Coast Earth Stations
COLREG	International Regulations for Preventing Collisions at Sea
CMRA	Canadian Marine Rescue Auxiliary
CRLS	Coast Guard Radio Liaison Stations
CRS	Coast Radio Stations
DDR	Deutschen Demokratischen Republik
DFO	Department of Fisheries
D/F	Direction Finding
DND	Department of National Defence
DOD	Department of Defence
DOT	Department of Transportation
E	East
EPIRBS	Emergency Position-Indicating Radio Beacon
FIR	Flight Information Region

V I I I

GDR	German Democratic Republic
GCC	Gulf Cooperation Council
GLI	German Lifeboat Institution
GMDSS	Global Maritime Distress and Safety System
ICAO	International Civil Aviation Organization
IHO	International Hydrographic
ICSAS	Interdepartmental Committee on Search and Rescue
IMCO	Inter-Governmental Maritime Consultative
IMU	International Maritime Organization
INMARSAT	International Maritime Satellite Organization
IR/UV	Infrared/Ultraviolet
ITCZ	Intertropical Convergence Zone
ITU	International Telecommunication Union
LUTs	Local User Terminals
MARITEX	Maritime Telex
MCCs	Mission Control Centres
MEDEVAC	Aeromedical Evacuation
MOC	Ministry of Communications
MOI	Ministry of Interior
MOD	Ministry of Defence and Aviation
MSC	Maritime Safety Committee
MRCCs	Maritime Rescue Coordination Centres
N	North
NAVTEX	Navigation Telex
NASAN	The National Swedish Administration of Shipping and Navigation
NCS	Network Coordination Station

OCC	Operations Control Centre
PTT	Post, Telegraph and Telephone
RAP	Radio Alerting Posts
RCC	Rescue Coordinator Centres
RSAF	Royal Saudi Air Force
RSC	Rescue Sub-Centre
RNLI	Royal National Life-boat Institution
SAR	Search and Rescue
SARSAT	Search and Rescue Satellite Aided Tracking
SESS	Ship Earth Stations
SEAPA	Saudi Arabia Sea Ports Authority
SOS	Urgency Signals
SOLAS	Safety of Life at Sea
SRR	Search and Rescue Regions
SRU	Sea Rescue Unit
SOLAR	Side-Looking Airborn radar
SMCS	SAR Mission Coordinators
SSRS	Swedish Sea Rescue Institution
Telecom.	Swedish Telecommunications Administration
USA	United States of America
USCG	United States Coast Guard
W	West
WMU	World Maritime University

ACKNOWLEDGEMENT

I am deeply indebted to the government of the Kingdom of Saudi Arabia which has been and still is progressively encouraging education and scientific research whenever and wherever it is attainable.

I wish to expressly thank the Ministry of Communications, headed by H.E. Mr. Hussein Al Mansouri and his deputy for Transport Affairs, Engineer Ahmed Yousef Al-Turki, for their direct support to improve our technical capabilities in the maritime transport technology.

Professor Charles Mathieu, who supervised my work on this project, has given me all the assistance one could offer, without which the work would be undoubtedly handicapped, I am very much grateful to him.

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My thanks have to be also extended to all professors of WMU and Programme Officer, Captain S.A. Wernhult for their valuable assistance, also to all who have assisted me during my field trips and/or on-the-job training, as well as those who offered their facilities of search and rescue in the KSA, UK, FRG, Sweden, USA, and Canada.

Mr. Urban Hallberg of the Swedish Maritime Administration is also offered my thanks for his distinguished assistance.

My thanks to my uncles, specially Engineer Abdul Aziz Ghandourah for his permanent encouragement and assistance.

My high appreciation is also offered to my colleagues at the World Maritime University who assisted me in various aspects to produce this project.



Many thanks are dedicated to my dear friend who has assisted in typing the project.

A B S T R A C T

The main reason for embarking on this topic is the urgent necessity for establishing a "Search and Rescue Service" in the Kingdom of Saudi Arabia.

Many disasters have been caused by a minor accident such as "electrical spark", or a match stick, hesitation in taking actions to avoid collisions, which result in loss of lives and property.

To minimize such losses one must have a responsive Search and Rescue Service, which unfortunately is not properly established in the Kingdom.


The area is congested with traffic without any search and rescue coverage by the Kingdom or even neighbouring countries, which should be available in all coastal states to render such services. This is part of the coastal states international obligation as stated in:-

- 1) The International Convention for the Safety of Life at Sea, 1974 (SOLAS '74), Regulation 15 - Chapter V.
- 2) The UN Convention on the High Seas, 1958 - Article 12(2).
- 3) The UN Convention on the Law of the Sea, 1978 (UNCLOS III).

Article 98 (2) refers to: Duty to render assistance.

As I have discovered, carrying out research in this field was hard but my educational background and especiality as a technical person (Marine Engineer) have assisted greatly whilst conducting such a task.

However, because of the importance and necessity of this topic for the Kingdom which oversees two strategic maritime zones (the Red Sea and the Arabian Gulf) each as important as the other, and since the



Kingdom is the leading country in the region in many aspects, she must obviously and automatically play the leading role and take the necessary steps to establish such a valuable and active service in the field of "Search and Rescue". She should take into consideration her ability to conduct such a service after careful study and well established research nationally, regionally, and internationally.

Therefore this study has chiefly been derived from information provided by states which have had considerable experience in the field of Search and Rescue, e.g. Federal Republic of Germany, Sweden, United Kingdom, United States, and Canada.

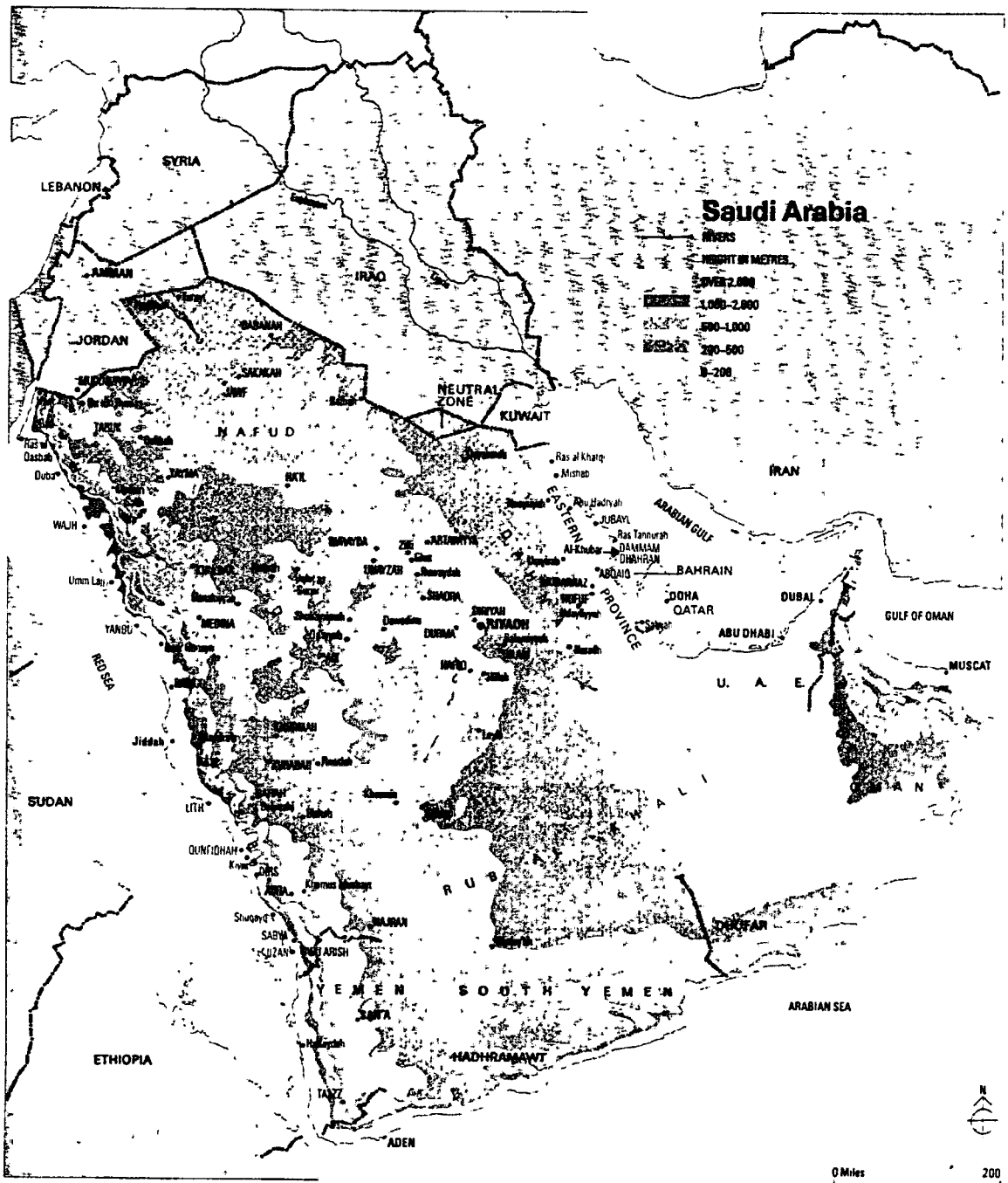
The study and research was not limited to reading their publications. Field visits were made to most of them mainly: United States of America, the Federal Republic of Germany, as well as the host country of the World Maritime University - Sweden.

Even though the Kingdom of Saudi Arabia has the means to establish a "Search and Rescue Service" with the latest techniques available, my study was based on providing practical and economical "Search and Rescue" coverage of the area.



INTRODUCTION

PHYSICAL MAP OF SAUDI ARABIA



I N T R O D U C T I O N

The Kingdom of Saudi Arabia encompasses approximately 80% of the Arabian Peninsula and totals about 2,240,000 square kilometers. The entire western boundary of the Kingdom is the Red Sea; the two Yemens edge the Southern borders; to the north lies Jordan, Iraq and Kuwait; to the east are the Arabian Gulf, the Island of Bahrain, the peninsula of Qatar, the United Arab Emirates and the Sultanate of Oman.

The length of Saudi Arabian coastline is approximately 2250 kilometers which is more than the distance between the two extreme points of the Mediterranean Sea, Beyrouth-Gibraltar. 1800 kilometers of this length extends along the eastern side of the Red Sea and 450 kilometers stretches along the western side of the Arabian Gulf.

The Red Sea splits in the north into the shallow Gulf of Suez and the deeper Gulf of Adaba. At its southern end it narrows to the straight of Bab-al-Mandab, where it joins the Indian Ocean via the gulf of Aden.

Oil and oil products, the main exporting commodities of the Kingdom, are exported to foreign countries by sea. In addition to the social, constructional and industrial development of the Arabian Gulf States, especially the Kingdom of Saudi Arabia, the gradual transfer of International Trade from west to east, and the re-opening of the Suez Canal, the shortest route between them, have contributed to the dependency on sea transport means which includes super tankers, cargo and passenger ships. This in turn, has contributed to the increase of the sea traffic along the coastal waters of the Kingdom, especially in the Arabian Gulf, even though the Kingdom has acted wisely by constructing an oil pipeline extending from the east coast in the Arabian Gulf to the west coast in the Red Sea to reduce the sea traffic in the Gulf, as well as facilitate the export of oil and oil products.

In recent years, it has been noticed that ship-building generally has developed in construction, equipment, speed, size and design according to the needs of international trade.

The development of shipping had adverse effects, especially the rapid increase in the number of ships which have resulted in catastrophic accidents with loss of life occurring in the area, despite the availability of some rescue facilities in those areas which do not meet the real requirements for the area coverage. Also, lack of national, regional and international co-ordination to make rescue operations successful.

This calls for the establishment of a national organization to conduct and carry out search and rescue operations in the Kingdom, to serve our coastal waters in the Red Sea and the Arabian Gulf, in addition to co-ordination with neighbouring coastal states, especially the Arabian Gulf States.

The organization of Search and Rescue is not only humanitarian or economical, but it is also a religious obligation, in the sense that our Islamic religion has called for providing assistance to the needy and effect their rescue.

The most important element which may exist in the organization and establishment of such a service is the implementation of the International Convention on Search and rescue.

Guidance for Search and Rescue is laid down in the publication by the International Maritime Organization (IMO), the primary purpose of which is to assist governments in the implementation of the convention which requires from every coastal state to promote the establishment and maintenance of an adequate and effective Search and Rescue Service regarding safety at sea and where circumstances so require on the basis of national, regional and international co-operation.



CHAPTER I

KINGDOM OF SAUDI ARABIA .

KINGDOM OF SAUDI ARABIA

Background:

The majority of Saudi Arabia population is living near the coast. The growing industrialization of the country will probably raise the tendency towards the coast. Significant signs of the Kingdom's efforts are the industrial centres in Yanbu and Jubail.

The interest of the Kingdom of Saudi Arabia in its waters was from its early days considerably high. In 1353 H. the Law of the Directorate of the Coast Guard was issued by Royal Decree No. 318/218.

A code of maritime commerce was issued by Law No. 32/1350 H. The navy was inaugurated in 1960 (1380 H.) starting with one single vessel.

Saudi Arabia began a programme of naval expansion in 1969. The government's aim was for a rapidly expanding of and making the Saudi Royal Navy first class in the near future, a progress which is still going on.

In marine transportation the Kingdom has actively been improving and developing its commercial fleet by adding the most modern ships and in the course of time its fleet has become comparable to the fleets of developed countries with respect to volume, quality, and operational efficiency. The Kingdom's plans are made for developing marine transport on the local, regional, Arab Islamic and International levels.

Steps have been taken to modernize the Saudi fleet and increase its capacity. The tonnage of the national fleet has increased from 543 thousand tons carried by 166 ships in 1981 to 5,597,000 tons carried by 372 ships in 1984.

RED SEA

It is reported that almost 2000 years ago the trade relation between the Roman Empire and India via the Red Sea reached a volume of 120 sailings a year. The first full year operation of the Suez Canal in 1870 had a traffic of just 486 transits and in year 1980 increased to 20,795 ships.

The coastal states are:-

- EGYPT: Land: 1001,449 Km²
 Land boundaries: approximately 2,580 Km.
 Water: limits of territorial waters "claimed" 12 nm,
 200 nm exclusive economic zone.
 Coast Line: 2,450 Km.
 Ports: 4 major (Alexandria, Port Said, Suez and Bur
 Safajah
 12 minor (8 petroleum, oil and iubricon
 terminals)
- ETHIOPIA: Land: 1,221,900 Km²
 Land boundaries: 5,198 Km.
 Water: limits of territorial water "claimed" 12 nm
 Coast Line: 1094 Km. including shore islands
 Ports: 2 major (Aseb, Mitsiw)
- JORDAN: Land: 90,650 Km²
 Land boundaries: 1,770 Km.
 Water: limits of territorial waters "claimed" 3 nm
 Coast Line: 26 Km.
 Ports: 1 major (Al Agabah)
- SUDAN: Land: 2,505,813 Km²
 Land boundaries: 7,805 Km.
 Water: limits of territorial waters "claimed" 12 nm
 Coast Line: 853 Km.
 Ports: 1 major (Port Sudan)

YEMEN: Land: 194,250 Km²
Land boundaries: 1,528 Km.
Water: limits of territorial waters "claimed" 12 nm
Coast Line: 523 Km.
Ports: 1 major (Al Hudaydah)
3 minor ones.

ARABIAN GULF

Since the late 18th, early 19th century Britain was present in the Gulf. Interested to defend India and British Empire in the east. This brought the Gulf into a framework of treaties earlier than the Red Sea and in the beginning of the nineteenth century the Gulf experienced ongoing maritime strife among the boarder entities.

The coastal states are:

- BAHRAIN: Land: 676 Km² plus group of 32 smaller islands.
 Water: limits of territorial waters "claimed" 3 nm
 Coast Line: 161 Km.
 Ports: 2 major (Free Port and Nassaw)
 9 minor ones.
- KUWAIT: Land: 17,818 Km² (excluding neutral zone but including islands.
 Land boundaries: 459 Km.
 Water: limits of territorial waters "claimed" 12 nm
 Coast Line: 499 Km.
 Ports: 3 major (Ashshuwaykh, Ashshuvaybah, Mina Al Ahmadi)
 6 minor ones.
- OMAN: Land: about 212,380 Km²
 Land boundaries: 1,384 Km.
 Water: limits of territorial waters "claimed" 12 nm
 (200 nm exclusive economic zone).
 Coast Line: 2,092 Km.
 Ports: 2 major (Mina Qabus, Mina Raysut)
 5 minor ones.

- IRAN: Land: 1,648,000 Km²
 Land boundaries: 5,318 Km.
 Water: limits of territorial waters "claimed" 12 nm fishing 50 nm or median line.
 Coast Line: 3,180 Km. including islands with 676 Km.
 Ports: 5 major (Abadan, Bandar-e Abbass, Bandar-e Khomeyni, Bandar Beheshti and Bandar-e Bushehr) 12 minor ones (Khorram Shahr)
- IRAQ: Land: 434,924 Km²
 Land boundaries: 3,668 Km.
 Water: limits of territorial waters "claimed" 12 nm
 Coast Line: 58 Km.
 Ports: 3 major (Al Basrah, Umm-Qasr and Al Faw)
- QATAR: Land: about 11,000 Km²
 Land boundaries: 56 Km.
 Water: limits of territorial waters "claimed" 3 nm (exclusive economic zone to median line)
 Coast Line: 563 Km.
 Ports: 2 major (Doha and Musa) 1 minor one.
- U.A.E.: Land: 83,600 Km²
 Land boundaries: 1,094 Km.
 Water: limits of territorial waters "claimed" to agreed centre boundary or median lines.
 Coast Line: 1,448 Km.
 Ports: 7 major and 25 minor ones.

SAUDI ARABIAN MARITIME LEGAL POSITION IN
THE RED SEA AND THE ARABIAN GULF

General:

The waters under discussion are limited. The coast line of Saudi Arabi is about 2,250 Km.

In the two ^{U Nations} united conferences on the Law of the Sea 1958 and 1960 Saudi Arabia fought for 12 nautical miles of territorial waters. The result of the next United Nations' Conferences on the Law of the Sea from 1973 to 1982 finally accepted 12 miles for territorial waters plus further 12 miles for a contiguous zone.

In 1968 Saudi Arabia took the lead in its claim over mineral resources beyond a continental shelf (Red Sea). Today this claim is covered by the general attempt of the coastal states to accept a 200 nautical mile ~~exclusive~~ ^{exclusiue} economic zone.

The Territorial Sea and the Contiguous Zone:

The Royal Decree No. 33 concerning the territorial waters of the Kingdom of February 16, 1958 established the extension of the territorial waters to 12 nautical miles (Article 4) and a contiguous zone (Article 8), beyond the territorial sea over a distance of 6 nm.

a. Territorial Sea:

The decree describes the inland waters of the Kingdom (Article 3) thereon water of the bays and between every shoal and island and the main land as long as the distance does not exceed 12 nm is defined as "INLAND WATERS". Beyond this line - outside the inland waters - there is the territorial sea of 12 nm (Article 4). Articles 5, 6 and 7 of the decree describe in particular how the territorial sea should be measured.

b. Contiguous Zone:

In 1958 the Kingdom claimed a contiguous zone as follows:

"With a view to assuring the compliance with the law of the Kingdom relating to security. Navigation fiscal and health matters, maritime surveillance may be exercised in a contiguous zone".

Bilateral Agreements:

1. Saudi Arabia - Bahrain Agreement - February 22, 1958:

By this Agreement the sea area between the two countries was divided. The two Governments also agreed to share equally the income from the exploitation of petroleum resources in the Fasht Bu Saafa Hexagon, which is located in Saudi Arabian waters.

It was the first delimitation of submarine areas between two states in the Arabian Gulf and is a unique feature of a sea area boundary agreement.

2. Saudi Arabia - Kuwait Agreement - July 7, 1965

After a condominium for the neutral zone was established in 1922 by the Al Uquatr Agreement (December 2, 1922), the two countries agreed in 1965 that in the future the southern half of the main land would be administered directly by Saudi Arabia and the northern part by Kuwait.

Special provisions deal with the natural sources in the seabed and subsoil on the principle of "EQUITABILITY" as far as rights are not granted solely to the portioning the neutral zone offshore area was announced in December 1978.

3. Saudi Arabia - Iran Agreement - October 24, 1968:
(in force since January 29, 1969)

This Agreement concerns the sovereignty over all delimitations of boundary line separating submarine areas between the Kingdom of Saudi Arabia and Iran.

Except in the vicinity of the Al Arabiyah and the Al Farsi Islands, the offshore boundary is determined by straight lines some fourteen points specific in the Agreement. The Iranian island of Kharg has to some extent been treated as MAINLAND.

4. Saudi Arabia - Qatar Agreement - June 27, 1965:
(signed on December 24, 1965)

This agreement led to the division of Salwa Gulf, whose width is 9-50 nm. By means the middle line between the two coasts.

5. Saudi Arabia - U.A.E. Agreement from 1974:

This Agreement includes the following provisions:-

- a. The Kingdom left Barini field in lieu of an access to the Gulf 20 miles from Qatar land and the new borders.
- b. The islands of Khur Daigon and Howziah belong to Saudi Arabia.
- c. Abu Dhabi kept Ghannah Island (currently called Dhabian) at the approach of Khur Al Adid.
- d. Saudi Arabia has the right of using the islands located along its new coast as oil exporting ports.
- e. The oil fields belong to the countries in which the utmost of the field exists.

- f. This Agreement does not violate or affect the submerged borders previously agreed upon between Abu Dhabi and Iran.

6. Saudi Arabia - Sudan Agreement - May 16, 1974:

In 1974 an agreement was signed concerning these respective sovereign rights in the seabed and subsoil of the submarine areas lying between their coasts in the Red Sea. According to the Agreement, the Red Sea was divided into zones.

a. A National Zone:

1. The eastern belt area of the Red Sea at the coast of Sudan 1,000 m. deep. This belt is under the sovereignty of Saudi Arabia.
2. The western belt of the Red Sea at the coast of Sudan 1,000 m. deep is under the sovereignty of Sudan.

b. The Common Zone:

Lying between the two national zones in which each party would "have equal sovereign rights in all natural resources of the common zone of which rights are exclusive to them.....".

Pollution and the Regional Agreements for the Red Sea and the Gulf:

A conference held in 1974 and 1976 at Jeddah had dealt with scientific research and with problems of pollution. It was agreed that a draft convention on the protection of the Red Sea and the Gulf of Aden environments was prepared on February 14, 1982. It was signed in Jeddah by seven Arab countries (including Palestine) with access to the Red Sea, except Ethiopia.

The regional convention for the conservation of the Red Sea and Gulf of Aden environment. This Agreement is not in force yet.

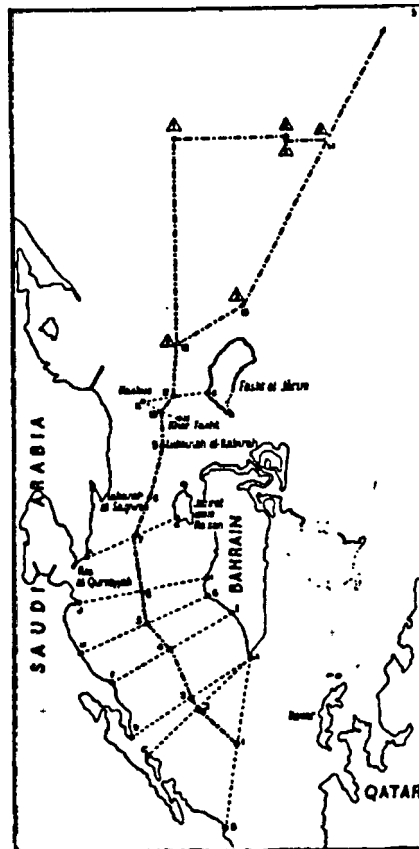
A similar conference was held in Kuwait on April 15-23, 1978, attended by all Gulf States. All States, except Oman, signed on April 24, 1978.

The Kuwait Regional Convention for co-operation of the protection of the maritime environment from pollution, a protocol related to combatting pollution and resolutions.

The preparation of this conference was supported by the governing council of the United Nations' Environment Programme, which started in 1976. This Agreement is not in force yet either.

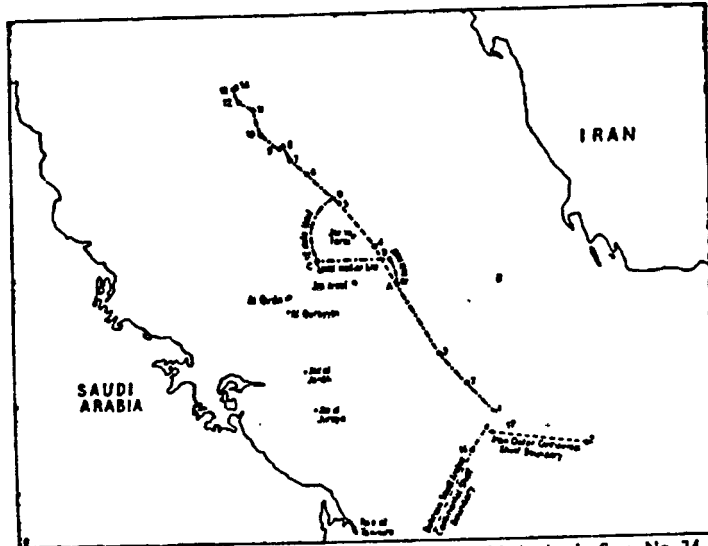
The Agreements can be seen as additional measures to MARPOL 1973. Also it provides for the establishment of regional organization for the protection of the marine environment. The protocol provides for joint cooperation in marine emergencies such as would be present in a major oil spil.

OFFSHORE BOUNDARIES IN THE ARABIAN GULF



Bahrain-Saudi Arabia continental shelf boundary. After *Limits in the Seas*, Series A, No. 12, Office of the Geographer, Bureau of Intelligence and Research, U.S. Department of State, Washington, D.C., 10 March 1970.

OFFSHORE BOUNDARIES IN THE ARABIAN GULF



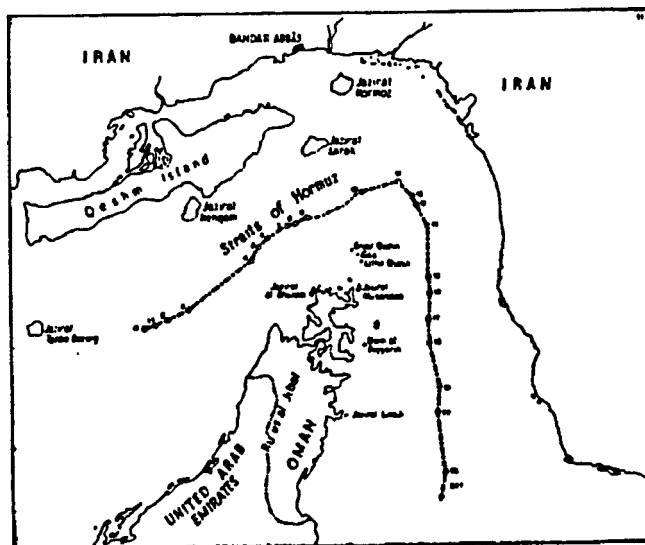
Iran-Saudi Arabia continental shelf boundary. After *Limits in the Seas*, No. 24, 6 July 1970.

OFFSHORE BOUNDARIES IN THE ARABIAN GULF



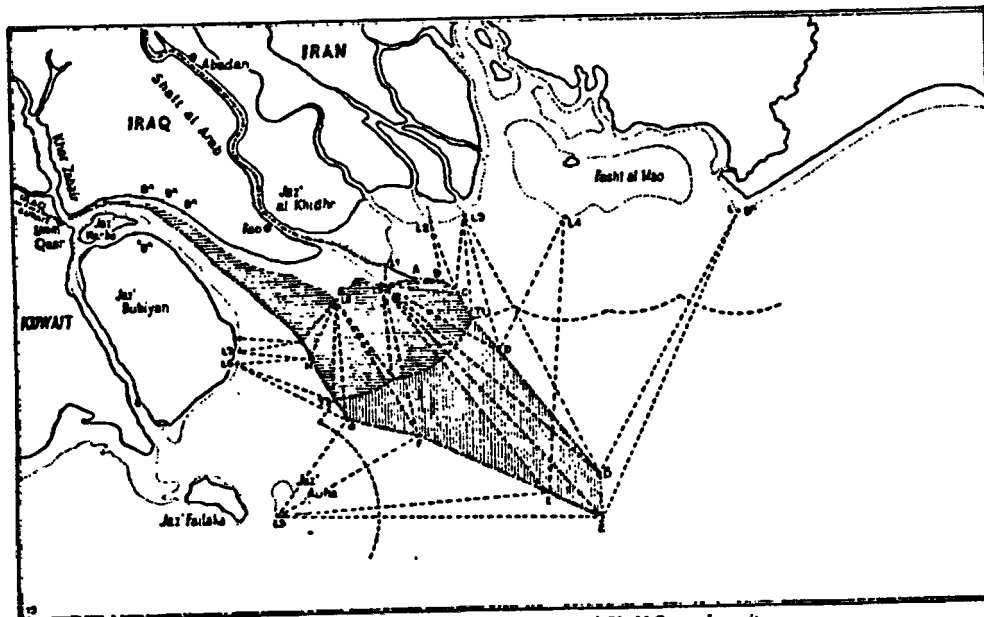
The Arabian Gulf. After J. D. Anthony, *Arab States of the Lower Gulf*, Washington, D.C., 1975.

SPECIFIC REGIONAL ISSUES



Iran-Oman continental shelf boundary. After *Limits in the Seas*, No. 67, 1 January 1976.

SPECIFIC REGIONAL ISSUES



Iraqi territorial sea and continental shelf. After *North Sea Continental Shelf Cases*, loc. cit.

SAUDI ARABIA THE INTERNATIONAL MARINE TRANSPORT
AND SAFETY ORGANIZATIONS AND AGENCIES

The Kingdom has continued its keen interest in the work of such organizations by active participation in all their activities and by implementing their decisions and recommendations. Key areas of interest include commercial fleet development, crew safety, and safe and secure transportation and handling of goods.

The Kingdom is a member of three United Nations' organizations active in marine transportation. Each of these organizations is concerned with a different aspect of marine transportation:

1. International Labor Organization
2. The United Nations' Conference on Trade and Development (UNCTAD)

The Ministry of Communications (MOC) has actively participated in meetings of the marine transport industry and participates in deliberations and research of the conference. The Kingdom has recently joined the directory of procedures of marine shipping unions issued by "UNCTAD".

The Kingdom also recently signed the United Nations' Law of the Sea, not in force yet, but it has been signed by more than 150 states.

This agreement which aims at developing an international legal system and setting guidelines to direct various sea and ocean activities. The agreement is also aimed at facilitating international communications, encouraging countries to use seas and oceans for peaceful purposes. Utilize the resources of the seas in equitable and effective ways and preserve marine life resources. The agreement strives to facilitate an economic use of resources in the interest of all nations, particularly under-developed nations.

3. The International Maritime Organization (IMO)

There are 131 members in the organization with a 32-member Board of Directors. Saudi Arabia was elected by the General Assembly to the board in Moharram 1402 H. (1982 A.D.). The election recognized the Kingdom's cooperation, interest and support of the IMO as well as the Kingdom's accomplishments in marine transport. The Kingdom was re-elected to the Board in 1984. The Ministry of Communications, represented by the Deputyship for transport affairs, participates in the work of many important IMO activities including the Marine Safety Commission and the Maritime Environment Preservation Commission in addition to several smaller commissions.

The Ministry of Communication's Deputyship for Transport Affairs reviews international maritime conventions issued by various organizations before submitting them for approval. After approval of the conventions the Deputyship administers the provisions for Saudi ships and foreign ships in the Kingdom's ports.

Following are some of the major conventions issued by IMO which have been endorsed by the Kingdom and are now applied to Saudi shipping:

- The International Convention for Safety of Life at Sea
(1394 H., 1974 A.D.)
- The International Convention of Loadlines
(1386 H., 1966 A.D.)
- The International Convention for Ships, Measurements and Tonnage
(1389 H., 1969 A.D.)
- The Agreement of Passenger Ships for Special Voyages
(1391 H., 1971 A.D.)
- Protocol of Required Spaces in Passenger Ships for Special Voyages
(1393 H., 1973 A.D.)
- The International Convention of the Instructions for the prevention of Collision at Sea
(1392 H., 1972 A.D.)

- The International Convention for the Prevention of Sea Water Pollution With Oil
(1374 H., 1954 A.D.)
- The International Convention for Container Safety
(1392 H., 1972 A.D.)
- The Convention of the International Maritime Organization (IMO)

REGULATIONS AND DECISIONS ON MARINE TRANSPORT
IN SAUDI ARABIA

The Ministry of Communications (MOC) Marine Department supervises the marine transport sector in the Kingdom and takes necessary actions to promote its development. The following regulations, decisions and rules apply:-

1. The regulation on public transport on the Kingdom's road issued by Royal Decree No. M-25 dated 21.06.1397 H. (1977 A.D.). The regulation states that MOC is responsible for the regulation and supervision of the transport sector in the Kingdom with the exception of air transport.
2. Ports and marine lighthouse regulation issued under Royal Decree No. M-27 dated 24.06.1394 H. (1974 A.D.).
3. The statute for ports and lighthouses, issued under Ministerial Decree No. 181 dated 09.10.1395 H. (1975 A.D.).
4. Ministerial Decree No. 53 dated 24.03.1403 H. (1983 A.D.).
5. Ministerial Decree No. 53 dated 24.03.1403 H. (1983 A.D.) concerning application for marine transport licenses.
6. Ministerial Decree No. 147 dated 15.10.1404 H. (1984 A.D.) concerning the requirements for classification societies in the Kingdom.
7. Statutes on fishing, pleasure and diving vessels.
8. Ministerial Decree No. 11 dated 12.02.1406 H. (1986 A.D.) concerning ship registration.
9. Ministerial Decree No. 13 dated 12.02.1406 H. (1986 A.D.) authorizing classification societies to issue safety certificates for typical container loads.



CHAPTER II

INTERNATIONAL MARITIME ORGANIZATION (IMO)

INTERNATIONAL MARITIME ORGANIZATION (IMO)

As I mentioned in my introduction, guidance for search and rescue is laid down in the publication by the International Maritime Organization (IMO).

IMO - What it is, when it was established and what does it do?

In 1948 a conference held by the United Nations and adopted a convention establishing the Inter-Governmental Maritime Consultative Organization (IMCO). From 22 May 1982 the organization was called International Maritime Organization (IMO).

The convention entered into force in 1958. The governing body of IMO is the assembly which meets once every two years. It consists of all Member States and one Associate Member.

Between sessions of the assembly of council consisting of 32 Member Governments elected by the Assembly acts as IMO's governing body - One of these members is the KINGDOM OF SAUDI ARABIA.

IMO and Safety Matters:

The Maritime Safety Committee (MSC):

Is the most senior of the committees that carry out the organization's technical work. It has a number of sub-committees whose titles indicate the subjects with which they deal.

The Sub-Committees of the MSC:

- Safety of Navigation
- Radio Communications
- Life-Saving Appliances
- Standards of Training and Watch Keeping
- Carriage of Dangerous Goods

- Ship Design and Equipment
- Fire Protection
- Stability and Loadlines and Fishing Vessels Safety
- Containers and Cargoes
- Bulk Chemicals

The first conference organized by IMO in 1960 was appropriately enough concerned with safety matters. This conference adopted the International Convention on Safety of Life at Sea (SOLAS) which came into force in 1965 replacing a version adopted in 1948.

Among the most common causes of accidents at sea are collisions. Regulations for preventing collisions were adopted by the 1960 safety of life at sea conference.

However In 1972 IMO adopted new and revised regulations in the 1972 convention on the International Regulations for Preventing Collisions at Sea (COLREG 1972). This included a number of new features. Among these was a provision which made traffic separation schemes adopted by IMO, mandatory to ships of states parties to the convention. Traffic separation schemes had been introduced, as recommendation in several parts of the world where maritime traffic was particularly congested.

Another sign of IMO's response to the changes in maritime transport was in 1976 by the adoption of the Convention on the International Maritime Satellite Organization (INMARSAT) and its operating agreement conventional radio facilities have become increasingly congested in recent years and it is physically impossible to expand the number of wavelengths available. But by using space satellites these difficulties can be overcome.

This Convention came into force in July 1979.

In April 1979 IMO adopted the International Convention on Maritime Search and Rescue. This Convention is designed to improve existing

arrangements for carrying out search and rescue operations, following accidents at sea although many countries have their own established plans for such emergencies. This is the first time international procedures have been adopted.

This Convention entered into force on 22 June 1981.

ADVANCED MARITIME TECHNOLOGY IN THE USE OF SATELLITE COMMUNICATIONS

Throughout history, it has always been impossible for seafarers to communicate with land or other ships once at sea. Marconi's communication system was subsequently widely developed, leading to rapid spread of its services. In 1906 at a conference in Berlin, the radio telegraph distress signal "SOS", a rhythmic three dots-three dashes-three dots in morse code, was adopted as the international call for help at sea. Popularly interpreted as meaning "Save Our Ship". The letters actually have no intrinsic meaning.

On Sunday 14 April 1912 the luxury liner Titanic sank with a loss of 1503 lives, including her wireless operator, J.G. Phillips whose SOS was first heard by the radio officer on the Clifornia at 11.20 PM. The Titanic tragedy prompted new regulations demanding increased transmitting power and 24-hour manning of radio rooms for passenger carrying ships.

In 1922 the first ship-to-shore voice communication took place between a station at Deal Beach in New Jersey, USA, and the SS America, 650 Km. out at sea.

The 1974 Safety of Life at Sea (SOLAS) Convention included two manually operated distress systems.

Cargo ships over 1600 grt and passenger ships have to carry both radiotelephone and radiotelegraph equipment. Cargo ships between 300 and 1600 grt must carry only the radiotelephone equipment. Radiotelephony on 2182 KHz and 156.8 MHz provides common distress communications for all ships.

Morse telegraphy on 500 KHz requires a radio officer qualified in Morse Code.

Though the current international maritime distress and safety system

has served us for over 50 years, it can be unreliable and labour intensive. Since the range for currently specified shipboard communication equipment is 100-150 NM, assistance can normally be arranged only with other ships in the vicinity.

Satellite Systems for Safety and Distress:

Two satellite systems, COSPAS-SARSAT and INMARSAT are revolutionizing distress and safety communications. COSPAS-SARSAT detects positions and relays signals from aeronautical and maritime distress beacons to SAR authorities. INMARSAT provides two-way telex and telephone services and may eventually be used in additional ways.

COSPAS/SARSAT:

In the late 1950's the first satellites were placed into earth orbit. The concept for a satellite-aided search and rescue project began to take shape.

The COSPAS/SARSAT programme became an international effort in 1976 with the United States, Canada, and France discussing the possibilities of satellite aided SAR. Joint SARSAT testing agreements in 1979 stated that United States would supply the satellites, Canada would supply the space-borne repeaters for all frequencies, and France would supply space-borne processors for the 406 MHz frequency. The Soviet Union joined the programme in 1980, agreeing to equip their COSMOS satellites with COSPAS repeaters and processors, Norway added their participation in 1981 representing Sweden as well.

Only nine days after testing began, on September 9, 1982, the Ottawa ground station detected distress signals relayed by COSPAS 1 from an airplane crash in northern British Columbia. The location coordinates supplied by COSPAS-SARSAT enabled searchers to find the airplane in a mountain valley 90 Km. off its planned route. Three injured survivors were rescued by Canadian Forces personnel. This was the first rescue ever using data from the COSPAS-SARSAT system.

On October 11, 1982 was the first marine rescue using data from the COSPAS-SARSAT system. Capsize of GONZO during a storm 480 Km. east of Boston.

The first SARSAT satellite was launched in 1983. By 1984, the system had a constellation of two COSPAS and two SARSAT satellites and operationally used the 121.5/243 MHz frequencies. Bulgaria and Finland joined the programme. The operational use of the 406 MHz system, designed for global coverage by satellite was initiated in 1985.

Ground Segment:

The COSPAS-SARSAT ground segment is an intricate support network that is continually expanding to increase system efficiency.

A. Local User Terminals (LUTs):

The LUTs are the ground stations that receive the distress signals from the satellites. The ground based equipment consists of an antenna to receive the unprocessed, real-time data at the 121.5/243 MHz frequencies and preprocessed, real-time, and stored data at the 406 MHz frequency down linked from a satellite on L-band (1544.5 MHz). The position of the beacon is determined from this information. Processing time for the information is a matter of minutes and then the signal alert and location information are sent to the Mission Control Centres (MCCs).

There will be a total of 13 LUTs with 3 in the United States, 3 in Canada, 1 in France, 4 in the Soviet Union, 1 in the United Kingdom, 1 in Norway, and 1 in Brazil.

B. Mission Control Centres (MCCs):

The MCCs collect and edit information from the LUTs and forward the data to the appropriate RCC. If the emergency is located in another country, the appropriate international MCC is notified. As of early 1986, MCCs were located in the United States, Canada, France, the Soviet Union, Norway and the United Kingdom. Specific duties vary slightly in each country. The MCCs in the United States and the Soviet Union maintain and distribute satellite orbit and status information.

C. Rescue Coordination Centres (RCCs):

COSPAS-SARSAT provides early alerts and valuable location

information to RCCs that are in charge of actual rescues. The type of rescue effort varies according to the needs of the particular national geography and available resources.

Co-operation:

Co-operation between organizations and countries fosters the success of the COSPAS-SARSAT mission. Both SARSAT and COSPAS systems are compatible with each other. Life saving messages cross the international telecommunications network regardless of political boundaries when lives are in the balance.

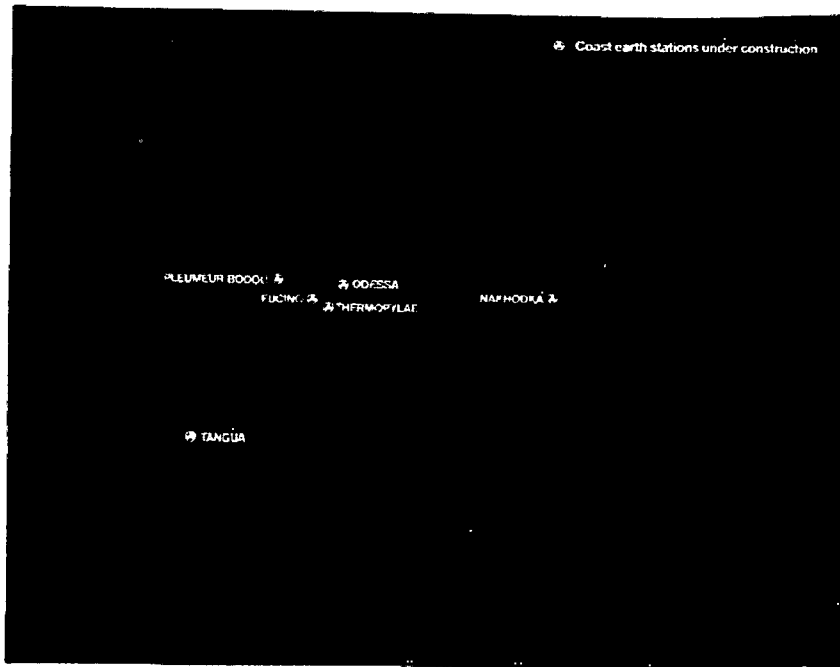
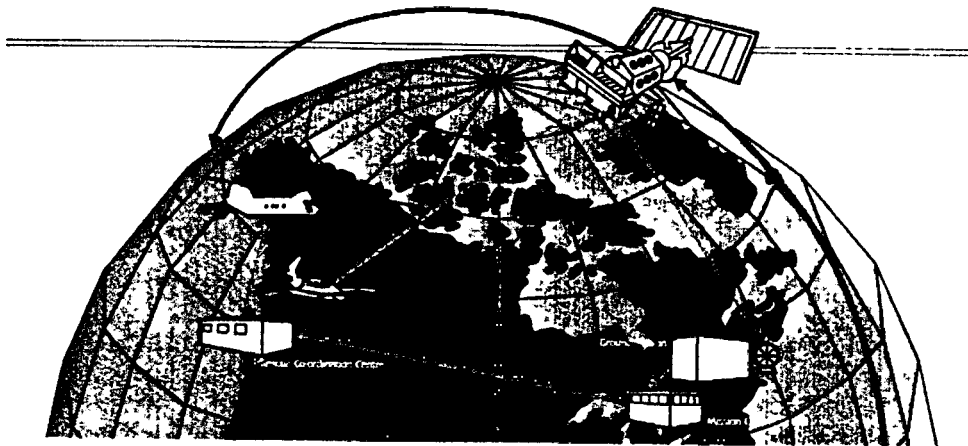
Future of COSPAS-SARSAT:

COSPAS-SARSAT has proved successful detecting signals from existing emergency beacons which is operating at 121-5 MHz to use new frequency at 406 MHz.

This frequency is exclusively assigned to satellite-aided search and rescue. Location accuracy will be better than 5 Km., compared to 20 Km. with existing 121-5 MHz transmitters.

The 406 MHz beacons also relay data messages carrying the following codes:-

1. USER - provides information on the type of vessel such as an aircraft, a pleasure craft, a fishing boat, or a commercial marine vessel.
2. COUNTRY - identifies the vessel's country of registration.
3. EMERGENCY - identifies the nature of distress for example whether there is a fire on board or passengers are injured and need medical help.
4. IDENTIFICATION - provides the aircraft or ships registration number or a unique beacon identification.



I N M A R S A T:

The International Maritime Satellite Organization (INMARSAT) provides a maritime communications system space segment that works like an international telephone company.

INMARSAT is mostly for SAR coordination and prevention e.g. meteorological warnings, while COSPAS-SARSAT relays EPIRB alerts with periodic position updates.

Both may be used for identification of vessels in distress.

INMARSAT provides instant-easy, reliable and high quality maritime communications for commercial and safety purposes, and could be adapted for automatic positioning via special EPIRBs that transmit position data (whether special EPIRBs will be developed for use with INMARSAT is still undecided).

INMARSAT has six geostationary satellites two over each non-polar ocean region, 19 Coast Earth Stations (CESs) in ten countries, and over 5000 Ship Earth Stations (SEs, 7000 expected by 1989). It now leases three satellites from COMSAT.

The overall system comprises:

1. The Coast Earth Stations (CESs) owned and operated by INMARSAT members. CESs link the space segment with the international and national telephone and telex networks.
2. The ship earth stations (SEs) owned by shipowners and operated by ship personnel.
3. The space segment which includes the necessary ground control functions, provided by INMARSAT as an international body.
4. One CES in each ocean region as a Network Coordination Station

(NCS), controlling the operation and allocating available channels to each CES and SES within the ocean region.

5. An operations control ocean region as a Network Coordination Station (NCS), controlling the operation and allocating available channels to each CES and SES within the ocean region.
6. An Operations Control Centre (OCC) in London, England, to co-ordinate the operation of the whole system.

Maritime satellite communications work in the L-band for the ship-satellite sector, more properly defined in accordance with the International Radio Regulations, as the following frequencies:-

1. Upwards from ship-to-satellite in the band between 1626.5-1645.5 MHz (19.0 MHz band width).
2. Downwards from satellite-to-ship in the band between 1535-1544 MHz (9 MHz band width).

From 1st January 1990 this will be increased to include 1530-1535 MHz (5MHz band width).

An additional 1 MHz for earth-to-satellite has been allocated between 1645.5-1646.5 MHz and for satellite-to-earth.

A corresponding 1 MHz between 1544-1545 MHz, exclusively for distress and safety purpose. The CESs communicate with the satellites in the C-band of 4 and 6 GHz and frequency conversion takes place in the satellite.

Ship Satellite Terminal or Ship Earth Station (SES) as it is called, consists of two main parts. The Above Deck Equipment (ADE). The ADE comprises the antenna assembly and the BDE the communication console and hardware (telex, telephone set, etc.). All controls and indicators are readily accessible to allow easy operation and maintenance of SES.

Besides the unit directly connected to the BDE Consol, operation from different locations on board ship is also possible. This is particularly important for the distress alert (SOS) capability which in case of distress when time is critical can be initiated from places other than the radio room.

The distress alert capability is an important feature, or a special command is given via the control teletype or keyboard, an SOS message, which contains the identification number of the ship, is transmitted virtually instantaneously to the CES and through this to a Rescue Coordination Centre for further action.

The Network Coordination Stations (NCSs):

In the initial Maritime Satellite Communication System, MARISAT, there was one CES in each ocean region: Southbury, USA for the Atlantic, Santa Paula, USA for the Pacific and Yamaguchi, Japan for the Indian.

All ships in a particular ocean area were connected to subscribers (or vice-versa) via the one CES.

The INMARSAT system provides for more than one CES to work in each ocean region. A Network Coordination Station (NCS) is therefore necessary in each region to assign the available channels to the SESs and CESs.

The CESs have been appointed as NCSs of the system. They are at Southbury for the Atlantic Ocean Region at Yamaguchi for the Indian Ocean Region and at Ibaraki for the Pacific Ocean Region.

Satellite System Comparisons:COSPAS-SARSAT

- primary for distress beacons
- global coverage
- one-way traffic
- printed output
- one hour average relay
- polar-orbiting constellation
- 90 minute orbit
- 1,100 mile altitude

INMARSAT

- primary for general communications
- coverage between 70N and 70S latitude
- two-way traffic
- printed output (voice optional)
- relay almost immediate
- geostationary over ocean areas
- 24 hour orbit
- 22,300 mile altitude

406 MHz EPIRBs:

New 406 MHz Satellite EPIRBs being developed internationally specifically for use with COSPAS-SARSAT, and carriage requirements for EPIRBs are being revised. Several countries will begin use of the new beacons soon.

The combination of satellite beacons and satellite detection promises to be one of the few major improvements that have come to SAR system in many years.

The new standards provide for three categories of Satellite EPIRBs:-

- No. 1 Worldwide use where a float-free EPIRB is needed or required (operates 48 hours minimum at -20°C .)
- No. 2 Same as Category 1, except is intended for use where a manual EPIRB is appropriate or required (e.g., survival craft).
- No. 3 Same as Category 2, except limited to use by ships which operate where 24 hour minimum alert signal life is acceptable (homing signal operates 48 hours) and air temperature is above 0°C .

System Concept:

A low-orbiting satellite is used to receive signals from existing ELTs/EPIRBs operating in the 406-MHz band. As the satellite passes over these emergency transmitters. It perceives a Doppler shift (a change in frequency). When the satellite approaches a transmitter it receives a frequency higher than that being transmitted, when the satellite is directly overhead. The frequency is identical and, when the satellite leaves the transmitter site the frequency becomes lower.

With a given pass of the satellite over an emergency transmitter.

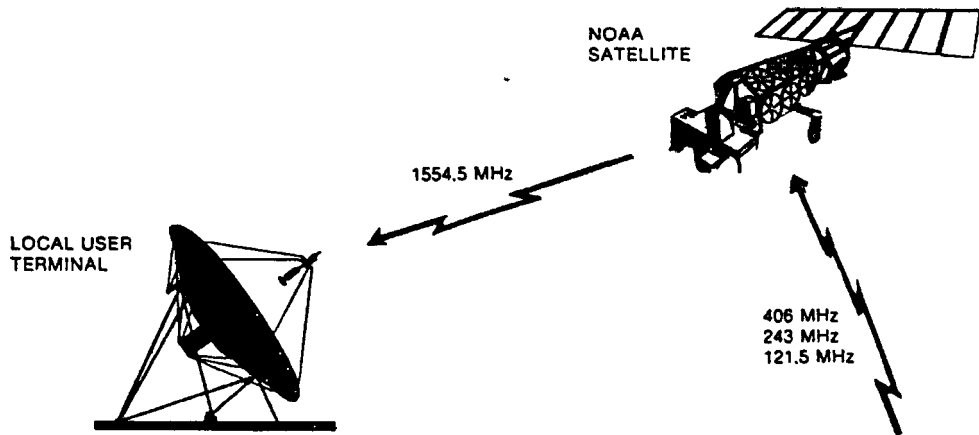
The Doppler data are recovered as an S-shaped curve of frequency versus time. The shape and slope of the Doppler Curve, together with the location of the satellite at each point of the Doppler Curve, are used to locate the emergency transmitter site. Because a satellite in a low attitude orbit passing over the North and South poles "sees" the entire Earth in a 12-hour period. An operational SARSAT system comprised of four satellites could detect a distress signal anywhere on Earth within a few hours.

The New Experimental ELT/EPIRB Transmitters:

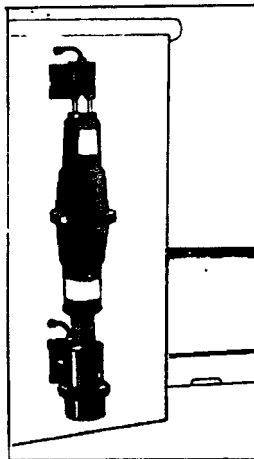
TRON 30 S

1. Fully Automatic Activated EPIRB.
2. Float Free Release Mechanism
3. Transmits on SAR Frequencies 121.5 MHz, 243 MHz and on SEARCH AND RESCUE SATELLITE AIDED TRACKING (SARSAT) Frequency 406 MHz. That signal can be received, processed and stored on-board the satellite. The stored Doppler and Time Data can be transmitted to the ground on command, at a later time when, a ground station is in view of the satellite.
4. Rugged structure of housing.
5. Equipped with Lithurn Batteries with 4 years storage time and more than 48 hours operation time.

TRON 30 S EPIRB AND THE WAY IT WORKS

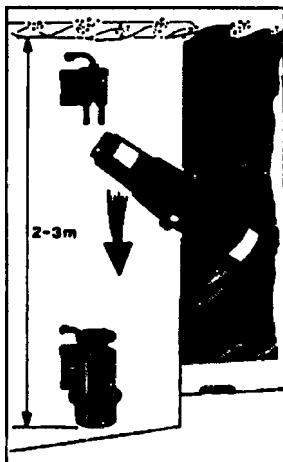


-A
TRON 30 S
MOUNTED
UPSIDE DOWN
IN BRACKET

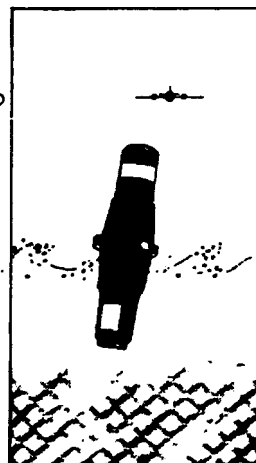


TRON 30 S EPIRB

-B
AT A DEPTH
OF 2-3 M
THE BEACON
IS FREED
AND FLOATS
TO THE
SURFACE



-C
TRON 30 S
TURNS AROUND
AND STARTS
TO TRANSMIT
ON ALL
3 SAR
FREQUENCIES
406 MHz
243 MHz
121.5 MHz



NAVTEX:

NAVTEX System:

In the international rule-making, NAVTEX is referred to as the:

AUTOMATED DIRECT - Printing Telegraph System for
Promulgation of navigational and meteorological
warnings and urgent information to ships.

The NAVTEX Organization:

1. IMO the international body responsible for the safety of lives at sea - responsible for the general rules and implementation of the NAVTEX system.
2. For the compilation of information to be transmitted. The (IHO) International Hydrographic, the responsible party.
3. The international technical requirements for NAVTEX equipment are issued by (CCIR) the International Radio Consultative Committee.

In frequency allocation questions, the (ITU) International Telecommunication Union is the head organization.

The NAVTEX Broadcasts:

The main groups of transmitted information are:

- A. Navigational Warnings
- B. Meteorological Warning (Storm Warnings)
- C. Ice Reports
- D. Search and Rescue Information
- E. Weather Forecasts
- F. Pilot Service Messages

- G. DECCA System Information
- H. LORAN-C System Information
- I. OMEGA System Messages
- J. SATNAV System Messages

NAVTEX Transmitting Stations for Search and Rescue (SAR):

1. BAY of BISCAY to GIBRALTAR:

IDL Location	Scheduled Hours UTC will be (1988)
Cap Finisterre	0030, 0430, 0830, 1230, 1630, 2030.

Spanish stations with transmissions in the English and Spanish languages. Lisbon in English and Portuguese.

2. Black Sea and Bosparus, Sea of Marmara:

IDL Location	Scheduled Hours UTC from 1986
Istanbul	0030, 0430, 0830, 1230, 1630, 2030.

3. ATLANTIC South America:

IDL Location	Scheduled Hours UTC
Comodoro Rivandavia	0000 - 2400

NAVTEX Transmitting Stations in the Red Sea and the Arabian Gulf:

1. Suez Channel and Red Sea:

IDL Location	Scheduled Hours UTC
Sarabiyum (H) Jeddah	N.A. 0000 - 2400

2. Arabian Gulf:

IDL Location	Scheduled Hours UTC
(G) Dammam	(KSA) 0000 - 2400
() Hamala	(Bah) N.A.

The NAVTEX C:-

Is the deadline of compulsory installation of NAVTEX receivers. To comply with the new international safety rules (FGMDSS) is coming closer.

M A R I T E X:

Introduction:

MARITEX is a computerized and fully automatic system for telex over radio. It is jointly operated by the telecoms administrations of Sweden, Norway, Denmark, Finland, and Iceland.

MARITEX was introduced by Swedish Telecom Radio in the early seventies and became fully computerized by 1975. The current development programme, with global coverage through link-up with overseas sub-stations further accentuates the position of MARITEX as a world leader in radio telex and furthermore an alternative and/or complement to satcom.

The Coast Station Network:

The heart of the MARITEX system is the Central Computer Plant at Gothenburg Radio in Sweden. To ensure uninterrupted operation and maximum security the system is run with a twin computer configuration.

The coast station central controls different sub-stations located in Sweden and overseas. The control is performed by means of switched and leased data links.

Each MARITEX, sub-station accommodates transmitters, receivers and radio telex modems (ARQ) for a varying number of radio channels in the medium and high frequency bands (2-22 MHz).

To be Global System MARITEX was taken a first step in November 1986 when radio telex equipment at INTEL MAR RADIO in PANAMA was connected to the MARITEX central for direct and full control. Through this arrangement, MARITEX is now practically capable of 24 hours global coverage. To further secure the coverage, there are advanced plans to establish a second overseas sub-station in the FAR EAST region.

The Global MARITEX is a virtual break-through in Radio Telex MARITEX. In addition to the automatic exchange of telex messages, MARITEX offers services like ship-to-shore telex letters, phono-telex and free medical advice.

MARITEX Development:

Very soon, Gothenburg Radio will be introducing an automatic position tracking and alarm system. By interfacing the navigator equipment with the MARITEX Ship Terminal the Ship's position is automatically sent to and stored in the Coast Station Central. From there it can be sent automatically or by request to any authorized telex subscriber. In addition to this strictly commercial use, this facility can also directly alert the Gothenburg Radio Rescue Center (RRC) in distress situations, within the frame-work of MARITEX TELEFAX and ON-LINE DATA Communication.

Direction-Finding and Homing:

Subsequent to the transmission of the distress message on 500 KHz two dashes of ten to fifteen seconds duration shall be transmitted, each followed by the ship's call sign, to enable coast direction-finding stations and ships to take a D/F bearing. This transmission should be repeated at regular intervals.

In cases where 2182 KHz is used similar action should be taken. Using a continued repetition of the call sign or name of ship or a long numerical count in place of the two dashes mentioned in last paragraph above.

Maritime Surveillance System:

The equipment includes cameras, a Side-Looking Airborne Radar (SLAR) and an IR/UV scanner with supporting equipment for real-time processing and display, data recording, quick-look documentation and air-to-ground image transfer.

Side-Looking Airborn Radar:

This sensor can be used also in bad visibility due to rain-snowfall or mist.

The SLAR antenna is fixed mounted (with no moving parts) along the aircrafts body. Due to the aircrafts motion forward a continuous scan is obtained of both sides of the aircraft.

The SLAR used for surveillance of sea traffic, fishery inspection, search and rescue, sea ice mapping and also for oil spill. The SLAR can detect lifeboats and oil spill at 30 Km. distance on each side of the aircraft and ships at 80 Km. distance. The pictures are presented in real-time on a standard TV-monitor onboard the aircraft.

The use of an infrared/ultraviolet (IR/UV) scanner has been developed for close range inspection of the water surface. The purpose is to inspect a ships wake or to make close survey of water area at night-time as well as detected oil spill. The IR part of the scanner measures the thermal radiation which is less from the oil than the surrounding water and makes the oil look colder. The IR channel can be used day and night but needs clear sight to work. The UV channel measures the reflected skylight from the water surface and can only be used during day-light.

An oil film on the water reflects the UV-light better than the water and makes the oil appear as a clear area in the sea.

The IR/UV-system offers real-time imagery on a TV-monitor (the same as for the SLAR) with false colour coding for image enhancement. The oil slick can be presented e.g. as a red patch in surrounding blue water.

POSITION REPORTING SYSTEMS

General:

Information in this section has been compiled from various international sources. For more detailed information mariners should consult the instructions issued by the countries who operate the described system.

1. Automated Mutual Assistance Vessel Rescue System (AMVER):

On April 15, 1958 the United States Coast Guard and commercial shipping representatives began discussions which led to the birth of AMVER, known as Atlantic Merchant Vessel Reporting System. AMVER began on July 18, 1958. The system's first computer was an IBM RAMAC (Random Access Method Accounting Control). Installed at New York's Custom House in Lower Manhattan. It began running July 21, 1958, and was characterized as being the "evaluate information and determine the position of vessels through dead reckoning. The system, growing in its geographic coverage was receiving messages from Iceland, Caanary Islands and from vessels transiting south of the Equator.

Rescue Coordinator Centers (RCC) in England and Ireland were offered AMVER's services. And by 1962, they were receiving search and rescue information from the AMVER System.

By 1963 AMVER was worldwide.

In December 1982 the US Maritime Administration and the Coast Guard signed a memorandum of understanding. The Coast Guard agreed to plot all US flag vessels required by the Maritime Administration to be AMVER participants. Participation in AMVER is strictly voluntary, unless made mandatory by government agencies or flags.

AMVER System Communications Network and Information Reported:

A worldwide radio station communications network of coastal and ocean station vessel facilities support the AMVAR system. Propagation conditions, location of vessel, and traffic density will normally determine which station may best be contacted to establish communications.

The information voluntarily provided by vessels to AMVER is kept strictly confidential, and is protected by the Coast Guard. It will be released only for safety purposes and as a free service to our participants to satisfy certain advance notification requirements of title 33, U.S. Code of Federal Regulations.

AMVER Voyage Report Types:

There are five types of AMVER reports: Sailing Plan, Departure, Arrival, Position, and Deviation Reports.

Other Required Information:

AMVER also needs other information which might be useful in an emergency. This includes data such as the ship length, communications equipment, radio watch schedule, speed, rig, and so forth. This information is collected separately once, and retained in the automatic data processing system, periodically validated, and used only for search and rescue purposes.

2. Australian Ship Reporting System (AUSREP):

The AUSREP system is mandatory for all Australian ships while in the AUSREP area, and for all foreign ships from arrival in their first Australian port until their departure from the last Australian port.

The AUSREP system is co-ordinated by the Australian Coastal Surveillance Centre (ACSC) in Canberra. It requires that vessels send a sailing plan report to the ACSC either up to 24 hours before or 2 hours after they have left an Australian port or as they enter the AUSREP area. This report must contain enough information to enable the Centre to make a plot, and it must give an outline of the intended passage. The sailing report also nominates a reporting time at which the Master is required to send a daily report to the Centre. The position report must consist of the ship's position, course, speed, and the time and date. This allows the Centre to keep a regular check on all the ships in the area. At a maximum of two hours before either arriving in port or leaving the AUSREP area, a final report must be sent in. This must detail estimated time of arrival in port, or the position of departure if leaving the AUSREP area.

If one of the regular daily position reports is not logged for any reason, then the wheels of the Australian SAR System are set in motion. A period of two hours' grace is given, to allow for the message to filter through any "crossed wires" that may have found their way into the system. During this period internal checks are carried out to ensure that the message has not been received, and subsequently not passed on. After this period, the vessel is put on traffic lists, which request the master to furnish the overdue report.

By the time the report becomes 24 hours overdue, search action will have been initiated. There are no hard and fast rules as to the type of action, as different incidents will require different methods, and each case must be considered separately. Clearly, however, AUSREP allows for aircraft to be launched within 24 hours of a ship failing to report in. For ships at sea, the method of reporting is to send a message through any Australian coast radio station addressed "Cosurcen Canberra".

3. New Zealand System:

The area of this system extends south from the equator between 140° W and 160° E. Ships on international voyages in this area are requested to send name or international call sign, position, course and speed to Auckland, Wellington or Awarua Radio daily at 0000 GMT.

4. Madagascar System:

This is a local system within the vicinity of Madagascar. The area involved lies between 5° S and 30° E and the east coast of Africa ships are requested, when travelling in this area to transmit to the nearest Coast Radio Station of Madagascar their international call sign, position, course and speed daily at 1000 GMT. The message should be addressed to: SOUCENCORSAU DIEGO SU AREZ.

5. Greenland System:

The area of this system extends north from 57° N, within a distance of 250 miles of the coast of Greenland. Ships traversing these waters should transmit to the Greenland Command, Gronnedal their name or international call sign, position, course, speed, route and destination between 1100 and 1130 GMT and between 2300 and 2330 GMT daily. Arrival and departure reports are required for Greenland ports.

GLOBAL MARITIME DISTRESS AND SAFETY SYSTEM
(G M D S S)

Since the conference of SAR convention, April, 1979 in Hamburg, Germany, realized that more reliable communications were needed and were becoming available. It recommended development of GMDSS to support mariners and the SAR system. It will enable a ship, regardless of where it operates, to perform functions considered essential for the safety of that ship and of others in the same area.

It will support all necessary SAR communications, ship-to-ship, ship-to-shore, and shore-to-ship.

GMDSS is expected to dramatically improve safety at sea by providing rapid and reliable distress alerting and by enhancing the way SAR missions are carried out.

In GMDSS primary distress alerting will be ship-to-shore rather than ship-to-ship. SAR will be coordinated by specially trained personnel and better awareness of available SAR resources. GMDSS was developed mainly for "Convention Ships", with the view that other vessels will participate on a voluntary basis.

Seven basic functions have been identified for GMDSS Incorporation of COSPAS-SARSAT and INMARSAT into GMDSS made some of these functions attainable.

1. Alerting:

A vessel must be able to rapidly and reliably report a distress situation to a unit that can provide or coordinate assistance. Using either satellite or terrestrial communications an RCC would then relay the alert to selected SAR units or other ships in the vicinity. Distress alerts will normally be sent and acknowledged manually. But a float-free satellite EPIRB will automatically activate if the ship sinks.

2. SAR Coordination for RCCs:
The RCC must be able to coordinate SAR efforts with other RCCs and with vessels or aircraft conducting on scene searches.
3. SAR Communications on Scene:
Vessels and aircraft involved in SAR operations must be able to communicate with each other and with the vessel in distress.
4. Transmit and Receive Signals for Locating:
Locating signals help locate the vessel in distress or its survivors with direction-finding equipment and will include use of 9 GHz transponders which interact with the radar of assisting units.
5. Dissemination of Marine Safety Information:
This includes automatic reception by ships of important meteorological, navigation or other urgent information via direct printing telegraphy or INMARSAT.
6. General Business Communications:
These communications between the ship and a shore-based communications network may affect its safety ordering charts or tugs are examples of use of the system.
7. Bridge-to-Bridge VHF Communications:
These intership communications assist in safe ship movements.

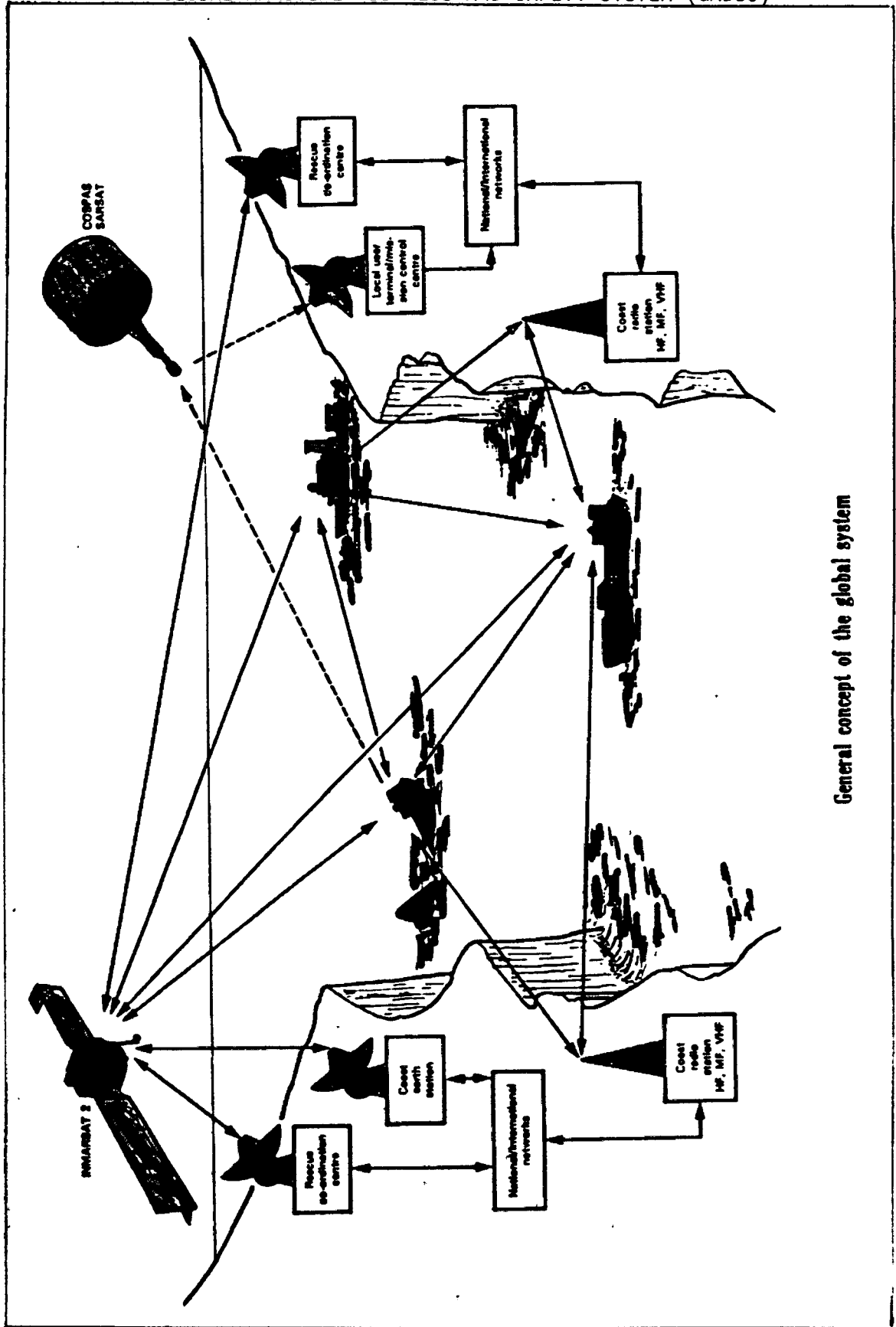
GMDSS vessels will be equipped with special units of NAVTEX.

Areas of Operation:-

A vessel must be able to perform the seven basic GMDSS functions, particularly distress alerting, regardless of where the vessel might sail. Several geographic operating areas were defined so GMDSS carriage requirements could be tailored to the actual equipment needed to communicate to shore. In general, ships that sail only in

area (A1) must carry VHF equipment; (A2) ships must carry VHF and MF equipments; (A3) ships must carry VHF, MF and HF and/or satellite equipments; and (A4) ships must carry VHF, MF and HF equipment. ALL ships must carry satellite EPIRBs (VHF EPIRBs optional for area "A1"), a NAVTEX receiver and a locating device.

GLOBAL MARITIME DISTRESS AND SAFETY SYSTEM (GMDSS)



General concept of the global system



CHAPTER III

SEARCH AND RESCUE ORGANIZATIONS

SEARCH AND RESCUE ORGANIZATIONS

Most SAR organizations are financed entirely by the States (e.g. U.S. Coast Guard) and other non-governmental organizations are financed on a voluntary basis. Some use full-time employees, others use non-paid volunteers as crews.

Both systems work well, but require to be tailored to meet local conditions with special regard to number of SAR incidents, finance, availability of manpower and the geography and demography of the country.

There are different systems have ~~which~~ been adopted on the West and North Coast of Europe as regards SAR (Lifeboats):-

UK and Republic of Ireland:
State organization and voluntary.

Federal Republic of Germany:
Entirely voluntary (DGZRS).

Sweden:
State organization and voluntary (National Swedish Administration of Shipping and Navigation).

Denmark:
State organized.

France:
Voluntary service, one third state paid, one third paid by local authorities, balance collected voluntarily but all controlled by SNSM.

Belgium:
State organized.

VOLUNTARY SAR ORGANIZATIONS AND THE ASSISTANCE

Most voluntary SAR organizations endeavour to obtain helicopter assistance from local oil rig operators, the armed forces or police which might be so equipped and use can be made of fishing boats, yachts but some voluntary lifeboat services as in the Federal Republic of Germany, maintain control of their own lifeboat fleet by having their own rescue co-ordinating centre which is recognized by the government.

MARITIME SEARCH AND RESCUE
FEDERAL REPUBLIC OF GERMANY MODEL

History:

In 1865 the German Lifeboat Institution (GLI) was founded by 120 delegates out of small local rescue societies who met at Kiel - Germany. A uniform and overall rescue service along the German Coast in North and Baltic Sea was created.

In April 1979 the International Conference on Maritime Search and Rescue was held in Hamburg - Germany.

In 1982 the Federal Republic of Germany has ratified the IMO SAR - Convention.

In March 1982 an agreement between Ministry of Transport and the GLI was signed. According to this agreement SAR - execution on SAR - coordination of Maritime Search and Rescue within the SAR-Region of the FRG North and Baltic Sea was officially handed over to the GLI.

The Rescue Co-ordination Centre (RCC) - Bremen:

RCC Bremen operates Rescue Sub-Centres in Cuxhaven, Borkum, Sylt and Travemünde as well as 11 distress alerting post along the coasts.

RCC Bremen is coordinating and leading distress at sea. RCC Glücksburg Port of the German Navy, is coordinating aeronautical distress. Both RCC's are connected to each other by a direct telephone line.

Today:

SAR-Region of FRG is as follows:

Coordinates	Latitude	Longitude
German-Dutch border	53-40 N	006-30 E
	55-00 N	006-30 E
	55-00 N	008-00 E
German - Danish border	54-24 N	012-00 E
German - GDR	Bay of Lübeck along the border with GDR.	

Also Today:

The Rescue Co-ordination Centre (RCC) Bremen uses and operates only 37 Rescue Units from 7m. - 44m. length and diesel driven. 17 are sea-going rescue-cruisers with daughter boat, 20 are coastal life boats self-righting and self-baling. 8 rescue units are stationed in Baltic, 19 in the North Sea.

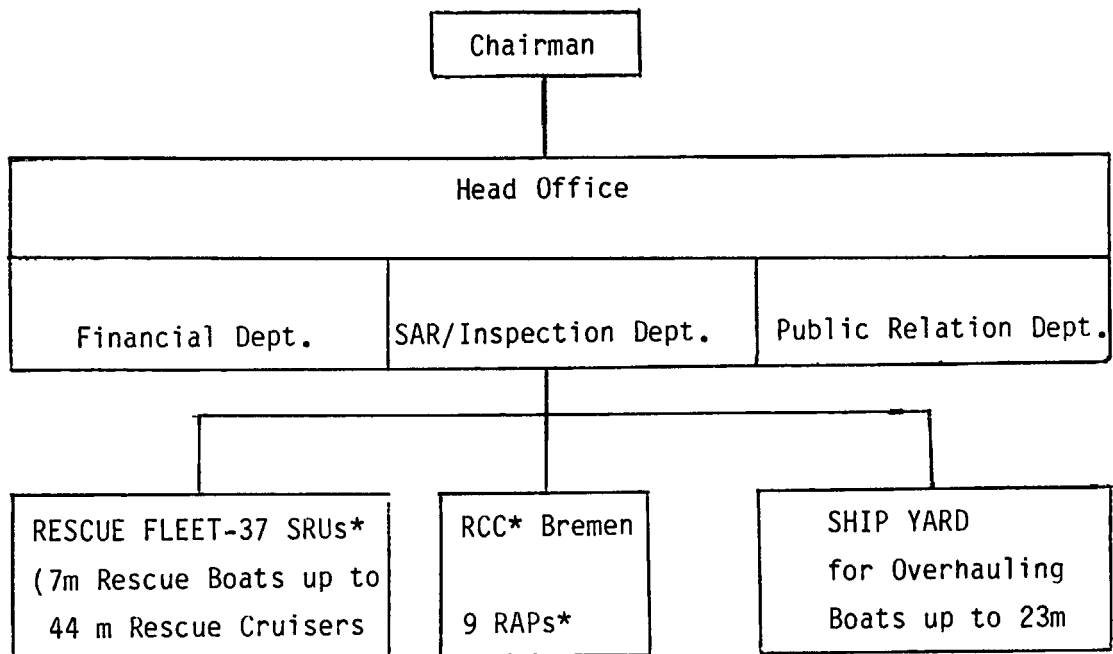
All rescue-cruisers have fire-fighting equipment, versatile possibilities for direction finding, and telecommunication.

The National Agreement Between the Federal Ministry of Transport and the Federal Ministry of Defence:

The military search and rescue (SAR) service shall assist the GLI during SAR-operation in cases of maritime distress along the areas of North and Baltic Sea coast of the Federal Republic of Germany.

ORGANIZATION OF THE GERMAN LIFEBOAT INSTITUTION - GLI

The GLI is a private society, founded in 1865, which is maintained and run only by private contributions, without any governmental aid.

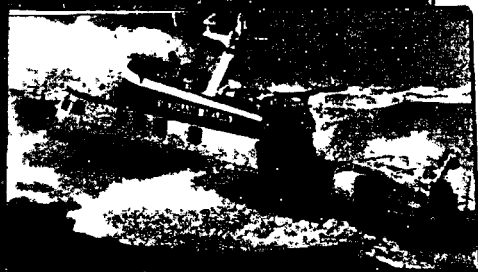
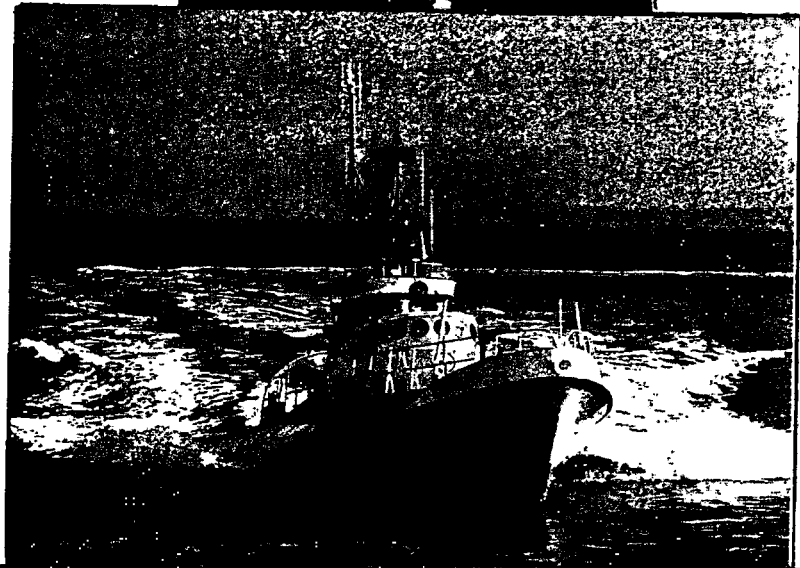


- * RCC = Rescue Coordination Centre
- * RAP = Radio Alerting Posts along German Coast Lines
- * SRU = Sea Rescue Unit

Employees in SAR - Department:










Head Office : 5
 RCC : 10 (24 hours duty)
 Rescue Fleet : 330 (200 are volunteers)
 Ship Yard : 12

FEDERAL REPUBLIC OF GERMANY
GLI SAR UNIT



DEUTSCHE GESELLSCHAFT ZUR RETTUNG SCHIFFBRÜCHIGER

- THE RESCUE - FLEET OF THE G.L.I. -

CLASSES	No. of each cl.	LENGTH	BEAM	DRAFT	DISPL.	SPEED	CREW
		28,20m	8,05m	2,75m	185t	26 kn	6 men
 with 8,8 m 20 Kn Daughter-boat	3	<u>Propulsion:</u> 3 engines, 3 propellers 4405 kw . (5990 hp) fire-fighting equipment, bilge pumps, medical emergency sets, 2 t crane, helicopter working - deck, echo sounder, radar, decca navigator, maritime and aeronautical radiocommunication and direction finding					
 with 7,5 m 16 Kn Daughter-boat	2	27,5m	6,53m	1,65m	100t	24 kn	4 men
 with 8,5 m Daughter-boat	3	<u>Propulsion:</u> 3 engines, 3 propellers 1287 kw . (1750 hp) fire-fighting equipment, bilge pumps, medical emergency sets, echo sounder, radar, decca, maritime and aeronautical radiocommunication and direction finding					
 with 7,0 m Daughter-boat	2 *2	23,30m	5,70m	1,70m	63t/*66t	20 kn	4 men
 with 5,5 m Daughter-boat	4	<u>Propulsion:</u> 2 engines, 2 propellers 1300 kw . (1768 hp) * 1430 kw . (1944 hp) fire-fighting equipment, bilge pumps, medical emergency sets, echo sounder, radar, decca, maritime and aeronautical radiocommunication and direction finding					
 with 5,5 m Daughter-boat	1	18,90m	4,30m	1,40m	35t	16 kn	3 men
 with 5,5 m Daughter-boat	2	<u>Propulsion:</u> 1 engine, 1 propeller 365 kw . (496 hp) fire-fighting equipment, bilge pumps, vhf-radio-telephone, echo sounder, radar bilge-pump, radar, echo sounder, vhf-radiotelephone					
 with 5,5 m Daughter-boat	5	12,20m	3,00m	1,00m	10t	12 kn	3 men
 with 5,5 m Daughter-boat	13	<u>Propulsion:</u> 1 engine, 1 propeller 110 kw . (150 hp) bilge-pump, salvage door, vhf - radiotelephone 9,00m 2,70m 0,90m 5t 13 kn 2 men 7,00m 2,34m 0,60m 2t 10 kn 2 men 33 kw . (45 hp) bilge-pump, salvage door					

MARITIME SEARCH AND RESCUE
THE SWEDISH MODEL

Background:

Since 1871 the National Swedish Administration of Shipping and Navigation (NASAN) has been responsible for the SAR services along the Swedish coast.

The Swedish SAR Organization is formed by eight organizations with the National Administration of Shipping and Navigation (NASAN) as the responsible authority and coordinator.

- Royal Navy
- Royal Air Force
- The Police
- The Coast Guard (Special Branch of the Customs Administration)
- The Board of Civil Aviation
- The Sea Rescue Institution
- The Swedish Telecommunications Administration (Telecom.)

The different organizations have agreed to participate with suitable resources such as ships, helicopters, fixed-wing aircraft, radio stations, radar installations and personnel.

A contract signed between the National Administration of Shipping and Navigation and the Telecommunications Administration for the operation of SAR in Sweden and the other organizations ~~are~~ participating after requisition from the NASAN.

In January this year 1987 a ^{?? change?} regeneration in the regulation of NASAN was approved. The regeneration in the Search and Rescue Organization authorized the Swedish Telecommunications to contact directly with the other coordinators for participation in SAR services.

SAR Organization:

The National Administration of Shipping and Navigation (NASAN).

They are responsible for supervision of sea-resources, resources and incident control agreements with neighbouring countries, training, development of methods, facilities adjustment to international rules.

The administration shipping districts participate by Pilot Stations, pilot boats, rescue boats, district vessels, hydrographic survey ships, ice breakers with light helicopters. The seven coordinators responsible according to the agreement concerning sea rescue and participants are as follows:

1. Royal Navy
rescue helicopters - radar - naval vessels
2. Royal Air Force
rescue helicopters
3. The Police
light helicopters - land patrols - police boats
4. The Coast Guard , Customs Administration
aircraft - customs cutters patrol boats.
Coast Guard service goes back to 1638.

The duties of the Coast Guard are as follows:

- Supervision and Law Enforcement
- Territorial waters interests
- Customs regulations in the coastal areas
- Military protected areas
- Fishery within the fishing zone
- Hunting and fishing in the coastal zone

- Sea traffic in navigable waters
 - Continental shelf activities
 - Dumping
 - Oceanographic observations
 - Search and Rescue
 - Marine environment protection
 - Surveillance and monitoring
 - Abatement of marine pollution at sea and in coastal waters.
5. The Board of Civil Aviation
commercial aircraft - air traffic control
 6. The Sea Rescue Institution (SSRS)
167 lifeboats in 30 stations
The service goes back to 1906.
 7. The Swedish Telecommunications
Rescue Coordination Centres, RCC

The Maritime Rescue Coordination Centres (MRCCs) work by plans and instructions set out by the shipping administration and according to the IMO-SAR Convention. The operations are handled by specially trained SAR Mission Coordinators (SMCs).

The MRCCs and MRSCs are:

MRCC - North at Härnösand (Härnösand Radio)

MRCC - East at Stockholm (Stockholm Radio)

MRCC - West at Gotenburg (Göteborg Radio)

MRSC Tingstäds, Kaslshamn and Öresund are operated by Navy and Coast Guard under responsibility of telecom. MRCC.

MRCCs always have direct communication with their units on MF or VHF radiotelephony. They are also equipped with telex and facsimili.

The units engaged in an operation should follow the plan laid out by the SMC as long as it does not create any danger to the unit.

MRSC Tingstäde, Karlskrona and Malmö are operated the by Navy and the Coast Guard directly under the NASAN SAR-branch but will get the missions from the MRCC:s.

MRCCs always have direct communication with their units on MF or VHF radiotelephony. They are also equipped with telex and facsimili.

The units engaged in an operation shall follow the plan laid out by the SMC as long as it does not create any danger to the unit.

Alerting:

The Swedish MRCC are located with three different CRS:

- National Emergency phone number 90000
- International radio distress frequencies
- Citizen band radio frequencies
- Remote islands with emergency radio station on VHF or citizen band
- Telex from COSPAS - SARSAT terminal
- Telex from INMARSAT ground station

MRCC Gotenburg at Göteborg Radio:

Is responsible for sea rescue operations along the western seaboard of Sweden and on lakes, Vänern and Vättern.

When there is an emergency at sea, the SAR Mission Coordinator will assess the situation and decide the action to be taken, dispatching offshore rescue vessels, rescue helicopters or fast inshore lifeboats as the case may be.

Also at Göteborg Radio accept, on all frequencies 500 KHz, 2182 KHz and VHF channel 16, messages according to the AMVER system for improving the sea rescue work in the oceans of the world. Göteborg Radio /SAG is one of the oldest coast radio stations in the world.

In September 1911 it was established for public correspondence and it has been a pioneer of marine radio communications ever since offering:

- HF telegraphy since 1930
- HF telephony since 1937
- Search and Rescue Coordination Since 1949
- VHF telephony since 1961
- MARITEX automatic radio telex since 1971

Presently Göteborg Radio is a technically advanced coast station performing a number of duties by means of new and flexible operating such as the operation of remote controlled VHF stations covering the Swedish west coast and lakes Vänern and Vättern and the channels.

Note: The NASAN, the Telecom and the Civil Aviation Authority all belong to the Ministry of Communication. This means that both Maritime and Aviation SAR are under the same Ministry.

Training:

Since 1979 the Shipping Administrations SAR School on Arkö has been offering SAR training to all SAR personnel.

Teaching facilities, communication simulator, a slip-way for rescue boats and life rafts, various boats equipment and audiovisual aids.

At the moment there are two full-time instructors and eight part-time teaching in combination with the jobs within the SAR service.

The school offers training courses in safety according to IMO requirements. At present it works with IMO in order to standardize

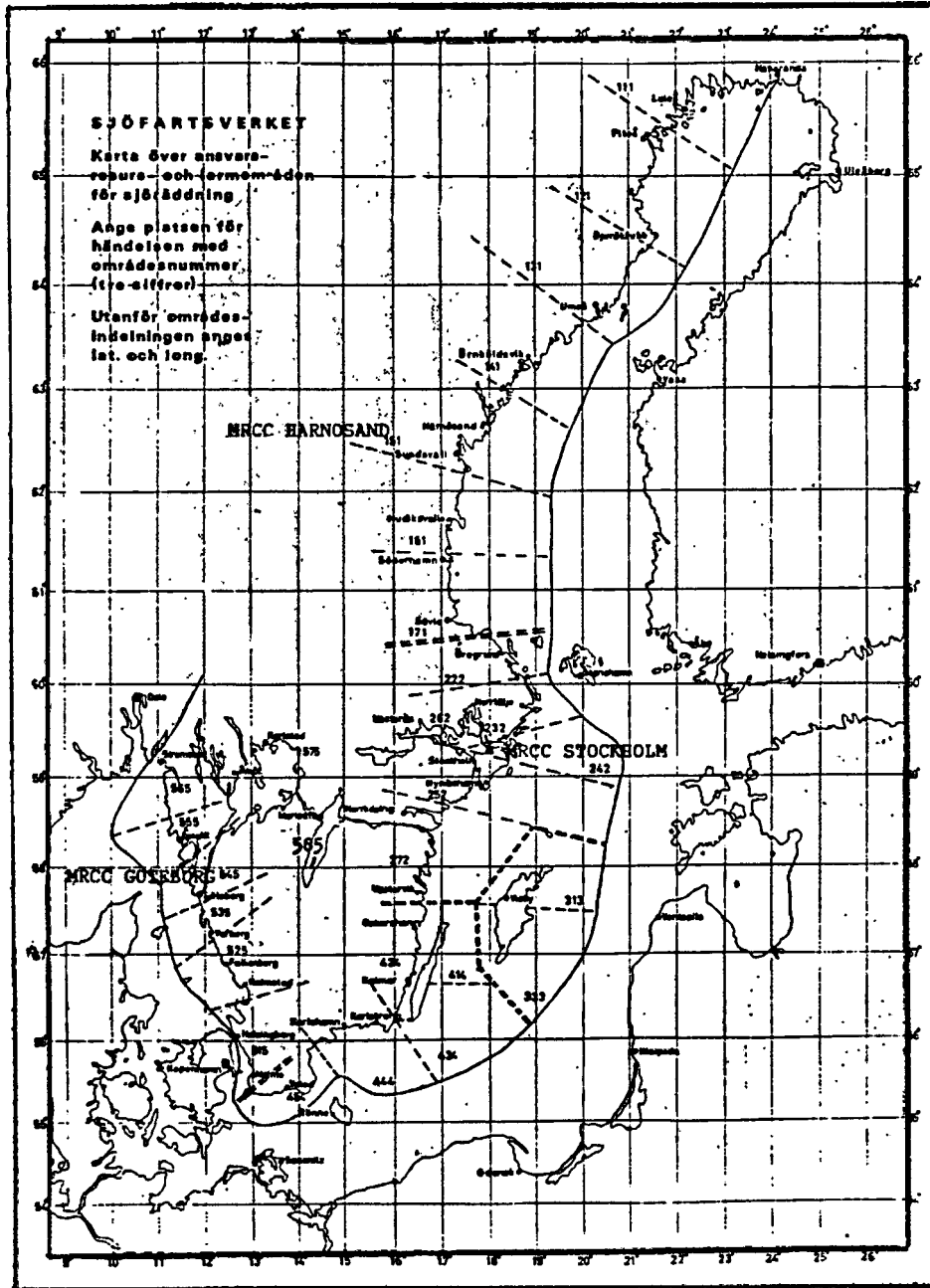
International SAR Training Programmes and the Shipping Administration has declared that the school can undertake training for foreign students.

International Agreements:

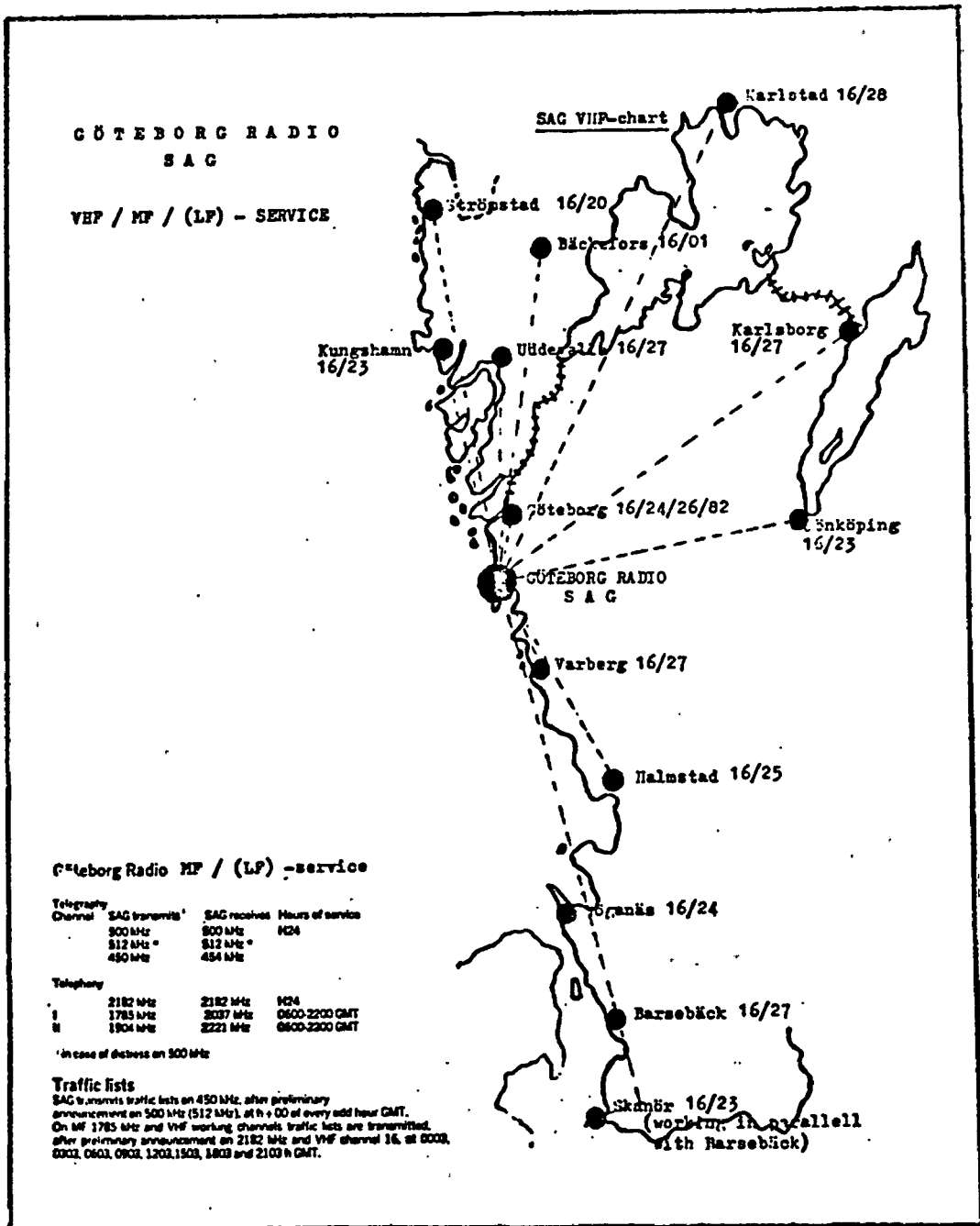
Sweden takes part both in SAR Plan for the Baltic Sea and the North Sea.

Complete agreement has been reached with Finland, German Democratic Republic and substantially complete agreement with the Soviet Union. At present work is done on agreement with Norway and Denmark.

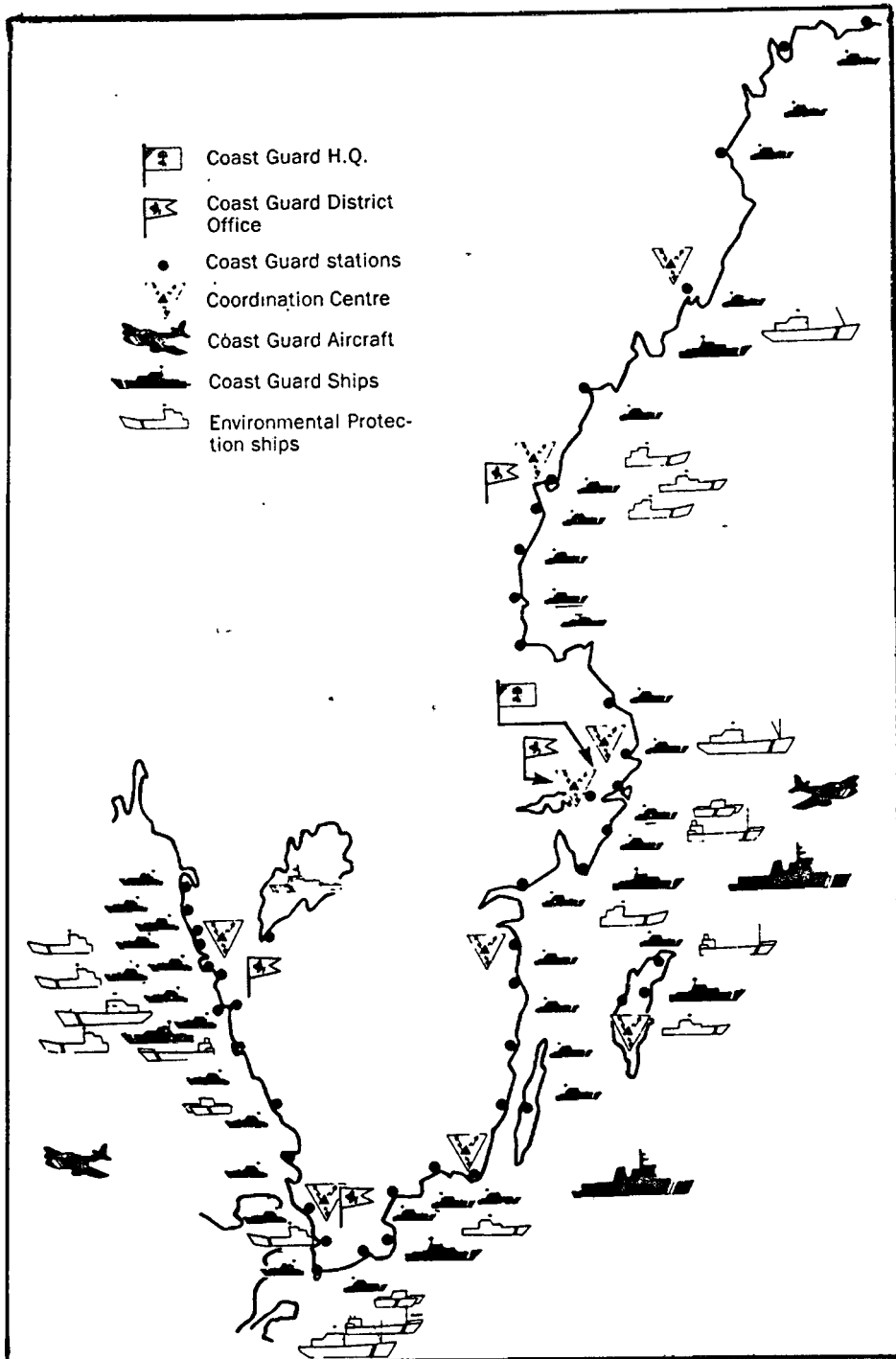
THE SWEDISH SEARCH AND RESCUE AREA



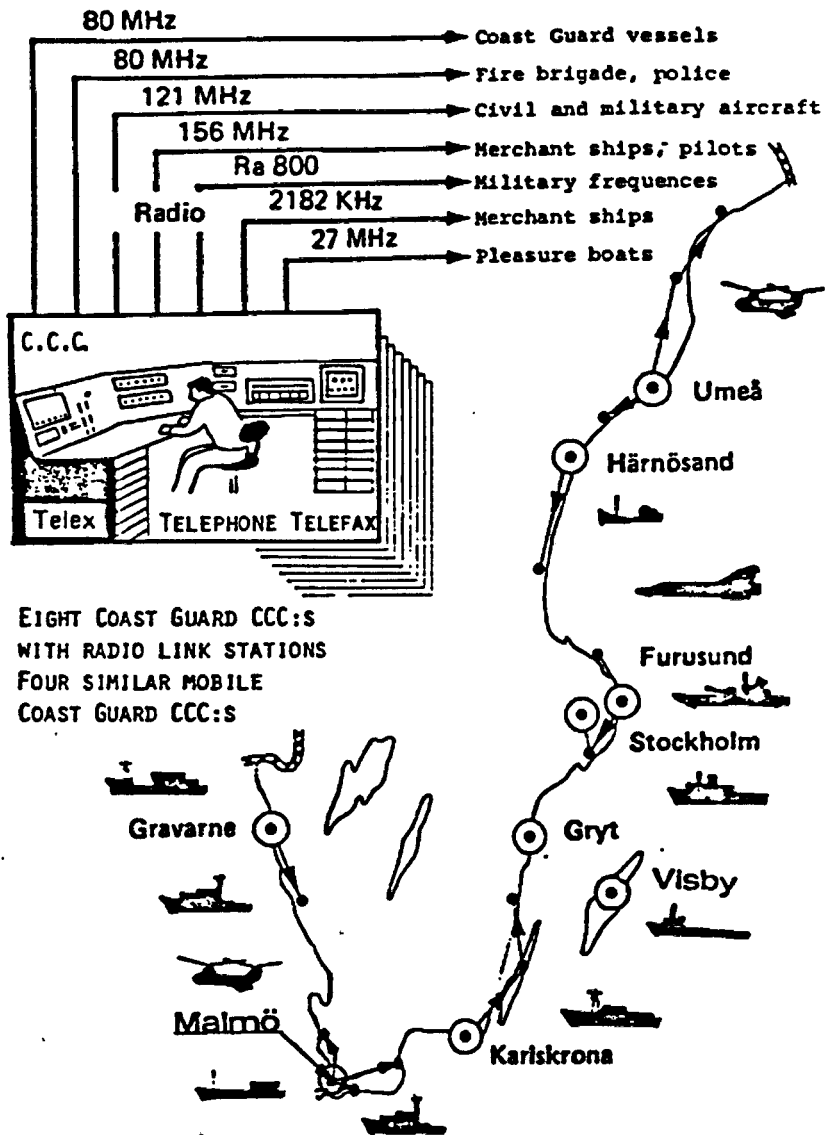
GÖTEBORG RADIO



SWEDISH COAST GUARD

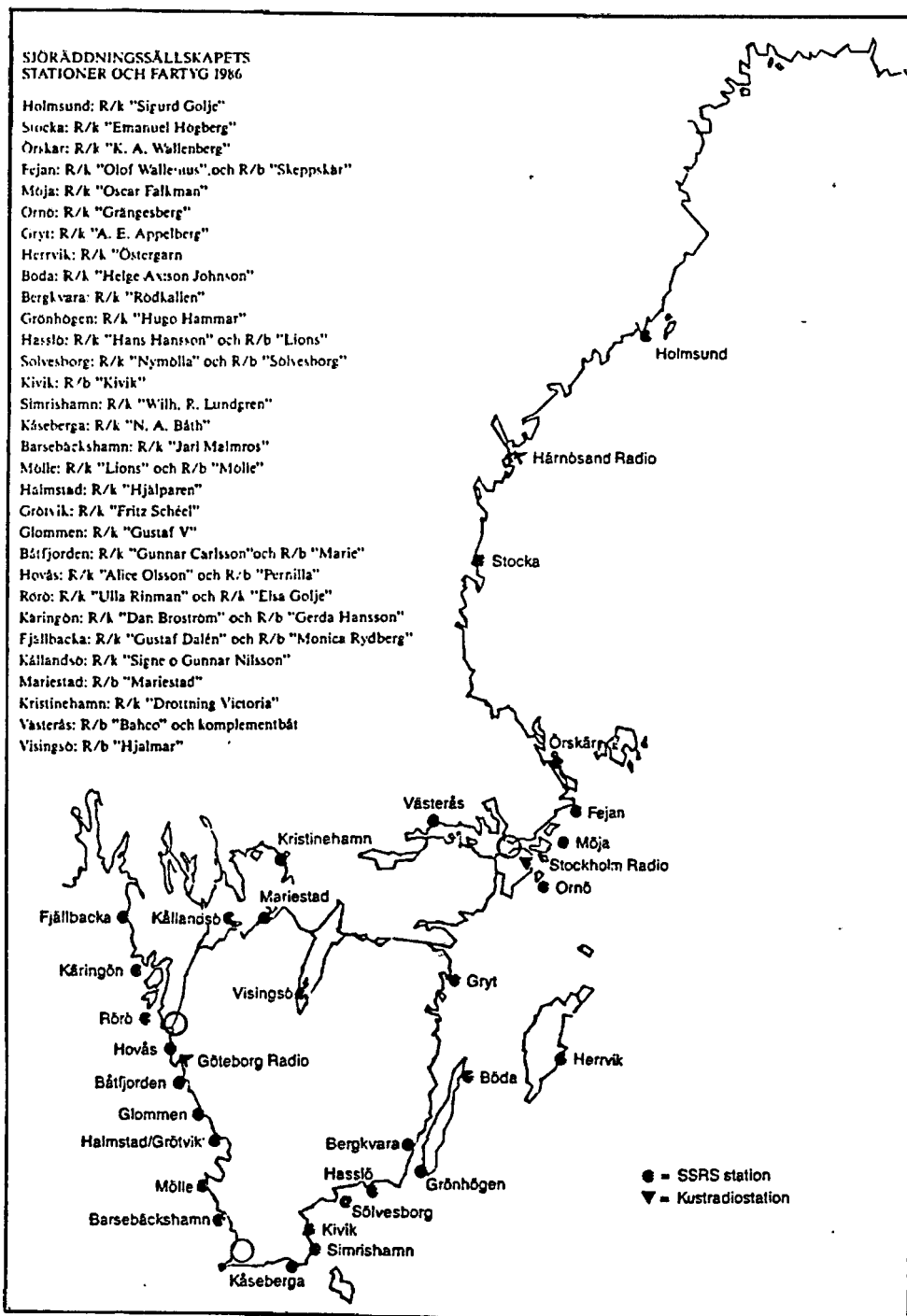


SWEDISH COAST GUARD TELECOMMUNICATION NET



C.C.C = Communication and Co-ordination Center

THE SWEDISH SEA RESCUE INSTITUTION (SSRS)



A G R E E M E N T

Between the Ministry of Transport of the German Democratic Republic and the National Administration of Shipping and Navigation and the Civil Aviation Administration of the Kingdom of Sweden on co-operation in respect to the rescue of human life in the Baltic Sea.

The Ministry of Transport of the Germany Democratic Republic and the National Administration of Shipping and Navigation and the Civil Aviation Administration of the Kingdom of Sweden as competent authorities of the Contracting Parties according to Article 3 of the Agreement between the Government of the German Democratic Republic and the Government of the Kingdom of Sweden concerning co-operation in respect to the rescue of human life in the Baltic Sea have agreed as follows, in accordance with Article 6, paragraph 2 of that Agreement:

Article 1:

1. For the purposes of this Agreement the definitions contained in Chapter 1 of the Annex to the International Convention on Maritime Search and Rescue, 1979, and in Chapter 1 of Annex 12 to the Convention on International Civil Aviation, 1944, will be applicable.
2. In addition, the IMO Search and Rescue Manual and MERSAR-Manual should be used as a basis for the conduct of operations covered by this Agreement.

Article 2:

1. The services responsible for maritime and aeronautical search rescue are:
 - A. In the German Democratic Republic the search and rescue services (hereinafter referred to as SAR-services)
 - the maritime search and rescue service of the German Democratic Republic

Board of Navigation and Maritime Affairs of the GDR
(Seefahrtsamt der Deutschen Demokratischen Republik)
 - the aeronautical search and rescue service of the German Democratic Republic

State Civil Aviation Inspection of the German Democratic Republic
(Staatliche Luftfahrtinspektion der DDR)
 - B. In Sweden the SAR-services
 - The National Swedish Administration of Shipping and Navigation
(Sjöfartsverket)
for maritime search and rescue
 - The Swedish Civil Aviation Administration
(Luftfartsverket)
for aeronautical search and rescue.
2. The competent authorities shall inform each other of the main equipment and facilities of their respective SAR-services and on changes in them. The exchanged information shall be attached as an Annex.

Article 3:

1. Assistance to be rendered by Swedish SAR-services in cases where human life is or is believed to be in danger on or over the Baltic Sea:
 - In respect to surface vessels,
the maritime rescue co-ordination centre (MRCC) Rostock, GDR,
shall contact the Swedish maritime rescue co-ordination
centre (MRCC) Stockholm.
 - In respect to aircraft,
the aeronautical rescue co-ordination centre (ARCC)
Berlin-Schönefeld, GDR = ATCC Berlin-Schönefeld
shall contact the Swedish aeronautical rescue co-ordination
centre (ARCC), Stockholm.
2. Assistance to be rendered by SAR-services of the German Democratic Republic in cases where human life is or is believed to be in danger on or over the Baltic Sea:
 - In respect to surface vessels,
the Swedish maritime rescue co-ordination centre (MRCC)
Stockholm shall contact the maritime rescue co-ordination
centre (MRCC) Rostock, GDR.
 - In respect to aircraft,
the Swedish aeronautical rescue co-ordination centre (ARCC)
Stockholm shall contact the aeronautical rescue co-ordination
centre (ARCC).
Berlin-Schönefeld, GDR = ATCC Berlin-Schönefeld.
3. When requesting assistance from the other party's RCC, the requesting RCC shall arrange for any necessary permission for entry into this state's territory of rescue units from the other party. In order to arrange for such permission, the assisting

party shall soonest inform the requesting RCC about number, type(s) and call-sign(s) of the rescue-units offered.

4. When granting permission, any special conditions for such entry e.g. ports or landing grounds to be used, shall be stated.

Article 4:

1. When a request for permission to enter into the other state's territory is made, such a request shall be made:
 - from MRCC-Stockholm to MRCC Rostock
 - from ARCC-Stockholm to ARCC-Berlin-Schönefeld
 - from MRCC-Rostock to MRCC-Stockholm
 - from ARCC-Berlin-Schönefeld to ARCC Stockholm
2. All requests for entry shall be acknowledged by the receiving RCC.
3. The receiving RCC shall as soon as possible advise whether entry is permitted or not and whether there are any special conditions for the entry.

Article 5:

1. When carrying out joint SAR-operations, the RCC in the search and rescue region where the SAR-incident occurred, shall coordinate with the RCC of the other party the way to communicate with the rescue-units.

All messages shall be confirmed via telex or AFTN using the IMO sitrep-form.

2. For the efficiency of a SAR-operation, the rescue co-ordination centres can agree between themselves a different responsibility for coordinating it.

Article 6:

1. The parties shall inform each other about telex, telephone, AFTN and facsimile codes or numbers to be used for co-operation and shall immediately inform each other about changes.
2. The serviceability of the lines shall be checked at least once every three months.

Article 7:

As a rule, liaison officers of the SAR-services shall meet every year alternatively. At their meeting they shall especially consider matters concerning:

- any need for a conference between the competent authorities of the parties;
- any need for liaison visits of SAR experts;
- any need for mutual exercise to be held;
- the possibility for SAR experts to participate as observers at national exercises of the other party;
- development of proposals for any additional or modified regulations for the promotion of the cooperation within the frames of this Agreement.

Article 8:

Modifications of and amendments to this Agreement within the frame

of the governmental Agreement may be agreed by the competent authorities of the Contracting Parties and shall be made in writing. Modifications and amendments of the Annexes shall be agreed by the contact officers.

Article 9:

This Agreement shall enter into force upon signature. It shall remain in force as long as the "Agreement between the Government of the German Democratic Republic and the Government of the Kingdom of Sweden concerning co-operation in respect of the rescue of human life in the Baltic Sea", 27 August 1986, is in force.

At the same time the "Protocol between the Ministry of Transport of the German Democratic Republic and the Swedish Civil Aviation Administration on co-operation in respect of the search and rescue of passengers and members of the crew of aircraft in emergencies above the Baltic Sea", 13 October 1975, shall cease to be effective.

MARITIME SEARCH AND RESCUE
UNITED KINGDOM MODEL

The United Kingdom's responsibility for search and rescue measures for ships or persons in distress or in need of assistance covers the coasts of the UK and Northern Ireland and extends over an area which corresponds to that laid down by the International Civil Aviation Organization (ICAO) as the area assigned to the UK for aircraft distress except in the English Channel where a mutually agreed demarcation line for Maritime Search and Rescue purposes has been established by the United Kingdom and France.

The UK has six civil Maritime Rescue Co-ordination Centres (MRCCs) which are supplemented by 21 Maritime Rescue Sub Centres (MRSCs). These centres are manned by Her Majesties Coast Guard. Two RCCs in addition to the six are at Plymouth and Edinburgh who control all aeronautical SAR in their respective regions of UK search area.

Co-operation With HM Coast Guard:

1. The Royal Navy Rescue Helicopters.
2. The royal Air Force Nimrod, Sea King and Wessex Aircraft.
3. Eleven Coast Radio Stations (CRS), cooperate with direct telephone and telex links to adjacent coast guard radio liaison stations (CRLs) which communicate directly to MRCC/MRSL.
4. 200 lifeboat stations are run by the Royal National Lifeboat Institution (RNLI).

The Royal National Lifeboat Institution (RNLI)

History:

A hundred and sixty three years ago the RNLI was founded in 1824, following the publication of "An Appeal to the British Nation" by Sir William Hillary. Hillary witnessed many shipwrecks and himself helped to rescue over 300 people from death at sea following the foundation of the "National Shipwreck Institution" (the title RNLI was adopted in 1854).

During the period 1854 - 1869, the RNLI received a government grant. This was relinquished at the Institution's request, for the government had imposed conditions which were unpopular with the local station committees. Furthermore the existence of the grant adversely affected income from voluntary contributions.

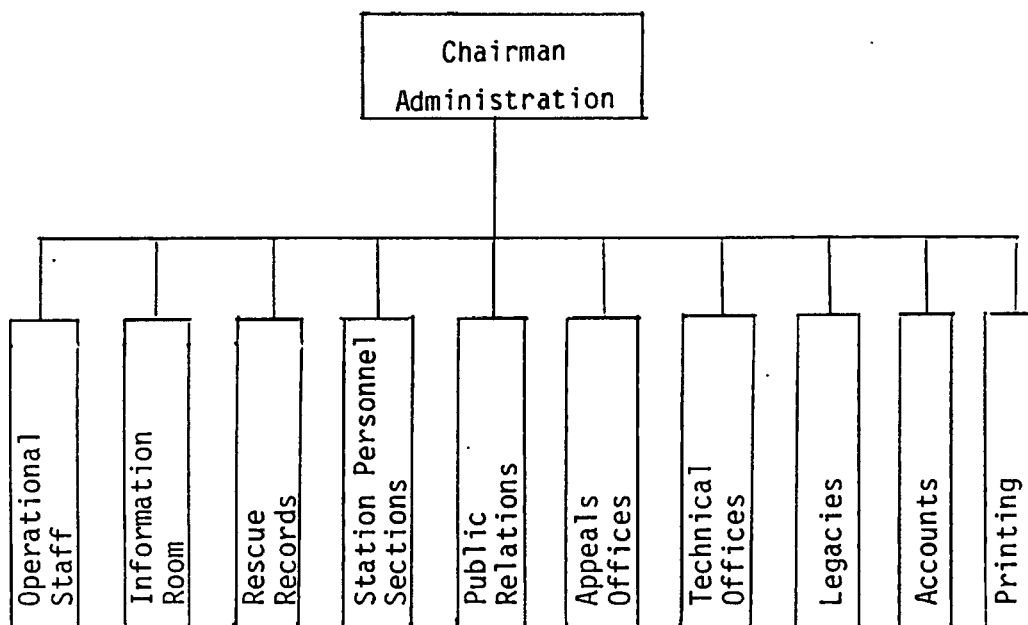
After an enthusiastic start the Institution went into a period of declining income and in 1850 there were only 19 lifeboats connected with the service.

The RNLI Today:

There are over 128 large lifeboats, ranging from 10 to 21.3 m. in length and more than 129 lifeboats of 4.9 to 6.4 m. There are 200 lifeboat stations and these stations are divided into seven operational divisions, each under the supervision of an Inspector of Lifeboats, with other coastal staff consisting of engineers, hull surveyors and electronic engineers.

Stations have honorary medical advisers, who in addition to giving first aid training may also go in the lifeboat if a doctor is required by a vessel.

The RNLI's headquarters in Polle Dorset, the Head Office Bode.



The Fund of RNLI:

To run the Lifeboat Service around 25 million pounds a year must be raised. There are fourteen fund-raising regions, each with a paid regional organizer and a small staff who assist the fund-raising activities of almost 2,000 voluntary branches and ladies guilds. The voluntary system operates in other countries, such as the Netherlands, Spain, Sweden, New Zealand and South Africa and West Germany.

The 260 lifeboats, ranging from 4.9 to 21.3 m. in length and the relief fleet of 111 lifeboats are run by volunteer lifeboat men and women and there is only one part time member of the crew, who is the mechanic, whose job is to maintain the lifeboat and its engine. Also there are two completely full time crews at Humber (Yorkshire), where the men live on an isolated peninsula, and Clovelly (Devon),

where there is a cruising lifeboat. The volunteers receive a small allowance to compensate for loss of earnings when they are on service. This is 5 pounds for the first hour and 1.70 pounds for each hour afterwards.

The RNLI works and co-operation with HM Coast Guard in its role as co-ordinator the coast guard service may decide to call out helicopters from the nearest Royal Navy or Royal Air Force Base or RNLI.

Most calls on a lifeboat come from the coast guard who will contact the honorary secretary. He will alert the coxwain, crew and launchers by firing maroons, telephoning and, at a growing number of stations, by using radio paging beepers.

Once a lifeboat is at sea it is the coxswain who is in command. He will keep radio contact with the nearest coast guard station who will be able to keep him up-to-date with information about the casualty if the lifeboat is not already in direct radio contact.

THE ROYAL NATIONAL LIFEBOAT INSTITUTION (RNLI)
SAR UNIT



MARITIME SEARCH AND RESCUE
THE UNITED STATES MODEL

Introduction:

In 1973 a conference was held for the National Search and Rescue, the purpose of which was to establish the Interagency Committee on SAR.

The Committee shall consist of representatives of the Departments of Transportation, Defense, Commerce, Interior, the National Aeronautics and Space Administration, the Federal Communications Commission, and the Federal Emergency Management Agency.

The National SAR Plan - 1981 is superseded by the 1986 National SAR Plan.

That plan continues by interagency agreement the effective use of all available facilities in all types of SAR missions in any one area by a single federal agency.

The Agencies Carrying Out SAR Responsibilities in USA:

The agencies of the Department of Transportation carry out broad responsibilities in transportation safety. The United States Coast Guard develops, established, maintains and operates rescue facilities for the promotions of safety on, under and over the high seas and waters subject to the jurisdiction of the United States.

To help assign United States SAR coordination responsibilities, three SAR areas are identified. Federal agencies are assigned overall responsibility for coordinating SAR within each area.

1. Inland Area - U.S. Air Force:

Continental United States, except Alaska, and waters under the jurisdiction of US.

2. Overseas Area - Appropriate Overseas Unified Command or Alaskan Air Command:

The inland area of Alaska and all other portions of the globe are not included within the Inland Area or Maritime Area.

3. Maritime Area - US Coast Guard:

Waters subject to the jurisdiction of the US, Hawaii, portions of Alaska South of 58 degrees north latitude and east of 141 degrees west longitude, and the high seas and those commonwealths, territories and possessions of the US lying within the Maritime Area as designated on the attached chart. The Maritime Area has two portions, the Atlantic Area and the Pacific Area.

THE UNITED STATES COAST GUARD (USCG)

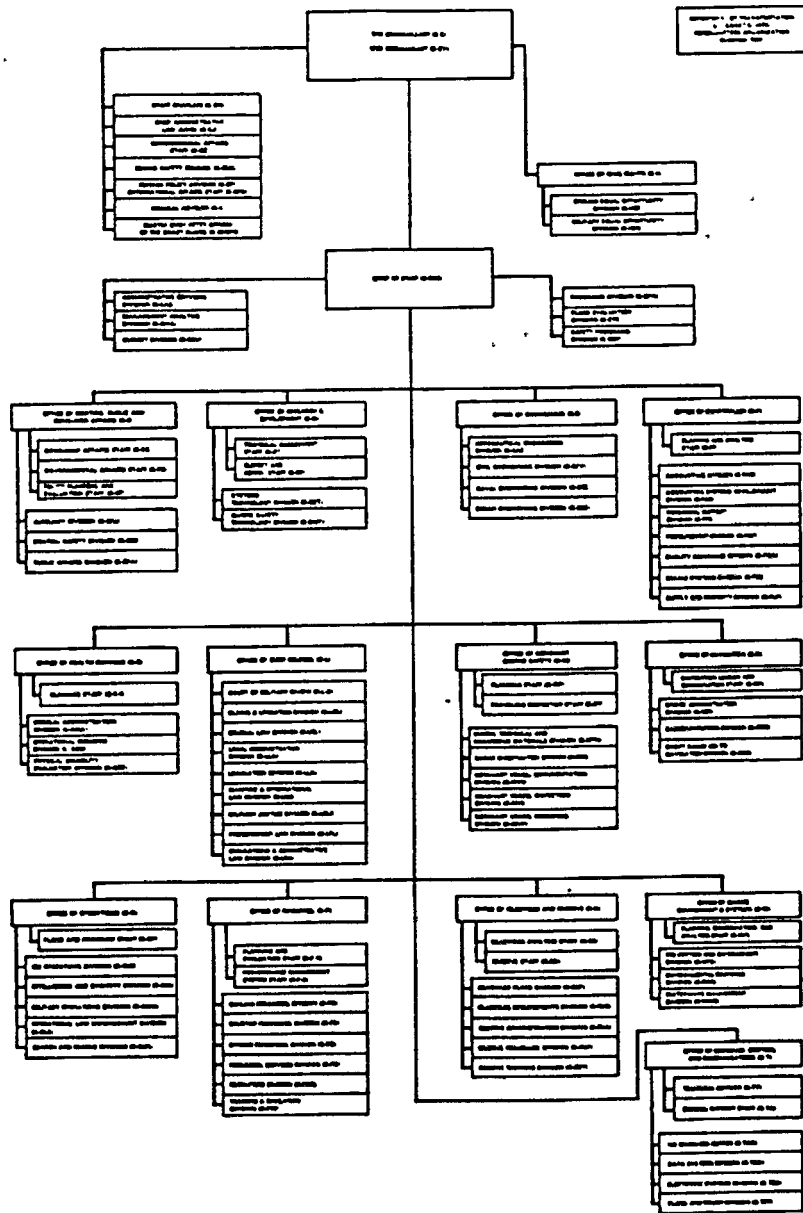
Background:

The Coast Guard is a unique and complex organization which serves the diverse roles of military service, regulator, operator, ambassador, and handyman. It developed into its present character through a series of changes starting from its roots as the Revenue Cutter Service in 1790 and adding such other specialized functions as the Life Saving Service and the Lighthouse Service over the years.

Overall Organization:

1. One of five armed services with peacetime and wartime responsibilities.
2. Agency of Department of Transportation (DOT) in peace time, become part of Department of Defence (DOD) in wartime or when President directs.
3. Comprised of approximately 32,240 military personnel and 6,077 civilians. Augmented by 12,500 reservists and over 32,000 auxillarists.
4. Executes missions thru operating fleet of ships, aircraft and boats plus shore facilities, communications network and training facilities.

OVERALL ORGANIZATION OF THE DOT - CG



Thanks!

Specific Functions of CG to Carry Out Missions are:

1. Military operations and preparedness.
2. Training to exercising Maritime Search and Rescue by using its fleet of ships, aircraft and boats, additionally involves an extensive network of small stations and a high seas mutual assistance service for merchant ships of all nations.
3. Vessel inspections.
4. Ship building and repair oversight.
5. Licensing and certifying mariners.
6. Documenting vessels and accident investigations.

Throughout US inland waters and along her coasts the Coast Guard receives yearly an average of 80,000 calls of assistance on water. Some 5,000 persons are saved from death and over 140,000 other persons are aided in some way. The CG man stations round the clock ready to dispatch rescue boats to distress calls. The 26 air stations are also on 24-hour call ready to lend search assistance, or to perform rescues when vessel rescue is not possible. The vital communications necessary to coordinate the work of these units are handled through a network of Rescue Coordination Centers. Related to the Coast Guards Search and Rescue activities is the Automated Mutual - Assistance Vessel Rescue (AMVER) programme, sponsorship of (SARSAT) system and participation in the International Ice Patrol since 1913 as a result of the TITANTIC disaster.

Office of Operations Briefing

Operating Programs

<u>Program</u>	<u>Office Managing</u>
Aids to Navigation	Navigation
Radio Navigation Aids	Navigation
Bridges	Navigation
☛ Domestic & Polar Icebreaking	Operations
☛ Law Enforcement	Operations
Marine Safety, Security & Environmental Protection	Marine Safety
Recreational Boating Safety	Boating
Waterways Management	Marine Safety
☛ Defense Operations	Operations
Reserve Force Training	Reserve
☛ Search and Rescue (SAR)	Operations

September 17, 1987

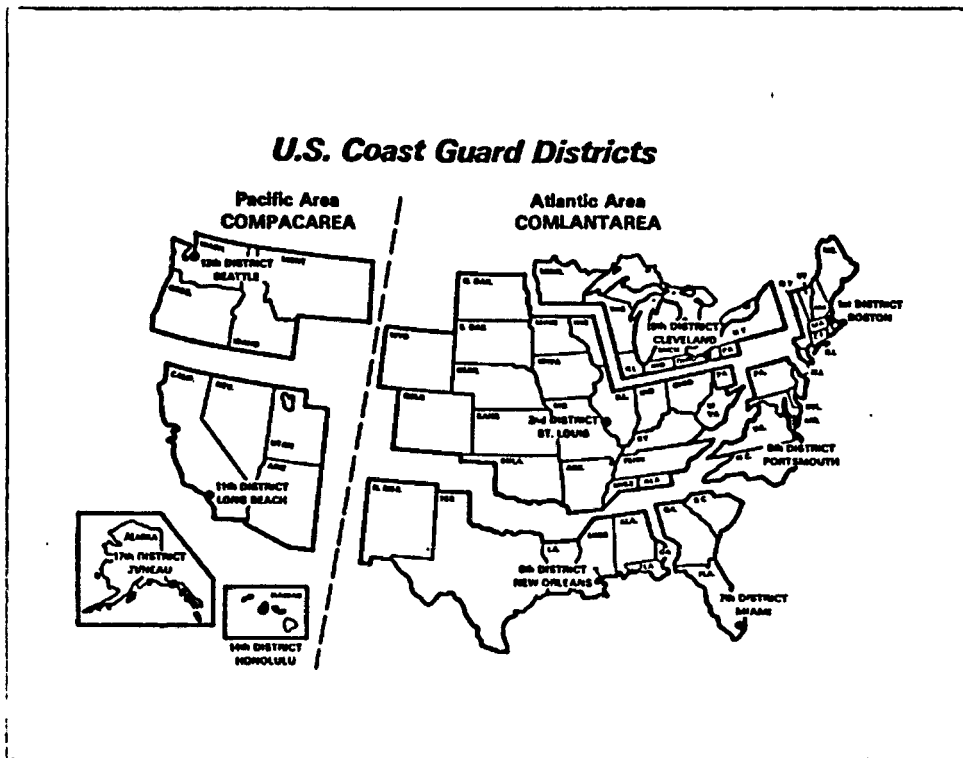
Office of Operations Briefing

Search and Rescue

Program Goals

- o Minimize the loss of life, personnel injury, and property damage on, over, and under the high seas and waters subject to the jurisdiction of the United States.
- o Promote international and domestic cooperation to provide and improve search and rescue activity.
- o Perform assigned search and rescue responsibilities in support of military operations.

September 17, 1987



UNITED STATES SEARCH AND RESCUE AREAS

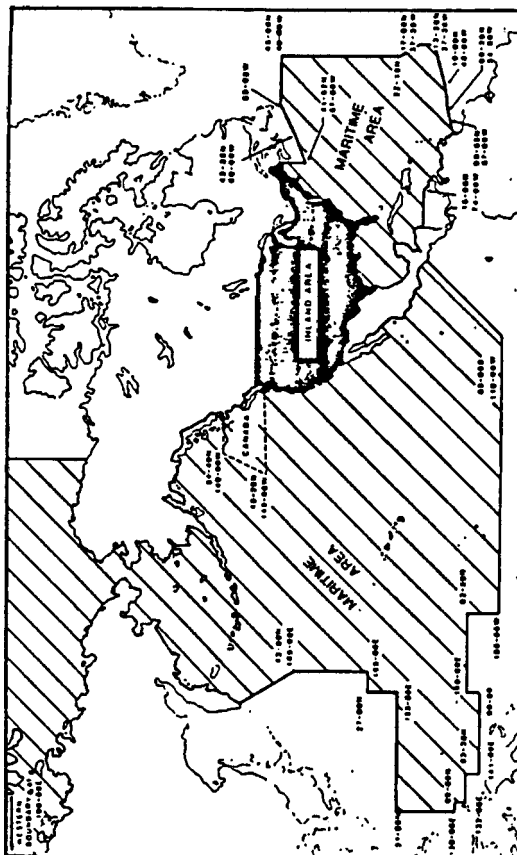


Figure A-1. United States Search and Rescue Area

AGREEMENT BETWEEN THE GOVERNMENT OF THE
UNITED STATES OF AMERICA AND THE GOVERNMENT OF
JAPAN ON MARITIME SEARCH AND RESCUE

The Government of the United State of America (hereinafter referred to as "the U.S.A.") and the Government of Japan,

Under the International Convention on Maritime Search and Rescue, 1979 (hereinafter referred to as "the Convention"),

Recognizing the great importance of cooperation in maritime search and rescue and of the provision of expeditious and effective search and rescue services,

Have agreed as follows:

Article I:

1. The Parties limit, in accordance with the relevant provisions of the Convention, their respective search and rescue regions in the North Pacific as follows:

The search and rescue region of the U.S.A. is limited on the western and northern sides by the line connecting the coordinates $52^{\circ}30'N$, $165^{\circ}E$; $21^{\circ}N$, $165^{\circ}E$; $21^{\circ}N$, $130^{\circ}E$; and $17^{\circ}N$, $130^{\circ}E$.

The search and rescue region of Japan is limited on the eastern and southern sides by the line connecting the coordinates $52^{\circ}30'N$, $165^{\circ}E$; $17^{\circ}N$, $165^{\circ}E$; and $17^{\circ}N$, $130^{\circ}E$.

2. The establishment of search and rescue regions is intended only to effect an understanding concerning the regions within which each Party accepts primary responsibility for coordinating maritime search and rescue operations.

Article II:

Either Party, on receiving information of any person in distress at sea within its search and rescue region as provided in Paragraph 1 of Article I, shall take urgent measures to provide the most appropriate assistance available regardless of the nationality or status of such a person or the circumstances in which that person is found.

Article III:

1. The Parties, in conducting their search and rescue operations including the urgent measures referred to in Article II, shall cooperate with each other when necessary and coordinate their search and rescue operations for that purpose.
2. For any search and rescue operation involving the rescue units of both Parties in the area where the search and rescue regions of both Parties overlap, the Parties shall decide in each case which Party will have primary responsibility for coordinating the search and rescue operations through consultation.
3. In order to facilitate the coordination referred to in Paragraph 1, the Parties shall endeavor to ensure the use of common search and rescue procedures and to provide the necessary means of communication.

Article IV:

1. The Parties shall report to each other on maritime search and rescue cases of common interest when necessary or appropriate.
2. The Parties shall endeavor to exchange information, in addition to that related to specific search and rescue cases, that may serve to improve the effectiveness of maritime search and rescue operations.

Article V:

The Parties, to promote mutual cooperation in the field of maritime search and rescue, will pay due consideration to various collaborative efforts including:

- a. Mutual visits between search and rescue programme managers and Rescue Coordination Center personnel,
- b. Conduct of joint exercises of search and rescue operations, and of training in search and rescue services,
- c. Mutual use of ship reporting systems for search and rescue,
- d. Development of search and rescue procedures, techniques, equipment, and facilities, and
- e. Provision of services in support of search and rescue operations such as use of fueling or medical facilities.

Article VI:

1. Nothing in this Agreement shall affect in any way the rights and duties based on other international agreements pertaining to either Party.
2. The Parties will implement this Agreement in accordance with international law and their respective laws and regulations.

Article VII:

1. This Agreement shall enter into force on the date of signature.
2. This Agreement shall remain in force for a period of three

years, and shall continue in force thereafter subject to termination on the date of expiration of six months after written notice by either Party to the other of its intention to terminate this Agreement, or on the date of the entering into force of a superseding agreement.

3. Termination as referred to in Paragraph 2 shall not affect the maritime search and rescue operations which have been undertaken hereunder and are not yet completed at the time of termination as referred to in Paragraph 2 unless otherwise agreed to by the Parties.
4. This Agreement may be amended by written agreement between the Parties.

MARITIME SEARCH AND RESCUE
CANADIAN MODEL

Introduction:

The Search and Rescue Organization in Canada is a coordinated organization, involving the participation of several governmental departments and agencies - the Departments of National Defence (DND), Transport Canada (TC) - The Canadian Coast Guard, with DND having the ultimate authority for the establishment of priorities pertaining to the allocation of SAR resources in response to SAR incidents. These are partners with the assistance of other federal departments, particularly the Department of Fisheries and Oceans (DFO), the Royal Canadian Mounted Police, Indian Affairs and Northern Development and Energy, Mines and Resources.

All government services related to Search and Rescue are formally reviewed on an annual basis. This process involves local identification of SAR needs in all regions of Canada and assembly of these into a comprehensive set of proposals for review by the Inter-departmental Committee on Search and Rescue (ICSAS) which is co-chaired by senior officials of National Defence and Transport Canada.

Departmental SAR Tasks:

A. Department of National Defence (DND):

a. Primary SAR Tasks:

1. To coordinate, control and conduct SAR operations in relation to air SAR incidents within Canadian area of responsibility.
2. To provide resources in support of the prosecution of marine SAR operations and to exercise ultimate authority

in the allocation of all SAR resources during a SAR incident.

3. To conduct ground searches in relation to air and marine SAR incidents.

b. Secondary SAR Tasks:

1. To provide SAR resources when and where available to assist in the prosecution of humanitarian and civil incidents which occur within provincial or municipal areas of responsibility.
2. To support Canadian Air Transport Administration (CATA) and CCG in SAR prevention through participation in related educational programmes and by advising the appropriate authority of possible infractions of regulations.

B. Canadian Coast Guard (CCG):

a. Primary SAR Tasks:

1. To detect marine incidents and in collaboration with DND to coordinate, control and conduct SAR operations in marine SAR incidents within the Canadian area of responsibility.
2. To provide marine resources in support of the prosecution of air SAR operations where applicable.
3. To coordinate control and conduct SAR prevention programmes to reduce the number and severity of marine SAR incidents.

b. Secondary SAR Tasks:

To provide SAR resources when and where available to assist

in the prosecution of humanitarian and civil incidents within provincial or municipal of responsibility.

Civil Associations and Volunteers:

The Canadian Marine Rescue Auxiliary (CMRA):

The CMRA associations have contractual agreements to provide members/vessels to augment existing Coast Guard SAR resources in SAR operations and to assist the Coast Guard in SAR prevention activities. Tasking of CMRA units is to be considered in the absence of more appropriate SAR facilities or when it is perceived that by utilizing CMRA units the SAR objectives can be achieved more quickly.

The CMRA Volunteers provide SAR services on waterways, the Gulf of St. Lawrence, the St. Lawrence River and the Great Lakes system.

More than 1500 Rescue Auxiliary Volunteers work in the five Coast Guard regions across Canada.

Volunteers must be of legal age and in good health. Volunteers join the CMRA either as owner/operators or as crew members. In the tradition of all volunteers CMRA members do not receive a salary. They do receive insurance coverage and partial payment for fuel used while effecting a rescue. More importantly, all CMRA members can take great pride in the knowledge that they are serving fellow mariners.

Search and Rescue Regions (SRR) Boundaries:

1. Victoria SRR
2. Edmonton SRR
3. Trenton SRR
4. Halifax SRR

CANADA COAST GUARD AND SAR SERVICES

Twenty-three CCG officers conduct SAR prevention activities throughout the five CCG Regions, particularly in areas where significant demands for marine SAR services have been demonstrated.

The nerve centres for searches are four RCCs across Canada. Here the movements of search air-craft and rescue helicopters of the Canadian Armed Forces are coordinated with CCG - vessels of transport, also federal fisheries patrol ships and others to locate and rescue lost mariners and aviators across 243,800 kilometre coastline - the longest in the world.

A national SAR plan recommends SAR improvements based on assessments at the regional level. The plan also provides for additional SAR resources for activities with a high hazard potential.

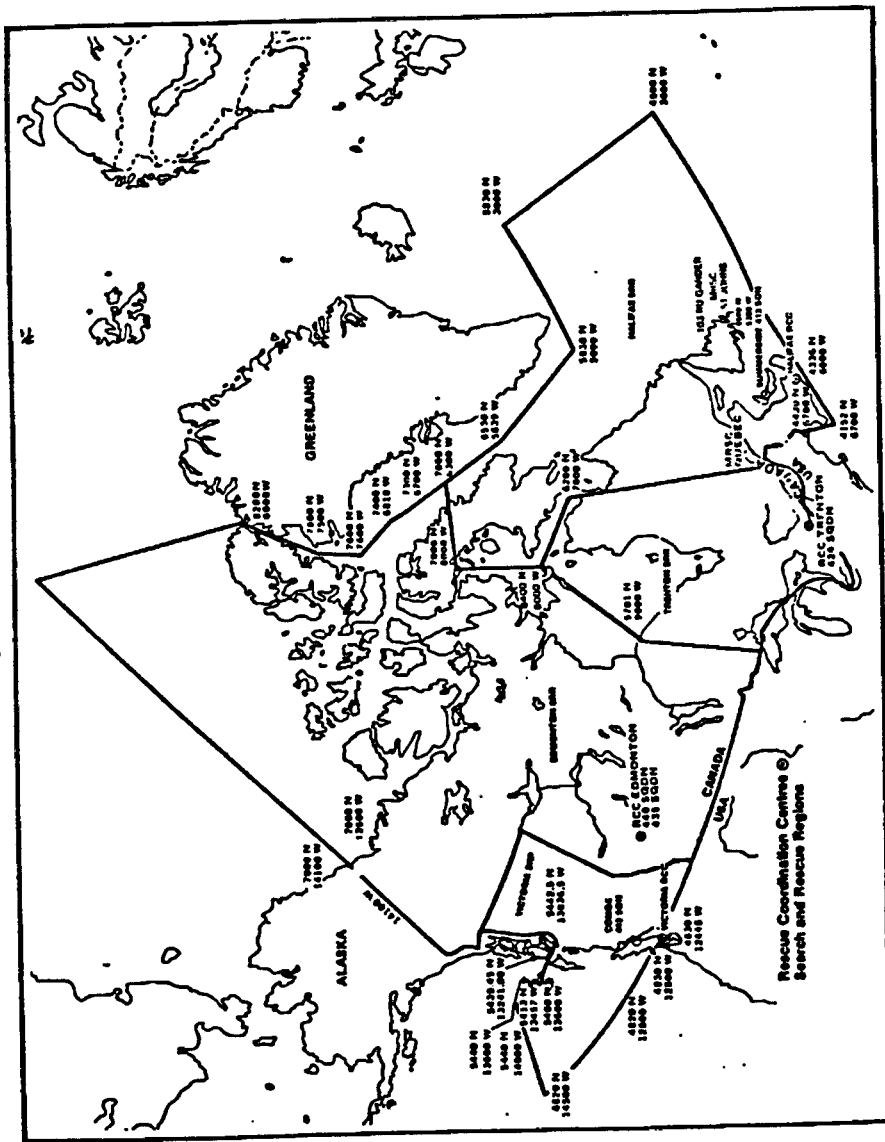
RCCs are strategically located at Halifax, Nova Scotia, Trenton, Ont., Edmonton, Alta., and Victoria, B.C. similar to wartime operations rooms.

As well, the CCG operates two SAR Emergency Centres (SARECs) which function like Rescue Coordination Centres, located at Quebec City and at St. John's Nfld. These centres operate in close cooperation with the RCCs and provide a fast response to local emergency situations.

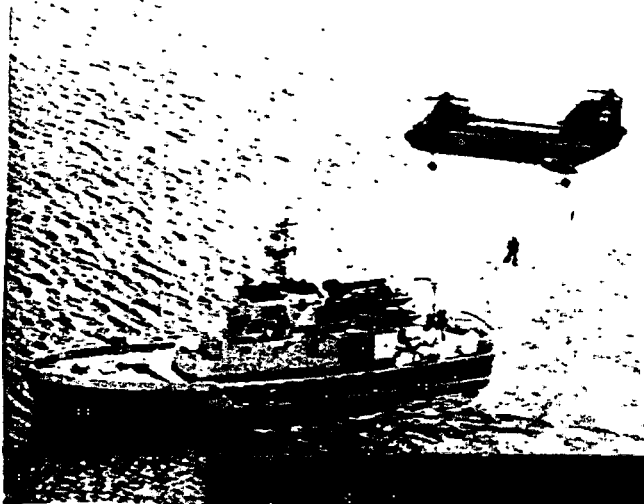
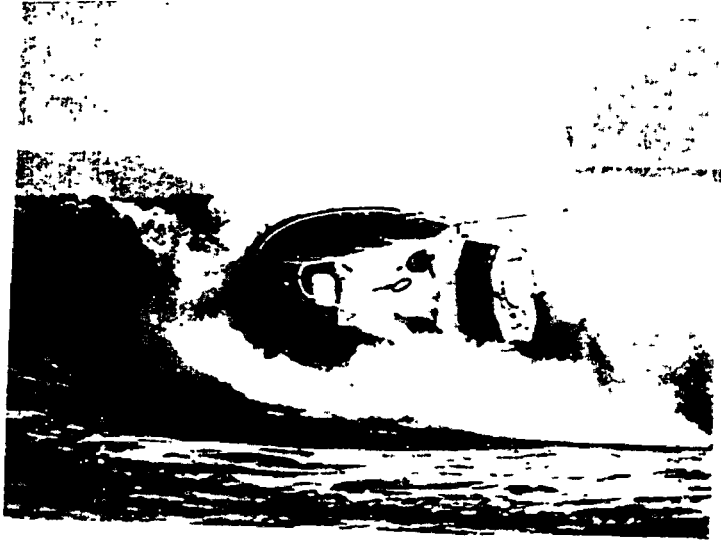
The TC-CCG fleets provide full time SAR marine craft of different sizes and types at numerous locations in Canada. Many of these vessels, including offshore and inshore cutters, launches, lifeboats, and even hovercrafts are assigned solely to SAR work. All other Coast Guard vessels have a secondary search and rescue role. The fleet of DFO may use in SAR service. They operate a large fleet of fisheries patrol, research and survey ships, a number of which are "multi-tasked" for SAR. This means that these vessels can

combine their regular tasks with SAR duties. They carry additional equipment such as portable water pumps, radio direction-finding equipment and illumination flares for night searches. A distinctive yellow and orange flag is flown when multi-tasked vessels are on SAR work.

SRR BOUNDARIES



CANADIAN COAST GUARD
SAR UNIT



SEARCH AND RESCUE AGREEMENTS

The following SAR agreements are currently maintained by DND:

DATE	AUTHORITIES	AGREEMENT
31.01.49	Canada United States	SAR operations along the common boundary outlining customs procedures.
24.06.57	RCAF USAF	Provide for mutual cooperation, coordination and support of SAR.
27.04.72	MARPAC 17 Dist USCG	Provide for mutual assistance, delineating responsibility and control.
02.02.73	MARPAC USCG Pacific	Authority for agreements between MARPAC and 13 and 17 districts USCG.
18.05.73	MARPAC 13 Dist USCG	Provide for mutual assistance, delineating responsibility and control.
25.10.74	Chief of Defense staff Commandant USCG	Areas of responsibility and provision for agreements between sub-commands.
01.11.74	ATCHQ ONTARIO PROVINCIAL POLICE	Principles governing utilization of joint resources and areas of responsibility.
11.06.82	ATGHQ 17 Dist USCG	Provide for mutual assistance, delineating responsibility and control for mutual boundary with RCC Edmonton.

DATE	AUTHORITIES	AGREEMENT
28.07.82	Minister of National Defence Minister of Transport	Joint sponsorship and cost-sharing of the civil air search and rescue association.
23.02.83	ATGHQ 9 Dist USCG	Provide for mutual assistance, delineating responsibility and control for mutual boundary with RCC Trenton.

MASTER CF-USCG SAR AGREEMENT

REFERENCES:

1. a. Convention of International Civil Aviation, Chicago, December 7, 1944.
- b. International Convention for the Safety of Life at Sea, London, June 17, 1960.
- c. Treaty signed at Washington, DC, on May 18, 1908, relating to reciprocal rights in wrecking and salvage in the waters contiguous to the boundary between Canada and the United States of America.
- d. Exchange of Notes of January 24 and 31, 1949 between Canada and the United States constituting an agreement relative to Air Search and Rescue along the common border of the two countries.
- e. Search and Rescue Agreement between the Canadian Forces and the United States Coast Guard which become effective 21 July 1972.

PURPOSE:

2. The purpose of this agreement is to provide for co-ordinated search and rescue activities in maritime areas of mutual interest.

GENERAL:

3. a. The CF is responsible for organizing and coordinating search and rescue operations on behalf of Canada.

- b. The USCG is responsible for organizing and coordinating search and rescue operations on behalf of the United States in the maritime areas covered by this agreement.

AGREEMENT:

- 4. a. The CF shall coordinate search and rescue operations in and over the water areas described as follows:
 - (1) Ocean areas contained within the Edmonton Flight Information Region (FIR).
 - (2) Ocean areas contained within the ICAO Victoria SAR Region (SRR).
 - (3) Ocean areas contained within the ICAO Halifax SRR, and the Moncton and Gander FIRs.
 - (4) Waters on the Canadian side of the international boundary between Canada and the United States in waters through which such boundary passes.

- b. The USCG shall coordinate all search and rescue operations in and over the water areas described as follows:
 - (1) Ocean areas contained within the ICAO Juneau SRR.
 - (2) Ocean areas contained within the ICAO San Francisco SRR.
 - (3) Ocean areas contained within the ICAO New York SRR.
 - (4) Waters on the United States side of the International boundary between Canada and the United States in waters through which such boundary passes.

- c. The CF and the United States Coast Guard shall provide for mutual cooperation in the coordination and support of search and rescue operations.

- d. The sub-commands of both signatories shall provide for such coordination and cooperation by the establishment of

appropriate agreements and procedures.

- e. Nothing contained herein shall prevent either signatory or officials thereof from initiating search and rescue operations or from assuming coordination of a particular operation in the maritime areas of the other as described above when such action may be required or appropriate to meet the demands of the situation. Each signatory shall keep the other informed of activities of mutual interest in order that continuity in search and rescue operations may be ensured.
5. ICAO approved FLIGHT INFORMATION REGIONS (FIRs) and Search and Rescue Regions (SRRs) referred to in this agreement mean those FIRs and SRRs as they existed on 10 December 1973. Subsequent changes made by ICAO to these FIRs and SRRs will only be incorporated into this agreement with the consent of the parties.
6. This Agreement shall come into force upon signature by both parties thereto, and shall supersede reference (e). This agreement may be terminated by either party giving six months notice in writing to that effect.



CHAPTER (IV)

THE EFFECT OF TRAFFIC ON THE PHYSICAL, BIOLOGICAL
AND METEOROLOGICAL ASPECTS IN THE RED SEA AND THE
GULF AREAS

As I mentioned earlier in the fourth paragraph of my introduction, oil and oil products, the main exporting commodities of the Kingdom, are exported to foreign countries by sea, etc.

The progressive evolution of trade between the far east and the middle east, added to the industrial revolution in both areas, has and still is leading to the gradual transfer of the world trade from west to east of the world. This transfer is explained by the following facts:-

1. The progressive industrial and scientific development in the two areas.
2. The low costs of manpower.
3. Exploration and exploitation of natural resources and the accessibility to manufacturing areas.
4. The opening and dredging of Suez Canal.

All these factors have assisted to increase the traffic in the area, either directly to/and or from the area. The traffic in the Arabian Gulf and the Red Sea is shown including relevant statistics later on in this paper.

THE NEED FOR SAR SERVICE EVEN IN
SAFE AREAS



Marine Accidents in the Red Sea "Jeddah Area":

From January 1, 1980 to February 3, 1982, 72 marine accidents (excluding fires) occurred in Jeddah port area and its approaches during that period.

Owing to the nature of the accidents they were divided into three distinctive groups:

1. Collisions (8 cases)
2. Accidents during berthing/unberthing (26 cases)
3. Grounding (38 cases)

The Collision Causes:

Restricted space at quay and masters' errors of judgement. Two collision occurred in 1980 and the number increased to 6 in 1981.

Groundings Causes:

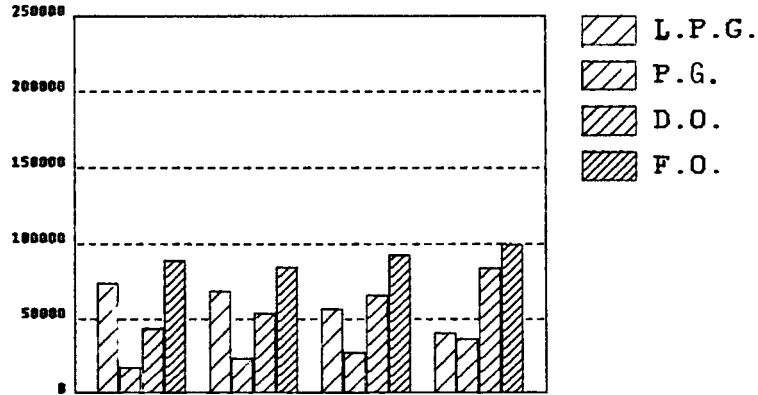
1. Error in navigation
2. Avoid collision
3. Dragged anchor
4. Drifted after engine failure

Place where the groundings occurred:

1. Shib Al Kabir
2. Qaham
3. Shib Abu Al-Faramish
4. Irgal Gurab
5. Shib Al Falahiat
6. Abu Al Faramish
7. Mismari
8. Samdiya
9. El-Wastani

10. Abu Al-Yahood
11. Shib Jeddah
12. Irg Al Kabir
13. Shib Jehan
14. 1-5 M North of Jeddah, 23 M NW of Jeddah
15. 21 35N 38 55 E.

SAUDI ARABIA OIL PRODUCTS FROM 1980 TO 1983



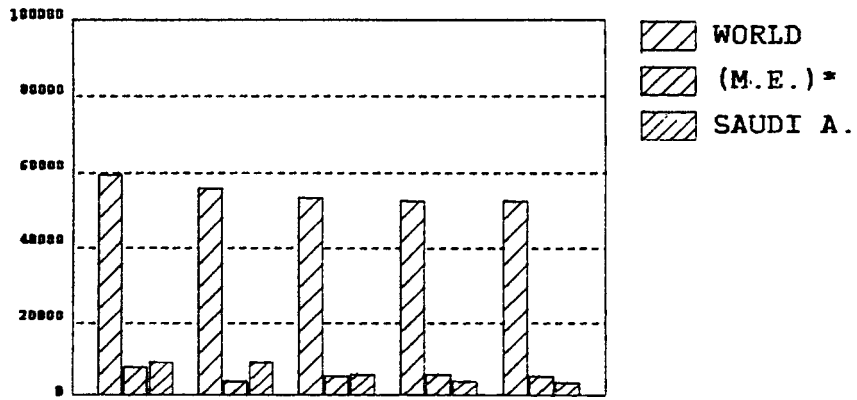
L.P.G. = Liquefied Petroleum Gas

P.G. = Premium Gasolines

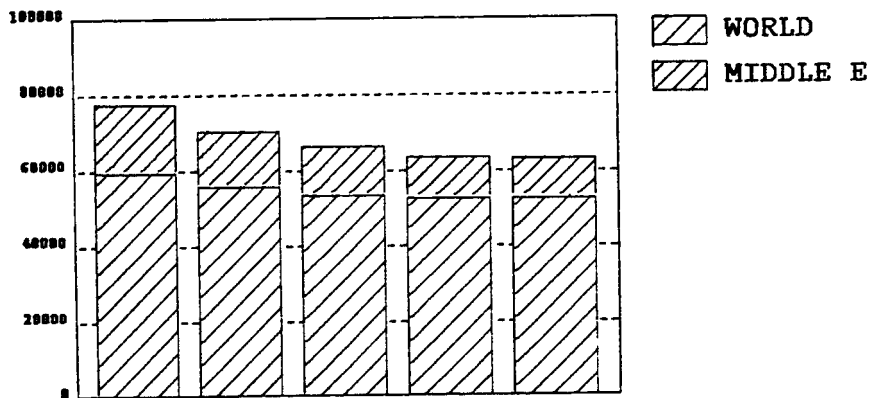
D.O. = Diesel Oil

F.O. = Fuel Oil

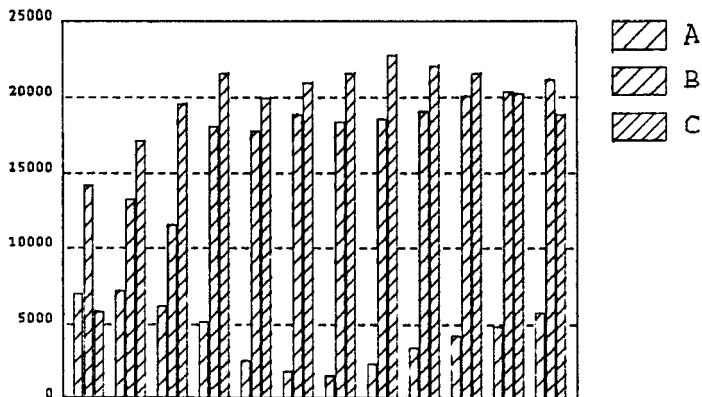
THE COMPARISON OF CRUDE OIL PRODUCTS BETWEEN THE WORLD,
THE MIDDLE EAST AND SAUDI ARABIA (1980-84)



COMPARISON OF CRUDE OIL
PRODUCTS
BETWEEN THE WORLD AND THE MIDDLE EAST
(1980 - 1984)



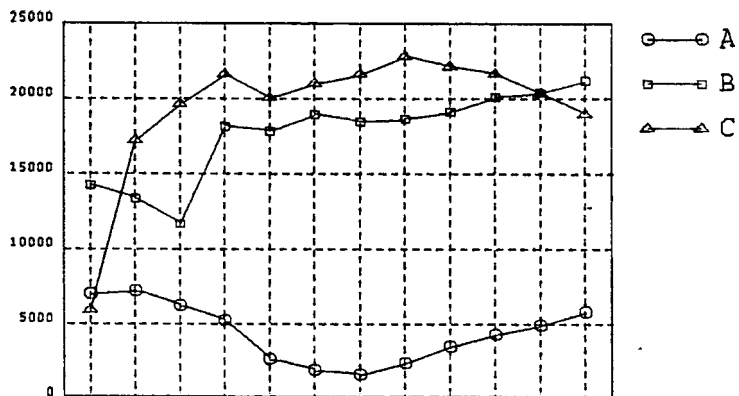
SUEZ CANAL NET TONNAGE FROM 1936 TO 1986



A = 1936 to 1947
B = 1955 to 1966
C = 1975 to 1986

Source: Lloyd's List, Monday August 3 1987
Special Report

SUEZ CANAL NUMBER OF TRANSITS
FROM 1936 TO 1986



A = 1936 to 1947
B = 1955 to 1966
C = 1975 to 1986

Source: Lloyd's List, Monday August 3 1987
Special report

SERIOUS CASUALTIES OF TANKERS, OIL CHEMICAL TANKERS, COMBINATION CARRIERS AND GAS CARRIERS FROM 1971 TO 1985

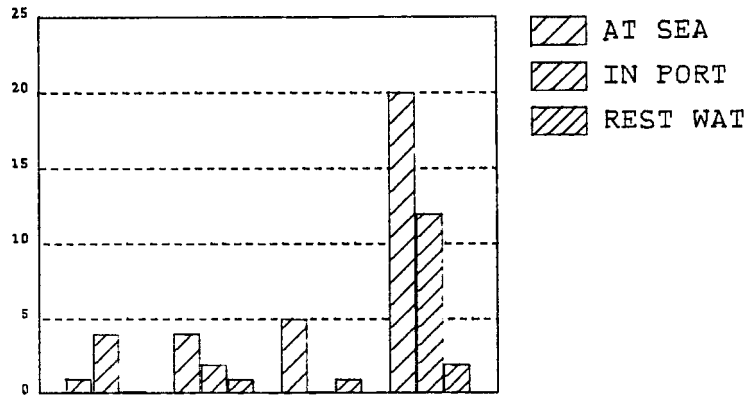


Figure (A) - Zone (7) - The Red Sea Area

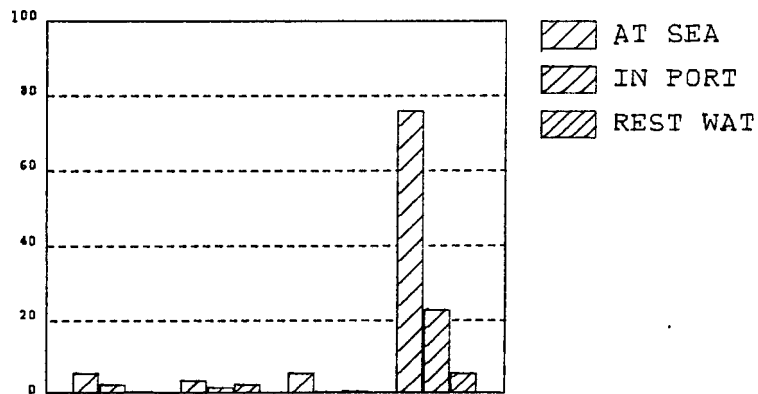
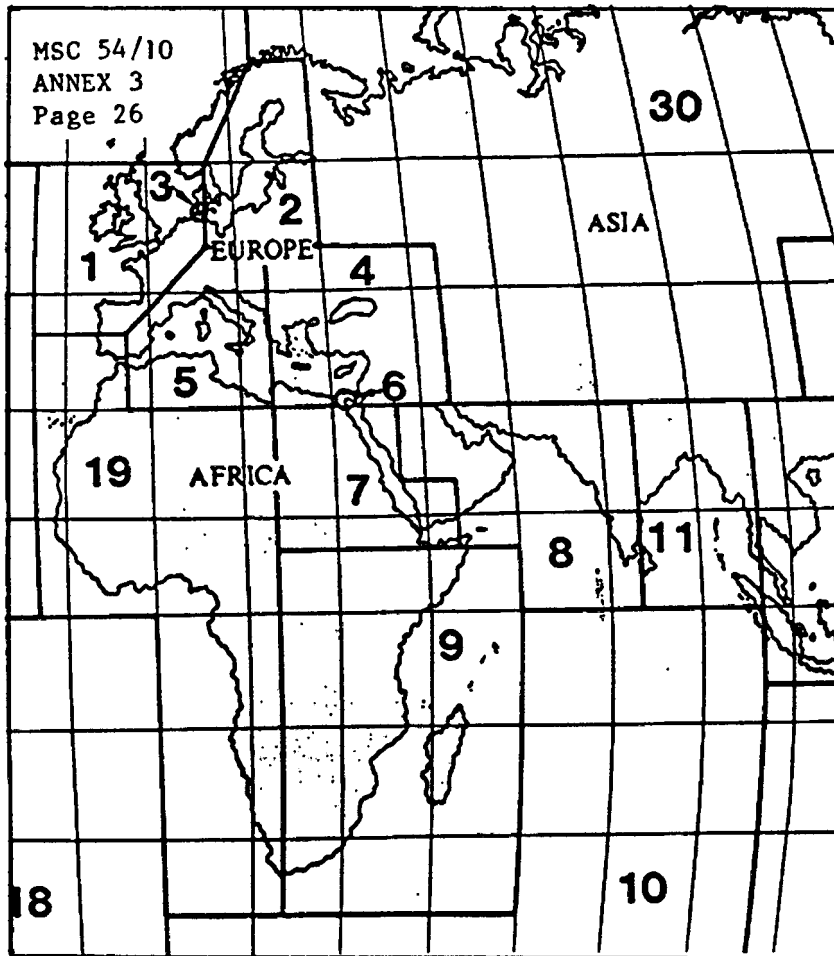


Figure (B) - Zone (8) - The Gulf and The Arabian Sea

SOURCE: IMO MSC 54/10 Annex 3 Page 27 and Annex 4 Page 15



THE RED SEA

General Remarks:

The Red Sea which is generally of considerable depths, is encumbered in places with rocky islets and coral reefs which extend far into the Central or Main Ship Channel.

The S part of the Red Sea is more encumbered than the N part. In the vicinity of latitude $16^{\circ}30'$ N, Dahlak Bak lies up to 70 miles from the W shore and Farasan Bank lies about the same distance from the E shore, leaving a deep central area some 45 miles in width.

Farther S the central position is partly encumbered by Zuboir Islands in latitude $15^{\circ}05'$ N and Hanish Islands in latitude $13^{\circ}45'$ N.

The reefs in Gulf of Suez have general depths of 0.6 to 0.9 m. over them. In summer when the level of the sea is at its lowest, they are occasionally dry in places. A slight ripple always breaks on the weather side of these reefs.

The reefs in the Red Sea generally extend in long strips parallel with the coast with which many are connected. There is usually a depth of 1.5 m. or less over the reefs but the sea seldom breaks on them, and their outer edges are usually steep-to. There are also many isolated reefs but owing to the clearness of the water they can generally be plainly seen.

The water outside the reefs especially when moved by tidal streams or strong winds is often of a milky appearance, caused by the coral sand being stirred up. This whitish water frequently indicates a reef but some reefs, as for instance those at Jiddah, are dark green.

At certain times in summer, when there is smooth water, minute

particles of seaweed cover large tracts of water with a brown scum, but at the same time many reefs just under water are also covered with the particles and have the same appearance. Sometimes red or green discolorations caused by algae make reef discolorations less noticeable. These tracts of water discoloured by seaweed have often been reported as shoals.

RADIO FACILITIES

Position-Fixing Systems:

Loran C Sky Wave is available N of Latitude 24° N.

Omega is available throughout the area.

Aero Radiobeacons:

There are several aero radio beacons.

Radio Navigational Warnings:

The coordinator of which is the Director of Hydrography, Naval Headquarters, Karachi.

Navigational warnings are also broadcast by Djibouti, in French, and by Aden, in English.

Radio Weather Forecasts:

Radio weather forecasts in English are available from the following radio stations.

Djibouti, Massawa for Red Sea and Massawa and Assab harbours.

Agaba for Gulf of Agaba.

El-Quseir (Kosseir) for Red Sea N of Latitude 23° N.

Port Sudan for Red Sea between Latitudes 18° N and 23° N.

Nowadays Jiddah Station also is involved in the job.

Maritime Topography:

The Red Sea is a narrow sea way which is only 190 miles wide at its maximum breadth in the S sector. At Ras Banas, two thirds of the way from the S straits to Gulfs of Suez and Agaba, the sea is only 90 miles wide.

To the S of Ras Banas ($23^{\circ} 55'$ N $35^{\circ} 47'$ E) the shores are bordered by broad, reef-studded shelves less than 50 m. deep.

To the N of Ras Banas the shelves are narrower and the central trough broadens to a shallower irregular surface.

Sinai Peninsula divides the N extremity of the central trough into Gulf of Suez on the W, and Gulf of Agaba on the E. Gulf of Suez is shallow, but Gulf of Agaba is only about 10 miles wide.

The greatest depths in the Red Sea, over 2800 m., are situated in this trough, in the central sector.

CURRENTS

General Remarks:

Seasonal reversals of current in general are especially associated with the reversals of the Indian Monsoon over the Arabian Sea, where the currents tend to be strongest and also in Gulf of Aden.

In the Red Sea where currents are comparatively weak, there are separate patterns broadly representative of winter and summer.

Diagram (1.114a) shows the typical pattern of current for January and diagram (1.114b) for July. These are the months when the NE and SW monsoons, respectively with their associated currents, are fully developed. Even during these months there is a good deal of variability in currents so that occasionally sets may be encountered in directions very different from those depicted.

Very roughly the January Pattern is representative of currents from October to March and the July Pattern from April to September, but there are significant local differences. Currents in the Red Sea are predominantly weak but also dangerous because:

1. There is great variability currents on occasions often set in directions different to those indicated in the diagrams. Sometimes even in the opposite directions.
2. During May and October, the months of transition between these patterns, there is no predominant direction of set except S of about Latitude 14° N, where NW sets prevail in accordance with the flow through straits of Bab-al Mandab.
3. The great variability of currents within the Red Sea is probably due in part to many local eddies being superimposed on the overall flow SE or NW. Such eddies are indicated schematically in the diagrams, but the sizes and positions of the eddies may vary greatly from those shown.

4. The currents in the centre of the Red Sea towards either coast can be encountered suddenly. The rates of the current, too, may be increased locally as the water shallows near reefs and shoals.

TIDES AND TIDAL STREAMS

Tides:

The tide of the Indian Ocean does not enter the Red Sea, where a local oscillatory tide, of semidiurnal type is developed. This oscillation is not large but is such that it is high water at the S end of the Red Sea whilst it is low water at the N end and vice-versa.

At Shaker Island ($27^{\circ}30' N$, $34^{\circ}00' E$) in the N part of the Red Sea the spring range is about 0.6 m., while at Massawa ($15^{\circ}37' N$, $39^{\circ}29' E$) and Kamaran Bay ($15^{\circ}20' N$, $42^{\circ}40' E$) at the S and the spring range is about 0.9 m.

The tidal range decreases from the N and S ends to the central area of the sea where near Suakin ($19^{\circ}07' N$ $37^{\circ}20' E$) and Jiddah ($21^{\circ}29' N$ $39^{\circ}11' E$) there is no appreciable semi-diurnal tide.

There is also a small diurnal tide, which does not oscillate in the same manner as the semi-diurnal. Consequently in the central area diurnal tides of very small range occur.

Tidal Streams:

In some of the narrow channels near the shores of the Red Sea there appear to be tidal streams, but there is no perceptible stream elsewhere until near straits of Bab-al-Mandab.

Sea Surface Temperature:

In diagrams 1.127a to 1.127d the main deviations over the waters off the SE coast are the effects of upwelling during the summer monsoon. The areas of cooler water are indicated in the diagram for August. The temperature of the water is uniform in May and November over the Arabian Sea while the normal latitudinal range prevails in winter.

SEA AND SWELL

Winter:

In the N half of the Red Sea, light to moderate swell from NW occurs, but tends to become erratic about Latitude 20⁰ N. The dominant swell movement in S half is from SE.

Summer:

Over most of the Red Sea the swell movement is mainly light from NW, but becomes moderate at times towards straits of Bab-al-Mandab and an increase in sea disturbance occurs in the narrow waters.

Pressure:

Diagrams 1.133a to 1.133d, show the seasonal reversal of the pressure pattern. The average winter distribution is dominated by a belt of relatively high pressure lying E to W to the N of the area and a ridge of high pressure across NE Arabia. A trough of lower pressure from Central Africa extends N to the Red Sea.

The summer pattern prevails during June to August. The spring change is gradual during February and March and then more rapid in April and May. The Autumn transition occurs during September and October. Seasonal changes are less over the N part of the Red Sea. Despite the change in the mean pressure the actual pattern from January to June shows little change.

In addition to the seasonal and other irregular changes, there is a small regular diurnal change. This gives maxima at 1000 and 2200 and minima at 0400 and 1600. The amount of the daily range varies from 3 mb in the N part of the Red Sea to 4 mb. near Aden with minor deviations.

There are occasions when the pattern differs greatly from the normal

distribution. Unusually deep depressions near Cyprus may cause disturbed conditions over the N sector of the Red Sea as cold fronts move E. These cause thundery squalls and raise dust and sand. Small depressions develop over the North African desert and move E to give changeable weather in the Suez Canal area.

Winds and Gales:

The winds over the whole length of the Red Sea are canalised by the topography, and ship observations give NW or SE with great regularity throughout the year. Most deviations are influenced by the distance from ship to shore combined with the orientation of the adjacent coastline.

No.	Area	%	Force
1	Winds N of Latitude 26° N From October to May	50	3 or less
		25	5 over in summer
		25	5 over in winter
2	26° N - 22° N	1	7
		99	3 or less
3	22° N - 20° N	80	3 or less in summer
		15	5 in winter
4	S of Latitude 20° N		The seasonal wind change operates in this sector

The NW winds of this sector merge with the SW Monsoon of the Arabian Sea in summer. The NE Monsoon takes over in winter becoming E in Gulf of Aden and then SE from Aden to Port Sudan. Funnelling increases the wind speed through straits of Bab-al-Mandab.

Winds Near the Coast:

The topography and large diurnal range of temperature on land have a great influence on the direction and speed of the wind.

High ground near the coast also deflects the wind and increases the speed over inshore waters.

Special Winds, Khamsin:

1. Khamsin:

These are strong S winds in advance of E-moving depressions from North Africa. They are most common from February to May and cause widespread sand or dust storms over the N sector of the Red Sea.

2. Haboobs:

Are violent squalls which develop suddenly at points on the coast of Sudan. The most frequent approach is from between SE and W, with gusts reaching force 8 and over.

3. Whirl Winds, Dust-Devils and Water Spouts:

These due to uneven heating are occasionally encountered near the coast in all parts of the area.

Convergence Zones:

The Intertropical Convergence Zone (ITCZ) separates the monsoon airstreams of the N and S hemispheres. This rather diffuse belt follows the sun to reach the N limit along the SE coast.

The dominant NW wind in the N sector from the prevailing SE wind of the S sector. This discontinuity occurs during October to May and moves to and from between Assab and Port Sudan, depending on the relative straightness of the two airstreams. A cloud layer, sometimes

with rain, indicates the area of increased turbulence.

Visibility and Fog:

Visibility is normally good or very good and fog is rare

Poor visibility, below 5 miles occurs over many parts of the area between May and September. Drizzle and heavy rain also reduce visibility. At times dust or sand storms reaching coastal waters may reduce visibility below fog limits. The worst affected regions are in the N part of the Red Sea.

Humidity:

Average values at stations along the coast and the adjacent waters are about 75% or less. Air descending from the high ground is very dry and often drops well below 20%. Maximum values occur around dawn with readings of over 90% in flat coastal areas.

The following table gives the average wet-balt temperature ($^{\circ}\text{C}$).

Month	Lat. 27° N	21° N	15° N
January	16	19	23
April	21	24	26
July	25	27	29
October	23	27	27

coasts. The frequency of haze is low in winter months, less than 5%, but increases during spring to 20-30% in April and summer to values in excess of 50% by mid-summer. July is normally the month when haze is most frequent at coastal stations. the dust is raised during intense local heating combined with the action of the NW winds. Vortices of hot air generated in favourable restricted areas produce multiple dust storms and these extend over the water for a time to reduce visibility locally below fog limits.

Humidity:

The highest values generally occur around dawn and lowest values in the afternoon. The diurnal change is often greater than the seasonal changes during the year.

In the E approaches to Gulf of Oman and the Iranian Makrān coast. That part of the region affected by the SW monsoon, humidity is high in July and August and low in November to January due to the change in air streams. Relative humidity is one measure of humidity observation and although relative humidity reading is low in the afternoons when the dry bulb temperatures are so extreme the moisture content of the air is usually as high or even higher than the moisture content in the early morning.

THE ARABIAN GULF

General Remarks:

Arabian Gulf is comparatively shallow with depths of less than 90 m. within the Strait of Hormuz. It is approached by way of the Gulf of Oman, which latter may be considered as an arm of the Arabian Sea.

Extending in a north-west direction from a line joining Ras al Hadd ($22^{\circ} 30' N$, $59^{\circ} 48' E$) near the E extremity of Arabia and Khalije Gavater or Gwater Bay, about 185 miles NE, then through the Strait of Hormuz.

Seabed:

Arabian Gulf is a shallow tectonic depression nearly 1000 Km. long with an average depth of 40 m. and a maximum depth of 170 m. found near its entrance, the strait of Hormuz. The basin is markedly asymmetrical, the slope on the Arabian side being much gentler than that of the Iranian side. The deepest waters lie close to the Iranian coast, especially in the eastern half of the basin.

CURRENTS

General Remarks:

Diagrams (1-99-1) and (1-99-2) show patterns of currents during January (generally NE monsoon period) and July (generally SW monsoon period). The effect of the monsoon winds is marked in the Arabian Sea immediately SE of the Gulf of Oman, mostly weak and variable currents.

Through Strait of Hormuz and within Arabian Gulf the movement of water is predominantly tidal and the non-tidal currents are significant only when strong winds have been sustained for some time.

Arabian Gulf:

The water movement is principally due to tidal streams. However, it's a region where NW winds predominate, although for more than 50% of the time the winds are of 10 knots or less. On the occasions of stronger NW winds, the SE-going currents so induced will increase or even overwhelm, the NW-going streams of the flood tide.

Gulf of Oman and Iranian Makran Coast:

The currents across the entrance of Gulf of Oman between Ras al Hadd and Gwatar Bay, set mainly to the SW from November to January and to the NE during February to October. The strength of the current is about 1/2 knot, but at the height of the SW monsoon during July and August will set to the NE at about 1 knot.

Within the Gulf of Oman such currents as have been identified, have been variable and light, mostly 1/4 knot, but may also increase during July and August to 3/4 knot. The currents in Gulf of Oman, although variable, do have a tendency to flow around the coasts in a counter checkwise direction, more noticeably between April and October.

Effect of a Tropical Revolving Storm on the Current:

No tropical cyclones have ever been reported in the Gulf. In general the prevailing pattern of currents of an area is affected, sometimes considerably, by the violent winds which accompany such a storm.

A slow moving storm may generate currents of more than 2 knots, and when a cyclone approaches the coast yet stronger currents may be produced running parallel to the coast.

TIDES AND TIDAL STREAMS

Tides:

Two principal constituents of the semi-diurnal tide each have two amphidromic points:

1. The Central W Part of the Gulf about $28^{\circ}30'$ N, $49^{\circ}45'$ E.
2. The S Part about $24^{\circ}40'$ N, $52^{\circ}35'$ E.

In these two areas the tides are normally diurnal with only one high and one low water during a 24-hour period and conditions can change rapidly over a short distance in extreme cases. High water at a port can coincide with low water at a position in the open sea less than 50 miles distant.

Tidal Streams:

Within the Gulf the complexity of the tides previously described, is reflected to some extent in the tidal streams which cause one of the two streams setting in a particular direction during a 24-hour period to be considerably stronger than the other is usually less than that of the tides. In extreme cases it produces diurnal tides which turn only twice in 24 hours. This diurnal inequality is most marked in the vicinity of Great Pearl Bank, E of Al Qatar Peninsula, NW and E of which it diminishes.

In general within the Gulf, the tidal streams set W on the rising tide, dividing N of Al Qatar Peninsula to set NW towards the head of the Gulf and S Port Al Bahrayn into Dawhat Salwā the reverse occurs on the falling tide. Due to the difference in characteristics between the streams and the tides, the time of the turn of the stream and its rate at any locality, bear no fixed relation to the vertical movement of the tide in that locality.

Sea Temperature:

Average seasonal sea surface temperatures are illustrated in diagrams (1-106-1) to (1-106-4).

The temperatures are lowest in winter months ranging from about 17^o C in the N of the Gulf to 22^o C in Gulf of Oman.

The average temperature of the sea seldom differs by more than 2^o C from that of the overlying air the rapid rise of air temperatures in May, however, can give a margin of 4^o or 5^o C above that of the water for a while. The opposite effect occurs in winter months when incursions of very cold air from Iraq and the N brings air temperatures which are several degrees below that of the sea.

The shallow water in shore is influenced by the greater temperature range over the adjacent land, both diurnal and seasonal.

Substantial changes in the sea temperature in the N of the Gulf occur when the estuaries of the Euphrates and the Tigris are inundated with flood water as the snow melts in N Iraq and Turkey, in the spring, frequent freshets also develop in this area during brief spells of winter rain.

SEA AND SWELL

1. In the N part of the Gulf, low to moderate N swells commonly occur with seas mostly calm or slight swells from S and SW occur with significant frequency only in winter months and are usually low to moderate-high swells are rare in any season. The wave periods are mostly short (averaging 3 to 5 seconds) because of the short fetch of the prevailing NW winds, but on rare occasions periods as long as 10 seconds have been observed.
2. Over most of the Gulf and Gulf of Oman, swells from the W and NW also occur throughout the year in central parts of the Gulf. Their frequency is about 30% in spring and 40 to 45% in other seasons, but farther S and in Gulf of Oman the frequency is less. Most of the swells are low to moderate with calm or slight seas, but areas at the end of the longest fetches, namely in central of the Gulf, can be affected by swells of 1.8 m and over and with seas 1.5 m and higher. Wave periods are considerably longer than in N of the Gulf.

To summarise generally, slight seas less than 1 m high prevail more than 75% of the time in the Gulf and Gulf of Oman, rough through high seas 1.5 m or higher average 5 or 6%, having their maximum occurrence during autumn and winter. High swells 3.5 m or higher occur less than 1% of the time with moderate through high swells 1.8 m or higher occurring on average on less than 10% of occasions.

Fog and Visibility:

Reduction of visibility to less than 1 Km. due to water droplets in suspension is rare in this region at sea, but is occasionally reported near the coast and may be dense.

In winter visibility is good at sea, but haze occurs due to raised dust, reducing visibility to less than 8 Km. especially near the

coasts. The frequency of haze is low in winter months less than 5% but increases during spring to 20-30% in April and summer to values in excess of 50% by mid-summer. July is normally the month when haze is most frequent at coastal stations. the dust is raised during intense local heating combined with the action of the NW winds. Vortices of hot air generated in favourable restricted areas produce multiple dust storms and these extend over the water for a time to reduce visibility locally below fog limits.

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CHAPTER (V)

PRESENT GOVERNMENTAL BODIES WHICH MAY ASSIST
IN THE ESTABLISHMENT / DEVELOPMENT OF SEARCH
AND RESCUE SERVICE

MINISTRY OF COMMUNICATION

Introduction:

The Kingdom's transport and communications progress and achievements can be best explained by the following extracts from the Ministry of Communications' letter "foreword" in the book published by the Ministry:-

"The Transportation and Communication Sectors are the first and most important areas to which Saudi Arabia's first king paid attention. He believed that modernization of the Kingdom required - first and foremost - means to connect the Kingdom's borders and link its many and diverse regions. In other words, paving and constructing roads and bridges was to help spread civilization and its benefits to every part of the Kingdom.

In addition, the Transportation Sector has had a major and increasing role in the economy and has facilitated development plans in all fields (industrial, agricultural or social).

In short it has been necessary for the Transportation Sector to develop in step with the major developments of the Kingdom in all areas."

The Ministry of Communications, established with the founding of the Kingdom, is one of the oldest public agencies in the country.

Historical Background:

In 1345 AH (1926) Transport and Communication started its activities under a formal government agency.

In 1375 AH (1955) Ministry of Communications (MOC) was established. The Ministry was originally responsible for road construction, telephone, telegraph, sea ports, electricity, rail line and all land and

sea transportation affairs in general.

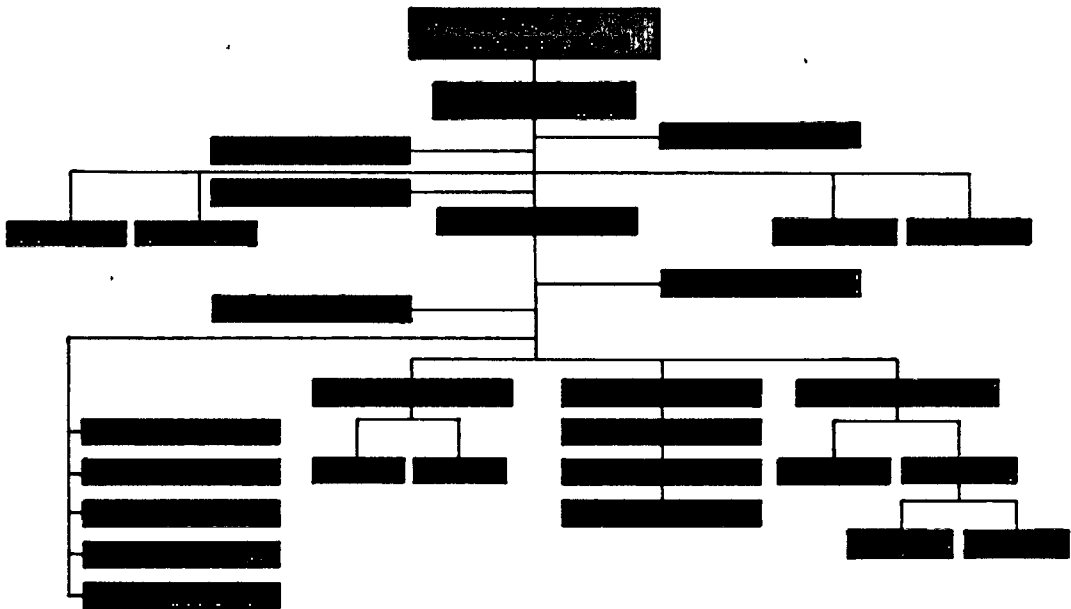
In 1395 AH (1975) a new Ministry was created with responsibility for post, telephone and telegraph affairs.

The MOC is now responsible for all land and sea transportation in the Kingdom, including the construction and maintenance of roads and bridges, supervising and regulating surface and sea transportation as well as railroad operations.

In the year 1397 AH (1977) Royal Decree No. M/25, dated 21/06/1397 AH., approved the organization of a public transport system, except for air transportation services, by the Ministry.

In the same year Ministry Deputyship for Transport Affairs was organized.

**MINISTRY OF COMMUNICATIONS
ORGANIZATIONAL CHART OF THE MINISTRY
DEPUTYSHIP FOR TRANSPORT AFFAIRS**



General Department for Marine Transport:

The general department for marine transport is one of the most important departments in the Ministry Deputyship for Transport Affairs in the Ministry of Communications. This is due to its responsibility in the supervision of maritime transport, not only locally but also at the Gulf, Arabian, Islamic and the international level.

The general department is subdivided into:

- The Navigational Affairs Department,
- The Marine Transport Department, and
- The Marine Inspection Department.

Here is talk about the functions of one of the departments, which is the Navigational Affairs Department as mentioned in the press review by his excellency the "Deputy Minister of Communications for Transport Affairs" in one of the Saudi Newspapers dated 15 November, 1984:-

"The Navigational Affairs Department is responsible for carrying out the necessary studies in marine survey projects and navigational aids and following up their implementation and supervision by co-ordinating with the concerned parties. Also, in organizing maritime traffic in the territorial waters and the anchorage areas; in addition to the execution of the special studies concerning the projects of traffic separation schemes outside the ports limits, with its follow up and supervision.

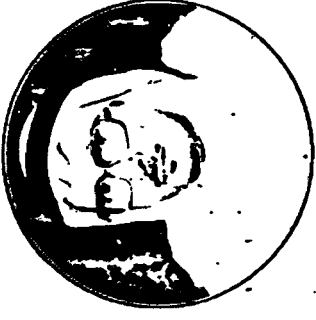
In addition, the department issues regular navigational warnings, and processes navigational safety messages from ships and forwards them in the form of navigational warnings. The department is responsible for the establishment, organization and the execution of the search and rescue in the Kingdom's coastal waters. They are the receivers of wrecks and are responsible for salvage operations

outside ports limits, approval of submarine cables laying plans and operations, and all sea constructions.

They also carry out studies of international and regional conventions/protocols and put forward suggestions and are responsible for the implementations of such conventions in coordination with the department for the Arab and International Conferences.

تحت إشراف اللجنة الوطنية للملاحة البحرية
17 محرم 1406 هـ الموافق 1 أكتوبر 1985 م
بإشراف اللجنة الوطنية للملاحة البحرية
بمقرها في الرياض
بمقرها في الرياض
بمقرها في الرياض

المملكة تشارك دول العالم الاحتفال باليوم البحري العالمي



بموجب مرسوم ملكي رقم 177 م/ب المؤرخ 17 محرم 1406 هـ الموافق 1 أكتوبر 1985 م، وافق الملك فهد بن عبدالعزيز آل سعود على مشاركة المملكة العربية السعودية في الاحتفال باليوم البحري العالمي الذي يصادف في 1 أكتوبر من كل عام في جميع دول العالم.



ويأتي هذا المرسوم في إطار حرص المملكة العربية السعودية على المشاركة الفعالة في جميع المناسبات العالمية التي تعزز التعاون الدولي وتبادل الخبرات بين مختلف دول العالم.

ويتمثل الاحتفال باليوم البحري العالمي في إقامة عدد من الفعاليات والأنشطة التي تهدف إلى توعية المواطنين بأهمية الملاحة البحرية ودورها في التنمية الاقتصادية والاجتماعية.

وتتضمن هذه الفعاليات إقامة معرض للملاحة البحرية في الرياض، وذلك بهدف تعريف الجمهور على أحدث التطورات في صناعة السفن والملاحة البحرية.

بالإضافة إلى إقامة ندوة علمية في جدة، تناقش فيها القضايا المتعلقة بالبيئة البحرية وحماية الثروة السمكية، وذلك بالتعاون مع المؤسسات العلمية والبحثية.

ويتميز الاحتفال باليوم البحري العالمي في المملكة العربية السعودية بالتنوع والشمولية، حيث تشمل الفعاليات مختلف المناطق الساحلية والداخلية.

وتعد مشاركة المملكة العربية السعودية في الاحتفال باليوم البحري العالمي خطوة مهمة في تعزيز التعاون الدولي في المجال البحري.

والمملكة العربية السعودية ملتزمة بدعم وتطوير قطاع الملاحة البحرية، وذلك من أجل تحقيق التنمية المستدامة وبناء اقتصاد قوي.

وتتطلع المملكة العربية السعودية إلى مزيد من المشاركة في المناسبات العالمية التي تعزز التعاون الدولي وتبادل الخبرات بين مختلف دول العالم.

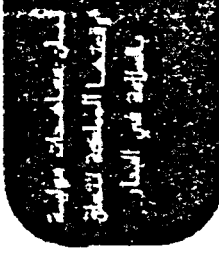
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Summary of the Main Activities of MOC's In Marine Transportation:-

1. The MOC takes an active role in many technical commissions of the Gulf Cooperation Council (GCC).

Some of the most important of these commissions are:

- a. Marine Search and Rescue Commission.
 - b. Supervision and Classification Commission.
 - c. Marine Transport Commission, which is studying the feasibility of establishing a coast wise transport company between the various Gulf Cooperation Council ports.
 - d. Maritime Aid Commission.
 - e. Commission on Piracy and Law Enforcement.
2. The basic regulations of the proposed confederation, prepared by MOC, were submitted by the Kingdom and approved by Muslim leaders in their third Islamic Summit Conference. The confederation was announced after a meeting of the Foreign Ministers of Islamic States in Bangladesh on 2-6 Rabi Awal 1404 AH. (1984).

The confederation's basic regulations were approved by ten Muslim States.

3. The MOC has given high priority to training Saudi Maritime personnel to work at the various maritime organizations in the Kingdom. The continued training of qualified personnel is necessary to meet the growing needs of the Kingdom's maritime industry. The Ministry has undertaken to develop the following organizations.

- a. Local Universities, Institutes and Training Centres
- b. The Arab Maritime Transport Academy (AMTA)
- c. The World Maritime University (WMU)

MOC has developed a programme to send the Academy graduates and personnel of the Saudi Port Authority and other related agencies to the WMU in Malmö, Sweden.

Further projects and development in marine transportation:

1. Development and Prospects of Marine Transport.
2. Coastal Survey Project.
3. Navigational Aids.
4. Marine Search and Rescue.

THE ROYAL NAVY

The Royal Navy is one of the cornerstones of the Ministry of Defence and Aviation.

The Main Royal Navy Bases are:

1. King Faisal Royal Navy Base - Jeddah
2. King Abdul Aziz Royal Navy Base - Dammam

The Royal Navy Activities:

In addition to their expertise as a navy they deal with search and rescue operations and coordination.

It plays an important role in the search and rescue operations, as it consists of a very large and up-to-date fleet with the latest sophisticated equipment in dealing with such operations speedily and effectively. It also acquires speed boats and rescue aircraft .

A highly developed equipped and manned command centre was established in 1985 with the ability to have instant contact and communication with all the fleet and aircrafts under its command in order to speed up and ensure the effectiveness of the fleet operations.

ROYAL SAUDI AIR FORCE (RSAF)

The Air Force plays a major role in the Armed Forces and is an important element of the Ministry of Defence and Aviation. A special section in the Air Force looks after the safety aspects and is called "The Directorate of Safety".

The main function of The Directorate of Safety is the conduct of Search and Rescue Operations when disasters or emergencies or distress occurs.

Bases of the Air Force in the West and East Coasts are:

- 1) Tabuk
- 2) Jeddah
- 3) Khamis Mushik
- 4) Dammam

Centres for the Rescue Aircraft:-

In every centre there are at least three helicopters available at all times for rescue services.

The main centre for the helicopters is based in Taif, which is the supply base for the rescue aircrafts.

Details of the Rescue Aircrafts:

1. Carriage capacity in excess of eight persons.
2. The helicopter is equipped with hoist and its operator.
3. Rescue aircrafts are equipped to land in the water by using the fixed float installation, or by the inflatable installation method which may be activated manually or automatically.

2. The East Coast:

A. Main Commercial Ports:

1. King Abdul Aziz Port, Dammam
2. Jubail Commercial Port

B. Petroleum Ports:

1. Ras Tannura
2. Ras Al Juaymah

C. Industrial Ports:

1. King Fahd Industrial Port

D. Small Ports:

1. Al Qatif
2. Darin
3. Al Khobar
4. Al Agoyr
5. Ras Al Juaymah

Safety Systems at Major SEAPA Ports:

Safety in ports can be divided into the following main categories:-

1. Search and Rescue - SAR (within and outside the port limits).
2. Fire-prevention and fire-fighting.
3. Industrial safety as accident prevention, dangerous cargo handling, safety in port buildings, etc.
4. Emergency planning.

Search and Rescue:

1. A search and rescue operation within the port limits will be undertaken by the departments belonging to it, E.G. Fire Service, Medical Service, and Marine Department's Floating Units as fire-boats. Further action will be taken by police unit forces, security forces, customs and other parties involved. Assistance will be given also by units from the Coast Guard.
2. Outside the port limits the port gives assistance, if required, especially on the following:-
 - medical help
 - tug boat service
 - fire boat service
 - divers
 - facilities and assembly points
 - berthing of distressed vessels E.G. in the floating dock
 - communications
 - speed boat service

Fire Fighting and Safety Equipment:

1. SEAPA ports are equipped with all necessary fire fighting and safety equipment as fire trucks, breathing apparatus, portable fire pumps, fire hoses and nozzles, life belts, etc.
2. All ports are equipped with a fire main and hydrant system. The water supply takes place by diesel engine pumps which are located on one or more port pumping stations and are specially designed for the supply of fire fighting water in case of a fire at the port or on board ships.
3. Most ports have a "recharging station" available in which empty

fire extinguishers, breathing apparatus compressed air cylinders or halon/carbon dioxide cylinders can be recharged by port personnel.

4. All important port areas are connected to an emergency generator system which guarantees the supply of electricity in case of a power break down of the main system and in case an emergency lighting system is connected so that important areas are adequately lit in case of a power break down.
5. Port personnel receive regular training on fire prevention procedures such as handling of fire extinguishers, fire precautions in housing areas, handling of explosive substances, etc.

Port Fire-Fighting in Saudi Arabia:

A. The Red Sea Ports:

1. The fire service ashore is under the responsibility of the civil defence forces, but floating craft with fire-fighting equipment and fire boats are owned and controlled by the ports.
2. The fire-fighting from offshore is carried out by the Coast Guard and by SEAPA contractor. The floating craft specialised for fire-fighting are under the responsibility of the Marine Department.
3. On land a safety contractor if contract is conferred, is responsible for transport of casualties, safety service and maintenance of equipment and assistance of civil defence only.

B. The Arabian Gulf Ports:

SEAPA operates its own fire service. The fire-fighting equipment is owned by SEAPA and their contractors provide the necessary manpower. The SEAPA fire-fighting system consists of:

1. Contractors for land fire service.
2. Contractors for offshore fire service.
3. Contractors for operating tugboats and floating cranes with fire-fighting equipment.

In case of fire the floating craft will be informed via a port control tower and will be on site under the command of a principal emergency officer.

All floating units are under the responsibility of the port marine department.

The civil defence, located outside the port area backs the port fire service in case of an outbreak of major fire.

Medical Services:

Major SEAPA ports are fitted with a port medical clinic which is under the supervision of a port doctor.

First aid treatment will be given to injured in the port and the injured then will be transported to nearby hospitals for further treatment.

Most of the ports are fitted with ambulance cars. In some ports a hospital is directly in front of the ports entrance.

The ports' First Aid Stations are manned by nurses which are working

on a 24 hours shift system.

The task of the port medical section in case of emergency is clearly defined in the port contingency plan. The port medical station is manned by contractors personnel. All equipment belongs to the port.

SEAPA FLOATING CRAFT WITH FIRE-FIGHTING
AND POLLUTION EQUIPMENT

- Ocean Going Salvage Tugs
- Tugs (Water Tractor)
- Fire-Fighting Boat
- Oil-Recovery Vessels
- Separator Barges

A. Ocean Going Salvage Tugs:

- Several types with engine power from 4000 HP up to 5500 HP.
- Foam Concentrate Tanks with a capacity of 10 cu. m.
- Raisable monitors - 22 m each 1000 cu. m./hour
- Dual purpose monitors each 500 cu. m./hour
- Spray Booms
- Floating Barriers
- Water Spray System
- Breathing Apparatus
- Speed from 15 knots to 18 knots.

B. Tugs (Water Tractor):

- Several types with engine power from 1500 HP up to 2800 HP.
- Foam Concentrate Tanks with a capacity from 6 cu. m./10 cu.m.
- Raisable monitores 300 cu. m./hour
- Dual purpose monitor 150 cu. m./hour
- Spray Booms
- Floating Barriers
- Breathing Apparatus
- Speed from 12 knots to 15 knots

C. Fire Fighting Boats:

- Several types with engine power from 1700 HP up to 13500 HP.
- Foam Concentrate from 4 cu. m. to 35 cu. m.
- Dry chemical powder from 250 kg. to 1000 kg.
- Raisable monitors 30 m. each 500 cu. m./hour
- Dual purpose Monitors each 500 cu. m.
- Foam Concentrate Pumps
- Floating Barriers
- Water Spray System
- Rescue Daughter Boat
- Speed from 12 knots up to 25 knots.

THE DEPARTMENT OF CIVIL DEFENCE

This Department is part of the Ministry of the Interior.

Civil Defence Functions:

The main functions of the Civil Defence are fire-fighting on land and also assisting in fighting fires at sea, as well as in dealing with disasters.

Civil Defence Centres:

The Civil Defence Centres are located all over Saudi Arabia, especially concentrated in heavily populated areas and in the airports and in some sea ports.

These Centres usually come under regional control.

Many of the Civil Defence Centres are located in the east and west coasts of the Kingdom which are the most populated areas before the central region. The main purpose of these centres is to carry out the fire-fighting activities.

Some of the other areas in which Civil Defence Centres are located, are as follows:

Duba, Tabuk, Yanbu, Jeddah, Abha, Tizan, Najran,
Rastannora, Al-Jubail and Dammam.

The number of the centres in the above mentioned places are more than 59 internally and 66 externally.

All these centres are fully equipped with the latest equipments and with the needed expertise.

ROYAL SAUDI AIR FORCE (RSAF)

The Air Force plays a major role in the Armed Forces and is an important element of the Ministry of Defence. A special section in the Air Force looks after the safety aspects and is called "The Directorate of Safety".

The main functions of the directorate of safety is the conduct of Search and Rescue Operations when disasters or emergencies or distress occurs.

Bases of the Air Force in the West and East Coasts are:

- 1) Tabuk
- 2) Jeddah
- 3) Khamis Mushik
- 4) Dammam

Centres for the Rescue Aircraft:-

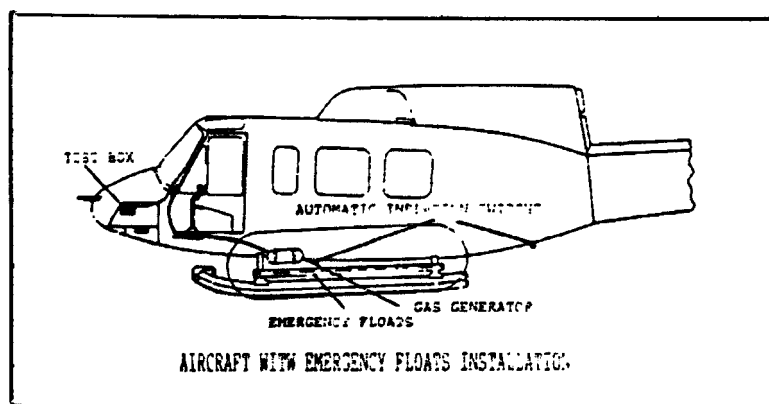
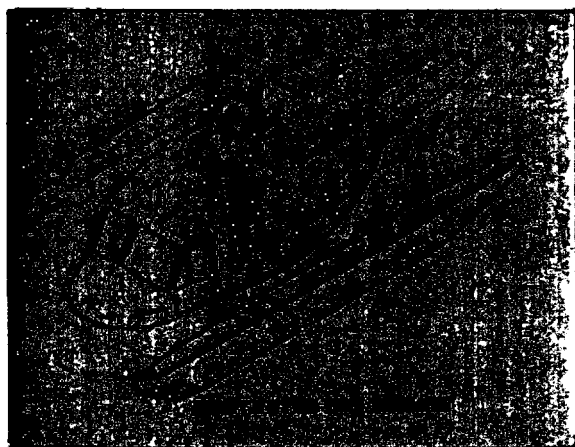
In every centre there are at least three helicopters available at all times for rescue services.

The main centre for the helicopters is based in Taif, which is the supply base for the rescue aircrafts.

Details of the Rescue Aircrafts:

1. Carriage capacity in excess of eight persons.
2. The helicopter is equipped with hoist and its operator.
3. Rescue aircrafts are equipped to land in the water by using the fixed float installation, or by the inflatable installation method which may be activated manually or automatically.

4. Capable of communicating via Channel UHF 243 or VHF 12105 which are the international resource channels of communications.



AEROMEDICAL EVACUATION
(MEDEVAC)

Introduction:

It is one of Saudi Arabian Armed Forces Medical Services Department's activities which is under structure of Ministry of Defence and Aviation.

The services were started in 1401 AH (1981) with one aircraft.

MEDEVAC was formed to provide the ability for transferring patients on a twenty four hour emergency basis. These transfers of the sick and injured involves moving patients both within and without the Kingdom to hospitals offering the specialised medical needs of the patient.

In addition MEDEVAC aircraft are capable of carrying surgical facilities, medical equipment and medical teams to the location of major disasters or outbreaks of epidemic diseases.

Logistical and medical support is provided by MEDEVAC to the pilgrims during HAJ and to the military when engaged on exercises or maneuvers.

Objectives:

The flight was formed with the objectives of:

1. Transferring critically ill patients to hospitals offering the necessary specialist medical treatment both within and outside the Kingdom of Saudi Arabia.
2. Providing an emergency casualty evacuation service.

3. Providing air mobile operating theatres, staff, and intensive care unit nursing as required in disaster areas both within and outside Saudi Arabia.
4. Transferring highly specialised medical staff on an emergency basis as circumstances require.

THE MEDEVAC AIRCRAFT

Type of Air Craft	Range in Nautical Miles	Altitude in Feet	Speed in Knots
Aerospatiale SA 365 N Dauphin 2	520	12,000	140
Agusta Bell 212	350	10,000	100
Gates Learjet 35A	1800	45,000	450
Grumman Gulfstream II	2700	45,000	460
Grumman Gulfstream III	3500	45,000	480
Lockheed C130H, C130H-30, L100-30	2500	30,000	310

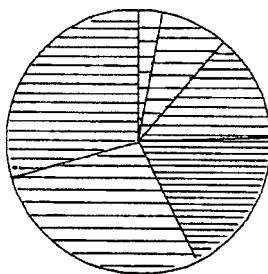
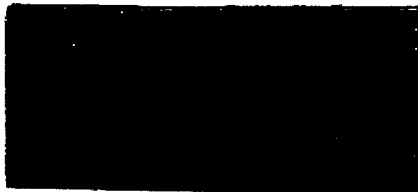
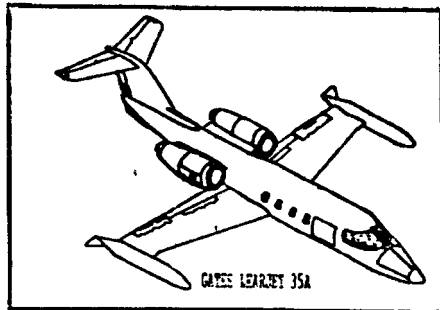
At present, there are 21 aeroplanes and one service centre in Riyadh. In the coming months two new centres will be established in Jeddah/Red Sea and Al-Jubayl/Arabian Gulf. Also, it is suggested that another centre should be established in Tabuk and Khamis-Mushit in the Red Sea.

Operational Aspects:

- Communication room in the military hospital at Riyadh receives calls for assistance. This, in turn, makes the necessary arrangements with the specialist doctor on duty, giving him all the required details on the condition of patients.

- Contact the aeromedical evacuation service to provide the necessary transportation and conduct the necessary arrangement for this purpose.
- The aeroplanes in order to carry out their part in this service are usually on stand-by and are able to take-off from base within 40-70 minutes.
- In emergency cases the time to offer and carry out such services is very expedient and does not take very long.

AEROMEDICAL EVACUATION FLEET



A	3.0%	(1981)
B	8.2%	(1982)
C	13.1%	(1983)
D	18.2%	(1984)
E	27.8%	(1985)
F	29.7%	(1986)

The diagram above shows the percentage of the participation of Aeromedical Fleet in emergency medical services.

THE COAST GUARD

The Coast Guard as well as the Department of Civil Defence, is under the responsibility of the Ministry of Interior.

The Coast Guard has been well established for sometime now and its functions were firstly defined in 1353 AH.

The Ministerial Council Resolution No. 1407 dated 24.09.1395 AH cancelled the previous Coast Guard's functions defined in 1353 AH because of the promulgation of the Borders Security Royal Ordinance No. M/26 dated 24/06/1394 AH and the Ports and Marine Lighthouses Royal Ordinance No. M/27 dated 24/06/1394 AH.

This resolution No. 1407 gave the Ministry of Interior the responsibility to make rules and regulations organizing the functions of the Coast Guard.

The Coast Guard's Function:

As mentioned in Article 3 of the Borders Security Regulation which states:-

- a. Guarding the Kingdom's borders, be it on land and at sea, in addition to combating smugglings, infiltrations internally and externally with respect to the existing regulations.
- b. Early warning of any unusual movements on the border lines.
- c. Participating in the rescue operations along the coastal waters and rendering assistance to shipping.
- d. Rendering assistance to lost persons in the border areas.
- e.
- f. Surveillance of all border movements and its adherence to the laws governing such movements.

- g. Co-ordinations with official departments within the rules and as required by the general needs within the Coast Guard's functions.

The Coast Guard's Organization:

The Coast Guard consists of a General Directorate and eight regional commands including sectors and units and centres.

The Coast Guards are located in both the East and West Coasts of the Kingdom:-

a. The Red Sea Coast from North to South:-

1. Haql
2. Sharma
3. Alwejh
4. Ras Abumad
5. Yanbu
6. Mastura
7. Rabigh
8. Obhar
9. Jeddah
10. Abu-Snauk
11. Shu Aiba
12. Abu-Duda
13. Al-Lith
14. Qunfida
15. Matna
16. Hali
17. Gizan

b. The Arabian Gulf Coast from North to South:-

1. Al Khafji
2. Jubayl

3. Juaimah
4. Ras-Tannurah
5. Dammam
6. Al-Khubar
7. Al-Aziziah
8. Salwa

The above mentioned centres are part of the regional sectors and units such as the areas of Al-Wegh, Jeddah, Gizan and Dammam of which the most important are Jeddah and Dammam.

In addition to the official function, the Coast Guard participates in the SAR operations conducted by those centres equipped with the proper facilities for SAR. There are two fire fighting boards in the western region, in Jeddah. Others are also available in the eastern centre in Al-Aziziah near Dammam.

Length 25.05m
 Maximum speed 19.25 NM
 Cruising speed 15.25 knots
 Foam capacity 2800 litres
 Endurance 2 days

Rescue Boats: There are other rescue boats of which:

Length 15.09
 Maximum speed 25 NM
 Cruising speed 24 knots
 Endurance one day

Small Boats:

Length from 3 - 4 m.
 Speed 26 - 45 knots

in addition to tug boats, and hovercrafts.

Hovercrafts:

In general, they are very suitable for SAR operations because of their quick response and ability to conduct search operations day and night with the assistance of two radars with range capabilities of 5-48 miles and from 2-3 miles. In addition to their manoeuvring capabilities which can be utilised to rescue persons in need, also they can tow small boats. These are normally used in long range operations for speeds which can reach upto 60 knots. In adverse weather conditions this speed can drop by 10 knots.

The hovercrafts are located in the western and eastern sectors with more than 9 hovercrafts per sector.

From the above mentioned we deduce that from articles (c) and (g) / regulation 3 of the Border Security Laws concerning SAR, the Coast Guard covers the Kingdom seas and inland borders and its presence in these areas make it ideally located for rendering assistance to those in need.

In addition it communicates with responsible sectors of the SAR organizations to fulfill the obligations under their jurisdiction.

THE KINGDOM COASTAL RADIO STATION

In order to participate in the international effort to contribute to the safety of shipping world wide, the Kingdom of Saudi Arabia and the Ministry of Post, Telegraph and Telephone (P.T.T.), established two transreceiver centres at Jeddah to cover the Red Sea area and at Dammam to cover the Arabian Gulf in addition to worldwide coverage.

The Jeddah radio station is well equipped with the latest trans-receiver medium frequency equipment facilities communicating with eight (8) very high frequency relay stations spread along the western coast of the Kingdom overlooking the red sea area.

Dammam station is also well equipped with very high frequency equipment which facilitates operation from the control station.

Both stations render extra services as follows:

1. Search and Rescue
2. Medical Guidance
3. Navigational Warnings
4. Meteorological Forecast
5. Storm Warnings
6. Traffic Movements

These services are provided via VHF, IF and MF channels.

Dammam station contributes to additional services on HF for the following purposes:

1. Search and Rescue
2. Medical Guidance
3. Meteorological Forecasts
4. Traffic Movements

The Special Services are as follows:-

1. Search and Rescue:

The coastal station for this service deals with continuous warning messages received on special frequencies for the rescue and the safety in the region.

These warning frequencies are respectively of 500 KHz, 2182 KHz and 156.8 MHz used specifically for direct communication link between all vessels in danger requiring assistance and the special agency in the Kingdom is responsible for the safety at sea.

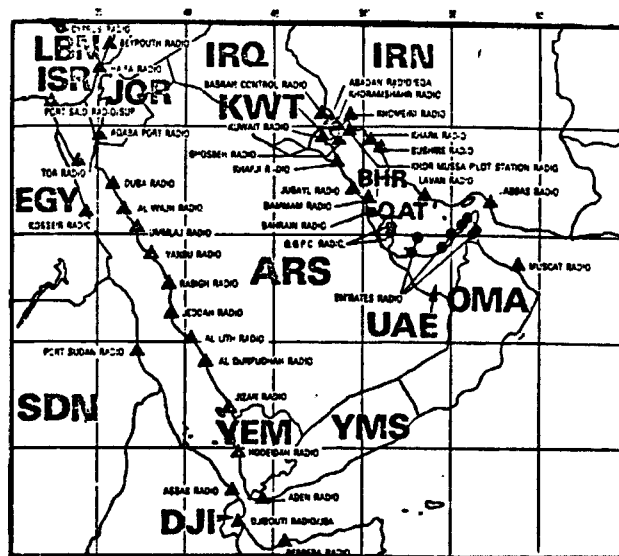
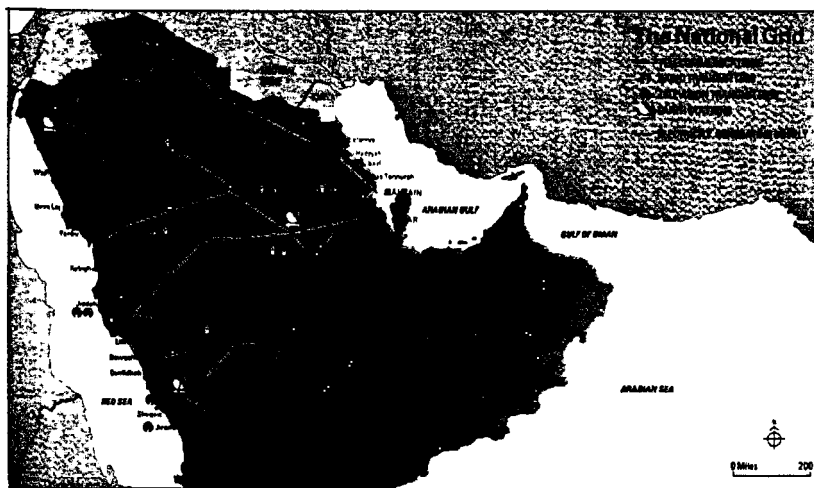
2. Medical Guidance:

The above mentioned frequencies are also used for communication link between the vessels in need of medical assistance and the medical centres in the Kingdom such as hospitals, paramedical units, etc.

3. Meteorological Forecasts:

The two stations broadcast continuous weather forecast messages twice a day on medium waves to cover the Arabian Gulf and the Red Sea areas using morse code and radio telephony.

COMMUNICATIONS IN SAUDI ARABIA
AND
COAST RADIO STATIONS POSITIONS



JEDDAH COASTAL RADIO STATIONS

Radio Stations	MF	HF	VHF	RT	WT	RTTY
Alwajh Radio			X	X		
Al Qunfudhah Radio			X	X		
Al Lith Radio			X	X		
Juzan Radio			X	X		
Robigh Radio			X	X		
Umm Laj Radio			X	X		
Yanbu Radio			X	X		X
Jeddah Radio	X	X	X	X	X	
Duba Radio			X	X		

DAMMAM COASTAL RADIO STATIONS

Radio Stations	MF	HF	VHF	RT	WT	RTTY
Dammam Radio	X	X	X	X	X	X
Al Khafqi Radio			X	X		
Jubayl Radio			X	X		X

Both Jeddah and Dammam coastal radio stations consist of:

1. Operational Centre
2. Transmitter Centre
3. Receiver Centre

The relay stations of Duba, Umm Laj, Al Wajh, Robigh, Al Lith, Al Qunfudhah and Juzan on the Red Sea and Jubayl on the Arabian Gulf work by Solar Energy Model DELCO and there is automatic diesel generator for emergency uses of 50 KVA.

Figure A below shows signals which were received by Jeddah Stations, in 14 months from Muharram 1406 AH (September 84) to Rabi II 1407 AH (January 1987).

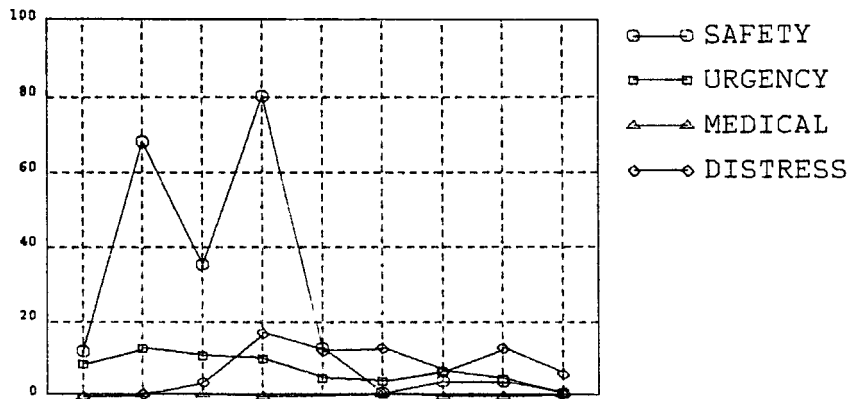


Figure A

The signals which were received consist of the following:

1. 23 distress signals
2. 111 safety signals
3. 13 urgency (SOS) signals

Figure B below shows signals which were received by Dammam stations, in 47 months from Jumada I 1403 (April 1984) to Rabi I 1407 AH (January 1987).

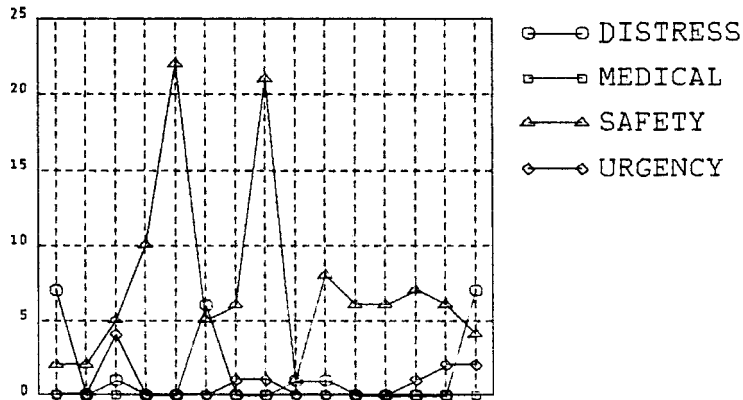


Figure B

The following signals were received consist of:

1. 73 Distress signals
2. 65 Urgency (SOS) signals
3. 199 Safety signals
4. 3 Medical guidance signals



CHAPTER (VI)

CONCLUSIONS AND RECOMMENDATIONS

The research for the establishment of a Search and Rescue Service in our area like the Arabian Peninsula, especially to cover the maritime borders under the jurisdiction of the Kingdom of Saudi Arabia, is not easy for a person such as me or a consultant specialized in this field who has no knowledge about the realistic situation of the areas concerned.

This difficulty is because the Saudi Arabian littoral is very much different, varying from one coast to the other in its physical, biological, and meteorological structure, as well as from the point of view of traffic pattern. The Red Sea is a passage for vessels sailing from the Indian Ocean to the Mediterranean Sea, Europe and the American Continent or on the opposite direction. The Arabian Gulf is the source of "life" for all the countries in the world including the Gulf's countries.

In this context, the research I made for the establishment of a Search and Rescue Service proceeds from the study of the marine aspects of the area, the international systems and instruments in force according to the IMO Convention on Search and Rescue at sea and all the published documents related to, and the study of the well established SAR Organizations in Europe and North America (The United Kingdom, Federal Republic of Germany, Sweden, United States and Canada) which have developed organizations with different approaches in the operation structures of their services such as follows:

1. The United Kingdom's SAR Service is under the command of the Coast Guard but the active branch of the system is the R.N.L.I. which disposes of the entire British SAR Units. However, the helicopters and aircrafts units belong to the Royal Navy and the Royal Air Force which participate in the SAR operation in addition to other services.
2. In the Federal Republic of Germany, the system is headed by the G.L.I, who owns and operates all units utilized for search and rescue. Similar to the U.K., helicopters, air crafts and other auxiliary units are owned and operated by other authorities.

3. In Sweden, NASAN has delegated the Administration of Search and Rescue to Telecom, which operates three coastal stations; one in the western part of Sweden, and two on the eastern coast. Each of these stations forms a Search and Rescue Centre (RCC). Telecom owns and operates the concrete base for a successful SAR service, that is a reliable communication unit. Once a (RCC) receives a SOS signal, the responsible officer advises SSRS, Coast Guard, Navy, Air Force, the National Administration for Ports and Navigation and any other authority as needed. During any SAR operation all involved parties are responsible to the SAR officer in the coastal station.
4. Maritime SAR in the USA is under the authority and responsibility of the USCG. In this context, the CG is responsible for the ownership, management and operation of all SAR Units. However, other parties may be involved in SAR operations, i.e., Navy, Air Force, etc.
5. Comparing the system in Canada to that of the USA, one could not find much difference, save the role of life boat institute and D.N. where their activities in SAR is much more noticeable. In Canada the organization is civilian rather than military.

Recommendations:

Considering the above mentioned abstract about various SAR system in such highly developed countries, I may comment as follows:

- Systems described have proven extremely high efficiency. Meanwhile the initial and running costs of such units is also high in order to keep permanent availability of the units. The Kingdom is therefore facing no difficulty in financing the establishment, management and operation of a comparable centre.
- Finances could be provided for the purchase of units needed for a successful SAR operation, this may include fast boats, helicopters, air crafts, communication units, and any other equipments. The main problem could be in the availability of qualified personnel to manage and operate the centre and the equipments. The number of nationals qualified in this field is very limited, that is to say the availability is very scarce.

A feasible solution may be by the unification of all efforts presently participating in SAR:

- Navy
- Coast Guard
- Civil Defence
- Port Authorities
- Hospitals (Private and Public)
- Saudi Air Lines (Aeronautical)
- Shipping Companies and Agencies
- Oil Companies, i.e. ARAMCO
- Fishing Boats

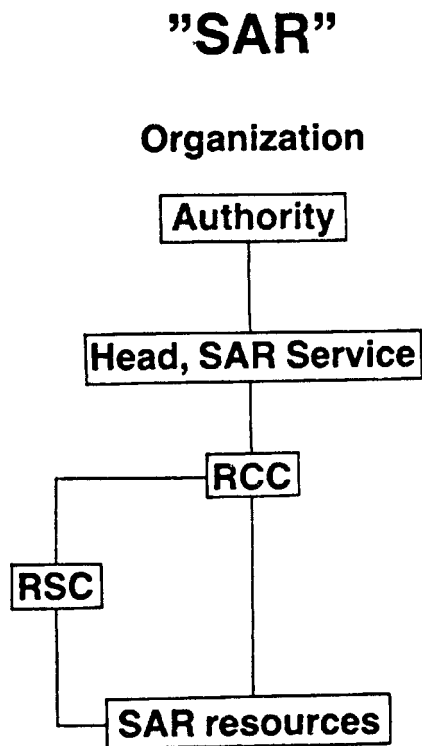
It may be necessary to deeply express that SAR is a religious, human, and national obligation which aims to save lives and properties.

The beneficiaries of SAR can be every individual in the globe.
It is also a direct service to each of our countries which we
owe a lot.

SAFE COASTS ARE THE RESULTS OF GOOD SAR SERVICE



The SAR Organization in its simplest form is as shown in the chart below:



RCC = Rescue Co-ordination Centre

RSC = Rescue Sub-Centre

The two operations - search and rescue - may take many forms depending on whether they are both required, on the site or complexity of the organized staff and facilities available. The type and density of traffic as well as the nature of the area to be covered as different climatological, physical, characteristics and topographical.

In the case of my country, The Kingdom of Saudi Arabia, an efficient SAR Service can be set up with verily no need for specialized SAR Units. That can be deduced from the following:-

1. I believe that the cost of providing adequate maritime SAR facilities will be too high but we can always make use of the basic facilities which already exist and all that is required is to co-ordinate their response through a SAR authority.
2. We have all the resources necessary for a SAR Service even if we think we do not - it only needs organizing.
3. My aim is not to make do with what we have but to make better use of what we have by co-operation between the providers of facilities useful to Maritime Search and Rescue.
4. It is necessary that the available resources be so organized and co-ordinated that effective and expediting search and/or rescue operations can be assured.

This requires the establishment of a search and rescue organization provided with a SAR plan and the means for carrying it into effect.

SAR Plan:

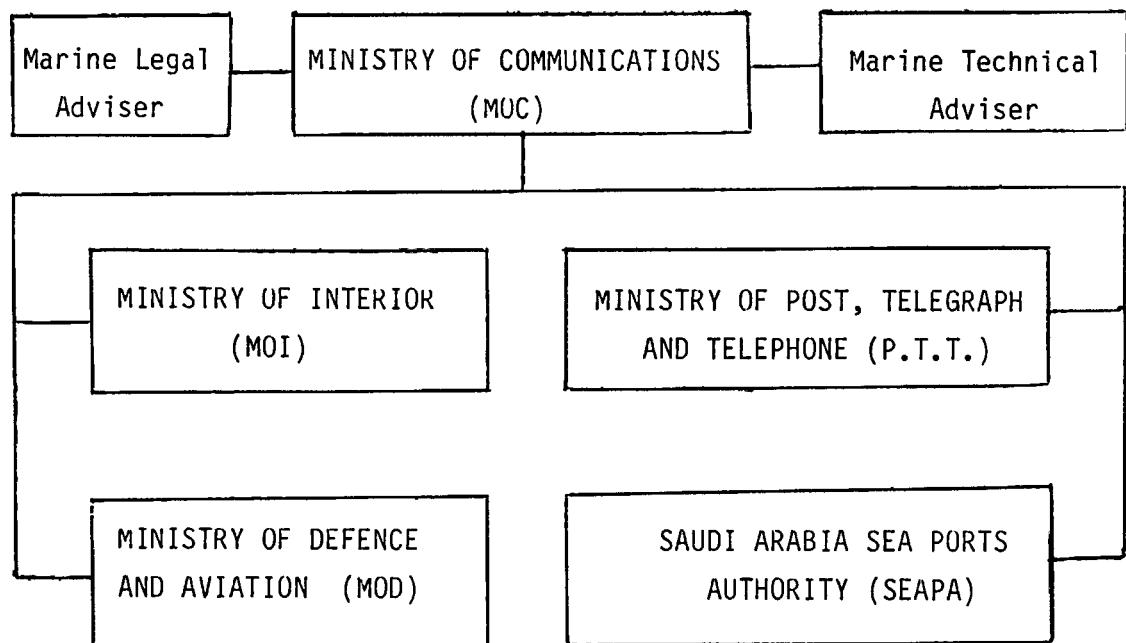
The plan must set out the details for the conduct of SAR at operational levels. It should state precisely which agencies are responsible for communicating with them. It should also indicate by whom and to what extent any of these facilities can be requested to participate in an operation so that no unit will be in doubt as to its authority to carry out the SAR operation. Hereby, the first step is to set up SAR Co-ordinating Committee nationally.

The function of the national SAR Committee is:

To give general guidance and ensure good co-ordination, cooperation and communications between SAR organization and providers of facilities to have a successful SAR service.

I propose that the Ministry of Communications will be the leading authority responsible for coordinating the committees affairs re-created by this is mainly based on legal task the Royal Government Decree No. M/25, dated 21.06.1397 AH (1977), which involves the MOC for the coverage of all type of public transport system, except for air transportation service.

NATIONAL SAR COMMITTEE



1. Ministry of Communications:
 - Ministry Deputyship for Transport Affairs
 - Director General of Marine Department for Transport
 - Director of Navigational Affairs Department
 - Director of Search and Rescue Organization

2. Ministry of Interior:
 - a. Director General of the Coast Guard
 - Director Maritime Districts

 - b. Director General of the Department of Civil Defence
 - Director responsible for a region with a coastal area

3. Ministry of Post, Telegraph and Telephone:
 - Deputy Ministry of Telephones
 - Director General of Coast Radio Station
 - Director of Jeddah Radio Station
 - Director of Dammam Radio Station

4. Ministry of Defence and Aviation:
 - a. Director General
The Royal Navy
 - Director King Faisal Royal Navy Base
 - Director King Abdul Aziz Royal Navy Base

 - b. Director General
The Royal Saudi Air Force
 - Directors responsible for a region with a coastal area

 - c. Director General of Meteorology

 - d. Director of Aeromedical Evacuation

- e. Director General of
 - Adudi Arabia Airlines
 - Aeronautical

5. Saudi Arabia Sea Ports Authority:

- Director General of the Ports Authority
- Director of Major Ports
- Director of the Minor Ports

EFFECTIVE USE OF HELICOPTERS IN SAR OPERATIONS



The Establishment of SAR Organization and Operation:

It will be on two stages:

First stage is:

1. The Rescue Co-ordination Centre (RCC) must be in Riyadh to permit the centralized information for rapid and reliable means of operation.
2. Two Rescue Sub-Centres (RSC): one in Jeddah Coast Radio Station and the other at Dammam Coast Radio Station.

The RCC Riyadh shall have:

1. Ready access to detailed information.
2. Large scale map of the SRR
3. Special symbols and positions for:
 - RSCs
 - SAR units engaged in SAR operations
 - SAR facilities
 - Air traffic service units
 - DF-Stations
 - CRS (Coast Radio Station)
 - Location of emergency supplies
 - Medical facilities
 - Shipping information agencies
 - Meteorological office
 - Telephone and teleprinter services

RSC Duties (Dammam and Jeddah RSCs):

1. Listen and control of distress signals on the following frequencies:

- 500 KHz - Morse
 - 2182 KHz - Radio
 - Channel 16, 156 MHZ
2. In case of receipt of a distressed signal, it should be transmitted at both same frequency and channel 16 for all ships in the area, giving details regarding the position of the ship and nature of accident.
 3. Informing SAR unit via telephone and telex.
 4. In case a vessel confirms availability close to the distressed vessel or craft, such as vessel would have to advise the following to Jeddah or Dammam RSC while proceeding to the distressed vessel position.
 - Vessel's name
 - Flag
 - Route
 - Speed

Then the RSC of Dammam/or Jeddah would advise the distressed vessel of this information. Simultaneously, advising the SAR Unit and other ships which responded to the signal and directed course towards the position.

Operations:

RCC of Riyadh will be the responsible authority to request assistance from various parties, i.e. Coast Guard, Navy, Ports Authority, Air Force, Saudi Air Lines - Aeronautical, etc. as situation is judged by officers responsible in the RCC.

In case of a distressed signal of any patrolling unit of the Coast Guard, Navy, Air Force, Porth Authority, and individuals, such signal should be directed to the RSC station of Jeddah/Dammam according

to the geographical position of the distressed unit. All units of the same organization as that of the distressed unit should immediately proceed to the position and receive instructions from the RCC in order to provide assistance to person/s or unit/s requesting such an assistance.

It should also be noted that relay stations in direct link with the Jeddah and Dammam sub-stations will be equipped with DF equipment for remote control communications.

to the geographical position of the distressed unit. All units of the same organization as that of the distressed unit should immediately proceed to the position and receive instructions from the RCC in order to provide assistance to person/s or unit/s requesting such an assistance.

It should also be noted that relay stations in direct link with the Jeddah and Dammam sub-stations will be equipped with DF equipment for remote control communications.

Establishment of a Training Programme for SAR Purposes:

This training programme will be designed for qualified personnel who are or will be involved in the search and rescue operations for the Kingdom and the neighboring countries in the framework of international co-operation.

So far the IMO has not provided signatory countries with a plausible training programme in this field but has only stated that this kind of training is available in some European and North American countries where other countries are most welcome to benefit from it. This statement is mentioned on a report by the Sub-Committee on Safety of Navigation (32nd Session - Agenda Item 5) on matters concerning search and rescue (Nav. 32/Wp. 2, paragraph 7.1).

During my field trips to USA, FRG and Sweden I found out that our trainees would most benefit from the type of training available in these countries. However the kind of programme available in the USA requires the trainee to have sufficient understanding knowledge to be able to absorb the type of programme offered. I can hereby train my trainees in Sweden first and then I can send them to one of the other countries for more benefit.

The experience gained from the above mentioned countries would enable us to carry out our own training in respect to the country's needs and requirements.

Towards an Adequate and Most Reliable SAR System:

Equipment utilized for SAR services must be of high accuracy for a better and efficient control of the situation occurring in the respective area.

Therefore in this respect it is highly recommended of the organization responsible for SAR services to acquire the type of equipment for provision and control purposes.

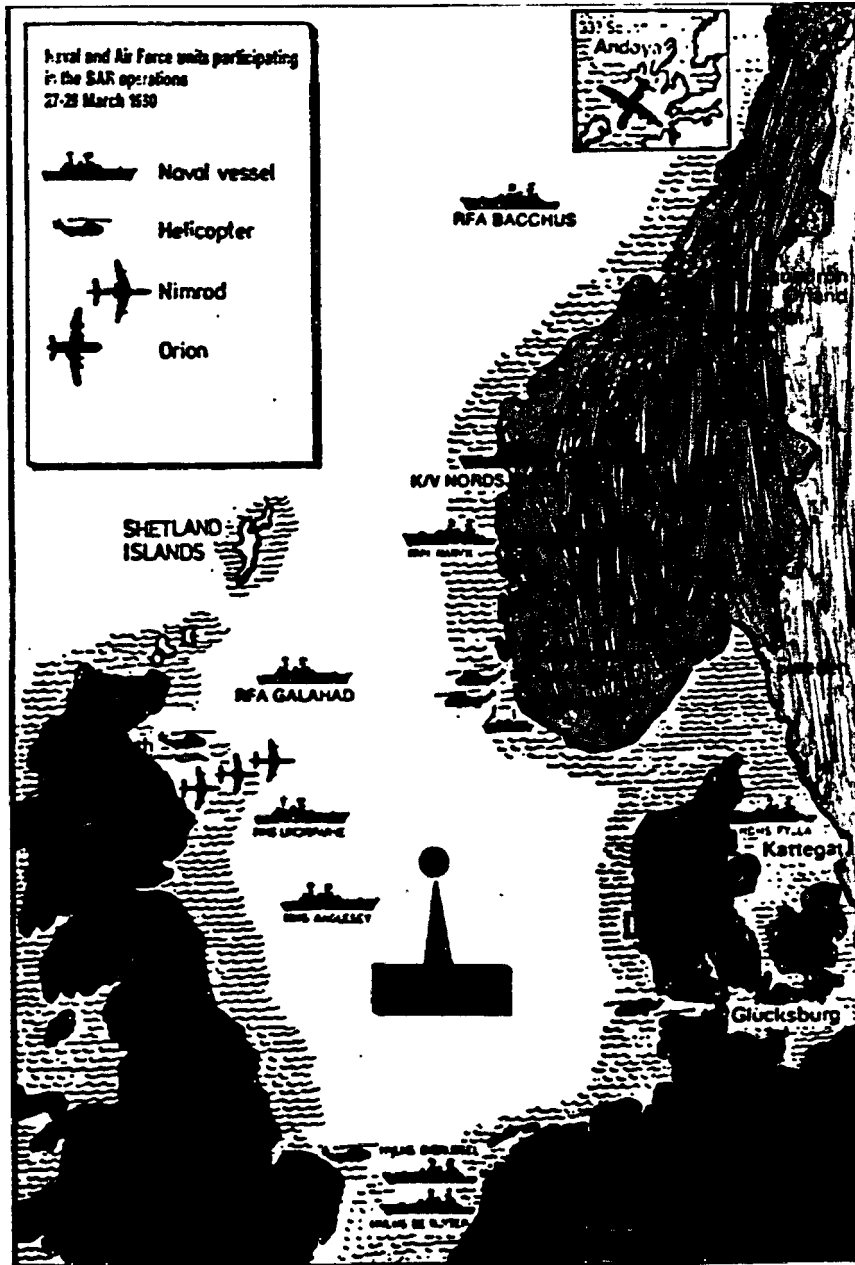
Position Reporting System:

This system is highly recommended to assist the SAR services in the way that ships in the area would inform the respective coastal station on their destination, position, cargo and the type of medical assistance available aboard - i.e. similar to AMVER recommendations -. Through this it is possible for our services to give the utmost assistance.

If this system comes into existence, the Kingdom of Saudi Arabia would play a conducting rôle for SAR in the area and in this respect it would be most feasible for it to be designated as the leading and the most potential country with the most adequate SAR system in the Red Sea and Gulf areas. Therefore it should be suggested for the Kingdom to take up the area collector of information specifically in the area 10a which covers the North West Indian Ocean.

In this way, the Kingdom of Saudi Arabia would finally reach the second stage of search and rescue which would be considered to be the specific objective of my paper.

AN EXAMPLE OF SEARCH AND RESCUE GLOBAL CO-OPERATION BETWEEN COUNTRIES



Regional Co-operation:

The geographical position of the Kingdom of Saudi Arabia gives a strong incitement to close co-operation. So we need co-operation between the regional states.

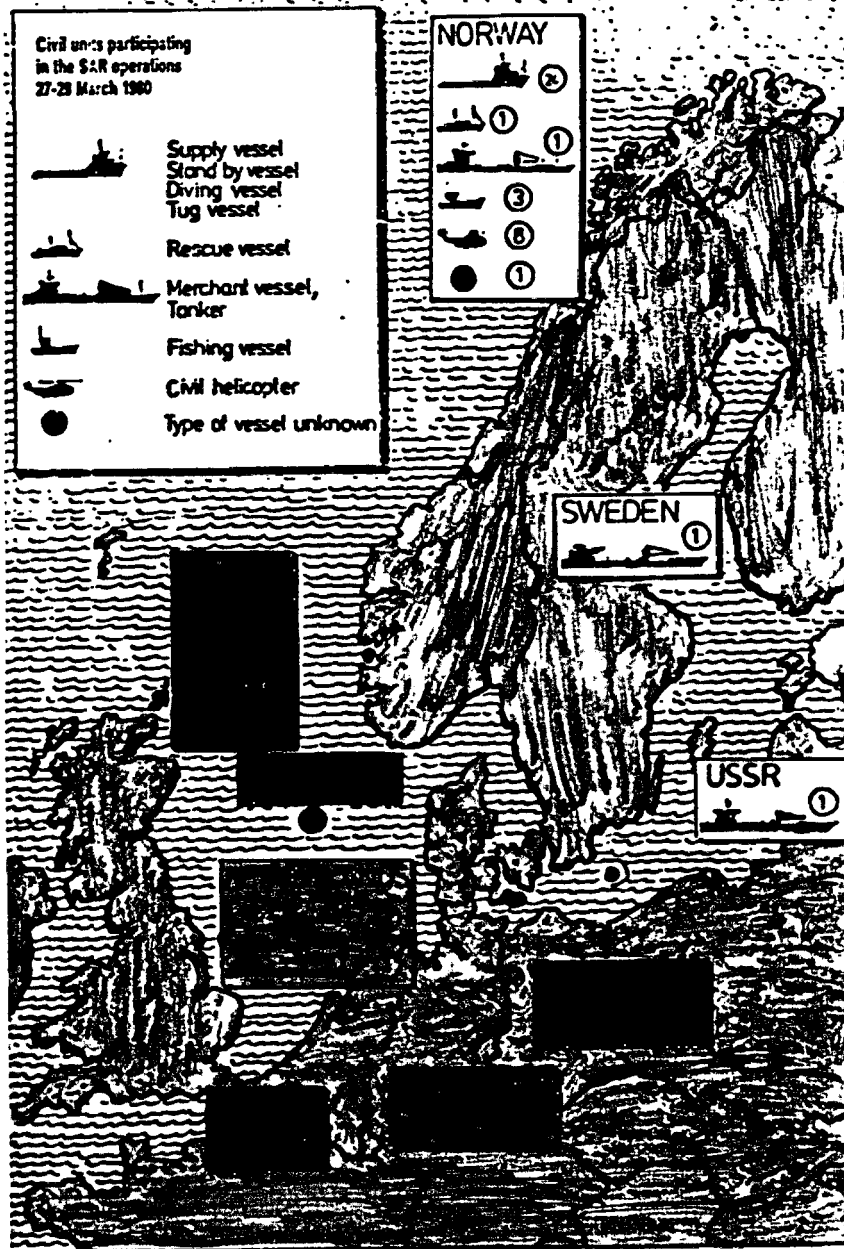
It is well understood that each of the Red Sea and the Arabian Gulf countries has its own SAR organization and procedure.

In the case of countries in the Arabian Gulf, particularly the GCC states, it is recommended to have the following system/procedure:-

1. Establishing a regional RCC in Riyadh, fully responsible for the whole area.
2. Establishing a national RCC or more in each of the GCC states, with RSC as may be required.
3. All national RCC are to be responsible to Riyadh RCC, where they will receive both information and instructions.
4. Riyadh RCC will have to keep information concerning all SAR units including auxiliary units, positions and communication.

Same procedure may be required for the other countries in the Red Sea, Arabian Sea and Arabian Gulf.

AN EXAMPLE OF SEARCH AND RESCUE GLOBAL CO-OPERATION BETWEEN COUNTRIES



R E F E R E N C E S

1. Convention on the High Seas 1958.
2. Information from Several Ministries and Departments in Saudi Arabia Dealing with Maritime Safety Matters.
3. IMO SAR Manual, 1987 edition.
4. International Agreements:
Sweden-FRG, Canada-USA, USA-Japan,
Saudi Arabia-Bahrain/Iran/Kuwait/Sudan/Qatar/UAE
5. Ports and Marine Lighthouse Regulations of Saudi Arabia.
6. SAR Convention 1979.
7. SOLAS Convention 1974.

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