Implementation of vessel traffic services in Iranian waters

Hossein Mokhlesiyan

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IMPLEMENTATION OF VESSEL TRAFFIC SERVICES IN IRANIAN WATERS

by

Hossein Mokhlesiyan

Islamic Republic of Iran

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 EDUCATION AND TRAINING (NAUTICAL).

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

Signature: 

Date: 30 October 1990

Supervised and assessed by: Co-assessed by:

Jef H. Mulders
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Professor Dr. ing. G. Wiedemann
Min. Dir. a.D.
Bonn, Federal Republic of Germany
By The Name Of The Beneficent, Merciful God
FOR MY PARENTS, MY FAMILY (ZAHRA, SHILLA, SHAHIN) AND ALL THOSE WHO HAVE WORKED HARD FOR THE PROGRESSING OF MY COUNTRY 'IRAN' SINCE 1979.
ACKNOWLEDGEMENTS

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comprehensive and valuable advice and documents.

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ABSTRACT

The Persian Gulf is known as one of the special areas, under the MARPOL 1973/78 and its protocol. The degree of maritime contamination in this sensitive area is about forty times as much as the maximum allowable ceiling. This and the rapid increase in the traffic density in these sensitive waters have raised critical concern among the officials of my country the "Islamic Republic of Iran".

The aim of this dissertation is to recommend various proposals to achieve safer and expeditious movement of traffic in the Iranian part of these sensitive and congested area. A general analysis of Iranian harbour and their services is given. The present status of maritime traffic safety including the existing navigational aids and equipment are described and suggestions for improvement are made.

A Vessel Traffic Services Network for all Iranian ports and harbours is suggested. This includes the establishment of:
- an Iranian data network,
- a modern VTS for the main Iranian ports,
- a TSS for Shahid Radjaie approaches and where necessary in other ports, and
- the harmonization of all port's VTS.

Finally, the dissertation summarized with a note of confidence that with the implementation of the above recommendations, safer navigation and cleaner seas will be provided.
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<td>Automatic Data Processing</td>
</tr>
<tr>
<td>ARQ</td>
<td>Automatic Repeat Request</td>
</tr>
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<td>BSR</td>
<td>Bandar Shahid Radjaie</td>
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<td>BSB</td>
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<td>R95</td>
<td>95% of the accuracy</td>
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<td>SRO</td>
<td>Survey and Registration Office</td>
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<td>TCC</td>
<td>Traffic Coordination Center</td>
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<td>Abbreviation</td>
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<tr>
<td>VDU</td>
<td>Video Display Unit</td>
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<td>VTC</td>
<td>Vessel Traffic Center</td>
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IMPLEMENTATION OF

VTS

IN IRANIAN WATERS
CHAPTER ONE
IRANIAN HARBOURS AND THEIR SERVICES

1.1. PORT & SHIPPING ORGANIZATION IN THE ISLAMIC REPUBLIC OF IRAN

According to the Iranian Maritime Code the Port and Shipping Organization (P.S.O) is the only executive branch of the Iranian Government to deal with national or international maritime affairs. These activities include:

- safety of navigation,
- prevention of pollution,
- training, examination and certification of the seafarers,
- maintenance and marking of the waterways,
- construction, operation and maintenance of the ports,
- loading and discharging of ships' cargo,
- certification of the vessels,
- preparation of proposals for maritime regulations,
- enforcement of the approved national maritime codes and
related international regulations in cooperation with other related organizations or bodies, and

- implementation of SAR activities and related regulation.

Some of these activities such as the certification and examination are dealt with by the P.S.O staff at the Head Office in Tehran and the other "operational parts" are entrusted by the P.S.O to the ports.

1.2. IRANIAN PORTS TERRITORY AND THEIR RESPONSIBILITIES

1.2.1. Iranian Ports

Presently the number of Iranian ports located on the Persian Gulf and the Gulf of Oman amounts to ninety two. Seven of them are main ports and the others are for small vessels of up to 1000 GRT including fishing boats and small crafts.

The main ports are:

i) Shahid Radjaiie
ii) Shahid Bahonar
iii) Bushehr
iv) Imam Khomeini
v) Abadan
vi) Khoramshahr
vii) Shahid Beheshti

In fig 1.1. the main port locations are shown. In addition to the aforementioned ports, there are two
rather big ports - Anzali and Noshahr - in the northern part of Iran on the Khazar Sea (Caspian Sea). Due to their geographical positions their activities are limited to the transportation of certain kinds of cargo between the

Fig 1.1
Location of Main Ports and their territories
Islamic Republic of Iran and U.S.S.R. The annual traffic of these two ports amounts to 110 and 242 ships respectively.

1.2.2. Iranian Ports' Territory and Their Responsibilities

According to the National Maritime Code each major port has its own region and territory. The region involves each main port area together with its own harbour, approaches and related waters. The territory covers a number of small ports, their regions and related waters.

Establishment of this territorial boundary is due to the determination of a sub-administration for the small ports and the securing of the safety of navigation in the national water. The officials in each of the major ports are responsible for exercising all appropriate safety measures, prevention of pollution, search and rescue and for combatting any kind of incident harmful to the environment and living creatures in the related territorial waters.

The Iranian coastal water in the Persian Gulf and the Gulf of Oman is divided into four territories as follow; (see fig 1.1.)

i) Imam Khomeyni 200 Miles
ii) Bushehr 220 "
iii) Shahid Bahonar/Radjaee 356 "
iv) Shahid Beheshti 155 "

4
1.3. ORGANIZATION OF THE PORTS AND THEIR SERVICES

1.3.1. Organization

The structure and extent of the organization of Iranian ports is based on the level of their maritime activities, the extent of their territories and regions, and the traffic density in their waters. The organizational structure of the major ports is shown in fig 1.2.

As shown in the diagram, maritime activities in the ports, except Bandar Shahid Radjaie and Bandar Bushehr, are managed by an operational department comprising two offices. One of them in each port is responsible only for the loading and discharging, while the other, the Maritime Services Office, deals with all the maritime services and operations including; dredging, search and rescue, installations and maintenance of navigational aids and navmarks (e.g., buoys, light vessels and fog signals), berthing and unberthing of vessels, pilotage, towing, issuing of port clearances and the establishment of proper communication with the vessels within its own region.

1.3.1.1. Organization in Bandar Shahid Radjaie

As shown in fig 1.3, maritime affairs in this port are managed by two operational departments, namely; the Maritime Logistic Department, and the Maritime Operation Department. Each department is headed by a port deputy managing director, and comprises three offices. In these departments, three of these offices deal with loading, discharging and firefighting. The others listed
below are responsible for maritime activities in the harbour and their own territory.
Fig 1.3
Organizational diagram of Shaid Rjale

Organizational Chart of Bandar Shaid Rjale
Two of the above mentioned offices are practically involved and responsible for marine affairs.

The Maritime Safety & Dredging Office is responsible for dredging, search and rescue, installations and maintenance of navigational aids e.g. buoys, light vessels and fog signals.

The Maritime Services office is in charge of the other tasks such as berthing and unberthing of vessels, pilotage, towing, issuing of port clearances and the establishment of proper communication with the vessels within its region.

1.3.1.2. Bushehr

In Bandar Bushehr two offices - the Maritime Services Office and the Maritime Safety & Dredging Office - headed by the operational department are responsible for maritime affairs. The function of these offices is identical to those mentioned in 1.3.1.1. In other ports the function of these two offices is assigned to one office only; namely the Maritime Services office.
1.3.2. Ports Services

The responsibility of the offices dealing with the maritime affairs was mentioned in the previous paragraphs.

To cope with these important responsibilities and to secure the safety of navigation and prevention of pollution on behalf of the P.S.O. each of the ports has its own organization which was mentioned before in 1.3.1.

In spite of the huge responsibilities for these offices, the number of specialized personnel seems to be insufficient. This fundamental shortage makes implementation of the services rather difficult. The current services offered in all the Iranian ports are more or less similar and can be summarized as follows:

i) Pilotage of ships; which is compulsory in all ports.

ii) Towage service; the required services in this field are carried out in proper ways with a sufficient number of suitable tugs and experienced personnel.

iii) Establishment of communication with ships to provide them with all the necessary information.

iv) Marking and maintenance of their territory including the channels, the port entrances and approaches.

v) SAR service. This service is carried out in each port and its territory by a number of tugs equipped with firefighting equipment and one or two fast crew carrier boats. The involved personnel comprises a group of operational and technical
personnel who are capable of crew rescue and assistance at casualties.

iv) Pollution Control; this service is limited to the pollution control in the port area.

vii) Other miscellaneous services; providing ships with fresh water, fuel oil, etc.
PRESENT STATUS OF MARITIME TRAFFIC SAFETY IN THE ISLAMIC REPUBLIC OF IRAN

2.1. GENERAL CONSIDERATION

In the previous chapter the function, organization and the services of Iranian ports were described. The description concentrated only on the maritime services of Iranian ports located on the Persian Gulf.

At Iranian ports located in the Persian Gulf. The majority of Iranian seaborne trade and transportation are concentrated. Hence, these ports accommodate the major part of ship traffic destined for Iranian ports.

At present the minimum annual volume of traffic passing through Iranian ports is more than four million tons GRT, which represents only the tonnage owned by the Islamic Republic Shipping Line of Iran.

It is clear that the port authorities as well as P.S.O should provide ships with necessary safety measures in all navigable water and especially, in those port and harbour areas which represent the most sensitive parts of the Persian Gulf.

Up to now the primary principle of safety for ship
Up to know, the P.S.O and the port authorities have implemented the primary measures required for the safe
traffic of ships in the area.

Considering the port's facilities and accommodations, the volume of traffic in the harbour areas and the current difficulties of the ports in connection with the traffic, of ships, it becomes clear that the safety in some of the Iranian ports and harbours should be improved.

The safety requirements and regulations in ports and harbours are interrelated with many factors such as; port facilities and accommodations, traffic congestions, environmental conditions and its geographical particulars.

Consequently, in order to determine the current level of maritime traffic safety and of the necessity for the implementation of additional safety requirements in Iranian ports, the aforementioned interrelated factors and current difficulties in each port should be analyzed.

2.2. MARITIME TRAFFIC SAFETY IN IRANIAN HARBOUR AREAS

2.2.1. Bandar Shahid Radjaie and Bahonar

Bandar Shahid Radjaie (BSR) and Bahonar (BSH) are two of the biggest Iranian ports. These two ports are located in the eastern part of the Persian Gulf and just in front of the Strait of Hormuz.

These two ports have a cargo handling record of at least 12 million tons per year, and represents more than 50% of the imported and exported dangerous goods of the Islamic Republic of Iran (IRI).
According to the available statistics, the average daily traffic of these two ports has been 3600 ships per year (coastal going and ocean going vessels). This number will probably increase sharply in the near future for various reasons such as the future expansion and modernization of port facilities and the increase of importing and exporting.

It is worth mentioning that these two ports are situated within 11 miles of each other and have similar environmental conditions:

i) Temperatures;
   - Mean Highest 44 centigrade
   - Extreme Highest 47 " "

ii) Rainfall;
   - Average 162 mm/year
   - Number of Days with one mm or more 9 days

iii) Wind Speed;
   - Mean wind speed 6 kns
   - Max. Highest 80 kns
   - Prevailing and direction variable mostly N-NE
iv) Visibility:

- Number of days with visibility less than two miles: 50 days
- Number of days with visibility less than one mile: 30 days

v) Sea State:

- Wave heights (peak): 3 meters
- Max current: 3 knt
- Current direction: E and W
- Sand storm: sometimes in summer
- Tidal range max: 3 meters
- Max height above MSL: 6 m
- Chart datum (CD):
  i) BSR: 10.5 m
  ii) BSB: 6.6 m

---

* Iranian Hydro/Meteorology Association
2.2.1.1. Bandar Shahid Radjaie (BSR) See chartlet 2.1.

i) Port approaches;

The distance between this port and its anchorage is approximately twelve miles including an artificial buoyed channel 3.5M long, 249m wide with a minimum depth of 13.5m (see part AB in the chartlet). There is a project in preparation for increasing the depth up to 15m. The harbour is protected by breakwaters and in the near future the installation of a leading line will make navigation and pilotage of ships in the channel safer and easier. Fig 2.1.

ii) Anchorage

All kind of vessels are allowed to anchor in an area located between the Hormuz, Qeshm island and the Bandar Abbas coast line with the exception of the areas allocated to the port approaches. The area is a joint anchorage for all ships carrying either general cargo or dangerous goods.

iii) Port Accommodations And Facilities

The harbour, protected by two breakwaters, consists of two basins with a total berthing length of 4640m. The maximum depth at the berths is 14 meters and the minimum is 11.5m. Ten berths are available for container and bulk cargo vessels. The other two berths can accommodate a tanker of max 70000 dwt and one Ro-Ro up to 45000 dwt. In addition, a bunkering jetty and three mooring berths are also available for 70000 dwt and 30000 dwt vessels.
Fishing vessels, specialized vessels and port resources such as tugboats, pilot boats and dredgers are berthed in a separate basin specially constructed for them.

Chartlet 2.1
Bandar Shahid Radjaie Port
iv) Port Resources

There are eight tugs (power ranging from 1200 to 3600hp) each equipped with a fire fighting system. In addition, two fast boats for transportation of the pilots are permanently on stand by.

2.2.1.2. Bandar Shahid Bahonar (Bandar Abbas) See chartlet 2.2.

This port is a secondary port to the Shahid Radjaie port. For this reason the anchorage of this port is collocated with the anchorage for Bandar Shahid Radjaie.

i) Port Approaches

The distance from the anchorage to the harbour, which is protected against waves and swells by a breakwater, is a buoyed channel of approximately 3 miles in length with a max depth of 12m at H.W and a minimum depth of 9.5 m at L.W. To facilitate navigation for the ships proceeding to this port, a leading light in line bearing 000 is installed to lead between the breakwaters.

ii) Port's accommodation

The harbor is an artificial one constructed with two basins; one is commercial and the other belongs to the navy. The first has six jetties of 1050m length for general cargo, an ore loading berth and an oil jetty with a maximum depth of 10.5m at L.W, while the latter has some quays and piers.
Fig 2.2

Bandar Shahid Bahonar

(17a)
iii) Port Resources.

There are two tugs of 1200 and 2400hp (the last is equipped with firefighting equipment). In addition there is a fast boat for the required transportation of pilots and ship's crew, etc.

2.2.1.3. Maritime Services Office

As previously mentioned, there are two offices (see 1.3.1.1) which are located in a two-floor building at Bandar Shahid Radjaie Port. They are jointly responsible for providing safe approach for more than 3600 vessels yearly.

The Maritime Services Office is responsible for the safe traffic in the port region. This office in order to accomplish all the related functions, comprises three sections, viz; Communication Section, Port Resources Section and Maritime Services Section. Each of these sections is headed by an employee who is accountable to the head of the Maritime Services Office, one of the decision makers among the port authorities.

i) Communication Section

This section has a number of qualified V.H.F operators. The most important part of daily task of VHF operators are:

- to establish proper communication with the ships proceeding to the port area to acquire ships data,

- to transfer received data whenever necessary to
the top official of the related office or port authorities.

There are also a number of other operators at this section who are responsible for communication with other Iranian ports, the P.S.O in Tehran and some other companies or governmental bodies in connection with the current maritime affairs. This communication is mainly carried by means of M.F and/or H.F, telex and facsimile.

The M.F - H.F - telex - facsimile and other communication equipment are installed in the communication center. Apart from this equipment a sufficient number of VHF is also installed in the tower of Bandar Shahid Rajaie on the top of a building where the Maritime Services Office and its sections are accommodated.

The information exchanged between the communication section and ships consists of:

- E.T.A and E.T.D
- pilotage and towage services
- berthing and unberthing of ships
- the primary measures necessary to proceed to the port such as, fixing the pilot ladder for pilot, having enough crew on board for berthing and making ready all the document for declaration of either cargo or crew assets.
- weather forecast on request by ships.
- the notice of readiness by ship to shore or shore to ship before starting any kind of operation including shifting and unberthing.

ii) Port Resource Section

This section is managed by a pilot or tug master and an additional administrative personnel. The most important parts of the section's activities are:

- to ensure the instantaneous readiness of the crew working on board the floating units (tugs, fast boats, etc.) and the unit itself to participate in any kind of operation according to the port authorities instruction,

- the management of the crew who are working on board these floating units; and

- to ensure the safety of the floating units and their crew.

iii) Maritime Services Section

This section is headed by a pilot who has a vast experience in pilotage. A number of administrative person, not more than five, also co-operates in administrating this section in proper way.

The major activities of the section are:

- to register arrival and departure time of vessels.
- to provide pilots, tugs or any other services necessary for a safe harbour operations.

- to keep track about the present situation of ships either in anchorage or in the harbor area.

- to file the records and data of ships such as: crew list, draft, length, beam, ETA and ETD, nature and amount of cargo, flag and call sign, technical status of ship and the name of the master.

2.2.1.3.1. Present Difficulties

Because of the lack of adequate local regulation and the absence of specific anchorages, scrapped, blackout, unmanned, dead and laid up ships are anchored in navigable waters regardless of the national and international regulation. This already has caused a considerable number of incidents and accidents in the port and harbor’s area and region.

Disorderly traffic of small coastal fishing and cargo ships is also a major difficulty in the port area. They enter and leave the port without any contact or pre-information to the V.H.F operators. Most of the time they occupy berths irrespective of the port regulations and formalities. Due to such irresponsible actions there have been various dangerous accidents and close quarter situations and also a lot of cases in which an ocean going
vessel had to wait in front of the jetty for a considerable time.

2.2.2. Bandar Imam Khomeyni (see chartlet 2.3)

This port is also one of the biggest Iranian ports on the Persian Gulf. It was originally constructed with 37 berths, 31 of which are only twelve years old. The annual traffic statistics for this port for many reason including the imposed war are not available at this moment.

This port like the other parts of the Persian Gulf has rather calm weather and environmental conditions as shown below:

i) Temperatures;

- Mean Highest 49 centigrade
- Extreme Highest 51 = = =
- Mean lowest 00 = = =
- Extreme Lowest -5 = = =

ii) Rainfall;

- Average 142 mm
- Number of days with
  1mm or more 15 days

iii) Wind Speed;

- Mean wind speed 15 kns
- Max. Highest 80 =
- Direction Variable
- Number of days with
wind speed 22 kts and more
- prevailing winds NE’ly and SW’ly monsoons

iv) Visibility:
- Number of days with visibility less than one mile
  30 days

v) Sea State;
- Wave heights (peak) 3 meters
- Tidal average range 4
- Height above MSL 6
- Chart datum (CD)
  i) harbour area 20
  ii) channel 9

2.2.2.1. Port Approaches and Anchorage

i) Port Approaches (Fig 2.3)

The distance between the port and Khor-e-Musa anchorage, which is the common anchorage for ships destined to Bandar Imam Khomeyni, is nearly 49 miles. It includes an artificial stony channel or bar which is well marked by light beacons and dredged up to 9.1m (chart datum), at L.W.

With the exception of the bar, the route is a natural narrow gulf with some obstacles, bends and promontories marked by buoys. Vessels of 32 feet draft
may enter the port at any time, but larger drafts should be anchored to wait up to the time of high high water.

ii) Anchorage

The anchorage is a joint anchorage for all kinds of ships without any restriction as to the ship's size and the nature of the cargoes carried.

2.2.2.2. Harbour Traffic Safety Policy

The Maritime Services Office in this port is dealing with the required safety in the port area. Its organization, except for a section which is responsible for the installation and maintenance of the buoys, beacons etc., is more or less similar to the Bandar Shahid Radjaie office and comprises of three sections with the same functions, personnel and procedures as follows:

i) Communication Section

The section is staffed with a number of V.H.F operators. The V.H.F operators make contact with vessels to interchange information either in English or Persian about ships' anchor time, nature and amount of cargo on board, scheduled time of berthing and unberthing, and any other kind of data requested.

ii) Port Resources Section

This section is responsible for more than three hundred
employees, who work on board fast boats, pilot boats, dredgers, the tugs and any other floating units owned by the port. Most of the tugs are equipped with advanced fire fighting equipment.

The primary function of the person who is in charge of the section is to deal with crew problems and the floating units themselves.

iii) Maritime Services Section

This section is manned by a few none-maritime personnel, headed by an experienced person in nautical field whose prime responsibilities are:

- determination of the sequence of ships piloted and/or berthed in port,

- collection of the ships' documents and records,

- coordination with the Port Resources Section to provide required assistance for any kind of operation such as pilotage, berthing and unberthing of ships,

- establishment of the essential contact with the other relevant authorities in the port to take necessary action relating to ships, cargoes and crews.

All the ships entering or leaving the port are steered and piloted by the pilots. Up till now, there has not been much traffic congestion of fishing vessels and small cargo
ships in the area concerned. As already mentioned the route provides adequate depths and width.

There are only two problems in pilotage. One is stranding emanating from the lack of experience and knowledge of certain junior pilots. The other is the foggy weather conditions in the summer and autumn.

2.2.3 Bandar Bushehr (see chartlet 2.4)

This port is one of the oldest Iranian ports and is located in the center of the north eastern coast of the Persian Gulf. It has two jetties for general cargo ships which are 360m long and 29 feet deep. In addition a dolphin and a jetty are available for discharge of liquid cargo. The environmental conditions of the port are:

i) Temperature;

- Mean Highest 45 centigrade
- Extreme Highest 50 = = =
- Mean Lowest 3 = = =
- Extreme Lowest -1 = = =

ii) Rainfall;

- Average 230 mm
- Number of days with 1mm or more 17 days

26
iii) Wind Speed;

- Mean wind speed 8 kts
- Max. Highest month 80 =
- Number of days with wind speed 22 kts or more 41 days
- Prevailing winds direction variable

iv) Visibility;

- Number of days with visibility less than 1 mile 30 days

v) Sea State

- Wave Heights(peak) 3 meters
- Tidal average range 1.5 meters
- Heigh above MSL 4 = = =
- Chart datum (CD);
  i) channel 9.5 = = =
  ii) Port area 10 = = =

2.2.3.1. Port Approaches And Anchorage

i) Port Approaches

The port is linked to the sea by an artificial stony buoyed channel (fig.2.4) 7.9M long 150m wide equipped with
a leading line and on average depth of 30 feet at H.W and a minimum depth of 6 meter at L.W.

There is a fairly strong cross current in the channel where, apart from 150 ocean going vessels per year, there is a congested daily traffic of many small vessels and fishing boats. In this port, as in all Iranian ports, pilotage for ships of more than 1000 GRT is compulsory.

ii) Anchorage

The port has two anchorages, viz, inner bar anchorage with a capacity of three ships and an outer anchorage positioned outside and close to the entrance of channel in the open sea. In the outer anchorage there is no restriction or procedure for anchoring with respect to the nature of the ship's cargo. The only obligation for the master is to inform the port V.H.F operators above the exact time of anchoring. The inner anchorage is used as a temporary anchorage for some ocean going vessels when there is any shifting in the port area. Sometimes, the floating units of the port resources such as dredger are also anchored there.

2.2.3.2. Harbour Traffic Safety Policy

The maritime affairs in this port are carried out by two offices similar with that of Bandar Shahid Radjaie.

Maritime Services Office in this port is also the official body to deal with the enforcement of the safe traffic and necessary allied services.
The organization, policy and the services offered by this office are identical with those in the other ports.

2.2.3.3. Present difficulties

According to the last annual document published by the P.S.O. The average number of the ships destined to this port is only 13 percent of the total number of vessels that annually proceed to Iranian ports. Therefore, there are not more than two or three daily movements of ocean going vessels in the channel. However, there is a dense daily traffic of fishing boats and coastal going vessels of up to 1000 GRT. These vessels enter and leave the port without any notice or required contact with the port VHF operators. They are mainly operated by crews who have not enough knowledge about navigation and related regulations. This creates for the port authorities the same difficulties as Bandar Shahid Radjaie.

2.2.4. Bandar Shahid Beheshty

This port has been constructed with four jack-up jetties in a natural bay, called bay of Cha Bahar and located on the Oman Sea. fig 2.5.

The system of the maritime affair management in this port is similar to the other ports. The annual average of traffic in this port is five percent of the total traffic of the Iranian ports. Because of the limited population in Bandar Cha Bahar, there is no congested coastal traffic in
Fig. 2.5

Bandar Shahid Beheshty

(29a)
the harbour area. Hence, there are no major difficulties.

There has been a great project for expansion of the port to evolve the overall economic situation of the province concerned. After implementing the project the port is expected to become one of considerable importance in the future, but up to now there is no authoritative news available about the expected date of completion of the project.

Currently a jetty for ships of up to a maximum of 28000 d.w.t and a maximum draft of 28 feet at H.H.W is available.
SUMMARY

In chapter one and two a description on the present organization, structure, responsibilities, management and difficulties of the maritime affairs in the Islamic Republic of Iran and Iranian ports in the Persian Gulf was given. Considering the structure of the maritime affairs, the management and difficulties in the ports, it can be summarized that:

i) the maritime traffic safety is managed by two offices namely "Maritime Services Office", "Maritime Safety and Dredging Office";

ii) Presently, the maritime traffic safety consisted mainly of:

- the exchange of information between ship and shore regarding anchoring, ETA and sometimes ETD.

- the installation and maintenance of navigation marks including buoys, light vessels in the navigable waterways.

- the pilotage of ships in port and harbour areas.

- providing tug assistance.

iii) the existing major difficulties stem mostly from disorderly traffic of coastal vessels which are either cargo or fishing vessels.
iv) uniform and efficient information systems and procedure for the ports do not exist.

- adequate monitoring and controlling of the ship's traffic in the ports and harbours areas is not carried out.
CHAPTER THREE
3.1. INTRODUCTION

Beside oil exploitation the use of the sea in the Persian Gulf includes:

1. Shipping, transportation of goods and passengers;
2. Fishing, the area is biologically very productive and holds one of the richest fishing stocks;
3. Leisure activities.

These activities will increase in the future and therefore a number of important aspects related to the use of the sea in the Persian Gulf should be considered, such as:

1. The sensitivity and vulnerability of the maritime environment in these waters, which is recognized as a special area under the IMO-MARPOL 1973/78 convention and protocols;

2. The concentration of the richest fishing stock on the Iranian side of the Persian Gulf, especially in the region around Bandar Shahid Beheshty, Bandar Bushehr and Bandar Shahid Radjaie.

3. The difficulties of the ports in the management of
the maritime traffic;

4. The international conventions such as SAR, SOLAS and MARPOL. They in general specify a number of obligations for the coastal states regarding the control and management of the maritime traffic including interactive communication between ships and shore for promulgation of information on navigational dangers, aids to navigation, routeing measures and reports on incidents related to pollution.

As has been mentioned in chapter two, nowadays among Iranian ports BSR is especially faced with difficulties for conducting safe and efficient maritime traffic in its region. These difficulties together with some other parameters form a great potential for the risk of pollution in the area. The parameters are:

1. The nature and amount of dangerous and hazardous cargoes shipped to the port;

2. The type of the ship and the volume of the annual traffic;

3. The sensitivity of the area to pollution.

There are a number of measures by which the difficulties in traffic and the risk of pollution in the area can be reduced. These includes:

1. Providing ships with information necessary for a safe navigation in the area by interactive
communication between shore and ship;

2. Controlling, monitoring and surveillance of all traffic, either ocean or coastal going vessels;

3. Setting up especial areas and regulating the use of these areas for the traffic of ships;

4. The enforcement of regulations designed to improve traffic safety;

5. Pre-planning of procedures and actions in case of incidents and emergencies;

These measures have already found their applications in many ports around the world. Statistics and experience have shown that each of the above mentioned measures up to a certain level will help to improve the safety and efficiency of traffic management and reduce the risk of pollution emanating from collision and stranding.

An example for the effectiveness of these measures is found in the Dover Strait. Figure 3.1 gives the annual collisions and the effects of the above mentioned measures on traffic management in the Dover Strait.

These measures find their applications in:

1. Traffic Separation Scheme (TSS) by which ships in particular areas are restricted to travel only in specified directions.

2. Vessel Traffic Services (VTS) consisting of a series of functions for the acquisition,
processing and distribution of information.

Finally and as a result, it can be stated that the need to establish a proper management of traffic, in order to ensure the safety of life and to protect the maritime environment in the Persian Gulf, is a key issue in the policy of the Port and Shipping Organization (P.S.O) on behalf of Iranian government. Especially, the sea area of BSR is to be given much attention.

**Annual collisions in the Dover Strait**

Fig 3.1.
In order to design an effective traffic management system for BSR, the following items should be taken into consideration:

1. Arrangement for the separation schemes.

2. Availability of necessary navigational aids and services: buoys, racons, lights, pilots and tugs;

3. Defining the functions of the VTS;

4. Organization of the VTS;

5. Assessment of the VTS procedures

6. Installation of adequate surveillance and communication aids and equipment;

7. Establishing of cooperation with other authorities such as; Maritime Services Office, Port authorities, Customs and Health office, Shipping Companies and Agencies.

6. Training of VTS operators and other relevant personnel.

3.2. BSR SEPARATION SCHEME

For the proposed separation schemes the followings are recommended:

All the navigable water enclosed between Larak, Qeshm and Hormuz island together with the approaches of both ports with respect to the Ships' Routing and other
relevant regulations approved by IMO should comprise arrangements as shown in Fig. 3.2.

1. Two separation schemes (TSS) including a Round About;

2. Buoyed channels at the port entrance in which pilotage is compulsory;

3. Two separate anchorages.

3.2.1. Traffic Separation Schemes (see fig 3.2)

Pursuant to the preceding arguments (see chapter one and two) and in order to:

1. Facilitate and promote the safety of traffic of ocean going vessels, specially, those with dangerous cargoes in the area,

2. Improve safety of other maritime activities, efficiency in the ports and protect the environment.

two separation lanes (the eastern and western) are proposed. The eastern one is a three-mile wide separation scheme, divided by a 1.2 mile wide separation zone and is basically allocated to ships proceeding to or from the Hormuz Strait. The western one also has width of three miles, divided by a 1.2 mile wide separation zone and situated between Qeshm and Lark Island for traffic of ships destined to and from ports in the Persian Gulf.

Moreover, in order to make the traffic of ships in the
TSS as safe as possible and to separate the traffic at the junction of the eastern and western lanes, a roundabout with a radius of one mile is established.

**Fig 3.2**

**TSS and Anchorages**
Fig 3.2A

Nautical Chart of the Area

(39a)
As is shown in the chart of the area (fig 3.2a), the minimum depth in the eastern TSS is 19m and in the western TSS is 15.6m.

There is no obstacle, sharp bend or promontory and other activity like fishing, drilling and dredging in the area of the TSS to hamper or deter the safe movement of the vessels.

In spite of the existence of enough and suitable objects for positioning in the three islands (Geshm, Larak, and Hormuz), it is worth mentioning that the type of ships, nature of the traffic, and the length of each TSS lane, which is more than 10 miles, requires the installation of a number of buoys or Racons which are vital for the safety of navigation. Therefore, it is suggested that the separation zones be equipped with sufficient number of buoys with radar reflectors and additionally at the roundabout with one Racon, which transpond to 10 and 3 cm radar pulses.

As shown in the figure the distance between every two buoys should be:

- 4.2 M in the eastern TSS,
- 4.7 in the outer western TSS and 4.3 in the inner one.

These buoys and the Racon at the Roundabout will be of great assistance for masters to define the position of ships with more accuracy either in normal condition or at the time of dense fog and sand storms. Apart from that, the buoys are of great help for the small crafts, fishing vessels and boats, which mostly are not equipped with
electronic navigation aids.

The minimum acquired position accuracy for the navigation of ships in the TSS should obey:

\[ R_{95} < \frac{1}{3} B \]

\[ B = \text{width of the Separation zone} \]

Considering the related formulae for the position accuracy with radar \( R_{95} = \text{range} \times 3.6\% \) and the position for the Racon, it is concluded that, the position accuracy in the TSS would be better than the following value which obeys the requirement that \( R_{95} \) should be less than \( \frac{1}{3}B \). Since the width of Separation Zone \( B = 1.1 \) mile the accuracy of the position in TSS should not be worse than:

\[ \frac{1}{3} \times (1.1) = 0.37 \text{M} \]

According to the formula mentioned in the preceding page:

- \( R_{95} \) for the Eastern TSS \( 3.6\% \times 10.3 = 0.37 \text{M} \)
- \( R_{95} \) for the Western TSS \( 3.6\% \times 9.2 = 0.33 \text{M} \)

As it is clear the \( R_{95} \) for all part of TSS is less than 0.55M which is half of the separation zone width. And if we consider \( R_{99.5} \) for ship steering in the TSS, the proposed width for the separation zone will also be more than enough because:

\[ \text{--- table on MPP accuracies para 9.10 of "Error Analysis of Position Fixing" Professor J.H. Mulders} \]
3.2.1.1. Traffic of Ships in the TSS

Ships which use the TSS can be divided into four groups:

1. Vessels proceeding to the area from the Hormuz Strait; after required reporting to the Vessel Traffic Center (VTC) and after receiving clearance by the VTC, should proceed and navigate in the appropriate traffic lane in the eastern separation scheme.

The first contact of such ships with the VTC should be at least one hour before entrance to the TSS. This timespan permits the Vessel Traffic System (VTS), TCC and other authorities concerned to perform necessary pre-planning and arrangement of the services such as pilotage, tugs and berth planning.

2. Ships which are going to leave BSR or BSB with destination Strait of Hormuz should navigate along the extreme right of the traffic lane allocated in the eastern separation scheme. Notice of departure should be given to the TCC at least one hour before leaving the port.

3. Vessels destined to the other ports on the Persian Gulf. These ships should navigate in the part allocated for the outbound going vessels in the western TSS as shown in the fig 3.2.

4. Those approaching to the area from other domestic
ports or other Arabian ports located in the Persian Gulf; are also required to report at least one hour before the entrance of the TSS. The intended traffic lane for these ships is the inbound part of the western TSS depicted in fig 3.2.

Proposed general rules for ships in the TSS are:

i) the maximum allowable speed of 12 knots for reducing the risk of any contact due to the probable contravention of small vessels and fishing boats;

ii) while proceeding towards and in the TSS a continuous radio watch in VHF channel 16 should be maintained;

iii) the estimated time of departure (ETD) or ETA from/at the TSS should be reported to the VTC.

3.2.2. Port Approaches

The port approaches in this scheme are the part where pilotage is compulsory. Starting point of the approaches is envisaged from the Racon located in the roundabout. As already mentioned, there are two port approaches - one terminates in Bandar Shahid Radjaie and the other in Bandar Bahonar.

3.2.2.1. Bandar Shahid Bahonar approaches; (see fig 2.2)

The approaches to this port, which is 3M long, starts from the line connecting two geographical positions: 56 15.5E, 27 02.7N and 56 19E, 27 03N.
The minimum depth in this approaches is 12 meter and its seabed is mud and soft sand. With respect to the maximum acceptable draft of 10 meters by and the seabed material, 12m depth seems to be safe enough for ships piloted to the port. The maximum current in the area does not exceed two knots.

3.2.2.2. Bandar Shahid Radjaie approaches; (see fig. 2.1)

The approaches to this port, divided into two parts. It starts from the line connecting the following geographical positions: 27°1.9N, 56°16E and 27°03E, 56°16E. The first part is a channel with 1.4M width and 7.5 M length.

The installation of two buoys at the following position in this part of the approaches is vital for safe navigation;

\[27°2.5N, 56°13E \text{ and } 27°1.5N, 56°13E\]

The second part, as is shown is a dredged buoy channel, 3.5M in length and 249 meter in width.

The channel has a soft black mud seabed and apart from the buoy and the suggested racon, it is intended to install a leading line.

As is seen in the fig 3.2 (part CD) another narrow channel 6.5M in length and 0.6M in width between the ports is suggested only for traffic of the ports' resources such as tugs, fast boats and other small crafts. The minimum depth in this channel is 6 meters.
Considering the length of this channel, it is advisable that the channel be equipped with buoys - at the entrance, in the middle and at its termination - to make navigation for the port's resources as safe and easy as possible.

3.2.3. Segregation of Anchorages

In order to regulate the traffic, to reduce the probability of incidents and to limit after effects of accidents in the area, two separate anchorages are proposed here:

1. An anchorage for general cargo and fishing vessels (GCA), and

2. An anchorage for ships with dangerous cargoes or hazardous substances (DGA); (see Fig 3.2)

3.2.3.1. General cargo anchorage (GCA)

As shown in Fig 3.2 the position of this anchorage area is chosen as near, clear and safe as possible to both ports and the TSS. One of the great advantage of this position is its nearness to Bandar Shahid Bahonar which implies a short transportation line between BSB and the anchorage. Another advantage of this anchorage is its relative sheltered position. The anchorage should be marked by four anchorage buoys at its four corners with the geographical positions:

27 4.5N, 27 01.5N, 27 05N, 27 8.5N
56 19E, 56 24E, 56 24E, 56 19E
The total area of the anchorage is 19.2 square M of which 3 square M (sub-area "F" in fig. 3.1) is reserved to accommodate 12 fishing vessels and the remainder is allotted to a maximum of 32 general cargo vessels. The depth in this anchorage varies from 9 to 23 meters. After the necessary report to the VTC, ships with general cargo should follow the TSS and anchor at the position allocated by VTC in the GCA anchorage.

3.2.3.2. Dangerous cargo anchorage (DGA)

The location of the anchorage is chosen after careful consideration of recommendations for dangerous cargo anchorages. Its distance from the three islands and Bandar Abbass is one of the most important factors to be considered. The location of this anchorage has been chosen after consideration of the following subjects:

1. At the occurrence of an accident, there would be a minimum after effect and harm for the environment, the fishing grounds of the area and the population of: Qeshm, Larak, Bandar Abbass and Hormuz.

2. The Hormuz Island is not densely populated.

3. In the case of an accident or incident there will probably not be much consequences for the maritime activity or other ships navigating in the TSS.

4. The water depth and the seabottom guarantee a good anchoring site.
As shown in fig 3.2, the anchorage is located between the following geographical positions which are to be equipped with special anchorage buoys.

27° 01'N 26° 56'N 26° 56.7'N 27° 01'N
56° 31'E, 56° 36'E, 56° 31'E, 56° 36'E

The complete area of the anchorage is 22 square miles and can accommodate 27 ships. Therefore, the proposed anchorage area for each ship is 0.8 square M which is judged to be a safe space for all type of ships carrying dangerous or hazardous substances. The maximum depth in the area is more than 20 meters which with respect to accepted draft by the port, 14.5 meters, it is adequate and sufficient.

Ships with hazardous cargo, after getting in touch with the VTC for determination of their area to anchor should anchor in the DGA which is allocated just in the vicinity of the entrance of the related separation scheme. Pilotage for these ships in the TSS is considered to be compulsory.

Ships which are instructed to anchor should wait until the necessary arrangements for pilot have been made. After defining the position of the anchor by VTC then ship should approach safely to the anchorage.
3.3. PLANNING, MONITORING AND CONTROL FUNCTION OF VTS

3.3.1. Definition of the Functions of VTS in General

Some international communities classify the functions of VTS in "primary", "enforcement", "remedial", and "other functions". IMO in its "Guidelines For Vessel Traffic Services" define the functions of VTS as follows:

- data collection, and evaluation,
- information service,
- navigational assistance service, and
- support of allied activities.

With regard to the aforementioned explanations, it can be stated in general that the VTS functions involve four dimensions: planning, monitoring, control functions and other functions. These are the functions which are aimed to be introduced as the new functions of the BSR VTS.

It is worth mentioning here that the decision concerning the effective navigation and maneuvering of the vessel remains with the master. Neither sailing plans nor requests or instruction change to the sailing plan can supersede the decision of the master of a ship.

Therefore, in order to avoid arbitrariness it is suggested that traffic instructions be limited, as far as possible, decision on the route to be followed, the schedule, and within the VTS area. Strategical levels

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**Ref. No: Cost 301/FR2.00{AN 0102)issue C/06/67 ,page 1-19.

-** Guidelines For VTS, IMO Res.A.578(14)para.3.3.2.4

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should include special precautions and general navigational policies. Finally, these functions should define the degree of authority over the use of the spaces and committed infractions or rogues within the VTS area.

Therefore, related rules and enforcement procedures should be defined by the competent authorities in a way to intimate proper benefits to those they apply to.

3.3.2. Planning Functions

As implies by the name of this function, it deals with preplanning of all the measures necessary for a safe and efficient operation. In general, such functions are started at the reported entrance of ships into the VTS area and terminated at ships’ departure from the area. These function can be defined as follows:

1. Preplanning of ships’ track, speed and way points time slots;

2. Planning and providing the required operational schedule for ships entering or departing the VTS area including: position of anchoring, the time of pilotage, date of berthing and unberthing, number of the required tug boats for safe maneuver for all the required operations, etc. based on the acquired ETA and ETD;

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*COST 301 para.1.3.4.2.*
3. Preplanning of necessary services for ship such as Medical check and Custom clearance and police affairs;

4. Timely preplanning for ships in the VTS area at emergency conditions in particular at the time of predicted gale or storm which probably put in danger ships which are in operation, at anchorage or moored in the harbour area;

5. Preplanning of any precautionary measures required for maneuver of ships carrying dangerous goods or substances.

### 3.3.3. Monitoring Functions

Monitoring is performed by VTS operators through the assessment of traffic movements, the situation of navigational aids, the hydro/meteo data and the trend in the VTS area.

The satisfactory performance of this function depends heavily on the data acquisition, data processing, data evaluation, tracking and surveillance of ships and their behavior within the VTS area and the capabilities of the VTS operators. The various stages of the monitoring function in the VTS can be defined as follow:

1. Data collection regarding the traffic within the VTS area on expected arrivals and departures through communication with the ships and/or exchange of the data with authorities such as the port office, shipping companies, agents and other Iranian ports.
2. Collection of data on traffic, wind, visibility, sea state, tidal heights and current.

3. Processing all data achieved from various sources in order to assess the present and predict the future safety situation within the VTS area.

4. Monitoring of all movements in the VTS area in particular of ships with hazardous cargo, ships restricted by size or draft or manoeuvrability in order to foresee any probable potential dangerous situations.

5. Surveillance to maintain a plot of all navigation aids and marks including the location of all vessels berthed, moored or anchored in the VTS area and any harbour works which may affect the ship traffic.

6. Keeping radio watch on appropriate and pre-determined channels.

7. Provide the authority responsible for coordination of traffic with necessary information to facilitate the decision when and how to change over to the control function.

3.3.4. Control Functions

In the VTS area, every vessel must be monitored to remain within the allocated space which can be required by the VTS authorities. Such requirements depend mainly on the ship characteristics, its manoeuvrability, the nature of
its cargo, other traffic and other required safety factors.

Because of the prevention of any probable severe disaster the sensitivity of the control task increase when a ship is navigating in very congested part of the VTS area. The following control functions and traffic instructions concerning the ship behaviour in the proposed VTS area are advisable:

1. To instruct changes in the sailing plan. These changes may include:
   i) remaining at a specified location;
   ii) time slot changes of passing the next reporting waypoint or another specific point;
   iii) instruct not to enter the VTS area;
   iv) change of destination or request to follow another track;
   v) request to stay alongside the berth;

2. To start prompt actions to ensure compliance with the rules governing the navigation in the VTS area;

3. To give urgent advice for maneuverers to avoid collision or grounding;

4. To take required action against infractions and rogues which endanger the safety in the VTS area;
5. To coordinate the movement of the patrol boat;

3.3.5. Other Functions

These functions are in the form of support for - commercial and administrative activities of the maritime affairs, shipping agents, ports authorities and governments and, diminishing of consequences and after-effects of accidents. These other function includes:

1. The supply of repair information including provision of repair personnel on-board ships;

2. Salvage information, supplying towing and fire fighting facilities through the establishment of necessary contacts with authorities concerned.

3. Radio medical information, provision of information for diagnosis, treatment and supply of medical personnel on-board.

4. Supporting search and rescue operation, the acquisition and supply of information on casualties and disaster situations.

5. Supporting pollution prevention measures and provision of information of the pollution incident itself, its contents, severity and behavior.

6. Provision of information to appropriate authorities of hazards stemming from the maritime environment, e.g. risk of explosion.
3.4. VTS PROCEDURE

When defining the procedures of the BSR VTS, it is necessary that reference should be given to the relevant guidelines defined in section 5 of Guidelines For Vessel Traffic Services and General Principles For Ship Reporting Systems recommended by IMO in A 16/Res.648 (27 October 1989).

The intended procedures for the VTS in the area are classified as Operational and Communication Procedures.

3.4.1. Operational Procedures

The operational procedure is considered to:

- define the nature of the transferred information,

- regulate and harmonize the interchange of information between ship/VTC, VTC/ship and VTC/allied services in order to provide necessary services in the VTS area.

i) information from ship to VTS should include:

- ETA, ETD, present position, course and speed;

- Vessel particulars and characteristics;

- Vessel destination and navigational intentions;

- Request for navigation aids deficiency;
- Request to enter the VTS area;

- Request to pass roundabout area;

- Request for an anchorage;

- Request for pilot, tug or any other relevant port and allied services;

ii) VTS/ships interaction communication contains:

- Permission to enter the VTS area or pass special waypoints;

- Position, course, speed, of other especially rogues;

- Instructions to perform a maneuver

- Navigation obstructions/restrictions;

- Nav.Aids deficiencies

- Pilotage and tug availability;

- Allocation of berth or anchorage;

- Maneuvering advice and requests.

iii) Group broadcast to ships by VTS:

- Tidal information, obstruction for navigation, emergency warnings, specified area for navigation;
- Any accident or incident in the VTS area;
- State of aids to navigation;
- Dredging information and emergency notices;
- Weather broadcast;
- Any necessary information about TSS.

3.4.2. Communication Procedure

Communication procedure should be designed to support operational procedure and to convey information, e.g., by radio transmission from VTC to ship as precisely, clearly and unambiguously as possible. In doing so, it is therefore suggested that:

- a number of VHF channels be allocated for communication with ships,
- the language used should be English, and
- the standard Marine Navigational Vocabulary should be used in general,
- the reporting times should be pre-defined and published,
- the necessary instructions about the VHF watchkeeping aboard ships either in the anchorage or approaches to the VTS area should be pre-notified.
the time of the first report by ship before entrance or departure to/from the VTS area.

- regulations governing the VTS area should be published and distributed to all bodies concerned including; IMO, IAPH, IALA, IMPA, shipping companies and agencies, ship owners, other port's authorities, SAR office, other department within the P.S.O.
3.5. ORGANIZATION OF VESSEL TRAFFIC SERVICES

3.5.1. General Consideration

With respect to the system of maritime affairs in the country, it is suggested here that the Maritime Services Office should be responsible for the VTS in BSR. The underlying arguments for this suggestion are given in the following:

1. it has the responsibility for the Pilotage and pilots who have an important role in the VTS;

2. the Communication Section and Port Resources Section, which are under the responsibility of this office;

3. it has valuable experiences relating to the shipping affairs and other allied services.

3.5.2. Reorganization of Maritime Services Office

According to the proposal in the preceding section, it is suggested that the Maritime Services Office is to be responsible for the implementation and operation of the VTS in BSR. Thereby, it becomes an office responsible for the maritime traffic and services which hereafter will be called Maritime Traffic and Services Office (MTSO). The major functions of this office will be as follows:

1. Traffic management, which deals with all
organizational aspects for the management of safe maritime traffic including the organization of the VTS.

2. Planning and coordination of operational services for ships entering, shifting and leaving the ports. In general, all the adequate arrangements necessary for ships from berthing until leaving the berth excluding those related to loading and discharging operations and formalities.

To implement the abovementioned functions the following organizational chart is proposed for the MTSO, fig 3.5.

![Organizational Chart](image)

Fig 3.3
proposed chart for MTSO
As shown in the chart two sections are supplemented to the present organization of the MTSO to implement the functions of VTS and planning in the office. Here the focus of the implementation of a new organizational will be confined to the TCC and VTS.

3.5.2.1. Traffic Coordination Center (TCC)

The VTS functions of the Traffic Coordination Center are the coordination and planning of the required traffic services for all ships. As has already mentioned these functions are started at reported entrance of ships into the VTS area and terminated at the time of ships' departure from the area. The recommended function of the TCC can be defined as follows;

i) all the functions defined in 3.3.2. as the planning function of the VTS;

ii) collating and obtaining adequate data regarding the ship and other authorities. These data include ETA, ship's characteristics, length, service speed, beam and displacement, together with manouvring characteristics and nature and amount of cargo;

iii) distribution of the acquired data to various point including VTC, shipping companies, agents or any other related bodies and organizations depicted in fig.3.6. in order to pre-arrange timely necessary measures and schedule for the ship such as berthing, required medical check, custom declaration, etc.;
iv) registration of all ships data and communication in the VTS data system;

v) initiate adequate measures against the contravention of relevant and approved law and regulations committed by any ships within the VTS area;

vi) communication with and participation in other maritime operations such as SAR and anti-pollution;

vii) collection and filing all of the data necessary for the immediate contact with the shipping companies, SAR, police, agencies, customs, pilots, authorities in other ports and other authorities in the data system concerned;

iiix) pre-scheduling for the fuel and fresh water requested by ships in advance;

ix) scheduling daily working of the VTC attendants and their assistants;

x) providing and distributing of required publications; particularly, Vessel Traffic Services' Guide to ships and other national and international organizations concerned;

xi) dealing with all the relevant correspondence with other correlative bodies or organizations.
3.5.2.2 Vessel Traffic Center (VTC), Functions and Procedure

Functions of this center, have already been defined in the form of the VTS functions and in 3.3.3, 3.3.4 and 3.3.5. The procedure is also defined in 3.4.

![Diagram](image)

Fig.3.4

The organizations and bodies in connection with TCC
3.6. REQUIRED EQUIPMENT AND PERSONNEL

3.6.1. General Consideration

Figure 3.1. (page 35) provides an overview regarding the significance of the successive measures carried out in order to decrease the rate of annual collision in the Dover Strait. The figure shows:

1. The benefit of the TSS in the Dover Strait;

2. The rise in the rate of collisions, between 1967 and 1972, due to the lack of means and measures in order to encourage and enforce compliance with rules.

3. The effect of traffic monitoring and control which together with TSS considerably reduced the rate of collisions in this area after 1972.

The above mentioned observations imply that the most important measure to achieve the full benefit from TSS, is the establishment of a suitable navigation information services. A VTS through its monitoring and control functions can improve the encouragement and enforcement of rules. Therefore, it is necessary for a VTS to be capable of collecting all the required data including the navigational behavior of ships. In general the main sources for information on the navigational behavior of ships are:

1. The VHF; a communication link between ship and VTS, and

2. Shore based VTS sensors for position fixing,
tracking and identification of targets.

It is also worth mentioning that one of the major factors that directly influences the quality and efficiency of services offered by a VTS is the quality of equipment and personnel employed within the VTS.

The main criteria for the determination of the proper equipment and manning depend on geographical features, environmental parameters, the characteristics of the traffic in the VTS area and the function of the VTS. (see 3.3).

3.6.2. Equipment For Bandar Shahid Radjaie VTS

As explained in the preceding sections any VTS for the processing of the required data and effective performance of its functions needs a number of sensors and communication links. Nowadays these are composed of:

1. Position fixing, tracking and identification sensors;
2. Communication links;
3. Data processing equipment;
4. Visual display units.

With respect to the role of advanced technology in this field, the peculiarities of Bandar Shahid Radjaie and the nature of the proposed VTS the application of the sensors mentioned above are contemplated for this VTS.
3.6.2.1. Position Fixing, Tracking And Identification Techniques

As has already been mentioned the Position fixing, tracking and identification techniques can be considered as the backbone of a VTS.

The most powerful sensor for the purpose of position fixing and tracking of target is radar with automatic plotting, tracking and predicting facilities. The VDU should have a high resolution with alphanumerical information.

The integration of radar sensors into VTS will confer significant benefits by providing an overview of all traffic, position of buoys and Racons in the area of responsibility in any condition of light and visibility including:

1. The information regarding ships closing on each other,

2. The information about the nearest point of approach or a ship approaching an obstacle,

3. The position of the ship with respect to the limits of the TSS and waypoints.

To fully benefit from the advantages of radar, other sensors and equipment for the improvement of the traffic management in BSR, the following proposal is made. The proposals however should not prevent to decide on other solutions being considered which could have an agreeable
efficiency-cost ratio.

With respect to the extent of the BSR VTS area and the heights of the mountains of the three surrounding islands (Qeshm 163m, Larak 145m, Hormuz 164m) depicted in the relevant chart (figure 3.5), three radar antennas, and one VHF-DF installation are considered for a proper coverage of the VTS area. In addition the sea area up to the Hormuz Strait is under radar and VHF-DF coverage. The intended sites for the installation of the radar antennas are as follows:

1. The tower of Harbour Master Office with a total antenna height of 30m which can cover section (1) of the VTS with a range of at least 12 miles;

2. The highest point of Qeshm island (163m). The range for this radar will be at least 28.5 miles which can cover the complete VTS area in addition to parts of the Hormuz Strait’s area.

3. The highest point of Larak island (141m) where there is a marine light beacon on a tower of 20 meter in height. The antenna of the radar can be installed on the same tower. The range of this radar will be at least 30 miles by which all the VTS area (except the part placed on the north parts of Qeshm island) and the Strait of Hormuz will be covered.

The technical parameters of these radars are proposed as follows:
i) for the radar mentioned in para 1, which is also to be used for the surveillance of the basins and the harbour area, the following characteristics are suggested:

- pulse length of 0.03 microsecond which implies a range discrimination of about 10m;
- horizontal beamwidth of 0.4 degree which also indicates the bearing discrimination
- P.R.F of not more than 2000 Hz.

ii) for the other two radars the following specifications are proposed:

- pulse length 0.03-0.07 microsecond,
- horizontal beamwidth of 0.4 to 0.6 degree,
- P.R.F of 1500-2000Hz,

iii) apart from those mentioned above following particulars for the synthetic picture, inside the VTS area, of three radars is proposed:

- Max speed error : < 0.1 m/s =0.2knt.
- Max length error: <10% L>50m
- Max Ground Course error:< 5 degree
- Max True Course error : = = = =
- all radar ARPA to be equipped with tracking filter which is combined of a, B, Y filters.

4. One VHF/ DF sited on Larak island for identification
of the ship passing the Strait of Hormuz to proceed to these ports or directly to the other Iranian ports in the Persian Gulf. The area covered by this VHF is at least 30nm which is enough to cover the VTS area.

Nowadays, VHF Radio Transponder System is also about to be introduced as an identification, polling, tracking and automatic reporting system to operate in conjunction with the VTS radars. The VHF radio transponder functions for VTS as VHF DF does. Nevertheless, the adequacy of the system will be subjected to the result of further studies which is currently carried out by the relevant authorities, IMO and IALA.

5. For selection of the best radar tracking process (optimal noise reduction) and the reduction of false echoes, it is suggested that the radar system should be equipped with a radar-extractor.

By means of a micro-wave link the raw-radar video and VHF/DF transition can be carried from the unmanned radar antenna stations to the VTC in which the radar processor(extractor), the three monitors and the VHF/DF receiver are installed. Installation of three monitors can provide simultaneous and instantaneous picture of the traffic in all the VTS area - harbour area, separation scheme and the strait of Hormuz - which is necessary for the performance of a proper control and adequate surveillance by VTS operators.

It could be arranged that the number of radar site to be limited to those in BSR and Larak island. These two radars can also cover the VTS area and the strait of
Hormuz with a lower cost and expenditure. But it should however be considered that:

i) the positional accuracy and the prediction of targets are far more accurate by mixing the radar information of the three radar sensors in the VTC radar processor. This is because the combination of three radar fixes which has a weight which is equal to the sum of the weight of three single radar fix:

\[ W(\text{combined}) = W_1 + W_2 + W_3 \]
\[ R(\text{combined}) = \sqrt{\frac{1}{W(\text{combined})}} \]

Therefore, it can be concluded that the position accuracy \( R_{95} \) of targets with a three radars-extractor on the average is:

- 60% of the accuracy of \( R_{95} \) with one radar,
- 80% of the accuracy of \( R_{95} \) with two radars.

ii) Pursuant to the above mentioned formulae, the position accuracy of ships in the TSS area and in the port approaches can be stated in the figure as follow:

in the Eastern TSS;

- 0.29M \( < R_{95} < 0.24M \) by the Larak radar.

---------------------------------------------
- * "Error Analysis Of Position Fixing (Methods&Systems)"
  Professor J.H. Mulders.
Fig. 3.5

The Position and the Area Covered by Radars

(69a)
- 0.48M<\text{R95}>0.24M by the radar of Qeshm.
- 0.23M<\text{R95combined}>0.17M by two radar (Larak and Qeshm).

in the the Western TSS;

- 0.3M<\text{R95}>0.14M by the radar of Larak.
- 0.25M<\text{R95}>0.16M by the radar of Qeshm.
- 0.17M<\text{R95combined}>0.12M by the two radars (Larak and Qeshm).

in the Roundabout area;

- 0.39M<\text{R95}>0.37M by the radar of Larak.
- 0.28M<\text{R95}>0.21M by the radar of Qeshm.
- 0.48M<\text{R95}>0.45M by the radar of BSR.
- 0.2<\text{R95com}>0.15M by means of the three radars (BSR, Qeshm and Larak).

in the port approaches;

- 0.45M<\text{R95}>0.14M by the radar of BSR.
- 0.3M<\text{R95}>0.16 by the radar of Qeshm.
- 0.64M<\text{R95}>0.39M by the radar of Larak.
- 0.2M<\text{R95combined}>0.12M by the three radars (BSR, Qeshm and Larak).

With respect to the aforementioned position accuracies, it can be concluded that the accuracies by the combination of the three radars would be limited to between 0.12M and 0.24M.

iii) The reliability of the radar system is enlarged by three radars. When one radar has a break-down there
are still two left. If the MTBF of one radar = 2000 hours than the MTBF of three radar can be considered to amount to 6000 hours.

iv) Preventive maintenance can be more easily carried out with three radars because, during the maintenance of one radar there are still two radars in operation.

Finally, a Closed Circuit Television can be installed in the critical and sensitive positions of the port basins to control movement, berthing and unberthing operations. This kind of device is very useful especially for the checking and controlling of wooden small crafts that have created a lot of difficulties in the port area in particular at the time of berthing and unberthing operations mentioned in preceding chapter.

3.6.2.2. Communication Equipment

The researches and evaluation of communication requirements in VTS carried out by competent international authorities or communities have shown that the following techniques are applicable in general:

1. NAVTEX which has been in use since 1987. It has the disadvantages of printed communication;

2. INMARSAT satellite systems (standard C and standard A terminal), which is rather costly at present;

c) INMARSAT standard M terminal from 1993;
d) Terrestrial MF and HF;

e) Terrestrial VHF;

The existing V.H.F for communication between VTS and ships is the most suitable one. It is suggested that two channels of the existing duplicated (dual) V.H.F for establishment of the communication link, with regard to the procedure of the Radio Regulations, between VTC and ships be selected by the authorities concerned.

For domestic shore to shore communication, in particular, with Islamic Republic Shipping Line of Iran, PSO, other ports and all shipping agencies, VTC and TCC should be equipped with at least one line for facsimile/telex and two telephone lines.

3.6.2.3. Data Handling and Voice Logging Systems

a) Data Handling System

Considering the function of the proposed VTS, it is recommended that the VTS operation centers (TCC and VTC) should be equipped with automatic data processing (ADP) equipment so that:

- current difficulties will be remedied,
- a vast quantity of information can be handled,
- important information can be stored easily.

To implement this important measure at least two microcomputers (one for VTC and the other for TCC) with
Data storage requirements of 150 megabytes are considered for the storage of the required data. The information to be stored comprises:

i) Ships data (seagoing and inland);
   - Hull-dependent data including vessel’s length, beam, draft and characteristic of cargo.
   - Machinery-dependent data including; machinery type and power.
   - Ships’ dynamic and handling characteristic data; service speed, stopping distance, turning circle.
   - Other data e.g; vessel’s name, tonnages, flag and radio call sign, IMO and Lloyd’s numbers, position of ship at specified time, ETA, last port, owner, agents and their relevant data, cargo etc.

ii) Data on dangerous goods; (emergency procedure, checklists, names, sequence UN No, description division, class, IMDG volume and page relating to the cargo, etc.)

*Typically data storage requirements for computer as such may fall between 40 and 150 Mbyte (the views of ABP Computer Services Limited, associated British Ports Holdings PLC, Britain’s largest ports operating group)
iii) Journey data of Seagoing and Inland Ships; the nature and amount of cargo, purpose of journey, etc.

iv) Port resources, Pilots and Duty rosters (list of the personnel on duty);

v) Incident data, Addresses, Berth data, Historical data, Tidal data, Anchorage data.

It is worth mentioning that advanced technology could link data handling systems to the other systems used in VTS; therefore, by this means data can be input, handled and output in different ways via:

- Data terminal Visual Display Unit (VDU);

- Radar display Magnetic Tape Unit;

- Line printer.

It is important that the various copies of the data base file be not kept only in this center but also in the other centers to be kept in file.

Finally, it is recommended that Iranian experts in programming and designing of data network should study the possibility for designing such a system not only for BSR but also for a network establishing data link between all Iranian port and PSO in Tehran. Moreover, the possibility for defining BSR as the main center of the network is also one of the important matters which can be taken into consideration when the required evaluations and studies will be conducted.
b) Voice Logging System

This important measure which is in common use also can be done by means of a Central Magnetic Tape Unit which is linked to the related communication equipment. It is recommended that all the daily interchanged data between the ship/VTC for a 24 hours - be taped and filed for a certain period (thirty days). If necessary the VTS-communication can be retrieved.

3.6.2.4. Other Equipment

For the proper control of small crafts which have been causing major difficulties for the ports, it is recommended that at least one patrol boat should be allocated for this purpose.

3.6.3. Manning Requirements

With respect to the proposed equipment, organization, and functions of the VTS, the number and qualification of the required personnel are considered as follow;

3.6.3.1. Traffic Coordination Center (TCC) Personnel

Considering the working time of the TCC (eight hours a day), it is recommended that this center should be staffed by a senior maritime expert and two TCC assistants.
3.6.3.1.1. Maritime Expert (Head of the VTS-organization)

The senior maritime expert is recommended to be one of the most experienced academic senior pilots of the port with necessary background in English language, enough administrative experience, adequately familiar with the functions and procedures of VTS and capable enough to manage the employed VTS equipment. The major responsibilities of the expert are:

i) managing of the VTS-organization.

ii) to obtain required information regarding ships that are destined to the Iranian ports. This information may consist of all data necessary for the pre-planning of the ships' schedule such as ; ETA, ETD, nature and amount of cargo, last port, ports of call, draft, ship's requirements during the stay in the port, length and breadth of the ship, etc. It is recommended that this data being being acquired through ship owners and/or the agents by facsimile or telex or telephone line in urgent cases.

iii) to keep data in file either automatically or by the help of the TCC assistant.

iii) to implement necessary pre-coordination about the schedule of ships with other relevant authorities including, pilots, tugs, port deputy operation, head of loading and discharging office, custom office, police department, fire brigade of the port through the head of MTSO.
iv) to inform VTC about the number of the probable daily movements in the VTS area and the schedule of ships proceeding or leaving the port in near future.

v) to pre-determine required precautionary measures and requirements necessary for different kinds of dangerous goods on board ships and inform the relevant offices in the port like fire brigade to be on standby for emergency cases.

vi) to report infractions or rogues to the head of MTSO.

3.6.3.1.2. TCC Assistants

It is recommended that the two assistants should be selected from those who are the most qualified existing radio or VHF operators trained in connection with the IMO Maritime English Vocabulary, administrative procedures, proper handling of facsimile, telex and computer. The main routine functions of these assistants are:

i) To file ships data in the TCC data handling system.

ii) To extract required information for precautionary measures from data handling system and to distribute data to the relevant authorities.

iii) To establish necessary contacts and provide for communication with other authorities according to the TCC operator instruction.
3.6.3.2 Vessel Traffic Center (VTC) Personnel

3.6.3.2.1 VTC Operators

Five of the most qualified senior academic pilots of the port with sufficient knowledge - in English language, VTS functions and its procedures, handling of ARPA radar, computer and all the employed VTC equipment - are suggested that to be employed as VTC operators. It is intended that the VTC will provide a continues daily services. The duty of the VTC operators are:

1. To identify and keep track of any kind of vessel operation nearby or in the VTS area by radar or any other tracking system available in order to:

i) to monitor the position, course and speed of ships which are sailing in the VTS area,

ii) identify ships which are in an encounter or collision situation or any probable potential danger.

iii) to determine rogue ships and any contravention as well as intention of approaching ships or ships being overtaken in the VTS area.

2. To monitor the position and performance of buoys and Racons within the area.
3. To establish required communication with ships in the VTS area and authorities in the port area;
   i) interchanging of the necessary information: hindrances to navigation, traffic in the area, position of ships engaged in special operation in the VTS area.
   ii) giving any required advise, recommendation, warning and instruction to ships.
   iii) transmission of required data about infractions to the relevant authorities.
   iv) cooperation and advising functions to the pilots and tug masters involved in operation.

4. To operate the data handling system.

5. To participate in SAR, anti pollution and other emergency cases.

b) Additional duties of the VTS operators can be:

It is expected that in the absence of TCC staffs the duties of the VTS operators become more extensive as they are required to perform some parts of the TCC functions outside the official working hours. Therefore, it is recommended that a regular daily program should be scheduled for the pilots of the port to assist the VTC operators in the VTC tower. The advantageous of these VTS operator assistants are that;
1. There would be an opportunity for pilots in particular younger pilots to acquire insight in the operation of the VTS.

2. When the traffic density is high the VTC workload is divided over more operators.

3. Adoption of this kind of system will also contribute to improve contacts between the pilots and the VTS operators.

3.6.3.2.2. VTS Operator assistants.

Apart from the VTS assistants mentioned above, five VTC operator assistants with sufficient knowledge, as mentioned for the TCC assistants, are considered to ensure a continuous 24 hours service of the VTS. The functions of these VTS operator assistants can be specified as follows:

1. To perform VTS-operator functions under supervision of the VTS-operators,

2. To perform VTS-assistant functions (see 3.5.3.1.2) under the supervision of the Head of the VTS organization.

This center is also headed by the Maritime Expert who is, for the time being, headed by the director of the Maritime Services Office (MTSO).
3.6.3.3. Maintenance Group

The establishment of a maintenance group is a necessary measure to ensure the regular and successful operations of the employed equipment. Since the port and P.S.O have a sufficient number of technical staff, the recruitment of the new personnel is not necessary. However, the arrangement for the required training for the Electronic Engineers and a maintenance schedule are of the major elements to be considered.

3.6.3.4. Patrol Boat Crew

In this regard, it is suggested that negotiations should be started with the Iranian Gandarmery which is acting as coast guard in the Iranian waters. When cooperation is established, the training of the patrol boat crews regarding the legal aspects of VTS, their patrol functions and authority in the VTS in general are necessary. Otherwise, allocation of at least nine persons for a patrol boat together with the required training by the port authorities should be considered. The functions of the patrol boat and its crew can be defined as follow;

1. Standby to receive instructions issued by VTS operators while patrolling in the VTS area to enforce the relevant rules and regulations in the area.

2. Correcting and preventing any disorderly traffic of small craft, coastal going ships and fishing vessels in the area in conformity with the instructions of the VTS authorities.
3.7. RECRUITMENT, TRAINING AND QUALIFICATION OF VTS PERSONNEL

3.7.1. General Consideration

In spite of the tremendous development in VTS and the relevant employed equipment and techniques there is not yet any comprehensive internationally agreed standard and procedure for training and qualification of VTS-operators. The only authoritative document in this regard is "Vessel Traffic Services Guidelines" introduced by IMO, in which it is recommended that:

"The VTS authority should ensure that VTS operators have the qualifications and have received specialized training appropriate to their tasks within the VTS and meet the language requirement mentioned in paragraph 3.4, in particular with regard to VTS operator authorized to issue traffic instructions or to give navigational assistance."

Up to now the qualifications and the criteria for training of the VTS operators or personnel have been defined by national or regional authorities. Hence, there exist a wide variety of VTS operator qualifications and various training standards in different countries.

Nevertheless, when establishing a VTS, it is very important to anticipate and make arrangements for the adequate training of the VTS operators with regard to the following basic elements:

1. Functions and operation of the proposed VTS;
2. Background, experience and qualification of the staff to be appointed as VTS operators;

3. Complexity and type of equipment and techniques in use;

4. The tasks and the responsibilities of the VTS-operators.

3.7.2. Training

The knowledge and the current capabilities of pilots and VHF operators who are going to be recruited for the TCC and VTCC in BSR lead to the following training syllabuses.

3.7.2.1. VTS Operator

1. Communications;

   i) principle of radio communication;
   ii) Radio procedures;
   iii) Standard Marine Navigational Vocabulary;
   iv) English language;
   v) urgent, emergency and distress communication;

2. Navigation:

   - buoyage systems;
   ii) general outline and different type of ships (oil tanker, LNG carriers, car carriers, etc.)
iii) tidal knowledge;
iv) meteorological and hydrological knowledge;
v) principles of navigation;
vi) rules of the Road.

3. Ship Handling:

i) turning capacities of vessels.

ii) stopping capacities.

iii) good knowledge of ship behavior and nautical constraints.

iv) Effect and influence of wind, current, tide and shallow water on different types of vessels.

v) Anchoring manoeuvres;

vi) Berthing manoeuvres;

4. Equipment:

i) Radio principles;

ii) Radar principles;

iii) Performance and application of equipment used on board and in the VTS centers;

iv) computer operations;

5. Local Geographical Knowledge

i) configuration of area (coastline, channel, berths, swinging areas, anchorages).

ii) position of buoys, and other aids to navigation, fishing areas, etc.
iii) identifications of all fixed objects on the radar.
iv) Restricted area for turning of deep draft vessels
v) characteristics of aids to navigation in the area.
vi) depth of the water in the VTS area.

6. Law and Regulations;

i) related International regulation and agreements;
ii) national rules and regulation;
iii) international and national Law of the sea;

7. VTS concepts;

i) functions of VTS and its procedure;
ii) responsibility and authority of VTS;
iii) civil liabilities and consequences of errors and omission;

8. Typing and using computer for wordprocessing.

3.7.2.2. Assistant Operators

From the subjects mentioned in the previous paragraph the following items are proposed for this group of personnel:

1. Communication;
2. Computer operations;
3. VTS concepts;
4. Using computer for wordprocessing;
5. Performance and operation of equipment used in the VTS center;
6. Local geographical knowledge;
7. Rules of the Road;
8. Principle of navigation;
9. English language, Nautical English and Standard Marine Navigational Vocabulary;
10. Typing.

All of the proposed subjects can be taught in one of the training centers located in Bandar Shahid Radjaie or Anzali.

Since pilots in the proposed VTS act as field agents of the VTS, it is suggested that participation in the VTS-operator courses be made compulsory for all pilots.

3.7.3. Updating Course

It is advisable that for the VTS operators yearly refresher courses would be organized. The intention is to keep them updated about their function and also to make them familiar with the developments of VTS. The topics of this refresher course should deal with new developments in the subjects of 3.6.2.1.
CHAPTER FOUR
4.1. INTRODUCTION

The organization, throughputs and difficulties of the existing vessel traffic system in Iranian ports were described in chapter two.

To find an adequate solution for other ports than the BSR, reference should be given to the Guidelines for Vessel Traffic Services recommended by the IMO Resolution A.578(14) which defines that:

"A VTS is particularly appropriate in the approaches to a port, in its access channel and in other areas having one or more of the following characteristics:"

1. High traffic density;
2. Traffic carrying noxious or dangerous cargoes;
3. Navigational difficulties;
4. Narrow channels;
5. Environmental sensitivities.

Considering the above mentioned characteristics, it may be decided that a suitable VTS is necessary for each major port. To establish a suitable VTS, there are a number of parameters that should be taken into considerations. These parameters form the main criteria for determination.
of the proper VTS layout, equipments and installation. The parameters include:

1. Geographical features and environmental parameters;

2. Characteristics of the traffic;

3. The volume and the nature of cargo handled in the port.

4.2. PROPOSAL FOR THE IMPROVEMENT OF OTHER PORTS’ VTS

Except for BSR which was dealt with in chapter three, there are three other active Iranian ports to be considered in this chapter namely; Bushehr, Imam Khomeyni and Behesty.

With respect to the parameters mentioned above and the existing difficulties in these ports the following proposals are made:

1. Regarding the advantages of radar mentioned in 3.6.2.1., it is recommended that these ports should be equipped with a sufficient number of radars. The recommendation is given under the following consideration;

   i) to prevent the probable congestion of traffic in the port due foggy weather;

   ii) to control contravention;
iii) to encourage the compliance with rules;

iv) to reduce the risk of collision and stranding;

v) to strengthen the Iranian data processing network contributing into the promotion of the safety of life and prevention of pollution in the Persian Gulf.

The number, type and site of the radars should be decided on after careful analysis.

2. Establishment of a VTC if the radar coverage is provided for the areas.

3. Establishment of a TSS in each port when it is found necessary.

4. Establishment of the necessary functions and operational procedures as well as development of the procedures for the communication.

5. Allocation of additional VTS-operator training for the personnel involved, in particular for VHF operators who are presently acting as VTS operators.

6. Interlinking the database to the Iranian VTS computer network.

7. Appointing a sufficient number of experienced pilot in the VTC in order to cooperate with and give advice to other pilots during their pilotage of

4.2.1. Function and Procedure of VTS's

4.2.1.1. Function

The functions of the other ports VTS can be grouped as follows:

1. Functions in case of radar coverage

In this case the functions recommended are similar to those proposed in 3.3. for BSR VTS - planning, monitoring and control function.

2. Functions in case there is no radar coverage

In this case, it is suggested that the functions of the VTC in these ports should be defined as follows:

i) Primary functions;

- acquisition and distribution of information regarding the traffic, anchorages and berths by VHF,

- broadcasting of general information including weather and tidal conditions, procedures for customs, police and medical check of the crew on board etc,
- providing assistance to individual ships by VHF on demand or when it is considered necessary by VTC,

- providing Maritime Safety Information (MSI) for the area,

- distribution of information for planning of other port services (pilotage, tugs etc.)

- exchange of information with the other ports' VTS, in particular, with BSR VTS which will probably be considered as main center of Iranian VTS network,

- interchange of data with the other maritime services authorities.

ii) Remedial function

- coordination in activities such as pollution combat, SAR and salvage.

4.2.1.2. Procedures

In order to compile appropriate procedures for the VTSs, it is recommended that the same criteria as defined in 3.4. should be considered as main elements. It is worth mentioning that those criteria are also based on the IMO principle for ship's reporting systems and the IMO standard reporting format (A 16/Res.648).
It is clear that the interchange of this information, which is related to the TSS and the BSR VTS in 3.4, is not necessarily identical for the VTSs in other ports where there are no radar coverage.

In general however, the recommendation will result in the harmonization of all the Iranian VTS procedures. This is a very important consequence which will contribute tremendously to the protection of the environment and to the safety of ships calling at Iranian ports.

4.2.2. Information System

The installation of a radar and other navigation aids in these ports will be very useful and helpful for a proper surveillance and data acquisition system. But the installation of a VTS-radar in these ports should be considered later. It seems that the information system in each port can be improved by reinforcement and proper use of the existing data sources and communication links.

The present sources of data available in each port are:

- other ports TCC and VTC,
- ships' owners and agents,
- ships,
- pilots,
- port resources' crew,
- other relevant shore based authorities.

To interchange data with all the aforementioned bodies,
the same recommendations, procedure and medium mentioned for the BSR VTS in chapter three can be used. The procedure for interchange of data between VTSs will be dealt with further on.

In order to improve the present information systems of the ports' VTS as well as the Iranian VTS network the following measures are recommended:

1. Providing all the port's VTC with at least one microcomputer with the capacity of 100 megabytes (in order to store of all the data defined in 3.6.2.3.A), telexes, telephone, voice logging system, and a facsimile.

2. Regular exchange of data between the main port's VTS through the BSR main center of the Iranian VTS network.

The necessity and the importance of item has already been discussed in previous chapters. Therefore, item "b" will be the main subject of discussion in section 4.3.

4.2.3. Personnel and Required Training

4.2.3.1. Personnel

As recommended for BSR the recruitment of qualified personnel is essential for the improvement of the information system of the ports.

1. Appointment of a senior pilot as maritime expert, who is trained and experienced enough to deal with the
functions defined in 3.6.3.1.1. The proposed expert is supposed to be responsible for the TCC and VTC.

2. Recruitment of a sufficient number of trained and experienced V.H.F operators who are capable enough to deal with the function determined in 3.6.3.2.2.

Before appointing the aforementioned personnel in the suggested position, they should be trained to become capable of dealing with the assigned functions.

4.2.3.2. Training

In the preceding chapter, a rather complete training schemes was introduced for the training of VTS personnel. The compact of this training is considered for the personnel of VTSs that are provided by sensors including radar. When the ports are not equipped with required equipment, the training of the VTS personnel should be limited to:

1. Maritime experts and senior pilots, the subjects defined in 3.7.2.1.

2. The VHF operators the requirements mentioned in 3.7.2.2.
4.3. DATA EXCHANGE BETWEEN THE PORTS

4.3.1. General Consideration

As mentioned in chapter two, at present most of the data exchange regarding ships and ships' operation between the Iranian ports is carried out through the communication section of Maritime Services Office. This office in each port is also responsible for the traffic of the vessels in the port's area and territory concerned.

Up to now, there have not been many difficulties in the exchange of data between the main ports due to enough experience gained during the past years of maritime activities in the country. Contrary to that there has never been any data exchange between the ports' VTS. Therefore, this section will center on introducing a simple and efficient system for the VTS-data exchange between the so called "Iranian major ports" namely:

1. Abadan (is not in operation yet)
2. Bushehr
3. Imam Khomeini
4. Khoramshahr (is not in operation yet)
5. Shahid Beheshty
6. Shahid Radjaie (including BSB)

4.3.2. Data exchange between the Ports' VTS

The quality that a VTS can provide depends on the data available to it. Therefore, the exchange of information between the authoritative sources of data, mainly VTSs, is considered as a vital necessity for a VTS.
An effective data exchange between VTSs can:

- improve the planning capabilities of a VTS.
- decrease the probability of receiving incomplete information.
- decrease the number of reports to be made by ships.
- improve the information flow to allied port services.
- improve the planning capabilities of port services.
- improve the effectiveness of remedial functions such as cooperation with the SAR services.

The aforementioned advantages support the necessity for the interchange of data between the Iranian ports' VTSs which in fact can be called as the Iranian VTS network in the Persian Gulf which will take the form of an information network with a center for acquiring, processing, distributing and using data.

The data exchange between the ports has two major elements that are to be considered carefully:

- the kind of data which is necessary for interchange between the ports, and
- the format used for the transmission of data between the ports and type of medium.
4.3.2.1. The Data Necessary for Transmission

The data that should be exchanged between the ports’ VTS are divided into two parts: ship’s data and the data of the harbour and territory of the port concerned.

i) Ship data

This type of data should be transmitted by the present port of call of the ship to the port(s) which is (are) going to be called on next. Data should consist:

- Statics; ship data which is valid for a long period e.g., ships maneuvering characteristics, cargo handling gears, ship dimensions, call sign, etc.

- Type of the ship and the number of persons on board.

- Amount, nature and IMDG code class of cargo on board, where this cargo is stowed and details of dangerous goods on board.

- Draft, ETD and ETA,

- Last port and vessel destination,

- Radio communication system on board,

- Medical condition on board,
- number of necessary tugs,

- history of the ship in compliance with the international and the national rules and regulations.

ii) Data regarding the harbour and its approaches

This data should be updated frequently by the related port and is also of importance for transmission to ships in general.

- changes in VTS procedures.

- any defect in the navigation aids such as lights, buoys, leading lights, leading line and so forth.

- information about any accident or navigational danger in the area.

- restriction in availability of pilots, tugs.

- tidal and sea state.

- weather conditions.

- traffic concentrations and congestions.

- port operation delays.
4.3.2.2. Required Equipment and Format

i) Data Format

For transmission of the ship’s data, it is recommended that the standard reporting format, proposed in the IMO resolution A 16/Res.648, be used.

ii) Required Equipment or Medium

As suggested in the previous section for the VTCs in different ports, transmission of data can be performed by either telex or facsimile. There are other possibilities which include the Inmarsat satellite systems with standard C or A terminals as well.

Other solutions can be found in the establishment of a computer network between the ports’ VTS through the public telephone lines which can be hired from the Ministry of Post and Telegraph.

The major advantages of the such computer network include:

- saving in costs of data transmission.

- considerable reduction in the workload of the VTC operators.

- immediate data acquisition for all the VTSs.
enhanced efficiency in storing and further data processing.

4.4. BANDAR SHAHID RAJAIE AS THE VTS COMMUNICATION CENTER

As may be clear from the previous sections, BSR VTC is very suitable to be the center of the Iranian VTS network. The reasons for this can be summarized as follows:

1. The location of the port is between the Persian Gulf and the Gulf of Oman, and just in front of the Strait of Hormuz which is the gate for ships proceeding to and from Iranian ports in the Persian Gulf.

2. The port offers excellent possibilities as data switching center since the main offices of many relevant authorities, in particular shipping companies and agencies, are located in Bandar Abbas (SBH).

3. BSR has already been chosen as the Iranian principal port for the registration of ships proceeding to Iranian ports.

The data handling center for Iranian VTS network should perform the following functions:

1. Data and message acquisition.
2. Determining of the priorities of messages.

3. Composition of relevant message packages.

4. Distribution of messages to appropriate VTSs and other centers (SAR, port authority etc.).

5. Maintaining the quality of the communication links.

6. Maintaining a maritime traffic data bank for future use and providing other maritime centers and authorities with updated relevant information.

In order to have such a centralized network the following features should be realized. (see fig 4.1).

1. All ships passing Hormuz Strait and bound for or departing from Iranian ports should report to BSR.

2. Communication links of BSR with ships should be able to perform as required under all circumstances.

3. The BSR data bank facilities should have an adequate capacity.

4. The BSR should be equipped with a switching computer.

5. The required data links should have redundancy. The primary links might be the public telephone network links as a back up link to the satellite link via CES in Tehran might be used when
6. The link between BSR and Tehran should be a high-speed data link.

7. Ship reports should be uniform and conform with international accepted/agreed formats.

8. Data exchange formats should be standardized.

9. Network topology should be according a mesh-
structure.

10. Data flow should use packet switching, because of the standardized format of messages.

11. Routing should be isolated adaptive in the switching center (BSR, Teharan).

12. ARQ should be applied for faulty received messages at the host-station.
SUMMARY

The concern for the promotion of safety in shipping and the protection of the environment has shown a speedy growth during the last two decades. This has mostly been an aftermath of maritime disasters rather than the anticipation of them.

Currently, contamination of the Persian Gulf is forty times more than its maximum allowable value. The navigational aids in the Strait of Hormuz, Iranian ports and in general in the whole Persian Gulf are not sufficient for the purpose of safe navigation. Therefore, it is the aim of this dissertation to make recommendations which might contribute to safe and efficient passage of all ships proceeding to Iranian ports and harbour areas. These recommendations are:

- the establishment of a data network for Iranian ports,
- implementation of the TSS in BSR,
- segregation of anchorages,
- reporting requirement for ships,
- installation of an appropriate VTC in main Iranian ports
- installation of a uniform maritime information format systems,
- the harmonization of all the ports' VTS,
- training of the VTS-staff and pilots,
- introduction of a new organization for the Maritime Services Office in the other ports,
- harmonization of the communication procedure between the ports,
- introduction of an Iranian VTS data network.

All the above recommendations would form a comprehensive
package of information, regulation guidance and advice to assist ships towards a safer navigation to have cleaner seas, to protect the environment and to improve the efficiency of port operation including cargo handling in Iranian ports.
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19. Traffic Surveys, Ships Routing and Data Bases By; Captain G. Kop, Chairman IALA VTS-Committee.


ANNEX
RESOLUTION A.648(16)

adopted on 19 October 1989

GENERAL PRINCIPLES FOR SHIP REPORTING SYSTEMS AND SHIP REPORTING REQUIREMENTS, INCLUDING GUIDELINES FOR REPORTING INCIDENTS INVOLVING DANGEROUS GOODS, HARMFUL SUBSTANCES AND/OR MARINE POLLUTANTS

THE ASSEMBLY,

RECALLING Article 15(j) of the Convention on the International Maritime Organization concerning the functions of the Assembly in relation to regulations and guidelines concerning maritime safety and the prevention and control of marine pollution from ships,

RECALLING ALSO resolution 3 of the International Conference on Maritime Search and Rescue, 1979, on the need for an internationally agreed format and procedure for ship reporting systems,

CONSIDERING that current national ship reporting systems may use different procedures and reporting formats,

REALIZING that such different procedures and reporting formats could cause confusion to masters of ships moving from one area to another covered by a different ship reporting system,

BELIEVING that such confusion could be alleviated if ship reporting systems and reporting requirements were to comply as far as practicable with a number of general principles and if reports were made in accordance with a standard format and procedures,
RECALLING the Guidelines for Reporting Incidents Involving Dangerous Goods in Packaged Form developed by the Maritime Safety Committee (MSC/Circ.360/Rev.1),

RECALLING ALSO article 8 and Protocol I of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78), as amended, and also the Guidelines for Reporting Incidents Involving Harmful Substances (resolution MEPC.30(25)),

RECOGNIZING that States Parties to the International Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties (1969) and the Protocol Relating to Intervention on the High Seas in Cases of Marine Pollution by Substances other than Oil (1973) may take such measures on the high seas as may be necessary to prevent, mitigate or eliminate grave and imminent danger to their coastline or related interests from pollution or threat of pollution of the sea by oil and substances other than oil following upon a maritime casualty or acts related to such a casualty, which may reasonably be expected to result in major harmful consequences,

RECOGNIZING ALSO the need for coastal States to be informed by the master of an assisting ship, or of a ship undertaking salvage, of particulars of the incident and of action taken,

RECOGNIZING FURTHER that an incident involving damage, failure or breakdown of the ship, its machinery or equipment could give rise to a significant threat of pollution to coastlines or related interests,

HAVING CONSIDERED the recommendation made by the Maritime Safety Committee at its fifty-seventh session and by the Marine Environment Protection Committee at its twenty-sixth session,

1. ADOPTS the General Principles for Ship Reporting Systems and Ship Reporting Requirements, including Guidelines for Reporting Incidents Involving Dangerous Goods, Harmful Substances and/or Marine Pollutants set out in the Annex to the present resolution;
2. URGES Member Governments to ensure that ship reporting systems and reporting requirements comply as closely as possible with the general principles specified in the Annex to the present resolution;

3. URGES Member Governments to bring the reporting format and procedures to the notice of shipowners and seafarers as well as of the designated authorities concerned;

4. RECOMMENDS Member Governments and States Parties to MARPOL 73/78 to implement the Guidelines, in accordance with paragraph (2) of article V of Protocol I thereof;

5. REVOKES resolution A.598(15), resolution MEPC.30(25) and MSC/Circ.360/Rev.1.
ANNEX

GENERAL PRINCIPLES FOR SHIP REPORTING SYSTEMS AND SHIP REPORTING REQUIREMENTS, INCLUDING GUIDELINES FOR REPORTING INCIDENTS INVOLVING DANGEROUS GOODS, HARMFUL SUBSTANCES AND/OR MARINE POLLUTANTS

1 General principles

1.1 Ship reporting systems and reporting requirements are used to provide, gather or exchange information through radio reports. The information is used to provide data for many purposes including search and rescue, vessel traffic services, weather forecasting and prevention of marine pollution. Ship reporting systems and reporting requirements should, as far as practicable, comply with the following principles:

.1 reports should contain only information essential to achieve the objectives of the system;

.2 reports should be simple and use the standard international ship reporting format and procedures; where language difficulties may exist, the languages used should include English, using where possible the Standard Marine Navigational Vocabulary, or alternatively the International Code of Signals. The standard reporting format and procedures to be used are given in the appendix to this Annex;

.3 the number of reports should be kept to a minimum;

.4 no charge should be made for communication of reports;

.5 safety or pollution related reports should be made without delay; however, the time and place of making non-urgent reports should be sufficiently flexible to avoid interference with essential navigational duties;
.6 information obtained from the system should be made available to other systems when required for distress, safety and pollution purposes;

.7 basic information (ship's particulars, on-board facilities and equipment, etc.) should be reported once, be retained in the system and be updated by the ship when changes occur in the basic information reported;

.8 the purpose of the system should be clearly defined;

.9 Governments establishing a ship reporting system should notify mariners of full details of the requirements to be met and procedures to be followed. Details of types of ships and areas of applicability, of times and geographical positions for submitting reports, of shore establishments responsible for operation of the system and of the services provided should be clearly specified. Chartlets depicting boundaries of the system and providing other necessary information should be made available to mariners;

.10 the establishment and operation of a ship reporting system should take into account:

.10.1 international as well as national responsibilities and requirements;

.10.2 the cost to ship operators and responsible authorities;

.10.3 navigational hazards;

.10.4 existing and proposed aids to safety; and

.10.5 the need for early and continuing consultation with interested parties including a sufficient period to allow for trial, familiarization and assessment to ensure satisfactory operation and to allow necessary changes to be made to the system;
.11 Governments should ensure that shore establishments responsible for operation of the system are manned by properly trained persons;

.12 Governments should consider the interrelationship between ship reporting systems and other systems;

.13 Ship reporting systems should preferably use a single operating radio frequency; where additional frequencies are necessary, the number of frequencies should be restricted to the minimum required for the effective operation of the system;

.14 Information provided by the system to ships should be restricted to that necessary for the proper operation of the system and for safety;

.15 Ship reporting systems and requirements should provide for special reports from ships concerning defects or deficiencies with respect to their hull, machinery, equipment or manning, or concerning other limitations which could adversely affect navigation and for special reports concerning incidents of actual or probable marine pollution;

.16 Governments should issue instructions to their shore establishments responsible for the operation of ship reporting systems to ensure that any reports involving pollution, actual or probable, are relayed without delay to the officer or agency nominated to receive and process such reports, and to ensure that such an officer or agency relays these reports without delay to the flag State of the ship involved and to any other State which may be affected;

.17 States which are affected or likely to be affected by pollution incidents and may require information relevant to the incident should take into account the circumstances in which the master is placed, and should endeavour to limit their requests for additional information; and

.18 The appendix to this Annex does not apply to danger messages referred to under regulation V/2 of the 1974 SOLAS Convention, as amended. The present practice of transmitting such messages should remain unchanged.
2 Guidelines for reporting incidents involving dangerous goods

2.1 The intent of these Guidelines and those contained in the appendix is to enable coastal States and other interested parties to be informed without delay when any incident occurs involving the loss, or likely loss, overboard of packaged dangerous goods into the sea.

2.2 Reports should be transmitted to the nearest coastal State. When the ship is within or near an area for which a ship reporting system has been established, reports should be transmitted to the designated shore station of that system.

3 Guidelines for reporting incidents involving harmful substances and/or marine pollutants

3.1 The intent of these Guidelines and those contained in the appendix is to enable coastal States and other interested parties to be informed without delay of any incident giving rise to pollution, or threat of pollution, of the marine environment, as well as of assistance and salvage measures, so that appropriate action may be taken.

3.2 In accordance with article V(1) of Protocol I of MARPOL 73/78, a report shall be made to the nearest coastal State.

3.3 Whenever a ship is engaged in or requested to engage in an operation to render assistance to or undertake salvage of a ship involved in an incident referred to in subparagraph 1(a) or (b) of article II of Protocol I of MARPOL 73/78, as amended, the master of the former ship should report, without delay, the particulars of the action undertaken or planned. The coastal States should also be kept informed of developments.

3.4 The probability of a discharge resulting from damage to the ship or its equipment is a reason for making a report.
APPENDIX

1 PROCEDURES

Reports should be sent as follows:

Sailing plan (SP) - Before or as near as possible to the time of departure from a port within a system or when entering the area covered by a system.

Position report (PR) - When necessary to ensure effective operation of the system.

Deviation report (DR) - When the ship's position varies significantly from the position that would have been predicted from previous reports, when changing the reported route, or as decided by the master.

Final report (FR) - On arrival at destination and when leaving the area covered by a system.

Dangerous goods report (DG) - When an incident takes place involving the loss, or likely loss overboard of packaged dangerous goods, including those in freight containers, portable tanks, road and rail vehicles and shipborne barges, into the sea.

Harmful substances report (HS) - When an incident takes place involving the discharge or probable discharge of oil (Annex I of MARPOL 73/78) or noxious liquid substances in bulk (Annex II of MARPOL 73/78).

Marine pollutants report (MP) - In the case of loss or likely loss overboard of harmful substances in packaged form including those in freight containers, portable tanks, road and rail vehicles and shipborne barges, identified in the International Maritime Dangerous Goods Code as marine pollutants (Annex III of MARPOL 73/78).

Any other report - Any other report should be made in accordance with the system procedures as notified in accordance with paragraph 9 of the General Principles.
2 STANDARD REPORTING FORMAT AND PROCEDURES

2.1 Sections of the ship reporting format which are inappropriate should be omitted from the report.

2.2 Where language difficulties may exist, the languages used should include English, using where possible the Standard Marine Navigational Vocabulary. Alternatively, the International Code of Signals may be used to send detailed information. When the International Code is used, the appropriate indicator should be inserted in the text, after the alphabetical index.

2.3 For route information, latitude and longitude should be given for each turn point, expressed as in C below, together with type of intended track between these points, for example "RL" (rhumb line), "GC" (great circle) or "coastal", or, in the case of coastal sailing, the estimated date and time of passing significant points expressed by a 6 digit group as in B below.

<table>
<thead>
<tr>
<th>TELEGRAPHY</th>
<th>TELEPHONE (alternative)</th>
<th>FUNCTION</th>
<th>INFORMATION REQUIRED</th>
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<td>Name of system (e.g. AMVER/ AUSREP/MAREP/ ECAREG/JASREP)</td>
<td>System identifier</td>
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<td>State in full</td>
<td>Type of report</td>
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<td>Ship</td>
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<td>Time (bravo)</td>
<td>Date and time of event</td>
<td>A 6 digit group giving day of month (first two digits), hours and minutes (last four digits). If other than UTC state time zone used</td>
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<td>Position</td>
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<td>True course</td>
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<td>Speed (foxtrot)</td>
<td>Speed in knots and tenths of knots</td>
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<td>Time of next report</td>
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<td>4 digit group giving metres and centimetres</td>
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<td>Cargo on board</td>
<td>Cargo and brief details of any dangerous cargoes as well as harmful substances and gases that could endanger persons or the environment (See detailed reporting requirements)</td>
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<td>Brief details of defects, damage, deficiencies or other limitations (See detailed reporting requirements)</td>
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<td>FUNCTION</td>
<td>INFORMATION REQUIRED</td>
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<tr>
<td>R</td>
<td>Pollution/dangerous goods lost overboard (romeo)</td>
<td>Description of pollution or dangerous goods lost overboard</td>
<td>Brief details of type of pollution (oil, chemicals, etc.) or dangerous goods lost overboard; position expressed as in (C) or (D) (See detailed reporting requirements)</td>
</tr>
<tr>
<td>S</td>
<td>Weather (sierra)</td>
<td>Weather conditions</td>
<td>Brief details of weather and sea conditions prevailing</td>
</tr>
<tr>
<td>T</td>
<td>Agent (tango)</td>
<td>Ship's representative and/or owner</td>
<td>Details of name and particulars of ship's representative or owner or both for provision of information (See detailed reporting requirements)</td>
</tr>
<tr>
<td>U</td>
<td>Size and type (uniform)</td>
<td>Ship size and type</td>
<td>Details of length, breadth, tonnage, and type, etc., as required</td>
</tr>
<tr>
<td>V</td>
<td>Medic (victor)</td>
<td>Medical personnel</td>
<td>Doctor, physician's assistant, nurse, personnel without medical training</td>
</tr>
<tr>
<td>W</td>
<td>Persons (whiskey)</td>
<td>Total number of persons on board</td>
<td>State number</td>
</tr>
<tr>
<td>X</td>
<td>Remarks (x-ray)</td>
<td>Miscellaneous</td>
<td>Any other information - including, as appropriate, brief details of incident and of other ships involved either in incident, assistance or salvage (See detailed reporting requirements)</td>
</tr>
</tbody>
</table>
3 GUIDELINES FOR DETAILED REPORTING REQUIREMENTS

3.1 Dangerous goods reports (DG)

3.1.1 Primary reports should contain items, A, B, C (or D), M, Q, R, S, T, U, X of the standard reporting format; details for R should be as follows:

R 1 Correct technical name or names of goods.
2 UN number or numbers.
3 IMO hazard class or classes.
4 Names of manufacturers of goods when known, or consignee or consignor.
5 Types of packages including identification marks. Specify whether portable tank or tank vehicle, or whether vehicle or freight container or other cargo transport unit containing packages. Include official registration marks and numbers assigned to the unit.
6 An estimate of the quantity and likely condition of the goods.
7 Whether lost goods floated or sank.
8 Whether loss is continuing.
9 Cause of loss.

3.1.2 If the condition of the ship is such that there is danger of further loss of packaged dangerous goods into the sea, items P and Q of the standard reporting format should be reported; details for P should be as follows:

P 1 Correct technical name or names of goods.
2 UN number or numbers.
3 IMO hazard class or classes.
4 Names of manufacturers of goods when known, or consignee or consignor.
5 Types of packages including identification marks. Specify whether portable tank or tank vehicle, or whether vehicle or freight container or other cargo transport unit containing packages. Include official registration marks and numbers assigned to the unit.
6 An estimate of the quantity and likely condition of the goods.
3.1.3 Particulars not immediately available should be inserted in a supplementary message or messages.

3.2 Harmful substances reports (HS)

3.2.1 In the case of actual discharge primary HS reports should contain items A, B, C (or D), E, F, L, M, N, Q, R, S, T, U, X of the standard reporting format. In the case of probable discharge (see 3.4), item P should also be included. Details for P, Q, R, T and X should be as follows:

| P  | 1 Type of oil or the correct technical name of the noxious liquid substances on board. |
|    | 2 UN number or numbers. |
|    | 3 Pollution category (A, B, C or D), for noxious liquid substances. |
|    | 4 Names of manufacturers of substances, if appropriate, when known, or consignee or consignor. |
|    | 5 Quantity. |

| Q  | 1 Condition of the ship as relevant. |
|    | 2 Ability to transfer cargo/ballast/fuel. |

| R  | 1 Type of oil or the correct technical name of the noxious liquid discharged into the sea. |
|    | 2 UN number or numbers. |
|    | 3 Pollution category (A, B, C or D), for noxious liquid substances. |
|    | 4 Names of manufacturers of substances, if appropriate, when known, or consignee or consignor. |
|    | 5 An estimate of the quantity of the substances. |
|    | 6 Whether lost substances floated or sank. |
|    | 7 Whether loss is continuing. |
|    | 8 Cause of loss. |
|    | 9 Estimate of the movement of the discharge or lost substances, giving current conditions if known. |
|    | 10 Estimate of the surface area of the spill if possible. |

| T  | 1 Name, address, telex and telephone number of the ship's owner and representative (charterer, manager or operator of the ship or their agent). |
X 1 Actions being taken with regard to the discharge and the movement of the ship.

2 Assistance or salvage efforts which have been requested or which have been provided by others.

3 The master of an assisting or salvaging ship should report the particulars of the action undertaken or planned.

3.2.2 After the transmission of the information referred to above in the initial report, as much as possible of the information essential for the protection of the marine environment as is appropriate to the incident should be reported in a supplementary report as soon as possible. That information should include items P, Q, R, S and X.

3.2.3 The master of any ship engaged in or requested to engage in an operation to render assistance or undertake salvage should report, as far as practicable, items A, B, C (or D), E, F, L, M, N, P, Q, R, S, T, U, X of the standard reporting format. The master should also keep the coastal State informed of developments.

3.3 Marine pollutants reports (MP)

3.3.1 In the case of actual discharges, primary MP reports should contain items A, B, C (or D), M, Q, R, S, T, U, X of the standard reporting format. In the case of probable discharge (see 3.4), item P should also be included. Details of P, Q, R, T and X should be as follows:

P 1 Correct technical name or names of goods.

2 UN number or numbers.

3 IMO hazard class or classes.

4 Names of manufacturers of goods when known, or consignee or consignor.

5 Types of packages including identification marks. Specify whether portable tank or tank vehicle, or whether vehicle or freight container or other cargo transport unit containing packages. Include official registration marks and numbers assigned to the unit.

6 An estimate of the quantity and likely condition of the goods.
Q 1 Condition of the ship as relevant.
   2 Ability to transfer cargo/ballast/fuel.

R 1 Correct technical name or names of goods.
   2 UN number or numbers.
   3 IMO hazard class or classes.
   4 Names of manufacturers of goods when known, or consignee or
      consignor.
   5 Types of packages including identification marks. Specify
      whether portable tank or tank vehicle, or whether vehicle or
      freight container or other cargo transport unit containing
      packages. Include official registration marks and numbers
      assigned to the unit.
   6 An estimate of the quantity and likely condition of the goods.
   7 Whether lost goods floated or sank.
   8 Whether loss is continuing.
   9 Cause of loss.

T 1 Name, address, telex and telephone number of the ship's owner
   and representative (charterer, manager or operator of the ship or
   their agent).

X 1 Action being taken with regard to the discharge and movement of
   the ship.
   2 Assistance or salvage efforts which have been requested or which
      have been provided by others.
   3 The master of an assisting or salvaging ship should report the
      particulars of the action undertaken or planned.

3.3.2 After the transmission of the information referred to above in the
initial report, as much as possible of the information essential for the
protection of the marine environment as is appropriate to the incident should
be reported. That information should include items P, Q, R, S and X.
3.3.3 The master of any ship engaged in or requested to engage in an operation to render assistance or undertake salvage should report, as far as practicable, items A, B, C (or D), M, P, Q, R, S, T, U, X of the standard reporting format. The master should also keep the coastal State informed of developments.

3.4 **Probability of discharge**

3.4.1 The probability of a discharge resulting from damage to the ship or its equipment is a reason for making a report. In judging whether there is such a probability and whether the report should be made, the following factors, among others, should be taken into account:

.1 the nature of the damage, failure or breakdown of the ship, machinery or equipment; and

.2 sea and wind state and also traffic density in the area at the time and place of the incident.

3.4.2 It is recognized that it would be impracticable to lay down precise definitions of all types of incidents involving probable discharge which would warrant an obligation to report. Nevertheless, as a general guideline the master of the ship should make reports in cases of:

.1 damage, failure or breakdown which affects the safety of ships; examples of such incidents are collision, grounding, fire, explosion, structural failure, flooding, cargo shifting; and

.2 failure or breakdown of machinery or equipment which results in impairment of the safety of navigation; examples of such incidents are failure or breakdown of steering gear, propulsion plant, electrical generating system, essential shipborne navigational aids.
INTRODUCTION

On s'était rendu compte, depuis quelque temps, qu'il était urgent d'harmoniser les procédures des Services de Trafic Maritime.

Pendant la Conférence de Tokyo 1980, le Comité Exécutif de l'AISM, répondant à cet évident besoin, a établi une Commission avec le mandat suivant:
— étudier l'influence des STM sur les travaux des services de signalisation maritime;
— rassembler des informations sur les STM existants ou en projet;
— étudier la nécessité d'une harmonisation internationale des procédures opérationnelles et proposer, le cas échéant, des recommandations appropriées.

La mission de la Commission fut confiée à M. F. Eichelheim, puis à M. J.A. van Riet, à partir de 1984, tous deux du service de signalisation maritime (DGSM) au Ministère des Transports des Pays-Bas. Des membres de l'AISM de 17 pays ont pris part aux travaux.

Le fonctionnement des STM étant l'affaire d'autorités différentes et des utilisateurs, il fut décidé d'inviter des organisations internationales représentant les opérateurs et les utilisateurs. En ce qui concerne les organisations internationales, il était particulièrement important de s'assurer la coopération de l'IAPH car, à elles deux, l'AISM et l'IAPH représentaient pratiquement tous les opérateurs de STM du monde.

L'AISM désirait aussi que les utilisateurs de STM participent à la formulation des procédures opérationnelles et les organisations suivantes ont pris une part active aux travaux:
— Association Internationale des Pilotes Maritimes (IMPA)
— Fédération Internationale des Associations de Capitaines de Navires (IFMSA)
— Association Internationale des Instituts de Navigation (AIIN)
— Union Internationale des Courses de Yacht (IYRU).

La Commission a d'abord rassemblé des informations sur les STM existants ou en projet. Cette étape semblait indispensable pour s'assurer que les propositions formulées ne seraient pas en conflit avec des procédures déjà répandues. Cela a été fait grâce à un questionnaire dont le dépouillement a été confié à MARIN, aux Pays-Bas.

L'étude des réponses au questionnaire envoyées par les membres de l'AISM et de l'IAPH a prouvé que de nombreux STM fonctionnaient dans différentes parties du monde.

Il fut réconfortant de constater que les schémas des STM des différents continents, par exemple au Canada et en Europe, procédaient de la même philosophie.

Depuis le début des travaux, on avait admis que toute proposition de l'AISM devait être soumise à l'OMI pour s'assurer d'un accord effectif sur des règles internationales.

Les résultats des travaux de la Commission ont donc été présentés à l'OMI, conjointement par l'AISM, l'IAPH et l'IMPA.

Ce qui a finalement abouti à une Résolution de l'Assemblée de l'OMI A.578(14): "Directives sur les Services de Trafic Maritime".

Cette résolution est entièrement reproduite dans ce supplément.

L'idée principale de ces Directives est que dans une zone donnée (Zone STM), une autorité (autorité du STM) est créée pour servir la navigation.

Les Directives pour les STM introduisent quelques éléments nouveaux, par exemple:
— l'établissement d'un Service de Trafic Maritime est reconnu par l'OMI comme une mesure destinée à améliorer la sécurité sur le plan international;
— le schéma de son fonctionnement est normalisé;
— les fonctions et donc les responsabilités de l'autorité et des participants sont décrites.

Il faut rendre hommage aux organisations internationales qui ont contribué aux travaux, notamment l'IAPH, l'IMPA, l'IFMSA et l'IYRU, et qui ont permis d'aboutir à ce résultat dans un délai remarquablement court.

L'OMI a également exprimé sa satisfaction de voir des associations internationales prendre une telle initiative.

Il faut aussi remarquer que l'évolution relativement rapide de cette étude au sein de l'OMI est due à un travail de préparation minuieuses, montrant ainsi la voie à suivre à l'avenir pour parvenir à une coopération efficace entre l'OMI et l'AISM.

INTRODUCTION

It had been apparent for some time that the need to harmonize VTS procedures was becoming urgent.

During the 1980 Lighthouse Conference in Tokyo, the Executive Committee in response to the evident need established a Technical Committee with the following terms of reference:
— to consider the impact of the VTS on the work of Lighthouse Services;
— to collect information on VTS currently in use and projected;
— to examine the need for, and if necessary propose general recommendations on the international harmonization of operational procedures.

The chairmanship of the Committee was entrusted to M. F. Eichelheim (and since 1984 to Mr J.A. van Riet) both from the Directorate General of Shipping and Maritime Affairs (DGSM) of the Netherlands Ministry of Transport. IALA members from 17 countries participated in the work.

It was decided that because VTS operations affected many authorities and users, a number of international organisations representing operating authorities and users should be invited to cooperate in the work. As regards international organisations it was of particular interest to secure the co-operation of IAPH as between them, IALA and IAPH represented virtually all the world's VTS operators.

IALA was also anxious to ensure that the users of VTS should help to formulate any operational procedures and the following organisations played a very active part in the work:
— International Maritime Pilots Association (IMPA);
— International Federation of Ship Masters Association (IFMSA);
— International Association of Institutes of Navigation (AIIN);
— International Yacht Racing Union (IYRU).

The initial task of the Committee was to collect information about VTS currently in use or projected. This was seen as crucial to ensure that any proposals formulated did not conflict with any widespread current practice. This was achieved through a questionnaire that was analysed by MARIN of the Netherlands.

The response to the questionnaire from IALA and IAPH members was outstanding and proved when analysed that VTS operations were commonplace in many parts of the world.

It was also a great support to note that the framework for VTS used in different continents e.g. Canada and Continental Europe was based on similar lines.

From the beginning it was recognised that any output of IALA would have to be presented to the IMO to ensure that effective international rules would be agreed.

Accordingly the results of the work of the Committee were presented to IMO jointly by IALA, IAPH and IMPA.

This resulted ultimately in 1985 in an IMO Assembly Resolution A.578(14) "Guidelines for Vessel Traffic Services".

This resolution is printed in full in this Supplement.

The basic concept of the Guidelines is that for a given (VTS) area a VTS Authority is established to provide services to the traffic.

The VTS Guidelines establish a few new elements such as:
— a Vessel Traffic Service is recognised by IMO as an internationally approved safety measure;
— the framework for its operation is standardised;
— the tasks and thereby the responsibilities of participants and the authority are described;
— the potential use of VTS on a voluntary basis in international waters such as coastal seas, is established.

For achieving this result in a remarkably short period tribute must be paid to all the international organisations that contributed namely, IAPH, IMPA, IFMSA and IYRU.

In the same spirit IMO expressed its appreciation for the initiative of these international organisations.

It was also mentioned that the relatively fast progress in IMO was based on the extensive preparatory work, thus showing the way for further efficient cooperation between IALA and IMO in the future.
Resolution A.578(14) de l'Organisation Maritime Internationale, adoptée le 20 novembre 1985

DIRECTIVES SUR LES SERVICES DE TRAFIC MARITIME

L'ASSEMBLÉE,

RAPPELANT les dispositions de l'article 15, alinéa j), de la Convention portant création de l'Organisation maritime internationale qui ont trait aux fonctions de l'Assemblée liées à l'adoption de règles et de directives relatives à la sécurité maritime, à la prévention de la pollution des mers par les navires et à la lutte contre cette pollution,

RAPPELANT ÉGALEMENT la résolution A.158(ES.IV) intitulée "Recommandation relative aux services consultatifs portuaires" et la résolution A.531(13) intitulée "Principes généraux applicables aux systèmes de comptes rendus de navires",

CONSIDERANT qu'il incombe aux Gouvernements Membres de garantir la sécurité de la navigation et de prévenir la pollution dans les zones relevant de leur juridiction,

AYANT ÉTÉ INFORMÉE que des services de trafic maritime existent dans un certain nombre de régions et qu'ils ont contribué utilement à garantir la sécurité de la navigation, à améliorer l'efficacité de l'écoulement du trafic et à réduire les risques de pollution,

AYANT ÉTÉ INFORMÉE qu'un certain nombre de gouvernements et d'organisations internationales ont demandé des conseils au sujet des services de trafic maritime,

RECONNAISSANT que la sécurité et l'efficacité du mouvement du trafic maritime à l'intérieur d'une zone couverte par un service de trafic maritime dépendent d'une étroite coopération entre les opérateurs du service de trafic maritime et les navires participants,

RECONNAISSANT ÉGALEMENT que l'utilisation de procédures différentes d'exploitation des services de trafic maritime peut constituer une source de confusion pour les capitaines de navires qui passent d'une zone couverte par un service de trafic maritime à une autre,

RECONNAISSANT EN OUTRE que la sécurité et l'efficacité du trafic maritime étaient améliorées si les services de trafic maritime étaient mis en place et exploités conformément à des directives agréées au niveau international,

AYANT EXAMINE la recommandation faite par le Comité de la sécurité maritime à sa cinquante et unième session,

1. ADOPTE les directives sur les services de trafic maritime dont le texte figure en annexe à la présente résolution;

2. PRIE INSTAMMENT les Gouvernements Membres de s'assurer que les services de trafic maritime à l'intérieur de leurs mers territoriales sont exploités conformément au droit national et ne portent pas atteinte au droit de passage inoffensif à travers ces mers et que les navires qui se trouvent hors de leurs mers territoriales peuvent utiliser, à titre volontaire, le service offert;

3. RECOMMANDE aux Gouvernements Membres d'encourager les capitaines des navires qui traversent une zone où il existe un service de trafic maritime à utiliser ce service.

Resolution A.578(14) of the International Maritime Organization, Adopted on 20 November 1985

GUIDELINES FOR VESSEL TRAFFIC SERVICES

THE ASSEMBLY,

RECALLING Article 15(j) of the Convention on the International Maritime Organization concerning the functions of the Assembly in relation to regulations and guidelines concerning maritime safety and prevention and control of marine pollution from ships,

RECALLING ALSO resolution A.158(ES.IV) entitled "Recommendation on Port Advisory Services" and resolution A.531(13) entitled "General Principles for Ship Reporting Systems",

BEARING IN MIND that Member Governments are responsible for the safety of navigation and the prevention of pollution in areas under their jurisdiction,

BEING INFORMED that vessel traffic services have been provided in a number of areas and have made a valuable contribution to safety of navigation, improved efficiency of traffic flow and reduced risk of pollution,

BEING ALSO INFORMED that a number of Governments and international organizations have requested guidance on vessel traffic services,

RECOGNIZING that the level of safety and efficiency of maritime traffic would be improved if vessel traffic service procedures may cause confusion to masters of vessels moving from one vessel traffic service area to another,

RECOGNIZING FURTHER that the safety and efficiency of maritime traffic would be improved if vessel traffic services were established and operated in accordance with internationally approved guidelines.

HAVING CONSIDERED the recommendation made by the Maritime Safety Committee at its fifty-first session,

1. ADOPTS the Guidelines for Vessel Traffic Services set out in the Annex to the present resolution;

2. URGES Member Governments to ensure that vessel traffic services within their territorial seas are operated in accordance with national law and do not prejudice the right of innocent passage through such waters and to ensure that vessels outside territorial seas are able to use, on a voluntary basis, the service provided;

3. RECOMMENDS Member Governments to encourage masters of vessels navigating in an area for which a vessel traffic service is provided to make use of such service.
PREAMBLE

1. These Guidelines describe operational procedures and planning for vessel traffic services (VTS). The Guidelines do not address liability or responsibility - which should be considered by the authority establishing a VTS - nor do they create new rights to enact legislation which impose requirements on shipping.

2. VTS authorities are urged to ensure that vessel traffic services within territorial seas are operated in accordance with national law and do not prejudice the right of innocent passage through such waters and to ensure that vessels outside territorial seas are able to use, on a voluntary basis, the service provided.

3. No provision of these Guidelines shall be construed as prejudicing obligations or rights of vessels established in other international instruments.

4. VTS authorities or those planning VTS are recommended to follow these Guidelines, as appropriate to their needs in the interests of international harmonization and improving maritime safety.

5. These Guidelines describe the possible functions of VTS and provide guidance for designing and operating VTS once it has been decided that such a system, whether simple or highly sophisticated, is necessary. They further aim at international harmonization and address the procedures used by VTS taking into account current practice. They are based on relevant recommendations and resolutions adopted by the Organization, in particular Assembly resolution A.531(13) entitled “General Principles for Ship Reporting Systems”.

TABLE DES MATIERES

Les présentes Directives comportent les chapitres et sections suivants:

Chapitre 1 - Objectifs et procédures
Section 1 Services de trafic maritime
Section 2 Autorité du STM
Section 3 Éléments d'un STM
Section 4 Fonctions d'un STM
Section 5 Procédures
Section 6 Personnel
Section 7 Publication sur les STM à l'intention des utilisateurs

Chapitre 2 - Établissement d'un projet de STM

CHAPITRE 1 - OBJECTIFS ET PROCÉDURES

1. SERVICES DE TRAFIC MARITIME

Un STM est tout service mis en place par une autorité compétente dans le but d’améliorer la sécurité et l’efficacité du trafic et de protéger l’environnement. Il peut aller de l’émission de simples messages d’information à une organisation poussée du trafic à l’intérieur d’un port ou d’une voie de navigation.

CONTENTS

These Guidelines contain the following chapters and sections:

Chapter 1 – Objectives and procedures
Section 1 Vessel traffic services
Section 2 VTS authority
Section 3 Elements of a VTS
Section 4 Functions of a VTS
Section 5 Procedures
Section 6 Personnel
Section 7 VTS publication for users

Chapter 2 – Planning a VTS

CHAPTER 1 – OBJECTIVES AND PROCEDURES

1. VESSEL TRAFFIC SERVICES

A VTS is any service implemented by a competent authority, designed to improve safety and efficiency of traffic and the protection of the environment. It may range from the provision of simple information messages to extensive management of traffic within a port or waterway.
1.1 Les raisons d'établir un STM peuvent comprendre:
- l'assistance à la navigation dans les zones pertinentes;
- l'organisation des mouvements de navire pour faciliter l'écoulement du trafic dans la zone du STM;
- le traitement des données concernant les navires en cause;
- la participation aux interventions en cas d'accident;
- l'aide aux activités connexes.
1.2 Un STM est particulièrement approprié à l'approche d'un port, dans ses canaux d'accès et dans les zones pos­sédant une ou plusieurs des caractéristiques suivantes:
- forte densité de trafic;
- transport de cargaisons nocives ou dangereuses;
- difficultés de navigation;
- canaux étroits;
- environnement vulnérable.

2. AUTORITÉ DU STM

2.1 L’“autorité du STM” est l'autorité qui exploite un STM. Ce peut être notamment une administration maritime gouver­nementale, une simple autorité portuaire, une organisation de pilotage ou toute combinaison de tels services.
2.1.1 L'autorité qui établit un STM devrait délimiter sa zone de couverture, la déclarer zone du STM et diffuser aux navig­ateurs tous les détails la concernant, y compris les limites de la zone où la participation des navires est obligatoire ou recom­mandée, les services fournis et les procédures à suivre (voir section 5). Elle devrait définir également les classes de navires dont la participation est obligatoire ou recommandée et indiquer quels sont les centres responsables des fonctions du STM.
2.1.2 L'autorité devrait établir les qualifications et la forma­tion nécessaires pour les opérateurs de STM, conformément à la section 6.
2.1.3 L’autorité du STM devrait s’assurer que les services de trafic maritime, l’organisation du trafic, les aides à la naviga­tion, le pilotage, etc. sont parfaitement cohérents.
2.1.4 L’autorité du STM devrait en général limiter les fonc­tions d’un STM exploité à l’extérieur des zones portuaires et de leurs canaux d’accès à la prestation d’un “service d’in­formation” ou d’un “service d’assistance à la navigation” pour garantir la sécurité de la navigation ou la protection de l’environnement.
2.1.5 Il faudrait veiller à ce que les opérations du STM n’empêchent pas sur la responsabilité du capitaine concernant la sécurité de son navire, ou ne nuisent pas aux relations tradi­tionnelles entre le capitaine et le pilote.
2.1.6 Quand elle projette ou conçoit un STM, l’autorité de­vrait prendre en compte les facteurs et critères mentionnés au chapitre 2.

3. ÉLÉMENTS D’UN STM

3.1 Généralités
Un STM se compose des éléments suivants:
- l'organisation du STM;
- les navires utilisant le STM;
- les communications.

3.2 Organisation du STM
3.2.1 L'organisation du STM devrait être dotée de moyens de communication et comporter un radar de surveillance ou tout autre équipement, en fonction des tâches que doit rem­plir le STM. L'organisation du STM devrait être équipée pour utiliser les fréquences appropriées, selon les prescriptions de l'annexe 18 du Règlement des radiocommunications, y compris les fréquences internationales de détresse, de sécurité et d'appel.
3.2.2 Les “centres de STM” sont les centres à partir desquels les STM sont exploités.

4. VTS AUTHORITY

4.1 VTS authority is the authority operating a VTS. It may include a governmental maritime administration, a single port authority, a pilotage organization or any combination of them.
4.1.1 The authority establishing a VTS should delineate its area of coverage, declare it a VTS area and disseminate to mariners full details concerning the area of operation, including the limits of the areas where participation of vessels is required or recommended, the services provided and the pro­cedures to be followed (see section 5). It should also state the classes of ship which are required or recommended to partici­pate and indicate the VTS centres responsible for the VTS tasks.
4.1.2 The authority should establish appropriate qualifica­tions and training requirements for VTS operators in accord­ance with section 6.
4.1.3 The VTS authority should ensure that the effects of vessel traffic services, routing, aids to navigation, pilotage, etc. are fully integrated.
4.1.4 The VTS authority should in general limit the functions of a VTS operating outside port areas and their approach channels to those of providing an information service and navigational assistance service to vessels for the purposes of safety of navigation or the protection of the environment.
4.1.5 Care should be taken that VTS operations do not en­croach upon the master’s responsibility for the safe navigation of his vessel, or disturb the traditional relationship between master and pilot.
4.1.6 When planning or designing a VTS, the authority should take into account the factors and criteria of chapter 2.

3. ELEMENTS OF A VTS

3.1 General
A VTS consists of the following elements:
- VTS organization;
- vessels using VTS;
- communications.

3.2 VTS organization
3.2.1 The VTS organization should be equipped with commu­nications facilities and, where appropriate to the tasks per­formed by the VTS, have surveillance radar and other equip­ment. The VTS organization should be equipped to use the appropriate frequencies, as prescribed in appendix 18 of the Radio Regulations, including the international distress, safety and calling frequencies.
3.2.2 VTS centres are centres from which VTS are operated.
3.2.3.3 If voluntary or compulsory pilotage exists in the VTS area, the pilot makes decisions about the manoeuvre of the vessel, according to his judgement by the ordinary practice of seamen or by the special circumstances of the case.

3.2.3.1 1974 SOLAS Convention vessels participating in a VTS will be fitted with navigational and communications equipment in accordance with chapters IV and V of that Convention, as amended.

3.2.3 VTS operators are the appropriately qualified persons who perform the functions of the VTS (see section 4).

3.3 Vessels using a VTS

3.3.1 1974 SOLAS Convention vessels participating in a VTS will be fitted with navigational and communications equipment in accordance with chapters IV and V of that Convention, as amended.

3.3.2 The decisions concerning the actual navigation and manoeuvring of the vessel remain with the Master. Neither the sailing plan nor requested or instructed changes to the sailing plan can supersede the decisions of the master concerning the actual navigation and manoeuvring of the vessel, if such decisions are required according to his judgement by the ordinary practice of seamen or by the special circumstances of the case.

3.3.3 If voluntary or compulsory pilotage exists in the VTS area, pilotage plays an important role in such a VTS. The function of a pilot is to provide the master with: assistance in the manoeuvre of his vessel; assistance with ship/shore communications, particularly where there are language difficulties.

4. FUNCTIONS OF A VTS

4.1 General

The functions of a VTS may include:
- data collection;
- data evaluation;
- information service;
- navigational assistance service;
- traffic organization service;
- support of allied activities.

4.2 Data collection

Data collection may include:
- gathering data on the fairway and traffic situation by appropriate equipment, e.g. hydrological and meteorological sensors, radar, VHF direction finder, etc.;
du trafic à l'aide d'un matériel approprié (détecteurs hydrologiques et météorologiques, radar, radiogoniomètre à ondes métriques, par exemple); assurer une veille à l'écoute sur les fréquences désignées pour la sécurité et la détresse maritimes; recevoir les comptes rendus de navires; obtenir des rapports concernant l'état des navires quant à leur coque, leurs machines, leur équipement et leur équipage ainsi que, le cas échéant, aux marchandises dangereuses ou nocives transportées à bord.

4.3 Analyse des données

L'analyse des données peut inclure les fonctions ci-après: surveiller les manœuvres des navires afin de s'assurer que les prescriptions et règles internationales, nationales et locales sont respectées; interpréter la situation globale du trafic et son évolution; surveiller la situation des chenaux (renseignements hydrologiques et météorologiques, aides à la navigation); coordonner les renseignements et diffuser les messages les concernant aux navires participants et aux organisations intéressées; recueillir des données dans un but statistique.

4.4 Service d'information

Un service d'information est un service qui consiste à diffuser des informations à heures fixes, ou à d'autres moments chaque fois que le centre du STM le juge nécessaire, ou encore à la demande d'un navire; ce service peut inclure les fonctions ci-après: radiodiffuser des informations sur le mouvement des navires, les conditions de visibilité ou les intentions d'autres navires en vue de fournir une assistance à tous les navires, y compris les petites embarcations, qui ne participent pas au STM que par une veille à l'écoute; échanger avec les navires des informations concernant la sécurité (avis aux navigateurs, état des aides à la navigation, renseignements météorologiques et hydrologiques, etc.); échanger avec les navires toutes informations concernant les conditions et la situation du trafic (mouvements et intentions des navires qui approchent ou des navires rat-trapés); avertir les navires des obstacles à la navigation tels que navires handicapés, flottilles de navires de pêche, petites embarcations, autres navires effectuant des opérations particulières, et les informer des autres routes possibles.

4.5 Service d'assistance à la navigation

Un service d'assistance à la navigation est un service fourni à la demande d'un navire ou chaque fois que le centre du STM le juge nécessaire et peut inclure une aide aux navires en cas de conditions nautiques ou météorologiques difficiles ou en cas de défectuosité ou d'avarie.

4.6 Service d'organisation du trafic

Ce service s'occupe de planifier à l'avance les mouvements afin d'empêcher que des situations dangereuses ne se produisent et d'assurer un mouvement sûr et efficace du trafic à l'intérieur de la zone du STM, ce qui peut être effectué dans le cadre de plans de route. Ce service peut inclure les fonctions ci-après: établir et exploiter un système d'autorisation de mouvement et de comptes rendus pour des conditions et des mouvements particuliers ou établir l'ordre des mouvements; programmer les mouvements des navires à travers des zones spéciales telles que celles où est établi un trafic à sens unique; établir les routes à suivre et les limites de vitesse à observer; maintenir un registre du trafic; colliger des données dans un but statistique; permettre aux navires de suivre le trafic; et assurer l'efficacité du service.

4.3 Data evaluation

Data evaluation may include:
- monitoring the manoeuvres of ships for compliance with international, national and local requirements and regulations;
- interpreting the total traffic situation and its developments;
- monitoring the fairway situation (hydrological and meteorological data, aids to navigation);
- co-ordinating the information flow and distributing relevant messages to the participants or organizations concerned;
- collating information for statistical purposes.

4.4 Information service

An information service is a service provided by broadcasting information at fixed times, or at any other time if deemed necessary by the VTS centre, or at the request of a vessel and may include:
- broadcasting information about the movement of traffic, visibility conditions or the intentions of other vessels, in order to assist all vessels, including small craft that are participating in the VTS only by keeping a listening watch; exchanging information with vessels on all relevant safety matters (notices to mariners, status of aids to navigation, meteorological and hydrological information, etc.);
- exchanging information with vessels on relevant traffic conditions and situations (movements and intentions of approaching traffic or traffic being overtaken);
- warning vessels about hindrances to navigation such as hampered vessels, concentrations of fishing vessels, small craft, other vessels engaged in special operations and giving information on alternative routing.

4.5 Navigational assistance service

A navigational assistance service is a service given at the request of a vessel or, if deemed necessary, by the VTS centre, and may include assistance to vessels in difficult navigational or meteorological circumstances or in case of defects or deficiencies.

4.6 Traffic organization service

This is concerned with the forward planning of movements in order to prevent the development of dangerous situations and to provide for the safe and efficient movement of traffic within the VTS area, which may be accomplished on the basis of sailing plans. This service may include:
- establishing and operating a system of traffic clearance and reports for specific movements and conditions, or establishing the order of movement;
- scheduling vessels movements through special areas such as those in which one-way traffic is established; establishing routes to be followed and speed limits to be observed;
- designating a place to anchor;
- organizing vessel movements by means of advice or instructions, such as requiring a vessel to remain in or proceed to a...
fixer un lieu de mouillage;
organiser les mouvements des navires au moyen de conseils ou d'instructions, en demandant par exemple à un navire de se maintenir dans une position sûre ou de s'y rendre, ou à l'aide d'autres méthodes appropriées, lorsque la sauvegarde de la vie humaine ou la protection de l'environnement ou des biens le justifie.

4.7 Aide aux activités connexes
L'aide aux activités connexes peut inclure les fonctions ci-après:
- coordonner les informations et diffuser les messages pertinents aux participants ou organisations intéressées;
- aider les activités connexes à celles de l'autorité du STM telles que celles des services de pilotage, des ports, de la sécurité maritime, du contrôle de la pollution, de la recherche et du sauvetage;
- appeler les services de sauvetage et d'urgence et leur demander d'intervenir et, le cas échéant, participer aux actions de ces services.

5. PROCÉDURES
5.1 Généralités
5.1.1 Toute autorité de STM devrait établir et appliquer des procédures fondées sur les présentes Directives dans la mesure où elles correspondent à ses fonctions et à ses besoins.
5.1.2 Tout navire participant à un STM à titre volontaire ou obligatoire devrait suivre autant que possible les procédures applicables à ce STM.
5.1.3 Les procédures d'établissement des comptes rendus devraient être claires, simples et ne viser que des informations essentielles de façon à éviter d'alourdir indûment les tâches des capitaines, des officiers de quart et des pilotes.
5.1.4 Lorsqu'il doit échanger avec un navire des informations nombreuses et détaillées qui ne concernent pas les autres navires, l'opérateur du STM peut décider de communiquer avec ce navire sur une autre voie en ondes métriques.
5.1.5 Pour éviter l'inutile répétition des informations par le navire, les informations de base devraient être données une fois, entrées dans le système et complétées ou mises à jour en tant que de besoin et mises à la disposition des services côtiers le cas échéant.
5.1.6 Tous les navires qui participent à un STM devraient, sauf en cas de dérogation accordée par l'autorité du STM, assurer une veille permanente sur la fréquence appropriée du STM. Cette veille à l'écoute devrait être assurée à partir de la position d'où le navire est gouverné.
5.1.7 Nature du message
Tout message de STM adressé à un navire devrait indiquer clairement s'il contient des informations, des avis ou des instructions.
5.1.8 Informations données par un STM
Les heures de diffusion des bulletins réguliers de STM devraient être précisées de façon claire dans les documents nautiques appropriés et devraient tenir compte des heures d'émission des centres de STM voisins. Ces bulletins devraient être rédigés sous une forme normalisée et ne contenir que des informations essentielles (voir section 7). Des bulletins spéciaux, émis dans certaines circonstances, devraient faire l'objet d'annonces préalables de manière appropriée. Un navire peut aussi demander des informations.

5.2 Premier contact - Identification
5.2.1 En général, le navire prend contact avec le centre du STM sur ondes métriques; c'est là la première liaison directe entre le navire et le STM. Ce premier échange d'informations permet au navire, le cas échéant, de fournir des renseignements préliminaires (voir paragraphe 5.2.2). Il permet aussi au navire de demander à l'opérateur du STM certaines informations pertinentes ou d'instructions, en demandant par exemple à un navire de se maintenir dans une position sûre ou de s'y rendre, ou à l'aide d'autres méthodes appropriées, lorsque la sauvegarde de la vie humaine ou la protection de l'environnement ou des biens le justifie.

4.7 Support of allied activities
Support of allied activities may include:
- co-ordinating the information flow and distributing the relevant messages to the participants or organizations concerned;
- supporting activities allied to those of the VTS authority such as pilotage services, port services, maritime safety, pollution prevention and control and search and rescue;
- calling upon and requesting action by rescue and emergency services and, if appropriate, participating in the actions of these services.

5. PROCEDURES
5.1 General
5.1.1 Every VTS authority should establish and apply procedures based on these Guidelines to the extent required by its functions and needs.
5.1.2 Every vessel participating in a VTS on a voluntary or compulsory basis should as far as possible follow the procedures applicable to that VTS.
5.1.3 Reporting procedures should be clear and simple and should contain only essential information so as to avoid imposing an undue burden on masters, officers of the watch and pilots.
5.1.4 When detailed and extensive information has been exchanged with one ship which is not relevant to other ships, the VTS operator may decide to communicate with that ship on an alternative VHF channel.
5.1.5 To avoid an unnecessary repetition of information by the ship, basic information should be reported once, be retained in the system and be supplemented or updated according to requirements and should be made available to shore services as appropriate.
5.1.6 All ships participating in a VTS should, unless otherwise permitted by the VTS authority, maintain a continuous listening watch on the appropriate frequency of the VTS. This listening watch should be kept at the position from which the ship is navigated.
5.1.7 Status of the message
Any VTS message directed to a vessel should make it clear whether it contains information, advice or instructions.
5.1.8 Information broadcast by VTS
The times of regular broadcasts of VTS bulletins should be clearly published in relevant nautical publications and should take account of the transmission times of neighbouring VTS centres. They should be drawn up in a standard format and should only contain essential information (see section 7). Bulletins broadcast in special circumstances should be prefaced by an appropriate announcement. Information can also be requested by a vessel.

5.2 Initial contact – Identification
5.2.1 Generally, the ship contacts the VTS centre by VHF and this is the first direct link between the ship and the VTS. This initial exchange of data enables the ship to provide certain preliminary information, where appropriate (see paragraph 5.2.2). It also enables the ship to request certain specific data from the VTS operator. In most cases a ship will...
informations particulières. Dans la plupart des cas, le dialogue entre le navire et l’opérateur du STM permet l’identification du navire. Cette identification peut être aidée par des moyens techniques tels qu’un radar à terre ou un radiogoniomètre à ondes métriques.

5.2.2. L’arrivée d’un navire dans une zone portuaire est généralement prévue, car un agent de sa compagnie aura fourni une “heure prévue d’arrivée” (ETA) et réservé un poste à quai ou de mouillage. Dans le cas de navires transportant des substances dangereuses, on devrait se conformer à la circulaire MSC/Circ.299 (décembre 1980), intitulée “Sécurité du transport, de la manutention et de l’entreposage des marchandises dangereuses dans les zones portuaires”, qui recommande la notification d’informations particulières, ainsi qu’à tous règlements locaux qui peuvent être applicables.

5.3 Système de comptes rendus dans le cadre d’un STM

Les navires participant à un STM devraient rendre compte, s’il le faut, de leur passage en certains points et à certaines heures, suivant le format agréé. Autant que possible, le capitaine devrait s’assurer que ces comptes rendus sont faits correctement et en temps voulu. Les navires qui ne sont pas tenus de soumettre de compte rendu mais qui désirent profiter des services offerts par le STM devraient suivre les procédures appropriées. Chaque fois que nécessaire, les types de comptes rendus et le format décrits dans les “Principes généraux applicables aux systèmes de comptes rendus de navires” devraient être utilisés dans les procédures des STM. Tous les types de comptes rendus décrits ci-dessous ne sont pas applicables à tout STM. Les autorités des STM devraient faire en sorte que le nombre de comptes rendus demandés aux navires soit limité au minimum compatible avec les tâches du STM.

5.3.1 Plan de route

5.3.1.1 Normalement un plan de route comprend l’heure prévue d’arrivée dans la zone du STM ou de départ d’un poste ou de mouillage situé dans cette zone. L’autorité du STM devrait indiquer les informations supplémentaires à fournir dans le plan de route de tous les navires ou de certains navires spéciaux, suivant les conditions locales. Dans des cas exceptionnels, le plan de route peut être complété sur la demande du centre du STM.

5.3.1.2 Compte tenu de la situation du trafic ou de circonstances particulières, le centre du STM peut conseiller des modifications du plan de route.

5.3.1.3 Après que le navire et le centre du STM sont convenus du plan de route, le navire est autorisé à participer au STM et devrait, autant que possible, s’efforcer de se conformer à ce plan.

5.3.1.4 Si des circonstances particulières l’exigent et pour préserver la sécurité du trafic, le centre du STM peut, après en avoir indiqué la raison, demander au navire de suivre un plan de route modifié. Ces modifications qui devraient être aussi limitées que possible peuvent porter sur les points suivants:

- temps de passage au prochain point de signalisation ou en tout autre point particulier;
- comptes rendus de position supplémentaires;
- nouvelle destination;
- stationnement en une position donnée;
- ordre de ne pas entrer dans la zone du STM;
- ordre de rester le long du poste à quai; et
- ordre de suivre une route donnée.

5.3.1.5 Lorsque des circonstances particulières ou la sécurité du trafic l’exigent, et si l’opérateur du STM a autorité pour le faire, il peut demander à un navire de se conformer à un plan de route donné ou de changer son plan, conformément aux paragraphes 5.3.1.4 et 3.3.2.

* Résolution A.531(13) de l’Assemblée.
Dans certaines zones, il existe une réglementation du trafic.

5.4 Assistance à la navigation
Lorsqu'un navire demande une assistance à la navigation ou lorsque le centre d'un STM juge nécessaire une telle assistance, l'opérateur du STM devrait s'assurer positivement de l'identification et de la position du navire par des moyens fiables et chercher à obtenir d'autres informations. Une fois l'identification et la position établies, les messages d'assistance à la navigation devraient être envoyés à de brefs intervalles. Lorsque le navire n'a plus besoin d'assistance, il devrait en informer clairement le centre du STM. Dans les eaux libres, l'assistance à la navigation comportera principalement une description du trafic environnant, des avertissements concernant les risques d'abordage et d'échouement et, si nécessaire, des conseils sur la route à suivre. Dans les eaux resserrées, l'assistance à la navigation comportera souvent aussi des données de position (par exemple, distance jusqu'à une "ligne de référence" et un "point de route").

5.5 Réglementation du trafic
Dans certaines zones, il existe une réglementation du trafic. Cette réglementation peut concerner les mouvements de navires spéciaux, les limitations dans un chenal ou les cas de collision et de rattrapage. Lorsqu'une telle réglementation existe, l'opérateur du STM, s'il dispose de l'autorité voulue, peut au besoin donner des instructions pour que cette réglementation soit respectée par le trafic.

6. PERSONNEL
L'autorité du STM devrait s'assurer que les opérateurs du STM ont les qualifications voulues et ont reçu une formation spécialisée pour s'acquitter de leurs fonctions dans le cadre du STM et qu'ils possèdent les connaissances linguistiques mentionnées au paragraphe 3.4, notamment lorsqu'il s'agit d'opérateurs du STM autorisés à donner des instructions concernant le trafic et à fournir une assistance à la navigation.

7. PUBLICATION SUR LES STM À L'INTENTION DES UTILISATEURS
7.1 Les autorités des STM devraient s'assurer que la réglementation locale en vigueur sur les mouvements de navires, les services offerts et l'indication de la zone concernée sont diffusés de manière appropriée.

5.3.1.6 Si le navire ne se conforme pas aux demandes indiquées aux paragraphes 5.3.1.4 ou 5.3.1.5, il devrait en donner les raisons au centre du STM.

5.3.2 Autres comptes rendus
5.3.2.1 Lorsqu'il n'y a pas de poursuite automatique après réception du plan de route et identification du navire, des comptes rendus de position sont nécessaires pour la mise à jour des données sur le mouvement du navire. Il peut être demandé aux navires d'envoyer des comptes rendus de position depuis des positions données.
5.3.2.2 S'il ne peut suivre le plan de route, le navire devrait envoyer un compte rendu de déviation au centre du STM et arrêter un plan de route modifié en accord avec le centre du STM.
5.3.2.3 Le navire devrait envoyer un compte rendu final lorsqu'il quitte la zone du STM ou lorsqu'il arrive au poste à quai ou au mouillage dans la zone du STM.
5.3.2.4 Tout autre compte rendu exigé par l'autorité du STM devrait être établi conformément aux principes adoptés par l'Organisation pour la soumission de rapports. Par exemple, un "rapport sur les défauts" devrait être fait pour informer le centre du STM de tout dommage ou de toute avarie, défectuosité ou autre limitation.

5.3.2.4 Any other report prescribed by the VTS authority should be made in accordance with the reporting principles adopted by the Organization. For example, a "deficiency report" is a report which should be made to inform the VTS centre of defects, damage, deficiencies or other limitations.

5.4 Assistance to navigation
When a vessel requests navigational assistance or when such assistance is deemed necessary by a VTS centre, the VTS operator should ensure positive identification and location of the vessel by reliable means and obtain other relevant information. After the identification and location are established, the messages on navigational assistance should be sent at short intervals. When the vessel needs no further navigational assistance, clear notice should be given to the VTS centre. In open waters navigational assistance will usually also include position data (e.g. distance to a "reference line" or to a "way point").

5.5 Traffic rules
In certain places traffic rules exist. Such rules may cover the movement of special ships, limitations in a channel or passing or overtaking situations. Where such rules exist, and where the VTS operator has the authority, the VTS operator may need to issue instructions to ensure that traffic complies with these traffic rules as appropriate.

6. PERSONNEL
The VTS authority should ensure that VTS operators have the qualifications and have received specialized training appropriate to their tasks within the VTS and meet the language requirements mentioned in paragraph 3.4, in particular with regard to VTS operators authorized to issue traffic instructions or to give navigational assistance.

7. VTS PUBLICATION FOR USERS
7.1 A VTS authority should ensure that the local traffic movement rules and regulations in force, the services offered and the area concerned are promulgated appropriately.
7.2 La publication devrait pouvoir être utilisée facilement par les navigateurs et elle devrait contenir, si possible, des cartes montrant les limites de la zone et de ses secteurs, des informations générales sur la navigation dans la zone ainsi que les procédures, les fréquences ou voies radioélectriques, les lignes et points de signalisation. Lorsque le STM s'étend au-delà de la mer territoriale, la limite de cette mer devrait être clairement indiquée sur ces cartes.

CHAPITRE 2 - ETABLISSEMENT D'UN PROJET DE STM

1. La sécurité du trafic maritime dans la zone d'un STM résulte nécessairement d'une coopération entre personnel à terre et navigateurs. Il est donc important, lorsqu'on projette d'instituer un STM, de prendre en compte, parmi d'autres, les points de vue des navigateurs sur la nécessité d'un tel service et sur son fonctionnement. On devrait aussi considérer le niveau des besoins. Ceci aidera à la mise en oeuvre effective du STM et permettra d'obtenir plus facilement la coopération de tous les futurs participants qui auront d'ваantage confiance dans les procédures à suivre.

2. Lorsqu'elle envisage de mettre en place un STM, l'autorité devrait veiller à ce qu'il soit exploité conformément au droit international et national.

3. L'autorité du STM devrait être guidée, lors de l'établissement d'un projet de STM, par des critères tels que:
   3.1 le risque général d'accidents de mer et leurs conséquences possibles, ainsi que la densité du trafic dans la zone;
   3.2 la nécessité de protéger le public et l'environnement, particulièrement en cas de transport de cargaisons dangereuses;
   3.3 les incidences du fonctionnement du système, et son impact économique sur les utilisateurs et la communauté maritime en général;
   3.4 la disponibilité des moyens et des connaissances techniques requises;
   3.5 les services de trafic maritime existants ou prévus dans les eaux avoisinantes et la nécessité d'une coopération entre États voisins;
   3.6 la configuration du trafic et les systèmes d'organisation de trafic existants ou prévus dans la zone, y compris la présence de lieux de pêche et de petites embarcations;
   3.7 les modifications de la configuration du trafic qui sont en cours ou prévues par suite de l'aménagement de ports ou de terminaux au large ou d'explorations en mer dans la zone;
   3.8 l'existence de systèmes de communication et d'aides à la navigation appropriés dans la zone;
   3.9 la consultation avec les parties intéressées et l'évaluation des procédures envisagées;
   3.10 les facteurs météorologiques tels que le temps et les glaces;
   3.11 les facteurs hydrologiques tels que la marée, son amplitude et les courants; et
   3.12 les chenaux étroits, la configuration du port, les ponts et autres zones où la progression des navires peut être limitée.

4. La zone d'un STM peut être divisée en secteurs, mais leur nombre devrait rester aussi faible que possible. Leurs limites devraient être indiquées dans les documents nautiques appropriés.

5. Les limites des zones et des secteurs ne devraient pas passer par des points où les navires généralement changent de route, manœuvrent ou approchent de zones de convergence ou de jonction, ou encore là où s'effectue un trafic traversier.

CHAPTER 2 - PLANNING A VTS

1. The safety of maritime traffic in a VTS area is necessarily a co-operative activity between those ashore and those at sea. It is therefore important, whenever a VTS is being planned and designed, that, amongst others, the mariners' views on the need for the operation of the service are taken into account. The level of need should also be considered. This will assist in the effective implementation of VTS and facilitate the co-operation of all the future participants and promote confidence in the procedures to be followed.

2. When considering the introduction of a VTS, the authority should verify that its operation will be in accordance with international and national law.

3. When planning a VTS, the VTS authority should be guided by criteria such as:
   3.1 the general risk of marine accidents and their possible consequences and the density of traffic in the area;
   3.2 the need to protect the public and safety of the environment, particularly where dangerous cargoes are involved;
   3.3 the operation and economic impact on users of the system and the marine community as a whole;
   3.4 the availability of the requisite technology and expertise;
   3.5 existing or planned vessel traffic services in adjacent waters and the need for co-operation between neighbouring States;
   3.6 existing or proposed traffic patterns or routing systems in the area, including the presence of fishing grounds and small craft;
   3.7 existing or foreseeable changes in the traffic pattern resulting from port or offshore terminal developments or offshore exploration in the area;
   3.8 the adequacy of existing communications systems and aids to navigation in the area;
   3.9 consultation of interested parties and assessment of proposed procedures;
   3.10 meteorological factors such as weather and ice conditions;
   3.11 hydrological factors such as tides, tidal ranges and current conditions; and
   3.12 narrow channels, port configuration, bridges and similar areas where the progress of vessels may be restricted.

4. A VTS area can be divided into sectors but these should be as few as possible. The boundaries should be indicated in appropriate nautical publications.

5. Area and sector boundaries should not be located where vessels normally alter course or manoeuvre or where they are approaching convergence areas, route junctions or where there is crossing traffic.