WORLD BANK GROUP

A Review of the Current Status of Inland Water Transport (IWT) Safety in Bangladesh

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CONTENTS

LIST OF ABBREVIATIONS

AIS	-	Automatic Identification of Ships (System)
BCG	-	Bangladesh Coast Guard
BIWTA	-	Bangladesh Inland Water Transport Authority
BIWTC	-	Bangladesh Inland Water Transport Corporation
BMD	-	Bangladesh Meteorological Department
CAAB	-	Civil Aviation Authority Bangladesh
COLREG	-	Collision Regulations
C&C	-	Command & Control
CoP	-	Code of Practice
DINA	-	Digital Inland Waterways Activity
DGPS	-	Differential Global Positioning System
DoS	-	Department of Shipping
DSC	-	Digital Selective Calling
EC	-	European Commission
ECDIS	-	Electronic Chart Display and Information System
EGIMNS		Global Maritime Distress and Safety System (GMDSS) and Integrated Maritime Navigation System
ENCs		Electronic Navigational Charts
FSCD	-	Fire Service Civil Defence
GMDSS	-	Global Maritime Distress and Safety System
HF	-	High Frequency
IAMSAR	-	International Aeronautical Search and Rescue (Manual)
IMO	-	International Maritime Organization
ISO	-	Inland Shipping Ordinance
ISPS	-	International Ship & Port Facility Security (Code)
IWT	-	Inland Waterway Transport
LRIT	-	Long Range Information and Tracking (of ships)
LSA	-	Life Saving Appliances
MARPOL	-	International Convention for the Prevention of Pollution by Ships
MEPC	-	Maritime Environmental Protection Committee
MRCC	-	Maritime Rescue Co-ordination Centre
MRSC	-	Maritime Rescue Sub Centre
MSC	-	Maritime Safety Committee (IMO)
MF	-	Medium Frequency
MSI	-	Maritime Safety Information
MoS	-	Ministry of Shipping
NAVTEX		Navigational Telex (an international automated medium frequency direct-printing service for delivery of navigational and meteorological warnings and forecasts, as well as urgent maritime safety information (MSI) to ships.)
NMCC		National Meteorological Communications Centre
NSDPC		National Ships & Mechanized Boats Database Management and Capacity Building Project
NSTMS		National Ships and Mechanized Boats Tracking & Monitoring System (NSTMS) Project.
NtS	-	Notice to Skippers
ORIL	-	Open Reversible Liferaft

OSC	-	On Scene Co-ordinator
RIS	-	River Information System
RO's	-	Recognized Organizations
SAR	-	Search and Rescue
SMC	-	SAR Mission Co-ordinator
SRR	-	Search and Rescue Region
SOLAS	-	Safety of Life at Sea (Convention)
STCW	-	Standards of Training, Certification and Watchkeeping
SWC	-	Storm Warning Centre
TMAS	-	Telemedical Maritime Advice Services
UAV	-	Unmanned Aerial Vehicle
VHF	-	Very High Frequency
VTMIS	-	Vessel Traffic Management & Information System

1. INTRODUCTION

The World Bank are financing the BIWTA (Bangladesh Inland Water Transport Authority) through a project which involves dredging Dhaka to Chittagong and Dhaka- Ashuganj sections and developing additional passenger/cargo terminals along these sections (Bangladesh Regional Waterway Transport Project). The objective being to improve Inland Water Transport (IWT) efficiency and safety for passengers and cargo along the Chittagong-Dhaka-Ashuganj regional corridor and to enhance sector sustainability. Therefore with the prospect of the IWT system becoming more important the World Bank required a quick diagnostic examination in order to understand the current overall safety situation concerning Inland Waterway Transport (IWT) for both passenger and cargo traffic, in particular to understand the capability and resources of the existing agencies responsible for management of IWT network and the response to any incidents/accidents occurring on the waterways.

Approximately 90 percent of the land in Bangladesh is in the delta region, the largest delta in the world comprising low-lying land that is no higher than 10 meters above sea level, and approximately seven percent (9,770 square kilometres) of the land is covered by water. Water transportation is often used in the inland waterways, particularly in the southern area where such transportation is concentrated three times more than in the northern area. In the inland waterways, many serious maritime and river accidents occur, resulting in vessels sinking - and also resulting in oil spills - primarily due to overloading, collisions and stormy weather. Accidents also often occur in the coastal areas where cyclones strike each year. The IWT network carries 25% of all passenger traffic in the country and approximately 194 million tons of cargo. There are 22,300 registered vessels of which 10% are passenger vessels and there are 750,000 country boats which plays a significant role in the mobility of the poorest of poor and their farm products. However, there are believed to be many more vessels which are unregistered.

IWT plays a very significant role in the transportation system of Bangladesh. Its low expense and high accessibility, as compared with other alternatives, amplifies a great demand for carrying goods and passengers within the country. Although the water transportation sector in Bangladesh possesses geographical advantage there are some deficiencies in the safety aspect, particularly in the areas concerning; regulatory oversight, disaster response, lack of communication systems, safety equipment, and crew training. It is evident that there is a poor safety culture in the country, this can be witnessed on the roads and railway transport systems, the roads are overcrowded and chaotic, driving is dangerous there seems to be little observance of any highway code and fatalities on the roads are all too frequent. This scenario can also be seen on the IWT sector and causes the UK to publish the following current travel advice;

Sea and river travel

"River and sea ferries are often dangerously overcrowded, particularly in the days around religious festivals and other holidays. There have been a number of serious accidents in Bangladesh and capsizing is common. Take care if you use the ferries, they are often found without appropriate safety and survival equipment and many do not carry communication equipment in case of emergency."

Australia and the U.S. also publishes very similar travel advice for Bangladesh.

2. EXECUTIVE SUMMARY

The primary objective of this study was to review policy, regulatory, institutional and operational environment affecting all dimensions of the IWT safety environment and recommend measures to enhance the overall safety of the IWT sector in Bangladesh.

This report provides an assessment of the current status of safety on the inland waterways and makes recommendations concerning measures and actions to be taken to mitigate some of the risks faces by travellers on the waterways.

Effective laws and standards concerning shipping and vessel safety on Bangladesh inland waterways - together with their enforcement - are a crucial component of a healthy shipping sector. In their absence poor safety measures, lack of routine and adequate vessel maintenance, outdated vessels, and overcrowding combine to create frequent, dangerous accidents.

The report makes 13 recommendations covering issues concerning;

- Safety of Navigation;
- Vessel lifesaving appliances;
- Vessel firefighting equipment;
- Search and rescue;
- Enforcement;
- Security, and
- Passenger Safety.

Bangladesh is exposed and vulnerable to natural disasters such as cyclones and flooding so there will always be accidents of some sort particularly on mass transport systems such as the passenger carrying vessels plying the waterways. Nevertheless, implementation of the recommendations in this report will go some way alleviating the level of accidents and reducing the subsequent loss of life and injuries to passengers and crew.

3. STAKEHOLDERS

3.1 International

3.1.1 The International Maritime Organization (IMO)

As a specialized agency of the United Nations, IMO is the global standard-setting authority for the safety, security and environmental performance of international shipping. Its main role is to create a regulatory framework for the shipping industry that is fair and effective, universally adopted and universally implemented. In other words, its role is to create a level playing-field so that ship operators cannot address their financial issues by simply cutting corners and compromising on safety, security and environmental performance. This approach also encourages innovation and efficiency.

The world relies on a safe, secure and efficient international shipping industry – and this is provided by the regulatory framework developed and maintained by IMO. IMO measures cover all aspects of international shipping – including ship design, construction, equipment, manning, operation and disposal – to ensure that this vital sector remains safe, environmentally sound, energy efficient and secure.

Bangladesh joined the IMO in 1976, figure 1 below shows all the IMO sponsored international conventions ratified by Bangladesh as of November 2018. However, unless expressly provided otherwise the present regulations apply only to ships engaged on international voyages and for ships over a certain size. They do not apply to vessels such as passenger carrying vessels and cargo vessels plying in domestic routes such as the IWT network.

Nevertheless, if the government of a Member State wished to apply the standards set out in any of the conventions and particularly the convention(s) on the Safety of Life at Sea (SOLAS) then it is free to so and indeed encouraged to do so in the case of domestic passenger carrying vessels.

Figure 1: Bangladesh - Status of Conventions

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As at 16/11/2018	IMO Convention 48	SOLAS Convention 74	SOLAS Protocol 78	SOLAS Protocol 88	SOLAS Agreement 96	LOAD LINES Convention 66	LOAD LINES Protocol 88	TONNAGE Convention 69	COLREG Convention 72	CSC Convention 72	CSC amendments 93	SFV Protocol 93	Cape Town Agreement 2012	STCW Convention 78	STCW-F Convention 95	SAR Convention 79	STP Agreement 71	Space STP Protocol 73	IMSO Convention 76	INMARSAT OA 76	IMSO amendments 2006	IMSO amendments 2008	FACILITATION Convention 65	MARPOL 73/78 (Annex I/II)	MARPOL 73/78 (Annex III)	MARPOL 73/78 (Annex IV)	MARPOL 73/78 (Annex V)	MARPOL Protocol 97 (Annex VI)	London Convention 72	London Convention Protocol 96	INTERVENTION Convention 69	INTERVENTION Protocol 73	CLC Convention 69	CLC Protocol 76	CLC Protocol 92	FUND Protocol 76	FUND Protocol 92	FUND Protocol 2003	NUCLEAR Convention 71	PAL Convention 74	PAL Protocol 76	PAL Protocol 90	PAL Protocol 02	LLMC Convention 76	LLMC Protocol 96	SUA Convention 88	SUA Protocol 88	SUA Convention 2005	SUA Protocol 2005	SALVAGE Convention 89	OPRC Convention 90	HNS Convention 96	HNS PROT 2010	OPRC/HNS 2000	BUNKERS CONVENTION 01	ANTI FOULING 2001	BALLASTWATER 2004	NAIROBI WRC 2007	HONG KONG CONVENTION
Bangladesh	X	X		X		X	X	X	X					X		X	X	X	X	X			X	X	X	X	X	X			X															X	X				X					X	X		

The highlighted conventions in figure 1 above are the Most important instruments as far as this study is concerned. However, none of these conventions apply to inland waterways or the vessels operating on them unless any of those vessels proceed into open seas as would be the case for a vessel sailing from inland waters to a sea port such a Chittagong.

The Ministry of Shipping is listed in the IMO's Global SAR Plan as the national responsible authority, administration or service co-ordinator for maritime SAR and the Bangladesh Navy is listed as the co-ordinator for SAR in Bangladesh's maritime search and rescue region (SRR) with a Maritime Rescue Co-ordination Centre (MRCC) at the Navy HQ operations room located at Banani, Dhaka. The global SAR plan also lists the Navy's Maritime Rescue Sub Centre (MRSC) at Chittagong as the provider of Telemedical Maritime Advice Services (TMAS). MRSC (Chittagong and Khulna) is co-located with Navy Hospitals where specialized doctors remain available at all times for advice over voice circuit and email.

For the purposes of the global SAR plan additional information on the resources allocated by Bangladesh as a member state is not found with IMO.

The IMO's Maritime Safety Committee (MSC) and the Marine Environment Protection Committee (MEPC) in their respective Circulars (MSC/Circ.971 and MEPC.6/Circ.6) concerning the national contact points for safety and pollution prevention lists the Department of Shipping (DoS) as the national point of contact.

In October 2017 the maritime administration of Bangladesh underwent an audit under the IMO Member State Audit Scheme (Resolution A.1067(28)). The mandatory audit of all Member States commenced from 1 January 2016, (previously it was voluntary) with the aim of determining the extent to which they give full and complete effect to their obligations and responsibilities contained in a number of IMO treaty instruments. The mandatory IMO instruments included in the scope of the audit scheme cover safety of life at sea (SOLAS 1974 and its 1988 Protocol); prevention of pollution from ships (MARPOL); standards of training, certification and watchkeeping for seafarers (STCW 1978); load lines (LL 66 and its 1988 Protocol); tonnage measurement of ships (Tonnage 1969); and regulations for preventing collisions at sea (COLREG 1972). Therefore, the report could be a good source to find out some measures that will be helpful to implement the safety of maritime as well as IWT sector.

3.2 Public

The main public institutions in the sector are:

a. The Ministry of Shipping (MoS), which has overall responsibility of the sector;
b. The Department of Shipping (DoS), which is a department of MoS;
c. Inspectorate of Inland Shipping, which is a department of the DoS;
d. The Bangladesh Inland Water Transport Authority (BIWTA);
e. The Bangladesh Inland Water Transport Corporation (BIWTC);
f. Fire Service / Civil Defence;
g. Bangladesh Coast Guard;
h. Bangladesh Navy.

3.2.1 The Ministry of Shipping (MoS)

The Ministry of Shipping encompasses within its fold shipping and port sectors which include national waterways, inland water transport, ports, ocean shipping, oversight of safety

and environmental matters and the regulatory aspects of maritime shipping and maritime education. This ministry is responsible for formulating policies and plans on these subjects and facilitate the quick implementation of various projects. This ministry also cares for the maintenance and expansion of viable, efficient and dependable water transportation and communication systems as the cheapest way of economic activities for both rural and urban areas. The vision of the MoS is the modernization of sea ports, river ports and land ports, conservation of the navigability of the waterways, creation of efficient workforce in the maritime sector, safe and affordable transportation of passengers and goods and facilitation of international trade.

The MoS is made up of the following Wings and Sections;

Administration Wing

- Administration Section
- Department of Shipping Section
- I.O Section
- Budget Section
- Maritime Education and Training Section
- Parliament & Co-ordination
- ICT Section
- Accounts Section

Port Wing

- Chattogram Port Authority Section
- Bangladesh Land Port Authority Section
- Mongla Port Authority Section
- Payra Port Authority Section

Development Wing

- Development Section
- Planning Section

Organization Wing

- Bangladesh Inland Water Transport Authority (BIWTA) Section
- Bangladesh Inland Water Transport Corporation (BIWTC) Section
- National River Conservation Commission (NRCC) Section
- Bangladesh Shipping Corporation (BSC) Section
- Audit Section
- Law Section

3.2.2 The Department of Shipping (DoS)

DoS is a section (or Wing) of the MoS and is responsible for safety, the provision of the regulatory framework for the sector and for training and scrutiny of maritime staff. It includes the Inland Ship Safety Administration (ISSA), which is responsible for the definition and enforcement of ship safety rules and for registering vessels. ISSA is also the institution responsible for managing environmental aspects of the sector. The DoS is the maritime safety administration of Bangladesh responsible for the formulation and implementation of the national policies and legislations to ensure the safety of life and ships at sea, development of shipping industry, maritime education and certification, employment and welfare of seafarers

and other shipping related matters. The department is also responsible for ensuring the compliance of international conventions relating to maritime matters.

The DoS was established in 1976. As a regulatory body, its functions are administered in accordance with two main legal instruments: The Bangladesh Merchant Shipping Ordinance 1983 and The Inland Shipping Ordinance 1976. The head office of the Department is situated in Dhaka. The office is headed by a Director-General under whom is; a Chief Engineer and Ship Surveyor, a Chief Nautical Surveyor and a Director of Shipping. As mentioned earlier DOS is mainly concerned with coastal and overseas shipping i.e. foreign going ships. The function of this department with inland shipping is mainly looked after by the Inspectorate of Inland Shipping Office (IISO) which is headed by a Chief Inspector, its function includes carrying out annual survey of vessels under the Inland Shipping Ordinance (ISO) and to register vessels with the Registrar of Inland Ships. The department also carries out investigations of marine accidents and identifies the person(s) responsible. A major task of IISO is to conduct professional competency certificate examinations of crews of inland vessels. Surveyors of this department compare the construction of the vessels with approved drawings, supervise the inclining tests carried on inland vessels and checks their stability. Presently an effort is currently underway by IIS for preparation of rules for design and construction of inland vessels.

Following a series of tragic passenger vessel disasters in early parts of 1986, a consultant of the IMO advised the Government of Bangladesh to reorganize this department and assign all statutory functions to it, including the design approval process which is presently being looked after by the Mechanical and Marine Engineering Department of BIWTA. This was reportedly accepted by the Government of Bangladesh and has been implemented.

Following are the subordinate/field offices under the administrative and functional control of the department:

Merchant Shipping:

1. Mercantile Marine Department, Chittagong.
2. Mercantile Marine Office, Khulna.
3. Government Shipping Office, Chittagong.
4. Seamen Welfare Directorate, Chittagong.

Inland Shipping:

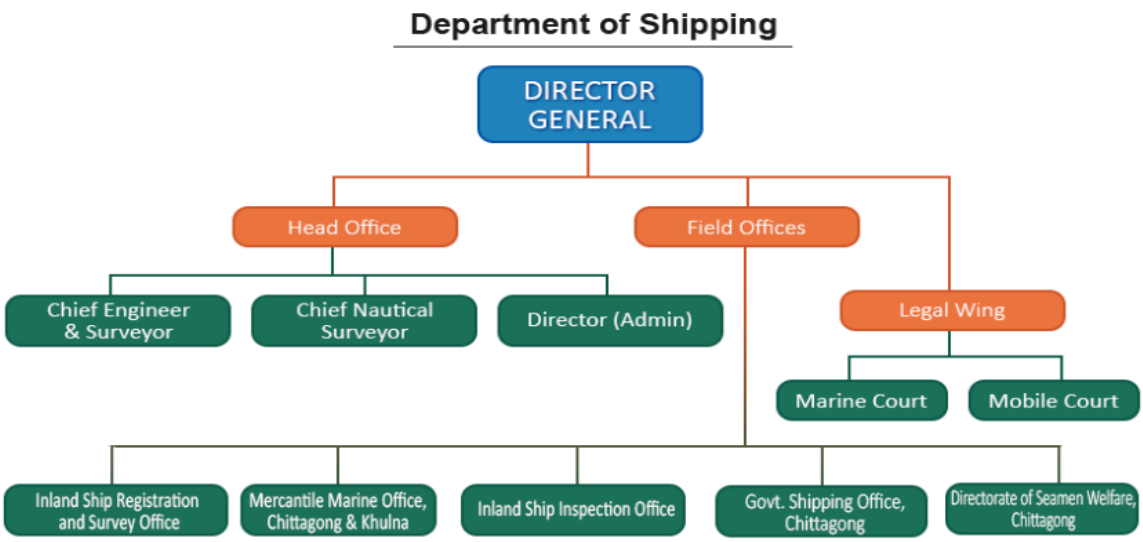
1. Registrar and Surveyor of Inland Ship, Dhaka.
2. Registrar and Surveyor of Inland Ship, Narayanganj.
3. Registrar and Surveyor of Inland Ship, Khulna.
4. Registrar and Surveyor of Inland Ship, Barisal.
5. Inspectorate of Inland Ships, Dhaka.
6. Inspectorate of Inland Ships, Narayangonj.
7. Inspectorate of Inland Ships, Chandpur.
8. Inspectorate of Inland Ships, Khulna.
9. Inspectorate of Inland Ships, Barisal.
10. Inspectorate of Inland Ships, Patuakhali.

The DoS currently has 23 ship surveyors and authorises marine surveyors from the following Recognized Organizations (RO) to conduct ship surveys;

- American Bureau of Shipping (ABS)
- Bureau Veritas (BV)

- Det Norske Veritas (DNV)
- Germanischer Lloyd (GL)
- Lloyd's Register (LR)
- Nippon Kaiji Kyokai (NKK)

Figure 2: Organogram DoS



3.2.3 Bangladesh Inland Water Transport Authority (BIWTA)

Responsibilities and Functions of BIWTA:

The Bangladesh Inland Water Transport Authority was set up in November 1958 for development, maintenance and control of inland water transport and of certain inland navigable waterways of Bangladesh.

The authority has the following statutory functions: -

a) Carry out river conservancy works including river training works for navigational purposes and for provisions of aids to navigation, including marks, buoys, lights and semaphore signals.

b) Disseminate navigational and meteorological information including publishing river charts.

c) Maintain pilotage and a hydrographic survey-service.

d) Draw up programmes for dredging requirements and priorities for efficient maintenance of existing navigable waterways and for resuscitation of dead or dying rivers, channels or canals including

e) Development of new channel and canals for navigation.

f) Develop, maintain and operate inland river ports, landing ghats and terminal facilities in such ports or ghats.

g) Carry out removal of wrecks and obstructions in inland navigable waterways.

h) Conduct traffic surveys to establish passenger and cargo requirements on the main rivers, feeders and creek routes.

i) Develop the most economical facilities for passenger traffic to ensure comfort, safety and speed on mechanised crafts.

j) Fix minimum and maximum fares and freight rates for inland water transport on behalf of the government.

k) Approval timetable for passenger services.

l) Develop rural water transport by progressing of schemes for modernizing and mechanizing country crafts.

m) Ensure co-ordination of inland water transport with other forms of transport, with major sea ports, and with trade and agricultural interests for the optimum utilisation of the available transport capacity.

n) Conduct research in matters relating to inland water transport including development of:

- craft design
- technique of towage
- landing and terminal facilities
- port installations

o) Arrange programmes of technical training for inland water transport personnel within and outside Bangladesh.

p) Maintain liaison with the shipyards and ship design industries to meet the requirements of the inland water transport fleet repairs and new constructions.

q) Maintain liaison with the government and facilitate import of repair materials for inland water transport industry.

r) Prepare plans or schemes for carrying out any of the above-mentioned functions.

s) Any other function or functions which the government may, from time to time, prescribe.

The authority also performs a number of other functions beyond what have been stated above.

The major technical departments of the BIWTA are;

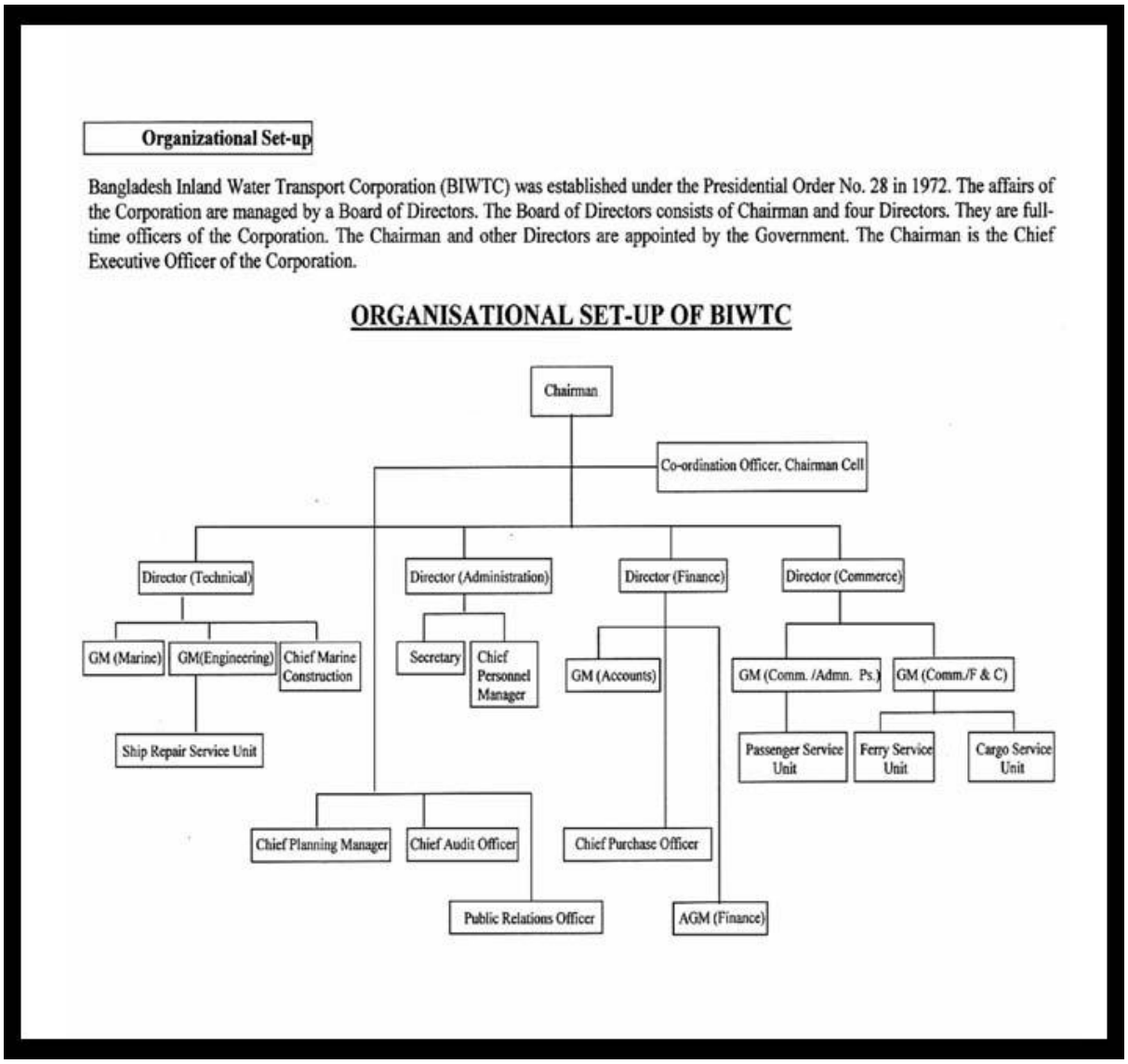
- Engineering,
- Hydrography,
- Mechanical & Marine Engineering,
- Planning,
- Marine Workshop,
- Conservancy & Pilotage,
- Deck Personnel Training Centre.

The Mechanical and Marine Engineering Department is entrusted with the responsibility of approval of drawings of inland vessels and scrutiny of stability.

BIWTA currently employs 3,403 personnel and operates some 100 vessels, 24 river ports, 8,448 riverine stations, 374 landing points, 23 coastal stations, 8 ferry terminals, 24 pilot stations, 25 field offices and 5 Differential Global Positioning System (DGPS) stations. It also has three training centres, one each at Narayanganj and Barisal and a ship personnel training institute at Madaripur.

3.2.4 Bangladesh Inland Water Transport Corporation (BIWTC).

BIWTC is a parastatal organization providing passenger and freight shipping services. Its main business is the provision of ferry services at four major river crossings and the operation of passenger services in the coastal area. BIWTC operate ferries in areas mostly in the south of the country where the private operators are reluctant to provide services due to small revenues. BIWTC does not have any regulatory responsibilities.



3.2.5 Bangladesh Coast Guard (BCG)

BCG is the maritime law enforcement force of Bangladesh. It is a paramilitary force which is under the jurisdiction of the Ministry of Home Affairs. Its officers are transferred from the Bangladesh Navy. The Bangladesh Coast Guard also performs the duty of maritime border security of Bangladesh. The headquarters is in Dhaka.

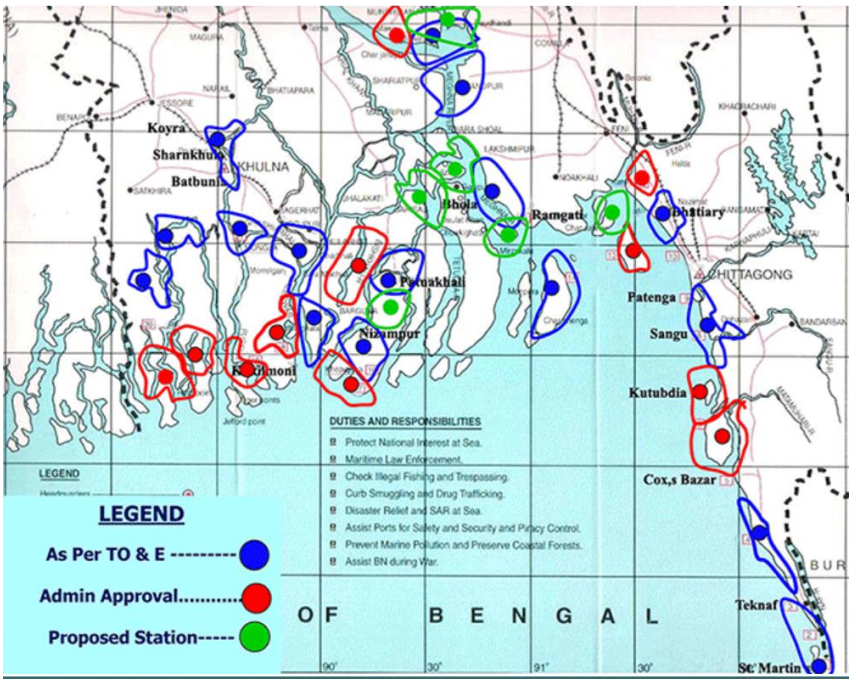
Mission:

Control piracy, illegal trafficking, protect fishery, oil, gas, forest resources and environmental pollution in Bangladesh waters and coastal areas. Ensure overall security and law and order through security assistance to sea ports, conduct relief and rescue operation in the coastal areas during natural calamity

Primary Role:

a. Preserve national interest at sea
b. Fishery protection
c. Prevent illegal immigration through the sea
d. Pollution control
e. Piracy control
f. Prevent smuggling, trafficking of illegal arms, drugs and narcotics
g. Disaster relief operations
h. Search and rescue operations
i. Preservation of forest
j. Surveillance over the sea areas of Bangladesh
k. Carry out any other duty assigned by the government

Figure 3 Bangladesh Coast Guard Area of Responsibility (AOR)



Apart from the sea territory of Bangladesh, it is understood that the government has also placed the waterways of the mangrove forest of Sundarban and major rivers up to Dhaka under the jurisdiction of the Coast Guard. BCG is primarily in charge of emergency rescue and relief activities in the coastal areas and inland waterways however they do not have any mandate to oversee IWT safety. They respond to accidents on the waterways in a support role to BIWTA, they do not have any regulatory or enforcement responsibilities.

Figure 4 Coast Guard Metal Shark Defiant 38 Patrol Craft

3.2.6 Fire Service – Civil Defence (FSCD)

The fire service plays a significant role during accidents on the waterways and they are mandated by Government to respond to all riverine accidents. The FSCD has 23 river fire stations 50+ divers for underwater rescue and a number of boats, the are 3 control centres for river incidents which are equipped with radiocommunications which is networked throughout the country.

4. REVIEW OF INCIDENTS AND KEY FACTORS AFFECTING SAFETY

On Tuesday 29th January the consultants held meetings at the Department of Shipping firstly, with the Chief Inspector -MD. Saiful Islam followed by a meeting with the Chief Nautical Surveyor Captain K.M. Jashimuddin Sarkur. The Chief Inspector provided the consultants with a record of accidents involving passenger ships, cargo ships and other non-specified vessels for the period from 1999 to 2018, all the data is shown in figure 5 below. The data also shows the cause of the accidents in two categories a) Collision and b) Grounding/Hull crack/Storm. During the period a total of **544** accidents were recorded causing **3,651** fatalities, **483** injuries and **469** missing persons, details are shown at figure 5 below and most of the accidents involved passenger vessels as shown in figure 6 below. It hasn't been possible to verify these casualty figures and it is thought very possible that there are a

significant number of accidents involving small unregistered and unregulated county boats that go unreported.

The figures provided by the DoS show that the majority of accidents involve passenger carrying vessels and the major cause is due to collisions and hence the large number of fatalities, injuries and missing persons. A study into inland waterway transport accidents in Bangladesh prepared by Bangladesh University of Engineering and Technology in 2006 shows that most of the accidents occur during the monsoon season (March – July). However, the university's study also shows that the major cause was overloading and cyclone and not collisions. To summarise the university finding the study concluded that;

- The predominant causes of accidents in water ways of Bangladesh are cyclone, overloading and collision of vessels;
- Accidents are more frequent in the monsoon season, particularly in the months March to July and in October. most of the cyclone & overloading accidents have occurred in these months;
- During the study period most of the collision and cyclone type accidents took place in the evening and before midnight;
- Apart from accidents in stormy weather, a high percentage of accidents occurred in fair weather. Table 1 prepared by Bangladesh University of Engineering and Technology summarises these factors and some causes behind the water transport accidents.

Table 1 Factors Behind Waterway Transport Accidents

Factor	Causes
Vessel Design	• Faulty design and construction • Mechanical failure of the vessels • Insufficient and flawed navigational instruments
Operating environment	• Poor visibility • Excessive current and whirlpool • Cyclone and stormy weather
Human	• Overcrowding and overloading • Rush of passengers during embarking and disembarking • Incompetence of the Captain, Master and other professionals
Enforcement and educational	• Negligible amount of application • and practice of vessel safety regulations • Deficiency in public awareness building programs • Deficiency in weather warning and counter measure system

Following an accident in February 2015 at least 69 people were killed when a vessel carrying about 140 passengers sunk after colliding with cargo ship. The Al Jazeera news network quoted Bangladesh Naval officials as saying than 95 percent of Bangladesh's hundreds of thousands of small and medium-sized boats do not meet minimum safety regulations[1].

[1] Al Jazeera News 23rd February 2015 https://www.aljazeera.com/news/2015/02/dozens-feared-missing-ferry-sinks-bangladesh-150222074939027.html

Figure 5 Inland Ship Accidents 1991 – 2018

Inland Ship Accidents from 1991 to 2018 with Causes

Sl.	Year	Accidents Statistics				Fatality	Injury	Missing	Cause of Accident						Total
									Collision			Aground/Hull crack/Storm			
		Passenger	Cargo	Others	Total				Passenger	Cargo	Others	Passenger	Cargo	Others	
1	1991	7	1	3	11	19	3	0	4	0	1	3	1	2	11
2	1992	14	1	2	17	5	3	0	10	1	1	4	0	1	17
3	1993	8	3	13	24	183	24	0	5	2	5	3	1	8	24
4	1994	18	3	3	24	303	20	0	10	2	2	8	1	1	24
5	1995	11	2	6	19	40	79	60	8	1	2	3	1	4	19
6	1996	4	4	12	20	147	5	47	2	3	5	2	1	7	20
7	1997	5	3	2	10	102	36	2	3	2	0	2	1	2	10
8	1998	7	0	3	10	91	91	58	5	0	1	2	0	2	10
9	1999	2	0	4	6	104	0	11	1	0	3	1	0	1	6
10	2000	7	0	2	9	353	50	50	5	0	1	2	0	1	9
11	2001	8	1	7	16	33	3	13	5	1	3	3	0	4	16
12	2002	11	2	4	17	297	11	0	7	2	1	4	0	3	17
13	2003	23	3	6	32	464	3	7	15	2	1	8	1	5	32
14	2004	14	12	15	41	127	31	0	9	8	5	5	4	10	41
15	2005	11	4	12	27	248	7	4	5	3	5	6	1	7	27
16	2006	11	3	9	23	51	50	10	5	2	3	6	1	6	23
17	2007	4	4	3	11	2	0	0	3	3	1	1	1	2	11
18	2008	8	5	9	22	120	26	10	5	3	3	3	2	6	22
19	2009	10	7	17	34	260	12	22	6	5	3	4	2	14	34
20	2010	5	7	16	28	118	22	73	3	5	6	2	2	10	28
21	2011	3	11	10	24	74	0	25	1	7	4	2	4	6	24
22	2012	2	4	8	14	163	3	0	0	2	3	2	2	5	14
23	2013	3	7	3	13	22	0	3	2	5	2	1	2	1	13
24	2014	8	6	2	16	123	1	67	5	5	0	3	1	2	16
25	2015	6	10	6	22	120	0	0	4	7	2	2	3	4	22
26	2016	2	3	3	8	35	0	2	2	2	1	0	1	2	8
27	2017	8	15	2	25	45	0	0							0
28	2018	4	14	3	21	2	3	5							0
	Total	**224**	**135**	**185**	**544**	**3651**	**483**	**469**	**130**	**73**	**64**	**82**	**33**	**116**	**498**

Figure 6 Recorded Accidents by Vessel Type 1991 - 2018

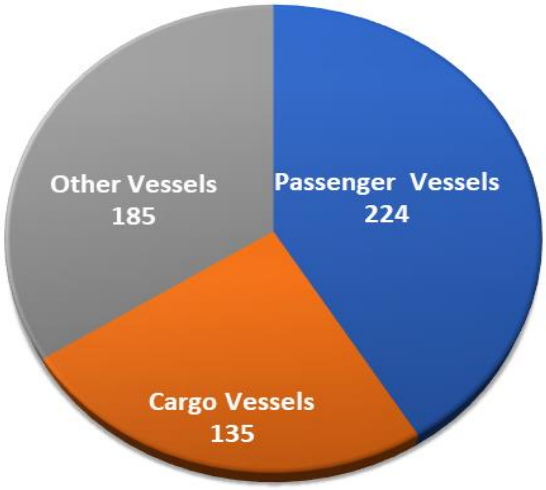


Figure 7 Outcome of all Accidents

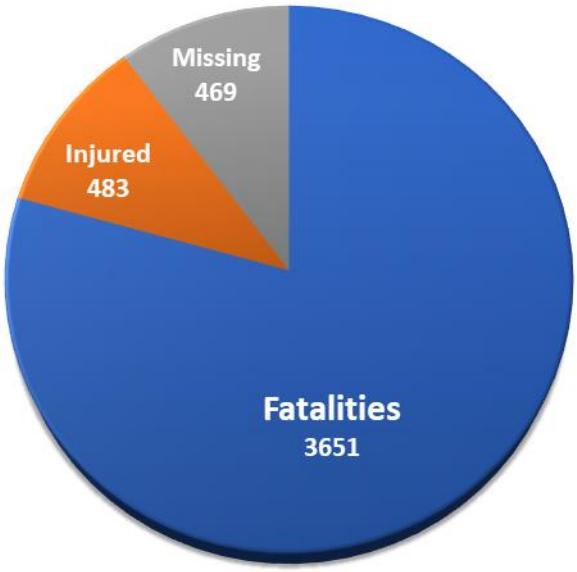


Figure 8 Collisions by Vessel Type

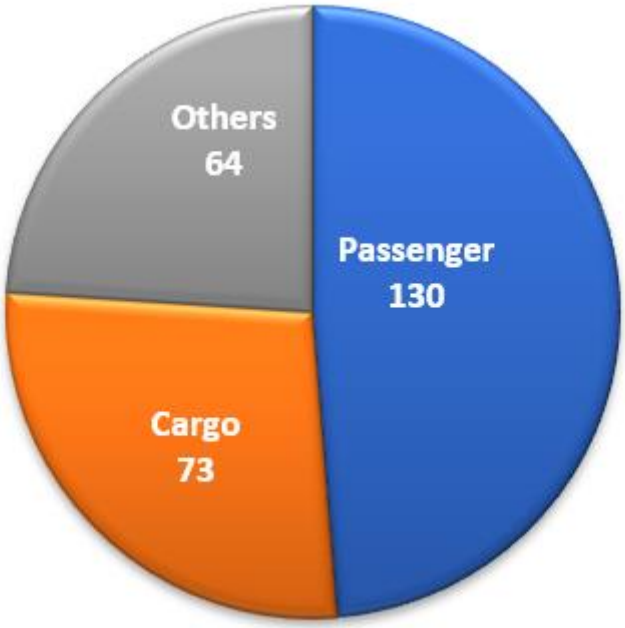


Figure 9 "Other Accidents" (Grounding, Hull Breach Storm) by Type of Vessel

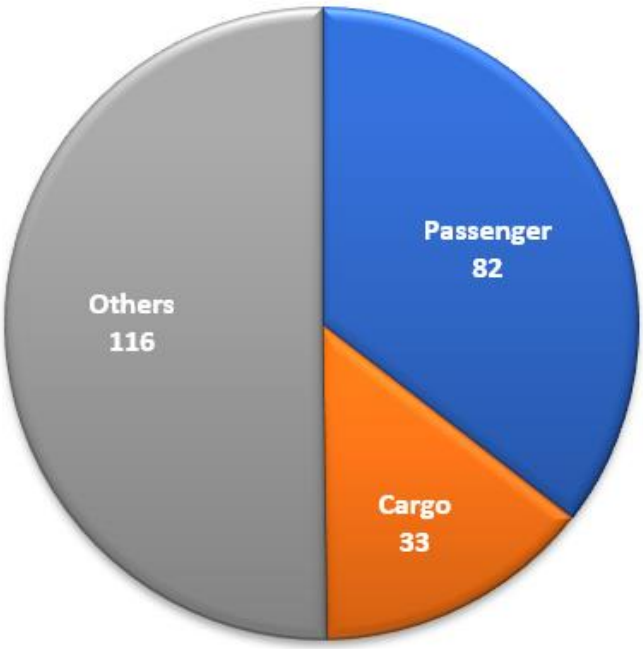
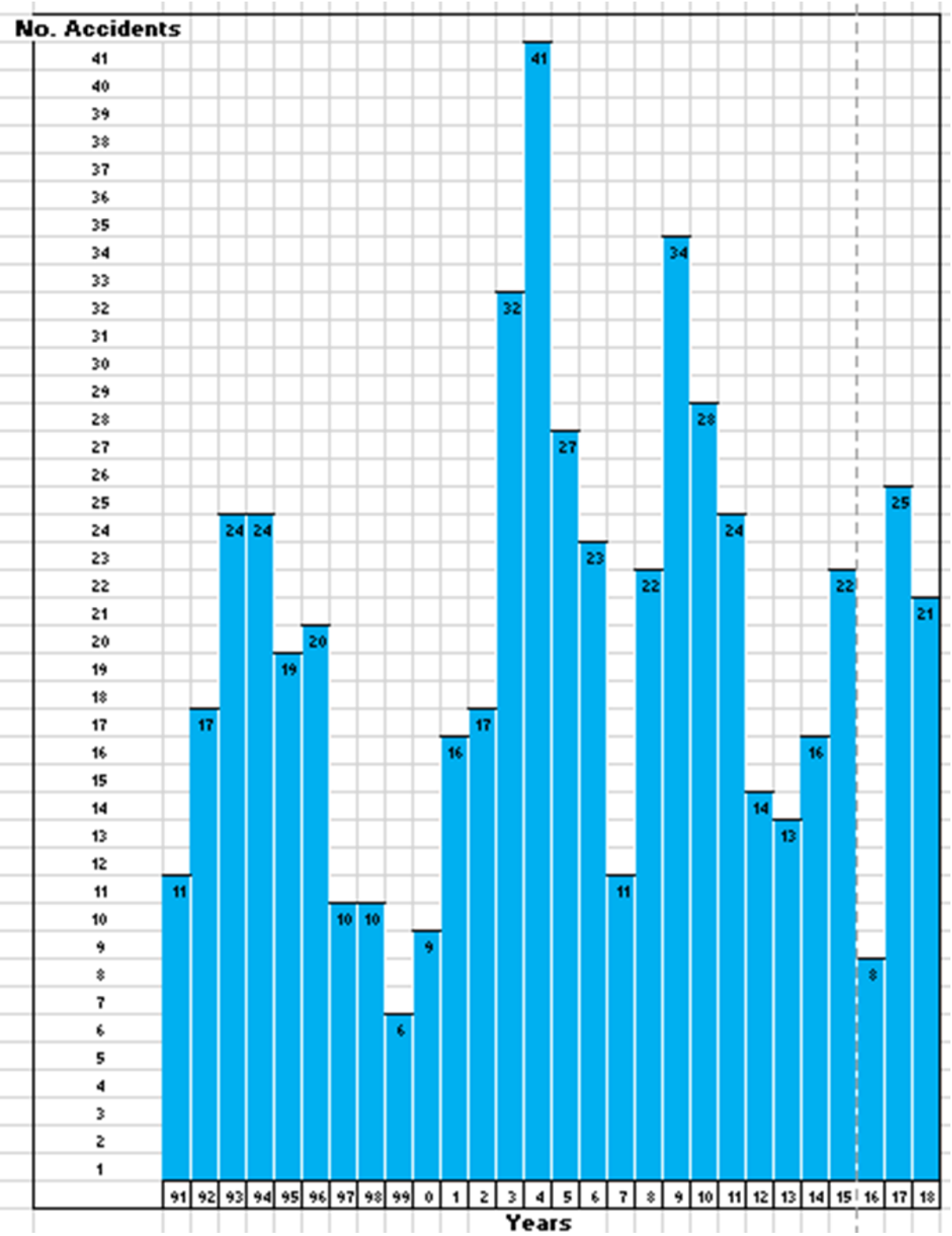


Figure 10 Accidents - All Types of Vessel 1991 - 2018



For the traveling public, the most serious hazards associated with passenger vessel travel is of the vessel sinking or being destroyed resulting in passengers losing their lives. Accidents with the consequent loss of lives and property on the inland waterways are a common phenomenon arising out of the existence of very large number of craft and extensive use of the riverine transport system in the country. The available data concerning accidents can be broadly divided into three categories:

The first category is the official one maintained by the DoS in the form of preliminary information reports, official investigation report and/or court proceedings and judgments, this category consists of cases where accidents causes have been officially identified by the investigating officers and/or by the court. This category almost always involves passenger vessels having accidents which result in the loss of lives and property. Accidents that might be quite serious but without any loss of life are hardly ever investigated.

The second category consists of accidents reported in the media. The number of such cases is much greater than the official record, among those reported in the press, only those which are considered major and involve loss of life, are officially Investigated and records maintained. A large number go unnoticed and therefore without investigation. A large number of accident cases reported in the press are beyond the preview of the DoS such as those involving engine boats (mechanized country boats) and sea going fishing boats.

The third category consists of those accidents which are not reported at all. There are reasons to believe that a large number of such accidents take place, but are kept out of the knowledge of the DoS or of the press because they take place in very far and remote areas or have been settled mutually by the parties and where loss of life involving relatives have been unofficially compensated by the owner to avoid court cases.

Although there is no doubt, that a good number of accidents of various types are taking place every year on the IWT network, considerable confusion exists as to their number and as to how they are caused.

At a subsequent meeting with the Fire Service/Civil Defence on the 24th April 2019 the consultants where provided with the accident data recorded by the Fire Service at 8 of their service divisions from 2014 to 2018, this data is shown in figure 11 below. Interestingly the figures show a marked contrast between those recorded by the DoS, for example the total number of accidents and the resulting fatalities for the 5-year period are significantly higher than those recorded by the DoS. The Fire Service recorded **2,148** accidents and **2,309** fatalities whereas the DoS data shows only **92** accidents and **325** fatalities during the same period. However, it not known exactly what criteria the Fire Service uses when recording accidents or if all of the data refers only to vessel accidents but since there is such a huge difference in the data it is quite likely that the information recorded by the Fire Service also includes data from other occurrences such as accidents to individuals such as swimmers, very small and probably unregistered craft and possibly accidents occurring on the banks of the rivers.

Figure 11 Accidents and fatalities recorded by the Fire Service 2014 to 2018

Fire Service Division	Criteria	Year				
		2018	2017	2016	2015	2014
Dhaka	No. of Accidents	195	195	219	219	111
	No. of deaths	121	162	175	338	177
	No. of Survivals	52	155	131	83	
Chittagong	No. of Accidents	54	43	43	31	20
	No. of deaths	87	67	62	22	11
	No. of Survivals	77	66	35	7	
Rajshahi	No. of Accidents	32	45	46	52	44
	No. of deaths	38	35	38	19	25
	No. of Survivals	34	62	30	15	
Khulna	No. of Accidents	40	30	31	39	24
	No. of deaths	38	34	28	36	30
	No. of Survivals	22	47	26	33	
Barisal	No. of Accidents	18	39	21	20	17
	No. of deaths	17	36	60	28	38
	No. of Survivals	71	83	54	13	
Sylhet	No. of Accidents	42	26	21	12	23
	No. of deaths	39	48	8	11	37
	No. of Survivals	18	36	8	10	
Rangpur	No. of Accidents	61	90	44	45	28
	No. of deaths	46	80	39	25	33
	No. of Survivals	47	84	37	65	
Mymanshigha	No. of Accidents	66	62			
	No. of deaths	40	181			
	No. of Survivals	34	38			
Total	No. of Accidents	508	530	425	418	267
Total	No. of deaths	426	643	410	479	351

5. POLICY REVIEW

5.1 Regulatory, Institutional and Operational Environment

As discussed at section 2 the Ministry of Shipping and its various sections – and specifically the Department of Shipping (DoS) and the Bangladesh Inland Waterway Transport Authority (BIWTA) - has overall responsibility for the regulatory environment in the shipping and port sectors. DoS is responsible for safety, the provision of the regulatory framework for the sector and for training and scrutiny of maritime staff. It includes the Inland Ship Safety Administration (ISSA), which is responsible for the definition and enforcement of ship safety rules and for registering vessels. ISSA is also the institution responsible for managing environmental aspects of the sector. BIWTA is responsible for maintenance and development of waterways. This responsibility includes: (a) provision of dredging services; (b) provision of pilots and navigational aids; (c) provision of hydrographic services; (d) management and administration of inland ports and landing facilities of significant importance; (e) regulation of transport operations, including licensing and scheduling of routes and setting up of tariffs; and (f) training and research.

The national laws governing and regulating shipping in Bangladesh are;

- Bangladesh Merchant Shipping Ordinance (MSO) 1983 (as amended)
- Bangladesh Inland Shipping Ordinance (ISO) 1976 (as amended)
- Bangladesh Maritime Zones Act 1974
- Bangladesh Flag Vessel Protection Act 1982
- Port Act 1908

5.1.1 The Bangladesh Merchant Shipping Ordinance 1983 (as amended)

This is an Ordinance to consolidate and amend the law relating to merchant shipping and to provide for matters connected therewith, the Ordinance extends to the whole of Bangladesh and applies to all Bangladesh ships wherever they may be, <u>except inland ships</u> as defined in the Inland Shipping Ordinance, 1976.

5.1.2 The Inland Shipping Ordinance, 1976

This an Ordinance to provide for the survey, registration and control of navigation of vessels plying on inland waters. Chapter 1, articles e) and f) of this Ordinance makes the following definitions;

“inland ship” means every description of vessel ordinarily plying on inland waters and propelled wholly or in part by steam, liquid fuel, electricity or any other mechanical powers and includes a sailing boat, dumb barge and other craft which is not so propelled but is towed or pushed by a vessel so propelled;

“inland water” means any canal, river, lake or other navigable waters in Bangladesh and such portion of tidal water as the Government may, by notification in the official Gazette, declare to be inland waters for the purposes of this Ordinance.

The Ordinance merely states the rules and penalties that apply to anybody or any authority that contravenes the rules. It does not detail any specific standards or procedures for such matters as registration and survey, manning and certification etc.

The Ordinance comprises of 55 pages divided into 7 chapters as follows;

Chapter 1	Preliminary
Chapter 11	Registration and Survey
Chapter III	Manning Examination and Certification
Chapter IV	Shipping Casualties
Chapter V	Protection of vessels and passengers
Chapter VA	Protection of inland waters from pollution
Chapter VI	Penalties and procedures
Chapter VII	Miscellaneous

5.1.3 Bangladesh Maritime Zones Act 1974

This Act merely defines the meaning of different maritime zones such as;

- Territorial waters
- Contiguous zone
- Economic zone
- Conservation zone
- Continental shelf
- Control of pollution
- Power to make rules

The Act does not make any definition or have reference to inland waters.

5.2 DoS Ongoing Activities on Inland Ship Safety

An ongoing programme to improve IWT safety includes the following activities;

- Increase the number of Surveyors and Inspectors for the monitoring and management system;
- Increase the number of Regional Offices;
- Increase the number of Inspectorate Offices;
- More professionals to be appointed in the DoS for standard ship design to improve ship safety;
- Include reversible gear to small vessels and ferries to ensure safer shipping;
- A project is being undertaken to establish a database of all ships plying the inland waterways.

5.3 DoS Ongoing Operational Development and Improvement Projects

- The establishment of radiocommunications in the Global Maritime Distress and Safety System (GMDSS) and Integrated Maritime Navigation System (EGIMNS) project;

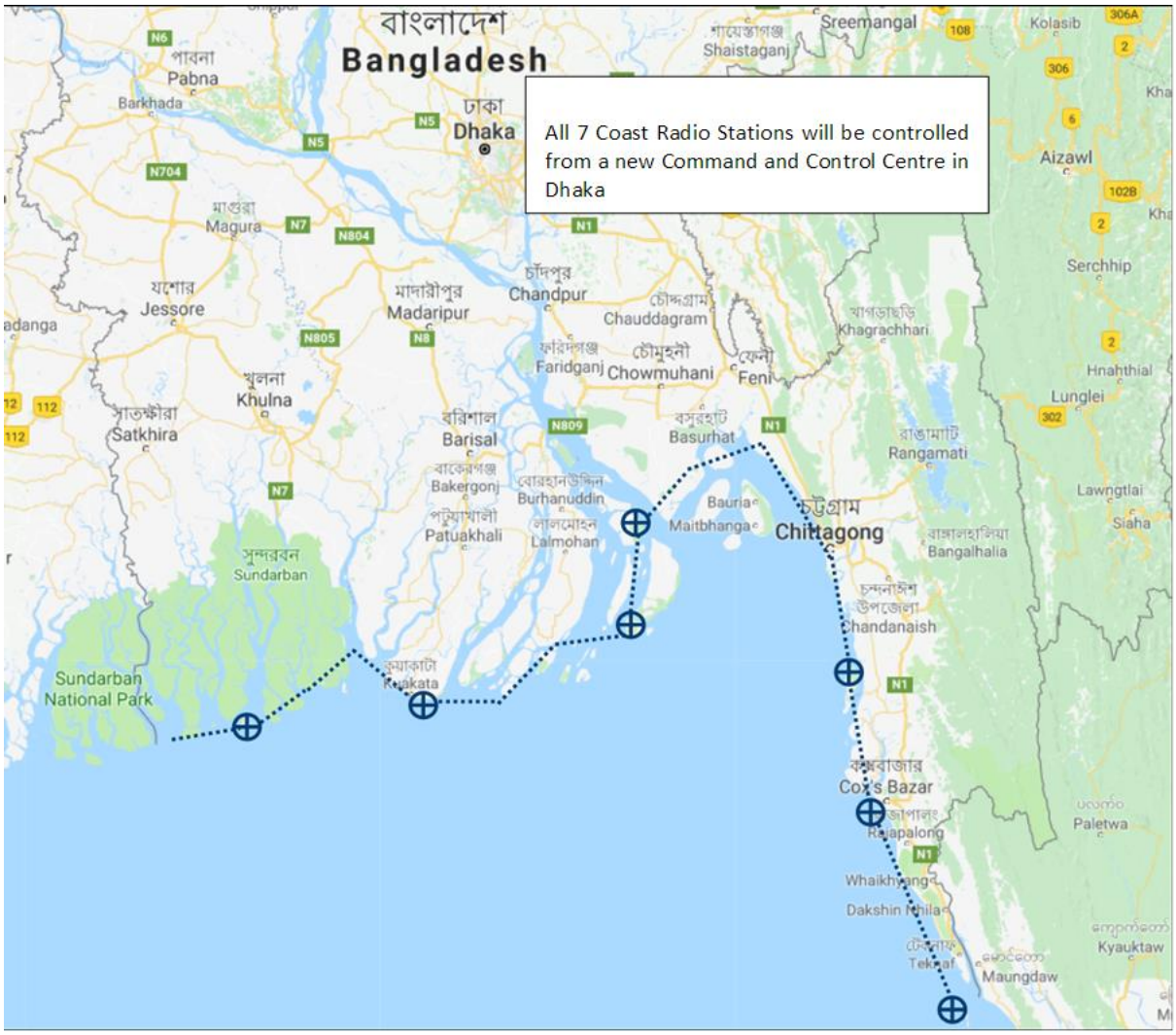
- National Ships & Mechanized Boats Database Management and Capacity Building Project (NSDPC);
- National Ships and Mechanized Boats Tracking & Monitoring System (NSTMS) Project.

5.3.1 The EGIMNS Project – Overview

This project includes;

- The construction of a Command and Control Centre in Dhaka and the construction of buildings and related facilities for 7 Coast Radio Station (CRS) sites at Kutubdia, Cox's Bazaar, St. Martain, Nizhum Dwip, Dhalchar, Kuakata, and Dubla Char;
- Installation of GMDSS/IMNS operating system in the Command & Control Centre in Dhaka including the network connectivity to the 7 Coast Radio Sites;
- Installation of the GMDSS and related facilities at the 7 Coast Radio Station Sites which will provide the new communications services to vessels navigating around the coastal areas in the Bay of Bengal.

Figure 12 The new GMDSS network



The GMDSS system will consists of:

- 7 VHF sites from Dubla Char in the west to St. Martins Island in the east, each equipped with 7 transceivers.
- 1 MF/HF/NAVTEX transmitter site with 10 MF/HF transmitters and 2 NAVTEX transmitters.
- 1 complete MF/HF/NAVTEX receiver site.
- 1 central operations centre in Dhaka with full remote control of all 7 sites in the network.

The system will be connected to an IP network and will ensure safe voice communications and Digital Selective Calling (DSC) messaging within the A1 and A2 Sea areas. The NAVTEX services will provide maritime safety information and meteorological warnings and forecasts to the ships at sea.

During discussions with the Chief Nautical Surveyor at the DoS it was noted that the project is behind schedule (for reasons unknown) and the DoS has requested the MoS for a two-year extension to the implementation period.

It is also understood that the system will include and Automatic Identification of Ships (AIS) system and it was suggested by the consultant that this could be extended into the inland waterways and by doing so create an inland waterway River Information System (RIS) which would greatly enhance safety and vessel traffic management on the waterways (see case study at section 11).

At a follow-up meeting at the DoS on the 28th April the Chief Nautical Surveyor explained that it their intention to extend the AIS system into the inland waterways. It is also their intention to make use of the NAVTEX broadcasting system on the waterways, this means that vessels will need to be equipped with AIS devices and NAVTEX receivers.

The Chief Surveyor also informed the consultant that work on the GMDSS project was ongoing, construction of the Command and Control centre was in progress and that staff to man the centre have been hired consisting of 6 mariners, 6 radiocommunications operators and some support technicians. These staff are currently supervising the construction of the GMDSS coastal sites.

The C&C centre will have connectivity to Navy HQ, DoS, BITWA and others so all will have a recognized picture of the maritime search and rescue region and the vessel traffic on the inland waterways.

5.3.2 The NSDCP Project – Overview

There are several hundred rivers, streams and canals in Bangladesh with a total length of 24,000 Kms - of which only 6,000 Kms are navigable in the monsoon season, shrinking to 3,900 Km in the dry season - where ships and boats are plying. Approximately 22,300 vessels of which 10% are passenger vessels are currently registered with the DOS and there are thought to up to 750,000 country boats. According to Bangladesh law there is a provision that all vessels have to be registered in the DOS but there are a large number of ships and boats without any registration or survey and therefore there are no accurate statistics on how many ships and boats are operating on the inland and coastal waters without registration or survey. These unaccounted vessels are a major threat to inland transportation safety as most of the operators and crews of these vessels are not trained and are not acquainted with the existing inland rules and regulations. As there are no exact statistics on the number of vessels it is

difficult to undertake a proper and justified programme to establish a safety regime and an effective safety administration. Therefore, the DoS is trying to remedy this situation.

The goal of the NSDCP project is to establish a comprehensive, effective and sustainable water transport ship registration, survey and inspection regime. The specific objectives of the NSDCP project are to;

- Develop an interactive national database of ships and boats plying all over the country;
- Implement a survey programme of all ships and boats to ensure quality survey;
- Maintain statistics of all ships and boats operating in Bangladesh;
- Improve the skills and safety awareness of the crews of mechanized boats;
- Improve the assessment of the construction and the design of vessels;
- Increase government revenue by bringing more vessels onto the registry;
- Enhance digital maritime in Bangladesh.

Project Status: - Approved by the MoS with a total budget of 4,432.42 Lakh Taka but as noted previously we understand that the project is well behind schedule and the DoS has asked for a two-year extension.

5.4 Bangladesh Coast Guard Development Plans – Coast Guard Goal 2030

Coast Guard Goal 2030 is a planned modernization program for the Bangladesh Coast Guard. The goal includes increasing manpower, purchasing more ships, hovercraft, helicopters, Unmanned Aerial Vehicles (UAVs), maritime patrol aircraft and adding new generation surveillance technologies. The vision of the goal is for the Bangladesh Coast Guard to be a technologically advanced two-dimensional force that is capable of protecting the coastal area of Bangladesh.

During the short-term implementation of the development period the manpower of the force will be increased from 3,305 to 6,197and the organization of the force will be updated. Currently the Coast Guard operates in three zonal headquarters. The coast guard will have three branches, six directorates, three regional headquarters and two more zonal headquarters by 2020. Four composite stations and one hospital will also be set up within this period.

Additionally, the coast guard has purchased four Minerva-class corvettes from Italy which have been refurbished and transformed into offshore patrol vessels which are currently known as Leader-class offshore patrol vessel. Already two vessels are in service and the remaining two were delivered in December 2017. By 2020, the force plans to buy four more Offshore Patrol Vessels and two Pollution Control Vessels. The number of small patrol crafts will also be increased to 38 within this period, it is assumed that these smaller craft – such as those shown figure 4 will be located and provide a rescue facility on the inland waterways.

The Coast Guard is also planning to introduce hovercraft into its service for better patrolling capacity through the coast. At least two hovercraft will join the force by 2020 and will also inaugurate an aviation wing in this period. Up to 4 maritime search and rescue (MSAR) helicopters will be procured for the force by 2020. Surveillance Unmanned Aerial Vehicle (UAV)s may be introduced. The force will also move towards procuring more modern technologies with the installation of Long-range Identification and Tracking (LRIT) and Vessel Traffic Management Information System (VTMIS) systems.

On August 27th, 2018, the Japan International Cooperation Agency (JICA) signed a grant agreement with the Government of the People's Republic of Bangladesh in Dhaka to provide

grant aid of up to 2.729 billion yen ($24.4m US) the Project for Improvement of Rescue Capacities in the Coastal and Inland Waters. The project will provide the Bangladesh Coast Guard (BCG) with up to four 20-meter type coastal rescue boats and up to 20 10-meter small rescue boats. https://www.jica.go.jp/english/news/press/2018/180828_01.html

Although the BCG is primarily in charge of emergency rescue and relief activities in the coastal areas and inland waterways, they currently have a limited number of rescue boats, and those boats that are deployed have deteriorated in performance due to nearly 30 years of use. Due to such circumstances, time is required for boats to reach the sites of accidents, and there are frequent cases in which rescue work is delayed. In order to adequately respond to rescue and aid needs, increasing the total number of rescue boats is a priority.

The project aims to strengthen the BCG's capacity for search and rescue operations to cope with maritime/river accidents and natural disasters through the improvement of the BCG's vessels and equipment, thereby contributing to the reduction of damage caused by maritime and river accidents and natural disasters in the coastal areas and the inland waterways.

6. PORT AND SHIP VISITS

6.1 Port Visit – BIWTA Port Office

On Sunday 3rd February the consultants visited the ferry terminal at Sadarghat River port where – prior to a visit to a ferry - a meeting was held with the Joint Director, Marine Safety & Traffic Management BIWTA (noted at Annex A). Our discussions centred around safety matters on the waterways, mostly concerning ferries.

In the Sadarghat river port area there are three ghats one either side of Sadarghat, from these three ghats there are on average 150 arrivals and departures every day. The biggest ferries carry up to 1,400+ passengers and a crew of up to 18. **Despite being told otherwise during this study there is no formal method of passenger counting**, we were informed that BIWTA inspectors estimate the number of passengers on a ferry with a probable maximum error of plus or minus 20%, although others argue that the error is no more than 10%. It was also learned that some of the ferries are overloaded and that this is a frequent occurrence during festivals such as during the Eid holidays, the explanation for this being that it is seen as a humanitarian gesture as people need to travel home during festive periods. When a passenger vessel is known or considered to be overloaded it is not allowed to carry any goods/cargo.

The Inland Shipping Ordinance Chapter IV – Penalties and Procedures – sections 67 and 80 deal with the matter of a ferry exceeding the number of passengers it certificated to carry vis;

"67. Where on any voyage for mercantile purposes an inland ship carries on board or in any part of the ship passengers in excess of the number set forth in the certificate of survey of the ship as the number of passengers which the ship or the part thereof is fit to carry."

"80. The owner or his representative, if present, on board the inland ship or at the terminal at the time of voyage, loading or unloading or master of the inland ship shall be punishable with fine which may extend to Taka three hundred for each passenger so in excess up to a maximum of Taka one lakh."

The BIWTA inspector(s) at the port office are on call 24/7 to receive and act on any accident which may occur to a ferry and it was explained that they are often working very long hours as there can be several groundings every week, This information coming directly from

BIWTA personnel suggests that the accident statistics produced by the DoS do not reflect the real situation.

The alert concerning an accident comes directly from the ships master by mobile phone, the BIWTA then inform other key personnel both inside and outside BIWTA, also by mobile phone, in order that a suitable response to the situation can be made. This appears to be a cumbersome practice and could cause delays in putting an effective response together, in any incident where lives are at risk and there is grave and imminent danger, time is of the essence.

Discussions continued surrounding safety matters and the following important points regarding safety were made by BIWTA.

a) Fully loaded bulk cargo vessels are not allowed to sail during the hours of darkness, but they do. Moreover, most do not carry any navigation lights, a very dangerous practice which significantly increases the risk of a collision.
b) Loaded cargo/bulk vessels are often overloaded causing not only a greater risk of an accident to themselves, particularly in adverse weather conditions, but also to others. When overloaded the freeboard of these vessels is only slightly above the waterline and so they present very little surface area for radar to detect.
c) There is a general lack of competency amongst the crews of cargo vessels and more training is needed.
d) Weather warnings from the Meteorological department are not as reliable or as timely as they could be especially when there is cyclonic activity in the Bay of Bengal. BIWTA needs early warnings so they can make an informed decision as to whether a ferry can depart and proceed on its voyage.
e) There is no mechanism for direct/dedicated issuance of weather alerts to the River ports. BIWTA relies on the media.

Figure 13 Sadarghat River Port Ferry Terminal

Another meeting was held with BIWTA on the 28th April with Md. Fazlur Rahman, Joint Director (Salvage), during which more details emerged concerning BIWTA's role when an accident occurs. The Joint Director (Salvage) and his team is the focal point for any operation following an accident they provide the first line of response so in effect they provide both assistance to passengers and crew and salvage operations, plus they play what can be termed as an On Scene Co-ordinator (OSC) role, they are also backed up as and when necessary by the Fire Service/Civil Defence, Bangladesh Coast Guard, Bangladesh Navy (divers) and the River Police.

During the meeting the Joint Director explained BIWTA's concerns which include the a required for modifications to ferries specifically for salvage operations and some additional equipment.

<u>The Ferries</u>

- There is a requirement for lifting hooks on each side and on each deck of the ferries.

<u>BIWTA</u>

They have requirements for;

- A dedicated and suitably equipped vessel for divers;
- A hovercraft for fast response;
- A BIWTA SAR department with a suitably equipped control room;
- More divers to be located around the country;
- More salvage vessels to be located around the country;
- Training for divers.

6.2 Ship Visit

A BIWTA official escorted the consultants onboard a ferry [Sundabaran 10] which was in the process of embarking passengers for an overnight sailing to Barisal in the south. On the ferry we were introduced to the Master who showed us the ships bridge and some other areas of the ship. This ferry was one of the most modern currently plying the waterways at over 4,000 gross registered tonnes, a length of 90 mtrs, breadth of 20 mtrs and an unloaded draft of 2.5 mtrs increasing to over 3 mtrs when loaded with passengers and goods.

The opportunity was taken to view the ships navigational and lifesaving equipment. On the bridge the master has use of a simple GPS device, an echo sounder, a small radar and a navigation console with a compass, a hydraulic mechanism for steering the ship and a VHF radio. There is also a portable VHF radio which is used for communication with the engine room.

Figure 14 GPS on the left & VHF radio on the right

Figure 15 Radar

Figure 16 Echo Sounder

Figure 17 Navigation Console

General observations are that for a ship of this size the equipment is very basic, and it must be noted here that only a few of the more modern ferries have this type of equipment, many of the older ferries which make up most ferries plying the waterways do not have this equipment. Moreover, for a ship that is only 2.5 years old the equipment looks much older.

The visit to the ships bridge was followed by a quick tour of the passenger decks and accommodations. It was noted that there are fire extinguishers on each deck but there are no fire hydrants or hoses. In the event of a fire of any significance then just a few extinguishers would be insufficient to control and contain the fire.

Figure 18 Lower passenger deck during boarding

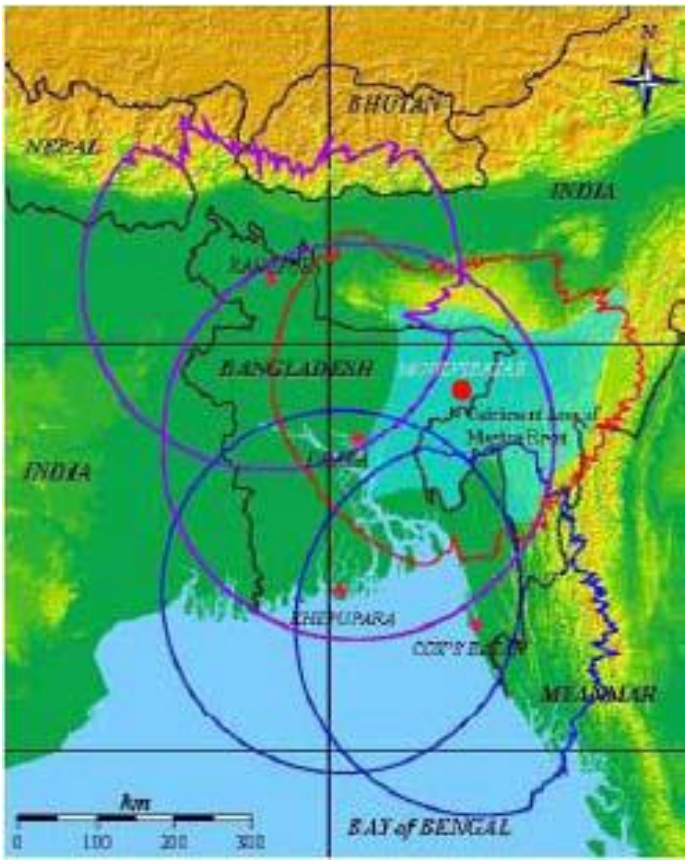
7. BANGLADESH METEOROLOGICAL DEPARTMENT

Bangladesh Meteorological Department (BMD) also known as Abohawa Office (Weather Office) is the national meteorological organization of Bangladesh, working under Ministry of Defence of the Government of Bangladesh. It is responsible for maintaining the network of surface and upper air observatories, radar and satellite stations, agrometeorological observatories, geomagnetic and seismological observatories and meteorological telecommunication system of Bangladesh.

The BMD is mandated by the Government to issue all kinds of forecasts and warnings for all extreme events including provision of earthquake information to Government and public. Other information provided includes.

- National forecasting on all time scales including the issuance of tropical cyclone forecast and warnings.
- Provide seismological information in and around the country along with Tsunami Advisories and warnings to the government and public.
- Cater to all international and domestic air lines, VVIP and VIP Flights.
- Providing agro-meteorological Advisories and long-range forecast for the agricultural sectors.
- Supplying and facilitating the applications of climate data and information to the government and private agencies for planning and performance of socio-economic activities.

Figure 19 BMD RADAR Coverage



The BMD's National Meteorological Communications Centre (NMCC) disseminates warning messages from its Storm Warning Centre (SWC) to;

- The Prime Minister's Office;
- Bangladesh Radio;
- Bangladesh Television;
- Ministry of Food and Disaster Management;
- Cyclone Preparedness Programme (CPP);
- Coastal Volunteers;
- Newspapers;
- Bangladesh Army;
- Bangladesh Navy;
- Bangladesh Air Force;
- Maritime and Riverine Ports[2];
- Flood Control and Forecasting Centre.

8. SEARCH AND RESCUE ARRANGEMENTS & CAPABILITIES

The Chief Nautical Surveyor at the DoS explained that a national SAR Plan is currently being prepared and so as of now there are no written details concerning roles and responsibilities in

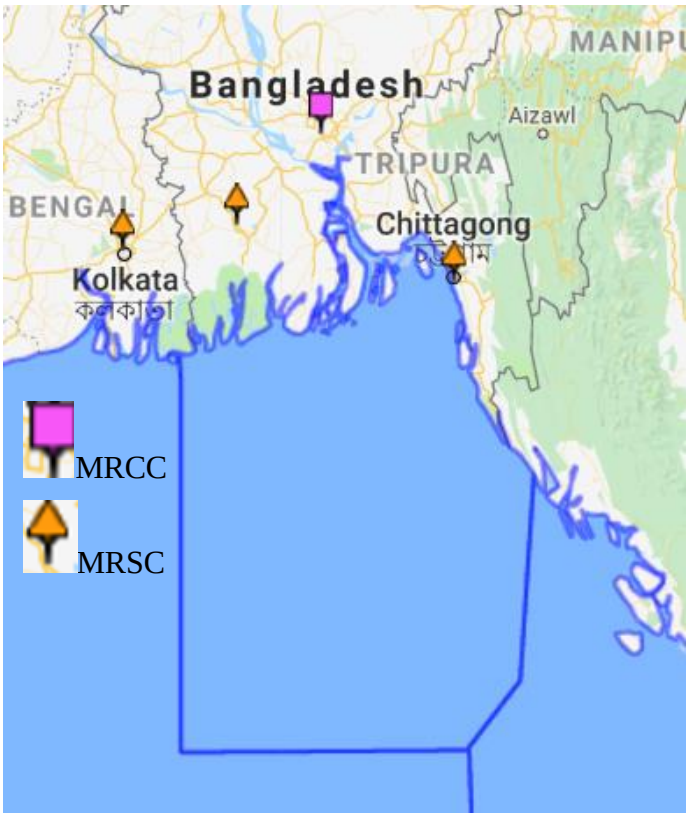
[2] At the Port visit the BITWA representative said the port does not get information directly from the meteorological department. They get their storm warnings from radio/TV broadcasts and other social media.

the national SAR system and very little information regarding resources. It is therefore essential that a SAR Plan is compiled as soon as possible and agreed by all stakeholders and certainly prior to the commissioning of the DoS's new Command and Control centre in Dhaka.

Bangladesh does have a recognized maritime Search and Rescue Region (SRR) shown in figure 19 below however the new SAR Plan should also include the plan for the Inland Waterways and specify which authority has overall responsibly for the co-ordination of a SAR mission in the event of an accident. It should specify who is the SAR Mission Co-ordinator (SMC) for aeronautical, maritime and land SAR and what resources he/she can call upon. It should provide details of all participating authorities and what resources/SAR facilities they can each provide including their availability.

Bangladesh Coast Guard does have a lot of very capable SAR facilities and is in the process of building on their current capability with the acquisition of more assets and it is currently assumed that the Bangladesh Navy is the authority responsible for the co-ordination of SAR for incidents in the designated maritime SRR but as noted it is not entirely clear which authority has that responsibility for the inland waterways the current picture is a little confusing. Figure 19 also shows the Bangladesh Navy's Maritime Rescue Co-ordination centre in Dhaka and two Maritime Rescue Sub Centres (MRSC's) at Chittagong and Khulna but further inspection in the IMO's global SAR Plan and the worldwide Search and Rescue Contacts website is managed by the Canadian Coast Guard do not show any contact information by way of radiocommunications as most other SAR authorities worldwide do, it only shows telephone and email contact information.

Figure 20 Bangladesh SRR & Rescue Co-ordination Centres & Sub Centres (3)



9. CHALLENGES & ISSUES CONCERNING IWT NETWORK SAFETY

9.1 The Ferries

The issues are;

- Overloading,
- No accurate passenger counts,
- Inadequate navigational and radio communications equipment,
- Inadequate lifesaving appliances,
- Inadequate firefighting equipment

To ensure no overloading of passengers occurs an accurate and reliable automatic passenger counting mechanism should be introduced and the system should also record the names of all the passengers so that in the event of an accident a passenger and crew list can be produced and provided to the concerned authorities. Before a passenger ferry departs its master must ensure that the number of persons on board does not exceed the number of persons the ferry is permitted to carry. This procedure will ensure the number of persons on board does not exceed the number for which the ship has been certified, and it will facilitate search and rescue activities following an accident. It will also greatly improve the safety and the possibility of a successful rescue of passengers and crew travelling on the waterways.

Whilst there is some navigational and communications equipment on the larger and more modern passenger ferries it is understood that there is very little on the older ferries which make up around 85% of the passenger ferry fleet. The DoS should establish a minimum standard of navigational equipment for all passenger and cargo vessels over a certain size/tonnage and this should include;

- A gyro compass
- Radar
- Echo sounder
- VHF radio
- Navigational Charts
- AIS transponders
- A NAVTEX receiver

Enough lifesaving appliances should be carried on all the ferries. The only floatation devices are lifebuoys and there are not enough for all passengers when a ferry is fully loaded. Lifebuoys alone are of limited use regarding survivability in the event of a capsize. People in the water will very quickly drift great distances down river with the current and unless they are all clinging onto each other all will diverge in different directions and so making a search and recovery extremely difficult, particularly at night. The plan should be to have at least a life jacket with a light and whistle for every passenger onboard and self-inflating life rafts with hydrostatic release mechanisms should also be carried on the vessels.

Internationally one of the main causes of accidents onboard ships is fire, although this is not reflected in the accident statistics it is, nevertheless, a very potential danger. Firefighting equipment appears to be inadequate, only portable fire extinguishers are available to fight a fire. The ferries should be equipped with enough fire hydrants and hoses and fire detection and alarm systems should be installed in cargo areas, accommodation, deck areas, and

machinery spaces along with an alarm system on the bridge to notify about any outbreak of fire or smoke at the earliest.

9.2 The Ports/Terminals

The issues are;

- Poor port security;
- No passenger counts;
- Poor embarking and disembarking facilities for passengers;
- A lack of supervision during boarding

Measures concerning port security are poor, it would be very easy for any terrorist or persons wishing to cause harm to a ferry terminal or a ferry to enter the terminal area and board a ferry with weapons and/or explosives. There appears to be no passenger screening, and this should be rectified. Every major port and ferry terminal and port should undergo a security assessment to identify the weaknesses and vulnerable areas and measures to mitigate the weaknesses should be introduced.

The means of embarking and disembarking the ferries should be improved, the current method which uses wooden planks from the quayside to the ships is inherently dangerous particularly for the elderly, disabled and less agile people.

9.3 The Waterways

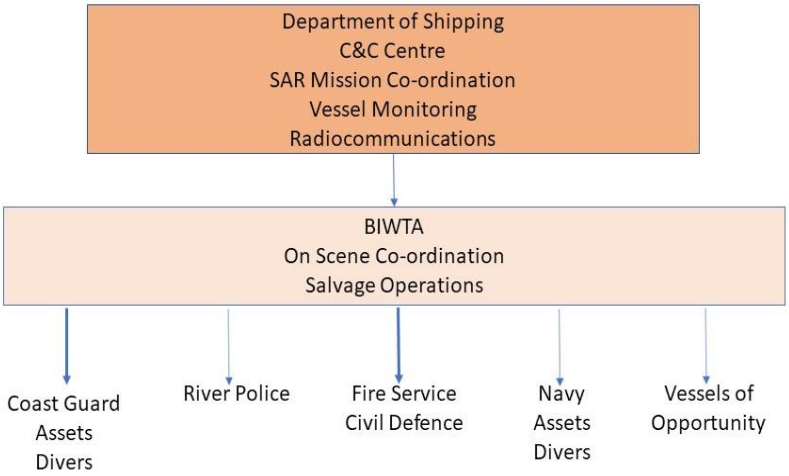
Shore-based navigational aids and their maintenance require improving. The DoS should also introduce a shorebased Automatic Identification of Ships (AIS) system (see next section) so that there is a clear picture of all suitably equipped vessels using the waterways. By using existing infrastructure such as masts and towers located along the waterways this should not be a hugely expensive programme.

9.4 The Organization of Search and Rescue

This is a very important area where some attention is deemed to be necessary. It not entirely clear where roles and responsibilities lie in the event of an incident on the inland waterways. On the one hand the CAAB have a Rescue Co-ordination Centre (RCC) in Dhaka and several Sub-Centres at airports and airfields around the country, they have also published a national SAR manual the contents of which are largely a direct copy of certain sections of the International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual. On the other hand, the Navy have a Maritime Rescue Co-ordination Centre (MRCC) at Naval HQ in Dhaka, very little is known about this MRCC's capability, but it is assumed that the navy has a co-ordination role for incidents on the high seas occurring within Bangladesh's Maritime Search and Rescue Region (SRR) and not on the inland waterways. The Navy also has two Maritime Rescue Sub Centres (MRSC's) at Chittagong and Khulna. In addition to this the Coast Guard has a responsibility for SAR on the inland waterways, but it is not clear if they have a co-ordination role and finally, as mentioned earlier in this report, the DoS is in the process of establishing a coastal wide GMDSS communications network (including AIS) and a Command and Control Centre in Dhaka.

It is encouraging to note that in discussions with the DoS it was mentioned that the ministry is in the process of developing a national SAR plan which involves all the previously mentioned key stakeholders so this should result in a clear statement regarding roles and responsibilities concerning the co-ordinating authority(s) and the providers of search and rescue facilities and their capabilities.

Figure 21 Future Structure for SAR on the IWT Network



10. NATIONAL WORKSHOP

10.1 On Thursday 25th April a workshop was held hosted by the World Bank at their HQ in Dhaka. The workshop was attended by 15 senior representatives from the following organizations; (see annex A for a list of external participants)

- The World Bank
- The Department of Shipping
- BIWTA
- BIWTC
- Fire Service/Civil Defence
- Bangladesh Coast Guard
- Ocean Marine Services

The objective of the workshop was to discuss and to verify the findings of the Interim Report which had previously been circulated to all IWT network stakeholders. The meeting was co-chaired by Commodore Syed Ariful Islam, Director General DoS and Commodore M. Mahbubul Islam, the chairman of BIWTA.

Following some in depth discussion it was generally agreed that there are a number of problem areas which need to be addressed by some stakeholders such as the DoS and BIWTA. However, some felt that some statements within the recommendations were a little to harsh and as a result some of the wording in those recommendations has been altered in this final report to reflect the concerns of some of the participants.

As a result of the workshop some follow-up meetings where held with the DoS and BIWTA during which the consultant was provided with some updated information which has also been included in this report,

11. RECOMMENDATIONS TO IMPROVE IWT SAFETY IN BANGLADESH

11.1 Rationale for Reform of IWT Safety in Bangladesh

Assessment of a number of aspects concerning safety on the IWT network shows a requirement for significant improvement particularly in the areas concerning safety of navigation on the waterways and enforcement of regulations. Improvements are required in the onshore infrastructure and to the vessels plying the waterways. The IWT network is a lifeline for millions of people, concerted action is crucial to halt and reverse the number of accidents, injuries and lives being lost.

Thirteen recommendations have been made, nine of which apply to the onshore infrastructure and four of which apply to the vessels all of which will enhance safety on the IWT network and most importantly allow millions of passengers to enjoy safer travel conditions within the country.

11.2 Recommendations Related to the Onshore Infrastructure

11.2.1 Extension of AIS to the IWT Network

The MoS/DoS should consider extending the planned coastal AIS system into the inland waterways and vessel owners should equip all vessels with Inland AIS transponders in order to provide ships masters and the proposed DoS command and control centre in Dhaka with a "real time" picture of traffic on the waterways and by doing so create a River Information System (RIS) greatly improving vessel traffic management and the safety of navigation. All as discussed in the Case Study at section 9 of this report.

Note; post follow-up meeting with the DoS; The Chief Nautical Surveyor explained that it is their intention to extend the coastal AIS system into the inland waterways and this will be done through an extension of the existing GMDSS contract.

11.2.2 NAVTEX Services

The proposed new GMDSS will include a NAVTEX transmitter, this should have a range of at least 300 – 500 nautical miles and probably greater at night. In view of this new NAVTEX capability NAVTEX receivers should be fitted on all ferries and in BIWTA river port offices to enable immediate reception of Maritime Safety Information (MSI) and particularly storm warnings. This will require the meteorological department to send alerts and warnings directly to the national NAVTEX co-ordinator for inclusion in the NAVTEX broadcasts to be made from the Department of Shipping's new Command and Control Centre in Dhaka.

11.2.3 Passenger Counting

An automatic passenger counting system should be introduced for every ferry over a certain size and passenger carrying capacity. This should require a system for accurately counting and recording the exact number of passengers embarked on a ferry prior to its departure. The system should also include the ability to record the names of all the passengers and crew on board.

11.2.4 Accident Reporting and Recording

There is a need to introduce a more reliable and accurate record of incidents occurring on the IWT network. This can be achieved by introducing new software at the new upcoming DoS command and control centre. Every incident must be reported, and an incident report should be generated by senior operations staff responsible for directing the response to the incident detailing all significant events in chronological order from the start of the incident through to

completion. Each incident report should also be chronologically referenced thus providing a more accurate database.

11.2.5 Alerting Mechanisms

The alerting mechanisms in the event of an accident must be improved, it is not right to rely solely on mobile phones. Once the new Command and Control Centre is established in Dhaka then new alerting procedures should be introduced to ensure that any distress or urgency broadcast made on VHF radio and/or VHF Digital Selective Calling (DSC) is immediately received by the all authorities responsible for the response and co-ordination of search and rescue operations.

11.2.6 Enforcement of Regulations

There are deficiencies in; regulatory oversight, disaster response, communication systems, safety equipment, there is a need to improve the enforcement of the regulations prescribed in the Inland Shipping Ordinance 1976 to ensure that; vessels are properly equipped, are not overloaded do not sail when they are not supposed to.

11.2.7 A Mandatory Code of Practice

A mandatory Code of Practice (CoP) applicable to all vessels over a certain size should be developed by the DoS in consultation with all other stakeholders. The primary aim of the Code being to set standards of safety, construction and protection for all persons onboard and to minimise the potential risk to third parties. The CoP should cover and regulate *inter alia* the following matters;

a) Approvals and Assessments

- Pre – construction approvals
- Pre – construction appraisals
- Approvals required prior to commencement of operations

b) Watertight Integrity

c) Machinery

d) Electrical Arrangements

- Electrical requirements
- Emergency power

e) Bilge Pumping

f) Intact and Damage Stability Criteria

g) Freeboard and Freeboard Marking

h) Life-saving Appliances

- Life-Saving Appliances and Equipment Carriage Requirements
- General equipment requirements
- Servicing of LSA
- Communications
- Retro-reflective material

i) Emergency Information for Passengers and Escapes

- Public Address Systems
- Means of escape

j) Search and Rescue Requirements

- SAR Plan
- SAR Exercises
- Accident Reporting

k) Fire Safety

- Firefighting arrangements
- Portable Fire Extinguishers
- Fire Fighting Systems for Machinery Spaces
- Fire Detection in Machinery Spaces
- Fire Protection of Machinery and Auxiliary Machinery Spaces
- Fire protection of passenger and crew accommodation
- Fire Safety for Galleys, Pantries or Isolated Pantries
- Availability of fire-fighting appliances
- Fire protection of LSA, assembly and embarkation areas

l) Safety Management System

- Lines of Communication between Personnel, Ashore and Afloat
- Procedures for Reporting Accidents
- Procedures for Responding to Emergency Situations
- Safety Plan

m) Pollution Prevention and Dangerous Cargoes

n) Navigation

- Navigational Equipment
- Bridge Visibility
- Navigational Operational Requirements

o) Manning

- Minimum Manning Levels
- Minimum Qualifications
- Training
- Hours of Work Provision
- Medical Fitness

p) Passenger Counting and Registration

q) Passenger and Crew Accommodation

r) Survey and Certification Requirements

Alternatively, this could be achieved by updating and making amendments and adjustment of standards, procedures and guidelines contained in the Inland Shipping Ordinance 1976.

11.2.8 Ferry Port and Terminal Security

River port terminals need to strengthen their port security arrangements. Every major port and ferry terminal should undergo a security assessment to identify weaknesses and vulnerable areas and measures to mitigate the weaknesses and vulnerabilities should be introduced.

11.2.9 National SAR Plan

The National Search and Rescue Plan which it is understood to be currently under preparation should be completed and agreed by all Parties as soon as possible and prior to the inauguration of the DoS's Command and Control centre and the entire EGIMNS project. The plan should cover all aeronautical, maritime and land-based SAR including the inland waterways and clearly explain all roles and responsibilities. Many Government departments can give valuable aid to SAR operations. The national SAR Plan should specify the extent and way each department is expected to aid the SAR system when called upon.

Guidelines and sample legislation concerning a national SAR organization are provided in Appendix A of the International Aeronautical and Maritime SAR (IAMSAR) manual. Additionally, and for guidance purposes, 2 two examples of a SAR Plan from the UK and USA are provided at Annexes B and C respectively.

11.3 Recommendations Related to the Vessels

11.3.1 Carriage of Liferafts

Noting that in a number of places and particularly where rivers converge the width of the river is > than 10 km. In view of this liferafts should be carried on all medium to large ferries. Evacuation in an emergency should be direct to shore, liferaft or attending ship as far as practical, therefore passengers should not be expected to enter the water. Ships should use the most appropriate lifesaving appliance or equipment to achieve this goal. In the event of flooding when damage exceeds the survivability standard, or uncontained fire, it is of paramount importance to evacuate the ship as quickly as possible. Open Reversible Inflatable liferafts (ORIL) which ideal for passenger ships operating in coastal or inland waters, they provide a safe evacuation platform and total evacuation time will be less than scenarios when other ships attend to evacuate passengers if they are not in close proximity.

11.3.2 Provision of Buoyant Lifesaving Apparatus

The provision of buoyant apparatus – lifejackets and lifebuoys - is to provide some temporary support for those persons who may enter the water because they were unable to successfully take advantage of the dry-shod evacuation facilities. In this event, buoyant apparatus would give those passengers in the water something to hold on to until they could transfer to a liferaft or until assistance arrives. Currently it appears that there is insufficient lifesaving equipment, only lifebuoys and the number of those does not meet the requirement. Enough life jackets and lifebuoys should be introduced to all passenger carrying vessels based on the maximum passenger carrying capacity of each ferry plus 20% of the maximum carrying capacity.

11.3.3 Firefighting Equipment

Firefighting equipment on the larger ferries appears to be inadequate and this should be rectified by installing pumps, fire hydrants and hoses on every deck. The crews should be trained in the use of all firefighting equipment.

11.3.4 Provision of Suitable Gangways & Supervision

Suitable gangways with handrails on either side should be provided. There should be adequate supervision by crewmembers during boarding to avoid pushing and crowding on the gangway.

11.4 Recommendations Pertaining to the World Bank

11.4.1 Assistance with the Procurement of Equipment

The World Bank should give due consideration to providing financial assistance to the Government of Bangladesh with the procurement an installation of AIS devices and NAVTEX receivers for all vessels over a certain size.

11.4.2 Facilitation of Stakeholders to Visit a European River Information System (RIS)

The World Bank could facilitate a visit for key stakeholders such as the DoS and BIWTA to view an operational River Information System in Europe.

12. CASE STUDY – EUROPEAN IWT SYSTEM

12.1 European IWT River Information Services (RIS)

In mainland Europe, River Information Services (RIS) are information services designed to enhance safety and efficiency of inland waterway transport (IWT) by optimising traffic and transport processes. The focal aspect is a swift demand oriented electronic data transfer between water and shore through real-time exchange of information. RIS's therefore aim to streamline the exchange of information between all IWT stakeholders. Since 2005, an EU framework directive provides minimum requirements for RIS implementation and agreed RIS standards to enable cross-border compatibility of national systems. The European waterways affected by the RIS Directive are illustrated in the following picture:

Figure 22 European Waterways using River Information Services (RIS)

The development of RIS, in combination with cost-effective and environmentally friendly logistics operations, enhances the competitive edge of inland waterway transport in the supply chain. The policy importance of RIS is presented in various EU policy papers, i.e. EC White paper, TEN-T Guidelines, NAIADES, Logistics Action Plan.

In 2015 the EC launched the Digital Inland Waterways Activity (DINA) initiative as part of the Digital Single Market (DSM) strategy of the Junkers Commission. Goal of the DINA initiative is to digitize information flows in IWT with the aim to allow for seamless integration of IWT in multimodal logistic chains.

Port and terminal operators benefit from the transparent and electronic exchange of information provided within the framework of River Information Services (RIS). Access to

the strategic traffic image and the ETA (estimated time of arrival) calculated as part of the voyage planning process enable a better and more exact planning of port and transhipment operations. Additionally, access to cargo data transmitted via electronic reporting of dangerous goods facilitates proactive management of transhipment and storage activities. Access to ship and cargo data by ports and terminal operators requires the vessel operator's consent.

The ongoing monitoring of vessel positions in the framework of RIS allows, for example, the automatic registration of vessels' arrival and departure at ports, terminals or landing stages in the context of berth management. The arrival and departure times are recognised by the RIS and can be computed for statistical or invoicing purposes. Such transfer of data also requires the prior consent of the vessel operator.

12.2 How RIS Works

12.2.1 RIS technologies

RIS technologies such as Inland AIS, Inland ECDIS, NtS and ERI are the basis for a variety of services, including fairway information services, traffic information, traffic management, information for transport logistics, port and terminal management, voyage planning and statistics.

12.2.3 Inland AIS

In inland navigation, the vessel tracking and tracing system Inland AIS (Inland Automatic Identification System) is used for the automatic identification and tracking and tracing of vessels. AIS was originally introduced by the International Maritime Organization (IMO) to support maritime navigation. In order to meet the requirements of inland navigation, it was extended to the Inland AIS standard which enables the transmission of additional information.

Figure 23 Inland AIS Transponder on board an inland vessel

The most important AIS element on board an inland waterway vessel is the so-called Inland AIS transponder, which enables the exchange of information relevant to the positioning and identification of vessels and also facilitates the exchange of data between vessels equipped with transponders. Each vessel equipped with an Inland AIS transponder sends static (e.g. ship number, call sign, name), dynamic (e.g. position, speed, course) and voyage-related (e.g. draught loaded, destination, estimated time of arrival, number of persons on board) data. All vessels equipped with transponders, as well as Inland AIS base stations on the shore, can see the transmitting vessel which is within reach on the display of the transponder or on a

computer with Inland ECDIS software. Hereby, boatmasters are provided with an accurate overview of live traffic within the surrounding area of their vessel.

River Information Services supported by Inland AIS include:

- Automated vessel tracking and tracing
- Tactical traffic imaging
- Real-time traffic information
- Calculation of estimated time of arrival
- Tracking of accidents
- Lock management

12.2.3 Inland ENCs and Inland ECDIS

Inland ENCs are electronic navigational charts which can be displayed with the aid of a special software (Inland ECDIS). The basic contents of electronic inland navigational charts (Inland ENCs) include:

- Limits of the fairway
- Traffic control data such as buoys, zones where traffic is prohibited,
- lighting and traffic signs
- Structures and obstacles such as bridges, locks and weirs
- Shorelines and river engineering structures (groynes and training walls)
- Orientation guidance such as waterway axis, kilometre and hectometre markers

Inland ENCs are fundamentally different from paper charts. The electronic storage of geographical data in the form of vector data enables the correct representation of all details and ensures a reliable and clear presentation of information. Inland ENCs are produced, updated and published either by commercial providers or by waterway administrations.

The advantages of Inland ENCs as opposed to conventional paper charts are:

- Detailed and well-arranged presentation of charts in all resolutions and all sizes of the chart sections.
- Simple and fast updating procedures
- Presentation in various levels of detail due to layer technology
- Access to information on all objects at the click of a mouse

River Information Services supported by Inland ENCs and Inland ECDIS include:

- Tactical traffic image;
- Monitoring of vessel traffic;
- Fairway information services.

Figure 24 An Electronic Navigational Chart in Support of Navigation

12.2.4 Notices to Skippers (NtS)

Notices to Skippers support traffic safety on inland waterways. In a similar way to traffic reports for road transport, NtS are published by the competent authorities and contain information regarding the usability of transport infrastructure (e.g. fairway or locks).

Among the fundamental functions of NtS are:

- **Fairway and traffic related messages** with information about waterway sections or objects (e.g. locks, bridges) such as suspension of navigation, reduced passage heights, widths or depth
- **Water level related information** with information about water levels, lowest fairway depths according to riverbed surveying, vertical clearance under bridges and overhead cables, discharge, flow regime or water level forecasts
- **Ice messages** containing information about obstructions and suspension of navigation caused by ice. (*although ice messages are not relevant to Bangladesh, this can be adapted to show other messages such as severe weather warnings, cyclone warnings, storm surges, flooding etc.)*

12.2.5 Electronic Reporting (ERI) of dangerous goods

Shipping companies are required to report data on the transport of dangerous goods to different authorities, depending on the national or international legislation in force. This results in the same data having to be reported again and again, sometimes in different languages and by means of different forms. When using electronic reporting, shipping companies only need to provide information about the cargo or the upcoming voyage once.

An Electronic Reporting software is a computer application available via an Internet browser which was developed to support users by simplifying the process of generating reports

detailing the voyage, the vessel and the cargo. The modification and deletion of voyage and cargo data, together with the import and export of this data, is also facilitated by this application.

Cargo codes enable an unambiguous identification of the load and an accurate translation into other languages. This is an especially important innovation for the handling of dangerous goods. Thanks to electronic reporting, errors and mistakes can be easily avoided. Furthermore, the provision of electronic cargo information enables better planning of the loading and unloading, and paperwork is also reduced because customary message reports no longer need to be sent by fax or letter.

River Information Services supported by Electronic Reporting include:

- Strategic traffic information
- Lock and bridge management
- Avoidance of accidents
- Transport management
- Border control and customs services

12.2.6 RIS Summary

River Information Services have played a determining role in the modernisation of inland navigation and has made a significant contribution to the improvement of safety on the Danube.

One of the main tasks of RIS is the electronic recording of the position of all ships in the system and their representation on an electronic navigational chart, the Inland ECDIS. This is achieved through the strategic use of satellite positioning, wireless data and customised visualisation. As a result, RIS provides an extremely accurate view of the current traffic situation, thereby providing permanent support for the ship's captain in his nautical decisions and in doing so enhancing traffic safety on the inland waterway network. In addition, the monitoring of hazardous cargo vessels and coordination of emergency services in the event of an accident by electronic processing of information with the RIS is significantly easier. Furthermore, stored data can be retrieved from a central database to facilitate the reconstruction of accidents and provide essential and critical information for accident investigators.

Figure 25 RIS Display in a Control Room

Figure 26 River Information Service (RIS) on the Austrian Danube

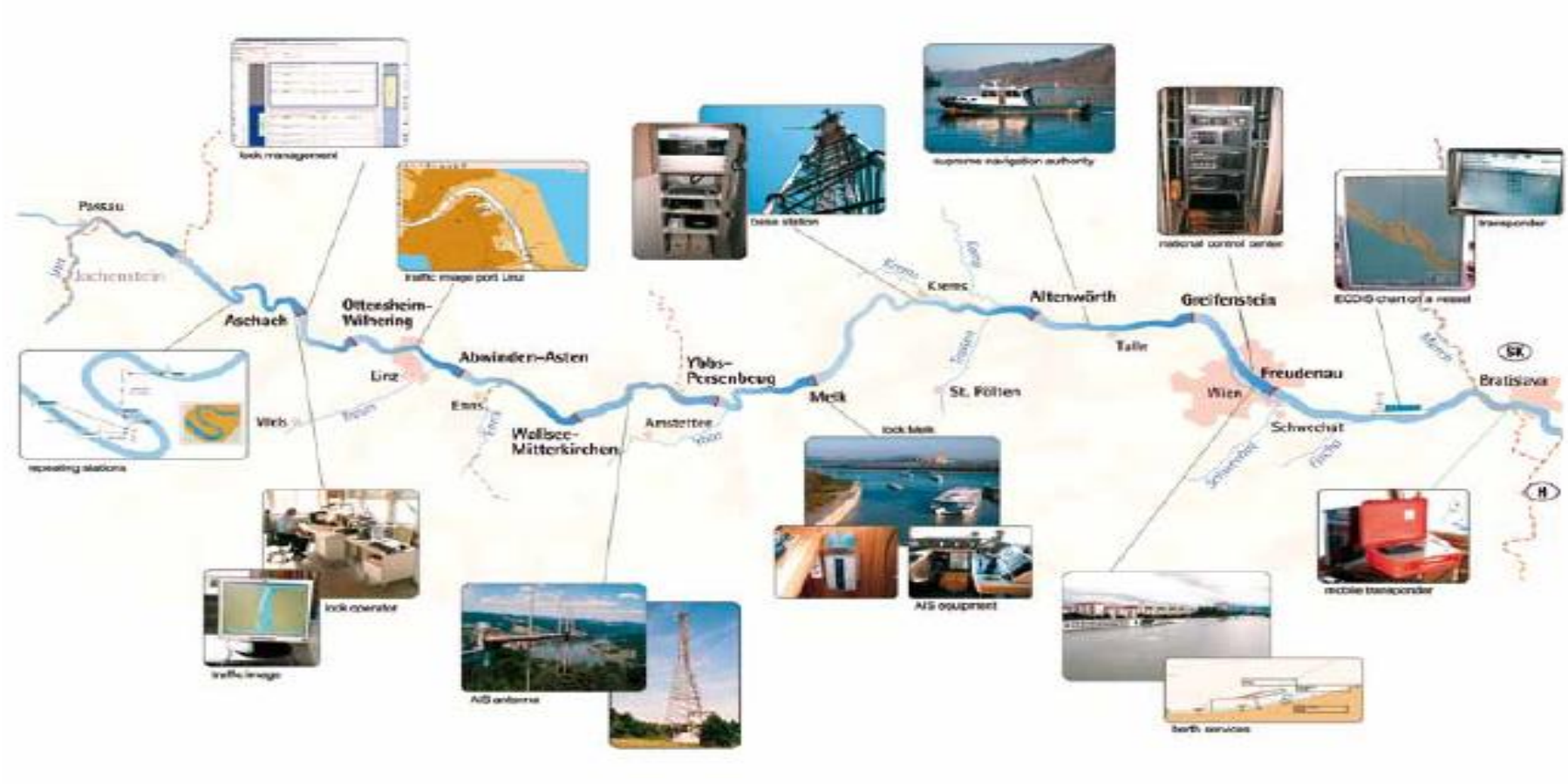
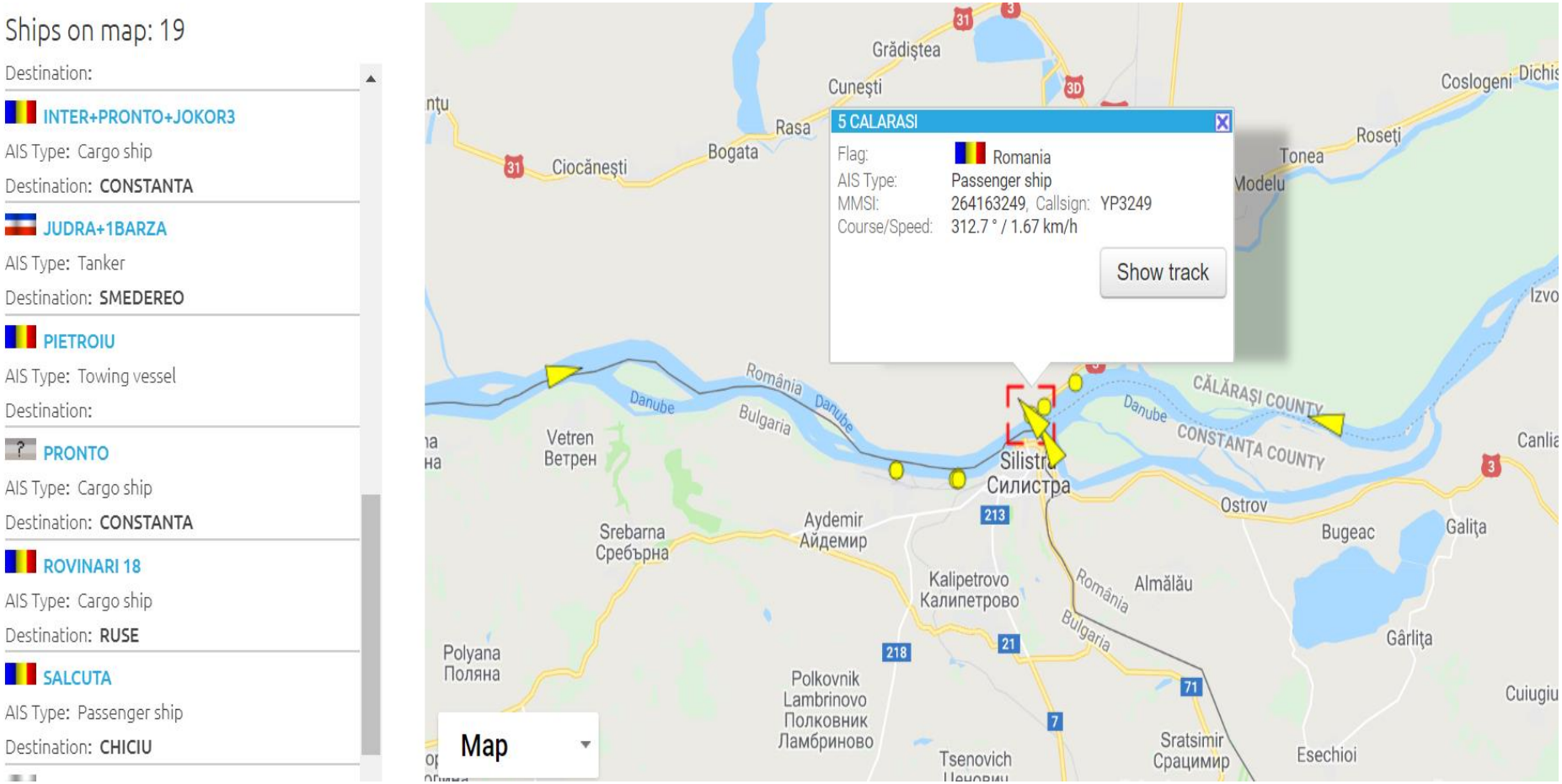


Figure 27 The RIS Picture at Silistra, Bulgaria



What is shown on the map?

The symbolic map at figure 25 above shows real-time ship positions on the Danube River in the town of Silistra, Bulgaria. Each moving vessel is denoted by ship icon,  where stationary - with a yellow circular ship icon. The AIS technology involves the sending and storage of a wide range of navigation and technical data, including the size of the vessel, which also allow to display the silhouette of a ship on a larger scale of the map.

13. CONCLUSION

The challenges presented by incorporating all this additional equipment and preparing new and more detailed and comprehensive procedures isn't really the physical restraint on the design of the vessels or the terminals but the fact that the ferry companies, DoS, BITWA and other relevant authorities are probably unwilling or – more likely - unable to spend extra money. Nevertheless, it is evident that there are moves being made by the DoS, BIWTA, Bangladesh Coast Guard and others to improve the present situation concerning overall safety on the IWT network.

Based on the latest United Nations estimate the current population of Bangladesh is 167,511,245 and 12.3% of the population - over 20.6m - people rely on water transport solely for movement between cities and towns within the country. The IWT sector carries 25% of all passenger traffic in the country and approximately 194 million tons of cargo but despite its importance, the IWT receives only about 4% to 7% of total transport sector funding.

To summarize the most significant factors affecting safety and the lack of it, and for which policy reform or new policies are required have been iterated in this report and thirteen recommendations have been made but, the main underlying factors can be summarized as;

- → A real-time lack of enforcement of the existing regulations;
- → Out-dated infrastructure in most areas of the IWT network;
- → Poor practice concerning the carriage of navigational and communication equipment on ferries and cargo vessels;
- → A confusing picture regarding the management and co-ordination of incidents;
- → No allocation of sufficient resources located at strategic positions along the waterways to ensure a quick and effective response to incidents
- → Poor communications throughout the system in the event of an accident.
- → A poor navigation aid system and very limited night-time aids;
- → A poor safety culture, including outdated rules and regulations concerning the design, licensing, construction, operation and maintenance of IWT vessels, and the lack of facilities for searching and rescuing people in distress;
- → Insufficient and dilapidated river port facilities for general cargo trade and passenger transport. Many terminal facilities consist of no more than wooden planks used to embark and disembark passengers which are a challenge for mothers with small children, pregnant women, elderly people and the disabled.

ANNEX A – MEETINGS HELD

Sunday 27th January

Project kick-off meeting with Mr Rajesh Rohatgi, Sr. Transport Specialist, Transport Global Practice, World Bank, Dhaka.

Tuesday 29th January

Department of Shipping (DoS)

1. Md. Shafiqur Rahman, Chief Inspector, Department of Shipping, Ministry of Shipping.
2. Captain K.M. Jashimuddin Sarker, Chief Nautical Surveyor, Department of Shipping, Ministry of Shipping.

Bangladesh Inland Waterway Transport Authority (BIWTA) Ministry of Shipping

1. Mahmud Hasan Selim, Project Director, BRWTP 1
2. Muhammad Abu Jafar Howlader, Director (Marine Safety & Traffic Department)
3. Md. Saiful Islam, Joint Director (Marine Safety & Traffic Department)
4. Md. Shah Jahan, Director (Conservancy & Pilotage)
5. Md. Fazlur Rahman, Joint Director (Salvage)

Sunday 3rd February

Sadarghat River Port, Dhaka

1. Md. Alamgir Kabir – Joint Director, Marine Safety & Traffic Management Department BIWTA, Ministry of Shipping.

Tuesday 23rd April

Bangladesh Coast Guard Force Head Quarters

1. Rear Admiral M. Ashraful – Director General + support staff.

Thursday 25th April

A Workshop held at the WB HQ Dhaka, attended by 13 representatives from 7 organizations.

<u>List of External participants in IWT workshop:</u>

1. Mohammad Hasan Salim, PD, BRWTP 1
2. CAPT. K.M. Jashimuddin Sarker, Department of shipping
3. Md. Shafiqur Rahman, Department of shipping
4. Maruf Md. Jahirul Islam, ocean Marine Service
5. Captain Showkat Sardar, Bangladesh Inland Water Transport Corporation.
6. Md. Monzurul Hogue, BIWTA
7. Md. Fazlur rahman, Joint Director (Salvage) BIWTA

8. MD. Shah Jahan, Director, Conservancy and Pilotage Department, BIWTA
9. Md. Abdul Momen, Fire Services and Civil Defence
10. Cdr S Ehban Mohiuddin BN, Coast Guard Head Quarter
11. Commodore Syed Ariful islam, DG, Shipping
12. Commodore M. Mahbubul Islam, Chairman, BIWTA
13. Md. Manjurul Kabir, Chief engineer and ship surveyor, DOS

Sunday 28th April

1. Follow-up meeting with Captain K.M. Jashimuddin Sarker, Chief Nautical Surveyor, Department of Shipping, Ministry of Shipping.
2. Follow-up meeting Md. Fazlur Rahman, Joint Director (Salvage), BIWTA.
3. Md. Abdul Momen, Fire Service and Civil Defence

ANNEX B – UK NATIONAL SAR PLAN

UNITED KINGDOM SEARCH AND RESCUE ORGANISATION
NATIONAL FRAMEWORK DOCUMENT

1. Introduction

1.1 The UK Search and Rescue Organisation is an amalgam of separate Government divisions and agencies including Police and Fire Services and for whom search and rescue (SAR) may not be a primary or statutory role. Additionally, a number of charitable and voluntary organisations, who are dedicated to SAR, also play a significant role in the UK SAR Organisation.

1.2 These authorities and organisations are committed to a cohesive and co-operative partnership, the aim of which is the continued provision of an effective national search and rescue organisation.

1.3 The purpose of this document therefore, is to provide a management framework within which the responsible parties can work together to meet this aim.

1.4 A more detailed description of the UK SAR Organisation is found in the sister document, the *United Kingdom Search and Rescue Handbook.*

2. International Obligations

2.1 The UK organisation for civil maritime and civil aviation search and rescue is derived from the UK Government's adherence to the Convention on the High Seas (1958), the Convention on Safety of Life at Sea (SOLAS) (1974), the Maritime Search and Rescue Convention (1979) and the Convention on International Civil Aviation (1943) (Chicago Convention).

2.2 The UK responsibility for SAR measures for ships, aircraft and persons, whether civilian or military, covers the territory of the United Kingdom and Northern Ireland including the United Kingdom SAR Region (see Annex A).

3. Scope of UK SAR

3.1 The key functions of the UK SAR Organisation are as follows :

3.1.1 The co-ordination of :

a) maritime SAR in offshore, inshore and shoreline areas

b) aeronautical SAR over land and sea

c) inland SAR

3.1.2 this requires the ability to :

a) receive details of persons, vessels and aircraft in distress

e) communicate between SAR units and the co-ordinating RCC, RSC or EC

f) communicate between SAR units

g) communicate between RCCs, RSCs and ECs

h) maintain dedicated SAR units for :

i) the provision of assistance to persons at or near the scene of a distress situation or its MoSt probable position(s)

ii) delivery of survivors to a place of safety or where further assistance can be rendered

4. Division of UK SAR responsibility

4.1 Ultimate responsibility for civil aeronautical and maritime SAR rests with the Department of the Environment, Transport and the Regions (DETR). The Ministry of Defence (MoD) has responsibility for all SAR arrangements for military aviation and MoD maritime units in the UK and, by agreement, exercises responsibility for civil aeronautical SAR on behalf of the DETR.

4.2 The responsibility for land-based and inland waterway SAR rests with the Police Service but is not governed by either statute, convention or other agreement, and is derived from the Police Service duty to protect life and property.

5. Government Departments with responsibility for national SAR

5.1 Department of the Environment, Transport and the Regions (DETR)

5.1.1 The Agencies and Branches of the DETR carry out broad responsibilities in maritime and aeronautical safety.

5.1.2 The Maritime & Coastguard Agency (MCA) establishes, maintains and operates search and rescue facilities including Maritime Rescue Co-ordination Centres (MRCC) and Sub Centres (MRSC) for the operation and co-ordination of SAR and the promotion of safety of life at sea, on the coastline and other waters subject to UK jurisdiction.

5.1.3 The Civil Aviation Division (CAD) has overall responsibility for UK civil aviation SAR and assigns appropriate SAR functions to the MoD and MCA.

5.2 Ministry of Defence

5.2.1 The MoD establishes and maintains an Aeronautical Rescue Co-ordination Centre (ARCC) for the operation and co-ordination of civil and military aeronautical SAR. The MoD provides SAR facilities for military operations, exercises and training within the UK. Where the coverage provided by military SAR assets meets the civil SAR coverage requirements, they will be made available for civil maritime and land-based SAR operations.

5.3 Police Service

5.3.1 The Police Service, through its command infrastructure, directs and co-ordinates land-based SAR operations including those that originated at sea and in the air and provide strategic co-ordination of all emergency services and other authorities where appropriate.

5.4 Fire Service

5.4.1 Fire Services in the UK have a statutory responsibility to deal with fires. However, each Fire Authority has the power to extend its use to deal with incidents that are not strictly related to fire and can include maritime, aeronautical and land based SAR operations.

5.5 Home Office

5.5.1 The Home Office has a role in ensuring the quality of preparedness for civil disaster at the local government level and across central government.

6. Management of UK SAR Organisation

6.1 The management of the UK SAR Organisation is vested by the Government in the UK SAR Policy Committee as supported by its UK SAR Operators Committee. The group structure is shown at Annex B.

6.2 UK SAR Policy Committee

6.2.1 The UK SAR Policy Committee (UKSARPC) is an inter-Departmental national forum and has overall responsibility for determining the structure, scope and policies of the UK SAR Organisation.

6.2.2 Its main responsibilities include:

a) To advise Ministers

b) To formulate national SAR policies and positions in response to directives from IMO and ICAO and advice from its UK SAR Operators Committee.

c) To oversee the implementation of SAR policies and directives.

d) To seek advice from the UK SAR Operators Committee.

e) To promote close co-operation between the various Government divisions and agencies including Police and Fire Services for the provision of an effective SAR service at national and, where appropriate, international level.

f) To determine criteria for the coverage, availability and responsiveness of SAR assets.

g) To oversee this framework document.

6.2.3 Terms of Reference for the UKSARPC are shown at Annex C.

6.3 UK SAR Operators Committee

6.3.1 Under the direction of the UKSARPC, the UK SAR Operators Committee (UKSAROC) is responsible for the development of national SAR policy for approval by the UKSARPC and the implementation of UKSARPC policy directives.

6.3.2 Its other responsibilities are:

a) To develop SAR procedures aimed at promoting best practice and compatibility.

b) To provide advice to UKSARPC.

c) To seek advice from non-governmental authorities and organisations dedicated to SAR who may be represented on this committee by invitation.

d) To encourage the development of new procedures, equipment and training to enhance the overall effectiveness and efficiency of UK SAR.

e) To maintain the *United Kingdom Search and Rescue Handbook.*

f) To form Consultative Groups for Maritime and Aeronautical SAR, and Inland and Inland Waterway SAR.

g) To develop terms of reference for the Consultative Groups.

6.3.3 Terms of reference for the UKSAROC are at Annex D.

7. Major Incident Response

7.1 Major Incident Response will encapsulate these key requirements, but the magnitude of such incidents will normally require a fully integrated emergency response under the guidelines provided in the Home Office publication *Dealing with Disasters* and the Scottish Office publication *Dealing with Disasters Together.*

ANNEX C

Terms of Reference for the UK SAR Strategic Committee (UKSARPC)

1. The UKSARPC will meet twice per year under the Chair of .....

2. The UKSARPC will comprise of permanent representatives from DETR, MCA, MoD, ACPO, ACPO (Scotland), CACFOA, ASA/Dept of Health and Home Office. Scottish, Welsh and Northern Ireland Offices will attend as Agenda dictates.

3. The UKSARPC may co-opt experts and delegates from other authorities and organisations when appropriate.

4. The UKSARPC may establish sub-committees as required for the development of policies affecting UK SAR.

5. The UKSARPC will determine criteria for the availability, responsiveness and coverage of SAR resources consulting, where required, the UKSAROC.

6. The UKSARPC will issue guidance in the form of a National SAR Plan comprising this document and the UK SAR Handbook.

7. The UKSARPC will advise Ministers as required particularly on ways and means of improving UK SAR efficiency and co-operation and will provide an Annual SAR Report for Ministers.

ANNEX D

Terms of Reference for the UK SAR Operators Committee (UKSAROC)

1. The UKSAROC will meet four times per year under the Chair of .....

2. The UKSAROC will comprise of representatives from MCA, MoD, ACPO, ACPO (Scotland), CACFOA, ASA, RNLI, RLSS(UK), MRC and MRC(S).

3. The UKSAROC may co-opt experts and delegates from other authorities and organisations when appropriate.

4. The UKSAROC may establish sub-committees as required for the development of SAR procedures and establishing best practice for the overall effectiveness and efficiency of UK SAR.

5. The UKSAROC will provide advice to UKSARPC as required.

6. The UKSAROC will oversee the implementation of policy directives from UKSARPC.

7. The UKSAROC will maintain authorship of the *United Kingdom SAR Handbook.*

ANNEX C – U.S. NATIONAL SAR PLAN

United States
National Search and Rescue Plan--1999

POLICY

1. It is the policy of the signatory federal agencies to provide a National Search and Rescue Plan for coordinating civil search and rescue (SAR) services to meet domestic needs and international commitments. Implementing guidance for this Plan is provided in the *International Aeronautical and Maritime Search and Rescue Manual* (IAMSAR Manual discussed below), the *National Search and Rescue Supplement* (a domestic interagency supplement to the IAMSAR Manual), and other relevant directives of the Participants to this Plan.

PURPOSE

2. This Plan continues, by interagency agreement, the effective use of all available facilities in all types of SAR missions. The National Search and Rescue Plan-1986 is superseded by this Plan.

TERMS AND DEFINITIONS

3. The following terms and definitions are based on international usage for civil SAR. For more information about these terms and others commonly used for civil SAR, refer to the IAMSAR Manual, which is jointly published by the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO).

   Search and rescue coordinator. A federal person or agency with overall responsibility for establishing and providing civil SAR services for a search and rescue region(s) for which the U.S. has primary responsibility.

   Search and rescue region (SRR). An area of defined dimensions, recognized by ICAO, IMO or other cognizant international body, and associated with a rescue coordination center within which SAR services are provided.

   Search and rescue services. The performance of distress monitoring, communication, coordination and SAR functions, including provision of medical advice, initial medical assistance, or medical evacuation, through the use of public and private resources including cooperating aircraft, vessels and other craft and installations.

   Rescue coordination center (RCC). A unit, recognized by ICAO, IMO or other cognizant international body, responsible for promoting efficient organization of civil SAR services and for coordinating the conduct of SAR operations within an SRR.

   Rescue sub-center (RSC). A unit subordinate to an RCC established to complement the latter according to particular provisions of the responsible authorities.

Joint rescue coordination center (JRCC). An RCC responsible for more than one primary type of SAR services, e.g., both aeronautical and maritime SAR incidents. *NOTE: The term "JRCC" will not be used for civil SAR purposes solely on the basis that an RCC is staffed by personnel from, or is sponsored by, more than one organization*.

OBJECTIVES

4. Knowing the importance of cooperation in providing expeditious and effective SAR services, the Participants to this Plan desire to:
   - Provide a national plan for coordinating SAR services to meet domestic needs and international commitments, and to document related basic national policies;
   - Support lifesaving provisions of the International Convention on Maritime Search and Rescue of IMO, the Convention on International Civil Aviation of ICAO, certain international agreements to which the U.S. is Party, and similar international instruments;
   - Provide an overall Plan for coordination of SAR operations, effective use of all available resources, mutual assistance, and efforts to improve such cooperation and services; and
   - Integrate available resources which can be used for SAR into a cooperative network for greater protection of life and property and to ensure greater efficiency and economy.
5. This Plan is further intended to:
   - Help the U.S. satisfy its humanitarian, national, and international SAR-related obligations;
   - Provide national guidance for development of SAR-related systems;
   - Describe its Participants and their roles in a pro-lifesaving context;
   - Recognize lead federal agencies, respectively, for the types of operations covered by this Plan, and describe geographic regions of SAR responsibility, as appropriate;
   - Account for saving property, but on a secondary basis to saving lives;
   - Account for all operations up to and including providing initial assistance (food, clothing, medical, etc.) to survivors and delivering them to a place of safety; and
   - Have, as a primary concept, cooperation for overall and continual development, coordination and improvement of SAR services.

SCOPE

6. It is intended that this Plan does not conflict in any way with SAR responsibilities agreed to by contracting States of the Convention on International Civil Aviation, the International Convention on Maritime Search and Rescue, or other appropriate international instruments to which the U.S. is or may become a Party.
7. No provisions of this Plan or any supporting plan are to be construed in such a way as to contravene responsibilities and authorities of any Participant as defined by statutes, executive

orders or international agreements, or of established responsibilities of other agencies and organizations which regularly assist persons and property in distress resulting from incidents of a local nature.

8. This Plan is solely intended to provide internal guidance to all signatory federal agencies. State organizations may wish to retain established SAR responsibilities within their boundaries for incidents primarily local or intrastate in character. In such cases, appropriate agreements are generally made between SAR coordinator(s) and relevant State organizations.

PARTICIPANTS

9. The Participants to this Plan are as follows:

- The agencies of the Department of Transportation (DOT) carry out broad responsibilities in transportation safety. The Coast Guard develops, establishes, maintains and operates rescue facilities for the promotion of safety on, under and over international waters and waters subject to U.S. jurisdiction, conducts safety inspections of MoSt merchant vessels, and investigates marine casualties. The Federal Aviation Administration has air traffic control and flight service facilities available to assist in SAR operations. The Maritime Administration operates a fleet of merchant ships for government use and promotes a safe merchant marine.
- Department of Defense (DOD) components have facilities and other resources that are used to support their own operations. These resources may be used for civil SAR needs on a not-to-interfere basis with military missions.
- The Department of Commerce (DOC) participates in or supports SAR operations through the National Oceanic and AtMoSpheric Administration (NOAA). NOAA provides nautical and aeronautical charting; information on tides and tidal currents; marine environmental forecasts and warnings for the high seas, and coastal and inland waterways; and satellite services for detecting and locating aircraft, ships or individuals in potential or actual distress.
- The Federal Communications Commission (FCC) promulgates rules and regulations for non-government use of wire and radio facilities for promoting safety of life and property, and cooperates in SAR operations through its long-range direction finder network.
- The National Aeronautics and Space Administration (NASA) has aircraft, spacecraft and worldwide tracking, data acquisition and communications networks which can assist in SAR operations. Additionally, NASA supports SAR objectives through research and development or application of technology to search, rescue, survival, and recovery systems and equipment, such as location tracking systems, transmitters, receivers, and antennas capable of locating aircraft, ships, spacecraft, or individuals in potential or actual distress.
- Land managing components of the Department of the Interior (DOI) provide SAR services on lands and waters administered by DOI and may assist in operations in adjacent jurisdictions. The degrees of responsibility assumed in each DOI field area depends upon the legislative and jurisdictional character of the bureau and field area. Responses range from support of law enforcement authorities or other local units to primary SAR coordination and operations. Similarly, components assume varying degrees of responsibility for preventative measures to protect the visiting public.

10. A federal agency that is not a Participant to this Plan may become a Participant by unanimous vote of the National SAR Coordinating Committee, followed by written notification by the agency to the Chairman of the National SAR Coordinating Committee of its accession to the Plan.

U.S. SEARCH AND RESCUE REGIONS

11. SRRs are established to ensure provision of adequate land-based communications infrastructure, efficient distress alert routing, and proper operational coordination to effectively support SAR services.
12. SRRs should be contiguous and, as far as practicable, not overlap.
13. Establishment of SRRs is intended to effect an understanding concerning where nations have accepted primary responsibility for coordinating or providing SAR services. The existence of SRR limits should not be viewed as a basis to restrict, delay, or limit in any way, prompt and effective action to relieve distress situations.
14. All SRRs of the U.S. are established in cooperation with neighboring nations, are internationally recognized, and are described in pertinent documents of IMO or ICAO.

    NOTE: U. S. maritime and aeronautical SRRs are established in accordance with the relevant IMO and ICAO Conventions and with the guidance of the IAMSAR Manual. These SRRs are internationally recognized and documented in the appropriate ICAO Regional Air Navigation Plans and in the IMO SAR Plan. More specific information on U.S. SRRs can also be found in the U.S. "National Search and Rescue Supplement," in which SRR charts will be included for convenient reference.
15. U.S. maritime and aeronautical SRRs will be harmonized with each other to the extent practicable, recognizing, however, that lines separating SRRs must normally be agreed by governments having neighboring SRRs when possible. SRRs will not be allowed to unduly affect or be affected by any political boundaries.
16. For civil SAR there must be, by definition, one RCC associated with each recognized SRR. Comprehensive standards and guidance pertinent to these RCCs have been developed by IMO and ICAO, and may be found in relevant Conventions, the IAMSAR Manual, and other publications which should be held and used by U.S. RCCs. U.S. SAR Coordinators as designated in this Plan are responsible for arranging for SAR services and establishing the RCCs for these SRRs. The U.S. civil SAR system becomes integrated into the global SAR system by establishing recognized SRRs and RCCs which comply with international standards.
17. SRRs may be subdivided as long as the delimitation of the sub-regions coincide with pertinent SRR limits. Where this is not practicable, changes to international limits should be proposed to the appropriate international organization through proper channels by the agency primarily concerned.

PARTICIPANT RESPONSIBILITIES

Primary Responsibilities

18. The SAR Coordinators, designated below, have overall responsibility for establishing RCCs as necessary, and for providing or arranging for SAR services within U.S. SRRs. Only RCCs

properly established by these SAR Coordinators should carry out domestic and international coordination of civil SAR operations.

19. U.S. SAR Coordinators are as follows (see paragraph 14):
    - The U.S. Air Force for the recognized U.S. aeronautical SRR corresponding to the continental U.S. other than Alaska;
    - The U.S. Pacific Command for the recognized U.S. aeronautical SRR corresponding to Alaska;
    - The U.S. Coast Guard for the recognized U.S. aeronautical and maritime SRRs which coincide with the ocean environments, and including Hawaii.

    NOTE: State and local authorities often designate a person to be a "SAR Coordinator" within their respective jurisdictions. Responsibilities of such personnel may be quite different from the responsibilities of national SAR Coordinators as designated in this Plan, but often these personnel are important contacts for the national SAR coordinators.
20. The National Park Service (NPS) is the lead agency that provides SAR and other emergency services within national parks.
21. The Department of State has designated the U.S. Coast Guard to lead and coordinate national participation in the SAR and safety-related initiatives of IMO.
22. The Department of State has designated the Federal Aviation Administration to lead and coordinate national participation in safety-related initiatives of ICAO.
23. Based upon invitations from ICAO and IMO, respectively, the U.S. Air Force will provide an aeronautical SAR expert and the U.S. Coast Guard will provide a maritime SAR expert, to serve as members of the ICAO-IMO Joint SAR Working Group.

Support Outside U. S. Search and Rescue Regions

24. SAR Coordinators, as well as other U.S. authorities, may support civil SAR operations anywhere in the world, consistent with their expertise and capabilities and legal authority. This is consistent with the principles of assisting persons in distress without regard to nationality or circumstances and of using all available resources for SAR. It is in the interest of the safety of U.S. citizens who travel or live worldwide. It is also consistent with U.S. humanitarian goals and the advantages of domestic and international cooperation.
25. In accordance with international law, U.S. SAR facilities, in a position to render timely and effective assistance, may exercise the right to enter into or over the territorial seas or archipelagic waters of another state for the purposes of rendering assistance to a person, ship, or aircraft whose position is reasonably well known, is in danger or distress due to perils of the seas, and requires emergency assistance.
26. Participants to this Plan, consistent with their capabilities and legal authority, will support civil SAR operations of other countries in territory and international waters beyond recognized U.S. aeronautical and maritime SRRs. As appropriate, and within their capaibilities, DOD combatant commands should provide such support within their respective geographic areas of responsibility.

27. In carrying out civil SAR support functions with other nations, such as training, exercises, and liaison, each Participant will coordinate its activities with other Participants having civil SAR expertise with respect to the support concerned.

    Note: A wealth of valuable reference material is available which should be used working with other nations in the area of civil SAR. These include, but are not limited to, the SAR-related conventions, the IAMSAR Manual (three volumes), this Plan, the National Search and Rescue Supplement, information about the AMVER ship reporting system, and many documents of Cospas-Sarsat, IMO, ICAO, etc. Some of these references are available in languages other than English. Participants should be familiar with such references and use them as appropriate.

28. While it is appropriate, to the fullest extent the Participants have the authority to do so, to maintain liaison and cooperate with authorities of other nations that have comparable civil SAR responsibilities, such support should be carried out in coordination with the U.S. SAR Coordinators, and with other neighboring SAR authorities, as appropriate. Such coordination will normally include U.S. Coast Guard Headquarters, Office of Search and Rescue, in order to ensure consistency with U.S. obligations under international agreements to which the U.S. is a Party, and compliance with the IAMSAR Manual and other relevant international guidance relevant to implementing such agreements.

29. Participants should not accept a SAR Coordinator or RCC role for SAR operations for SRRs for which other nations are responsible. However, the Participants may provide and support SAR operations in such areas when:

    - Assistance is requested (normally this should be in accordance with RCC-to-RCC procedures prescribed in the IAMSAR Manual);
    - U.S. citizens are involved; or
    - U.S. facilities become aware of a distress situation to which no other suitable facilities are responding, or where other available SAR services appear to be inadequate.

30. For distress situations in international waters or airspace where no SRR exists for which an RCC is responsible, or where it appears that the responsible RCC is not responding in a suitable manner, U.S. RCCs or facilities will assist as appropriate. Such assistance will be subject to availability of resources, legal constraints, and other applicable U.S. policies.

    NOTE: Provisions of international conventions dealing with SAR are intended to ensure that wherever any person goes in the world, suitable SAR services and responsibilities will be in place to assist should that person become in danger or distress. However, there may be nations which are not Parties to, or which have not yet fully complied with, these conventions. Therefore, situations may exist for U.S. resources to supplement SAR capabilities in certain geographic areas, or to support these nations by training or other means, consistent with U.S. domestic law, to help develop their SAR capabilities. Participants to this Plan may be take advantage of such situations as appropriate.

31. When assisting civil SAR authorities of other nations, or other agencies or organizations supporting these authorities, Participants to this Plan should ensure that:

    - They have appropriate legal authority and expertise to do so;

- Principles or provisions of conventions or agreements to which the U.S is Party are not violated;
- Applicable procedures set forth in the IAMSAR Manual, National SAR Supplement, and other relevant directives are known and followed;
- Such efforts are carried out in consultation with other Participants to this Plan as appropriate; and that
- The authorities assisted are responsible for the SAR functions in that country.

32. Policies on rendering assistance in foreign territories or territorial waters must have the goal of balancing concerns for saving lives, for sovereignty, and for national security. Provisions for territorial entry as necessary should be addressed in international SAR agreements where relevant, as discussed below, and care should be taken to ensure that such agreements are compatible with national policies in this regard.
33. When any Participant to this Plan is addressing civil SAR-related inquiries or proposals from other nations or organizations outside the U.S., or when hosting or attending international meetings on civil SAR, care should be taken that interested U.S. agencies, organizations, or persons are consulted and involved as appropriate.

CIVIL SAR AGREEMENTS

34. Bilateral or multilateral SAR agreements with other U.S. agencies or organizations, or with authorities of other nations, may be of practical value to civil SAR, and beneficial for purposes including:

- Helping to fulfil U.S. domestic or international obligations and needs;
- Enabling more effective use of all available resources;
- Better integration of U.S. SAR services with the global SAR system;
- Building commitment to support civil SAR;
- Resolving SAR procedures and sensitive matters in advance of time-critical distress situations; and
- Identifying types of cooperative matters and efforts which may enhance or support SAR operations, such as access to medical or fueling facilities; training and exercises; meetings; information exchanges; use of communications capabilities, or joint research and development projects.

35. Negotiation and conclusion of such agreements should consider matters such as the following:

- Which authorities of the governments, agencies, or organizations concerned are the proper ones to be involved with the agreement;
- Which types of SAR operations (e.g., aeronautical, maritime, etc.) or SAR support functions should be included within the scope of the agreement;
- Consistency with international and domestic SAR principles or policies;
- Establishment of lines separating SRRs if relevant;

- Whether other treaties, agreements, etc., exist which should be superseded or accounted for in preparation of a new agreement; and
- Relevant guidance of the IAMSAR Manual, National SAR Supplement, and other pertinent directives.

36. Participants which develop any agreement dealing with civil SAR shall ensure that such efforts are coordinated with other interested Participants.
37. Any such international agreement may not be signed or otherwise concluded without prior consultation with the Secretary of State (see Title 1 USC 112b).

NATIONAL SEARCH AND RESCUE COMMITTEE

38. The sponsor of this Plan is the National Search and Rescue Committee. The National Search and Rescue Committee, consistent with applicable laws and executive orders:
    - Coordinates implementation of this Plan;
    - Reviews matters relating to the Plan affecting more than one Participant, including recommendations for Plan revision or amendment;
    - Encourages federal, state, local and private agencies to develop equipment and procedures to enhance national capabilities for implementing the Plan; and
    - Promotes coordinated development of all national resources for this purpose.
39. In particular, the Committee is intended to accomplish the following:
    - Oversee this Plan;
    - Provide a standing national forum for coordination of administrative and operational civil SAR matters;
    - Provide an interface with other national, regional, and international organizations involved with providing or supporting civil SAR services;
    - Develop and maintain suitable guidance for implementation of this Plan, such as a National SAR Supplement to the IAMSAR Manual;
    - Promote effective use of all available resources for support of civil SAR;
    - Serve as a cooperative forum to exchange information and develop positions and policies of interest to more than one Participant;
    - Promote close cooperation and coordination between civilian and military authorities and organizations for provision of effective civil SAR services;
    - Improve cooperation among the various SAR communities for the provision of effective services; and
    - Determine other ways to enhance the overall effectiveness and efficiency of SAR services, and to standardize procedures, equipment, and personnel training where practicable.

SAR SERVICES COVERED BY THIS PLAN

40. This Plan covers civil SAR operations such as:
    - Maritime (involving rescue from a water environment);

- Aeronautical (including SAR assistance in the vicinity of airports);
- Land (including SAR operations associated with environments such as wilderness areas, swift water, caves, mountains, etc.)
- Provision of initial assistance at or near the scene of a distress situation (e.g., initial medical assistance or advice, medical evacuations, provision of needed food or clothing to survivors, etc.);
- Delivery of survivors to a place of safety or where further assistance can be provided; and
- Saving of property when it can be done in conjunction with or for the saving of lives.

NOTE: Outside national parks, state and local authorities or SAR units often accept responsibility for providing domestic land SAR services.

41. Civil SAR does *not* include operations such as:

- Air ambulance services which did not result from a rescue or recovery operation;
- Assistance in cases of civil disturbance, insurrection or other emergencies which endanger life or property or disrupt the usual process of government;
- Rescues from space (although rescue of persons returned from space can be included);
- Military operations, such as combat SAR or other types of recovery by military operations to remove military or civilian personnel from harm's way;
- Salvage operations;
- Response to natural or man-made disasters or terrorist incidents; and
- Typical disaster response operations, such as: assisting large numbers of persons in distress as the result of natural or man-made disaster situations; locating and rescuing victims trapped in collapsed structures; or other assistance provided under the scope of the Federal Response Plan.

NOTE: No provision of this Plan or any supporting plan is to be construed as an obstruction to prompt and effective action by any agency or individual to relieve distress whenever and wherever found.

EXTENT OF MUTUAL ASSISTANCE

42. The Participants agree to cooperate as follows:

- Support each other by pooling relevant facilities and support services as appropriate for operations within their respective SRRs, and consistent with each participant's relevant legal authorities;
- Make, and respond to, requests for operational assistance between the designated RCCs, RSCs, or comparable command centers (CCs) of the Participants as capabilities allow;
- Develop procedures, communications, and databases appropriate for coordination of facilities responding to distress incidents, and for coordination between the RCCs, RSCs or CCs of the Participants;

- Normally follow applicable guidance of the IMO, ICAO, or other relevant international bodies regarding operational procedures and communications; and
- In areas where more than one authority may respond to distress situations, agreed procedures should be in place, which balance concerns for saving lives and for jurisdiction.

43. The Participants may also enter into other collaborative efforts with each other such as:

- Mutual visits, information exchanges, and cooperative projects for support of SAR;
- Joint training or exercises;
- Cooperation in development of procedures, techniques, equipment, or facilities;
- Establishment of groups subordinate to the National Search and Rescue Committee as a means for more in-depth focus on matters of common concern; and
- Carry out cooperative efforts similar to those indicated above on an international level.

GENERAL TERMS

44. Cooperative arrangements between a Participant with operational responsibilities and state, local, and private agencies should provide for the fullest practicable cooperation of such agencies for operational missions, consistent with the willingness and ability of such agencies to act, and for such coordination by the responsible RCC, RSC, or CC of their facilities as may be necessary and practicable.

45. Participants with operational responsibilities may request assistance from other federal agencies having capabilities useful for a mission.

46. The federal government does not compel state, local or private agencies to conform to this Plan; such entities can direct and control their own facilities within their boundaries, and cooperation will be pursued through liaison and consultation.

CHARGING FOR SAR SERVICES

47. Each Participant will fund its own activities in relation to this Plan unless otherwise arranged by the Participants in advance, and will not allow a matter of reimbursement of cost among themselves to delay response to any person in danger or distress.

48. The Participants agree that SAR services that they provide to persons in danger or distress will be without subsequent cost-recovery from the person(s) assisted.

49. In accordance with customary international law, when one nation requests help from another nation to assist a person(s) in danger or distress, if such help is provided, it will be done voluntarily, and the U.S. will neither request nor pay reimbursement of cost for such assistance.

PRINCIPLES ACCEPTED BY THE PARTICIPANTS

General

50. Participants coordinating operations should, consistent with applicable laws and executive orders, organize existing agencies and their facilities through suitable agreements into a basic network to assist military and non-military persons and property in actual or potential danger or distress, and to carry out obligations under customary international law and international instruments to which the U.S. is a Party.

51. The Participants will seek to keep political, economic, jurisdictional, or other such factors secondary when dealing with civil lifesaving matters, i.e., where possible, what is best for lifesaving will govern their decisions.
52. Consistency and harmonization will be fostered wherever practicable among plans, procedures, equipment, agreements, training, terminology, etc., for the various types of lifesaving and recovery operations, taking into account terms and definitions adopted internationally as much as possible.
53. Terminology and definitions used throughout the U.S. SAR community will be standardized to the extent possible, and be as consistent as possible with usage in pertinent international conventions and the IAMSAR Manual.
54. If a distress situation appears to exist or may exist, rescue or similar recovery efforts will be based on the assumption that a distress situation does actually exist until it is known differently.
55. Assistance will always be provided to persons in distress without regard to their nationality, status, or circumstances.
56. Generally, cost-effective safety, regulatory, or diplomatic measures that tend to minimize the need for U.S. SAR services will be supported.
57. Close cooperation will be established between services and organizations, which may support improvements in lifesaving functions in areas such as operations, planning, training, exercises, communications and research and development.
58. Recognizing the critical importance of reduced response time to the successful rescue and similar recovery efforts, a continual focus will be maintained on developing and implementing means to reduce the time required for:
    - Receiving alerts and information associated with distress situations;
    - Planning and coordinating operations;
    - Facility transits and searches;
    - Rescues or recoveries; and
    - Providing immediate assistance, such as medical assistance, as appropriate.

Aeronautical and Maritime Search and Rescue

59. All SAR personnel should be generally familiar with the International Convention on Maritime Search and Rescue of the IMO, the Convention on International Civil Aviation, Annex 12 ("Search and Rescue") of ICAO, the joint ICAO-IMO IAMSAR Manual, the National SAR Supplement, and other primary directives or information applicable to their work in civil SAR.
60. Local cooperative arrangements within the U.S. should be made in advance between SAR, air traffic, and airport authorities for close coordination in handling aircraft emergencies, unless the same authorities hold all the involved responsibilities.
61. The SAR principles and procedures of relevant customary international law and international Conventions and the IAMSAR Manual will serve as the framework for coordination of any SAR operations, and especially those involving multiple countries, organizations or

jurisdictions; U.S. organizational or operational SAR plans and provisions of the National SAR Supplement will be consistent with these international provisions to the extent practicable.

62. The U.S. Coast Guard will sponsor a global voluntary ship reporting system for maritime and aeronautical SAR and offer pertinent information from the associated database to recognized RCCs worldwide. (This system will be used only for SAR, with its information being treated as "commercial proprietary" as promised to the ships reporting. Continuation of this system as just described will be reconsidered if need for the reporting system changes, or acceptable alternative international systems develop.)

63. Operational responsibilities for maritime and aeronautical SAR will generally be associated with internationally-recognized geographic maritime and aeronautical SRRs, and a single federal agency will be given primary responsibility for coordinating SAR operations within each SRR, with other agencies and organizations providing support as appropriate. However, in some specific sub-areas, such as within national parks, other federal authorities may be responsible.

64. Distress situations involving airborne aircraft will normally be handled by the maritime or aeronautical SAR authorities responsible for the SRR concerned once the distressed aircraft is down, and cooperatively between these authorities and air traffic service authorities as long as the aircraft remains airborne.

    NOTE: Land SAR services may include aeronautical SAR operations. Involvement of Participants in such operations may be governed by agreements between SAR coordinators and various state and local authorities. Participants will support such operations as appropriate, bearing in mind the provisions of paragraph 7 of this Plan.

Coordination of Operations

65. Each agency responsible for operations under this Plan will:

    - Keep information readily available on the status and availability of key SAR facilities or other resources which may be needed for operations; and
    - Keep each other fully and promptly informed of operations of mutual interest, or which may involve use of facilities of another Participant;

66. SAR Coordinators will delegate to their RCCs the authority to:

    - Request assistance via other RCCs/RSCs including those of other nations;
    - Promptly respond to requests for assistance from other RCCs/RSCs, including those of other nations as discussed below;
    - Grant permission for entry into the U.S. of SAR facilities of other countries; and
    - Make arrangements with appropriate customs, immigration, health or other authorities to expedite entry of foreign SAR facilities as appropriate

67. SAR Coordinators will authorize their RCCs to arrange promptly or in advance for entry of foreign rescue units into the U.S. should it ever become necessary. Such arrangements should involve appropriate U.S. authorities as well as proper authorities of the nation or SAR facility involved with the entry. Such entry may include overflight or landing of SAR aircraft, and similar accommodation of surface (land or water) SAR units) as circumstances dictate for fueling, medical, or other appropriate and available operational support, or delivery of survivors,

or it could also be in response to a request from a U.S. RCC to the RCC of another nation for assistance of those facilities.

68. Establishment of JRCCs, and of jointly sponsored and staffed RCCs or RSCs, are encouraged where appropriate.

69. Operations of SAR facilities committed to any SAR mission normally should be coordinated, and, as appropriate, directed, by an appropriate RCC or RSC consistent with the provisions of this Plan.

70. On scene coordination may be delegated to any appropriate unit participating in a particular incident under the cognizance of the SAR mission coordinator at an RCC or an incident commander.

71. No provision of this Plan or any supporting plan is to be construed as an obstruction to prompt and effective action by any agency or individual to relieve distress whenever and wherever found.

72. If an RSC is established by any agency, it must operate under the oversight of an RCC, and be responsible for certain tasks or for portions of the RCC's SRR, as determined by the agency concerned.

73. SAR Coordinators shall arrange for the receipt of distress alerts originating from within SRRs for which they are responsible, and ensure that every RCC and RSC can communicate with persons in distress, with SAR facilities, and with other RCCs/RSCs

Incident Command System

74. A coordination system often used in local areas, and for emergency response scenarios involving multiple agencies and multiple jurisdictions, is the Incident Command System (ICS).

75. When SAR forces become involved in situations where ICS is being used, an on scene incident commander will be in charge of coordinating operations overall. In such cases the SAR mission coordinator or person designated by the SAR mission coordinator will normally serve as a SAR Agency Representative to the incident commander.

76. RCCs should normally use the coordination procedures of the IAMSAR Manual and the National SAR Supplement, but should also be familiar with the ICS system, and may use or support ICS as the situation warrants.

Military Roles and Military-Civilian Relationships

77. Arrangements between federal military and civil agencies should provide for the fullest practicable cooperation among themselves, consistent with statutory responsibilities and authorities and assigned SAR functions.

78. Cooperative arrangements involving DOD and Coast Guard commands should provide for the fullest practicable use of their facilities for civil SAR on a not-to-interfere basis with military missions, consistent with statutory responsibilities and authorities and assigned agency functions.

79. Participants with operational responsibilities should develop plans and procedures for effective use of all available SAR facilities, and for contingencies to continue civil SAR operations if military forces are withdrawn because of another emergency or a change in military missions.

80. DOD responsibilities under this Plan include support of civil SAR on a not-to-interfere basis with primary military duties, in accordance with applicable national directives, plans, guidelines, agreements, etc.

Resources

81. To optimize delivery of efficient and effective services, and, where practicable and consistent with agency authorities, provide the organizations and persons interested in supporting these services the opportunity to do so, all available resources will be used for civil SAR. Certain state and local governments, civil and volunteer organizations, and private enterprises have facilities, which contribute to the effectiveness of the over-all SAR network, although they are not Participants to this Plan.

82. To help identify, locate and quantify primary SAR facilities, Coast Guard and DOD commands may designate facilities which meet international standards for equipment and personnel training as "SAR units" (SRUs). (Such facilities do not need to be dedicated exclusively to the associated type of operations, and this designation is not intended to preclude use of other resources.)

83. Recognizing the critical role of communications in receiving information about distress situations and coordinating responses, and noting that such responses sometimes involve multiple organizations and jurisdictions, the Participants will work aggressively to develop suitable SAR provisions for:

- Interoperability;
- Means of sending and receiving alerting;
- Means of identification;
- Effective provisions for equipment registration and continual access to registration data by SAR authorities;
- Rapid, automatic, and direct routing of emergency communications;
- High system reliability; and
- Preemptive or priority processing of distress communications.

Technical and Support Services

84. The Participants will strive together to:

- Apply the most effective systems to save the most lives at the least operational risk and cost; and
- Foster innovation in technical, administrative and informational systems, which will improve the ability of the Participants and associated non-governmental organizations to carry out their civil SAR duties.

85. Management, operational, and support personnel of the Participants will be partners, assisting each other with the goal of maximum operational effectiveness.

86. Priority goals of the Participants shall include:

- Make distress alerts and associated data available to operational personnel as quickly, comprehensively, and reliably as possible;

- Provide communications systems which are highly reliable, simple, problem-free, interoperable, and as functionally effective as possible; and
- Enable operational personnel to be as highly effective in planning and conducting operations as possible, by providing them with the training, equipment, procedures, facilities, information, and other tools necessary to carry out planning and operational duties in a consistent, highly professional, and effective manner.

87. Participants should:

- Encourage development and maintenance of proficiency in SAR techniques and procedures by other agencies participating in civil SAR, and assist them as appropriate;
- Encourage continued development of state and local SAR facilities as appropriate; and
- Enter into agreements, as appropriate, with State, local, and private organizations to provide for the fullest practicable cooperation in civil SAR consistent with their capabilities and resources, and to account for use of federal facilities in SAR missions with which these organizations are involved.

Suspension or Termination of Operations

88. SAR operations shall normally continue until all reasonable hope of rescuing survivors or victims has passed.

89. The responsible RCC/RSC concerned shall normally decide when to discontinue these operations. If no such center is involved in coordinating the operations, the OSC or IC may make this decision. If there is no OSC or IC involved, the decision will be made at an appropriate level of the chain-of-command of the facility conducting the operations.

90. When an RCC/RSC or other appropriate authority considers, on the basis of reliable information that a rescue or recovery operation has been successful, or that the emergency no longer exists, it shall terminate the SAR operation and promptly so inform any authority, facility or service which has been activated or notified.

91. If an operation on-scene becomes impracticable and the RCC/RSC or other appropriate authority concludes that survivors might still be alive, it may temporarily suspend the on-scene activities pending further developments, and shall promptly so inform any authority, facility or service which has been activated or notified. Information subsequently received shall be evaluated and operations resumed when justified on the basis of such information.

ENTRY INTO FORCE, AMENDMENT, OR TERMINATION

92. This Plan:

- shall enter into force effective January 1, 1999;
- may be amended by written agreement among the Participants; and
- may be terminated or superseded by a new Plan or by written agreement among the Participants.

An individual Participant may terminate its status as a Participant to this Plan by notifying the other Participants in writing at least six months in advance of such termination. Since the National Search and Rescue Committee sponsors this Plan, and it is intended that the Participants to this Plan

correspond to the member agencies of that Committee, such termination will be deemed to also terminate the Participant's membership on the Committee.

For the Department of Transportation

_____

Date: _____

For the Department of Defense

_____

Date: _____

For the Federal Communications Commission

_____

Date: _____

For the Department of Commerce

_____

Date: _____

For the Department of Interior

_____

Date: _____

For the National Aeronautics
and Space Administration

_____

Date: _____