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Study of inland water transport in India - with emphasis on harmonization of rules

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A STUDY ON INLAND WATER TRANSPORT IN INDIA — WITH EMPHASIS ON HARMONIZATION OF RULES.

by

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INDIA

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

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MARITIME SAFETY ADMINISTRATION

(MARINE ENGINEERING)

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

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A study on
INLAND WATER TRANSPORT IN INDIA
— WITH Emphasis On
HARMONIZATION OF RULES.

By

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M.S.A(E),'88
INDIA

CONTENTS

INVOCATION

"Thou art the Heavens, O ADITI
And Thou art the Unfathomable Space
By Thee we are measured and protected
And Thou art us, Thy Children
Thou art all the Gods in Heaven
Thou art the Five Nations
Thou art our Present and Future
Thou the Measure of Goodness
Thou the Mistress of Righteousness
To Thee we tender our offering
Far flung are Thy domains
Ever widening, ever prospering
Happy, O ADITI, and Blessed is Thy Guidance
With Thy Blessings we embark on this Ship
That rides well the waves
So broad in beam and spaceous, comfortable, resplendent
Blessed are her courses, her rudders strong
Faultless in construction, her bilges dry
So with the words of Praise to Thee,
we embark on this venture
That prosperity may flow
With Thy thrice Blessed Protection, O ADITI
Who are Thyself the spirit of the Earth
And the Space and the Heavens"

...ATHARVA VEDA

ABSTRACT

Presently in India there are various Acts and Regulations controlling the Inland Vessels. Since these regulations are framed by the different authorities there are many variations in the rules controlling the industry.

It is not the purpose of this paper to set out rules for the Inland Vessels. The aim of this paper is to achieve harmonised standard for examination and survey of the inland vessels as well as examination and certification of personnel serving on board these vessels. Also to incorporate in the rules the immediate need for prevention of pollution of inland waters by the inland vessels, on the basis of different acts of the country, since none of the existing rules for the inland vessels deals with the question of pollution from these vessels.

The paper projects the need for **one rule** and standardisation of navigational aids throughout the country, so that for examination as well as for actual navigation, operators do not face any practical difficulty.

INTRODUCTION

One may wonder why a person engaged in Maritime Safety Administration choose to write about the inland water transport. To satisfy their inquisitiveness it is most essential to point out that the choice of the subject is due to the following reasons :-

i) I had the privilege of opening an inland water route through international river way covering a distance of about 2500 Km. This personal experience of mine has given me the insight of the problems faced in inland water transport.

ii) In India the Inland Vessel Rules are administered by the Maritime Safety Administration under Central Government in most of the states. Hence it is a part of the duty of the maritime safety administrators.

iii) It is being considered to declare the major rivers in India as National Waterways, and the importance of the inland water transport has been realised by the government which will be clear from the following statements ;

(a) Big push for river transport -

"The Central Inland Water Transport Corporatation(CIWTC), is poised for a big expansion with a major thrust being given to it in the Seventh Five Year Plan, according to Mr.P.P.Nayyar,Seceratary to the Ministry of Surface Transport.Speaking at the keel laying ceremony of six dumb barges of 750tons each for the CIWTC at the Hindustan Shipyard Limited(HSL) here

today, he said that only a token investment was made in the CIWTC in the Sixth Plan but now with the government's assumption about the potential of inland water transport proving right, major modernisation plans for the corporation were afoot." This news item was published by Indian Express a leading news paper of India on 3rd August,1987, covering the ceremony that took place in Visakhapatnam on 2nd August,1987.

(b) Huge potential on great rivers - "Of the 100 operating tugs and barges, many have become old and uneconomical to run, and replacement with modern efficient vessels will increase the effective capacity. With length and draft limitations because of the narrow, winding shallow channels, tonnage is limited to about 1500 tons - 2 barges and a pusher tug with draught of about 1.8m. In comparison, the Western rivers of the U.S.A can handle 50,000 tons tow ! ------

----- The round trip between Calcutta and Assam now takes about 40 days including loading and unloading as night navigation is not possible. The Government has recognised the potential and is in the process of designating different stretches as National Waterways. A new body, the Inland Waterways Authority, has been formed to bring about the required navigational improvements and set up the allied infrastructure. ------

----- As the waterways are developed, I feel strongly that there will soon be a link-up between the inland waterways and coastal traffic. With our long coast line and Calcutta's industrial importance, I can see this happening in a few years." This statement of Mr.S.K.Bhose, Chairman & managing Director of Central Inland Water Transport Corporation was published by the Magazine of Lloyd's Register, January,1987 issue.

From above it is clear that the inland water transport has taken an important place in Indian life. Furthermore, the keen interest with which the government is trying to boost the inland water transport system in India, has also given an impetus to look deep into the subject.

In view of this the aim of this paper is to study, analyse and provide material so that the Inland Vessel Rules, which are the direct concern of the safety administrators, can be harmonised and improved throughout the country for ease of operation, safety and training.

CHAPTER - I

HISTORY OF INDIAN INLAND WATER TRANSPORT

1.1 Shipping in India is as old as our civilisation. The long and broad rivers of India have always played a great part in the development of the society. Small units of human habitation sprang up along their fertile banks and soon developed into the great cities of the past. Waterways helped to establish communication among these different cities. Thus, the call of the waters reached out not only to the people on the coastal territories but also to those in the hinterland.

1.2 The first evidence of Indian shipping is to be found along the archaelogical remains of Mohenjo-Daro, which are 5000 years old. Among these remains have been discovered seals and other relics depicting boats built and used in ancient India.

1.3 In Vedic literature (oldest literature of Hindu civilisation), however, there are a number of references to marititme activities. It is evident from a hymn in the Atharva Veda Samhita,quoted in the invocation, that the boats rode "well the waves" were "broad in beam and spacious, comfortable, resplendent,rudders strong, faultless in construction --"

1.4 It is clear from references in Greek literatu-

re that shipping was an important activity in India as early as 325 B.C. The references of Arrian and Pliny, about the shipping and shipbuilding activities in India, in their works are the examples.

1.5 Such was the development of Indian shipping in the age of the Mauryas. Pataliputra, modern Patna, on the bank of river Ganga was a prosperous and important river port and city.

1.6 Yuktikalpataru, an ancient Sanskrit manuscript, is a complete treatise on the art of ship-building in ancient India. A study of the manuscript reveals interesting details about the size, shape and the use of different types of vessels. There were two main classes of ships, according to their sizes- SAMANYA, or Ordinary, intended for inland traffic and VISESA, or Special, for seagoing purposes. There were again ten different types of Samanya vessels. Yuktikalpataru gives full details of their measurements in length, width, depth and height.

1.7 It will not be out of place here to quote Mr. H.M.Trivedi, Hon. ex-Minister of Shipping in India, from his book "Indian Shipping in perspective" :"India had a maritime tradition dating back to centuries. But for historical reasons that the tradition died. Shipping or Water Transport includes transport on navigable rivers and inland waterways and such transport plays an important part in a nation's economy. The cost of operation, even in the case of artificially navigable canals are comparatively small.

1.8 India has approximately 26,000 miles of inland waterways much higher as compared to its coast line of

4500 miles, but generally speaking is not endowed by Nature with very good navigable waterways. Mainly on that account river transport in India has not developed to any great extent."

1.9 Government of India after realising the importance of the inland water transportation formed Central Inland Water Transport Corporation in 1967. In the words of Mr. S.K.Bhose, Chairman and Managing Director of this corporation, "Inland waterways have a huge potential in India; people are realising that this is economic and efficient means of transport. --------

-----There are about 5000 Kms of waterways in India navigable by mechanised craft. C.I.W.T.C is the biggest inland waterways organisation operates over 2500 Km on the Ganga (Ganges as the Westerners call it) and Brahmaputra.

The Government has recognised the potential and is in the process of designating different stretches as National Waterways. A new body, The Inland Waterways Authority, has been formed to bring about the required navigational improvement and set up the allied infrastructure."

1.10 Thus the history of the inland water transport in India can be traced back from the days of civilisation to the modern era, of course with a decline and set back due to historical reasons.

1.11 Hence,it can be said that inland waterways system and allied activities like boat building, formulation and implementation of rules ensuring safety and efficiency, in India is a revival and not recent development.

CHAPTER - II

INLAND WATERWAYS

2.1 India is a country adorned by many rivers. Some are major and some are minor or tributary. Some rivers are perennial whereas some are just seasonal. Of these a few are of extreme importance both for navigation as well as irrigation. These rivers are Ganga, Brahmaputra, Krishna, Cauvery, Godavari, Beas, Sutlej, Narmada, Mahanadi etc.

2.2 Without any special reference to the type of the vessel, it can be stated that more or less all the rivers and their tributaries are being utilised as inland waterways to certain extent.

2.3 Inland water may be defined as a canal, a river or a lake or other navigable water. Section 70 of the Inland Vessels Act, 1917 states that the Central Government may by notification in the Official Gazette define how much of any tidal water shall be deemed to be an inland water for the purpose of this Act. Under this provision some states have defined Inland Waters in the rules. Some of these definitions are very old and have not been ammended with the development of port activities or passage of time.

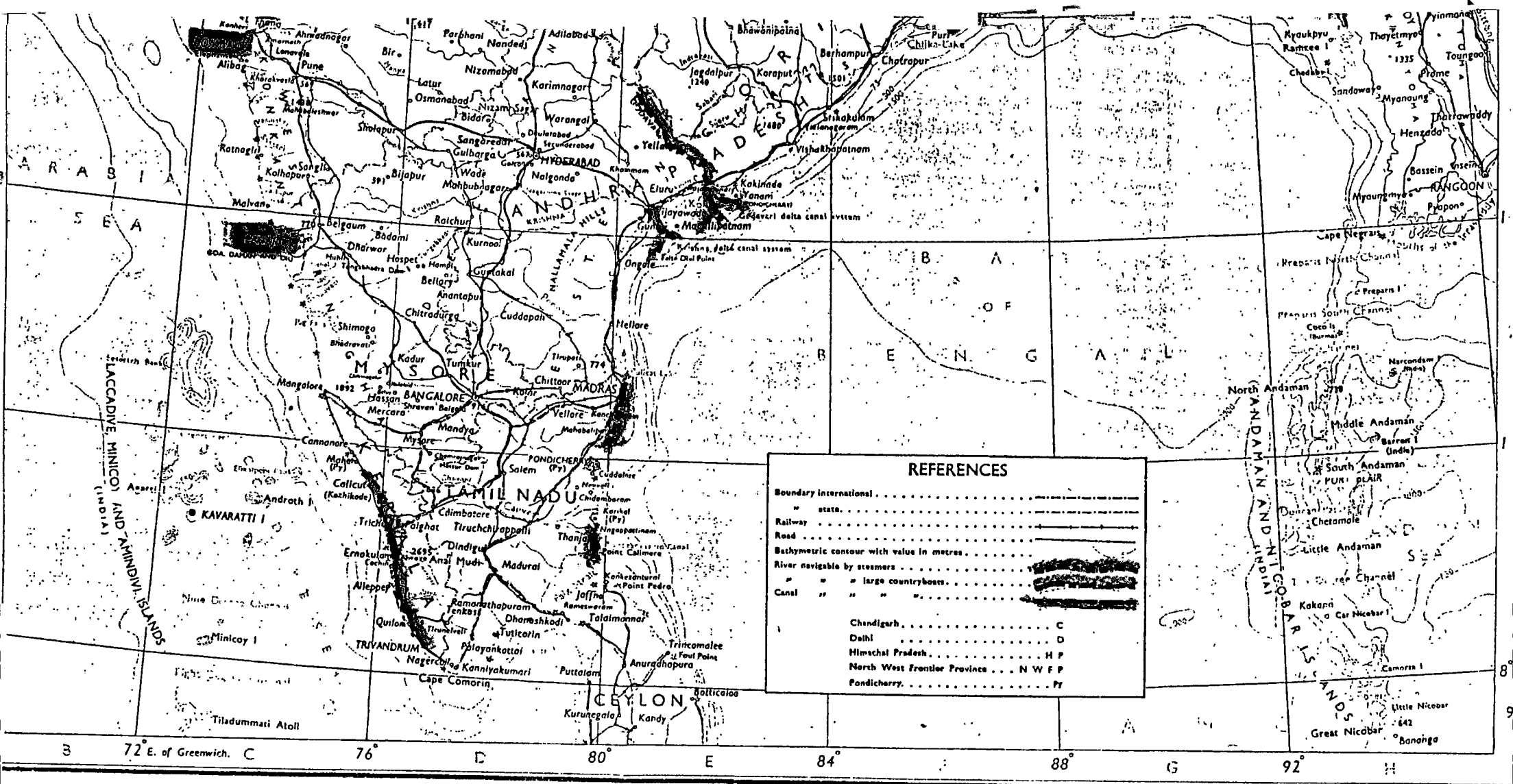
2.4 In India many committees were set up to go into the question of declaring important waterways as

National Waterways. All these committees submitted their reports to the Central Government.

2.5 The following table shows the statewise distribution of navigable rivers and canals in the country as assessed in 1973. This table does not include the part of the sea which falls under the category of Inland Water.

No.	STATE	Navigable length in Kilometers		
		River	Canal	Total
1.	Andhra Pradesh	309	1690	1999.
2.	Assam	1983	-	1983.
3.	Bihar	937	325	1262.
4.	Goa	317	25	342.
5.	Gujarat	286	-	286.
6.	Jammu & Kashmir	170	-	170.
7.	Kerala	840	708	1548.
8.	Karnataka	284	160	444.
9.	Maharashtra	501	-	501.
10.	Orissa	761	224	985.
11.	Tamilnadu	-	216	216.
12.	Uttar Pradesh	2268	173	2441.
13.	West Bengal	1555	782	2337.
	TOTAL --	10,211.	4303.	14,514.

2.6 Thus the total navigable length of the inland waterways may be considered as 14,500 Kms. Of this around 2000 Kilometers of water route are being utilised for navigation by mechanically propelled vessels. The map in the next page gives an idea of the location of these waterways. The copy of the map does not depict the part of the sea which falls under the category of inland



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Boundary international	
" state	
Railway	
Road	
Bathymetric contour with value in metres	
River navigable by steamers	
" " " large countryboats	
Canal " " "	

Chandigarh	C
Delhi	D
Himachal Pradesh	H P
North West Frontier Province	N W F P
Pondicherry	Pr

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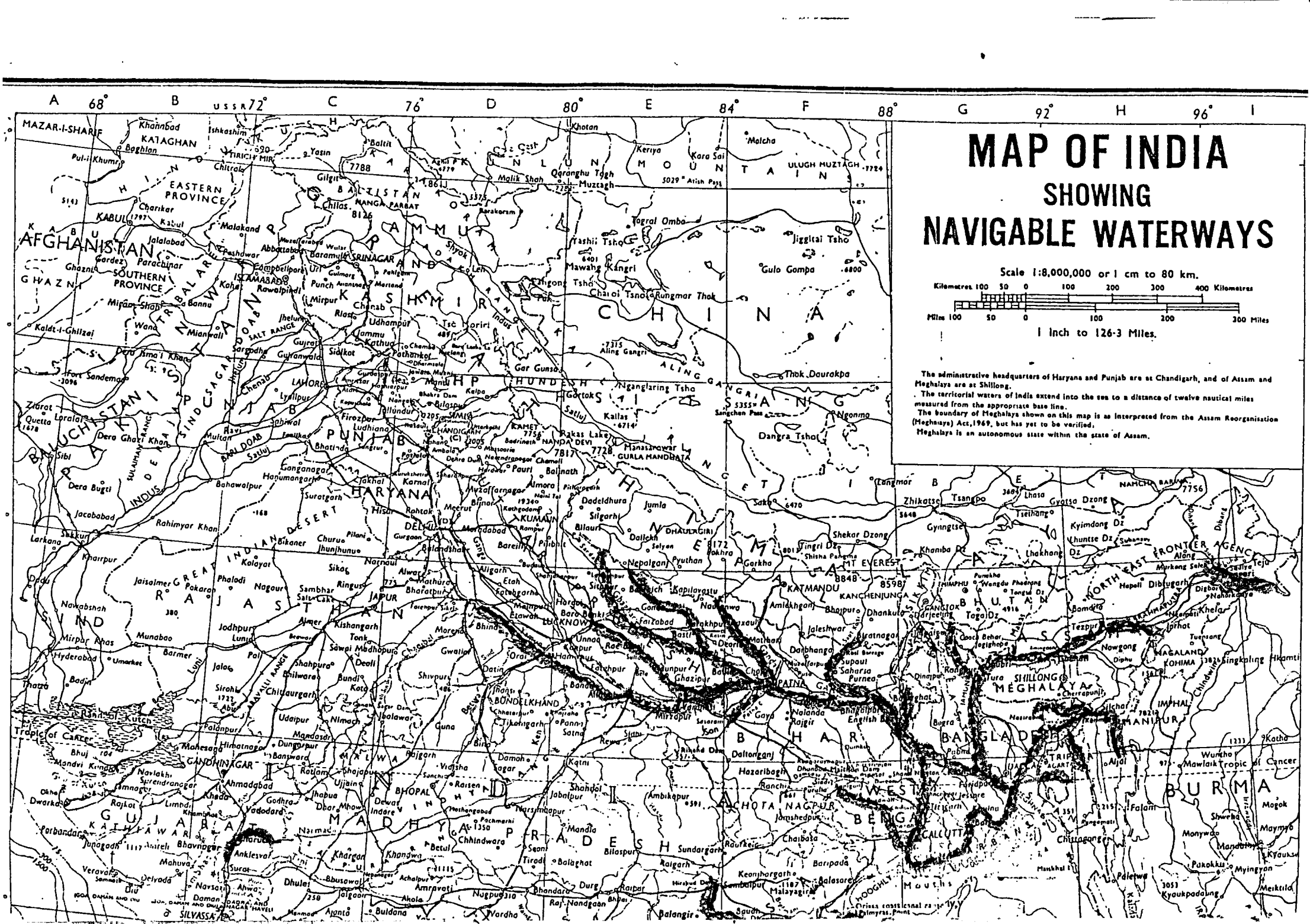

MAP OF INDIA
SHOWING
NAVIGABLE WATERWAYS
Scale 1:8,000,000 or 1 cm to 80 km.
Kilometres 100 50 0 100 200 300 400 Kilometres
Miles 100 50 0 100 200 300 Miles
1 Inch to 126·3 Miles.
The administrative headquarters of Haryana and Punjab are at Chandigarh, and of Assam and Meghalaya are at Shillong.
The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.
The boundary of Meghalaya shown on this map is as interpreted from the Assam Reorganisation (Meghalaya) Act,1969, but has yet to be verified.
Meghalaya is an autonomous state within the state of Assam.
A 68° B 72° C 76° D 80° E 84° F 88° G 92° H 96° I
AFGHANISTAN
PAKISTAN
CHINA
NEPAL
BHUTAN
BURMA
BANGLADESH
PUNJAB
HARYANA
RAJASTHAN
GUJARAT
MADHYA PRADESH
UTTAR PRADESH
BIHAR
WEST BENGAL
ASSAM
MEGHALAYA
MANIPUR
NAGALAND
NORTH EAST FRONTIER AGENCY
SIKKIM
JAMMU AND KASHMIR
DELHI
CHANDIGARH
GREAT INDIAN DESERT
KATMANDU
CALCUTTA
SRINAGAR
LAHORE
ISLAMABAD
KABUL
LUCKNOW
PATNA
SHILLONG
IMPHAL
Tropic of Cancer

CHAPTER - III

NAVIGATION

3.1 The seasonal variation in water levels in some of the major rivers between the monsoon and the dry season is of the order of 9 to 10 metres and more at times. This fluctuation causes caving of the river banks and opening of spill channels strewn with shifting shoals and islands, making SAFE NAVIGATION a difficult proposition. The nature or the trend of flow of the river also has a major role to play in safe navigation. The sharp bends, narrow channels or trough-shaped cross sections require different types of control with respect to navigation. In the absence of standards of aids to navigation, the person navigating the vessel has to depend on his experience and local knowledge.

3.2 The observations quoted below , made by Prof. G. WIEDEMANN,Dr.Ing.,who held the position of the Ministerial dirigent, in charge of Safety of Waterways, in the Federal Ministry of Transport, Federal Repblic of Germany, in this respect, in his paper "Measure against risks on inland waterways", are very pertinent.

" Canals which are man made and which therefore have defined cross sections and depths, are more easily and safely navigated.

When the conditions are considered under which the passage of a ship takes place, it can be understood that even now-a-days groundings can not be ruled out.

The essential priority in aids of navigation is to mark the limits of the fairways and the dangerous shallows so that they can be recognised on board the ship in good time.

On the initiative of the International Navigation Congress, held in Rome in 1953, and supported by a resolution of the Conference of European Ministers of Transport in October,1953, an European Working Group succeeded in formulating a complete and modern marking system for inland waterways. No such system existed before this. During the time from 1954 to 1956 a plan was formulated which was accepted by the European Economic Commission of the United Nations at Geneva as Resolution No.1, and which it was recommended that both western and eastern governments should bring into force. The system now known as SIGNI, controls the marking of the lateral limits of a channel, the dangers, the position of deep water channel and (by means of buoys and beacons and panels) the obstructions. It also covers the marking of structures such as bridges and locks and signs giving restrictions, obligations, and information needed for safe navigation."

3.3 The safety and reliability of navigation on inland waterways is directly dependent on good visibility and the constant need for the vessel's crew to make use of the natural orientation points and artificial signs of the waterways. In the absence of any one of these, the orientation of the crew of the vessel also decreases delaying their reaction. As a result the speed is cut down and navigation becomes less regular until it stops completely. This results in a greater risk of accidents and a substantial decrease in the transport capacity of the waterway.

3.4 This is substantiated by the statement of the Chairman of Central Inland Water Transport Corporation(India),"The round trip between Calcutta and Assam now takes about 40 days including loading and unloading as night navigation is not possible." This results in a considerable rise in the Unit Cost Of Transportation. Under the prevailing conditions navigation is only possible for about 12 hours in a day. If night navigation is made possible the turn around time will approximately be about 20 days.

3.5 Presently, in India there is practically no marking of inland waterways and the Rules of the Road are made by different authorities for different states. The lack of marking of the fairways in inland waterways leads to total dependance on the local knowledge and experience. As a result of which grounding of the vessels are not very uncommon incidents.

3.6 In light of this it may be of relevance to discuss about SIGNI, referred to by Dr. Wiedemann. SIGNI stands for Signs and Signals In Inland Waterways. The Economic Commission for Europe under the auspices of the Economic and Social Council of United Nations has formed Inland Transport Committee to deal with selected problems relating to the harmonization of Safety Requirements for inland navigation in Europe. The committee has entrusted the job to a Group of Experts under the Working party. The Group of Experts has developed two standards namely,

i) Signs and Signals in Inland Waterways - SIGNI and ii) European Code for Inland Waterways - CEVNI .

3.7 SIGNI as indicated earlier deals strictly with the methods of marking on a particular waterway or water-

way net work. Thus proposing harmonization of the fair-way marking in inland waterways in Europe. The methods are elaborated in 8 different chapters. Any further detail is beyond the scope of this paper.

3.8 With respect to the harmonization of the Rules Of the Road for inland waterways in Europe, it is worth mentioning about CEVNI. Besides dealing with Visual Signals(Marking) on Vessels and other relevant requirements in connection with navigation, the Rules Of the Road have been elaborated in great length.

3.9 Through the application of the recommendations by Governments and river commissions, the corresponding regulations in force on European inland waterways have to a large extent been harmonized.

3.10 The United States, which next to U.S.S.R, has the largest network of inland waterways in the world, also taken the steps to harmonize the Navigation Rules. United States Coast Guard, under the U.S. Department of Transportaion, has formulated and published Unified Inland Navigation Rules. This publication is a unique one in the sense that it has adopted a side-by-side presentation of the International and the Inland Rules.(Annexure-1) These rules have become effective on December,1981 for all inland waters except the Great Lakes, where it became effective from March,1983, thus unifying the rules for all the inland waters of U.S.A. Prior to this unification many different rules were applicable which have been revoked.

3.11 The Indian scenario in the same context is the existence of

(a) Rules for the protection of inland steam-vessels from danger by collision:Notification No.40 Marine, dated the 24th April, 1928. (Annexure-2)

and (b) Rules to regulate the navigation of inland steam-vessels on the river Hoogly:- Notification No.105 Marine, dated 4th August,1914.(Annexure-3)

Both under section 52 of the Inland Steam-Vessel Act,1917 (I of 1917), as published in the Manual of Regulations by the Government of West Bengal. Whereas, the Government of Goa under the provision of the same section of the same Act, has incorporated similar rules in the Inland Steam-Vessels (Construction and Survey) Rules,1965, as Appendix.(Annexure-4) An in depth scrutiny of these two rules exposes quite a few variations. Of course the rule (b) mentioned above, is intended for the river in particular. Which it is felt can be avoided by the use of proper signs and markings discussed earlier.

CHAPTER - IV.

VARIOUS ACTS AND SURVEYS

4.1 In India, pursuant to the Inland Vessels Act,1917 (as modified upto December,1977), the State Government is authorised to make and implement rules related to all activities of the inland mechanically propelled vessels. To make the point clear it may be stated that under the provision of the various sections of the above mentioned Act, the State Government may make rules as to :-

1) Surveys;
2) Registration;
3) Grant of Certificate of Competency;
4) Grant of Licences;
5) Protection from Accidents;
6) Carriage of Passengers;
7) General Rules etc.

4.2 In comparision, in the countries like Federal Republic of Germany, United States of America, who have large network of inland waterways, the Federal Government has the responsibility with respect to all the activities regarding the inland waterways and vessels. This is clearly indicated by the statement of Mr. Manfred Ueberschaer,of the Department of Transportation Planning, Ministry for Urban Development,Housing and Transport of the State North Rhine - Westphalia, F.R.G, "According to the Federal Constitution of Germany, the Federal

Government is responsible for planning, construction, maintenance and operation of all waterways --------". In U.S.A, the U.S.Maritime Administration is the federal agency responsible for this. The United States Coast Guard is the law enforcing agency of the government on the water. A brief description of the structure of the US Shipping Industry will probably highlight the situation further.

4.3 The shipping industry consists of a number of major and minor components, generally categorized under foreign , domestic or inland water shipping.

4.4 Inland water transportation is performed largely by river barges, engaged primarily in the carriage of dry and liquid bulk commodities.

4.5 US Maritime Administration(MarAd) is the federal agency responsible for allocating all forms of government aid and service to the US merchant marine. MarAd promotes and undertakes maritime research and development. In addition it supports the development of domestic and inland water transportation.

4.6 The Environmental Protection Agency(EPA), pursuant to the authority of the National Environmental Policy Act(NEPA) of 1969, reviews the planning and implementation of many aspects of inland waterway construction and maintenance for compliance with environmental requirements. As a result, the Army Corps of Engineers must tailor its navigational channel and inland water project planning approach to meet EPA requirements. Additional regulations affecting waterway projects administered by the EPA are the Federal Water

Pollution Control Act Amendments of 1972. These statutes modify the method and degree of dredging operations conducted for inland water construction and maintenance of navigation improvement projects. The Coast Guard is responsible for regulation and inspection of marine environmental pollution under both the Port and Tanker Safety Act of 1978 and the Federal Water Pollution Control Act Ammendments of 1972.

4.7 Thus only one authority being responsible for the industry, the probabilities of having any kind of variation in the rules is practically nil.

4.8 By entrusting the responsibility, of making rules, to the state governments having different types of inland waters, like part of sea or only river,as declared by the Central Government,and excluding certain part of the country from the Inland Vessels Act, the possibilities of drastic variations in the rules are very much high.

4.9 The situation is further aggravated by the existence of many other Acts besides The Inland Vessels Act,1917(I of 1917), namely:-

1. Northern India Ferries Act, 1878;
2. Bengal Ferries Act, 1885;
3. Cochin Public Canals and Backwater Navigation Act;
4. Travancore Public Canals and Public Ferries Act;
5. Madras Canals and Public Ferries Act,1890;
6. Bombay Ferries Act, 1908;
7. Hyderabad Ferries Act, 1914.

as well as section 68 of I.V.Act, which empowers the

state government to modify application of Act to certain inland mechanically propelled vessels, and of course not forgetting the various Port Acts, which authorise each and every port authority to frame their own rules for inland vessels plying within the port limits.

4.10 At the same time for the majority of country craft, carrying both cargo as well as passengers, beyond the port limits, there are no regulatory measures for exercising control on their river worthiness.

4.11 To highlight the possibilities of the variations pointed out earlier it may be stated that the Inland Vessels Construction and Survey Rules of different states differ to the extent that in some rules, the extent as well as types of surveys to be carried out are not mentioned at all. Thus, in one state an inland vessel may undergo;

a) A survey before the vessel is put in service.

b) A periodical survey once in every twelve months including an inspection of the whole of the hull in drydock, boilers, machinery and equipment.

and c) Additional surveys as occasion arises.

In another state for a similar vessel the requirements are not mentioned in the rules. These are indicated under General Instructions, only to a certain extent. This can be noticed in :

A) Draft Inland Steam Vessels (Construction and Survey) Rules 1975, of the Government of Maharashtra.

and B) Inland Steam Vessels (Construction and Survey) Rules 1965, of the Government of Goa,Da-

man and Diu.(Annexure-5&6 respectively)

4.12 Due to this variance, the employment scope of the inland vessels as well as personnel are practically restricted within the state. Although in the Act there is provision for the acceptance of the certificates by any other state.

4.13 To complicate the situation further, many of the states in India, having inland water transport system, do not have their own rules with respect to the inland vessels. If an operator intends to take advantage of this situation, he can get his vessel registered in one of these states under the provision of the Inland Vessels Act and ply the vessel without really undergoing any statutory control. There is no provision or system of checking the vessels, like under the provision of Port State Control of International Conventions, by the state authority. Hence, the vessel will not only jeopardise the safety but also have the advantage of operating at a lower operational cost as compared to the vessels undergoing regular surveys and fulfilling all the requirements. This will give rise to inequal competetion and opportunity.

4.14 In contrest, in U.S.A, Germany or Norway the rules are framed in one source and are implemented throughout the country. All these rules relate to the intended service of the vessels. Thus U.S.A has got rules for:

1) Steel Vessels for service on Rivers and Intracoastal Waterways;

2) Bulk Carriers for service on the Great Lakes.

In Norway, the "Nordisk Boat Standard 83" have been wor-

ked out in cooperation with the maritime authorities of Denmark, Finland, Iceland, Norway and Sweden alongwith the Det Norske Veritas. Under this standard about 600,000 boats, covering about 1300 types, have been certified. This standard deals with vessels less than 15 metres. It mainly covers the following types of vessls:

1. Leisure Boat, 2. Commercial Vessel,
3. Fishing Vessel,4. Passenger Vessel,
5. Decked Vessel, 6. Open Vessel.

Germany has got rules for the classification and construction of Inland Steel Ships. Mostly all these rules cover a) Construction Rules for Hull;
b) Construction Rules for Machinery;
and c) Electrical Installation Constructio Rules.

4.15 The realisation of the importance of harmonization of the Inland Navigation Vessels Rules in Europe came in the International Navigation Congress, held in Rome in 1953. As a result of which, the Working Party on Inland Water Transport, of the Inland Transport Committee under the Economic Commission for Europe, indicated in Chapter III, made Recommendations on Technical Requirements for Inland Navigation Vessels. These recommendations deal with the following items in detail;

Hull, Freeboard and Safety Distance, Stability and Sub Division, Machinery, Electrical Installations, Hoisting Gear,Rigging and Equipment, Anchoring,Towing and Mooring, Liquefied Gas Installations for Domestic purposes, Steering Gear and Wheel House, Fire Protection, Life Saving Appliances, Pushers,Pushed Barges and Pushed Convoys, Special Provisions for Passenger Vessels, Automation, Crew Accommodation and Working Spaces.

Once these recommendations are applied by the Governments and River Commissions, the corresponding regulations on European Inland Waterways will be harmonized.

CHAPTER - V

PREVENTION OF POLLUTION

5.1 The Government of India took cognizance of the importance of the water pollution problem and promulgated The Water(Prevention and Control of Pollution)Act in 1974. This Act mainly deals with

i) Establishment of Boards - Central, State or Joint;

ii) Powers and Functions of the Boards

iii) Prevention and Control of water pollution

Under this jurisdiction the State Government is empowered to :

a) restrict the application of the Act to certain areas

b) obtain information with respect to flow or volume and other characterestics of any stream or well

c) take samples of effluents

d) prohibit use of stream or well for disposal of polluting matter etc.

e) restrict new outlet and new discharges

f) emergency measures in case of pollution of stream or well

iv) Funds, Accounts and Audit

v) Penalties and Procedures

vi) Power of Central and State Governments to make rules.

From the foregoing it is clear that pollution as such has

not been dealt with specifically in the Act.

5.2 The Environment(Protection)Act,1986 on the other hand has defined ;

a) Environment,
b) Pollutant,
c) Pollution,
d) Handling,
e) Hazardous Substance etc.

It is in this Act the question of transportaion of the pollutants has been considered.

5.3 The environmental problem has two components: "Excessive" quantitative depletion of natural and physical resources i.e "Depletion Problem" and change in the quality of these resources due to "Excessive" accumulation of waste material and energy waste due to human activity i.e. "Pollution Problem".

5.4 Like any other industry the inland water transport system is also a contributing factor to the pollution problem. Unfortunately neither the Inland Vessels Act, 1917 (as corrected upto December,1977) nor the Acts concerning Prevention and Control of Pollution like

i) The Water(Prevention and Control of Pollution) Act, 1974;
ii) The Water(Prevention and Control of Pollution) Cess Act, 1977;
iii) The Air(Prevention and Control of Pollution) Act, 1981;

and iv) The Environment(Protection) Act, 1986

refer to the Prevention of Pollution of River Waters by the Inland Vessels like we have one for sea.

5.5 The country simply did not become satisfied with respect to the prevention and control of pollution just by the various enactments. It also took positive steps in this field as will be clear from the following news item, published in Indian Express, a leading news paper of India, on December 24, 1987, which reads as follows:

Coastal Pollution Survey Begins - "A coastal pollution survey covering the entire coast line of India stretching along 5,697 kilometres is underway with the water pollution boards of Gujarat and Tamil Nadu taking the lead.

The survey is to identify the sources of pollution along the coast line and to undertake use-based classification and zoning of the coast. The 173 pollution monitoring stations set up along the coast line for water monitoring were decided on the preliminary surveys conducted." These stations are based in inland, coastal, offshore and high sea areas.

5.6 The ambitious Ganga Action Plan is another positive step in this direction. In many states the Sewage and Effluent Treatment plants have already been set up and commissioned under this plan, like one in the state of Bihar.

5.7 But again all these actions mainly if not only concentrate on the urban liquid waste, industrial liquid waste, surface run off from urban waste dumps etc. Probably the importance and the growth of the inland

water transport system was not envisaged during this period, as a result of which this industry was not taken into consideration. All the efforts and the expenses will be futile if the inland water transport system is allowed to cause pollution, however negligible it may be as compared to the other sources, due to the lack of any legislation.

5.8 The importance of the inland water transport as a potential source of pollution has led Environmental Protection Agency of U.S.A to promulgate Federal Water Pollution Control Act Amendments of 1972 as well as other federal laws and regulations for marine environments. The Marine Safety Manual of U.S Coast Guard specifically mentions about the Inspection and Repair of Tank Barges. It states,"Tank barges employed primarily in river or inland service, and generally handled alongside or by pushing ahead as opposed to being towed astern are subjected to the rigors of locking and fleeting operations which are not normally experienced by sea going barges or individually self propelled vessels. As a result of this unique service, some distinct structural problems have evolved.

Normal operations result in frequent structural deformation of a vessel's hull. The rubbing of barges against one another and against lock walls causes the hull plating in some areas of the vessel to wear thin (e.g. side plating against framing members, barge corners, ends, knuckles), while the majority of the plating remains in good condition. This rubbing of the plating not only diminishes the plate thickness in these areas, but causes plate deformation at the edge of the internals. Repeated deformation and metal working results in

many weakened areas which are very prone to crack initiation and growth. Such degradation of strength of the product envelope(i.e. the barge hull) makes such barges prone to pollution incidents resulting from the minor damage of routine operations or low energy collisions." This is also true in Indian condition. There are many such barges employed in carriage of oil and othr dangerous goods in inland waters.

5.9 While considering the problem of pollution or environmental protection the most important factor that is to be borne in mind is the cost - benefit. India is a financially backward country. Having this in mind we can not afford the luxury of having highly sophisticated equipment fitted or installed either on board the inland vessels or on land. We have to draw a line somewhere. Considering the fact that International Convention for the Prevention of Pollution from Ships, 1973 and Protocol 1978 i.e. MARPOL 73/78, has entered into force and India is a party to it, it is now obligatory for the country to provide for the reception facilities. In formulating the legislation for the Prevention of Pollution from Inland Vessels this fact should be taken into consideration.

5.10 Working Party of the Inland Transport Committee of UNESCO has drawn up recommendations for the control of water pollution by Inland Navigation Vessels with a view to reduce to a minimum the pollution caused by inland navigation vessels to European Waterways. These have been catagorised in the following groups :

1) Transloading Hydrocarbons or Dangerous Substances;

2) Discharge of Oil Residues, Petroleum Products and mixtures of such products with water, including washing water;

3) Chemical Products;

4) Garbage.

The most important aspect of these recommendations is that they do not involve high cost or finance, but they are very much practical. The recommendations are as follows :-

i) PREVENTION OF POLLUTION BY OILY MIXTURE

a) In order to prevent pollution by oily mixtures where a vessel has no on-board separator for cleansing the oil-polluted water approved by the Administration, provision must be made for collecting and storing all oily mixtures on board the vessel, for subsequent transfer to reception facilities. In the case of a vessel having a separator it will suffice for the vessel to have equipment for collection and storage of cleansing residue.

b) The storage tanks or other on-board facilities (engine room bilges) for the collection of oily mixtures shall be of sufficient capacity to hold the whole of the aforesaid mixtures during the vessel's sojourn in a region where discharge into reception facilities is impossible.

c) If storage tanks are used, they shall be equipped with

A manhole for access and cleaning;

An air vent;

An automatic level-indicator or other indicating devices.

d) If storage tanks are used, a special pipe lea-

ding to the open deck shall be provided for the discharge of oily mixtyres into reception facilities.

ii) PREVENTION OF POLLUTION BY GARBAGE

a) Passenger vessels and Cargo vessels except those that operate on short routes and can discharge their garbage regularly shall be equipped with garbage-collection and garbage- storage installations.

b) Garbage-collection and garbage-storage installations may either be removable or be incorporated in the vessels hull. They shall be equipped with a device for opening and closing the covers of the outer discharge apertures.

c) Removable receptacles for collection and storage of garbage shall be either containers or bins lined with plastic bags.

d) The design of the garbage-collection receptacles and their locations on vessels shall be such as to enable the garbage to be discharged from the vessel without risk of its being scattered or of its fouling the sides of the vessel.

e) Garbage-storage receptacles shall have covers fitting snugly over the loading aperture.

f) The total capacity of the installations shall be calculated on the basis of the amount of garbage collected during the period of vessel's sojourn in a region where discharge into reception facilities is impossible.

g) At the discretion of the administration, vessels may be equipped with garbage incinerators.

From above it is clear that the requirements are not expensive but are definitely effective to prevent pollution as indicated earlier.

5.11 Reference to pollution by wastes incidental to inland waters navigation is also made in "Helsinki Rules on the Uses of the Waters of International Rivers."

5.12 Thus it is seen that the importance of the pollution related to inland water navigation can not be overlooked. The observation made by Mr. P.C.Laha, Chairman-Cum-Managing Director of Metallurgical & Engineering Consultants(India) Ltd., Ranchi, in his paper "Environmental Protection - Present Indian Scenario and Fututre Needs", published in the Journal of the Institution of Engineers (India) - Bulletin, Vol.37 Number3, September 1987 issue is very prudent in this regard. It is true that, "Environmental protection today is no longer only a desirable objective but an attainable goal. It is not merely an issue of ethics but one that is linked with the survival of mankind and economic growth."

5.13 The sea compared to the inland waters is more voluminous and to a greater extent capable of absorbing the abuse caused by the pollutant. Inland waters being much more limited and directly in contact with inhabitation need much more attention. In case of the International conventions it may be stated that the country has rather been forced to accept the same due to the international obligations. In case of the inland water which is a direct concern of the country a much more pragmatic and positive thinking in part of the authorities are needed, so that not only the inland environment remains clean but also it does not lead to any kind of international conflict due to the pollution being carried over to the international waters like sea.

CHAPTER- VI.

TRAINING, EXAMINATION AND CERTIFICATE OF COMPETENCY

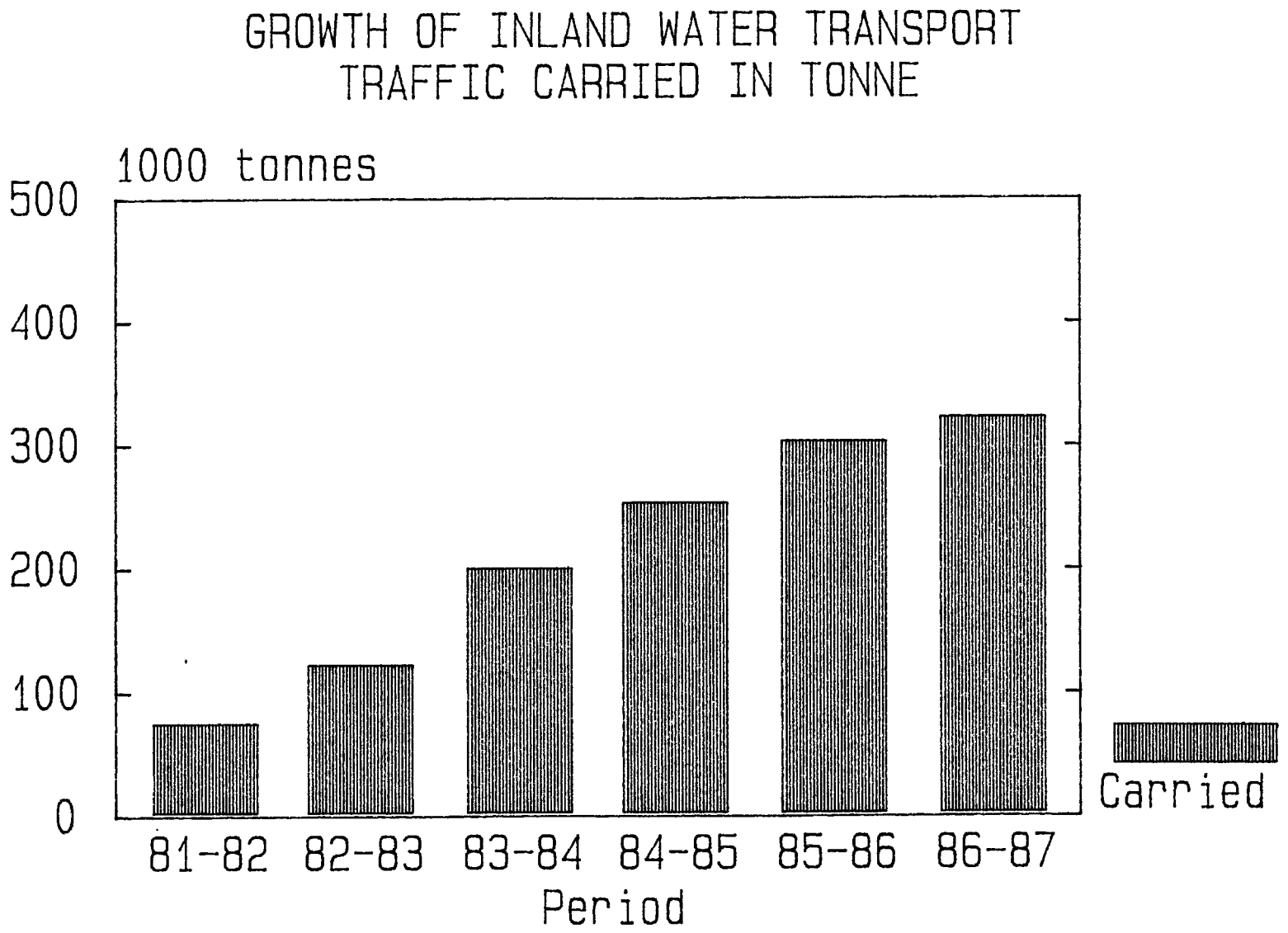
6.1. TRAINING.

6.1.1 Presently in India there is no facility for the formal training of the inland vessels operators. The system now being followed is based only on the services rendered by a prospective operator for a specified period of time on different types of vessels. Thus the informal or "Traditional Training" is the only source of education for the inland vessels operators. This system is going on for time immemorial. During the period of service on different vessels, these persons gather knowledge or know-how, in their respective fields, from the certified persons under whom they are serving in a practical manner, without really understanding the implications of various pratices. The industry is thus being manned by this type of personnel.

6.1.2 One may, therefore, question the relevance of any formal training in light of the fact that the industry is surviving through these operators. The answer to this question is simple. As indicated earlier the inland water transport in India is growing both in importance as well as in size. Table 1 and the bar chart shows the growth of the inland water transport between the period

TABLE — 1

Period	Traffic carried ('000 tonnes)	Tonne - Km. Performed
1981 - 1982	76	780
1982 - 1983	122	813
1983 - 1984	201	928
1984 - 1985	253	1184
1985 - 1986	304	1621
1986 - 1987	321	1566


GROWTH OF INLAND WATER TRANSPORT
TRAFFIC CARRIED IN TONNE
1000 tonnes
500
400
300
200
100
0
81-82
82-83
83-84
84-85
85-86
86-87
Period
Carried

1981 to 1987. It will not be an unjustified assumption that there will be further growth in inland water transport in the country with the realisation of the benefits of multimodal transport system. At the same time if it is decided to *harmonize* the rules and regulations for inland water navigation and the vessels, by implementing uniform rules of the road as well as the signs and signals and of course the measures of *Prevention of Pollution*, the traditional training may not be sufficient. The basic concept of the training is to give the operator an idea about the importance of the various rules and also the various equipment provided for life saving, fire fighting and polluton prevention.

6.1.3 The greatest problem of the training is not the formulation of the training programme but the language or the languages in which the training is to be imparted. India is a big country and it has got different languages besides the national language. As may be seen from Chapter-II that there are at least 13 states of India involved with respect to inland waterways. This means that for the training of the inland vessels operators 13 different languages are to be taken into consideration,since the most effective means of communication in any training programme is the language most easily understood by the participants. Thus if only for the training purpose every state government has to set up an institution it may not be a feasible proposition. But at the same time it may not be impossible to take advantage of some other institution connected with maritime activities,e.g.Central Institute for Fisheries Nautical and Engineering Training(CIFNET), to establish training programmes for inland waterways operators.

6.2.EXAMINATION & CERTIFICATE OF COMPETENCY.

6.2.1. The existing system of examinaton and issue of certificate of competency in most of the states of the country is in accordance with the provision of Section 20 of the Inland Vessels Act. This section empowers the state government to "appoint examiners for the purpose of examining the qualifications of persons desirous of obtaining certificates of competency, to the effect that they are competent to act as masters or serangs or as engineers or engine-drivers as the case may be, on board inland mechanically propelled vessels."

6.2.2. Most of the State Governments have appointed the surveyors, both engineer and nautical, of Mercantile Marine Department of the Central Government, under the control of the Principal Officer, as the examiners. But here again it is seen that in some states, taking the advantage of the existance of two different Acts, a State Government department is also examining and issuing certificate of competency. In the State of Kerala a certificate of competency is being issued by the Principal Officer of the Mercantile Marine Department under the Cochin Harbour Craft Rules and at the same time under the Canals and Ferries Act,VI of 1096, the Chief Engineer is also issuing a certificate of competency, having the same effect.(Annexure-7&8 respectively).

6.2.3. This is not the only ambiguity with respect to the examination and issue of certificate of competency. under the provision of Section 22 of the Inland Vessels Act "the state government may, if it thinks fit, grant without examination to any person who has served as a master or as an engineer, of an inland mechanically pro-

pelled vessel for a period of 3 years before the first day of November,1956, a certificate to the effect that he is, by reason of his having so served, competent to act as a first-class master, second-class master or serang or as an engineer, first-class engine driver or second-class engine driver, as the case may be, on board an inland mechanically propelled vessel." This certificate is known as certificate of service. Furthermore, under Section 22 A, the state government may also issue "Licences" as master and engineer of inland mechanically propelled vessel.

6.2.4. From above it is clear that the standard of examination and hence the effect of certificate of competency, is not the same even in the state level, not to talk about the country as a whole. This variation in the standard affects the industry even during the normal operation. The adverse effect of this can be well visualised if and when the country goes for further expansion of the inland waterways with the declaration of the National Waterways or modernisation of the vessels with the growing need of containerisation and other advancements with the realisation of the importance of the economy and the convenience of the *multimodal transport system.*

CONCLUSION AND RECOMMENDATIONS

In view of the growing importance of the Inland Water Transport system, declaration of National Waterways and the modern concept of the Multimodal Transport system it is felt that the most effective means of operating the inland vessels can only be achieved through the harmonization or unification of the rules throughout the country. Furthermore, with the introduction of night navigation facility with the help of Signs and Signals in Inland Waterways the economy of the inland water transport will considerably go up by way of cut down in the turn around time. This will give an opportunity to expand the activities without any further expansion or increase in the number of the inland vessels.

In the foregoing chapters the variations as well as the fields where the variations of the rules are possible have been projected. On the basis of those chapters it may be stated that it is imperative to have a single Act for the inland vessels in the country and the rules framed under this Act should be applicable throughout the country. Accordingly it is recommended that :-

a) The Inland Vessels Act, 1917 is to be amended as per the requirement and be made the only Act applicable to the Inland Vessels throughout the country without any exception;
b) In view of the Water(Prevention and Control of Pollution) Act, 1974, The Environment (Protection) Act, 1981, provision of Prevention of Pol-

lution of Inland Waters to be made;

c) The responsibility of the formulation of the Inland Vessels Rules will be that of the Central Government;

d) For the purpose of the formulation of the rules a Committee may be formed under the aegis of the Inland Waterways Authority, by drawing members from the various state governments, Directorate General of Shipping,Central Inland Water Transport Corporation Ltd., Indian Register of Shipping;

e) The implementation of the rules and the conduct of surveys may be carried out through the Department of the inland water transport of the State Government or through the Mercantile Marine Deparments wherever the state government authorities are not available;

f) The examination and the issue of the certificates of competency will be done by the Mercantile Marine Department on behalf of the Government of India, as is being done for the certificates of the sea farers;

g) Uniform marking of the navigable channels, so that the Rules of the Road as well as the navigation throughout the country become uniform;

h) The committee set up for the formulation of the rules may also look after the question of the training of the inland water operators.

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—INTERNATIONAL—

Steering and Sailing Rules

RULE 7

Risk of Collision

(a) Every vessel shall use all available means appropriate to the prevailing circumstances and conditions to determine if risk of collision exists. If there is any doubt such risk shall be deemed to exist.

(b) Proper use shall be made of radar equipment if fitted and operational, including long-range scanning to obtain early warning of risk of collision and radar plotting or equivalent systematic observation of detected objects.

(c) Assumptions shall not be made on the basis of scanty information, especially scanty radar information.

(d) In determining if risk of collision exists the following considerations shall be among those taken into account:

(i) such risk shall be deemed to exist if the compass bearing of an approaching vessel does not appreciably change;

(ii) such risk may sometimes exist even when an appreciable bearing change is evident, particularly when approaching a very large vessel or a tow or when approaching a vessel at close range.

—INLAND—

Steering and Sailing Rules

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Annexure – 2

RULES FOR THE PROTECTION OF INLAND STEAM AND MOTOR-VESSELS FROM DANGER BY COLLISION

GOVERNMENT OF BENGAL

Marine Department

NOTIFICATION

No. 40 Marine.—The 24th April, 1923.—In exercise of the powers conferred by section 52 of the Inland Steam-Vessels Act, 1917 (I of 1917), the Governor in Council is pleased to make the following rules for the protection of inland steam and motor-vessels from danger by collision, in supersession of the rules published under this Department Notification No. 148 Mne., dated the 23rd August 1900.

A. CASSELLS,
Secretary to the Government of Bengal.

RULES

Preliminary

These rules are applicable to, and shall be followed by persons in charged of, all inland steam-vessels, and all other vessels, hereinafter specified, on all inland waters in Bengal on which steam vessels ply, provided that rules 8, 21, 22 and 23 shall not apply to steam-vessels plying on the river Hooghly, between a line drawn west of Saugor Island Lighthouse and the northern boundary of the Port of Calcutta.

For the purposes of these rules—

(*a*) a vessel shall be deemed to be "underway" when she is not at anchor or made fast to the shore or aground,

(*b*) the word "visible" when applied to lights shall mean visible on a dark night with clear atmosphere, and

(*c*) the word "steam-vessel" shall include any vessel propelled by machinery.

Rules Concerning Lights, etc.

Article 1.—The rules concerning lights shall be complied with in all weathers from sunset to sunrise, and during such time no other lights which may be mistaken for the prescribed lights shall be exhibited.

Article 2.—*(1)* A steam-vessel when underway shall carry—

(a) in the forepart of the vessel above the awning roof a bright white light so constructed as to show an unbroken light over an arc of the horizon of 20 points of the compass, so fixed as to throw the lighe 10 points on each side of such vessel, viz., from right ahead to 2 points abaft the beam on either side, and of such a character as to be visible at a distance of at least 2 miles;

(b) on the starboard side a green light so constructed as to show an unbroken light over an arc of the horizon of 10 points of the compass, so fixed as to throw the light from right ahead to 2 points abaft the beam on the starboard side, and of such a character as to be visible at a distance of at least 1 mile;

(c) on the port side a red light so constructed as to show an unbroken light over an arc of the horizon of 10 points of the compass so fixed as to throw the light from right ahead to 2 points abaft the beam on the port side, and of such a character as to be visible at a distance of at least 1 mile.

(2) The said green and red side-lights shall be fitted with inboard screens projecting at least 3 feet forward from the light, so as to prevent these lights from being seen across the bow.

Article 3.—*(1)* When a steam-vessel is towing one or more vessels which are lashed alongside, the whole group of vessels shall be considered as one vessel for the purpose of displaying the sidelights prescribed in article *2 (1) (b)* and *(c)*: the white masthead light shall be carried by the steam-vessel in such a manner as to be visible as set forth in article *2 (1) (a)*.

(2) In cases in which a flat or other vessel is being towed by two steam-vessels lashed alongside on each side they shall have the white masthead light and the red and green side-lights so placed that they will be visible as set forth in article 2 (1), i.e, the white light prescribed in article 2 (1) (a) shall be carried on the vessel towed, the green and red lights prescribed by article 2 (1) (b) and (c) being carried by the steam-vessels lashed to the starboard and port sides respectively of the vessel towed. Such steam-vessels together with the vessel towed by them shall be taken as one vessel for the purpose of this rule.

(3) A steam-vessel when towing other vessels astern shall, in addition to her side-lights, carry two bright white lights in a vertical line one over the other not less than 3 feet apart in the fore part of the vessel. Each of these lights shall be of the same construction and character as the light prescribed in article 2 (a).

Article 4.—All vessels under oars or sails when underway, and all vessels being towed astern shall not be obliged to carry the lights mentioned in article 2 (1) (b) and (c) but if they do not carry them they shall, in those cases where there is a mast, carry thereon a white light in a lantern so constructed as to show a clear, uniform and unbroken light visible all round, and in those cases where there is no mast, shall show continuously a similar white light from a conspicuous position so as to be visible all round.

Article 5.—A vessel which is being overtaken by another, shall show from her stern to such last-mentioned vessel a white light.

Article 6.—Every vessel, when at anchor, or made fast to the shore or to a jetty or landing stage or to another vessel not underway, shal carry where it can best be seen, a white light in a lantern so constructed as to show a clear, uniform and unbroken light visible all round at a distance of at least 1 mile.

A vessel agrouud in or near a fairway shall carry the above light.

Article 7.—A steam-vessel using the electric search-light shal on meeting another throw the light broadly on that side of the river which she intends to take. When a steam-vessel makes fast

to allow another such vessel to pass, the search-light of the stationary vessel shall be either extinguished or be kept broad on the bank until the moving vessel has passed.

Article 8.—Whenever a red cone or red flag is hoisted by a dredger it shall be taken as a warning by other vessels not to pass her as she is engaged in dredging.

Sound Signals for Fog, etc.

Article 9.—All signals prescribed by this article for steam-vessels underway shall be given on the whistle or siren.

The words "prolonged blast" used in these rules shall mean a blast of from 4 to 6 seconds duration.

A steam-vessel shall be provided with an efficient whistle or siren, sounded by steam or some substitute for steam, so placed that the sound may not be intercepted by any obstruction, and also with an efficient bell.

In fog, mist or heavy rain-storms, whether by day or by night, the signals shall be used in the following manner:—

(*a*) A steam-vessel having way upon her shall sound at intervals of not more than two minutes, a prolonged blast.

(*b*) A steam-vessel underway, but stopped and having no way upon her, shall sound at intervals of not more than two minutes two prolonged blasts, with an interval of about one second between them.

(*c*) A steam-vessel, when at anchor, shall at intervals of not more than one minute, ring the bell rapidly for about five seconds.

Speed of Ships to be Moderate in Fog, etc.

Article 10.—(*1*) Every steam-vessel shall, in a fog, mist or heavy rain-storms, proceed at a moderate speed, having careful regard to the existing circumstances and condition.

(*2*) A steam-vessel hearing apparently forward of her beam, the fog-signal of any other vessel, the position of which is not ascertained, shall, so far as the circumstances of the case admit, stop her engines, and then navigate with caution until danger of collision is over.

General Warning Signals

Article 11.—One prolonged blast shall be given to convey a warning in the following cases :—

(*a*) When a steam-vessel approaches her destination.

(*b*) To attract the attention of other vessels, especially native craft.

(*c*) On approaching a bend in the channel.

STEERING AND SAILING RULES

Article 12.—When two steam-vessels are meeting end on, or nearly end on, so as to involve risk of collision, each shall alter her course to starboard so that each may pass on the port side of the other.

This Article only applies to cases where vessels are meeting end on, or nearly end on, in such manner as to involve risk of collision and does not apply to two vessels which must, if both keep on their respective courses, pass clear of each other.

The only cases to which it does apply are when each of the two vessels is end on, or nearly end on, to the other, and by night, to cases in which each vessel is in such a position as to see both the sidelights of the other.

It does not apply, by day, to cases in which a vessel sees another ahead crossing her own course, or by night to cases where the red light of one vessel is opposed to the red light of the other, or where the green light of one vessel is opposed to the green light of the other, or where a red light without a green light, or a green light without a red light, is seen ahead; or where both green and red lights are seen anywhere but ahead.

Article 13.—When two steam-vessels are crossing, so as to involve risk of collision, the vessel which has the other on her own starboard side shall keep out of the way of the other.

Article 14.—When a steam-vessel and a sailing vessel are proceeding in such directions as to involve risk of collision, the steam-vessel shall keep out of the way of the sailing vessel.

Article 15.—Where by any of these rules one of two vessels is to keep out of the way the other shall keep her course and speed :

Provided that when, in consequence of thick weather or other cause, the vessel which should be given way to, finds herself so close that collision cannot be avoided by the action of the giving-way vessel alone, she also shall take such action as will best aid to avert collision.

Article 16.—Every steam-vessel which is directed by these rules to keep out of the way of another vessel shall, if the circumstances of the case admit, avoid crossing ahead of the other.

Article 17.—Every steam-vessel, which is directed by these rules to keep out of the way of another vessel shall, on approaching her, if necessary, slacken her speed or stop or reverse.

Article 18.—Notwithstanding anything contained in these rules, every steam-vessel overtaking any other shall keep out of the way of the overtaken vessel.

Every steam-vessel coming up with another vessel from any direction more than two points abaft her beam, i.e., in such a position with reference to the vessel which she is overtaking that at night she would be unable to see either of that vessel's side-lights, shall be deemed to be an overtaking vessel; and no subsequent alteration of the bearing between the two vessels shall make the overtaking vessel a crossing vessel within the meaning of these rules or relieve her of the duty of keeping clear of the overtaken vessel until she is finally past and clear.

As by day the overtaking vessel cannot always know with certainty whether she is forward of or abaft this direction from the other vessel she should, if in doubt, assume that she is an overtaking vessel and keep out of the way.

Article 19.—In narrow channels every steam-vessel shall, when it is safe and practicable, keep to that side of the fairway or midchannel which lies on the starboard side of such vessel.

Article 20.—In obeying and construing these rules due regard shall be had to all dangers of navigation and collision, and to any special circumstances which may render a departure from the above rules necessary in order to avoid immediate danger.

Article 21.—When two steam-vessels, with or without flats in tow, meet in a narrow channel or at a place where the presence of a third vessel makes it difficult to pass, the one going against the current shall slacken her speed until the other has passed clear or when meeting at the bend of a narrow river or channel the vessel going against the current shall stop and remain under the point until the other vessel has passed clear.

Exception.—In straight or nearly straight reaches of a river or channel that is so narrow that it will not allow two steam-vessels meeting, with or without flats in tow, to pass each other without one of them stopping and making fast to the bank, the vessel proceeding with the current shall make fast to allow the vessel going against the current to proceed past at a slow speed. If it is necessary to cast off a flat or flats, the vessel going against the current shall drop one flat astern and if there is still insufficient room then the vessel that is made fast shall also cast off one of her flats.

Article 22.—When two vessels meet in large rivers, such as the Brahmaputra or Ganges, where shoals and narrow channels are encountered, the upward steamer proceeding against the current shall stop below the shoal giving the downward steamer proceeding with the current a clear fairway.

Article 23.—No steam-vessel shall attempt to strive or race against another. When steam-vessels are proceeding in the same direction, but with unequal speed, the vessel which is steaming slowest shall in the narrow reaches of a river offer no obstruction whatever by crossing the channel or otherwise to the free passage of the faster vessel and shall ease and if necessary stop the

engines as soon as the faster vessel comes abreast in order to allow her to pass freely. The master or pilot of the faster vessel if intending to pass, shall intimate such approach by a prolonged blast from his steam whistle. But no vessel shall pass another vessel at any of the turning points or bends of a river, or in a part of the channel so narrow that a third vessel could not with safety pass them.

Article 24.—No steam or motor-vessel shall get under way, either from her anchor or from the river bank, and turn across the river when another vessel is seen approaching from either up or down stream at such a distance that it is doubtful whether the approaching vessel can safely pass her before the turning round or crossing of the river is completed.

Article 25.—When two steam-vessels proceeding in opposite directions are likely to meet at the junction of two rivers, the vessel in the wider of the two streams shall not attempt to enter the narrower river, until the vessel in such latter river has passed out.

Sound Signals for Vessels in Sight of one another

Article 26.—The words "short blast" used in this rule shall mean a blast of about one second's duration.

Every steam-vessel under way shall, when in sight of any other vessel, in taking any course authorised or required by these rules, indicate that course by the following signals on her whistle or siren, viz :—

One short blast to mean, "I am directing my course to starboard".

Two short blasts to mean, "I am directing my course to port".

Three short blasts to mean, "My engines are going full speed astern".

Proper precautions to be taken in all cases

Article 27.—Nothing in these rules shall exonerate the owner, or master, or crew of any steam-vessel from the consequences of neglect to carry lights or signals or of any neglect to keep a proper lookout, or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

NOTE :—The practice of conning inland steam-vessels from a position alongside of or between, flats which obstruct the view, will be considered a breach of this article. Navigation should be controlled from a position which gives a clear view ahead and to two points abaft the beam on either side.

Penalty for disobedience of the Rules

Article 28.—Any person committing a breach of any of these rules shall, for each offence, be punished with imprisonment for a term which may extend to six months, or with fine which may extend to five hundred rupees, or with both.

No. 31 Mne., dated Calcutta, the 27th November 1933.

Notification by—The Government of Bengal, Marine Department.

Steering rules to be observed by inland steam and motor vessels in Bengal.

In exercise of the power conferred by clause (*g*) of sub-section (2) of section 52 of the Inland Steam Vessels Act, 1917 (I of 1917), the Governor in Council is pleased to make the following steering rules to be observed by inland steam and motor vessels in Bengal :

Steering Rules.

1. These rules shall come into operation on the 1st January 1935. Until that date both the direct and the indirect systems of helm orders which are now in common use on inland vessels may continue to be used.

2. When a ship is going ahead, the order—

"Dahina" (vernacular equivalent of right) shall only be given when it is intended that the wheel, the rudder blade and the head of the ship should go to the right.

"Byah" (vernacular equivalent of left) shall only be given when it is intended that the wheel, the rudder blade and the head of the ship should go to port.

3 On vessels steered by hand-tiller, the order "Dahina" shall only be given if the rudder blade and the head of the vessel are to be moved to the right and the order "Byah" shall only be given if the rudder blade and the head of the vessel are to be moved to the left.

(II) *Insert* the following on (1) page 501 of the Index and (2) page 3 of the Table of Contents :—

Rules. Steering—to be observed by inland steam and motor vessels in Bengal—(1) page 305 and (2) page 92.

No. 17 Mne., dated Calcutta, the 18th July 1934.

Notification by—The Government of Bengal, Marine Department.

In exercise of the powers conferred by section 52 of the Inland Steam Vessels Act, 1917 (1 of 1917), the Governor in Council is pleased to make the following rule for the protection of inland steam or motor vessels from accidents due to storm, in addition to the rules published under this department notification No. 40 Mne., dated the 24th April 1928 :—

Rule

Every inland steam or motor vessel departing from a place where a storm signal is displayed shall hoist a red flag by day in a prominent place on the forepart of the vessel as a warning to other vessels and craft that stormy weather is expected.

Annexure – 3

APPENDIX 3

REGULATIONS FOR PREVENTING COLLISIONS AT SEA

Rule 1

(a) These Rules shall be followed by all vessels and seaplanes upon the high seas and in all waters connected therewith navigable by seagoing vessels except as provided in Rule 30. Where, as a result of their special construction, it is not possible for seaplanes to comply fully with the provisions of Rules specifying the carrying of lights and shapes, these provisions shall be followed as closely as circumstances permit.

(b) The Rules concerning lights shall be complied with in all weathers from sunset to sunrise, and during such times no other lights shall be exhibited, except such lights as cannot be mistaken for the prescribed lights or impair their visibility or distinctive character, or interfere with the keeping of a proper look-out.

(c) In the following Rules, except where the context otherwise requires:—

(i) the word "vessel" includes every description of water craft, other than a seaplane on the water, used or capable of being used as a means of transportation on water;

(ii) the word "seaplane" includes a flying boat and any other aircraft designed to manoeuvre on the water;

(iii) the term "power-driven vessel" means any vessel propelled by machinery;

(iv) every power-driven vessel which is under sail and not under power is to be considered a sailing vessel, and every vessel under power, whether under sail or not, is to be considered a power-driven vessel;

(v) a vessel or seaplane on the water is "under way" when she is not at anchor, or made fast to the shore, or aground;

(vi) the term "height above the hull" means height above the uppermost continuous deck;

(vii) the length and breadth of a vessel shall be deemed to be the length and breadth appearing in her certificate of registry;

(viii) the length and span of a seaplane shall be its maximum length and span as shown in its certificate of airworthiness, or as determined by measurement in the absence of such certificate;

(ix) the word "visible", when applied to lights, means visible on a dark night with a clear atmosphere;

(x) the term "short blast" means a blast of about one second's duration;

(xi) the term "prolonged blast" means a blast of from four to six second's duration;

(xii) the word "whistle" means whistle or siren;

(xiii) the word "tons" means gross tons.

PART B.—LIGHTS AND SHAPES

Rule 2

(a) A power-driven vessel when under way shall carry:—

(i) On or in front of the foremast, or if a vessel without a foremast then in the forepart of the vessel, a bright white light so constructed as to show an unbroken light over an arc of the horizon of 20 points of the compass (225 degrees), so fixed as to show the light 10 points (112½ degrees) on each side of the vessel, that is, from right ahead to 2 points (22½ degrees) abaft the beam on either side, and of such a character as to be visible at a distance of at least 5 miles.

(ii) Either forward of or abaft the white light mentioned in sub-section (i) a second white light similar in construction and character to that light. Vessels of less than 150 feet in length, and vessels engaged in towing, shall not be required to carry this second white light but may do so.

(iii) These two white lights shall be so placed in a line with and over the keel that one shall be at least 15 feet higher than the other and in such a position that the lower light shall be forward of the upper one. The horizontal distance between the two white lights shall be at least three times the vertical distance. The lower of these two white lights or, if only one is carried, then that light, shall be placed at a height above the hull of not less than 20 feet, and, if the breadth of the vessel exceeds 20 feet, then at a height above the hull not less than such breadth, provided that the light need not be placed at a greater height above the hull than 40 feet. In all circumstances the light or lights, as the case may be, shall be so placed as to be clear of and above all other lights and obstructing superstructures.

(iv) On the starboard side a green light so constructed as to show an unbroken light over an arc of the horizon of 10 points of the compass (112½ degrees), so fixed as to show the light from right ahead to 2 points (22½ degrees) abaft the beam on the starboard side, and of such a character as to be visible at a distance of at least 2 miles.

(v) On the port side a red light so constructed as to show an unbroken light over an arc of the horizon of 10 points of the compass (112½ degrees), so fixed as to show the light from right ahead to 2 points (22½ degrees) abaft the beam on the port side, and of such a character as to be visible at a distance of at least 2 miles.

(vi) The said green and red sidelights shall be fitted with inboard screens projecting at least 3 feet forward from the light, so as to prevent these lights from being seen across the bows.

(b) A seaplane under way on the water shall carry:—

(i) In the forepart amidships where it can best be seen a bright white light, so constructed as to show an unbroken light over an arc of the horizon of 220 degrees of the compass, so fixed as to show the light 110 degrees on each side of the seaplane, namely, from right ahead to 20 degrees abaft the beam on either side, and of such a character as to be visible at a distance of at least 3 miles.

(ii) On the right or starboard wing tip a green light, so constructed as to show an unbroken light over an arc of the horizon of 110 degrees of the compass, so fixed as to show the light from right ahead to 20 degrees abaft the beam on the starboard side, and of such a character as to be visible at a distance of at least 2 miles.

(iii) On the left or port wing tip a red light, so constructed as to show an unbroken light over an arc of the horizon of 110 degrees of the compass, so fixed as to show the light from right ahead to 20 degrees abaft the beam on the port side, and of such a character as to be visible at a distance of at least 2 miles.

Rule 3

(a) A power-driven vessel when towing or pushing another vessel shall, in addition to her sidelights, carry two bright white lights in a vertical line one over the other, not less than 6 feet apart, and when towing more than one vessel shall carry an additional bright white light 6 feet above or below such lights, if the length of the tow, measuring from the stern of the towing vessel to the stern of the last vessel towed, exceeds 600 feet. Each of these lights shall be of the same construction and character and one of them shall be carried in the same position as the white light mentioned in Rule 2 (a) (i), except the additional light, which shall be carried at a height of not less than 14 feet above the hull. In a vessel with a single mast, such lights may be carried on the mast.

(b) The towing vessel shall also show either the stern light specified in Rule 10 or in lieu of that light a small white light abaft the funnel or aftermast for the tow to steer by, but such light shall not be visible forward of the beam. The carriage of the white light specified in Rule (2) (a) (ii) is optional.

(c) A seaplane on the water, when towing one or more seaplanes or vessels, shall carry the lights prescribed in Rule 2 (b) (i), (ii) and (iii); and, in addition, she shall carry a second white light of the same construction and character as the white light mentioned in Rule 2 (b) (i), and in a vertical line at least 6 feet above or below such light.

Rule 4

(a) A vessel which is not under command shall carry, where they can best be seen, and, if a power-driven vessel, in lieu of the lights required by Rule 2 (a) (i) and (ii), two red lights in a vertical line one over the other not less than 6 feet apart, and of such a character as to be visible all round the horizon at a distance of at least 2 miles. By day, she shall carry in a vertical line one over the other not less than 6 feet apart, where they can best be seen, two black balls or shapes each not less than 2 feet in diameter.

(b) A seaplane on the water which is not under command may carry, where they can best be seen, two red lights in a

ertical line, one over the other, not less than 3 feet apart, nd of such a character as to be visible all round the horizon t a distance of at least 2 miles, and may by day carry in a ertical line one over the other not less than 3 feet apart, where they can best be seen, two black balls or shapes, each ot less than 2 feet in diameter.

(c) A vessel engaged in laying or in picking up a submarine able or navigation mark, or a vessel engaged in surveying or underwater operations when from the nature of her work she is unable to get out of the way of approaching vessels, shall carry, in lieu of the lights specified in Rule 2 (a) (i) and (ii), three lights in a vertical line one over the other not less than 6 feet apart. The highest and lowest of these lights shall be red, and the middle light shall be white, and they shall be of such a character as to be visible all round the horizon at a distance of at least 2 miles. By day, she shall carry in a vertical line one over the other not less than 6 feet apart, where they can best be seen, three shapes each not less than 2 feet in diameter, of which the highest and lowest shall be globular in shape and red in colour, and the middle one diamond in shape and white.

(d) The vessels and seaplanes referred to in this Rule, when not making way through the water, shall not carry the coloured sidelights, but when making way they shall carry them.

(e) The lights and shapes required to be shown by this Rule are to be taken by other vessels and seaplanes as signals that the vessel or seaplane showing them is not under command and cannot therefore get out of the way.

(f) These signals are not signals of vessels in distress and requiring assistance. Such signals are contained in Rule 31.

Rule 5

(a) A sailing vessel under way and any vessel or seaplane being towed shall carry the same lights as are prescribed by Rule 2 for a power-driven vessel or a seaplane under way, respectively, with the exception of the white lights specified therein, which they shall never carry. They shall also carry stern lights as specified in Rule 10, provided that vessels towed, except the last vessel of a tow, may carry, in lieu of such stern light, a small white light as specified in Rule 3 (b).

(b) A vessel being pushed ahead shall carry, at the forward end, on the starboard side a green light and on the port side a red light, which shall have the same characteristics as the lights described in Rule 2 (a) (iv) and (v) and shall be screened as provided in Rule 2 (a) (vi), provided that any number of vessels pushed ahead in a group shall be lighted as one vessel.

Rule 6

(a) In small vessels, when it is not possible on account of bad weather or other sufficient cause to fix the green and red sidelights, these lights shall be kept at hand, lighted and ready for immediate use, and shall, on the approach of or to other vessels, be exhibited on their respective sides in sufficient time to prevent collision, in such manner as to make them most visible, and so that the green light shall not be seen on the port side nor the red light on the starboard side, nor, if practicable, more than 2 points (22½ degrees) abaft the beam on their respective sides.

(b) To make the use of these portable lights more certain and easy, the lanterns containing them shall each be painted outside with the colour of the lights they respectively contain, and shall be provided with proper screens.

Rule 7

Power-driven vessels of less than 40 tons, vessels under oars or sails of less than 20 tons, and rowing boats, when under way shall not be required to carry the lights mentioned in Rule 2, but if they do not carry them they shall be provided with the following lights:—

(a) Power-driven vessels of less than 40 tons, except as provided in section (b), shall carry:—

(i) In the forepart of the vessel, where it can best be seen, and at a height above the gunwale of not less than 9 feet, a bright white light constructed and fixed as prescribed in Rule 2 (a) (i) and of such a character as to be visible at a distance of at least 3 miles.

(ii) Green and red sidelights constructed and fixed as prescribed in Rule 2 (a) (iv) and (v), and of such a character as to be visible at a distance of at least 1 mile, or a combined lantern showing a green light and a red light from right ahead to 2 points (22½ degrees) abaft the beam on their respective sides. Such lantern shall be carried not less than 3 feet below the white light.

(b) Small power-driven boats, such as are carried by seagoing vessels, may carry the white light at a less height than 9 feet above the gunwale, but it shall be carried above the sidelights or the combined lantern mentioned in sub-section (a) (ii).

(c) Vessels of less than 20 tons, under oars or sails, except as provided in section (d), shall, if they do not carry the sidelights, carry where it can best be seen a lantern showing a green light on one side and a red light on the other, of such a character as to be visible at a distance of at least 1 mile, and so fixed that the green light shall not be seen on the port side, nor the red light on the starboard side. Where it is not possible to fix this light, it shall be kept ready for immediate use and shall be exhibited in sufficient time to prevent collision and so that the green light shall not be seen on the port side nor the red light on the starboard side.

(d) Small rowing boats, whether under oars or sail, shall only be required to have ready at hand an electric torch or a lighted lantern showing a white light, which shall be exhibited in sufficient time to prevent collision.

(e) The vessels and boats referred to in this Rule shall not be required to carry the lights or shapes prescribed in Rules 4 (a) and 11 (e).

Rule 8

(a) (i) Sailing pilot-vessels, when engaged on their station on pilotage duty and not at anchor, shall not show the lights prescribed for other vessels, but shall carry a white light at the masthead visible all round the horizon at a distance of at least 3 miles, and shall also exhibit a flare-up light or flare-up lights at short intervals, which shall never exceed 10 minutes.

(ii) On the near approach of or to other vessels they shall have their sidelights lighted ready for use and shall flash or show them at short intervals, to indicate the direction in which they are heading, but the green light shall not be shown on the port side, nor the red light on the starboard side.

(iii) A sailing pilot-vessel of such a class as to be obliged to go alongside of a vessel to put a pilot on board may show the white light instead of carrying it at the masthead and may, instead of the sidelights above mentioned, have at hand ready for use a lantern with a green glass on the one side and a red glass on the other to be used as prescribed above.

(b) A power-driven pilot-vessel when engaged on her station on pilotage duty and not at anchor, shall, in addition to the lights and flares required for sailing pilot-vessels, carry at a distance of 8 feet below her white masthead light a red light visible all round the horizon at a distance of at least 3 miles, and also the sidelights required to be carried by vessels when under way. A bright intermittent all round white light may be used in place of a flare.

(c) All pilot-vessels, when engaged on their stations on pilotage duty and at anchor, shall carry the lights and show the flares prescribed in sections (a) and (b), except that the sidelights shall not be shown. They shall also carry the anchor light or lights prescribed in Rule 11.

(d) All pilot-vessels, whether at anchor or not at anchor shall, when not engaged on their stations on pilotage duty, carry the same lights as other vessels of their class and tonnage.

Rule 9

(a) Fishing vessels when not fishing shall show the lights or shapes prescribed for similar vessels of their tonnage. When fishing they shall show only the lights or shapes prescribed by this Rule, which lights or shapes, except as otherwise provided, shall be visible at a distance of at least 2 miles.

(b) Vessels fishing with trolling (towing) lines, shall show only the lights prescribed for a power-driven or sailing vessel under way as may be appropriate.

(c) Vessels fishing with nets or lines, except trolling (towing) lines, extending from the vessel not more than 500 feet horizontally into the seaway shall show, where it can best be seen, one all round white light and in addition, on approaching or being approached by another vessel, shall show a second white light at least 6 feet below the first light and at a horizontal distance of at least 10 feet away from it (6 feet in small open boats) in the direction in which the outlying gear is attached. By day such vessels shall indicate their occupation by displaying a basket where it can best be seen; and if they have their gear out while at anchor, they shall, on the approach of other vessels, show the same signal in the direction from the anchor ball towards the net or gear.

(d) Vessels fishing with nets or lines, except trolling (towing) lines, extending from the vessel more than 500 feet horizontally into the seaway shall show, where they can best be seen, three white lights at least 3 feet apart in a vertical triangle visible all round the horizon. When making way through the water, such vessels shall show the proper coloured sidelights but when not making way they shall not show them. By day they shall show a basket in the forepart of the vessel as near the stem as possible not less than 10 feet above the rail; and, in addition, where it can best be seen, one black

conical shape, apex upwards. If they have their gear out while at anchor they shall, on the approach of other vessels, show the basket in the direction from the anchor ball towards the net or gear.

(e) Vessels when engaged in trawling, by which is meant the dragging of a dredge net or other apparatus along or near the bottom of the sea, and not at anchor:—

(i) If power-driven vessels, shall show in the same position as the white light mentioned in Rule 2 (a) (i) tri-coloured lantern, so constructed and fixed as to show a white light from right ahead to 2 points (22½ degrees) on each bow, and a green light and a red light over an arc of the horizon from 2 points (22½ degrees) on each bow to 2 points (22½ degrees) abaft the beam on the starboard and port sides, respectively; and not less than 6 nor more than 12 feet below the tri-coloured lantern a white light in a lantern, so constructed as to show a clear, uniform, and unbroken light all round the horizon. They shall also show the stern light specified in Rule 10 (a);

(ii) If sailing vessels, shall carry a white light in a lantern so constructed as to show a clear, uniform, and unbroken light all round the horizon and shall also, on the approach of or to other vessels show, where it can best be seen, a white flare-up light in sufficient time to prevent collision.

(iii) By day, each of the foregoing vessels shall show, where it can best be seen, a basket.

(f) In addition to the lights which they are by this Rule required to show vessels fishing may, if necessary in order to attract attention of approaching vessels, show a flare-up light. They may also use working lights.

(g) Every vessel fishing, when at anchor, shall show the lights or shape specified in Rule II (a), (b) or (c), and shall, on the approach of another vessel or vessels, show an additional white light at least 6 feet below the forward anchor light and at a horizontal distance of at least 10 feet away from it in the direction of the outlying gear.

(h) If a vessel when fishing becomes fast by her gear to a rock or other obstruction she shall in daytime haul down the basket required by sections (c), (d) or (e) and show the signal specified in Rule II (c). By night she shall show the light or lights specified in Rule II (a) or (b). In fog, mist, falling snow, heavy rainstorms or any other condition similarly restricting, visibility, whether by day or by night, she shall sound the signal prescribed by Rule 15 (c) (v), which signal shall also be used, on the near approach of another vessel in good visibility.

NOTE.—*For fog signals for fishing vessels, see Rule* 15 (c) (ix).

Rule 10

(a) A vessel when under way shall carry at her stern a hite light, so constructed that shall show an unbroken light over an arc of the horizon of 12 points of the compass (135 degrees), so fixed as to show the light 6 points (67½ degrees) from right aft on each side of the vessel, and of such a character as to be visible at a distance of at least 2 miles. Such light shall be carried as nearly as practicable on the same level as the sidelights.

NOTE.—*For vessels engaged in towing or being towed, see Rules 3 (b) and 5.*

(b) In a small vessel, if it is not possible on account of bad weather or other sufficient cause for this light to be fixed, an electric torch or a lighted lantern shall be kept at hand ready for use and shall, on the approach of an overtaking vessel, be shown in sufficient time to prevent collision.

(c) A seaplane on the water, when under way shall carry on her tail a white light, so constructed as to show an unbroken light over an arc of the horizon of 140 degrees of the compass, so fixed as to show the light 70 degress from right aft on each side of the seaplane, and of such a character as to be visible at a distance of at least 2 miles.

Rule 11

(a) A vessel under 150 feet in length when at anchor, shall carry in the forepart of the vessel, where it can best be seen, a white light in a lantern so constructed as to show a clear, uniform, and unbroken light visible all round the horizon at a distance of at least 2 miles.

(b) A vessel of 150 feet or upwards in length, when at anchor, shall carry in the forepart of the vessel, at a height of not less than 20 feet above the hull, one such light, and at or near the stern of the vessel and at such a height that it shall be not less than 15 feet lower than the forward light, another such light. Both these lights shall be visible all round the horizon at a distance of at least 3 miles.

(c) Between sunrise and sunset every vessel when at anchor shall carry in the forepart of the vessel, where it can best be seen, one black ball not less than 2 feet in diameter.

(d) A vessel engaged in laying or in picking up a submarine cable or navigation mark, or a vessel engaged in surveying or underwater operations when at anchor, shall carry the lights or shapes prescribed in Rule 4 (c) in addition to those prescribed in the appropriate preceding sections of this Rule.

(e) A vessel aground shall carry by night the light or lights prescribed in sections (a) or (b) and the two red lights prescribed in Rule 4 (a). By day she shall carry, where they can best be seen, three black balls, each not less than 2 feet in diameter, placed in a vertical line one over the other, not less than 6 feet apart.

(f) A seaplane on the water under 150 feet in length, when at anchor, shall carry, where it can best be seen, a white light, visible all round the horizon at a distance of at least 2 miles.

(g) A seaplane on the water 150 feet or upwards in length, when at anchor, shall carry, where they can best be seen, a white light forward and a white light aft, both lights visible all round the horizon at a distance of at least 3 miles; and, in addition, if the seaplane is more than 150 feet in span, a white light on each side to indicate the maximum span, and visible, so far as practicable, all round the horizon at a distance of 1 mile.

(h) A seaplane aground shall carry an anchor light or lights as prescribed in sections (f) and (g), and in addition may carry two red lights in a vertical line, at least 3 feet apart, so placed as to be visible all round the horizon.

Rule 12

Every vessel or seaplane on the water may, if necessary in order to attract attention, in addition to the lights which she is by these Rules required to carry, show a flare-up light or use a detonating or other efficient sound signal that cannot be mistaken for any signal authorised elsewhere under these Rules.

Rule 13

(a) Nothing in these Rules shall interfere with the operation of any special rules made by the Government of any nation with respect to additional station and signal lights for ships of war, for vessels sailing under convoy, or for seaplanes on the water; or with the exhibition of recognition signals adopted by shipowners, which have been authorised by their respective Governments and duly registered and published.

(b) Whenever the Government concerned shall have determined that a naval or other military vessel or waterborne seaplane of special construction or purpose cannot comply fully with the provisions of any of these Rules with respect to the number, position, range or arc of visibility of lights or shapes, without interfering with the military function of the vessel or seaplane, such vessel or seaplane shall comply with such other provisions in regard to the number, position, range or arc of visibility of lights or shapes as her Government shall have determined to be the closest possible compliance with these Rules in respect of that vessel or seaplane.

Rule 14

A vessel proceeding under sail, when also being propelled by machinery, shall carry in the daytime forward, where it can best be seen, one black conical shape, ponint upwards, not less than 2 feet in diameter at its base.

Rule 15

(a) A power-drive vessel shall be provided with an efficient whistle, sounded by steam or by some substitute for steam, so placed that the sound may not be intercepted by any obstruction, and with an efficient fog-horn, to be sounded by mechanical means, and also with an efficient bell. A sailing vessel of 20 tons or upwards shall be provided with a similar fog-horn and bell.

(b) All signals prescribed by this Rule for vessels under way shall be given:—

(i) by power-driven vessels on the whistle;
(ii) by sailing vessels on the fog-horn;
(iii) by vessels towed on the whistle or fog-horn.

(c) In fog, mist, falling snow, heavy rainstorms, or any other condition similarly restricting visibility, whether by day

or night, the signals prescribed in this Rule shall be used as follows: —

(i) A power-driven vessel making way through the water, shall sound at intervals or not more than 2 minutes a prolonged blast.

(ii) A power-driven vessel under way, but stopped and making no way through the water, shall sound at intervals of not more than 2 minutes two prolonged blasts, with an interval of about 1 second between them.

(iii) A sailing vessel under way shall sound, at intervals of not more than 1 minute, when on the starboard tack one blast, when on the port tack two blasts in succession, and when with the wind abaft the beam three blasts in succession.

(iv) A vessel when at anchor shall at intervals of not more than 1 minute ring the bell rapidly for about 5 seconds. In vessels of more than 350 feet in length the bell shall be sounded in the forepart of the vessel, and in addition there shall be sounded in the after part of the vessel, at intervals of not more than 1 minute for about 5 seconds, a gong or other instrument, the tone and sounding of which cannot be confused with that of the bell. Every vessel at anchor may in addition, in accordance with Rule 12, sound three blasts in succession, namely, one short, one prolonged, and one short blast, to give warning of her position and of the possibility of collision to an approaching vessel.

(v) A vessel when towing, a vessel engaged in laying or in picking up a submarine cable or navigation mark, and a vessel under way which is unable to get out of the way of an approaching vessel through being not under command or unable to manœuvre as required by these Rules shall, instead of the signals prescribed in subsections (i), (ii) and (iii) sound, at intervals of not more than 1 minute, three blasts in succession namely, one prolonged blast followed by two short blasts.

(vi) A vessel towed, or, if more than one vessel is towed, only the last vessel of the tow, if manned, shall, at intervals of not more than 1 minute, sound four blasts in succession, namely, one prolonged blast followed by three short blasts. When practicable, this signal shall be made immediately after the signal made by the towing vessel.

(vii) A vessel aground shall give the signal prescribed in sub-section (iv) and shall, in addition, give three separate and distinct strokes on the bell immediately before and after each such signal.

(viii) A vessel of less than 20 tons, a rowing boat, or a seaplane on the water, shall not be obliged to give the above-mentioned signals, but if she does not, she shall make some other efficient sound signal at intervals of not more than 1 minute.

(ix) A vessel when fishing, if of 20 tons or upwards, shall at intervals of not more than 1 minute, sound a blast, such blast to be followed by ringing the bell; or she may sound, in lieu of these signals, a blast consisting of a series of several alternate notes of higher and lower pitch.

Rule 16

Speed to be moderate in fog, etc.

(a) Every vessel, (or seaplane when taxi-ing on the water), shall, in fog, mist, falling snow, heavy rainstorms or any other conditions similarly restricting visibility, go at a moderate speed, having careful regard to the existing circumstances and conditions.

(b) A power-driven vessel hearing, apparently forward of her beam, the fog-signal of a vessel the position of which is not ascertained, shall, so far as the circumstances of the case admit, stop her engines, and then navigate with caution until danger of collision is over.

PART C. — STEERING AND SAILING RULES

Preliminary

1. *In obeying and construing these Rules, any action taken should be positive, in ample time, and with due regard to the observance of good seamanship.*

2. *Risk of collision can, when circumstances permit, be by carefully watching the compass bearing of an approaching vessel. If the bearing does not appreciably change, such risk should be deemed to exist.*

3. *Mariners should bear in mind that seaplanes in the act of landing or taking off, or operating under adverse weather conditions, may be unable to change their intended action at last moment.*

Rule 17

When two sailing vessels are approaching one another, so as to involve risk of collision, one of them shall keep out of the other, as follows: —

(a) A vessel which is running free shall keep out of the way of a vessel which is close-hauled.

(b) A vessel which is close-hauled on the port tack shall keep out of the way of a vessel which is close-hauled on the starboard tack.

(c) When both are running free, with the wind on different sides, the vessel which has the wind on the port side shall keep out of the way of the other.

(d) When both are running free, with the wind on the same side, the vessel which is to windward shall keep out of the way of the vessel which is to leeward.

(e) A vessel which has the wind aft shall keep out of the way of the other vessel.

Rule 18

(a) When two power-driven vessels are meeting end or, or nearly end on, so as to involve risk of collision, each shall alter her course to starboard, so that each may pass on the port side of the other. This Rule only applies to cases where vessels are meeting end on, nearly end on, in such a manner as to involve risk of collision, and does not apply two vessels which must, if both keep on their respective courses, pass clear of each other. The only cases to which it does apply are when each of two vssels is end on, or nearly end on, to the other, in other words, to cases in which, by day, each vessel sees the masts of the other in a line, or nearly in a line, with her own, and by night, to cases in which each vessel is in such a position as to see both the sidelights of the other. It does not apply, by day, to cases in which a vessel sees another ahead crossing her own course; or, by night, to cases where the red light of one vessel is opposed to the red light of the other or where the green light of one vessel is opposed to the green light of the other or where a red light without a green light or a green light without a red light is seen ahead, or where both green and red lights are seen anywhere but ahead.

(b) For the purposes of these Rules and Rules 19 to 29 inclusive, except Rule 20 *(b)*, a seaplane on the water shall be deemed to be a vessel, and the expression «power-driven vessels» shall be construed accordingly.

Rule 19

When two power-driven vessels are crossing, so as to involve risk of collision, the vessel which has the other on her own starboard side shall keep out of the way of the other.

Rule 20

(a) When a power-driven vessel and a sailing vessel are proceeding in such directions as to involve risk of collision, except as provided in Rules 24 and 26, the power-driven vessel shall keep out of the way of the sailing vessel.

(b) A seaplane on the water shall, in general, keep well clear of all vessels and avoid impeding their navigation. In circumstances, however, where risk of collision exists, she shall comply with these Rules.

Rule 21

Where by any of these Rules one of two vessels is to keep out of the way, the other shall keep her course and speed. When, from any cause, the later vessel finds herself so close that collision cannot be avoided by the action of the giving-way vessel alone, she -way vessel alone, she also shall take such action as will best aid to avert collision (see Rules 27 and 29).

Rule 22

Every vessel which is directed by these Rules to keep out of the way of another vessel shall, if the circumstances of the case admit, avoid crossing ahead of the other.

Rule 23

Every power-driven vessel which is directed by these Rules to keep out of the way of another vessel shall, on approaching her, if necessary, slacken her speed or stop or reverse.

Rule 24

(a) Notwithstanding anything contained in these Rules, every vessel overtaking any other shall keep out of the way of the overtaken vessel.

(b) Every vessel coming up with another vessel from any direction more than 2 points (22½ degrees) abaft her beam, *i.e.*, in such a position, with reference to the vessel which she is overtaking, that at night she would be unable to see either of that vessel's sidelights, shall be deemed to be an overtaking vessel; and no subsequent alteration of the bearing between the two vessels shall make the overtaking vessel a crossing vessel within the meaning of these Rules, or relieve her of the duty of keeping clear of the overtaken vessel until she is finally past and clear.

(c) If the overtaking vessel cannot determine with certainty whether she is forward of or abaft this direction from the other vessel, she shall assume that she is an overtaking vessel and keep out of the way.

Rule 25

(a) In a narrow channel every power-driven vessel when proceeding along the course of the channel shall, when it is safe and practicable, keep to that side of the fairway or mid-channel which lies on the starboard side of such vessel.

(b) Whenever a power-driven vessel is nearing a bend in a channel where a power-driven vessel approaching from the other direction cannot be seen, such vessel, when she shall have arrived within one-half mile of the bend, shall give a signal by one prolonged blast of her whistle, which signal shall be answered by a similar blast given by any approaching power-driven vessel that may be within hearing around the bend. Regardless of whether an approaching vessel on the farther side of the bend is heard, such bend shall be rounded with alertness and caution.

Rule 26

All vessels not engaged in fishing shall, when under way, keep out of the way of any vessels fishing with nets or lines or trawls. This Rule shall not give to any vessel engaged in fishing the right of obstructing a fairway used by vessels other than fishing vessels.

Rule 27

In obeying and construing these Rules, due regard shall be had to all dangers of navigation and collision, and to any special circumstances, including the limitation of the craft involved, which may render a departure from the above Rules necessary in order to avoid immediate danger.

PART D.—MISCELLANEOUS

Rule 28

(a) When vessels are in sight of one another, a power-driven vessel under way, in taking any course authorised or required by these Rules, shall indicate that course by the following signals on her whistle, namely:—

One short blast to mean "I am altering my course to starboard."

Two short blasts to mean "I am altering my course to port."

Three short blasts to mean "My engines are going astern."

(b) Whenever a power-driven vessel which, under these Rules, is to keep her course and speed is in sight of another vessel and is in doubt whether sufficient action is being taken by the other vessel to avert collision, she may indicate such doubt by giving at least five short and rapid blasts on the whistle. The giving of such a signal shall not relieve a vessel of her obligations under Rules 27 and 29 or any other Rule, or of her duty to indicate any action taken under these Rules by giving the appropriate sound signals laid down in this Rule.

(c) Nothing in these Rules shall interfere with the operation of any special rules made by the Government of any nation with respect to the use of additional whistle signals between ships of war or vessels sailing under convoy.

Rule 29

Nothing in these Rules shall exonerate any vessel, or the owner, master or crew thereof, from the consequences of any neglect to carry lights or signals, or of any neglect to keep proper look-out, or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

Rule 30

Reservation of Rules for Harbours and Inland Navigation

Nothing in these Rules shall interfere with the operation of a special rule duly made by local authority relative to the navigation of any harbour, river, lake, or inland water, including a reserved seaplane area.

Rule 31

Distress Signals

When a vessel or seaplane on the water is in distress and requires assistance from other vessels or from the shore, the following shall be the signals to be used or displayed by her, either together or separately, namely:—

(a) A gun or other explosive signal fired at intervals of about a minute.

(b) A continuous sounding with any fog-signal apparatus.

(c) Rockets or shells, throwing red stars fired one at a time at short intervals.

(d) A signal made by radiotelegraphy or by any other signalling method consisting of the group ... in the Morse Code.

(e) A signal sent by radiotelephony consisting of the spoken word «Mayday».

(f) The International Code Signal of distress indicated by N. C.

(g) A signal consisting of a square flag having above or below it a ball or anything resembling a ball.

(h) Flames on the vessel (as from a burning tar barrel, oil barrel, & c.).

(i) A rocket parachute flare showing a red light.

The use of any of the above signals, except for the purpose of indicating that a vessel or a seaplane is in distress, and the use of any signals which may be confused with any of the above signals, is prohibited.

NOTE:—A radio signal has been provided for use by vessels in distress for the purposes of actuating the auto-alarms of other vessels and thus securing attention to distress calls or messages. The signal consists of a series of twelve dashes, sent in 1 minute, the duration of each dash being 1 seconds, and the duration of the interval between two consecutive dashes 1 second.

Rule 32

All orders to helmsmen shall be given in the following sense: right rudder or starboard to mean «put the vessel's rudder to starboard»; left rudder or port to mean «put the vessel's rudder to port».

Annexure-4

RULES TO REGULATE THE NAVIGATION OF INLAND STEAM-VESSELS ON THE RIVER HOOGHLY

The 4th August 1914

No. 105 Marine.—In exercise of the power conferred by section 50A* of the Inland Steam-vessels Act, 1884 (VI of 1884), the Governor in Council is pleased, with the previous sanction of the Governor-General in Council, to make the following revised rules to regulate the navigation of inland steam-vessels in certain portions of the river Hooghly, in supersession of the rules published under this department Notification No. 5 Marine, dated the 10th January 1902, as amended by Notification No. 140 Marine, dated the 22nd December 1906.

These rules, which are applicable to the river Hooghly between Kidderpore Docks and Luff Point, are supplementary to those published under this department Notification † No, 148 Marine, dated the 23rd August 1900.

A. C. J. DE LOTBINIERE, LT. COL., R.E.,
Offg. Secretary to the Government of Bengal.

Steering rules to regulate the navigation of inland steam-vessels in certain portions of the river Hooghly

1. All inland steam-vessels navigating the river Hooghly shall be navigated as follows :—

(*a*) Between Kidderpore Docks and Luff Point, they shall be navigated on the shallow side of the channel when meeting or being overtaken by sea-going vessels,

*Now read section 52 of the Inland Steam-vessels Act I of 1917.
†Superseded by Notification No. 40 Marine, dated the 24th April 1928.

8. (i)Every vessel to which these Rules apply shall be subjected to the surveys specified below :

(a)A survey before the vessel is put in service.
(b)A periodical survey once every twelve months.
(c)Additional surveys as occasion arises.

(ii) (a)The survey before the vessel is put in service shall include a complete inspection of the hull, machinery and equipments. The survey shall be such as to ensure that arrangements, material, scantlings of hull, boilers and their appurtanances, main and auxiliary machinery, life saving appliances, fire applicances and other equipments fully comply with such of these Rules as are applicable in its case. The survey shall also be such as to ensure that the workmanship of all parts of the ship and her equipments are in all respects satisfactory. Provided that the bottom of the vessel which has been surveyed during the construction need not be examined in dry dock after launching if it has been examined by a Surveyor before the ship is launched unless the surveyor has special reasons for considering it necessary.

(b)The periodical survey shall include an inspection of the whole of the hull, boilers, machinery and equipments including the outside of the vessel's bottom in dry dock. The survey shall be such as to ensure that hull, machinery and equipments is in satisfactory condition and fit for the service for which the vessel is intended and that she complies with the requirements of such of these Rules as are applicable in its case.

(c)A survey either general or partial, according to the circumstances, shall be made; (i)every time an accident occurs or a defect is discovered which affects the safety of the vessel, (ii) its efficiency or completeness of its equipments or whenever any important repair or renewal are made (iii) whenever a request for extension of certificate of survey is being considered. The survey shall be such as to ensure that the necessary repairs or renewals have been effectively made, that the material and workmanship of such repairs or renewals are in all respects satisfactory and that the vessel is fit for the service for which she is intended.

9. After the survey of the vessel has been completed, no change shall be made in the structural arrangements, machinery, equipments etc. covered by the survey without the sanction of the Surveying Authority.

10. If the surveyor finds that any defect exists in the hull, machinery or equipments of a vessel he shall, before refusing to give a declaration of survey regarding the vessel, address a letter to the owner or master of the vessel pointing out such defect and the repairs, etc. necessary to make good the same. If the surveyor be subsequently informed by the owners or master of the vessel that the requisite repairs etc. have been executed, he shall

PART I

General instructions

CHAPTER I

Introductory

1. **Object of Instructions.** — The instructions are issued by the Government of Goa, Daman and Diu for guidance of Surveyors for survey vessels under I. S. V. Act, 1917. They also indicate to owners, ship-builders and other concerned the procedure to be adopted for the survey of Inland Vessels and the conditions under which the certificates of survey are issued:

These instructions should be read in conjuction with Inland Steam Vessels (Constructions and Survey) Rules 1962.

2. **The need for Certificate of Survey.** — Under Section 3 (1) of I.S.V. Act, 1917 all inland Steam vessels must be in possession of a valid certificate of survey issued by the Government of Goa, Daman and Diu before proceeding on any voyage in Inland Waters of Union Territory.

3. **Powers of Surveyors.** — Under Section 5(1) of I.S.V. Act, 1917 a Surveyor in the performance of his duties may go on board any Inland Vessel at all reasonable times and inspect it, or any part of it, or any of machinery, boats equipments, or articles on board or any of certificates of Master, Serangs or Engine Drivers and in consequence of any accident to the ship or for any other reason be considered it necessary, he may require the ship to be taken into dry dock for the purpose of surveying the Hull.

Surveyors should take every opportunity of visiting Inland steam vessels and should they find that any of the requirements of I.S.V. Act are not complied with, the fact should be pointed cut to the Master and owner and a report forwarded to the Captain of Ports.

If any person hinders a Surveyor for going on board any Inland vessel or otherwise impedes him in execution of his duties under the I. S. V. Act, he renders himself liable for each offence, to fine not exceeding five hundred rupees. Any case of hindrance must be reported to the Government through the Captain of Ports.

4. **Ports of Survey.** — Survey of inland vessel shall be conducted in places that are declared as ports of survey from time to time. The following places have been declared ports of survey:

Panjim, Mormugao, Daman and Diu.

5. **Manner of making applications.** — (i) Every application for the survey of an inland vessel shall be made on the prescribed form (Survey form no. 1) to the Captain of Ports, Panjim, at least 3 clear days (7 clear days in case of surveys at outports) before the day on which it is desired that the survey shall take place. An application received late is liable to delay the commencement of survey.

(ii) An application for survey should be accompanied by the prescribed survey fee together with such drawings and plans of the vessel as the Surveyor may require for the purpose.

6. **Appointment for surveyors.** — An applicant should contact the Surveyor appointed for the purpose at least a day before the commencement of survey and arrange with him as to the time and place of the Survey.

7. **Surveys on Sundays, etc.** — Surveys shall be carried out on all working days in the year between the hours of 7 a. m. and 5 p. m. Surveys on Sundays, Government Holidays and surveys outside the hours of 7 a. m. to 5 p. m. can only be arrange with prior concurrence of the Captain of Ports and on payment of additional Sunday, Holiday or Overtime fees.

8. **Preparation for Survey.** — (i) At the request of the applicant, the Surveyor shall provide a list of the requisite preparations for commencement of survey. If the Surveyor finds on the appointed day at the appointed time that such preparations have not been made and the vessel has not been properly presented for survey, the Surveyor may fix some other time for the survey. Such postponed surveys shall be carried out after the Surveyor has attended to his other normal engagements.

(ii) If, however, the surveyor is inavoidably prevented from being present at the time fixed for survey, he shall send earliest possible intimation to the applicant and fix some other time mutually convenient to the applicant and Surveyor.

9. **Drydocking.** — All inland vessels require to be inspected once in 12 months by a Surveyor in a dry dock or an a slipway such that all portions of the hull external can be examined during the hours of daylight. Unless specially authorised in any exceptional case, (by the Captain of Ports) no survey of the external hull shall be carried out during the hours of darkness. The period of validity of a certificate of survey shall normaly be limited for a period of 12 months from the date of last inspection of the hull external in a dry dock of slipway.

10. **Survey during construction.** — Applicants are advised that the Government of Goa, Daman and Diu consider it desirable that vessels under construction for eventually plying as inland vessels should be under inspection of a surveyor throughout all stages of construction. Applicants should accordingly make their application before lying the keel so that the progress of construction may be watched by the Surveyor from the very beginning.

11. **Declaration of Survey.** — (i) After his first inspection of a vessel under survey the Surveyor shall inform the applicant of the items that require attention with special reference to these defect which if not rectified, may preclude the Surveyor from issuing a Declaration of Survey under Section 7 of the Act.

(ii) If the Surveyor is fully satisfied as to all the requirements having been complied with, he shall issue a declaration of survey to the applicant. In case the Surveyor, is unable to issue such a declaration he shall, before refusing to do so, address the applicant in writing, pointing out the defects on which the refusal is based. If such defects are rectified to the satisfaction of the surveyor he shall forthwith issue the declaration.

(iii) The applicant or his agent on receipt of the declaration of Survey shall forthwith transmit to the Captain of Ports, Panjim, and in any case shall do so within 14 days after receipt thereof.

12. **Delivery of Certificate of Survey.** — The applicant should take delivery of the Certificate of Survey from the counter of the Captain of Ports Office,

Annexure - 7.

CERTIFICATE OF COMPETENCY AS ENGINE DRIVER OF MOTOR VESSEL HAVING ENGINES OF LESS THAN 226 BHP PLYING IN THE PORT OF COCHIN

To **********

Whereas you have been found, after examination, duly qualified to fulfil the duties of Engine-Driver of a motor-vessel having engines of less than 226 B.H.P plying in the Port of Cochin, I do hereby grant you this Certificate of Competency as such Engine-Driver.

Given under my hand and seal.

Principal Officer,
Mercantile marine Department
Madras District.

This.....day of ..... 19...
No. of Certifcate.....
Bearer **********, son of **********, by caste .....
Date and place of birth ..... showing village, thana and district.
Residence ..... showing village, thana and district
Personal description, stating particularly any permanent marks or scars ..... .
Height ..... .
No. of Register Ticket ..... .
Signature ..... .

N.B. Any person other than the owner thereof becoming possessed of this certificate is required to

transmit it forthwith to the Principal Officer, Mercantile Marine Department, Madras District, Madras.

Issued at ..... , on the .....day of .....19.. .

(Photgraph of the candidate) REGISTERED

Principal Officer,
Mercantile Marine Department,
Madras District.

Annexure - 8

FORM H.

CERTIFICATE OF COMPETENCY/SERVICE

Rule 118, Canals & Ferries Act VI of 1096.

No. ..... .

Name **********.

Son of (father's name) **********.

of (Permanent address) ..... .

(Temporay address) ..... .

Date of Birth ..... .

Height ..... .

Marks of identification ..... .

~~~~~~

(Photograph of the candidate)

Signature or thumb impression

Note :- When thumb impressions are taken they should be those of all the five fingers of the left hand.

Whereas it has been reported to me that you have found duly qualified to fulfil the duties of a Driver/Syrang/Master, on an inland steam or motor vessel, I do hereby, under the provisions of the Rules issued under Act VI of 1096(Public Canals & Public Ferries Act), grant you the certificate of competency as a Driver/Syrang/Master on a motor/steam launch fitted with a prime mover upto 10, 20 and over 20 H.P in a vessel of a registered
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tonnage of under 10, 20 and over 20 tons.

Station ..... .

Date ..... .

Canal Sub-Division Officer

Chief Engineer,
Travancore Cochin

Authorisation to serve in a Public Service Steam or Motor Vessel.

Date ..... .

Chief Engineer,
Government of Travancore, Cochin

This licence is hereby renewed upto the .....day of .... 19.. .

Signature of
Licencing Authority

ENDORSEMENTS

Date	Section and Rule	Fine or other punishment	Signature of endorsing authority

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