Development of the Common Standard Curricula on International Transport and Logistics Basic Training for ASEAN Member States under Sustainable Human Resource Development in Logistics Services

Inland Waterways Transport

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Objectives of The Modules

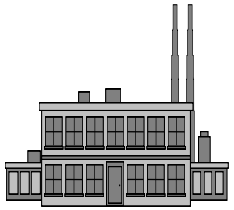
At the end of this module, each trainee should be able to :

1. Demonstrate that you can effectively and efficiently organize the carriage of goods by inland waterways for yourclients
2. Classify the legal framework of Inland waterways transport
3. Explain the cargoes, the facilities and equipment required of inland waterways transport operations
4. Arrange the documents of inland waterways transport

TRANSPORT MODE CHOICES

1. SHIPPER

2. CARRIER



3. CONSIGNEE

Transport Mode Choice Considerations

OPERATIONAL FACTORS

a. External Factors (Facilities, Regulations, etc)
b. Customer's Characteristics
c. Physical nature of the products
d. Other Logistics Components (Supply points, Production plan, Warehouse & Storage facilities, Marketing & plan policies)

Transport Mode Choice Considerations

TRANSPORT MODE CHARACTERISTICS

- Conventional Seafreight
- International Road Freight
- Rail Freight
- Airfreight
- Container System
- Inland Waterways Transport

Transport Mode Choice Considerations

CONSIGNMENT FACTORS

a. Routing & Transit
b. Distance
c. Type of Cargo
d. Quantity
e. Commodity Value
f. Regularity of Shipments

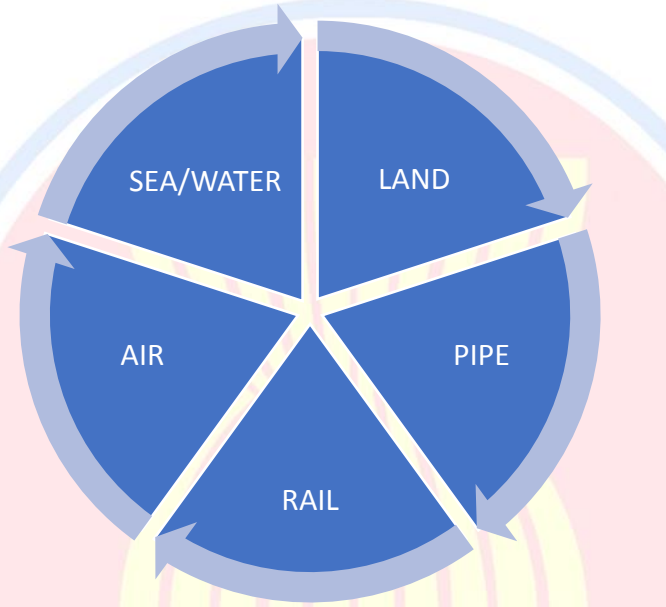
Transport Mode Choice Considerations

COST & SERVCE REQUIREMENTS

Trade-off between Cost & Service

a. Speed delivery
b. Service reliability

MODE OF TRANSPORTS



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INLAND WATERWAYS TRANSPORT

LEGAL FRAMEWORK

WHAT IS INLAND WATERWAYS TRANSPORT?

Transport within any of the waters (as lakes, canals, rivers, watercourses, inlets, and bays) within the territory of a state as contrasted with the open sea or marginal waters bordering another state subject to various sovereign rights of the bordering states

The Differences between Inland Waterways and Sea Routes

INLAND WATERWAYS

- Inland waterways exists in the form of rivers, canals, backwaters, and lakes
- Being used to transport goods from one place to another inside a mass of land
- “Generation” of hydroelectric power and navigation is possible in it
- Used, most widely, in internal trading within the country

SEA ROUTES

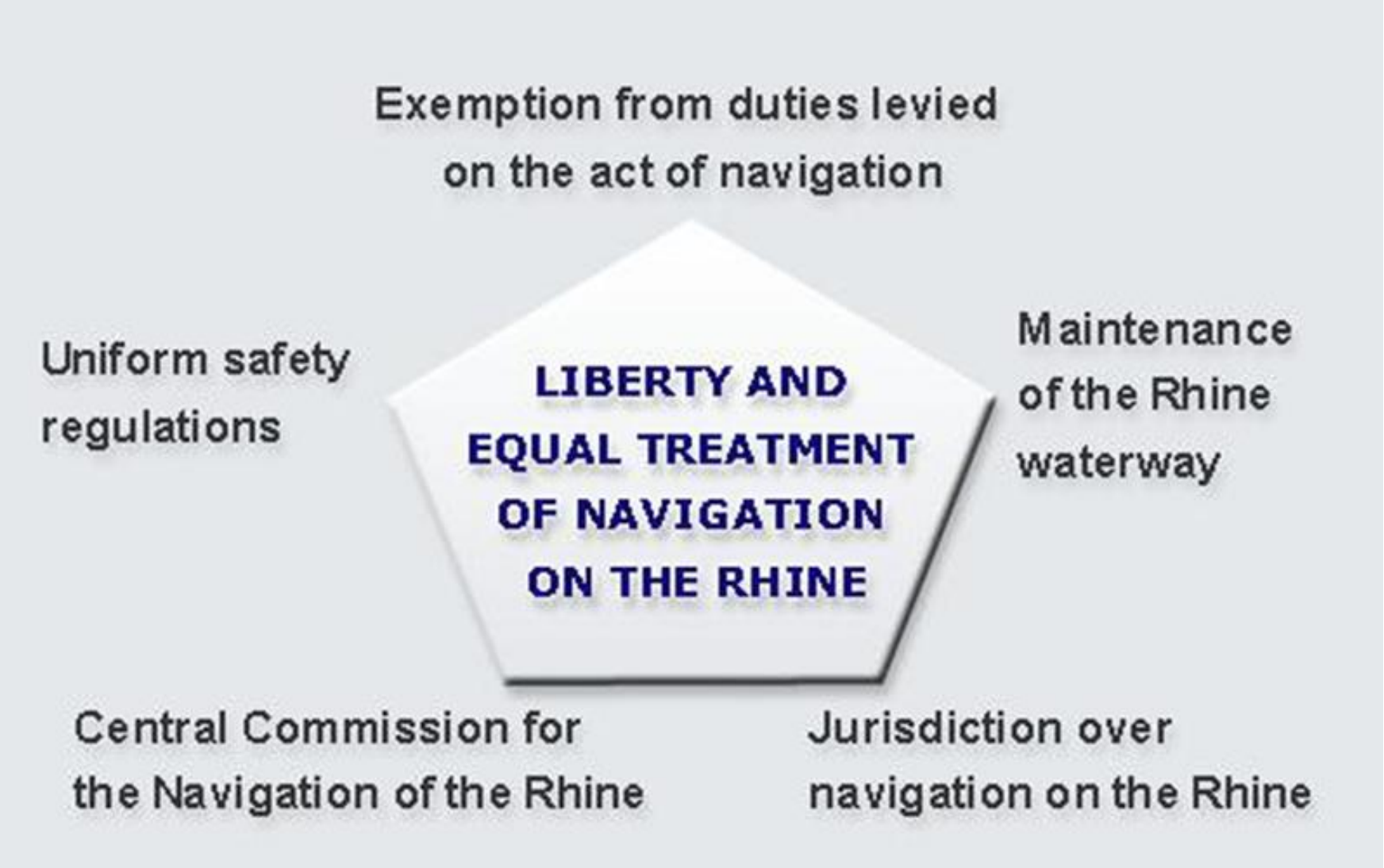
- Exists in the form of Seas & Oceans
- Being used to transfer goods from one land mass to another via the oceans & seas
- “Ready made carriage ways of ships”
- Used, widely, all over the world for international export & imports, and is one of the important way of transport compared to air route

LEGAL FRAMEWORK & CONVENTIONS

- The Manheim Act (MA) of 17 October 1868 constitutes the legal basis for the Central Commission for the Navigation of the Rhine (CCNR). It is applicable in its latest revised version which entered into force on 14 April 1967 and has been amended by seven additional protocols.

- Member States are Germany, Belgium, France, the Netherlands, and Switzerland

PRINCIPLE & SCOPE of “Manheim Act – CCNR”



PRINCIPLE & SCOPE of “Manheim Act – CCNR”

The “Mannheim Act” introduced the principle of free navigation on the Rhine and its tributaries. This means that in application of the Mannheim Convention, the Member States must refrain from imposing any toll, tax, duty or charge based directly on the fact of navigation.

THE CENTRAL COMMISSION OF THE RHINE NAVIGATION

- Vessels of all nations are allowed to navigate on this natural waterway which is navigable on more than 850 kilometers from the port of Basle in Switzerland up to the open see
- The first task of the new Central Rhine Commission was to lay down the principles for free navigation by drafting an international Rhine Convention
- International requirements for vessels and their cargo, the ship's leading and the crew as well as the behaviour and the communication during navigation, which are binding the authorities of member states

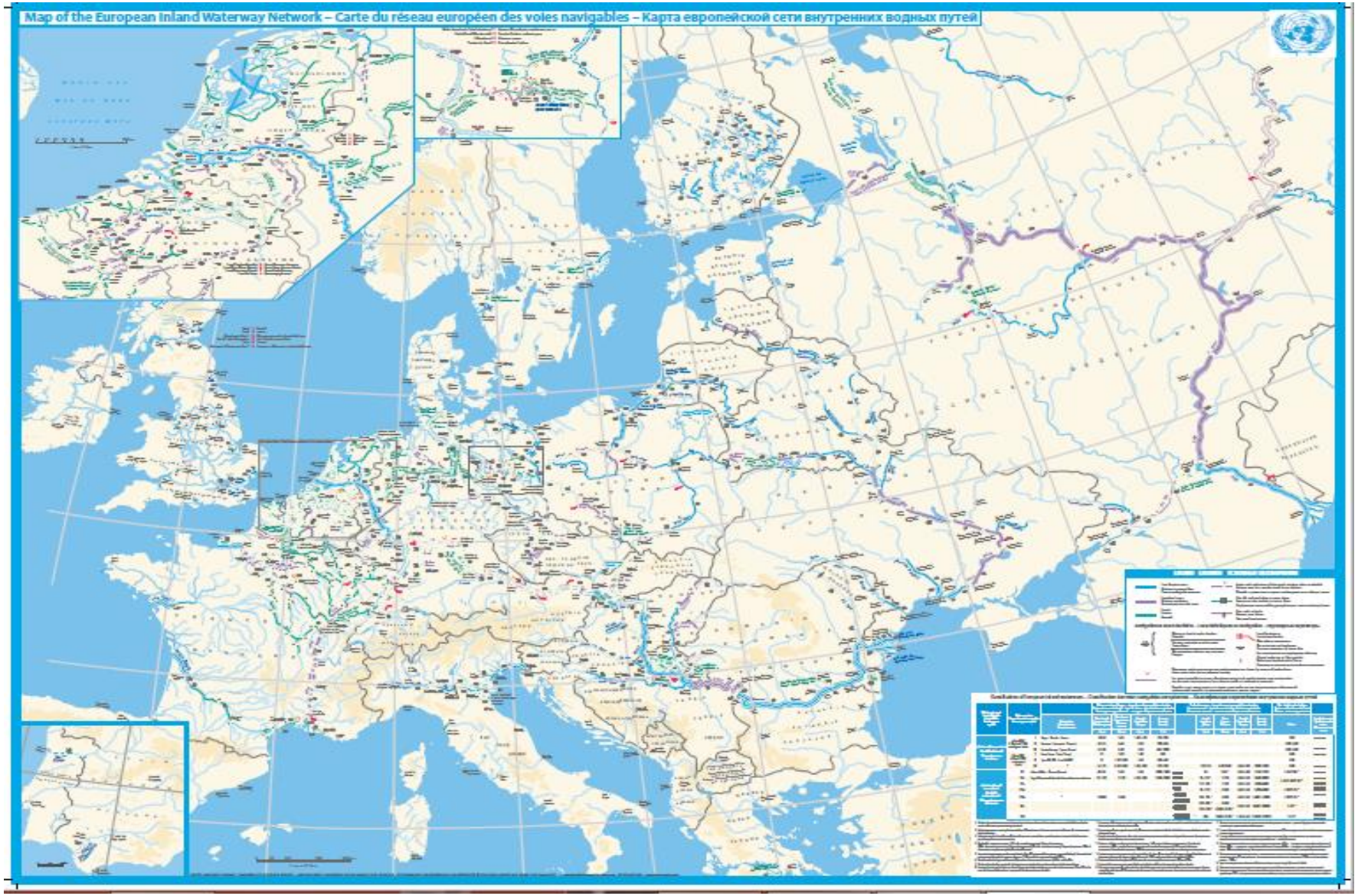
Regulations for the Navigation on the Rhine

- Each vessel have to be commanded by a boatmaster possessing a Rhine boatmaster's patent (licence).
- The boatmaster is the only responsible person on board of vessels and convoys and has to stay there during any navigation
- He may not be affected by alcohol, fatigue or medicaments.
- Each boatmaster has to make all precautions necessary to comply with the general obligation of carefulness, to avoid risks for human life, average, hindrance of naviga tion or impairment of the environment.
- All the crew has to follow his instructions.

TECHNICAL REQUIREMENTS FOR *V*ESSELS N*A*VIGATING ON THE RHINE

- All vessels have to be constructed according to the standard of ship building.
- The vessel's hull shall have enough strength to resist to the normal stress caused by navigation.
- The machinery prescriptions deal with the main and auxiliary machinary, gas exhaust, fuel system and pumping arrangement. There shall be other installations for gathering of oily water and used oil in order to prevent water pollution
- The vessel's steering gear has to ensure the ability to reach the requirements in manoeuvrability

European Network of Navigable Waterway



Source : CCNR

CMNI - DEFINITIONS

- **“Contract of carriage”** means any contract, of any kind, whereby a carrier undertakes against payment of freight to carry goods by inland waterways;
- **“Carrier”** means any person by whom or in whose name a contract of carriage has been concluded with a shipper;
- **“Actual carrier”** means any person, other than a servant or an agent of the carrier, to whom the performance of the carriage or of part of such carriage has been entrusted by the carrier;
- **“Shipper”** means any person by whom or in whose name or on whose behalf a contract of carriage has been concluded with a carrier;
- **“Consignee”** means the person entitled to take delivery of the goods;

DEFINITIONS

- **“Transport document”** means a document which evidences a contract of carriage and the taking over or loading of goods by a carrier, made out in the form of a bill of lading or consignment note or of any other trade document;
- **“Goods”** does not include either towed or pushed vessels or the luggage or vehicles of passengers; where the goods are consolidated in a container, pallet or similar article of transport or where they are packed, “goods” includes such article of transport or packaging if supplied by the shipper.
- **“In writing”** includes, unless otherwise agreed between the parties concerned, the transmission of information by electronic, optical or similar means of communication, including, but not limited to, telegram, facsimile, telex, electronic mail or electronic data interchange (EDI), provided the information is accessible so as to be usable for subsequent reference.

RIGHTS AND OBLIGATIONS OF THE CONTRACTING PARTIES

- The carrier shall carry the goods to the place of delivery within the specified time and deliver them to the consignee in the condition in which they were handed over to him
- Unless otherwise agreed, the taking over and delivery of the goods shall take place on board of the vessel.
- The carrier shall decide which vessel is to be used. He shall ensure that, taking into account the goods to be carried, the vessel is in a state to receive the cargo, is seaworthy and is manned and equipped as prescribed by the regulations
- The carrier shall ensure that the loading, stowage and securing of the goods does not affect the safety of the vessel.

Obligations of The Shipper

- The shipper shall be required to pay the amounts due under the contract of carriage.
- The shipper shall furnish the carrier in writing, before the goods are handed over, with the following particulars concerning the goods to be carried:

a. Dimensions, number or weight and stowage factor of the goods

b. Marks necessary for identification of the goods

c. Nature, characteristics and properties of the goods;

d. Instructions concerning the Customs or administrative regulations applying to the goods

e. Other necessary particulars to be entered in the transport document

Liability of the shipper

The shipper shall, even if no fault can be attributed to him, be liable for all the damages and costs incurred by the carrier or the actual carrier by reason of the fact that:

- The particulars or information are missing, inaccurate or inadequate;
- The dangerous or polluting goods are not marked or labelled in accordance with the applicable international or national regulations or, if no such regulations exist, in accordance with rules and practices generally recognized in inland navigation;
- The necessary accompanying documents are missing, inaccurate or inadequate.

Actual carrier

- Where the carrier has entrusted the performance of the carriage or part thereof to an actual carrier, whether or not in pursuance of a liberty under the contract of carriage to do so, the carrier nevertheless remains responsible for the entire carriage
- The carrier shall in all cases inform the shipper when he entrusts the performance of the carriage or part thereof to an actual carrier.
- The actual carrier may avail himself of all the objections invocable by the carrier under the contract of carriage
- If and to the extent that both the carrier and the actual carrier are liable, their liability is joint and several.

LIABILITY OF THE CARRIER

- **Liability for loss**

The carrier shall be liable for loss resulting from loss or damage to the goods caused between the time when he took them over for carriage and the time of their delivery, or resulting from delay in delivery, unless he can show that the loss was due to circumstances which a diligent carrier could not have prevented and the consequences of which he could not have averted.

- **Servants and agents**

The carrier shall be responsible for the acts and omissions of his servants and agents of whose services he makes use during the performance of the contract of carriage, when such persons are acting within the scope of their employment, as if such acts or omissions were his own.

LIABILITY OF THE CARRIER

Special exonerations from liability

The carrier and the actual carrier shall be exonerated from their liability when the loss, damage or delay are the result of one of the circumstances or risks listed below:

- Acts or omissions of the shipper, the consignee or the person entitled to dispose of the goods;
- Handling, loading, stowage or discharge of the goods by the shipper, the consignee or third parties acting on behalf of the shipper or the consignee;
- Carriage of the goods on deck or in open vessels, where such carriage has been agreed with the shipper or is in accordance with the practice of the particular trade, or if it is required by the regulations in force;

LIABILITY OF THE CARRIER

Calculation of compensation

- The compensation payable shall be equal to the value of the goods at the place and on the day of delivery according to the contract of carriage
- In the event of partial loss or damage to goods, the carrier shall be liable only to the extent of the loss in value.
- The value of the goods shall be fixed according to the commodity exchange price

LIABILITY OF THE CARRIER

Maximum limits of liability

- The carrier shall under no circumstances be liable for amounts exceeding 666.67 units of account per package or other loading unit, or 2 units of account per kilogram of weight, specified in the transport document, of the goods lost or damaged, whichever is the higher
- In the event of loss due to delay in delivery, the carrier shall be liable only for an amount not exceeding the value of the freight
- The aggregate liability shall not exceed the limitation

LIABILITY OF THE CARRIER

CLAIMS PERIOD

- The carrier and the consignee may require an inspection of the condition and quantity of the goods on delivery in the presence of the two parties.
- Where the loss or damage to the goods is apparent, at latest at the time of delivery, unless the consignee and the carrier have jointly checked the condition of the goods.
- Where the loss or damage to the goods is not apparent, at latest within 7 consecutive days from the time of delivery; in such case, the injured party shall show that the damage was caused while the goods were in the charge of the carrier.

LIABILITY OF THE CARRIER

Special exonerations from liability (Cont'd)

- The nature of the goods which exposes them to total or partial loss or damage
- The lack of or defective condition of packaging in the case of goods which, by their nature, are liable to loss or damage when not packed or when the packaging is defective;
- Insufficiency or inadequacy of marks identifying the goods;
- Rescue or salvage operations or attempted rescue or salvage operations on inland waterways;
- Carriage of live animals, unless the carrier has not taken the measures or observed the instructions agreed upon in the contract of carriage.

Dangerous and Polluting Goods

- If dangerous or polluting goods are to be carried, the shipper shall, before handing over the goods, inform the carrier clearly and in writing of the danger and the risks of pollution, inherent in the goods and of the precautions to be taken.
- Where the carriage of the dangerous or polluting goods requires an authorization, the shipper shall hand over the necessary documents at latest when handing over the goods.

Dangerous and Polluting Goods

- Where the continuation of the carriage, the discharge or the delivery of the dangerous or polluting goods is rendered impossible owing to the absence of an administrative authorization, the shipper shall bear the costs incurred by the carrier for the return of the goods to the port of loading or a nearer place, where the goods may be discharged and delivered or disposed of.
- In the event of immediate danger to life, property or the environment, the carrier shall be entitled to unload the goods, to render them innocuous or, provided that such a measure is not disproportionate to the danger they represent, to destroy them, even if, before they were taken over

Termination of The Contract of Carriage by The Carrier

The carrier may terminate the contract of carriage if the shipper has failed to perform the obligations

If the carrier makes use of his right of termination, he may unload the goods at the shipper's expense and claim optionally the payment of any of the following amounts:

- one third of the agreed freight; or
- in addition to any demurrage charge, a compensation equal to the amount of costs incurred and the loss caused, as well as, should the voyage have already begun, a proportional freight for the part of the voyage already performed.

Delivery Time

The carrier shall deliver the goods within the time limit agreed in the contract of carriage or, if no time limit has been agreed, within the time limit which could reasonably be required of a diligent carrier, taking into account the circumstances of the voyage and unhindered navigation.

Delivery of The Goods

- The consignee who, following the arrival of the goods at the place of delivery, requests their delivery, shall, in accordance with the contract of carriage, be responsible for the freight and other charges due on the goods
- In the absence of a transport document, or if such document has not been presented, the consignee shall be responsible for the freight agreed with the shipper if it corresponds to market practice.

Delivery of The Goods

- The placing of the goods at the disposal of the consignee in accordance with the contract of carriage or with the usage of the particular trade or with the statutory regulations applicable at the port of discharge shall be considered a delivery.
- The imposed handing over the goods to an authority or a third party shall also be considered a delivery.

TRANSPORT DOCUMENTS

- The carrier shall issue a transport document; he shall issue a bill of lading only if the shipper so requests and if it has been so agreed before the goods were loaded or before they were taken over for carriage
- The lack of a transport document or the fact that it is incomplete shall not affect the validity of the contract of carriage.
- The original of the transport document must be signed by the carrier, the master of the vessel or a person authorized by the carrier.

TRANSPORT DOCUMENTS

- The carrier may require the shipper to countersign the original or a copy. The signature may be in handwriting, printed in facsimile, perforated, stamped, in symbols or made by any other mechanical or electronic means
- The transport document shall be prima facie evidence, unless proved to the contrary, of the conclusion and content of the contract of carriage and of the taking over of the goods by the carrier.

TRANSPORT DOCUMENTS

The transport document, in addition to its denomination, contains the following particulars:

- The name, address, head office or place of residence of the carrier and of the shipper;
- The consignee of the goods;
- The name or number of the vessel
- The port of loading or the place where the goods were taken over and the port of discharge or the place of delivery;

TRANSPORT DOCUMENTS

- The usual name of the type of goods and their method of packaging and, for dangerous or polluting goods, their name according to the requirements in force
- The dimensions, number or weight as well as the identification marks of the goods
- The statement, if applicable, that the goods shall or may be carried on deck or on board open vessels
- The agreed provisions concerning freight
- For Consignment notes, the specification as to whether it is an original or a copy
- For Bills of lading, the number of originals

Reservations in Transport Documents

The carrier is entitled to include in the transport document reservations concerning:

- The dimensions, number or weight of the goods
- Identification marks which are not clearly and durably affixed on the goods themselves or, if they are packed, on the receptacles or packaging;
- The apparent condition of the goods.

BILL OF LADING

- The originals of a bill of lading shall be documents of title
- The goods shall be delivered only in exchange for the original of the bill of lading submitted initially

RIGHT TO DISPOSE OF THE GOODS

- The shipper shall be authorized to dispose of the goods
- The shipper's right of disposal shall cease to exist once the consignee has requested delivery of the goods - where carriage is under a consignment note, once the original has been handed over to the consignee.
- Where carriage is under a bill of lading, once the shipper has relinquished all the originals in his possession by handing them over to another person.

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INLAND WATERWAYS TRANSPORT OPERATION MANAGEMENT

TYPE OF INLAND WATERWAYS

- Open river waterways
- Canalized waterways
- Canals

Open River Navigation

There are few rivers where the discharge is adequate throughout the year to provide suitable channel dimensions for year-round commercial navigation of modem vessels and barges. Other natural factors which restrict open-river navigation *include high velocity currents*, *decreased depth in low-water periods*, and *sediment deposition in the channel*

Open River Navigation

Engineering measures are needed to improve the navigation conditions

- **Channel regulation** (river training, or rectification and stabilization) work to provide and maintain adequate channel dimensions for navigation
- **Dredging** to provide navigable depth

Canalized Waterways

A canalized river is one that has been transformed from a free-flowing stream to a series of slack water pools by construction of a number of locks and dams

A lock is a structure designed to pass vessels from one water level either up or down to another water level. It is an open chamber with gates at both ends—at the upper pool and at the lower pool

Canals

Canalization does not necessarily eliminate the need for regulation works, and some channel maintenance dredging is often required to maintain authorized channel dimensions, particularly in the upper end of pools

Classification and Planning of The Navigation Channel

Demands on the Navigation Channel

Two types of factors affecting navigation:

- One is the channel dimensions including the available depth, the width, the radius of curvature at bends, the cross-sectional area
- The flow conditions including current velocities and flow patterns, which are also very important for the vessels to navigate safely and easily

Demands on the Navigation Channel

- *Channel Depth*
- *Channel Width*
- *Channel Radius of Curvature at Bends*
- *Channel Cross Section Area*
- *Current Velocities*
- *Hazardous Flow Patterns*

Four Basic Channel Patterns

- **Straight Channels**
- **Meandering Channels**
- **Braided Channels**
- **Looped Branched Channels**

INLAND PORTS PLANNING AND CARGOS HANDLING OPERATION

Inland waterway terminal conveys the idea of an end point. Traditionally, ports were perceived as end points of the transport system whereby water transport of cargoes was either originated or terminated. However, from a broader point of view, in the so-called "chain of transport", ports or terminals are simply the intermediate points where cargoes are transferred between the links in the transport chain

PORTS PLANNING

(a) Ports' main function is to move the cargo and to avoid accumulating and damaging it

(b) In order to efficiently fulfill their transfer function, ports or terminals have to possess convenient access (rail and road) to the connecting modes of transport

PORTS PLANNNING

- In most cases, the IWT cargo does not originate or terminate at the port site itself, the main function of the inland port is to transfer the cargo between IWT vessels, trains, and trucks.
- The inland ports are important for the economic development of a country. The inland port, the rail, the road and the seaport are equally important

Port and Terminal

A port is composed of several terminals, or the terminals are components of a port

PORTS AND TERMINALS

The transfer operation performed in ports can be classified:

- Intra-modal transfer, connecting two (or more) hauling services within the same mode of transport.
- Inter-modal transfer, connecting two (or more) services from different transport modes.

if some shipping company transports some cargoes from this service to that service only by vessel, we can say it is intra-modal transfer, if this transport action is performed by vessel first , then by train car, and finally by truck, we can say it is inter-modal transfer.

CARGO TRANSFER

- Water-to-water transfer
- Land-to-water or water-to-land transfer
- Multi-modal transfer

Volumes of Throughput

Throughput is an important target of the inland port, and the gross income of the port is decided by throughput.

For all the enterprises, the finance is composed of two parts

1. Fixed cost
2. Variable cost

If the throughput is increased, the gross income will be increased, the variable cost will be decreased, and the economic benefit of the port will be good

Types of Cargos in Inland Waterways Transport

- General cargoes
- Bulk cargoes
- Liquid cargoes

GENERAL CARGOES

Usually, all commodities in bags or in boxes (paper box or timber box) or unitized, or single unit (usually big or heavy), are general cargoes

All daily necessities:

- Unitized Com, grain, wheat
- Rice in bags
- Cotton, wool, jute, flax package
- Structural steel Wood sand timbers
- All cargoes in container
- Cement, fertilizer in bags
- liquid in drums

The Bulk Cargoes

- Coal (powder,granular,lump)
- Ore (Powder,granular,lump)
- Com, grain,wheat,rice (granular)
- Fertilizer, animalfoods (granular)
- Sand, cobble stone (granular)
- Cement (powder)

Liquid Cargoes

- crude oil
- fuel oil
- petrochemical liquid
- oil cooking
- Water

- But most liquid cargo is crude oil and petrochemical products

Types of Terminals

The terminals can be classified made into

a. General cargo terminals

1. Neo bulk terminals
2. Container terminals

b. Bulk cargo terminals

1. Dry bulk cargo terminals
2. Liquid cargo terminals.

Types of Terminals

The terminals of inland port are different from the terminals OF seaport, and the main difference is the change of water depth and flow around the year

Passenger Terminals

Found mostly in developing countries, since in these countries water transport of passengers by river buses quite popular.

In developed countries, however, the main use of IWT for passenger transport is limited to river crossing and the terminal only provides a simple bridging device to facilitate moving on/off-board pedestrians and cars (ferry)

SHIP LOADERS IN INLAND PORTS

- Fixed shiploader - the shiploader is fixed on the concrete piled structure
- Movable shiploader - the ship loader move on the rail along the quay side, it is easy to move from one hatch to another

Cargo Handling Operation

The cargo handling and transfer is done at terminals

Consist of:

- (a) Terminal facilities
- (b) Terminal equipment
- (c) Labor and staffs

PORT OPERATION – HANDLING CARGOES

Basic questions:

- What is the cargo to be handled?
- Who performs this activity?
- Where and how is this activity performed?

What is the cargo to be handled?

- Type and form of cargo
- Size (dimension, weight) of cargo unit
- Number of units moved in one cycle
- Origin/terminal points
- Rate (productivity)
- Total volume

Who performs this activity?

- Number and professions of labor members
- Type and number of cargo handling machines
- Stevedoring tools

Where and how is this activity performed?

- Layout of facilities
- Type and size of vessels
- Trucks and rail cars
- Time (day/night)
- Weather conditions (temperature/rain)

“The Pipeline" of a series of Handling Operations

The port process is moving the cargo between the vessel and the truck or train. The basic work stations which participate in the marine terminal process include the vessel, dock, storage yard, and gate

“The Pipeline" of a series of Handling Operations

Most of the common port operations involve moving cargo between these station either along the gate-to-vessel line (in the outbound direction), or the vessel-to-gate line (in the inbound direction)

“The Pipeline" of a series of Handling Operations

BASIC ACTIVITIES

- (a) vessel transfer-moving cargo between the vessel, dock and yard;
- (b) storage-holding cargo in transit;
- (c) gate transfer-moving cargo between the yard and the land transport vehicle (truck or rail car), usually through the terminal gate.

Cargo Handling Equipment

(a) General cargo equipment;

General cargoes (bags,bundles of steel, paper reels,etc.) are defined as cargoes which are is handled in batches or in discrete units. Their handling method is lifting and moving the cargo units, or loads, in a cyclical, repetitive fashion.

(b) Bulk cargo equipment.

Bulk cargoes (grain, coal, etc.) are composed of a multitude of small and homogenous units. They are handled in a continuous fashion and their main handling methods are based on conveyance

The Basic Characteristics of any Handling Equipment

- What is to be moved?
- From where to where?
- How fast?

Cargo Handling Equipment

Cargo handling machines are characterized:

(a) Capacity-the size(dimensions and weight) of cargoes units

(b) Distance or reach-the distance (horizontal and vertical) between loading and unloading points

(c) Speed- the traveling, swinging and hoisting speeds (acceleration and velocity) of the various moving components and the resulting overall rate or productivity

General Cargo Handling Process

- In order to handle general cargoes efficiently and quickly, they must be unitized and palletized
- For the forklift to pick it up, the cargo should be mounted on pallets or skids
- Cranes or forklifts can be used
- Transportation by trailer and platform wagons
- In transport or storage, the attachments (bags,slings, pallets) can not be separated from the cargoes

Container Handling Process

There are three system to process the containers:

- Chassis system;
- Straddle carrier system;
- Transtainer system.

Bulk Cargo Handling Process

Handling process at bulk terminals involves two systems,

- land-to-water (unloading from truck/rail cars to storage/direct shipment)
- water-to-land (unloading the vessel to storage and then loading the trucks or rail cars)

Bulk Cargo Handling Process

Bulk cargo handling methods :

(a) Batch handling equipment (general cargo equipment adaptable for bulk handling, such as grab cranes)

(b) Continuous handling equipment (based on specialized bulk handling machines and are geared to them)

- Screw unloader
- Chain bucket unloader
- Belt conveyer
- Vessel loaders
- Rail car loader and unloader

VESSEL TYPES OF INLAND WATER WAYS TRANSPORT

There are principally two different means of transportation on inland waterways:

- Self-propelled ship
- Barges pushed by a self-propelled vessel (push boat or pushing cargo ship).

Motor Cargo Vessel

MCV is a single-hull ship type suitable for various types of cargo:

- Liquids,
- Bulk products
- Containers
- or Special cargo.

In terms of manoeuvrability this ship type is best compared to any formations with numerous barges which are slow in reaction to change of course

Motor Cargo Vessel

Bulk carrier: CMS AMIGOS, L: 135 m – B: 11.45 m – D: 3.60 m – T: 3922 t – P: 2x1020kW + 290kW bow thruster

Source : EU Interreg - DST

Motor Cargo Vessel

Container ship: GMS NOVA, L: 134,16m – B: 16,90m – D: 3,52m – T: 5175t – P: 2 x 1100kW + 860kW and 400kW bow thrusters

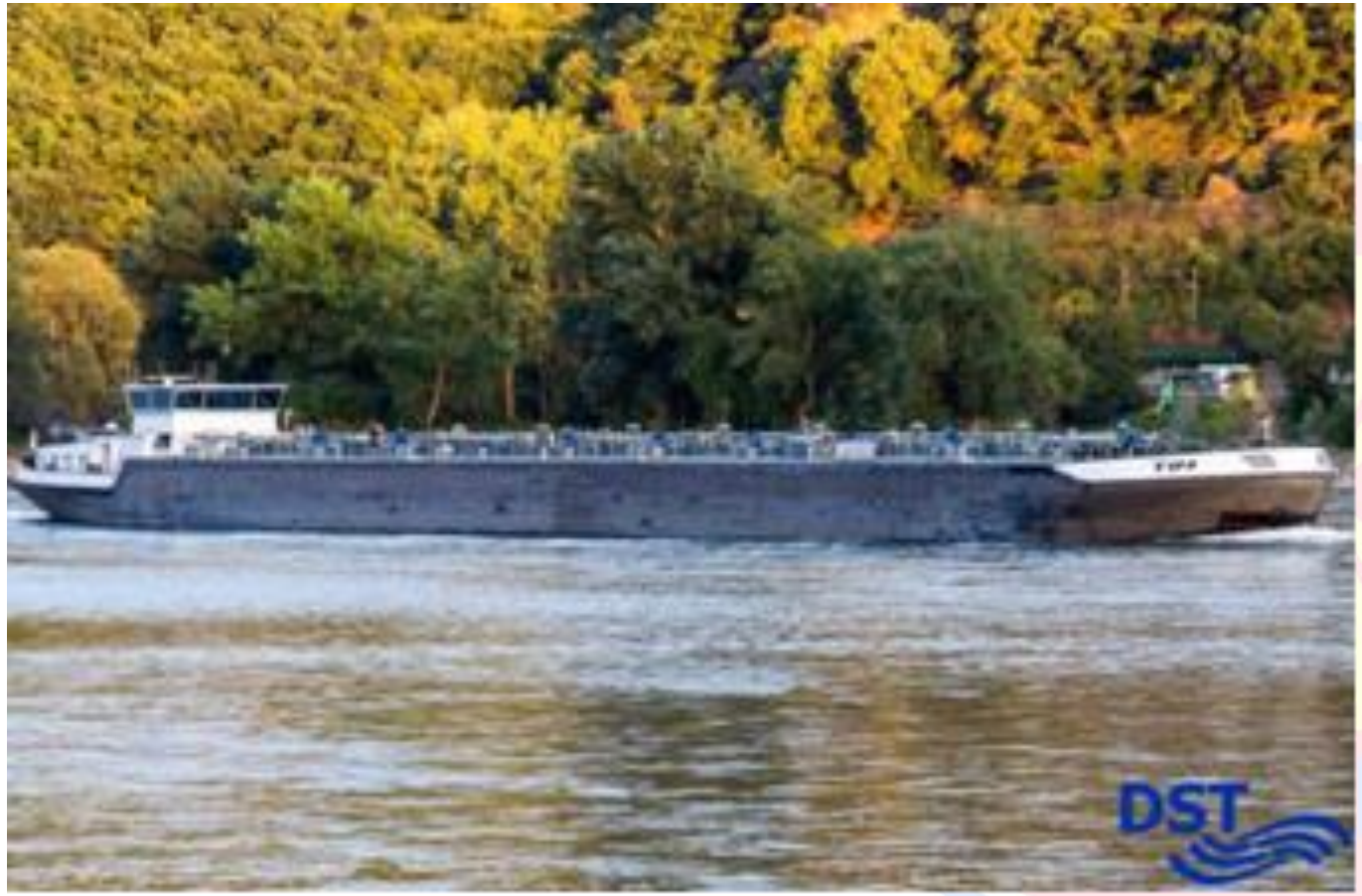
Source : EU Interreg - DST

Motor Ship „JOWI“

- length L = 135.00 m
- breadth B = 16.84 m
- draught T = 3.20 m
- loading capacity = 4600 t
- container capacity = 392 TEU (4 layers)

Source : www.factline.com

Motor Cargo Vessel



Source : EU Interreg - DST

Tank vessel: TMS TIM, L: 110 m - B: 11,45 m - D: 3,61 m - Ton: 2991 t – P: 1100kW + 400kW bow thruster

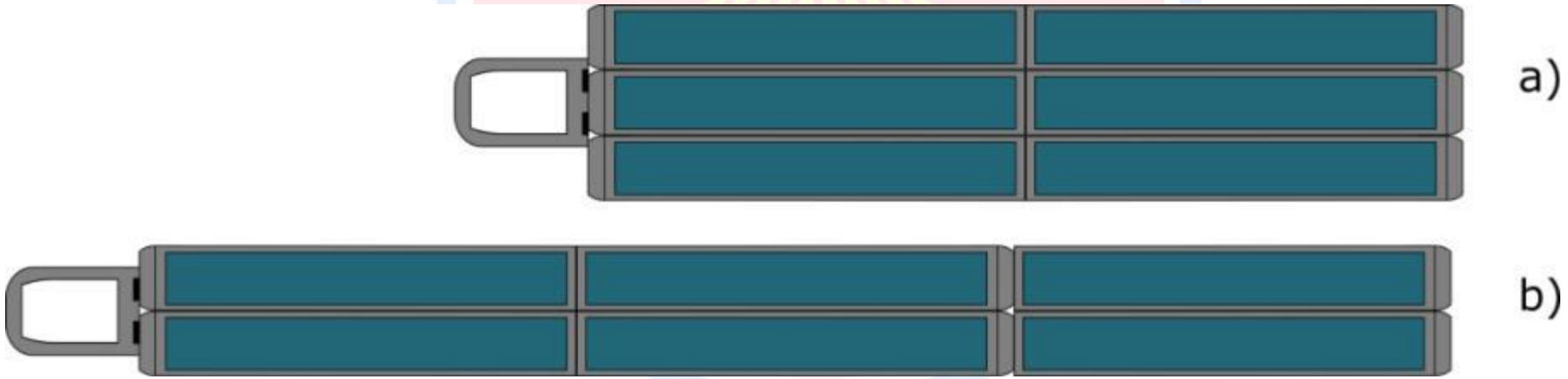
Motor Cargo Vessel

Source : EU Interreg - DST

RoRo ship for cars: RoRo TERRA - L: 110 m - B: 12 m - D: 2,16 m - T: 710 t – P: 2 x 750kW + 240kW bow thruster

Pushed Convoys

Pushed convoys usually consist of 2, 4 or 6 barges operated by a push boat of appropriate power



Source : EU Interreg - DST

Pushed Convoys

Pushed convoy is the most flexible transport option cargo types for barges (bulk products) also liquids, containers and general cargo.

It allows the simultaneous transport of different cargo types as each barge in the formation may load different cargo

Pushed Convoys

Source : EU Interreg - DST

Pushed Convoy PB+1: PB SWIND, L: 15.00 m – B: 9.50 m – D: 1.90 m – P: approx. 2x 500kW; Barge CHEMGAS 21, L: 76.52 m – B: 11.43 m – D: 2,75 m – T: 1467 t

Pushed Convoys

Source : EU Interreg - DST

Pushed convoy PB+1+1: HERKULES IX, L: 32.00 m – B: 11.40 m – D: 1.85 m – max. pushed weight: 12,000t, P: 2 x 1120kW; 2 Barges à 76.5m x 11.45m

Pushed convoy PB+1+1

Max. Length [m]	172	
Breadth [m]	11,4	
Max. Draught [m]	4,0	
Max. Cargo load [t]	5500	
Water depth [m]	3	5
Max. Velocity [km/h]	12	14
Power Installed [kW]	approx. 2800	

Source : EU Interreg - DST

Pushed Convoys

Source : EU Interreg - DST

Pushed convoy PB+2+2: HERKULES VIII, L: 39.88m – B: 11.38 m – D: 1.70m, P: 2 x 2200kW; 4 Barges à 76.5m x 11.45m

Pushed convoy PB+2+2

Max. Length [m]	270	
Max. Breadth [m]	34,2	
Max. Draught [m]	4,0	
Max. Cargo load [t]	16500	
Water depth [m]	3	5
Max. Velocity [km/h]	11	13
Power Installed [kW]	approx. 4500	

Source : EU Interreg - DST

Most Common Barges Sizes

	Europa 1	Europa 2	Europa 2a	Europa 2b	Europa 2c
Length [m]	70	76.5	76.5	76.5	76.5
Breadth [m]	9.5	11.2, 11.4, 11.45	11.45	11.45	11.45
Draught [m]	2.5	2.5	4.0	4.0	4.0
Bow shape	Ponton	Ponton	Ponton	Wedge frame	Reshaped wedge frame
Weight [t]	270	370	400	415	415
Cargo Hold					
Top length [m]	60.3	66.9	66.3	66.3	66.3
Bottom length [m]	58.5	65.1	62.7	62.7	62.7
Top breadth [m]	7.5	9.0	9.0	9.0	9.0
Bottom breadth [m]	7.5	9.0	9.0	9.0	9.0
Height [m]	3.8	3.7	4.2	4.2	4.2
Max. volume [m^3]	1640	2178	2437	2437	2437
Max. cargo at D_{max} [t]	1700	2215 - 2240	2565	2619	2619
Max. TEU, 4 layers	108	120	120	120	120
Max. TEU, 4 layers *	144	160	160	160	160
Power Installed [kW]			No power installed		

Source : EU Interreg - DST

* A barged that is optimized for container transport, can store 4 containers over its width

Coupled Formation

A coupled formation consists of one motor cargo vessel and a barge.

Often the barge's aft is fitted adapted to the ship's bow shape. The barge in front is equipped with a pump jet of approximately 500kW to assist manoeuvring

Coupled Formation

Coupled Formation: GMS Veronique, L: 110.00 m – B: 11.45 m – D: 3.32 m – T: 3066 t / 208 TEU – P: 2 x 970 kW + 300kW bow thruster; Barge VERONIQUE II, L: 71.00 m – B: 11.45 m – P: approx. 560 kW + 240 kW bow thruster

Source : EU Interreg - DST

Special Cargo Transport

One aspect that needs to be kept in mind for such a transport is the heights of the bridges to be passed.

Single heavy or voluminous units can be put on pontoon barges. It is also possible to put the units in a bulk carrier (e.g. wire coils, slabs).

Special Cargo Transport

Pushed convoy for special cargo: Pushboat BROEDERTROUW 2, L: 19.4m – B: 10.3m – D: 1.6m – T: 96t; Barge LASTENDRAGER 12, L: 66.4m – B: 11.4m – T: 1439t; Barge LASTENDRAGER 22, L: 36.5m – B: 6.9m – T: 272t; Barge LASTENDRAGER 22, L: 40.8m – B: 7.8m – T: 351t). The convoy transported the spacecraft BURAN on the Rhine to a museum in Speyer, Germany.

Source : EU Interreg - DST

Special Cargo Transport

Source : EU Interreg - DST

Motor vessel for special heavy or voluminous cargo: Roro BREUIL, L: 75.0 m – B: 13.8 m – T: 1300t. The BREUIL carries the wings for the Airbus A380.

CHARTER PARTY

Agreed separately between Owners and Charterers:

- The freight rate
- Demurrage rate
- The volumes and goods to be transported
- The transport routes, loading and discharging terminals
- The date or period of time when the transportation is to take place.
- The laytime allowance

Convention - Exception

- The terms of CMNI shall apply to contracts of carriage by barge agreed under the terms of this charter party.
- The terms of CDNI Part B, the Convention on the collection, deposit and reception of cargo-related waste, generated during navigation on the Rhine and other Inland Water ways, shall apply to contracts of carriage by barge agreed under the terms of this charter party.

Convention – Exception (Cont'd)

- Unless expressly provided otherwise in this Charter, neither Charterers nor Owners shall be responsible for any loss, damage, cost, expense, delay or failure in performance arising or resulting from act of God, natural events (such as storms, cyclones, earthquakes, tidal waves, floods, lightning), explosions, fires, destruction of pipelines and any other kind of installation, war (whether declared or not), civil war, civil commotions, riots and revolutions, hostilities, acts of piracy, acts of sabotage, lawful detention of the Barge, quarantine restrictions, threatened or actual boycotts or lock-outs.

CHARTER PARTY - DOCUMENTATION

- Owners shall ensure that all documents and certificates specified by ADN (listed in ADN 8.1.2) are fully completed, signed, valid and on-board the Barge before the beginning of the voyage. Charterers will provide Owners with the transport document for ADN and CDNI purposes
- Immediately after any loading procedure has been completed and irrespective of any activities carried out by an inspector who may have been commissioned, Owners shall carry out an internal survey of the Barge to ascertain the volume of the cargo on the basis of official and current valid tank volume charts

CHARTER PARTY – DOCUMENTATION (Cont'd)

- Owners shall ensure the Master maintains a cargo journal in which tank volumes with and without cargo are documented and kept on board in a secure format
- The Loading document and other cargo documents required by Charterers shall be issued by the loading terminal and signed by the Master

COMPLIANCE WITH CHARTERER'S VOYAGE ORDER

- The Barge shall proceed to the loading port (the term "port" shall include any port, terminal, berth, dock, loading or discharging anchorage, alongside Barges or lighters, or any other place whatsoever as the context requires)

- Owners undertake that the Barge is able to load, carry and discharge the quantities, grades and segregations of cargo

COMPLIANCE WITH CHARTERER'S VOYAGE ORDER (Cont'd)

- Owners shall determine the loading volume taking into account water level, authority requirements and the Barge's equipment, and shall advise Charterers immediately if the quantity of cargo nominated in Charterers' Voyage Orders exceeds the Barge's loading volume, taking into account the tolerance as stated on the voyage order

- Owners undertake that the Barge shall, upon completion of loading the cargo, proceed with all reasonable despatch to the discharge port stated

LOADING AND DISCHARGE PORT SHIFTING

- The Barge shall be loaded and discharged at any port in accordance with Charterers' Voyage Orders
- Charterers shall have the option of instructing Owners to load the Barge at more than one berth at each loading port and to discharge at more than one berth at each discharge port
- The barge shall load and discharge at any safe place or wharf, or alongside vessels or lighters reachable on her arrival

LAYTIME & DEMURRAGE – CHARTER PARTY

Laytime

- Charterers shall be allowed the number of hours per unit as laytime for loading and discharging and for any other purposes of Charterers in accordance with the provisions of this Charter

Demurrage

- Demurrage will be incurred if the allowed Laytime agreed between the Charterer and barge Owner is exceeded.

LAYTIME – CHARTER PARTY

- Allowed loading and discharging times for Barges meeting the required pump capacity are as follows and based on actual loaded quantity:
    - Up to 1100 tons of cargo = 24 hours
    - Over 1100 and up to 1575 tonne of cargo = 26 hours
    - Over 1576 and up to 2100 tonnes of cargo = 28 hours
    - Over 2101 and up to 3150 tonnes of cargo = 34 hours
    - Over 3151 and up to 4200 tonnes of cargo = 40 hours
    - Over 4201 and up to 5250 tonnes of cargo = 46 hours
    - Over 5251 and up to 6300 tonnes of cargo = 50 hours
    - Over 6301 and up to 7350 tonnes of cargo = 54 hours
- Over and above that, the times are extended by 4 hours per 1000 tonnes or part thereof.

DEMURRAGE INVOICE

- The demurrage invoice must be accompanied by the following documents in a legible format as agreed between Owners and Charterers:
    - Laytime statement and demurrage calculation.
    - Copy of the nomination including verifiable evidence of the relevant time and date of its transmission.
    - Signed or stamped timesheets from the Loading Terminal and Discharge Terminal (or if it is not the terminals custom to provide signed timesheets, a timesheet emitted by the barge and signed or stamped by a terminal and Barge representative).
    - Printout of AIS tracking or other internal tracking device for the duration of the Charter if required by the Awaiting Orders Clause.
    - Copy of all Letters of Protest.

FREIGHT – CHARTER PARTY

- Freight be payable as per value date specified on the freight invoice, on the gross quantity loaded by the Barge as evidenced by the Loading Documents
- Costs related to this Charter are for Owners account. Charterers shall not be liable for fuel, towing, pilotage, port charges or canal dues or other charges or expenses relating to loading and discharging
- Owners must send all freight invoices by the form of communication agreed with Charterers.
- For avoidance of doubt once Charterers have paid freight, Owners shall release Charterers from any liabilities arising from missed payments between Owners and legal owners of the Barge

CDNI – WASTE MANAGEMENT – CHARTER PARTY

- Charterers shall have no obligation to clean the barge tanks prior to loading
- Charterers and Owners must comply with their ‘rights and obligations’ as provided in the CDNI
- If after Charterers inform Owners of load port, Owners do not advise Charterers with 6 hours, that a Gas Free Certificate is required from a gas Doctor, then all cost as a result of no Gas Free Certificate is for Owners account.

ENVIRONMENTAL PROTECTION

Among the various activities are:

- The protection against pollution resulting from accidents ("accidental pollution")
- The protection at the level of working procedures on board vessels
- The techniques used for the treatment of waste produced ("operational pollution").

CDNI CONVENTIONS APPLY

ENVIRONMENTAL PROTECTION

Protection in the context of working practices and every-day operations

a) Reducing emissions of harmful exhaust fumes

b) Reducing carbon gas emissions

c) Handling of waste generated on board vessels

Handling of Waste

- Water transportation, whether involving passengers or cargo, generates waste.
- This waste must be handled in line with applicable regulations governing temporary storage on board vessels and transfer to recycling and disposal networks

Handling of Waste

- CDNI (Convention on the collection, deposit and reception of waste generated during navigation on the Rhine and other inland waterways)
- This Convention came into force in November 2009. It covers waterways in Belgium, Germany, the Netherlands, part of the waterways in France (Rhine and Moselle), Luxembourg and Switzerland (Rhine
- The Convention and its implementing regulation set out detailed rules on waste prevention, how to handle waste generated on board vessels and the procedures governing transfer to land installations.

The Rules Vary Depending on The Type of Waste

A) The handling and financing of oily and greasy waste generated on board

B) Cargo handling in light of the waste

C) Other waste: garbage, other special waste, sewage of passenger vessels and equivalent

Cargo Handling in Light of The Waste

Optimising cargo unloading in order:

- to eliminate cargo residues and cargo waste; It is up to the addressee of the cargo/stevedore, respectively the shippers,
- to unload in a manner that complies with applicable standards and, where necessary,
- to clean up (or have cleaned up), by means of washing the holds and tanks;
- to the extent that these processes generate waste, it is also up to the addressee of the cargo/stevedore or shipper

Cargo Handling in Light of The Waste (Cont'd)

- to dispose of them in the manner required by regulations (and to bear the costs); the discharge form that must be provided by the addressee of the cargo/stevedore to the vessel accompanies this process and enables the vessel
- to prove to the subsequent shipper that the holds and tanks are in a proper condition to take on a new cargo; in the case of the transportation of dry bulk goods, equivalent rules apply to handling residue; tankers must be fitted with a necessary stripping system
- to optimize the unloading of liquid cargo

Other Waste

Waste generated from hotel activities on passenger vessels, both the garbage and the sewage must be disposed of at dedicated installations (mobile, floating or stationary), where applicable, the relevant services being feebased

Development of the Common Standard Curricula on International Transport and Logistics Basic Training for ASEAN Member States under Sustainable Human Resource Development in Logistics Services

INLAND WATERWAYS TRANSPORT

ASEAN EXPERIENCE

INDONESIA

Source : Suprapto SS

MAHAKAM RIVER - KALIMANTAN

INDONESIA

Source : Suprapto SS

MAHAKAM RIVER - KALIMANTAN

INLAND WATERWAYS TRANSPORT –
VIETNAM EXPERIENCE




SOURCE : VIETNAM INLAND WATERWAY ADMINISTRATION (VIWA)

INLAND WATERWAYS TRANSPORT –
VIETNAM EXPERIENCE

In Vietnam, there are 2,360 rivers and channels with a total length of 41,900 km, of which 11,226 km have sufficient depth for waterway transportation.

RIVERS

	River System	Length	Basin Area
North (18,000km)	Bang Giang- Ky Cung	(Data unavailable)	(Data unavailable)
	Red River	1161km (Total) 541km (Vietnam portion)	61,400km2
	Thai Binh	185km	12,000km2
	Ma	415km (Vietnam portion)	17,600km2
Central (14,000km)	Lam	500km	(Data unavailable)
	Thu Bon	97km	(Data unavailable)
	Ba	317km	(Data unavailable)
South (10,000km)	Dong Nai	(Data unavailable)	(Data unavailable)
	Mekong River	4500km (Total)	810,000km2

Source : ALMEC Corporation - JICA

CARGO FORECAST (MEKONG RIVER)

(BY Mil Ton)

Commodity	2000	2015
Rice, Agricultural Products	5.03	6.35
Construction Materials	3.79	8.90
Timber	0.85	1.85
Fertilizer	1.54	1.98
Others	2.87	7.26
TOTAL	14.08	26.34
Inland Waterway Transport	9.20	15.60
(average annual growth rate)	(5.4%)	(3.6%)
	(-2000)	(2000-2015)

Source : ALMEC Corporation - JICA

MAIN INLAND WATERWAYS ROUTES

Area	No.	Route	Main River, Channel	Length (km)	Minimum Water Depth (m)	Maximum Vessel Size (DWT)
North	1	Quang Ninh-Ninh Binh	Luoc, Dao, Day	323	1.8	Barge use
	2	Quang Ninh-Hanoi, Hanoi-Viet Tri	Kinh Thay, Duong, Hong	313 79	1.5	Barge use
	3	Lach Giang-Nam Dinh- Hanoi	Ninh Co, Hong	181	1.5	600
	4	Cua Day-Ninh Binh	Day	72	0.8	300-1,000
South	1	HCMC-Kien Luong (1)	Dong Tien Lagrange, Van Nao, Mac Can Dung	288	1.5	Barge use
	2	HCMC-Kien Luong (2)	Cho Gao, Rach Soi- Hau Giang, Rach Gia- Ha Tien	319	1.5	Barge use
	3	HCMC-Ca Mau	Cho Gao, Ni Co Lai, Xa No	341	1.5	Barge use
	4	Cua Tieu-Tan Chau	Tien Giang	227	2.1	2,000
	5	**Cua Dinh An-Tan Chau**	**Hau Giang**	**235**	**2.6**	**3,000-5,000 (Cua Dinh An-My Thoi)**

Source : ALMEC Corporation - JICA

CARGO VOLUMES

Items	Volume of Freight (thousand tons)			Volume of Freight Traffic (million tons km)		
Year	All Modes	Waterways	(%)	All Modes	Waterways	(%)
1990	53,889	16,295	30	12,544	1,749	14
1991	56,431	15,566	28	17,210	1,765	10
1992	64,903	16,894	26	17,002	1,817	11
1993	70,464	16,797	24	18,419	2,335	13
1994	76,455	17,533	23	21,127	1,971	9
1995	87,220	20,051	23	21,858	2,248	10
1996	100,140	23,395	23	29,142	2,487	9
1997	104,709	24,144	23	35,297	2,821	8

Source : ALMEC Corporation - JICA

GOVERNMENT POLICIES

1. Creation of investment capital (domestic & foreign capital)
2. Development of inland waterways transportation
3. Management of inland waterways transportation
4. Creation of equitable and competitive environment

a. To ensure technical criteria of transportation safety and environmental protection.
b. To fulfill obligations toward the State (different fees and charges)
c. To abolish monopoly in transportation so that all participants to inland waterway transportation can compete through quality of service and price rationalization.

GOVERNMENT POLICIES

- Protection of environment
  - To impose tax on polluters.
  - To provide incentives to businesses using materials causing less pollution.
  - To protect and manage environment.
- Promotion of inland waterways transportation safety
- Application of advanced technology
- Development of human resource

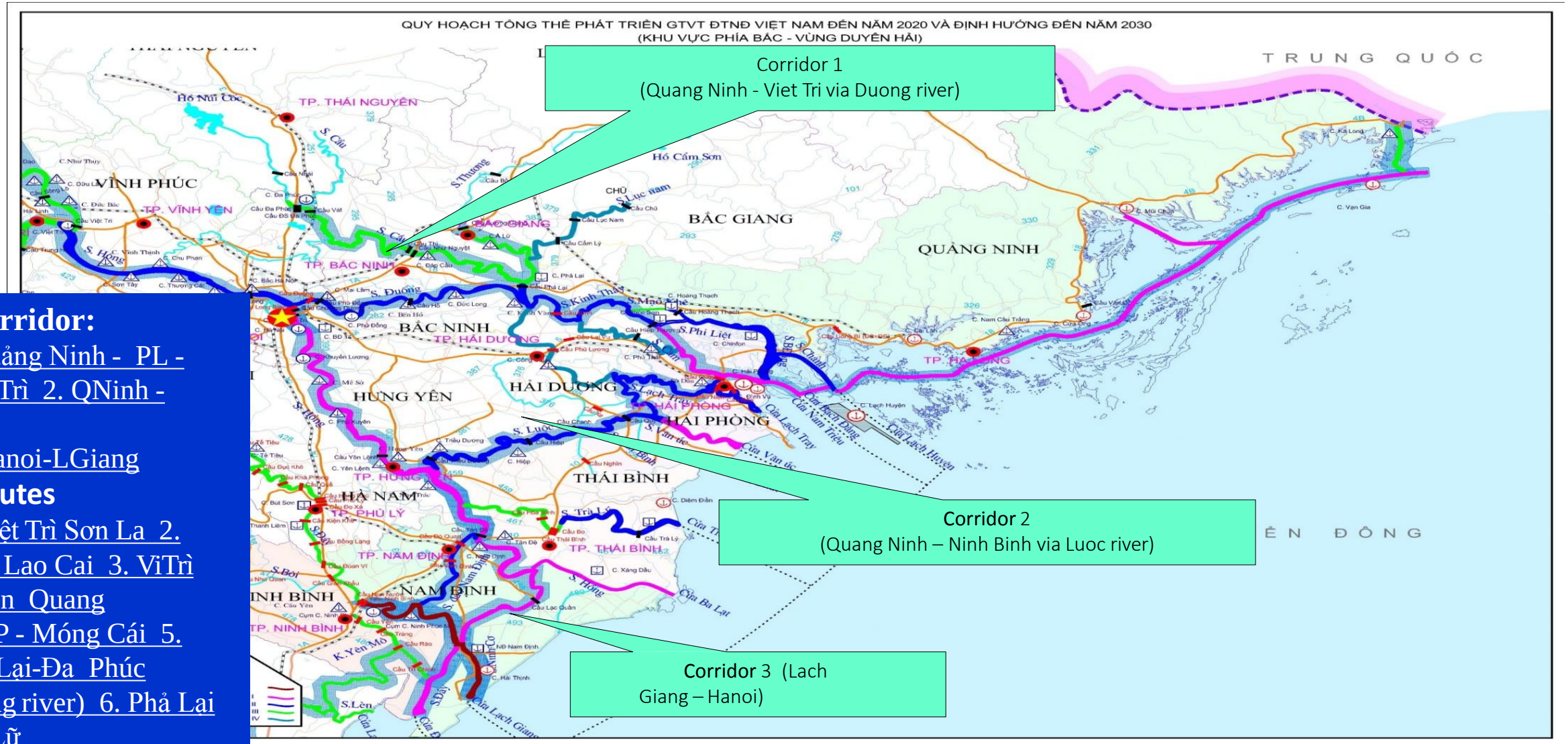
Inland Waterways Transport

- State owned Transport
- Specialized Transport (cement plants, paper mills, construction materials)
- Private Transport

TARIFF STRUCTURE

- The tariff for inland waterway transport is stipulated by the Government Price Committee and arrived at by taking into account the distance, commodity value and type of waterway through which cargoes are transported.
- For transport operators, VIWA charges the following: tonnage fee, formality fee, river vessels support fee, and fines.
- Individual port operators levy a handling charge, storage fee and berthing fee on cargoes. Cargo handling charge is based on cargo category and handling procedures.

INLAND WATERWAY IN THE NORTH OF VIETNAM



3 corridor:

1.Quảng Ninh - PL - Việt Trì 2. QNinh - NB

3. Hanoi-LGiang

6 routes

1. Việt Trì Sơn La 2. V.Trì Lao Cai 3. ViTrì Tuyên Quang

4. HP - Móng Cái 5. Phả Lại-Đa Phúc (Công river) 6. Phả Lại - Á Lữ

Source : VIWA – Ministry of Transport Vietnam

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THANK YOU

TERIMA KASIH