



## Terms of Reference

# Bottlenecks and Best Practices of Transport of Containers on Inland Waterways

### 1- Background

Making our economies climate neutral will lead to a decline in the volume of fossil fuels, often the most important cargo for inland navigation. In Europe, the market for coal is already shrinking and with the further electrification of road transport, the market for liquid fossil fuels will follow. Thus, inland navigation needs urgently to find other cargoes and to expand its market share in the transport of cargoes, which will stay relevant in the future.

In the Rhine region, the transport of containers is seen for inland navigation, perhaps, the most promising market segment of the future. However, road and rail are strong competitors, having often the advantage of being faster and requiring fewer transshipments of the containers. Thus, inland navigation must become more efficient, more reliable, and more customer oriented to increase its market share or just being able to defend the status quo of container transport.

In other parts of the world, in particular in China, container transport on inland waterways is growing rapidly. Thus, the challenge is less the competition with other modes of transport, rather than managing the growth.

A common feature of large scale container transport on inland waterways is its interdependence with seaports. This is not a surprise, as seaports are generally the largest hubs for container transport. In Europe, container transport on inland waterways is by far most developed in the wider Rhine region, where Europe's busiest seaports are situated. In China the container transport on inland waterways concentrate mainly on the Pearl river and the Changjiang river. The estuaries of these rivers are home to the largest container ports in the world. In the port of Shanghai, which is the largest container port in the world, about half of the container volume is handled at terminals at the river mouth which can be accessed by inland vessels. Another half is handled at the terminals out of the river mouth (Yangshan port area), which are served by river/sea vessels. This type of transport is growing rapidly along with increased waterway dimensions of the Changjiang river.

### 2- Earlier reports to be reviewed

PIANC recognized the potential of container transport for inland navigation early on. Indeed, the PIANC's WG 5 report "*Container Transport with Inland Vessels*", published in 1992, concluded that in practice there were no serious technical problems as regards dimensions, stability, manoeuvrability, draught and clearance of units, in the domain of container transport with inland vessels. It also noted that, apart from a few minor and specific improvements, the existing inland waterway and port infrastructure were satisfactory, where the traffic exists (Columbia/Snake or Rhine) as well as where attempts are being made to create it (Mississippi, Ohio, Tenn/Tom, Seine, Meuse, Rhine).

The only element identified by the WG as definitely open to improvement concerns the seaport interface. According to the WG, the problem of developing container transport with inland

vessels is not of a technical, hydraulic or infrastructural nature, but indeed almost exclusively of an economic and economic political character.

Other relevant PIANC reports include:

- WG 16 report "*Standardization of Ships and Inland Waterways for River/Sea Navigation*", published in 1996,
- EG 118 report "*Direct Access to Maritime Ports by Adapted Inland Waterway Vessels*", published 2013,
- WG 179 report "*Standardisation of Inland Waterways - Proposal for the Revision of the ECMT 1992 Classification*", published in 2020,
- WG 201 report "*Framework for an Inland Waterway Classification in South America*", published in 2020.

### **3- Objectives**

Now, 30 years after PIANC's first report on the subject, the transport of containers on inland navigation vessels has taken off in many parts of the world. This is particular the case in China, which was not even mentioned in the report from 1992. Moreover, inland navigation has developed many good and best practices for the transport of containers. These practices are resulting from the desire for better services, but also from the need to address specific bottlenecks. These bottlenecks concern for example the height of bridges over inland waterways or the servicing of inland navigation vessels by maritime container terminals.

Sharing globally, in the future good and best practices for the transport of containers on inland waterways including identification of typical bottlenecks and ways of how to overcome them will contribute to strengthen inland navigation's competitiveness in this market and support its future development.

Transporting a container on inland waterways instead of the roads can decrease the GHG emissions by up to three quarters. Thus, making container transport by inland waterways more competitive can contribute to the achievement of the Paris Agreement, given the fact close to a quarter of energy-related global greenhouse gas emissions come from transport and that these emissions are projected to grow substantially in the years to come. Carrying containers on inland navigation vessels is much safer than on trucks and therefore will also contribute to achieving SDGs as sustainable transport is now mainstreamed across several SDGs and targets, such as those related to health, energy, economic growth.

### **4- Scope**

These practices concern the waterway infrastructure, the core activity of PIANC. However, they also go beyond, encompassing the vessels, ITC applications as well as the organisation and management of the transport. This should not prevent PIANC from providing the platform for sharing good practices just as PIANC did in 1992.

This platform has to be realized by a PIANC WG. The WG will collect and describe lessons learned regarding the transport of containers on inland waterways. They will be used as the basis for identifying, gathering and describing good and best practices. These lessons and practices include the container terminals, the vessels, the waterways and ITC applications such as RIS. The WG will look at technical features, such as design of infrastructure and equipment, but also at operations and management. Finally, not only the handling and carriage of the containers will be examined, but also the related services, such as providing accurate and real-time transport related information, as these services are key factors in keeping or winning customers for inland navigation.

When undertaking its work, the WG will examine the aforementioned reports, in particular issues identified therein, which strongly influence container transport on inland waterways. Continuously increasing container size in length, width and height creates challenges for the design of the vessels and even more so of the infrastructure. Similarly, container terminals moving further out into the sea are becoming unreachable for conventional inland navigation vessels, requiring purpose built vessels instead. Another challenge to be addressed is the

management of inland navigation vessels in seaports, where they are often facing long waiting times due to low priority at the container terminals. The WG will also examine reports on relevant research in order to identify research results, which could become or support best practice in the future.

## **5- Intended product**

The WG will publish its findings and recommendations in a report. However, it is invited to use other ways of dissemination as well. In the same way, the WG is invited to find the best method for gathering information, such as questionnaires, interviews, workshops etc.

## **6- Working Group membership**

As the scope of the WG is very wide, so must be its composition. Representatives of operators of terminals, vessels, and waterways as well as other practitioners and researchers with relevant knowledge and experience are needed for the WG to succeed including specialists for ITC applications facilitating container transport on inland waterways. The geographical scope of the WG will be wider than in 1992 and will include in particular IW representatives from Asia (China, ...). But also, South America and other regions, where the transport of containers on inland waterways is rather emerging, will be included.

## **7- Relevance for Countries in Transition**

The topic is very relevant for countries in transition, as their increasing integration in world trade fuels growth of container transport.

## **8- Climate Change**

There is no particular relevance of climate change as in this respect transport of containers on inland waterways is not different from transport of other goods. However, where water levels will rise, permanently or temporarily, the air draught of bridges will be reduced possibly impacting negatively transport of containers on these waterways.