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Feeder Service and Container Train – The Main Links in the Logistics Chain on Rijeka Transport Route

Summary

The port of Rijeka as logistic platform provides for involving the Republic of Croatia and ports of Midle Europe countries into contemporary world – traffic flows. Beside the infrastructure and equipment of the container terminal, feeder service and container train represents strong logistic support to the Port of Rijeka. Feeder service as a modern way of organizing container transport and linking two or more container terminals as well as supplying larger container ships, represents a higher form of the marine transport containerization. Smaller container ships and the role feeder service is playing in the upgrading of the marine transport are matters of permanent attention and research. Container traffic reserves a great attention because of its very dynamic nature in modern transport technology. Basic features and ways of containerization considered by their directions and sea ports, have a great impact on the development of sea ports and the whole geografic area. Both, the current conditions and the prospects of the containerization and feeder service development are worthy of the attention paid by the Croatian research workers and men of practice, the more so as such forms of the container transport are very important for a successful functioning and development of the leading Croatian ports, north adriatic ports, particularly the Port of Rijeka.

Key words: Port of Rijeka, feeder service, container train, logistics chains.

1. Introduction

Port of Rijeka is the biggest and the most important Croatian port. Up to 1990 it was a strong factor within NEAR market with transhipment range of 35% (almost as port of Trieste). Following the proclamation of independence in Croatia, harbour transport has significantly dropped due to war, transition, decrease of total commercial activity and reduction of *gravity* area [1]. During the period 1990-2000 port of Rijeka's share dropped to less than 12%. Some authors [2] are of the opinion that political and military occurrences during the 90's did not initiate the process of port's decline, but that it was caused by subjective factors. Through process of revitalisation of Rijeka's port and modernisation of harbour infrastructure and superstructure its share within NEAR market in year 2004 has increased to 18,5%.

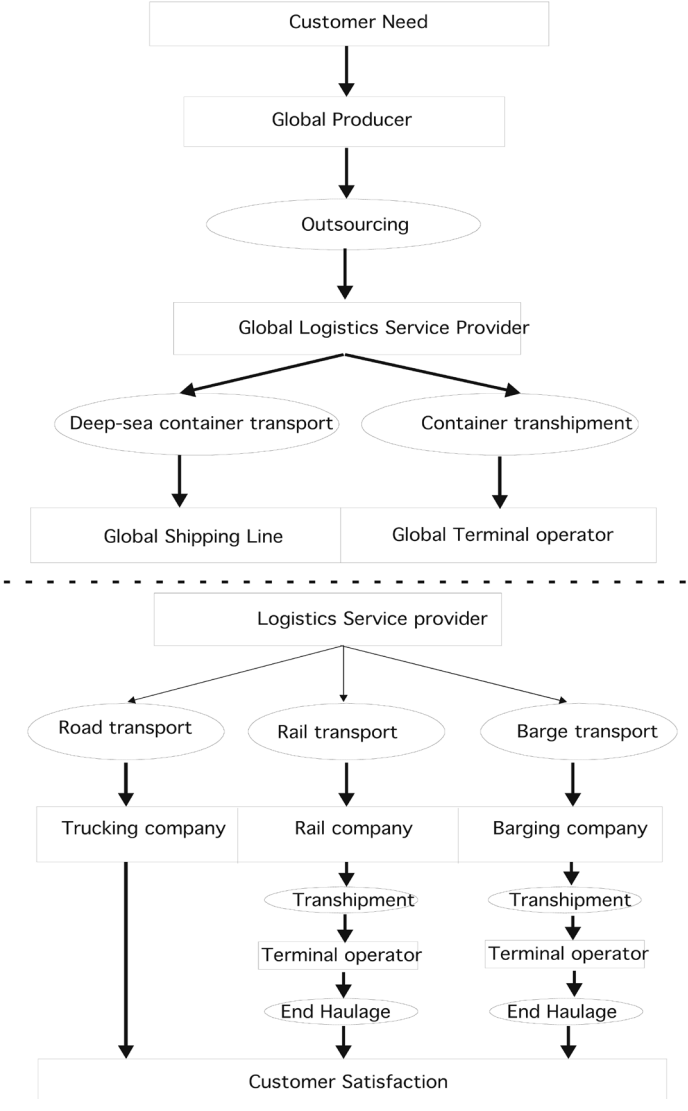
When considering present and future flows of goods the port of Rijeka, as connection point between sea and land transport, deserves special attention in transport and logistics network of central and eastern European countries. In order to correct the existing flows of goods, which have been diverted during the 90's to other transport routes, it is necessary for all transport companies active in connection to Rijeka's transport route to act in a unified and synchronised manner, thus forming the total transport cost. Accordingly, the following scientific hypothesis can be set: Feeder service and integral container train Rijeka – Budapest, are a main links in the logistics chain on Rijeka transport route. Such logistics support is a precondition for competitiveness of Rijeka's port within north Adriatic transport route and its profiling as a logistics platform of central and south-eastern European countries.

2. Relevant characteristics of logistics and logistics chain

Etymologically, logistics can be interpreted in different ways. In fact the Greek word "logos" referred to logic and reasoning, and the term we now use as supply function originated from the French word "logis" meaning to quarter so the term "logistics" become the art of moving and quartering troops, first used in the 19th century and subsequently for the supply of the army in the field. Over the years, logistics has been developing and it has been implemented in an ever-increasing scope of human activities. "Logistics" should be used simply to denote the supply function in the movement of goods from source point or store to a defined "customer". Logistics is the …"process of planning, implementing and controlling the efficient, effective flow and storage of goods, services and related information from point of origin to point of consumption for the purpose of confirming to customer requirements (Council of Logistics Management). Logistics involves … managing the flow of items, information, cash and ideas through the coordination of supply chain processes and through strategic addition of place, period and pattern values. (MIT Centre for Transportation & Logistics). The purpose of logistics management is to obtain efficiency of operations through the integration of all material acquisition, movement, and storage activities.

Good quality logistic system includes the total throughput of material, from accepting the raw material or reproduction material to the delivery of final products to end users. This means that storage, distribution and transport of goods represent an important component of logistic system. Such new concept, often based on relation marketing between numerous participants of different social economies, would be very hard to imagine without appropriate logistic chains that, through logistic networks and logistic system of all levels, connect potential sources of raw material, potential buyers, potential production centers, potential distributive centers and consumers with certain demands [8]. All logistics chains starts with customer needs and end with customer satisfaction. Most logistics chains start with a maritime part including continental prehaulage, deep-sea transport and transhipment, after which continental part of logistics chains operation commences (see Figure 1).

Figure 1: Global logistics chain



Source: Prepared authors according: Wiegmans, W., et. al.: Intermodal Freight Terminals: An Analysis of the Freight Terminal Market, Research Memorandum 1998-55, Vrije Universiteit, Amsterdam, 1999.

3. Port of Rijeka – Logistics Platform for the Countries of Central and South-east Europe

During the pre-transition period port of Rijeka was a significant factor in accelerating the transport flows and developing many commercial activities, so much so that the commercial entities in former Counties Union of Rijeka were extremely export-oriented, having placed 26% of total foreign currency income of Republic of Croatia in 1988, and thus establishing relations with business partners from 75 different countries.

During the 90's, in the past century, the bulk of harbour transport diverted to ports of Kopar and Trieste, so in year 2000 total harbour transport amounted to 50% of transport effected in 1990. Total income of Rijeka's port including the transhipment of dry cargoes is shown in table 1.

Table 1: Turnover Port of Rijeka by dry cargo structure 1980. – 2004. (in tons)

Year	Total	General Cargo	Bulk Cargo	Timber
1980.	7.374.000	1.664.000	5.230.000	480.000
1990.	5.796.000	1.641.000	3.908.000	247.000
1995.	3.705.033	990.771	2.562.943	151.319
1996.	2.309.281	682.976	1.488.252	138.053
1997.	2.523.581	702.732	1.686.585	134.264
1998.	3.288.377	620.076	2.526.207	142.094
1999.	2.545.747	726.097	1.683.546	136.104
2000.	2.564.133	795.399	1.603.483	165.251
2001.	2.908.230	831.951	1.925.659	150.620
2002.	2.726.012	791.239	1.733.067	201.706
2003.	3.557.206	1.061.748	2.327.629	167.829
2004.	4.654.618	1.392.089	3.080.723	181.886

Source: Port of Rijeka authority

Analysing the data in table 1, one can conclude that total transport of Rijeka's port is still below the level reached in 1990. It is an established fact that transport within port of Rijeka has been in steady growth since year 2000. Its dynamics structure is somewhat more favourable then before 1990, as high-tariff cargoes have increased in share. Thus, in 2004 general cargo had a share of 29,9%, while in 1990 it was 28,3% and only 22,5% in 1980. The goal to be reached is 35 to 40% of general cargoes, with steady growth of total transport.

With the opening of China and India the Mediterranean is a centre of gravity for movement of goods all over the world, with Gioia Tauro the transhipment hub to handle

cargo from Asia. The global economy only exists thanks to shipping, in particular container shipping. Worldwide seaborne dry cargo traffic has doubled from 1,8 billion tonnes in 1980 to a forecast 3,8 billion tonnes in 2005. The increasing dominance of containerised traffic is easy to see. In 1980 containers represented 6,3 per cent of world traffic. In 2003 they accounted for 23,8 per cent. By 2010 container port throughput should reach 432,2 million teu.

In 2003 Italian ports handled almost 454 million tonnes of cargo, up from 440 million in 2002. Genoa was the busiest port with 51,7 million – far short of Rotterdam or Antwerp, but in same league as London, Marseilles or Amsterdam [3]. Of the major ports, only Trieste, once the main harbour of the Austro-Hungarian Empire, has seen business shrink. Between 1994 and 2002 the number of containers passing through Italian ports rose by 200 per cent. In the year 2002. Luka Koper handled 9 431 496 tons of cargo. With such a result the Port of Koper exceeded the result of the year 2001 by 1 per cent or 77 500 tons. In comparison with the earlier year there are increases especially in the traffic of general goods timber, containers and alumina. The record [4] was reached in the container traffic with 114 863 teu which is 23 per cent more if compared to year 2001.

4. Feeder service – Factor for Port of Rijeka's inclusion to Macro and Global Logistics System

Globalisation and rationalisation in shipping system have a result in adaptation and port's specialisation for maximum adherence to new commodities' flows. Global navigation routes for large container vessels have resulted in creation of transhipment centres (ports), and accordingly creation of appropriate connections between these centres and final destinations. In Mediterranean regional market, ports of Gioia Tauro, Algeciras and Malta have distinguished themselves as main container transhipment ports, while many traditional ports, including all Adriatic ports, have feeder services.

After "Croatia Line" has been terminated, port of Rijeka was left without an important national liner company, and Rijeka's transport without one of the most important links in transport logistics chain. Therefore, it was necessary to initiate certain revitalisation of liner service in Croatia. First step towards that direction was a joined project between Croatian government, Ministry of Sea Transport, Traffic and Connections, Rijeka Port Authority, Lošinjska plovidba, Croatian Railroads and Port of Rijeka on starting a regular feeder service from port of Rijeka to Gioia Tauro. Regular weekly feeder line Rijeka – Malta – Gioia Tauro, the port of Rijeka has made part of Mediterranean container System. Although this feeder service creates losses for domestic shipper (Lošinjska plovidba), in view of supporting the interests of Croatian exporters and importers those are partially covered by state.

This established feeder service has resulted in first positive results: 1) for each TEU serviced through Croatian ports there is an income for Croatian economy of 700 USD,

2) port of Ploče, that until introduction of feeder service had no container transport whatsoever, has transhipped more than 9 000 TEU in year 2002, 3) since year 2000 there is an average increase of annual feeder service of more than 68%, 4) since year 2000 there is an average increase of feeder service in port of Rijeka of 66%, while there was an increase of 100% during 2003 compared with 2002, 5) including Montenegro's port of Bar into this feeder service the project was expanded to one additional country.

The reliability of the existing weekly feeder services in port of Rijeka and the competitiveness of the entire route has resulted in extra feeder contacts with foreign companies [6]. During year 2003 a contract has been concluded on weekly service with Israeli company ZIM Navigation from Haifa, and also vessels belonging to Lloyd Triestina and CMA. In this way port of Rijeka is entering the phase of becoming regional hub port.

5. Container train Rijeka – Budapest – the function of inclusion of Rijeka's port into logistics network for the countries of central and south-east Europe

Croatian railroads are the main factor in combined transport in Croatia. Container transport is the most used technology of combined transport and takes 70% of total quantities. One of the most important segments in combined transport in Croatia is sea transport through seaport of Rijeka. In order to achieve the greatest possible economical effects through this segment and to establish competitive advantages of railroad transport there have been many attempts since 1989 to introduce and maintain a container train Rijeka – Budapest.

From train station Brajdica on November 28th 1989 the first container trains Rijeka – Budapest has departed. The reduction in industrial production, economy transition of central European countries, war operations (…) have had as a result the decrease in quantities of imported, exported and transported goods, so this train was reinstated to service in 1993/1994, than again cancelled in 1996/1997 due to lack of container shipments on behalf of Hungarian railroads. But, in 1999 the Hungarian state envoys have come to Rijeka to seek a long-term partner in port of Rijeka. The basis for such co-operation was the introduction of feeder service. Container shipment from port of Rijeka towards foreign railroad stations was done sporadically, using the international combined freight trains, which was not satisfactory. Table 2 shows transport prices for different destinations including delivery times.

Table 2: Characteristics of sporadic container train shipments Rijeka – central European destinations and Rijeka – southeast European destinations

Relation	Rijeka-Budapest	Rijeka-Prague	Rijeka-Vienna	Rijeka-Sarajevo	Rijeka-Belgrade	Rijeka-Bratislava
-Distance	594 km	1 021 km	577 km	746 km	677 km	609 km
Time of delivery	shipment: day A delivery: day C	shipment: day A delivery: day D	shipment: day A delivery: day C	shipment: day A delivery: day D	shipment: day A delivery: day B	shipment: day A delivery: day C
Average price 40' UTI-1*	249 EUR	548 EUR	440 EUR	390 EUR	334 EUR	302 EUR
possible condition of container train	Q = 2000 t L = 600 m	Q = 2000 t L = 600 m	Q = 1000 t L = 400 m	Q = 2000 t L = 500 m	Q = 1600 t L = 500 m	Q = 1500 t L = 550 m

* Average price for UTI-1, in other words price for 40' loaded container weigh-tinnes cca 25 t for one way

Source: Kobak, D.: Ulaganja u razvoj kombiniranog transporta, Željeznice 21, Stručni časopis inženjera i tehničara Hrvatskih željeznica, Hrvatske željeznice, God. 2, br. 2, Zagreb, 2003., 59

In 2003 container train Rijeka – Budapest was once more reinstated into service. The reactivation of this important transport link on Rijeka's transport corridor was a result of joint efforts on the side of Port, Port Authority and Croatian Railroads. This train's destiny has not changed much, and again since 2004 it is out of service on this route. It can be anticipated that the critical number of containers necessary for new permanent reinstatement of this service will be reached by the end of 2005. Such prognosis is based on the fact that the container transport within port of Rijeka has increased for almost six times, and only in 2004 compared to 2003 it has doubled (cf. table 3).

Table 3: Container turnover at Port of Rijeka 1990. – 2004.

Year	Tonnes	TEU	Tonnes/TEU
1990.	403 083	50 282	8,02
1991.	304 239	41 729	7,29
1992.	350 842	47 953	7,32
1993.	365 025	49 913	7,31
1994.	297 724	46 516	6,40

1995.	244 670	43 705	5,60
1996.	188 399	29 492	6,39
1997.	132 000	15 858	8,32
1998.	82 000	12 182	6,73
1999.	66 524	10 134	6,56
2000.	92 084	14 500	6,35
2001.	115 606	17 852	6,48
2002.	137 860	18 078	7,63
2003.	249 939	28 298	8,83
2004.	510 000	60 000	8,50

Source: Port of Rijeka authority

As per data in table 3 it is obvious that the container transport in port of Rijeka has in year 2004 surpassed the results of 1990. Sudden increase of containers handled proves the importance of Rijeka's port on this transport route, and acknowledges port of Rijeka as one of the most important links in transport and logistics network for the countries of central and southeast Europe.

6. Conclusion

As logistics platform the Port of Rijeka assures integration of Republic of Croatia and other countries of central and southeast Europe into modern world's transport and commodities flows. Besides infrastructure and equipment of a container terminal, feeder service and container train Rijeka – Budapest represent the powerful logistics support to the Port of Rijeka. Feeder service has directly contributed to container transport revitalizations to Croatian ports and reviving of container transport on Rijeka's transport route. The pre-condition for efficient functioning of feeder service is the connection of port's container terminals and gravitating inland by railroad transport. This is very important especially because Italian railway system announced alliances with Austrian and Slovenian railways. Italian port of Trieste and Slovenian port of Koper aim to serve EU' eastward expansion. Therefore Croatia should improve competitiveness of its major ports, first of all the port of Rijeka.

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Feeder servis i kontejnerski vlak – glavne karike logističkog lanca na riječkom prometnom pravcu

Sažetak

Luka Rijeka, kao logistička platforma, osigurava uključivanje Republike Hrvatske i dijela srednjoeuropskih zemalja u suvremene svjetske prometne tokove. Osim infrastrukture i opreme kontejnerskog terminala, feeder servis i kontejnerski vlak predstavljaju snažnu logističku podršku Luci Rijeka. Feeder servis, kao suvremeni način organizacije prijevoza kontejnera i povezivanja dvaju ili više kontejnerskih terminala te snabdijevanje većih kontejnerskih brodova, predstavlja viši oblik kontejnerizacije pomorskog prometa. Manji kontejnerski brodovi i uloga feeder servisa u funkciji poboljšanja pomorskog prometa privlači stalnu pozornost i istraživanje. Kontejnerski promet zaslužuje veliku pozornost jer se radi o najdinamičnijem obliku suvremenih tehnologija prijevoza. Osnovne značajke i oblici kontejnerizacije po pojedinim pravcima te u pojedinim morskim lukama imaju velik utjecaj na razvoj morskih luka i cijelih područja. Postojeće stanje te perspektive razvitka kontejnerizacije i feeder servisa hrvatskih i drugih morskih brodara zaslužuju pozornost hrvatskih znanstvenika i praktičara, tim više što takvi oblici prijevoza kontejnera imaju veliko značenje za uspješno funkcioniranje i razvitak najznačajnijih hrvatskih luka, luka u Sjevernom Jadranu, te posebice Luke Rijeka.

Ključne riječi: Luka Rijeka, feeder servis, kontejnerski vlak, logistički lanci.

Servizio feeder e treno portacontenitori principali anelli della catena logistica di trasporto tramite lo scalo Fiumano

Sommario

Il porto di Fiume (Rijeka), come piattaforma logistica, assicura l'inserimento della repubblica di Croazia e parte dei paesi dell'Europa centrale nel flusso di traffico mondiale. Oltre alle infrastrutture ed agli impianti del terminale contenitori, il servizio feeder ed il treno portacontenitori rappresentano un notevole supporto logistico per lo scalo fiumano. Il servizio feeder, quale moderno strumento d'organizzazione del trasporto di contenitori e di raccordo tra due o più terminali con il trasbordo di contenitori su navi maggiori, rappresenta senza dubbio una forma avanzata di containerizzazione del trasporto marittimo. Navi portacontenitori di minor portata e il ruolo del servizio feeder
in funzione del miglioramento del traffico marittimo sono oggetto di attenzione e ricerca. Il traffico container richiama su di sé una grande attenzione essendo la forma più dinamica della moderna tecnologia dei trasporti. I caratteri distintivi e i modelli di containerizzazione in uso nei singoli itinerari e porti marittimi hanno un forte impatto sullo sviluppo degli scali marittimi e di intere regioni.
Lo stato attuale e le prospettive di sviluppo della contenairizzazione e del servizio feeder presso gli armatori croati ed altri meritano un attento interesse sia da parte di studiosi e ricercatori che dagli utenti stessi in quanto questa forma di trasporto è di grande importanza per l'efficiente funzionamento e il futuro sviluppo dei porti croati, dei porti dell'Adriatico settentrionale ed per lo scalo fiumano in particolare.

Parole chiave: porto di Fiume, servizio feeder, treno portacontenitori, catene logistiche.