

PAVE MARINOVIĆ, B. Eng.
Hrvatske željeznice
Zagreb, Mihanovićeve 12
GRGO LUBURIĆ, B. Eng.
Učenički dom HPT-a
Zagreb, Trg J.F. Kennedyja 9
SLAVKO SUK, B.Eng.
HŽ- Prijevozno područje Osijek
Kolodvor Bizovac

Integrated Transport
Review
U. D. C. 656.225/226
Accepted: Apr. 20, 1999
Approved: Oct. 5, 1999

TECHNICAL AND TECHNOLOGICAL CONDITIONS OF INTRODUCING CONTROLLED PIGGYBACK TRANSPORT ZAGREB - WEST EUROPE

ABSTRACT

The development of combined transport is highly required by the European countries. The pressure, both administrative and economic, is growing continuously for the use of railway as the ecologically most suitable land carrier. Considering the protection of roads, ecological, political and other reasons, Croatia will have to define her policy toward the "Piggyback" transport in transit (mainly through corridors X and Vb). No efficient integration into the European system of combined transport can be expected without the necessary stimulating measures by the government and without a clearly defined transport policy.

KEY WORDS

combined transport, railway, ecology, transit, piggyback transport

1. INTRODUCTION

The controlled piggyback transport (piggyback technology "A") in Europe is carried out in the organisation of combi companies, the UIRR members (International Union of Combined Road-Rail Transport Companies). The national combi companies are the only ones that have special wagons for this kind of transportation. The national combi company *CroKombi* from Zagreb, will soon become a full member of the UIRR, thus getting the opportunity to organise such an extremely demanding type of transport. Therefore, it is necessary, in co-operation with the combi companies from Slovenia, Austria, Germany, to study the possibility of leasing special wagons for the introduction of the controlled piggyback train on the line Zagreb - Austria - Germany.

2. MAJOR CHARACTERISTICS IN THE OPERATION OF COMBI COMPANIES

Combi companies co-ordinate the work, primarily between the railway and road carriers, i.e. forwarding agents. Organisationally, this means planning of piggyback unit deliveries, organisation and exploitation in piggyback terminals, administrative affairs related to transport, etc.

Commercially, this means that the companies make wholesale purchase of railway services, in order to sell them to road carriers and forwarding agents by retail.

It should be mentioned that these operators do not activate the goods. This is done instead by the road carriers and forwarding agents. They only try to stimulate the interest of the road carrier for railway transportation.

Therefore, when a piggyback unit is transported by railway from terminal A to B, the owner of the goods is the road carrier's and not railway carrier's consignee.

The national company *CroKombi* should basically also operate according to the mentioned principle.

By founding of the national combi company *CroKombi*, the premises and preconditions have been created to implement to the maximum extent the Croatian interests in the international combined transport. The national combi companies are first of all, specialised companies for piggyback combined transport, i.e. for transport of road vehicles (exchangeable truck cases, truck semi-trailers and trucks). However, over the recent years, these companies have been involved also in the organisation of container transport (from March 1, 1999, container

feeder service Rijeka (Ploče) - Gioia Tauro (Malta) will be established).

CroKombi will organise and sell services in the following organisational segments of combined transport:

- controlled combined transport - transport of complete truck vehicles on low-floor wagons - RO-LA trains - "A" technology.

[from the Republic of Croatia towards West European countries, east-west and north-south (Bosnia and Herzegovina) transit: in 1997 (transit Čakovec border - Kotoriba border) about 8,000 truck deliveries were transported]

- uncontrolled piggyback transport - transport of exchangeable truck cases and possibly truck semi-trailers

[in 1997 about 1,300 cases were transported in the Republic of Croatia (import-export, transit, and a negligible number in the internal traffic)]

3. PIGGYBACK TRAIN RELATIONS

As potential relations for possible transport of the piggyback train towards Germany, the following ones are considered:

- Zagreb west railway station - Munich and Riem and
- Zagreb west railway station - Wels (Austria)

The *Zagreb west railway station - Munich Riem* (575 km) relation via Ljubljana has the aggravating circumstance that the tracks pass in Slovenia between the railway stations Litija and Kresnica through the tunnel Pogonjek, whose profile is unsuitable, so that the piggyback train transport towards Ljubljana is possible along the irregular tracks at the same time having to stop the transport on the regular tracks. The travelling of this train would take approximately about 12.5 hours.

The *Zagreb west railway station - Wels* relation (519 km) satisfies the dimensional conditions, and the travelling of the train would take approximately 11.5 hours.

From the aspect of composition turnover, the duration of the ride is unsatisfactory in both cases, since 2x2 hours need to be added to the travelling time for loading and unloading the truck. This practically means that the set of wagons takes 16.5, that is, 15.5 hours in one direction, requiring that two wagon compositions be engaged for the daily transportation of one pair of trains.

Regarding technical and organisational conditions related to the transportation of these trains, the following may be emphasised:

- the transportation of the controlled piggyback trains is technologically possible without any special limitations through the container terminal at

Vrapče. The terminal has been designed for this kind of trains and has the necessary tracks length of 500 metres. Only the construction of adequate front ramp is necessary, which does not ask for any significant financial means.

- organisationally, the transport of these trains imposes conditions on the organisation of the police, customs and other accompanying services, for free delivery and acquisition of piggyback trains in accordance with the customs control.

4. COMMERCIAL CONDITIONS ON PIGGYBACK TRAINS

Commercial conditions for transport of the controlled piggyback trains differ from case to case, depending on the relation, various interests of those participating in the transport, etc. However, the general costs are known and therefore, the following should be noted:

a) Costs for special wagons

Speaking of costs for special wagons for the controlled piggyback transport, it needs to be stressed that no case has been known up to now, where the wagons were leased for certain transportation without involving a combi company - the wagons owner. Therefore, if Ökombi or KombiVerkehr had free wagons for this purpose, they would first of all check the possibility of having this train operate with 75% efficiency, since this is the condition for covering the travelling expenses of a controlled piggyback train. This requires a detailed analysis of the transportation market, searching for adequate support by the countries interested in such transport, as well as indicating all the other organisational measures for undisturbed traffic of the piggyback train.

The price for a used special wagon (owned by Ökombi), in a controlled piggyback train on the Ljubljana-Munich line (427km) in one direction, with composition turnover within 24 hours, taken in 1995, amounts to 95 ECU/wagon.

If the above criterion was used in determining the price per kilometre for the Zagreb-Wels line which is 519km long, the price for a used wagon on this line would amount to 115 ECU, and to Munich 128 ECU.

Additional expenditures need to be added to these prices, due to the possibility of composition turnover within 24 hours by about 30% (according to informally acquired knowledge), which amounts to 150, that is, 166 ECU/loaded wagon.

Railway transport charges

Railway transport charges for controlled piggyback trains range from 0.60-0.75 ECU/km for a loaded

wagon, while empty wagons and couchette coaches for the truck drivers travel for free.

The price per loaded wagon can be estimated according to the following:

I. Zagreb-Wels

$$H\check{Z} = 35 \text{ km} \times 1.77 = 62 \text{ ECU}$$

$$S\check{Z} = 159 \text{ km} \times 0.60 = 95 \text{ ECU}$$

$$\text{ÖBB} = 325 \text{ km} \times 0.60 = 195 \text{ ECU}$$

$$\text{TOTAL} \quad 352 \text{ ECU}$$

II. Zagreb-Munich

$$H\check{Z} = 35 \text{ km} \times 1.77 = 62 \text{ ECU}$$

$$S\check{Z} = 186 \text{ km} \times 0.60 = 112 \text{ ECU}$$

$$\text{ÖBB} = 214 \text{ km} \times 0.60 = 128 \text{ ECU}$$

$$\text{DB} = 140 \text{ km} \times 0.75 = 105 \text{ ECU}$$

$$\text{TOTAL} \quad 407 \text{ ECU}$$

These prices do not cover the railway costs of the railway administration which participate in the transportation, and they are given under the assumption that this transportation will also be subsidised both by the Austrian and by the Slovenian government. This is to be expected because the Austrian government co-funded the piggyback transit transport through Austria with 1,200,000,000 ATS in 1994, meaning concretely:

- Graz - Regensburg with 5000ATS per loaded wagon
- Ljubljana Moste - Munich with 3700ATS per loaded wagon

Slovenian government is co-funding such transportation with 20ECU per loaded wagon.

The price of 1.77 ECU/km per loaded wagon for the transportation using HŽ (Croatian Railways) network, may be explained:

- big investment and final costs, and a short transportation relation,
- HŽ needs to include one couchette coach into this train, for the transport of truck drivers, the use of which is free of charge, since the cost is already planned in the above mentioned price
- HŽ must provide service check of these wagons, and if need arises also the replacement of disc brakes.

Apart from the costs of using special wagons and railway transport charges, this kind of transport is burdened also by costs of agency services UIRR - combi companies:

- for the forwarding and receiving combi company, 25 ECU each (50 ECU)
- for the combi company of the transit train 5 ECU.

By summarising the mentioned costs, the selling prices per loaded wagon (prices paid by the transportation user) would amount to:

Structure of costs	relation	
	Zagreb - Wels	Zagreb - Munich
costs for a used special wagon	150 ECU	166 ECU
railway transport. charges	352 ECU	407 ECU
agency costs UIRR	55 ECU	60 ECU
Total	557 ECU	633 ECU

5. FINANCIAL RESULTS

It is very difficult to talk about the planned financial results of operation (profit, loss) related to the mentioned piggyback transport in this phase of the project, since it is an extremely sensitive kind of transport with high percentage of business risk. This can be explained by the following:

- a) from the point of view of the transport user, using the controlled piggyback transport is basically unfavourable due to the following reasons:
 - increase in transportation costs (for the user, the costs of controlled piggyback transport are usually higher than the costs with other types of transport),
 - the transportation of trucks depends on the railway schedule,
 - truck drivers are reluctant to accept riding by train for more than 10 hours.

The main motive to use this type of transport is the truck licence, since using piggyback train includes transit licences for the given transportation. Besides, Austrian government issues the user one truck licence for two return rides by controlled piggyback train.

- b) This type of transport depends on intervention by government regulations.

This is proved by numerous cases in practice. In cases where government does not intervene (truck licences, road taxes, etc.), this type of transport does not function.

This is confirmed by the unsuccessful piggyback transportation projects in the past, and especially of those in 1994, on the following lines: Ljubljana-Budapest, Ferentići-Budapest, Saget-Wels, Hanover-Poznan, Trst-Wels (discontinued on 1 Jan. 1995).

- c) It is to be expected that successful implementation of controlled piggyback transportation on the line Zagreb-Wels (Munich) will depend not only on perfect organisation but primarily on the intervention of the interested countries in the regions of truck transit licences, road taxes, etc.

7. CONCLUSION

It may be concluded that operator's activities for the controlled piggyback transport need to be entrusted to combi companies. The operator's activities basically consist of wholesale purchasing of transportation services from the involved railways and selling of these to road carriers by retail. This type of organisation is applied in combined transport in Europe and has been confirmed in practice.

The retail sales in the region of Wels (Munich) would be organised by ÖKombi and KombiVerkehr, and in the region of Zagreb by CroKombi.

The Croatian Railways are ready to accept their part of the job in this project, that is to organise delivery and acceptance as well as traction of controlled piggyback trains. The more so, since the container terminal in Vrapče has the necessary equipment to handle controlled piggyback trains provided police, customs and other required customs control services get organised.

The transportation price per kilometre on the HŽ network, would have to be reduced to 0.65ECU/km i.e. 23ECU/loaded wagon, and the rest of 39ECU per loaded wagon would have to be subsidised by the Croatian Government.

Finally, it may be said that the introduction of controlled piggyback transport is regarding organisation, technology, and exploitation a very complex task which requires a detailed approach and therefore this paper should be regarded as the starting point for further activities towards the realisation of the whole project.

SAŽETAK

TEHNIČKO-TEHNOLOŠKI UVJETI UVOĐENJA PRAĆENOG UPRTNOG PRIJEVOZA NA PRAVCU ZAGREB - ZAPADNA EUROPA

U europskim državama velika je potreba za razvitkom kombiniranog transporta. Sve su veći pritisci (administrativni i gospodarski) za korištenjem željeznice kao ekološki najprikladnijeg kopnenog prijevoznika. Vodeći računa o očuvanju cesta, ekološkim, političkim i drugim razlozima, Hrvatska će morati odrediti svoju politiku prema "Hucke-pack" prijevozima u tranzitu (poglavito na X i Vb koridoru). Bez poticajnih mjera države i jasno definirane prometne politike u odnosu na kombinirani promet nema učinkovitoga uključivanja u europski sustav kombiniranoga transporta

LITERATURE:

- [2] **Marković, I.:** Integralni transportni sustavi i robni tokovi, Fakultet prometnih znanosti, Zagreb, 1990.
- [3] **Marković, I.:** Hucke-pack transport – važan činitelj zaštite čovjekova okoliša i veće sigurnosti u prometu, Promet br. 2, Vol. 3, 1991
- [4] **Božičević, D.:** Kombinirani promet – prednosti i perspektive, Suvremeni promet br. 3-4, 1995
- [5] **Marković I., Božičević, D., Badanjak D.:** Suvremene transportne tehnologije u službi ravnomjernog razvoja prometnih grana, Suvremeni promet br. 3-4, 1998
- [6] Tarifa za prijevoz robe na prugama Hrvatskih željeznica – Prijevozni uvjeti i način računanja prevoznine HRT-151
- [7] Europäischer Tarif für Internationale Transporteinheiten (I.T.E.) – Tarif Nr. 9145,00