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Problems of railway container transportations between Europe and Asia

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Abstract **- In article problems of container transportations on a routes Asia - Europe - Asia are considered. Special attention is given for railway transportation and the problems of development of such traffic. Possibilities of improvement of transportations according to existing transport corridors are analysed.**

INTRODUCTION

Container transportations in the world turnover of goods has a huge share, thus their percentage parity increases every year. At transportations of piece cargoes more than 90 % of the market belongs to container transportations. Container transportations are carried out between all continents, and the direction West - East (Europe - Asia) is one of the most intense. To analyse container transportations on routes West - East and East - West, we will address to one of the freshest sources of the information. In article [1] it is specified, that following the results of first half-year of 2009 the volume of sea transportations of container cargoes between Europe and Asia on the western direction has decreased to 5377,394 thousand TEU. The volume of transportations in east direction has made 2538,056 thousand TEU. Thus, the disproportion in transportations takes place. Decrease in transportations in the conditions of the world, economic crisis is not something surprising. The disproportion reason in transportations is clear also.

Now owing to the economic reasons among which cheapness of labour is the main. The countries of South East Asia have turned to the main world factory for manufacture of every possible scale of goods, beginning from small chips of electronic devices to production of heavy mechanical engineering. Therefore there is nothing surprising in the imbalance of transportations between Europe and Asia where the part of containers in the specified direction should follow empty. How the given transportations are carried out? According to data [2] from May of 2008 the volume of world container fleet has made 13.3 million TEU, from them 11.3 million it is necessary on specialised container ships. Into this number enters 54 container ships with capacity of 9000 TEU and more, all of them belong to five companies: CMA-CGM (France), COSCON and CSCL (China), Maersk (Denmark) and MSC (Switzerland).

The most part of the specified courts works on service of container routes between ports of Europe and Asia. Now the leader on use large-capacity container ships is company MSC (Mediterranean Shipping Company). By request of this company on building berths Samsung Shipbuilding and Heavy industries Co. Ltd (South Korea) is under construction a series of container ships with capacity of 14 thousand TEU.

Use large-capacity container ships on routes Europe - Asia are economically grounded. It allows to reduce the cost price of delivery of containers as it is known, that the sea tariff inversely proportional capacity of a vessel: the more capacity - the more low transportation cost. On the other hand, it causes additional problems. Delivery of containers in ports of the Baltic or Black seas such container ships are impossible because of small depth of channels or water area of ports. In this case the following technology is used. Ocean container ships deliver containers in the ports which are hubs. If to look at tab. 1 where last data [3] are presented, becomes obvious, that the leading places in Europe are occupied by Rotterdam, Hamburg and Antwerp, i.e. northern ports. Nevertheless, value of ports of Black sea, for example, Constanca, Odessa or Ilyichevsk increases every year.

One of the most important questions of delivery of containers from Asia to Europe is the question of terms of such delivery. Term of containers delivery from East Asia to the countries of Central and Eastern Europe takes from 30 to 45 days. This time considers the additional terms necessary for processing and transfers of containers, for example, in Rotterdam or Hamburg. Besides it from 2 to 5 days it is necessary on transit from the port - hub to the port of destination. In the terms specified above considerable time leaves not on transportation, and on performance of port procedures on reception and departure of ships during concrete time.

It is obvious, that the question of the time of container deliveries is rather essential, but in most cases is not defined. Most part of goods delivered by containers is not perishable cargoes. In this case a primary factor is the delivery regularity to provide planned character of manufacture if accessories are delivered, or sales if end-

products are delivered. In that case the defining factor is the transportation cost.

I. Railway container transportations as the alternative to sea transport on routes the East - the West

What variant of transportations could become alternative to sea transport? If to consider global transportations on routes South - East Asia or China to Central or Western Europe railway transportation could become unique alternative in the near future only. Road transport is not capable to make yet serious competition on transcontinental transportations. At the Second European conference on transport, carried out on the island of Crete in 1994, nine trans-European corridors which in the literature are called Crete or Pan-European corridors have been defined. The part from them is continued now on the territory of Russia and used for container transportations. In particular, the second Crete corridor Berlin - Poznan - Warsaw - Minsk - Moscow - Nizhni Novgorod, is prolonged now to Ural Mountains (Ekaterinburg). The third Crete corridor Dresden - Katowice - Lvov - Kiev is important too. If ferries through the Black sea will be develop then 4, 7, 8 and 9 Crete corridors, which ended in the Black Sea ports, will be also important. It is possible to tell, that all specified directions have the developed infrastructure intended for container transportations. Thus, the main problem is delivery of containers to stations being on the specified lines. Meanwhile here the choice of possible directions of railway transportation of containers is insignificant. On fig. 1 the basic directions of such transportations [4] are shown.

TABLE I
Container transportations in the largest European ports

Place in a world rating	Port	Annual turnover of containers in TEU
9	Rotterdam	10 800 000
11	Hamburg	9 700 000
13	Antwerp	8 663 736
19	Bremerhaven	5 500 709
29	Valencia	3 602 000
37	Felixstowe	3 100 000
46	Barcelona	2 569 549
50	Le Havre	2 450 000
51	Malta Freeport	2 330 000
55	Zeebrugge	2 209 715
61	St Petersburg	1 983 110
68	Genoa	1 766 605
69	Southampton	1 710 000
78	Las Palmas	1 429 457
81	Constantza	1 380 935
85	La Spezia	1 246 139

If to consider the given map, such basic trans-Asiatic corridors exists four:

1. **Trans-Siberian Railway (TSR)** (on the map it is shown by a bold line 1 of dark grey color): Vladivostok (Nakhodka) - Khabarovsk - Chita - Irkutsk - Krasnoyarsk - Novosibirsk - Ekaterinburg. Further on a map the three possible exits on Pan-European corridors are shown: Northern (Ekaterinburg - Kirov - ports of Baltic sea or on the First Pan-European corridor of Helsinki - Tallinn - Riga - Kaliningrad - Gdansk); Central (Ekaterinburg - Yaroslavl or Nizhni Novgorod - Moscow - and further on Second Pan-European corridor); Southern (the Kurgan - Chelyabinsk - Ufa - Samara - Kharkov - Kiev - and further on Third Pan-European corridor). On the resulted map connections of the TSR with the railway system of Mongolia (Naushki - Ulan Bator - Erenhot) and China (Zabaykalsk - Harbin - Beijing or Seoul) are not allocated, and also a site Baikal-Amur Railway (BAR), nevertheless, the specified railways are shown.

2. **Northern Trans-Asiatic Corridor** (on a map it is shown by a black bold line 2): Lianyungang - Zhengzhou - Lanzhou - Urumqi - Dostyk - Almaty - Astana - Kurgan - is further transportation possibility on three directions resulted above). According to classification of ESCAP this route has received the name "Northern corridor" of the Trans-Asiatic Railway, and on classification of OSZhD (OSJD) - the first corridor.

3. **Southern Trans-Asiatic Corridor** (on a map on a site China - Kazakhstan coincides with the previous corridor, and further it is by a grey designated bold line 3): Beijing-Urumqi - Almaty - Tashkent – Chardzhou – Sarakhs - Mashhad - Tehran - Istanbul in the extent of 12 thousand the kilometers, almost coinciding with a line of the Great Silk Way of the Middle Ages.

4. **Corridor TRASECA** (on a map it is shown by black lines 4): Dostyk - Tashkent - Ashkhabad - Turkmenbashy - Baku - Tbilisi - Poti, further through ferries to Odessa, Varna, Constance, Istanbul. In May of 1993 in Bruxelles the working meeting of representatives of Azerbaijan, Armenia, Georgia, Moldova, Mongolia, Kazakhstan, Kirghizia, Tajikistan, Turkmenia, Uzbekistan, Ukraine, Romania, Bulgaria, Turkey, Iran, China, Pakistan and the countries of the European Union has taken place, on which the various routes connecting the countries of Europe, Caucasus and Central Asia were discussed. The result of this meeting was signing of the Bruxelles Declaration on Technical Assistance of EU for development of a Transport Corridor Europe-Caucasus-Asia (TRASECA), including the combined system of railways, highways, pipelines, airlines and sea ways.

It is possible to regret, that a number of authors see in development of the European transport network (ETN) political counteraction of Russia. In particular, as work

[5] affirms, that creation of the European network of transport corridors is «the major action for cutting off Russia from transport streams». It is obvious that it is impossible to agree with such approach. Firstly, creation of ETN is the investment project, and the European Union will not invest in the countries, which aren't its members, without a guarantee of return of the enclosed financial funds. Secondly, ETN provides joining with transport systems of the East European countries, including with the Russian transport system. Thirdly, in Russia frequently the use of other railway transport corridors instead of TSR, which have been listed above, are perceived as political counteraction. It is necessary to notice, that such approach is wrongful. The choice of a transportation way of the container more often depends on economic factors, and the transportation price in this case has crucial importance. So there is nothing surprising, that the greatest quantity of containers goes not by railway, but by sea, which is essentially cheaper. Thus railway routes have additional lacks.

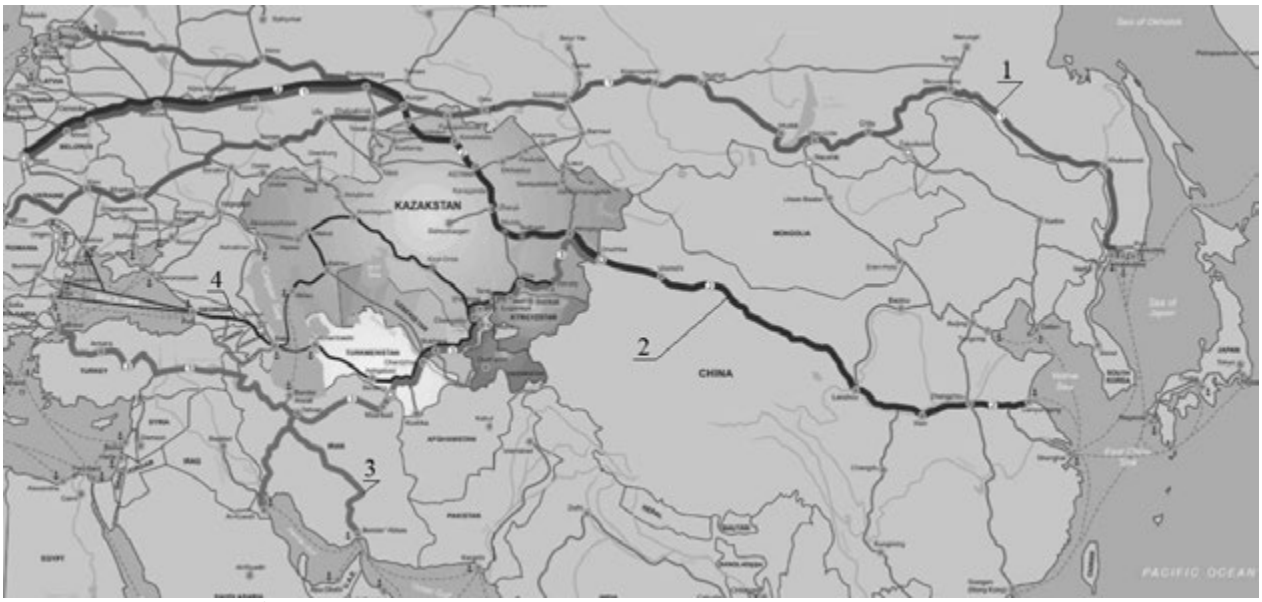

Fig. 1. The basic directions of railway container transportations

Let's consider problems, which arise on a way of railway container transportations. The first among them is the various width of a railway track in different countries. And if to consider transportation of containers from China to the Central or the Western Europe without dependence from a choice of a transport corridor it is necessary to change from a track of 1435 mm in China to a track of 1520 (1524) mm in the countries of the former USSR, Mongolia, Afghanistan, Finland and again to a track of 1435 mm (the European standard). Examples of such boundary transitions on the ways of containers transportation are stations Manchzhurija / Zabaykalsk between China and Russia, Mamonovo / Braniewo between Russia and Poland, Ala Shankou / Dostyk between China and Kazakhstan, Brest / Małaszewicze between Belarus and Poland, Chop / Zahony between Ukraine and Hungary, Sarakhs / Tedzhen between Turkmenia and Iran. It is obvious, that it is much more such transitions on the ways of containers [6], however the problems arising at such transitions, are identical. It is caused by technology of an overload.

According to [7] on the boundary transitions having different width of a track three basic technologies are used. The first is an overload of containers from one cars (platforms) on others. In this case it is enough to have parallel ways of different width and container reach stackers, which should work between the given ways.

The second technology is a exchange of wheel pairs. The given way is the most expedient for application by transportation to dangerous, bulk, oversized and other cargoes demanding care. This operation is possible only with wagons of the European standard. Such wagons have onboard a marking "MC-1" or "MC-0".

The third technology is use wagons with the bogies with expandable wheel pairs. If the two first technologies are fulfilled and obvious for a long time, the third technology is rather interesting and perspective. Such technology would allow to reduce considerably an idle time of container trains (routes) on boundary transitions. Unfortunately, such technology is fulfilled while only for passenger transportations. The information about several technical solutions is in the paper [8]. Between the countries of the former USSR and Central Europe only one design of the bogies with expandable wheel pairs is used now. This bogies SUW

2000 authorship of dr. hab. R. Suwalski use under wagons of the train nr 35/36 Kiev - Krakow. In article [9] it is offered to use similar bogies for tank-cars made by «Azovmach» (Mariupol). In particular, under recommendations of prof. Ju.V. Dyomin the design - technological bureau on wagons develops the technical plan of bogies modernisation for railways of the former USSR countries. The bogies of type DK2000 became result of realisation of this project at Darnitsky car-repair factory. It could be used for container routes between the East - the West.

Here it is necessary to notice, however, that in the process of commissioning of the specified technology there can be the problems connected with interaction a wheel - a rail. If same expandable wheel pair goes, for example, from China to Germany, there can be additional complexities, as at tracks 1520 mm and 1435 mm are different profiles of the rail heads and different rail cants (1:20 and 1:40). Thus this can be negatively reflected both in stability of the movement and on wear of elements of the wheel - rail pair.

Following problems of railway container transportations are more specific, concerning concrete corridors. For example, bottlenecks of corridor TRASECA is presence of two ferries: Turkmenbashy (Krasnovodsk) - Baku and Poti - Varna either Poti - Ilyichevsk or Poti - Kerch. It is obvious, that on container terminals Poti or Batumi it is possible to overload also containers to feeding container ships with delivery to Constance or Istanbul. containers processing will make 1,5 million TEU a year. The reconstruction of Now modernisation of the port Poti [10] is carried out, where at the first stage it is planned to build the container terminal which can accept ships with draught

Fig. 2. Use of reach stackers in warehouse and station work

up to 13 m, and further it is supposed to finish depths to 18 m. Volumes of existing port territory will begin after opening of the first stage. On a new place it is supposed to transfer an auto-railway ferry complex to simplify the scheme of calling of ferries in port. Similar works are carried out with the modernisation of container terminals in the port of Batumi.

One more problem of container transportations is instability of a political situation in region. Military actions at the conflict Russia – Georgia, which have mentioned port Poti, did not promote trust increase to transportations on corridor TRASECA. Straining in relations around Afghanistan, Iran or Iraq also influences on development of transportations on a Southern Trans-Asiatic corridor.

Apparently from the resulted factors, all should speak well of TSR and the majority of containers, which delivery by rail, should follow on this corridor. As most part of a route of containers movement should pass on the territory of the Russian Federation. In this case the organisation of such transportation should be simpler, especially because the basic operator for such transportations is Joint Stock Company "Russian Railways" (RR). But it not so, in full volume of cargoes transportations in containers in the Europe-Asia direction the percentage of RR makes only 1%. The lacks of the specified routes were marked in the numerous articles devoted to subjects of containers transportation on TSR. Unfortunately, these problems exist for many years, and motions in their solution are very insignificant. We will refer to rather detailed article in magazine «Container business» for December 2008 [11], having allocated the basic problems of transportations on the specified route:

1. Sharp shortage fitting platforms and large-sized containers;
2. The unreasoned tariff policy, the high rate of gathering for protection of containers, absence of preferential payment of the traffic of empty containers and platforms, as a whole tariffs on the Trans-Siberian Railway are noncompetitive;
3. Presence of bottlenecks, such as Nakhodka (Eastern) railway station;
4. Absence of due service, absence of technological discipline;
5. Logistical problems, lack of the legislative base, the extremely confused and inconsistent customs legislation;
6. Absence of repair capacities, which does not suffice even for operating repair of the rolling stock;
7. Absence of terminals for transfer of supersize containers at intermediate stations;
8. Uncooperative altitude in the world to a political and economic situation of Russia and, in particular, to its transport communications;

9. Absence of interstate arrangements under through tariff rates.

Let's notice, that in the article [11] the detailed substantiation resulted above these are given. But this article is not an exception. For example, in the article [12] which name «Jobless Russian Trans-Siberian Railway» is indicative, R. Bikmuhametov has specified, that in 2005 the volume of the international containers transit in the direction Asia - Europe - Asia has grown to 126 thousand TEU. But the following year this indicator has fallen to a mark of 40 thousand TEU. Blow on the Trans-Siberian Railway was put by railwaymen. Under insisting of RR at the governmental level the decision on increase at 30 % of tariffs for transportations of transit containers since 1st of January 2006 was accepted. Such approach has shown that the monopoly in the market of transportations not always is the positive factor. Absence of a competition in relation to RR does not promote trust for consumers. In this article one more problem of a considered route is considered. According to the author the Russian ports, except Vostochny Port and St.-Petersburg Port, technologically cannot work with the large lots containers.

In 2009 the dissertation work by N.A.Shpileva devoted to problems of containers transportation on TSR [13] has been prepared. In this work all advantages and lacks of the specified route have been subjected with scrupulous analysis. Besides above named problems the following also has been specified: limited throughput of TSR; absence of a guarantee of term of delivery; absence of delivery "from door to door"; insufficient safety of cargoes; absence of uniform operators of the mixed transportations and an effective carrier of cargo. Here causes interest comparison of transportations on TSR with Trans-Asiatic Corridors. The author notices, that distance of transportations on TSR rather is more (on 1000 km), that increases terms of delivery of containers. The raised tariff, smaller number of hauls and rather smaller safety of cargoes besides takes place. The basic advantages sound basically in a subjunctive mood. Potential possibilities are, but they are not realised yet.

Analyzing a considerable quantity of the literature, it is necessary to note also insufficient objectivity of many authors, which ignoring or belittling value of the problems standing on a way of development of transportations, thereby break their solution. For example, in article [14] it is underlined, that RR in common with all operators intermodal transportations working on TSR guarantee delivery of containers as a part of the accelerated routing trains from Republic Korea and Democratic People's Republic of Korea to Central Europe, depending on destinations of cargoes for 17-20 days, and to the basic ports of Finland - for 16 days. As one of TSR advantages the safety of transported cargoes is underlined, which are accompanied by armed security forces. These data contradict that is written in articles [12, 13] and in many others. Whether it means, what it is necessary to accuse the authors of the paper [14] in partiality? Most likely no, as it is also a lot of articles similar [14] and its authors quite often could lean on corresponding data.

As an obvious example of such contradictions it is possible to cite the data on volumes transit container turnover on TSR, which are resulted in articles [13] and [14]. It is obvious, that the cited data are based on different sources. The dissertation [13] by N.A. Shpileva leans against the given overloads of containers in the ports of the Far East. Article [14] according to the resulted reference leans on the data of thesis for a doctor's degree by O.V. Sokolova. To check up these data for the author there was no possibility, however causes a certain question the following fact. On the diagramme fig. 3b the data for 2006 are cited, while the specified dissertation was written in 2003. Certainly, it is possible to object, that not all transit containers are overloaded in ports of the Far East. It is obvious, therefore in 80s – 90s despite certain correlation of data on the diagramme fig. 3b is present on the average excess to 50% in comparison with the diagramme fig. 3a. However excess in 5 times! in 2004 - 2006 cannot be explained the objective reasons.

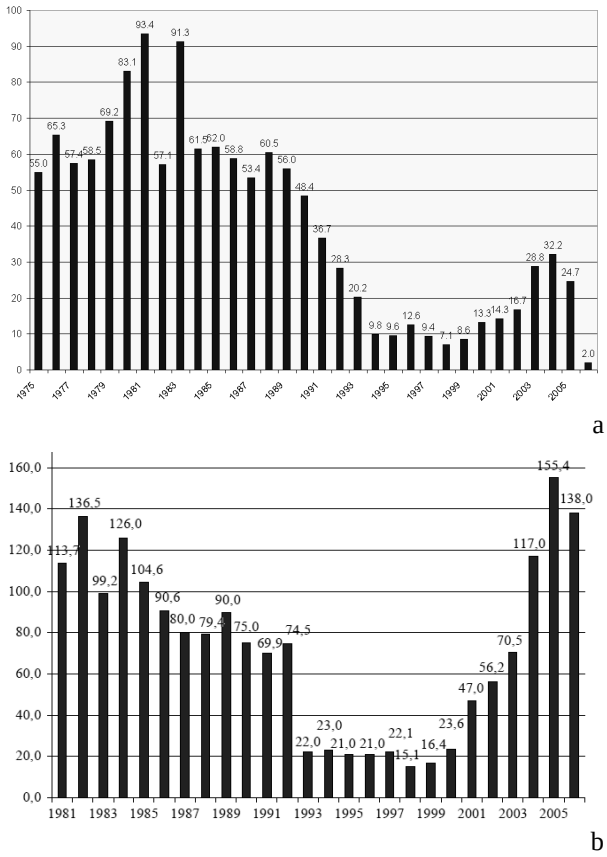

Fig. 3. Comparison of the turnover in thousand TEU on TSR: a) [13]; b) [14]

It is possible to come out with the assumption, that similar increase of transit is fictitious. In article [14] it is noticed, that in Russia the latent import of containers

delivered in the Baltic ports from the countries of Asia, which to avoid the raised customs duties are enlisted in transit, takes place. If this assumption is fair, it is a question of the quantity exceeding in separate years of 100 thousand TEU!

CONCLUSION

In enough polemic article [15] the editor-in-chief of the network edition «Maritime Bulletin - Sovfracht» M. Vojtenko does a conclusion, which we will result literally: «… to carry on the Trans-Siberian Railway now or not to carry in general - efficiency will be identical. Unless, not carrying in general, it will be possible to save on bribes and nerves. The uttermost misunderstanding by strategists of the most elementary bases of economy, possibilities and an essence, both the Trans-Siberian Railway and world container transportations, directly deafens. But that is worse - does not give chances to count that will be engaged in the Trans-Siberian Railway and logistics seriously». This conclusion is made in the end of 2008. Whether something has changed to the best recently? Whether and so all is tragic? It is thought, that is not present. There are certain preconditions to an exit from a world economic crisis that will promote substantial growth container turnover between Asia and Europe. Thus it is necessary to use all possibilities for expansion of container transportations on railway Trans-Asiatic corridors (including TSR). It is obvious, that the state support of development of an infrastructure as it, for example, takes place in the Peoples Republic of China here is important. There should be also a stability and appeal of a tariff policy and competition expansion between carriers. It is obvious, that elimination of the transportations resulted above problems will promote increase in volumes of railway transportations.

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Sladkovski A. Dzelzceļa konteineru pārvadājumu problēmas starp Eiropu un Āziju

Apskatītas konteineru pārvadājumu problēmas maršrutā Āzija-Eiropa-Āzija. Īpaša uzmanība pievērsta dzelzceļa transportam un šādu pārvadājumu attīstības problēmām. Veikta pārvadājumu uzlabošanas iespēju analīze pašreizējos transporta koridoros.

Сладковский А. Проблемы железнодорожных контейнерных перевозк между Европой и Азией

В статье рассматриваются проблемы контейнерных перевозок на маршруте Азия - Европа -Азия. Особое внимание уделяется железнодорожному транспорту и о проблемах развития таких перевозок. Анализируются возможности улучшения перевозок в соответствии с существующими транспортными коридорами.