Tacis

Feasibility Study of New Terminal Facilities of the Georgian Ports Plan

Annexes - Phase II

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Annexes to Volume II and Volume III

Volume II

Study on the Traffic Potential for the Rail Ferry Service between Poti (Georgia) and Iljichevsk (Ukraine)

Contents

1 Introduction and Executive Summary

Since some time there are urgent requests for ferry services on the Black Sea between the Ukraine and Georgia. These are voiced by international forwarders but also by transport and trade organisations from the Caucasian as well as from the Central Asian states.

As a consequence, last year the Ukrainian state shipping company UKRFERRY started a ferry service between Poti (Georgia) and Illiychevsk (Ukraine), although the superstructure for this service in both ports was either incomplete (Illiychevsk) or even non existent (Poti). The Port of Poti needs urgently a rail ramp and some connecting rail lines, while the Port of Illiychevsk needs to rehabilitate some of the superstructure for a safe and efficient ferry services on this traffic relation. Both ports need certain cargo handling equipment and facilities to handle road trucks and trailers.

In order to prove the economic profitability of the investment needed in both ports, all available data and information were collected and summarised in this report. This report is mainly based on the findings and traffic forecasts of a large number of Tacis and TRACECA reports, backed up by literature search and on-site interviews. The main findings of this report prove that investments in the superstructure that is needed for a rail/road ferry service between the two Black Sea ports is useful. The ferry connection will close a gap in the traffic infrastructure system of the TRACECA-States and link the TRACECA Corridor with the Trans European Networks. The investment of 15 million ECU is expected to have a high rate of return to the economies, which make use of the ferry connection.

The main findings of this report are as follows:

- The ports of Poti and Illiychevsk used to play an important role in the ports system of Soviet Union. In 1990, the total cargo turnover in Poti was nearly 4 million tonnes and in Illiychevsk the throughput was about 13 million tonnes.
- The port infrastructure of Poti is mainly dedicated to bulk cargo, such as ore, coal, metal, cotton, grain etc.. Since 1992, there is a rapid containerisation process in progress.
- In 1995, total cargo turnover in Poti reached about 1.8 million tonnes.
- Main destinations for cargo from Poti were ports at the Black Sea; cargo for Poti came mainly from Black Sea and other European countries.
- In the future, Poti will increasingly take on the role of a main gateway for Caucasian and Central Asian countries.
- Poti's traffic connections with the hinterland consist mainly of the Caucasian Railway line, which connects Baku at the Caspian Sea with the Georgian Ports of Batumi and Poti at the Black Sea. The principal road in Georgia, the "Magisterial", is connected with Poti by an access road. The main road is connected with Baku, too.
- A rail ferry service in the Caspian Sea between Baku and Turkmenistan connects the Caucasian transport network with the Central Asian network.
- The hinterland of Poti can be identified as the states of the TRACECA-community in the Caucasus and in Central Asia.
- The facilities in the port of Illiychevsk are dedicated for the handling of bulk, general cargo, containers and ro-ro cargo, both road and rail.
- In the year 1994, total cargo turnover was 8.7 million tonnes. The percentage of port infra- and suprastructure, that is presently unoccupied, is relatively high.
- Nearly 44% of the total cargo turnover of Illiychevsk is transit cargo for Moldavia, Belarussia and Russia.
- The maritime connections of the port of Illiychevsk are spread world wide.

- The transport network in the Ukraine is dominated by the railway system; Illiychevsk is well connected with this system.
- The highways in the Ukraine often run parallel to the railway tracks; the road density is less than the density of the railway system; Illiychevsk is well connected with the highway system, too.
- The hinterland of Illiychevsk can be described as the Ukraine, Moldavia, Belarussia and parts of South-West-Russia, Moscow included.
- Total cargo movements between the hinterlands of both ports concerned reached a volume of about 15 million tonnes in the years 1995/96.
- About 25% of total trade between the Caucasian/Central Asian states and Ukraine/Moldavia consist of bulk cargo, which is not normally transported by ferries. The trade of Belarussia and parts of Russia with the hinterland of Poti contains more than 61% bulk. The remainder - about 6 million tonnes - can be considered as potential cargo for the ferry line.
- The potential cargo for the ferry line is nowadays mainly transported by rail (more than 90%); between 2% and 7% is carried by truck. The remainder goes by sea and other modes. It is mainly the railway and truck load that is assumed to be potential ferry cargo.
- The cargo potential for ferries will grow from about 6 million tonnes in 1995 to about 10 million tonnes in 2010. As a consequence of structural change and the move to market economies the truck load potential will grow much faster than the railway load potential
- In order to prove the economic viability of the investment in port suprastructure in Poti and Illiychevsk, the potential transport costs savings, that could be attained, were calculated on the basis of the 1995 cargo flows. The main findings of this calculation are as follows:

  If 5% of the total cargo potential for truck and railway transport between the hinterlands of both ports were transported via the ferry connection, the total transport costs savings for one year would be

  2,8 million ECU

  For alternative exploitation quotas, the total annual transportation savings would be:

10% =	5,6 million ECU
15% =	8,4 million ECU
20% =	11,2 million ECU
30% =	16,8 million ECU
40% =	22,4 million ECU
50% =	28,0 million ECU
100% =	56,0 million ECU

  These figures show that the investment of 15 million ECU for rail/road ferry superstructure in Poti and Illiychevsk will be amortised by transportation cost savings within one year, when 27% of the total potential cargo volume would be transported by ferry instead of by railways and trucks without the use of a shipping link.

2 The Ports of Poti and Illiychevsk in the TRACECA Transport Network

There were about 70 recognised ports in the former Soviet Union, of which 26 ports were classed as major ports. The ports of Poti and Iliychevsk played an important role in the liege of the major ports, which all together handled over half of the former USSRs foreign trade. In 1990, the total cargo turnover in Poti was 3.9 million tonnes and in Iliychevsk 12.9 million tonnes, i.e. nearly 5% of total cargo of all FSU ports.

Riga at the Baltic Sea and Iliychevsk at the Black Sea used to be the only ports in the USSR with modern container facilities. In the year 1990, more than 1 million containers were handled in the port of Illiychevsk. Poti, in contrast, used to be a port for oil and dry bulk. In the meantime, however, there is a rapid containerisation process in progress in Poti: import and export containers increased from 230 TEU in 1992 to about 18,000 TEU in 1996.

The following maps show the ferry connection between both ports (Map 1) and the main Ukrainian and Georgian ports and their cargo turnover in 1993/95 (Map 2).

2.1 Main Characteristics of the Port of Poti

2.1.1 Infrastructure and Turnover

The characteristics of the Port of Poti are described in Table 1:

Table 1: Facilities in the Seaport of Poti

Source:

TRACECA: Regional Traffic Database and Forecasting Model

Progress Report II; Appendices March 1997
WS Atkins International Ltd.

	Depth (m)	Square (m²)	Length (m)	Amount	Capacity p.a. 1.000 t
Access canal	13,00		1.910		
Port water area		536.000			
General cargo pier:				4	
for:					
ore	12,20	15.000	183		1.500
metal	9,80	17.000	215		510
coal	8,50	5.290	173		1.530
coal	8,50	5.290	173		1.530
Berth for liquid bulks:	12,50	15.100	200	1	1.700
Multiputpose terminals				4	
for: chemical goods	9,75	1.600	220		240
cotton	8,00	2.600	130		220
grain	9,75	13.400	220		3.000
grain	8,00	13.400	180		3.000
Specialised piers:				5	
for containers	8,25	22.100	170		300
for feet of port	8,00	5.000	180		300

Table 2 shows the performance of the Port of Poti in 1995:

Table 2: Cargo turnover in Poti 1995

	Cargo appelation	Export	Import
1.	Total cargo turnover (1.000 tons)	389,3	1387,7
	of which		
1.1	Bulk cargo	170,0	185,8
	sugar		18,5
	differentores, fluxes	132,6	50,2
	coal, coke		4,0
	cement	0,6	
	construction cargo	1,7	6,4
	chemical cargo		1,5
	flour		75,7
	others	35,1	29,5
1.2	Grain cargo in bulk		625,0
1.3	Timber cargo	1,1	
1.4	General cargo	2,6	18,7
1.5	Other piece cargo of which	52,7	5,2
	machinery, equipment	4,4	3,1
	different metals	48,3	2,1
1.6	Petroleum products	145,9	474,4
2.	Amount of large tonnage containers	1760/630	2817/945
	20 & 40 foot units		

Source: Forwarding-Multimodal Transport Systems on the TRACECA Route Final Report; May 1997

Information about the maritime traffic connections with other ports can be seen from the following figures:
In the third quarter of 1995, 18 vessels were loaded in Poti, mainly with metal, scrap metal, containers, pipes and gasoline. The ports of destination of these vessels were located in

1 x Rumania
1 x Ukraine
2 x Greece
6 x Bulgaria
8 x Turkey

In the same period 83 vessels were unloaded. They carried mainly gasoline, sugar, general cargo, containers, motor equipment and grain; their ports of departure were located in:

20 x Rumania
11 x Greece
25 x Bulgaria
23 x Turkey
1 x USA
2 x Italy
1 x Belgium.

These figures show that in the observation period no main traffic relations were served with the Ukraine. In Batumi, the other important port of Georgia, three vessels unloaded and 9 ships loaded cargo from/to Ukrainian ports; they brought mineral water, tea and laurel leaf from Georgia and unloaded mainly barley, sugar and flower for Georgian needs.

2.1.2 Traffic Connections with the Hinterland:

Railway:

The port of Poti is located at the East Coast of the Black Sea. There are two main traffic links with the hinterland of the port.

The seaport of Poti is connected with its hinterland in the east mainly by the Trans-Caucasian Railway line from Baku at the Caspian Sea, via Tbilisi to Poti and Batumi. This railway line is by far the most important axis for Poti at the moment. The Georgian Railways conduct about 75% of their transports in the corridor Batumi/Poti-Tbilisi. The significance of this line has even increased because of the blocking of other important international links, due to political tensions in the region.

The main line linking Baku with Poti is of particular interest for freight movements between Central Asia and Europe. The line starts at the Caspian sea port of Baku and goes via Beyuk Kyacik (border station) to Samtredia (250 km) and to Tbilisi. From there it carries on to Samtredia, were two branch lines connect with Batumi and Poti. The entire link is electrified and double track to Samtredia and then single track to Poti (65 km).

The Trans-Caucasian Railway line is connected to the Russian rail system on the Black Sea, to the ports of Sotchi and Tuapse and further to the Russian rail system via Krasnodar. From Tbilisi via Armenia the system is also connected to the Turkish rail system.

The Baku port rail terminal is connected with the Turkmenbashi rail terminal by ferry, crossing the Caspian Sea. The port rail terminal at the Eastern Coast in Turkmenbashi is linked to the Central Asian republics. The system is also linked to the Russian rail system via Kazakhstan, providing connections to the Russian Far East and also to the People's Republic of China.

Road:

The principal road in Georgia, the "Magisterial" runs from the Azeri border through Tbilisi to the Black Sea (Sukhumi). There is a trifurcating system at Samtredia, close to the Black Sea, where two roads provide access to Poti and Batumi. The road runs along the valley between the two ranges of the Caucasus. The pavement is acceptable. The secondary roads appear to be in poor condition. In Azerbaijan, there is a main connection between Baku and Georgia, passing Evlakh and Gandja to the Magisterial.

The port of Turkmenbashi is connected with is hinterland by different roads to Kazakhstan, Uzbekistan, Tadjikistan and Kirghistan.

The major Inter-Central-Asian Highways are:

- H34 Tashkent - Dushanbe
- H37 Turkmenbashi - Ashgabat - Mary - Cardzaev - Bukhara - Samarkand
- H39 Almaty - Bishkek - Shikment - Tashkent - Samarkand - Termez
- H41 Bishkek - Djalai - Abad - Uzbekistan - Osh the Pamir - Dushanbe - Termez

Via the ferry connection between Turkmenbashi and Baku and via the Caucasian route, the port of Poti is, thus, well connected with the Central Asian transport system.

2.2 Main Characteristics of the Port of Illiychevsk

2.2.1 Infrastructure and Turnover

The infrastructural characteristics of the seaport of Illiychevsk are listed in Table 3:

Table 3: Facilities in the port of Illiychevsk

Source: Improvement To Port/Land Transport interfaces In The Ports Of The Black Sea; A-Port/ Land Transport

Facilities in the Seaport Ilyichesvk			
Quay No.	Dedication	Draught (m)	Capacity p.a. 1.000 t
2	Matal products	11,5	400
3,4	Miscellaneous	11,5	only Quay 3 400
5,6	Container	11,5	250
7,8,9	Metal products	11,5	800
10	Cereals	11,5	
11,12,14,15,16	Miscellaneous	11,5	220
17	Liquid bulk	11,5	700
19	Bulk fertilizer	11,5	500
20,21,22	Miscellaneous	11,5	220
26,27	Ro-Ro in wagon	9,6	2.400
28	Ro-Ro	9,6	100

Interface Action; A,2-Simulation of good Flows Final Report; November 1995 - Sogelerg Ingenierie

The amount of cargo turnover in the years 1993/94 is shown in table 4.

Table 4: Cargo turnover in Illiychevsk 1993/94

Type of cargo		Turnover (1.000 t)
Container		292,9
Grain		75,2
Chlorinated Potassium		765,4
Vegetable Oil		246,6
Ro-Ro-Cargo (railroad)		1648,9
Sand		366,9
General Cargo		5145,0
Total 1994		8564,7
Total 1993		8661,1
of which:	Ukrainian imports	1234,0
	Ukrainian exports	3189,0
	CIS Exports	3656,0
	CIS Imports	109,0
	local Exports	431,0

Source: Compare Table 3

As Table 4 shows, nearly 44% of total turnover was transit cargo, i.e. mainly CIS-Exports. In 1993, this land transit cargo came mainly from or went to the Russia Central Region, Belarussia, Russia Urals, Russia Northwest, Russia Volga Region, Russia East-Siberia and Russia Volgo-Vyatka.

The maritime connections in the same year (1993) ware dominated by countries like Bulgaria, Vietnam, Cuba, Egypt, Japan, Algeria, Angola, Yemen, Libya, et al.

2.2.2 Traffic Connections with the Hinterland:

Railway:

The network includes the following main trunk lines:

- Odessa-Lvov line, providing access to the cities Ternopil and Khmelnitsky, parallel to the Moldavian border;
- Odessa-Kiev line, western branch, running along the preceding line as far as Jmernika and then branching off to Vinnista, Kiev and the Russian border;

- Odessa-Kiev line, eastern branch, providing access to Kirovograd;
- Odessa, Nikolayev, Kherson, Feodosia, Kerch line;
- The especially densely meshed network around Dniepropetrovsk and Donetsk, which branches into the lines mentioned above and provides access to the ports in the Sea of Azov;
- Access to Reni via Moldavia;
- The coastal line Yuzhny, Odessa, Illiychevsk extending towards Belgorod-Dnievstrosky and Izmail.

Road:

The road network includes the following main trunk lines:

- North-South trunk line, E93-R20, linking Odessa, Kiev, Chernigov and Belarus;
- North-South trunk line, 593-R2, linking Simferopol, Melitopol, Zaporozhye, Dniepropetrovsk and Kharkov from Russia (Kursk, etc.);
- East-West cross trunk road, E40-R19, taken from Kiev, connecting Kharkov, the northern outskirts of Donetsk city and the Russian border;
- East-West cross trunk road, R267, between Uman and Lvov;
- The R23, East-West cross trunk connecting Odessa, Nikolayev, Mariupol, Melitopol and Berdiansk;
- The Odessa-Kichinev link via the E581-R1.

The existing road and railway networks connect these ports very well with their hinterlands.

2.3 The Hinterlands of Poti and Illiychevsk

The hinterland of a port can normally be defined by the region, where the cargo, which is handled in the port, comes from or where it goes to. As normally many kinds of cargo are transferred in ports, the hinterland cannot be marked off precisely; the hinterland for cargo, which is transported by truck, can differ from the hinterland for railway cargo due to different infrastructure equipment for road and railway transportation, for instance. A port, for example, in which only oil is loaded/unloaded, has a precisely delineated hinterland. Multi-purpose ports, however, have differentiated hinterlands in relation to the various kinds of cargo, which they handle. That is why the hinterlands of Poti and Iliychevsk can only roughly be defined.

In Illiychevsk, cargo mainly comes from or goes to the Ukraine, Moldavia, Belarussia, Russia Central Region, Russia Northwest, Russia Volga Region, Russia Volga-Vyarka and Russia Urals. The main hinterland of the port is shown in Map 3. In Poti, cargo is loaded and unloaded, which comes mainly from or goes to states, which are connected by the TRACECA-Corridor; i.e. Georgia, Armenia, Azerbaijan, Kazakhstan, Turkmenistan, Uzbekistan, Tadjikistan and Kirghistan. The hinterland of Poti roughly can be identified by these eight states, which are shown in Map 4.

3 Freight Movements between the Hinterland of Poti and the Hinterland of Illiychevsk

3.1 Total Cargo

The hinterlands of the ports Poti and Iliychevsk were described in the previous chapter. In the following chapter, total freight movements between both regions will be shown, in order to estimate the freight potential for a ferry link between the two ports.

Table 5 shows that in the year 1995 about 1.8 million tonnes of cargo were traded between the hinterland of Poti and Ukraine and Moldavia. About 38 million tonnes were transported between the Caucasian and the Central Asian states and Ukraine/Moldavia as well as Russia/Belorus.

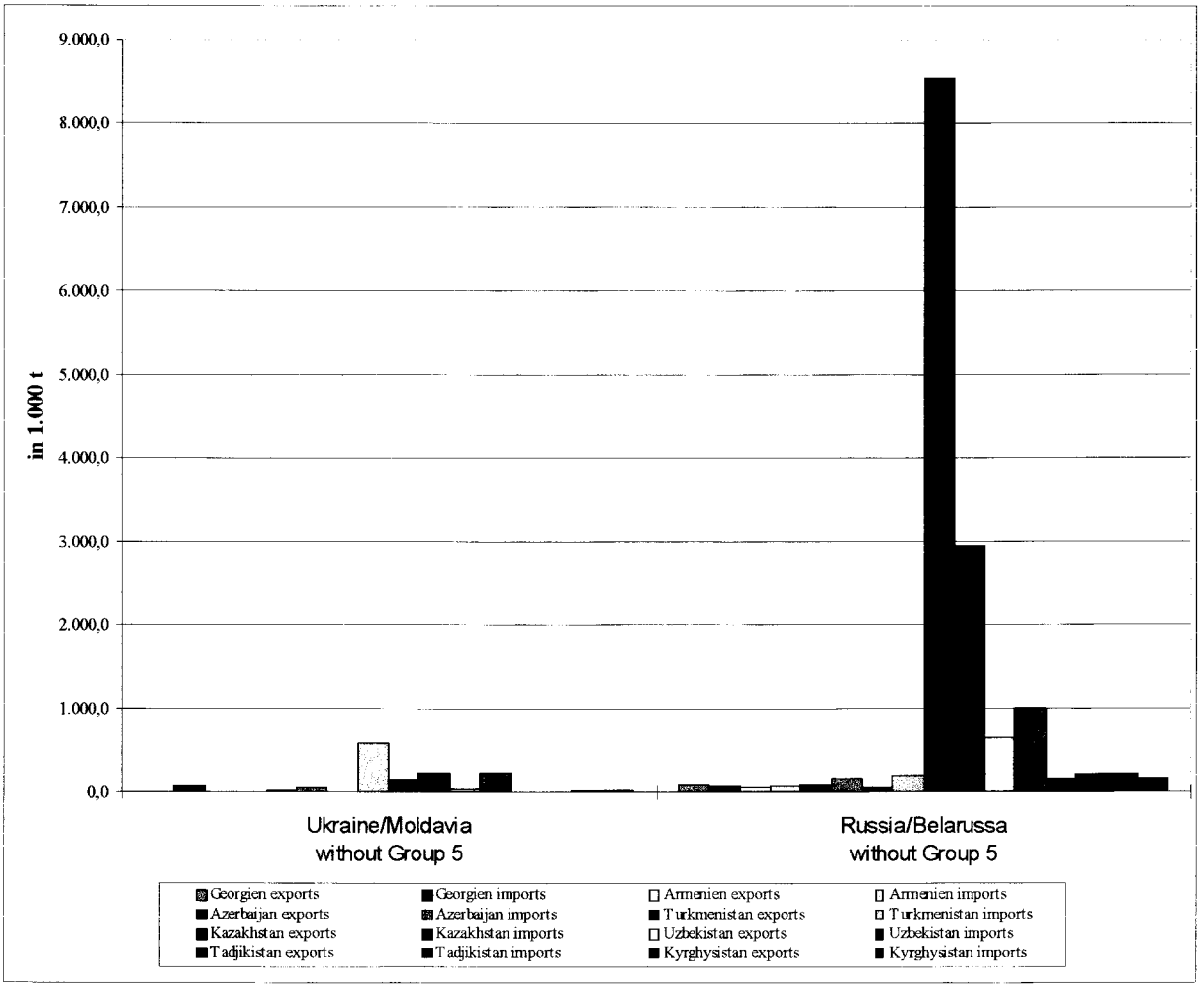
These last figures describe total trade between both regions. The hinterland of Iliychevsk however, covers only parts of Russia, mainly the South West of Russia, as it was shown in Map 3. That is why only a part of the total of 38 million tonnes came from or went to the hinterland of Iliychevsk.

The available statistical data does not allow a precise separation of Russian cargo flows from /to the hinterland of Iliychevsk and other Russian regions, not covered by the hinterland of the Ukrainian port. That is why the part of the total traffic, which comes from/goes to the hinterland of Iliychevsk has to be estimated.

Regional economic activity in Russia is partly concentrated around Moscow and Rostov. Both centres of economic activity belong to the hinterland of the port of Illiychevsk. Therefore, at least one third of the Russian and Belarussian trade with the Caucasus and Central Asia is estimated to originate from or can be dedicated to the hinterland of Illiychevsk, which was defined above. This estimation is cautious, it should not be too high.

Table 5: Cargo movements between the hinterlands of the ports of Poti and Ilyich

Hinterland Poti		Ukraine/Moldavia			Russia/Belarussa		
		Total	Groupe 5	Ukraine/Moldavia without Group 5	Total	Groupe 5	Russia/Belarussa without Group 5
Georgien	exports	4,3	0,9	3,4	101,1	12,3	88,8
Georgien	imports	91,6	20,4	71,2	97,4	35,8	61,6
Armenien	exports	8,3	0,0	8,3	66,6	10,1	56,5
Armenien	imports	8,2	1,6	6,6	90,5	13,8	76,7
Azerbaijan	exports	133,9	121,6	12,3	263,8	172,5	91,3
Azerbaijan	imports	57,9	3,5	54,4	170,3	20,7	149,6
Turkmenistan	exports	13,2	10,9	2,3	395,8	336,1	59,7
Turkmenistan	imports	577,4	1,5	575,9	198,7	14,0	184,7
Kazakhstan	exports	352,7	216,0	136,7	26.754,8	18.215,7	8.539,1
Kazakhstan	imports	228,7	14,7	214,0	6.871,3	3.919,8	2.951,5
Uzbekistan	exports	74,6	48,8	25,8	700,1	46,8	653,3
Uzbekistan	imports	222,7	3,4	219,3	1.101,0	114,4	986,6
Tadjikistan	exports	7,7	0,0	7,7	150,6	1,0	149,6
Tadjikistan	imports	6,5	0,4	6,1	524,9	311,2	213,7
Kyrghysistan	exports	10,0	0,0	10,0	217,8	15,4	202,4
Kyrghysistan	imports	14,0	0,0	14,0	256,8	99,0	157,8
		1.811,7	**443,7**	**1.368,0**	**37.961,5**	**23.338,6**	**14.622,9**



Source: **TRACECA Programme: Regional traffic database and forecasting model, Progress Report: Phase 1A (Revised), December 1996**

3.2 Cargo Potential for a Rail Ferry Link between Poti and Illiychevsk

Table 5 shows the total export/import cargo between the regions concerned. All figures include bulk cargoes, such as coal, coke, oil and ore commodities, which are normally not transported by ferries. Total cargo movement, thus, has to be calculated without bulk cargo. Available statistical traffic data are differentiated into 21 commodity groups. Commodity group 5 contains coal, coke, oil, ore, oil products, diesel fuel, gasoline, petroleum, petroleum products, salt and water. Figures of Table 5 show that about 25% of the total trade between the Caucasian /Central Asian States and Ukraine /Moldavia consists of Group 5 cargo; the trade with Russia/Belarussia contains even more, over 61% of these commodities are bulk cargoes. The rest, about 6.2 million tonnes [i.e. 14,622 x 0.3 + 1,368 thousand tonnes] can be regarded as the 1995/96 cargo potential for a rail ferry link between Iliychevsk and Poti.

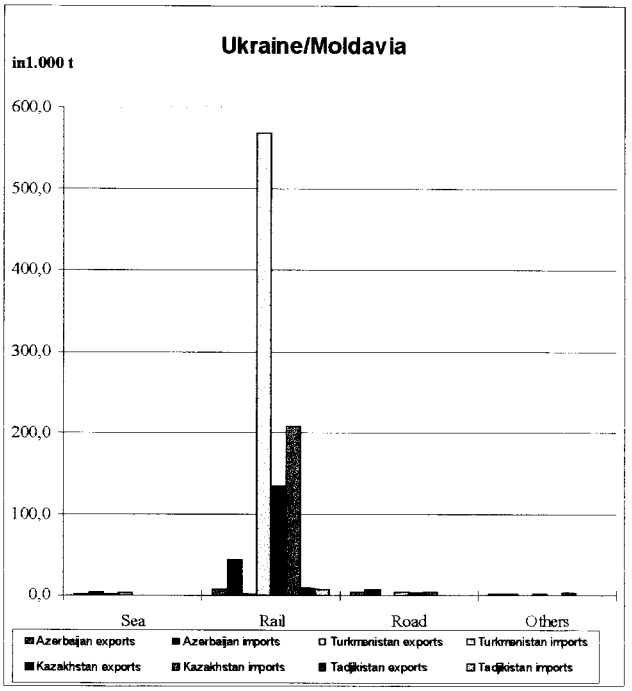
3.3 Current Modal Split of Cargo Potential

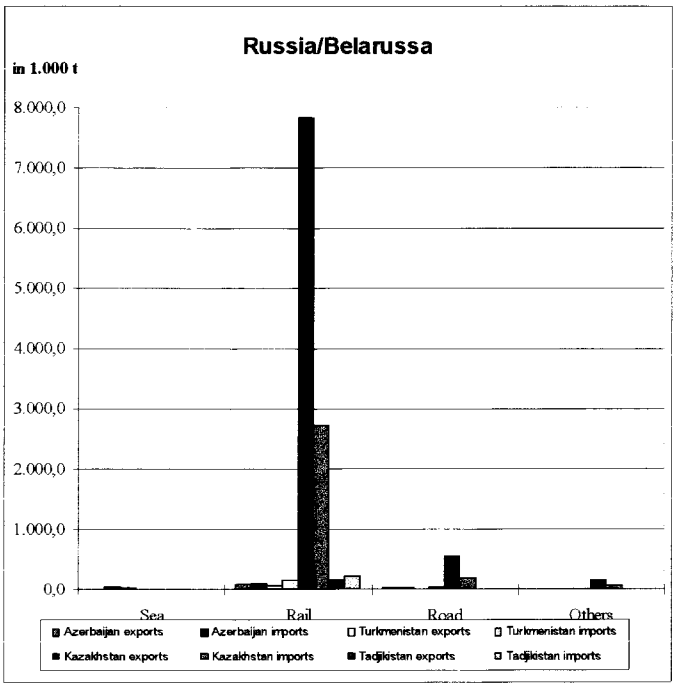
The statistical data concerning the modal split of cargo movements between the hinterland of the ports of Poti and Iliychevsk are unfortunately fragmentary. Only for Azerbaijan, Turkmenistan, Kazakhstan and Tadjikistan is information available (see Table 6). The available data show, that more than 90% of the total cargo movements are transported by rail; less than 2% are transported by sea, between 2% and 7% are moved by trucks and the rest is transported by other modes.

Assuming similar modal splits for the remaining countries Georgia, Armenia, Uzbekistan and Kirghistan, a total of about 450,000 tonnes are transported by truck, while 5.4 million tonnes are moved by railways between the hinterlands of both ports. That means that in the year 1995/96, nearly six million tonnes of cargo can be identified as potential cargo load for a rail/road ferry link between Poti and Illiychevsk.

Table 6: Modal split of cargo potential for the ferry link

Hinterland Poti		Ukraine/Moldavia Sea	Rail	Road	Others	Russia/Belarussa Sea	Rail	Road	Others
Azerbaijan	exports	1,3	6,2	4,1	0,7	0,6	69,3	20,0	1,4
Azerbaijan	imports	4,1	42,9	6,2	1,2	41,8	88,8	16,9	2,1
Turkmenistan	exports	1,1	1,2	0,0	0,0	10,0	47,2	2,5	0,0
Turkmenistan	imports	2,5	568,5	3,8	1,1	3,4	141,5	39,4	0,4
Kazakhstan	exports	0,0	133,4	3,2	0,1	6,2	7.837,3	541,7	153,5
Kazakhstan	imports	0,0	208,1	3,5	2,4	0,8	2.730,7	174,1	45,9
Tadjikistan	exports	0,0	7,7	0,0	0,0	0,0	149,2	0,0	0,4
Tadjikistan	imports	0,0	6,1	0,0	0,0	0,0	213,0	0,3	0,4
		9,0	**974,1**	**20,8**	**5,5**	**62,8**	**11.277,0**	**794,9**	**204,1**





Source: See Table 5

It is assumed that truck load tends to switch easier to a new ferry connection than railway load. Nevertheless, main forwarders from the hinterland of both ports already asked for information about rail transport facilities of the ferry connection; e.g. for cotton, grain, sugar, alcohol et al.

4 Development of Transport Demand in the Hinterlands of Poti and Iliychevsk

Until 1990, both hinterlands were integrated into the global transport system of the Soviet Union, which was geared to move huge volumes of bulk commodities among centralised production facilities over long distances, according to centralised and fairly rigid annual plans. Given the long distances within the Soviet Union, long and medium distance freight transport relied primarily on the railways, and, to a far lesser extent, on inland waterways. Road transport was used primarily for short trips, as a feeder to the railway and for distribution of goods within urban areas.

The data introduced in Chapter 3 for the hinterlands of the ports show that the dominant position of the railway in long distance traffic did not change till now.

When looking to the future, several major trends will change dramatically the pattern of freight transport in the hinterlands of the ports:

Structural change and the move to market economies will eliminate uneconomic, obsolete, and ecologically harmful industrial plants. A move from state owned industrial giants to smaller consumer-oriented firms will increase the shift from rail to road. The assumption is that the change to a market-based economy will cause a shift towards lighter industrial and consumer goods.

In a privatised, deregulated, market-oriented environment, road transport increasingly will become the mode of choice for shippers of high value or time-sensitive commodities, since road transport offers faster and more flexible service than railways.

Several factors affect the pace and size of the shift of freight traffic from the rail system to road transport:

- the speed at which the economies recover and become more market-oriented,
- the rate of growth of new business that require time and service-sensitive transports for goods that never will be shipped by rail,
- the speed at which road transport services are privatised and pushed by the drive for self sufficiency to provide flexible, fast and reliable services.

The dynamics of the shift from rail to road, than, depend on the onset and vigour of the economic growth of the states concerned. Several forecasts for different Eastern European States assume the ratio of transport demand to GDP will be 1 to 1 for rail and road transport until the economy begins to grow; thereafter, it is expected that transport demand will grow at a 1.25 to 1 ratio, with a general shift to road. That means, the elasticity is about 1.25.

For the purpose of this study, these general trends are used to estimate the future development for cargo potentials of the rail ferry link on the Black Sea between Poti and Illiychevsk.

For forecast purposes, in this study the thesis is, that the economic future of the states in the hinterland of the ports concerned is already indicated to a large extent by how far they have progressed in the process of transition, i.e. the creation of general conditions that allow for private-sector activities.

The categorising of the countries is based to a large extent on studies and work carried out by EBRD[1].
It assessed the countries according to different criteria on a scale of 1= very poor to 4= very good. Recent experience and updated knowledge about single countries was used to correct the EBRD estimates. The results are shown in Table 7. The good positions of Azerbaijan and Turkmenistan in the ranking list are a result of the good prospects of the oil and gas industries in these countries.

The expected growth rates, which are listed in Table 7, are deduced from research work from Prognos[2]. Based on the global elasticity of transport demand (1.25) in relation to GDP, the annual growth rate of transport demand for each country is calculated. These figures are listed in Table 7, too.

Table 7: Assessment of the position in the transition process and expected average growth rates of GDP and transport demand in % p.a. 1995 - 2010

7: Assessment of the position in the transition process and expected average growth rates of GDP in % p.a. 1995 - 2010

Country	GDP1993 (Billion US$)	Average position	Expected growth rates (% p.a.) till 2010		total growth of transport demand in % 1995-2010
1. Hinterland of Poti			GDP	transport demand	
Armenien	2,5	1,6	1,0	1,25	20,5
Azerbaijan	4,4	3,5	3,5	4,40	90,0
Georgien	2,8	1,3	0,5	0,60	10,0
Kazakhstan	24,9	1,5	1,0	1,25	20,5
Kyrghysistan	3,1	2,4	4,0	5,00	108,0
Tadjikistan	2,3	1,5	1,0	1,25	20,5
Turkmenistan	5,3	3,5	2,5	3,10	56,0
Uzbekistan	17,8	1,8	2,5	3,10	56,0
Average			1,9	2,40	./.
2. Hinterland of Ilyichevsk					
Ukraine	81,4	1,3	0,5	0,60	10,0
Moldavia	5,4	1,9	2,5	3,10	56,0
Russia	329,1	2,3	3,5	4,40	90,0
Belarussia	27,3	1,5	1,0	1,25	20,5
Average			2,8	3,50	./.

Source:		
	Prognos:	Strukturdatenprognose 2015 für den Bundesminister für Verkehr, Basel
	EBRD:	Transition report 1996; Infrastructure and savings; London 1996
	Own calculations	

The calculations show that overall transport demand in the countries in the hinterland of the ports will grow with an annual rate between 0.6% and 5% p.a.. The weighted average (the GDP was used as weighing factor) was calculated as 2.4 for the hinterland of Poti and as 3.5 for the hinterland of Illiychevsk.

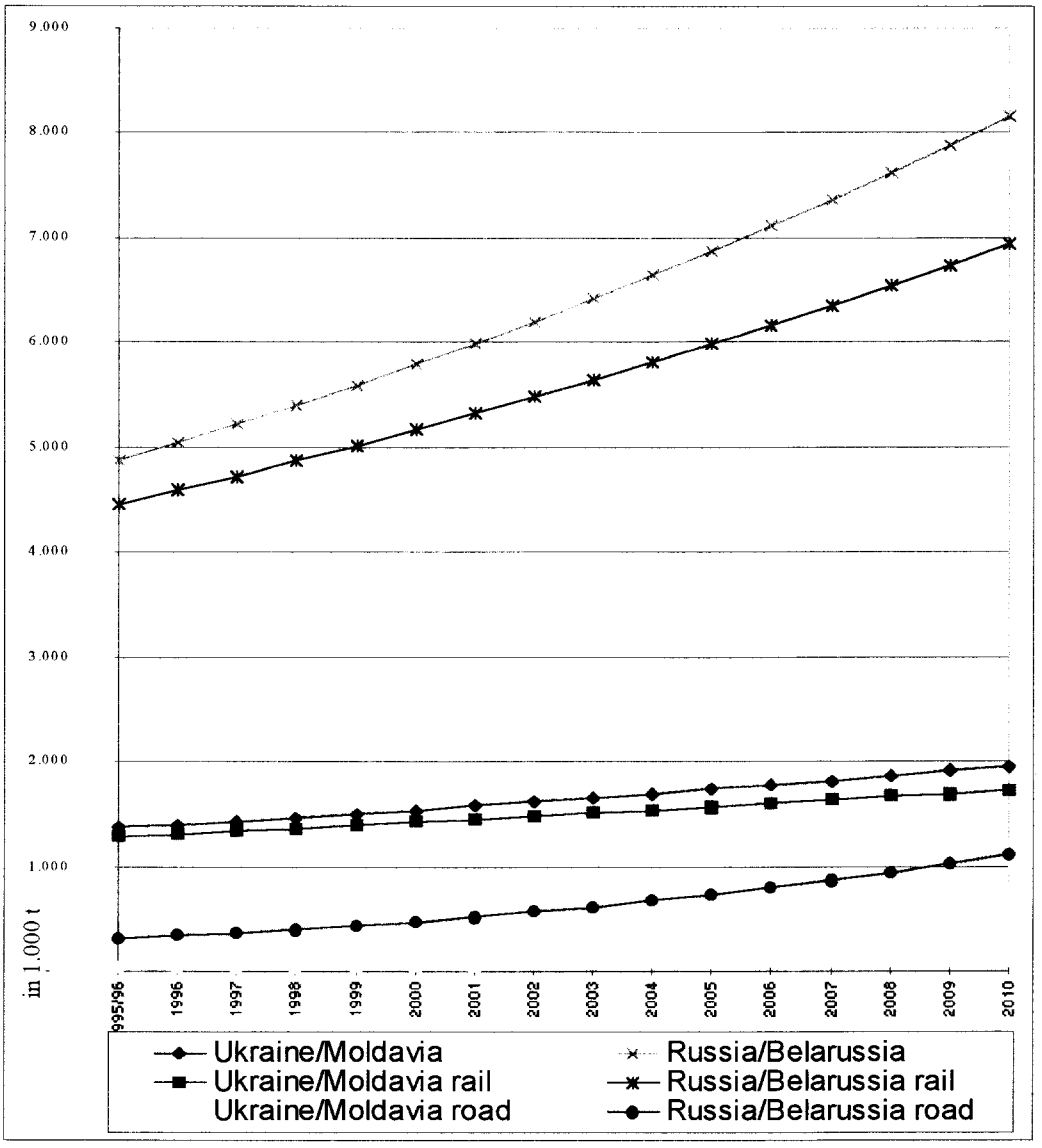
These growth rates were used to calculate the development of cargo potential for the ferry connection concerned.

[1] EBRD: Transition report 1996

[2] Prognos: Strukturdatenprognose

Table 8: Development of cargo potential for ferry-transportation between Ilyichevsk and Poti

	Cargo potential (1.000 t)			
	1995/96	2000	2010	annual growth rate 1995-2010
Ukraine/Moldavia	1.368	1.540	1.952	2,4%
of which:				
rail	1.286	1.420	1.731	2,0%
road	27	50	167	12,8%
Russia/Belarussia	4.874	5.789	8.166	3,5%
of which:				
rail	4.454	5.163	6.939	3,0%
road	312	478	1.118	8,9%



Source: Own calculations

The figures are calculated by overall annual growth rates, which were worked out above. The modal distribution, however, was found by calculating a slightly lower growth rate for rail cargo and a corresponding higher rate for truck cargo.

The results of these forecasts show a truck load potential which grows from nearly 350.000 tonnes in 1995 to about 1.2 million tonnes in 2010; the railway load potential will reach a volume of nearly 8.8 million tonnes in the year 2010.

5 Economics of a Rail/Road Ferry Link between Iliychevsk and Poti

The rail distance between Poti in Georgia and Illiychevsk (Ukraine) through the Russian Federation crossing Krasnodar and Rostov-on-Don is about 1,900 km. Trucks have to run about 1,800 km to get from Poti through the Russian Federation to Illiychevsk. Both, railways as well as trucks, must choose the routes lying north of the Azov Sea, because the ferry connecting the Crimea Peninsular with the Russian Federation at Kerc is not in operation.

The shipping distance, however, between Poti and Illiychevsk is only about 1,050 km. The distance difference, thus, for railways is about 850 km, for trucks about 750 km (see Map 5). The cargo, however, from the hinterland of Illiychevsk is not the cargo from/to Illiychevsk. Assuming Kiev as a node, there is another distance difference of about 450 km to take into account in favour of the ferry relation, which raises the distance difference for rail transport to about 1,300 km; for road transport to about 1,200 km.

In order to calculate a monetary value for the savings, which can be realised by superstructure investment in the ports of Poti and Illiychevsk, the following data have to be taken into account:
The main findings of these calculations are given in Table 9 (overleaf).

ferry distance:	Poti - Ilyichevsk	1.050	km
road distance:	Ilyichevsk - Kiev	500	km
railway distance:	Ilyichevsk - Kiev	500	km
truck distance:	Rostov - Kiev	960	km
railway distance:	Rostov - Kiev	1.000	km
distance by road only:	Poti - Kiev	1.840	km
distance by railway only:	Poti - Kiev	1.900	km
distance by road and ferry:	Poti - Kiev	1.550	km
distance by railway and ferry	Poti - Kiev	1.600	km
cost of transportation by truck		0,050	ECU/tkm
cost of transportation by railway		0,015	ECU/tkm
cost of transportation by ferry: (incl.handling)		0,013	ECU/tkm
cargo potential for road-ferry transportation		350.000	tons
cargo potential for railway transportation		5.740.000	tons

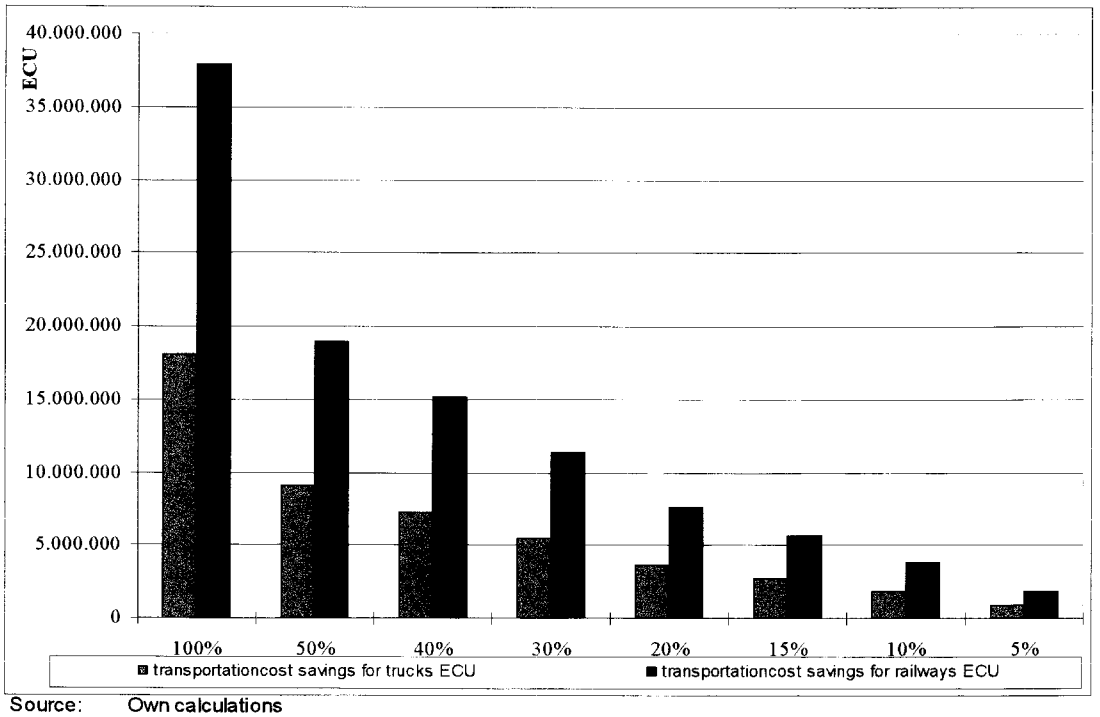
These figures show, that, because of lower transportation costs per tkm considerable savings can be realised when a ferry link between Poti and Illiychevsk is in operation.

For an investment of 15 million ECU in harbour related superstructure for a combined rail and road ferry service in both ports, about 27% of the total cargo potential has to be transported by the ferry service, for the savings to equal the costs of the new superstructure within one year.

Table 9: Calculation of transportcost savings (ECU)

cargo volume in 1.000 t for trucks	Exploitation quota	total transportation costs ECU	transportation costs ferry ECU	transportation costs road ECU	total transportation costs ECU	transportation cost savings for trucks ECU
339,0	100%	31.188.000	4.627.350	8.475.000	13.102.350	18.085.650
169,5	50%	15.594.000	2.313.675	4.237.500	6.551.175	9.042.825
135,6	40%	12.475.200	1.850.940	3.390.000	5.240.940	7.234.260
101,7	30%	9.356.400	1.388.205	2.542.500	3.930.705	5.425.695
67,8	20%	6.237.600	925.470	1.695.000	2.620.470	3.617.130
50,9	15%	4.678.200	694.103	1.271.250	1.965.353	2.712.848
33,9	10%	3.120.495	462.735	847.500	1.310.235	1.810.260
17,0	5%	1.559.400	231.368	423.750	655.118	904.283

cargo volume in 1.000 t for railways	Exploitation quota	total transportation costs ECU	transportation costs ferry ECU	transportation costs railway ECU	total transportation costs ECU	transportation cost savings for railways ECU	transportation cost saving for total cargo ECU
5.740,0	100%	163.590.000	78.351.000	47.355.000	125.706.000	37.884.000	55.969.650
2.870,0	50%	81.795.000	39.175.500	23.677.500	62.853.000	18.942.000	27.984.825
2.296,0	40%	65.436.000	31.340.400	18.942.000	50.282.400	15.153.600	22.387.860
1.722,0	30%	49.077.000	23.505.300	14.206.500	37.711.800	11.365.200	16.790.895
1.148,0	20%	32.718.000	15.670.200	9.471.000	25.141.200	7.576.800	11.193.930
861,0	15%	24.538.500	11.752.650	7.103.250	18.855.900	5.682.600	8.395.448
574,0	10%	16.367.610	7.835.100	4.735.500	12.570.600	3.797.010	5.607.270
287,0	5%	8.179.500	3.917.550	2.367.750	6.285.300	1.894.200	2.798.483



Source: Own calculations

Volume 3

Port Master Planning

Annexes

Annex 1

Tables - Port of Poti

Annex 1

Tables Port of Poti

Table 1.1: Port of Poti - Oil Terminal

YEAR	Annual throughput	No of vessels	Average pumping capacity
1997	583.822	140	about 200 mt/hr

Table 1.2: Development of Grain and Wheat Flour Import via Georgian Ports

Poti

Year	Grain in tons	Wheat flour in tons	Total
1994	663.000	79.700	742.700
1995	633.500	54.100	687.600
1996	364.500	95.400	460.900
1997(9 Month)	(119.600)	(140.600)	
1997 estimated	159.500	187.500	347.000

Table 1.3: Container Handled in the Port of Poti - 1997

	Units	Export		Import		Total		Total container
		20'	40'	20'	40'	20'	40'	
January	"-----"	465	337	359	355	824	692	1516
February	"-----"	366	331	300	276	666	607	1273
Mart	"------"	319	332	407	340	726	672	1398
I quarter	"------"	**1150**	**1000**	**1066**	**971**	**2216**	**1971**	**4187**
April	"-----"	351	341	381	363	732	704	1436
May	"------"	351	491	613	685	964	1176	2140
June	"-----"	544	730	700	800	1244	1530	2774
II quarter	"------"	**1246**	**1562**	**1694**	**1848**	**2940**	**3410**	**6350**
6 months	"-----"	**2396**	**2562**	**2760**	**2819**	**5156**	**5381**	**10537**
July	"-----"	475	758	712	1705	1187	2463	3650
August	"-----"	538	922	779	1196	1317	2118	3435
September	"----"	333	572	611	1034	944	1606	2550
III quarter	"-----"	**1346**	**2252**	**2102**	**3935**	**3448**	**6187**	**9635**
9 months	"-----"	**3742**	**4814**	**4862**	**6754**	**8604**	**11568**	**20172**
October	"------"	632	671	624	459	1256	1130	2386
November	"------"	477	1216	412	504	889	1720	2609
11 months	"------"	4851	6701	5898	7717	10749	14418	25167
December	"------"	617	**674**	**641**	**652**	**1258**	**1326**	**2584**
IV quarter	"------"	**1726**	**2561**	**1677**	**1615**	**3403**	**4176**	**7579**
Per year	"-----"	**5468**	**7375**	**6539**	**8369**	**12007**	**15744**	**27751**
								12007+31488=43495 TEU

Table 1.4: Port of Poti - Total Amount of Cargo per Commodity per Vessel per Year

Commodity	1992		1993		1994		1995		1996		1997 (9 months)	
	Total weight unit or container (in numbers) carried by vessel ths. tons	No of ships with this cargo during the year	Total weight unit or container (in numbers) carried by vessel ths. tons	No of ships with this cargo during the year	Total weight unit or container (in numbers) carried by vessel ths. tons	No of ships with this cargo during the year	Total weight unit or container (in numbers) carried by vessel ths. tons	No of ships with this cargo during the year	Total weight unit or container (in num-bers) carried by vessel ths. tons	No of ships with this cargo during the year	Total weight unit or container (in numbers) carried by vessel ths. tons	No of ships with this cargo during the year
grain bulk	339.6	32	423.9	56	663.3	35	633.5	33	364.5	49	119.6	24
flour in bags	30.6	7	62.4	21	79.7	27	54.1	28	95.4	39	140.6	89
sugar, bags	22.0	11	55.2	11	10.5	4	12.3	9	89.4	30	53.6	28
other foodstuff, bags	2.7	1	25.8	17	27.8	14	16.2	12	40.8	26	16.3	9
fertiliser, bags	27.4	11	24.3	15	24.3	14	22.2	16	53.2	16	55.9	19
coal bulk	292.2	10	298.2	10	32.9	1	50.2	1	-	-	-	-
silico manganese	232.1	29	85.7	22	3.6	2	3.9	1	1.3	1	-	-
iron ore/pellets bulk	14.0	11	24.6	13	57.9	38	43.1	25	7.5	6	17.7	7
aluminium powder bulk	117.8	46	160.4	84	44.4	20	41.2	28	4.8	5	3.1	3
barite	6.2	11	1.1	3	-	-	-	-	1.0	1	-	-
caustic soda	-	-	-	-	-	-	3.3	4	3.7	1	-	-
cotton, bales	-	-	3.0	1	-	-	1.7	2	3.6	4	3.6	4
metal products	-	-	-	-	-	-	0.8	1	28.3	12	42.9	21
wooden logs	-	-	-	-	13.5	11	8.8	13	81.9	27	73.8	40
scrap bulk	3.2	7	0.3	1	3.0	2	0.8	2	4.0	8	1.9	4
rolling units (ferry)	4.9	4	0.9	1	19.1	19	35.0	36	9.2	5	81.8	35
containers pieces	-	-	-	-	-	-	1300	44	3472	107	3373	114
containers TEUs	149	2	1773	12	4022	59	7991	111	19765	213	32048	255

(total commodity vessel Poti)
Source: statistical dept of port Poti

Table 1.5: Port of Poti - Additional Berth Demand per Commodity and in Total - 2002

Commodity *mtons/year (units, TEUs)*	*Ass-igned Berth Nos* *(0)*	*Average amount of cargo per vessel in mt (units, TEUs)* *(1)*	*Average through-put per day mt(units, TEUs)* *(2)*	*Average laytime per vessel in days* *(3)*	*Number of vessels per year* *(4)*	*Average occupied space of vessels in meters* *(5)*	*Required berthlength / commodity per year in meters* *(6)* *3x4x5*	*Available berth - length/year/ for berth in m Berth occ. 65% max.* *(7)* *Lx365x b'occ * (b'occ)*	*Required additional berth - length/ commodity in meters* *(8)* *8 = 0 x 9*	*Fraction of berth occupied by this cargo* *(9)* *6 / 7*
Grain in bulk 501,900 mt	**9, 11 320 m**	10,000	4,000	2.5	50	225	28,125	58,400 (0.5)	nil	0.48
Other bulk 696,100 mt	**4 175 m**	9,000	8,000	1.1	77	75	14,883	19,162 (0.3)	nil	0,77
Oil products 898,500 mt	**1 200 m**	4,500	4,800	0.94	200	170	31,960	21,900 (0.3)	92	1.46
General cargo 991,400 mt	**5,8,10 615 m**	3,000	750	4.0	330	150	198,000	145,909 (0.65)	142	1.36
Containers 98,050 TEUs	**7,6,12 870 m**	150 (97 = 75)	150 (8/hrx9.5hrs)	1,0	654	185	120,990	206,408 (0.65)	nil	0.58
Roro cargo 56,784 units	**2,3 185 m**	172	665 35/hrx9.5x2	0.26	330	185	15,873	20,257 (0.3)	nil	0.78
Total additional berth requirement										

* b'occ = berth occupation factor

Assumptions:

- New container terminal not completed.
- Berths No. 6,7,12,14 will be used for container handling until new container terminal will be completed. Total length = 870
- Vessels will adjust to the sizes, which are used compulsory in shipping for certain volumes of cargo
- Container-handling moderately improved due to modern handling equipment. However still seriously hampered by lack of sufficient yard space. Applied mode of calculation 8 containers/hr x 9.5 hrs effective working time x 2 shifts. Operation hampered due to split operational areas.
- RoRo ramp for handling of rail - and conventional RoRo - cargo in full operation.
- Average payload of vehicles transported by RoRo ferries is 15 mt
- Improvements in throughput in the general cargo handling due to modernised cargo - handling techniques, management procedures and reorganized manpower deployment.
- Maximum size of vessels, which can be moored at Berth No.1 is around 20,000 mt dwt for bulk and oil handling. When a RoRo ferry is operating the maximum size to berth is about 10,000 mt dwt, because ferry services, which have to enjoy priority at Berth No.2, would otherwise be hampered in their operation.

Conclusions:

- General cargo handling will run into serious bottleneck situation due to the fact, that container handling area will increase.
- Berth No 3 will be needed for direct delivery
- Oil pumping capacity will have to be improved, other bulk cargo will have to be handled at Berth No 4

Table 1.6: Additional Berth Demand per Commodity and in Total - 2007

Commodity *mtons/year (units, TEUs)*	*Ass-igned Berth Nos* *(0)*	*Average amount of cargo per vessel in mt (units,TEUs)* *(1)*	*Average through-put per day mt (units, TEUs)* *(2)*	*Average laytime per vessel in days* *(3)*	*Number of vessels per year* *(4)*	*Average occupied space of vessels in meters* *(5)*	*Required berthlength / commodity per year in meters* *(6)* *3x4x5*	*Available berth - length/year/ for berth in m Berth occ. 65% max.* *(7)* *Lx365x b'occ ** *(b'occ)*	*Required additional berth - length/ commodity in meters* *(8)* *8 = 0 x 9*	*Fraction of berth occupied by this cargo* *(9)* *6 / 7*
Grain in bulk 623,700 mt	**8,15 375 m**	10,000	8,000	1.25	63	225	17,718	68,438 (0.5)	nil	0.26
Other bulk 1,122,600 mt	**4 420 m**	9,000	10,000	0.9	125	175	19,688	19,162 (0.3)	3.50	1.02
Oil products 1,105,100	**1 200 m**	10,000	8,500	1,18	111	225	29,471	47,450 (0.3)	nil	0.62
General cargo 982,200 mt	**5,6,7, 9,10 835**	5,000	900	5.6	197	170	187,544	198,104 (0.65)	nil	0.95
Containers TEUs 151,320	**New Term. 500 m**	250	550	0.45	605	155	42,198	91,250 (0.5)	nil	0,46
Roro cargo units 81,276	**2, 185 m**	176	730	0.24	461	185	20,468	20,257 (0.3)	capacity exhausted	1,0
Total additional berth requirement									**n i l**	

* b'occ = berth occupation

Assumptions :

- New Container Terminal with two berths in operation.
- RoRo facility at Berth No. 2 & 3 accommodates RoRo-traffic. Berth No. 3 considered to be blocked permanently by RoRo operations.
- Productivity on European standard.
- Berth No. 15 rebuilt and receiving cargo for flour mill.

Conclusion :

- Berth length available for general cargo at the end of its capacity. Actual development to that date to be monitored.
- The capacity of oil and bulk handling will not suffice. Pier No. 1 will not have even have sufficient capacity to handle the oil transfer.
- Pumping rate for oil transfer has to be increased considerably gradually to about 10,000 mt/day.
- General cargo operational capacities nearly exhausted .To be further streamlined and modernised to cover the future needs .
- New container terminal eases situation in this field

Table 1.7: Additional Berth Demand per Commodity and in Total - 2012

Commodity *mtons/year (units, TEUs)*	*Ass-igned Berth Nos* *(0)*	*Average amount of cargo per vessel in mt (units, TEUs)* *(1)*	*Average through-put per day mt (units, TEUs)* *(2)*	*Average laytime per vessel in days* *(3)*	*Number of vessels per year* *(4)*	*Average occupied space of vessels in meters* *(5)*	*Required berthlength / commodity per year in meters* *(6)* *3x4x5*	*Available berth - length/year/ for berth in m Berth occ. 65% max.* *(7)* *Lx365x b'occ * (b'occ)*	*Required additional berth - length/ commodity in meters* *(8)* *8 = 0 x 9*	*Fraction of berth occupied by this cargo* *(9)* *6 / 7*
Grain in bulk 794,400	**8,15 375 m**	10,000	8,000	1.25	79	225	22,219	68,438 (0.5)	nil	0.32
Other bulk 1,536,900	**4 175m**	9,000	10,000	0.9	171	175	26,932	19,162 (0.3)	70	1.40
Oil products 1,324,400	**1 200 m**	10,000	10,000	1.0	132	225	29,700	21,900 (0.3)	272	1.36
General cargo 988,900	**5,6,7,9,10 835 m**	5,000	750	6.7	198	170	225,522	198,103 (0.65)	100	1.12
Containers TEUs 287,930	**New Term. 500 m**	500	2,100 (4 gantries)	0,24	576	205	28,339	91,250 (0.5)	nil	0.31
Roro cargo units (85,176)	**2, (3) 185 m**	176	730	0,24	484	200	23,232	20,257 (0.3)	30	1.15
Total additional berth requirement									**n i l**	

* b'occ = berth occupation factor

Assumptions:

- Bulk handling procedure by grab system
- RoRo handling on Berth 2-3
- Oil transfer and bulk handling still at Pier No. 1
- Oil and Bulk handling area are separated
- General cargo productivity to remain unchanged between 2007and 2012.

Conclusions:

- Measures to modernise the bulk handling equipment will have to be taken to achieve higher productivity.
- Area for bulk handling to be shifted to 'new area' north of the existing port.
- Oil transfer capacity to be increased further to cope with higher throughput.
- General cargo handling equipment and procedures to be modernised

Table 1.8: Total Demand for Shed and Open Storage Space Poti - 2002

Commodity	*Throughput per year mt , TEUs, units*	*% direct*	*mt,units TEUs direct*	*% indirect*	*mt, units, TEUs indirect (T)*	*average dwelltime factor (n)*	*mt per m2/ TEU, unit (q)*	*deduction for oper. requirements (K)*	*Total required storage space in m2 (type) (S)*
Grain in bulk	501.900	100	501,900	nil	nil	n.a.	n.a.	n.a.	nil
Other bulk	697,100	20	139,420	80	557,680	36	12.5	10 %	4,400
General cargo	991,400	80	793,120	20	198,280	36	2	0.5	5,508
Containers TEUs	98,050	nil	nil	100	98,050	26	17.5 m2/TEU	0.4 rst/f	65,962
Roro Units (conventional)	15,600	nil	nil	100	15,600	n.a.	85 m2/Unit (gross)	n.a.	8,500 (100 units)
								Totals (mix)	***51,463***

Assumption :

- Bulk cargo mainly handled at Berth No. 1, with the exception of scrap, which will be handled at Berth No. 4.
- Required storage area for bulk cargo is 50,000 mt to achieve flexibility for shipment.
- Storage area at Berth No. 1 could - based on official parameters - accommodate 63,600 mt of iron ore.
- Grain in bulk handled by grabs
- Parking and marshalling areas are calculated to accommodate 100 road vehicles each requiring 85 m2.
- Average dwell time for containers 10 days . Dwell time factor 36.
- Storage area for containers comprises of (apron deducted for ship - shore operation): Berth No. 7 = 12,000 m2, area behind berth No. 7 = 14,000 m2 earmarked for empty container stacking. Berth No. 6 about 10,000 m2. Berth No 12-14 = 18,000 m2 . *Total = 54,000 m2*

Table 1.9: Additional Demand for Storage Space - 2002.

Commodity	*Total required storage space (m2)*	*Total required storage area sheds (%) (m2)*	*Total available storage area sheds (m2)*	*Occupied fraction of shed storage space*	*Additional demand for storage space sheds (m2)*	*Total required storage area for open storage (m2)*	*Total available storage area for open storage (m2)*	*Occupied fraction of total open storage facilities*	*Additional demand for open storage (m2)*
Grain in bulk	nil								nil
Other bulk	4,400	nil	n.a.	nil	n.a.	4,400	6,800	0.65 *	nil
General cargo	5,508	4,957 (90)	11,700	0.42	nil	1,530 (q=1.5)	20,000	0.08	nil
Container(TEUs)	65,962	nil	n.a.	n.a.	nil	65,962	54,000	1.22	11,962
Roro (units conventional)	8,500	nil	nil	nil	nil	8,500	15,200	0.56	nil
Totals	***51,463***	***4,957***	***11,700***	***0.42***	***nil***	***47,485***	***87,100***		***11,962***

* storage area at Berth No. 1

Assumptions:

- All open storage areas assigned for general cargo, containers and RoRo cargo will have been rehabilitated and permit the storage of goods under normal conditions as far as the pavement is concerned.
- Assignment of open storage areas : Berth No. 1 bulk cargo, 2 - RoRo- traffic, 3 - direct delivery of general cargo as far as roro - operations permit, 4- scrap, No. 5- containers and general cargo with changing priorities, No.6 -containers, No. 7 containers, No 8 - mix of bulk (grain) and general cargo, No.9 grain in bulk, No. 10 - general cargo, No. 11 direct delivery of grain in bulk, No. 12,14 containers.
- Container stacking operation based on reachstacker and truck-trailer system.
- Shunting tracks for rail ferry shunting operations are under construction

Conclusions:

- Open storage space for 'other bulk' will be sufficient until 2002 .
- Shed space sufficient until 2002.
- Numbers of containers do justify the construction of a specialised container terminal. Viability range , which is around 50-60,000 TEUs has been reached.

Within the period until 1998-2002 the port will face grave difficulties to maintain an efficient container operation. The available space will despite of the proposed enlargement not be sufficient to cover the operational needs.

Table 1.10: Total Demand for Shed and Open Storage Space - 2007

Commodity	*Throughput per year mt , TEUs, units*	*% direct*	*mt, units TEUs direct*	*% indirect*	*mt, units, TEUs indirect (T)*	*average dwelltime factor (n)*	*mt per m2, TEU, unit (q)*	*deduction for oper. requirements (K)*	*Total required storage space in m2 (type) (S)*
Grain in bulk	623,700	100	623.700	nil	nil	n.a.	n.a.	n.a.	nil
Other bulk	1,122,600	16	179,161	84	943,439	36	12.5	(10%)	5,000
General cargo	982,200	50	491,100	50	491,100	36	2	0.5	13,667
Containers TEUs	151,320	nil	nil	100	151,320	36	17.5m2/TEU	0.4 rst/f	73,558
Roro Units (conventional)	19,500	nil	nil	100	19,500	n.a.	85m2/unit (gross)	n.a.	8,500
								Totals (mix)	***63,444***

Assumption :

- Silo and flour mill operating at full capacity and grain will either be discharged directly at berth No. 15 or transferred from inner harbour to silo by conveyor belt. This subject to the location of the new container terminal.
- Scrap mainly handled at Berth No. 4 (16% of total other bulk). Ferrous metal mainly scrap will be loaded direct from wagons. Scrap not cut in the port area anymore.
- General cargo direct delivery phased out slowly.
- In the field of container handling the worst case scenario has been applied. This would mean, that a new container terminal would not be available, and the envisaged operation by truck-trailer and reachstacker would have to be maintained until 2002. It would mean a very complicated operation would have to be carried out, which due to the various operational area should not be fully computerised.

Conclusions:

- A new container terminal is required to be in operation before 2007 to cope effectively with the forecasted volume of containertraffic at Poti.

Table 1.11: Additional Demand for Storage Space - 2007

Commodity	*Total required storage space (m2)*	*Total required storage area sheds (%) (m2)*	*Total available storage area sheds (m2)*	*Occupied fraction of shed storage space*	*Additional demand for storage space sheds (m2)*	*Total required storage area for open storage (m2)*	*Total available storage area for open storage (m2)*	*Occupied fraction of total open storage facilities*	*Additional demand for open storage (m2)*
Grain in bulk	nil	nil	n.a.	nil	nil	n.a.	n.a.	n.a.	n.a.
Other bulk	5,000	nil	n.a.	n.a.	n.a.	5,000	6,800	0.73*	nil
General cargo	13,669	(60) 8,201	11,700	0.70	nil	9,113 (q=1.5)	20,000	0.46	nil
Container(TEUs)	73,558	nil	n.a.	n.a. **	n.a.	73,558	54,000	1.36	19,558
Roro (units)	8,500	nil	n.a.	n.a.	n.a.	8,500	15,200	0.56	nil
Totals	***63,444***			***0.70***	***nil***	***58,888***	***87,100***		***19,558***

* Storage area at Berth No. 1

Assumptions:

- ** Requirements for CFS space considered in general cargo calculations.

Conclusions:

- All categories nearing the range where flexibility to accommodate bigger consignments is lost.
- *It has to be observed, that the calculated space will under no circumstances satisfy the operational requirements for an efficient container-handling. The area needed for an efficient operation would have to be around 150,000 m2 in total.*

Table 1.12: Total Demand for Shed and Open Storage Space Poti - 2012

Commodity	*Throughput per year mt , TEUs, units*	*% direct*	*mt, units TEUs direct*	*% indirect*	*mt, units, TEUs indirect (T)*	*average dwelltime factor (n)*	*mt per m2 (q)*	*deduction for oper. requirements (K)*	*Total required storage space in m2 (type) (S)*
Grain in bulk	794,400	100	794,400	nil	nil	n.a.	n.a.	n.a.	nil
Other bulk	1,566,500	20	313,300	80	1,253,200	36	12,5	10 %	5,500
General cargo	988,900	0	nil	100	988,900	36	2	0.5	27,469
Containers TEUs	287,930	nil	nil	100	287,930	73	17.5m2/TEU	0.4 rst/f	69,024
Roro Units (conventional)	23,400	nil	nil	100	23,400	n.a.	85m2/ unit (gross)	n.a.	8,500
								Totals (mix)	***110,493***

Assumptions :

- Reachstacker mode applied for stacking, which in this range is not applicable, to underline the need for a new specialized containerterminal .
- Containers are dwelling incoming 4 days and outgoing 6, with an average of 5 days resulting in a dwelltime factor of 73. The figure is however theoretical as it is deemed to be impossible for the port to perform accordingly under the given circumstances.

Table 1.13: Additional Demand for Storage Space - 2012

Commodity	*Total required storage space (m2)*	*Total required storage area sheds (%) (m2)*	*Total available storage area sheds (m2)*	*Occupied fraction of shed storage space*	*Additional demand for storage space sheds (m2)*	*Total required storage area for open storage (m2)*	*Total available storage area for open storage (m2)*	*Occupied fraction of total open storage facilities*	*Additional demand for open storage (m2)*
Grain in bulk	nil	nil	n.a.	n.a.	nil	n.a.	n.a.	n.a.	nil
Other bulk	5,500	nil	n.a.	n.a.	n.a.	5,500	6.800	0.81	nil
General cargo	27,469	16,481	11,700	1,41	4,781	18,313(q=1.5)	20,000	0.92	nil
Container(TEUs)	69,024	nil	n.a.	n.a.	n.a	69,024	54,000	1.28	15,024
Roro (units)	8,500	nil	n.a.	n.a.	n.a.	8,500	15,200	0.55	nil
Totals	***110,493***		***11,700***	***1.41***	***4,781***	***101,337***	***96,000***		***15,024***

Assumptions

- No further sheds built and open storage areas not extended further.
- New container terminal not available. Operations to be carried out in existing port.

Conclusions:

- Port in its present location and layout is not in position to handle the forecasted amount of containers.
- Bottleneck situation is also building up in the general cargo area.

Annex 2

Minutes of Meeting - Port Development Planning Poti

MINUTES OF MEETING

DATE:	10/12/97
FROM - TO :	10:15 - 13:00 hrs
LOCATION:	Office of Deputy Manager of Planning
PARTICIPANTS:	Mr. Guram Adavia , Chief Engineer (part time) Mr. Devi Gvalia, Deputy Mgr for Planning Mr. Bodo Rössig , Port Development Expert and Teamleader HPTI Mr. Horst Raschdorf , Port Development Expert

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SUBJECT: Status of actual planning development Port of Poti

Pier No. 1

Pier had in the past been used for bulk handling and oil transfer.

Currently pier is exclusively being used by oil company (KHOLKI) , who is operating the oil transfer .It is planned to reorganise the oil transfer procedures. After construction of a pipeline from the tanks behind the area of berth No. 7 , the railwagons carrying the oilproducts will no longer be required to enter the port area. The project had been started and later abandoned by private investors , with parts of the pipeline completed. It is not sure, when the construction works will resume. The contract with the oil company is running out, but is supposed to be renewed with effect from January 1998.

Behind the pier and extending to part of the adjacent Pier No. 2 about 57,000 mtons of iron ore pellets in bulk are stored. The total amount of this ore had been 104,000 mtons which is stored there since a couple of years. 47,000 mtons had already been loaded some time ago. There are however no prospects, when the rest of this cargo is being loaded.

The Commercial Department is said to be in charge of the subject. The main problem seems to be, that the owner of the cargo is the Ministry of Industry and that the sales value in the world market is very low due to the poor quality of the ore. The cargo is occupying valuable space , which is not giving the port any revenue. The storage dues are accumulated but might have to be considered as bad debts.

Berth No. 2

This berth is not part of the contract with the oil company , but is used at times for their operations.

The berth is being used for general cargo - and container operations. Plannings are , that in connection with the establishment of a multipurpose ferry RoRo facility in the end of berth 2, the berth will be occupied by the RoRo ferries at considerable times once the operation will start.

The area behind Berth No. 2 will have to be paved to be used as a marshalling area for trucks, trailers and other rolling goods being transported by the ferries.

Berth No. 3

The berth is now being used for the handling of break bulk cargo.

Future use of the berth will be decided in connection with the traffic pattern of the ferry services and the design of the ramp and the adjacent areas applied by the Greek construction firm.

It will in any case have to be paved to meet the standards of modern cargo handling requirements and to withstand the wheelloads of heavy mobile handling equipment.

Berth No. 4 & 5

Both berths and the areas behind will be rehabilitated and paved in, including the railtracks. order to be able to accommodate project cargo and other break bulk cargo and for movements of heavy mobile handling equipment . Works to start and completed in 1998. Estimated time of completion 6 month after the start of the construction works. Provisions in the Budget have been made.

Berth No. 6

Berth utilised by joint venture operation of the Port of Poti and the German company Dockerell. The purpose of the undertaking is to handle scrap .This joint venture supposed to last until 2002. Valuable space to handle other cargo and particular containers is being lost by an operation, which does not generate as much income, as a normal cargo handling operation. It is furthermore not in line with normal port safety standards, that the scrap is burnt in a normal port area , which is freely accessible.

Both Port Development Experts expressed their opinion, that they also see the need to clear up the country from scrap. But on the other hand expressed their view, that the scrap should be handled at another place, where the important port operations are less affected. As a consequence the contract between the two parties should be screened under the context to find legal terms, which would allow to move the scrap operation to another place.

The berth is furthermore occupied by ferries which are usually operating by a stern - ramp , which is laid on berth No. 7 , whilst the vessel is moored to Berth No. 6 .

Berth No. 7 (Container Terminal)

The Container Terminal is consisting of one berth only. All relevant calculations undertaken by the experts showed , that the area is too small to accommodate the current number of containers which are already near to 35,000 TEUs in 1997 .

The experts proposed, to develop the area across the road as stacking area and at the same time to further extend the stacking area to berth No. 6. Simultaneously the joint venture scrap operation would have to be moved to the area behind Berth No. 8.

The container - throughput will further increase and should therefore enjoy top attention and priority over other development projects.

The experts drew the attention of the Deputy Manager of Planning that quality and speed of container operations would determine the reputation of the port in a highly competitive environment.

Berth No. 8

Berth No. 8 is presently used to handle grain and general cargo. Behind the berth a small scale container stripping operation being maintained, sometimes in an very unsafe matter.

A study financed by the ERBD proposed to erect a grain handling facility at berth No. 8 for a total investment o US $ 15 million. The actual development of the grain- throughput shows a continuous downward trend in the import of grain in bulk during the last three years and a continuous upward trend in the import of flour during the same period. This applies for Poti and Batumi.

The viability calculations conducted in this respect have been calculating the macro-economic figures, whereas by very rough calculations it seems, that the port by its own financial resources will not be in position to meet the financial obligations deriving from the installation and financing of such a project within reasonable limits. Hence the developments in the field of grain in bulk should be monitored carefully before embarking on a investment of this size.

At the present stage the port does not experience problems in the handling of grain, which would constitute an urgent need to carry out the project.

Furthermore it is the dedicated opinion of TACIS, that before contemplating to extend facilities, existing facilities should be upgraded to achieve productivity.

Mr. Bodo Rössig mentioned, that he had received the above mentioned study and was studying the contents.

Berth No.9 & 10

These berths are mainly used to handle general cargo, which is dominated by the handling of bagged foodstuff and chemicals . In the back of the yard of Berth No. 9 there are buildings, which do not have a clear function and are not be needed with the exception of one building, which is currently being used by the fire brigade. It is planned to demolish all the buildings and erect new transit sheds and warehouses instead. the fire brigade does not need much of space and it will not be a problem to find it. This planning is the best solution for the area and received the full agreement of the experts.

The experts and the Deputy Manager of Planning could not agree on the demolishing of the ramp, presently used to load rail wagons by means of forklift truck. This ramp is in the centre of the potential stacking area and also obstructs the direct access to the planned sheds.

The loading of rail wagons in Poti is performed by FLTs. As the name of this piece of equipment already incorporates the capacity to lift. There is no need for a ramp in this area.

In the area of Berth No. 10 the cargo pattern is almost identical. Shed No. 4 is easy accessible from this berth and is presently the most frequented covered storage area of the port.

In the back of the yard there is a skeleton steel construction which was supposed to become one shed. The construction has been interrupted a couple of years ago. It is envisaged to complete the shed as soon as possible, which means as soon as contractual matters have been solved and the financing could be secured. The layout of the present construction and the planned extension seem to make the best out of the available space, although a location about 25 m to the south would have been more convenient in respect of gaining as much as possible open storage space.

Berth No. 11

This berth is presently out of use . It is planned to utilise it for grain discharge. It has however been of observed , that the hopper for the intended use is in a poor technical condition.

It is difficult to undertake big developments, because of the narrow approach, any vessel lying there presents a potential nautical hazard for all vessels intending to berth or to leave the harbour basin between Berth Nos. 3 and 10 .

Berth No. 12- 14

The entire area which is presently used to berth the 'UKR' rail - and truckferry and for the occasional container operations could be used as a buffer zone for both container and RoRo operations. For this purpose the area would have to be paved to the required standards. The area adjacent to the berth No. 14 would have to be bulldozed and paved. The laid up fishery fleet double - and triple banked alongside the Berth No. 14 would have to be cleared and probably scrapped , which could be a break even or even a profitable operation.

As far as the environment is concerned, the palm trees could easily be excavated and contribute to the beautification of the city elsewhere.

Waterdepth and condition of the piers would suffice for the described kind of operation for some time to come.

Berth No. 15

Works had begun to renew and extend the existing outdated pier construction at this berth. These works could not be continued. The experts and the Deputy Manager of Planning agreed, that serious thought should be given to the idea to reactivate the Silo, which does not belong to the port ,with a storage capacity of 24,000 mt. The need to study this possibility seriously before embracing the idea to construct a facility, which can store 5,000 mt on an intermediate basis only, is further underlined by the fact , that the flour mill beside the grain silo has been rehabilitated with state of the art new technical equipment, and has taken up the operation again.

Conclusion

The participants mutually agreed, that everything should be done to make Poti Port, which is the most important money maker for the city of Poti a prospering entity. This should be the kept in mind always when planning the future development. the Dty Manager of Planning and the Experts vowed to move along that line.

Meeting adjourned at 14:00 hrs.

Annex 2 a

Minutes of Meeting Poti, 2

MINUTES OF MEETING

DATE:	23/1/98
FROM - TO :	14:00 - 15:30 hrs
LOCATION:	Office of Chief engineer
PARTICIPANTS:	Chief Engineer Poti Port, Mr. Guram Adamia TACIS Port Development Expert and TL, Bodo Rössig TACIS Environmental Expert, Tatiana Eggert (Mrs) TACIS Civil Engineer, René A. van Lierop TACIS Port Development Expert, Horst Raschdorf

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SUBJECT: Co-ordination meeting for Poti Port development planning

Information about anticipated cargoes which under negotiation

Granulated Sulphur
The Chief Engineer advised that since some time the port has been working to negotiate annual shipments in the range of 700,000 mt annually of granulated sulphur from Kirgistan. The Experts advised, that the handling of these cargoes should be carefully planned due to the dangerous nature of the cargo.

Silico Manganese
In the near future the port hopes to handle about 500,000 mt annually of this cargo for export.

Bauxite
Shipments of about 700,000-800,000 mt are expected to pass through the Port of Poti. This cargo would be shipped from Australia.

Container Operations
The TACIS Experts lined out, that the available space even considering Berth No. 5 & 6 would not be sufficient to maintain an efficient container operation. This would become even more difficult in the forthcoming years until a new container terminal would be available.

Agreed

- *Area behind Berth No. 7 across the road will be paved and used for container stacking.*
- *Berth Nos. 5 & 6 will e paved and used for container stacking and loading and discharging by self-sustaining container vessels. This subject to the agreement of Messrs. Cotterell to move their operations to Berth No. 4 . Berth No. 5 however will also have to be used for handling for general cargo as the need may appear.*
- *Viewing the aforesaid it appeared, that also Berth No. 12 - 14 would have to used for container operations.*
- *New Container Terminal will have to be constructed as soon as possible to meet the anticipated demand for such services.*
- *The most likely alternative for construction of a new Container Terminal would be in the earmarked port development area north of the existing port.*

- *Another alternative would be to fill the southern basin and extend the Pier No. 12.*
- *The northern option was favored .*
- *In order to prepare the northern area, intensive refilling and dredging works would have to be carried as well as the construction of about 2,000 m of breakwater, infrastructure and buildings. This apart from the construction of about 500 m of quay wall and paving of the area.*
- *Infra-structural measures would entail the building of new roads and railway lines to accommodate the traffic. This traffic would be routed alongside the river Rioni minimise the environmental impact on the city by the extensive volume of traffic.*
- *Considering the time frame for settlement of the refill and the duration of the construction works the new container terminal could be ready for operation by 2002 at the earliest.*
- *By that time the container situation would be dramatic, provided the volume would develop as being fore-casted.*

Redirecting the River Bed of Rioni

The Chief Engineer advised, that plans existed to redirect the flow of the river Rioni in its natural bed. This should be done by regulating the flow of the river in a way that would serve both intentions

- to prevent the flooding of the city,
- and to stop the erosion of the coastline in the region of the city, which had reached substantial propor-tions.

In this context it was noted, that there was a possibility, that the biotopical area north of the port extension area could be affected, which would mean that nature would take some of the area which ma had created by the redirection of the river in the past.

Mr. Adamia mentioned that without the port, there would be no city, and without the city no port. So every-thing should be done to revert the process of erosion endangering the port and the city. For the purpose to arrange for the redirection into the natural riverbed, it would be necessary to undertake to build a control dam and to dredge the old river bed.

The meeting was adjourned at 15:30 hrs.

Minutes of meeting prepared by : Horst Raschdorf
Translation by : Asa Shengelia (Mrs)

Poti2.mom

Annex 3

Tables - Port of Batumi

Annexes

Table 3.1 Throughput of Oil Cargo as Liquid Bulk

PORT OF BATUMI

	GRADES							
YEAR	**Crude Oil**	**Diesel Fuel**	**Gasoline**	**Kerosine**	**Mazut**	**Furnace fuel**	**Pyrolysis pitch**	**Miscellaneous**
1992								
1993								
1994								
1995								
1996	96.0	110.0	-	110.0	211.0	7.0	88.0	-
1997 (1 - 9)	648.0	152.0	152.0	142.0	281.0	11.0	25.0	8.0

oil cargo throughput for Bat

Table 3.2 Annual Throughput of Oil in Bulk in 1997

PORT OF BATUMI

No of vessels	*Total throughput in mtons*	*Export mtons*	*Import mtons*	*Average size of vessels dwt cargo cap.*	*Average gross pumping rate mtons/hr*
113	2,119,866	1,981,724	138,142	18,760	472

Table 3.3 Development of Grain and wheat flour Import via Georgian Ports

Batumi

Year	Grain in tons	Wheat flour in tons	Total
1994	498.500	66.800	565.300
1995	524.569	71.436	596.005
1996	351.000	95.000	446.000
1997(estimate)	296.000	200.000	496.000

Table 3.4 Average Amount of Cargo per Ship - 1995, 1996 and 10 Months of 1997

PORT BATUMI

№	COMMODIITY	amount of cargo			number of ships			average weight of cargo		
		1995	1996	1997	1995	1996	1997	1995	1996	1997
1	grain in bulk	524569	351124	434315	33	33	42	15896	10640	10341
2	flour in bags	71436	96810	174435	51	71	162	1400	1364	1077
3	sugar in bags	11088	48546	115789	53	30	56	209	1618	2068
4	food stuff in packages	38417	13170	25699	124	50	59	310	263	436
5	fertilisers in bags	732	20598	19564	4	12	9	183	1716	2174
6	boxits in bulk	0	0	0	0	0	0	0	0	0
7	coal in bulk	4424	10727	0	2	3	0	2212	3576	0
8	silico manganese	17750	3900	0	20	2	0	889,5	1950	0
9	ferrous metal, iron, steel cast iron	16392	0	0	19	0	0	863	0	0
10	aluminium powder	0	2500	0	0	3	0	0	833	0
11	barite	0	5101	7866	0	3	6	0	1700	1311
12	caustic soda	0	0	0	0	0	0	0	0	0
13	cotton in bales	0	3581	3821	0	2	4	0	1791	955
14	metal construction	1032	3177	3042	3	4	6	344	794	507
15	wooden logs	1706	0	1590	1	0	4	1706	0	398
16	scrap bulk	30003	8051	2799	50	11	2	600	732	1400
17	rolling units	358	321	565	43	60	32	89.5	29	18
18	containers per/ t	5/11	0	580/90822	4	0	12	1,25/2,7	0	48757
19	containers TEU	0	0	580/90822	0	0	12	0	0	48757
20	oil barrels box	2401	5405	12061	7	5	5	343	1081	2412
21	fruits and vegetables in packages	209	453	14	8	20	1	26	23	14
22	citrus in boxes	17055	21012	326	156	74	6	109	284	54
23	mineral and construction cargo	94	4222	597	2	4	8	47	1056	75
24	animal food	0		3408	0		19	0		572
25	other cargo	3925	3904	4001	66	32	7	59	122	179
TOTAL		**741642**	**602602**	**818974**	**646**	**419**	**440**	**1148**	**1438**	**1861**

Source: statistics dept port of Batumi

Table 3.5: List of ships of port fleet for 1996 - Batumi

Name of ships	Type of ships	No of project	Year and place of construction	Main engine		Lifting capa-city	Passen-ger capacity	Main dimension			Summer draft		Displacement		Dead weight
				quantity and power	type and brand			length (m)	width (m)	height (m)	empty m	loaded m	empty t	loaded t	t
"Ushba"	Tug	134 B	1973 Yugoslavia	2x1155	726-MTBH-40	-	-	35.43	9.21	4.5	3.05	3.1	386.4	450	83.25
"Metehi"	- " -	134	1968 Yugoslavia	2x1155	- " -	-	-	31.45	9.18	4.515	3.52	4.34	386.17	469.421	83.25
"Kvachantira dze"	- " -	498	1979 Gorohovets	2x600	6D 30/50	-	-	29.27	8.49	4.35	2.7	3.0	253	303	46
"Gare-dji"	tug	057	1963 Maymakskai	2x150	(64 SP 15/18)	-	-	29.27	8.49	4.35	2.7	3.0	253	303	46
"LK"-93	pilot boat	1459	1988 Leningrad	2x300	CD 1211	-	8	23.2	5.82	2.8	1.65	1.8	72.17	86	14.5
"PK Shalta"	inshore boat	1411	1972 Leningrad	1x150	CD 6C	-	50	21.3	5.32	2.61	1.4	1.54	20.	67	9.0
PK Opizari	- " -	1462	1982 Rostov	1x318	6INCH 18/22	-	70	23.15	6.24	2.8	1.76	1.89	84.6	108	14.0
Batumi	passenger boat	1430	1978 Iljichevsk	2x300	CD12. AL-1	-	200	33.5	5.7	2.55	1.41	1.55	50	102	24
"Tsis-cari"	collection of ballast water	1582	1982 Baku	1x225	64HC P/22.	350	-	35.17	8.01	3.6	104	3.12	159	622	482
"Iveria"	- " -	10110	1990 Iljichevsk	1x100	210 B	-	250	34.01	6.9	2.9	-	1.68	116.09	150.4	34.31
"Aisi "	- " -	1582	1989 Baku	1x225	64HC P18/22 430	430	-	35.15	7.65	3.6	1.7	3.4	167.4	622	455
"Aragvi"	- " -	2550/4	1982 Mariupol	1x135	-	18	-	17.7	4.6	2.4	0.9	1.68	45.6	72.1	26
"Fauna"	oil waste	2550/5	1988 Mariupol	1x135	AMZ-236-	22.55	-	18.95	4.5	2.4	0.75	1.6	48.87	71.42	2.2
"Chorohi"	water barge	20640	1985 Taganrok	-	-	18	-	17.7	4.6	2.4	0.9	1.68	45.6	72.1	26
"Kintrish	oil barge	4150	1956 Taganrok	2x150	ZD6	250	-	39.98	6.02	3.0	1.4	2.6	225	476	290

Name of ships	Type of ships	No of project	Year and place of construction	Main engine		Lifting capa-city	Passen-ger capacity	Main dimension			Summer draft		Displacement		Dead weight
				quantity and power	type and brand			length (m)	width (m)	height (m)	empty m	loaded m	empty t	loaded t	t
SHK- 13	mooring boat														

Ships to be signed off

BK "Storm"	tug	1966 y	253 t -	sunken at berth № 4
MKMC "Alazini"	oil waste	1978 y	45,5 -	on shore

Mode of calculation

For the purpose of conducting the following calculations the following has been assumed and applied :

- For the purpose of covering the aspect of RoRo cargo it is assumed, that this RoRo ferry connection will generate additional traffic.
- Average space occupied by vessels incorporates allowance for safety distance and effective mooring lines.

Table 3.6: Berth Demand per Commodity and in Total - Based on actual figures 1997

PORT OF BATUMI

Commodity mt/year (units, TEUs)	*As-signed Berth Nos (0)*	*Average amount of cargo per vessel mt/year, (untis, TEUs) (1)*	*Average through-put per day mt/year, (units, TEUs) (2)*	*Average laytime per vessel in days (3)*	*Number of vessels per year (4)*	*Average occupied space by vessels in meters (5)*	*Required berthlength / commodity per year in meters (6) 3x4x5*	*Available berth - length/year/ for berth and commodity in meters (7) Lx365xbocc(*)*	*Required additional berth-length/ year/ commodity in meters (8) 8 = 0 x 9***	*Fraction of Berth occupied by this cargo (9) 6 / 7*
Grain in bulk 346,500	7 260 m	10,500	4,000	2,6	33	210	18,018	47,450 (0.5)	nil	0.38
Other bulk 178,392	7 260 m	44,598	4,000	11.1	4	260	11,544	47,450 (0.5)	nil	0.24
Oil products 2,119,866	1-3 505 m	18,760	11,328	1.7	113	245	47,065	119,811 (0.65)	nil	0.39
General cargo 361,281	6,8,9 539 m	1,455	700	2.1	351	135	99,509	127,878 (0.65)	nil	0.8
Containers	N/A	N/A.	N/A.	N/A.	N/A.	N/A.	N/A.	N/A.	N/A.	N/A.
Roro cargo 9,000 (600)	11 194 m	150 units	100	1,5	4	165	990	21,243 (0.3)	nil	0,05
Total Additional Berth requirement									**nil**	

bocc* - berth occupancy factor / **nil was applied when the calculations showed that no additional berth length was required

Conclusions:

- Berth No. 7 is used to 38% capacity for handling of bulk cargo.
- Berths No. 6,8,9 are considered to be utilised by 24 % .
- RoRo cargo does not play an important role in terms of throughput.
- Oil Cargo Berth has ample spare capacity , and is used by 39 % .

Table 3.7: Berth Demand per Commodity and in Total 2002

Commodity mt/year (units,TEUs)	*Ass-igned Berth Nos (0)*	*Average amount of cargo per vessel mt/year, (units, TEUs) (1)*	*Average through-put per day mt/year, (units,TEUs) (2)*	*Average laytime per vessel in days (3)*	*Number of vessels per year (4)*	*Average occupied space by vessels in meters (5)*	*Required berthlength / commodity per year in meters (6) 3x4x5*	*Available berth - length/year/ for berth (Berth Occ. 65 % max.) (7) Lx365xbocc (*)*	*Required additional berth - length/ year/ commodity in meters (8) 8 = 0 x 9***	*Fraction of Berth occupied by this cargo (9) 6 / 7*
Grain in bulk 483,400	7 260 m	10,500	4,000	2.6	46	210	25,116	47,450 (0.5)	nil	0.5
Other bulk 315,200	7 260 m	20,000	6,000	3.3	16	245	12,936	47,450 (0.5)	nil	0.27
Oil products 1,098,200	1-3 505 m	18,760	11,328	1.7	58	245	24,157	119,811 (0.65)	nil	0.2
General cargo 660,900	6,8,9 539 m	3,000	750	4	220	150	132,000	127,878 (0.65)	17	1.03
Containers 24,700 (2,470)	6,8,9 539 m	150	150	1	16	150	2,400	127,878 (0.65)	10	0.01
Roro cargo 11,250 (750)	11 194 m	150 (units)	100	1,5	5	190	1,425	21,243 (0.3)	nil	0.07
Total Additional Berth requirement									**27**	

bocc* = berth occupancy factor / **nil was applied when the calculations showed that no additional berth length was required

Assumptions :

- Limited number of containers can be handled in the port.
- Most of the roro traffic will have be handled in the port. Berth No. 11 lies in the Passenger and Tourist Area with the new Yacht Club under construction adjacent to it. Under this aspect it is doubtful, whether extensive RoRo operations at this berth will be tolerated by the city - council.
- Roro traffic referred to covers the citrus trade only .Conventional RoRo traffic is bound to increase due to a contract conducted 12/97 between the Port of Constanza and Batumi.
- Ship size is expected to increase in line with the development of the economy and shipments of project cargo.
- Direct delivery system will still dominate, albeit on a lower level, due the effect of modernising activities.
- Productivity expected to increase slowly but hampered by rehabilitation works.

Conclusions :

- Additional berth length required for general cargo at 2002 is 27 m. Extension necessary before 2002.
- As container traffic will have to be accommodated in the general cargo area, the required berth length for container traffic will have to be added to the required length for general cargo. **Container handling facilities has to be established .**
- **Roro handling facilities within the port area are urgently required.**

To be considered:

During the rehabilitation works the available berth lengths will be reduced. Additional berth capacity will be needed. Operation will be effected

Table 3.8: Berth Demand per Commodity and in Total - 2007 (Scenario without Use of Multi-purpose Terminal)

Commodity *mt/year (units,TEUs)*	*Ass-igned Berth Nos* *(0)*	*Average amount of cargo per vessel (mt/year, (units, TEUs)* *(1)*	*Average through-put per day mt/year, (units, TEUs)* *(2)*	*Average laytime per vessel in days* *(3)*	*Number of vessels per year* *(4)*	*Average occupied space by vessels in meters* *(5)*	*Required berthlength / commodity per year in meters* *(6)* *3x4x5*	*Available berth - length/year/ for berth in m (berth occ.rate 65% max)* *(7)* *Lx365xbocc (*)*	*Required additional berth -length/ commodity in meters* *(8)* *8 = 0 x 9***	*Fraction of berth occupied by this cargo* *(9)* *6 / 7*
Grain in bulk 626,500	7 260 m	15,000	8,000	1.9	42	210	16,758	47,750 (0.5)	nil	0.3
Other bulk 537,600	7 260 m	20,000	10,000	2	54	260	28,080	47,450 (0.5)	nil	0.5
Oil products 1,350,600	1-3 505 m	20,000	15,000	1.3	67	260	22,646	119,811 (0.65)	nil	0.2
General cargo 654,900	6,8,9, 527 m	3,000	900	3,3	218	150	107,910	125,030 (0.65)	nil	0.84
Containers 41,900 (4,190)	6,8,9 527 m	150	114	1.3	28	150	5,460	125,030 (0.65)	nil	0.05
Roro cargo 69,750 (4.650)	5,6 187 m	150 units	100	1.5	31	195	9,068	20,477 (0.3)	nil	0.22
			Total Berth requirement		**6,8,9 - 122,438**			**6,8,9 - 145,507**	**nil**	**6,8,9-0.84**

bocc* - berth occupancy factor / **nil was applied when the calculations showed that no additional berth length was required

Assumptions:

- Most areas have been rehabilitated and the productivity in the bulk and dry cargo categories improved.
- Container handling capability on berth 6,8,9 has been established.
- Berth 4 & 5 (Multipurpose Terminal) construction not completed .
- Intermediate RoRo cargo handling capability established in the port area. Regular services calling Batumi Port.

Conclusions:

- Bulk handling throughput nearing available capacity. Measures to increase productivity of grain in bulk necessary.
- Combined general cargo and container - capacity is nearly utilised in full and has to be extended.
- Berths No 6,8,9 utilised to 84 % of their capacity. Extension of berth capacity required.

Table 3.9: Berth Demand per Commodity and in Total - 2007 (Scenario: Multi-purpose Terminal Completed)

Commodity mt/year (units,TEUs)	*Ass-igned Berth Nos (0)*	*Average amount of cargo per vessel mt/year, (units, TEUs) (1)*	*Average through-put per day mt/year, (units, TEUs) (2)*	*Average laytime per vessel in days (3)*	*Number of vessels per year (4)*	*Average occupied space by vessels in meters (5)*	*Required berthlength / commodity per year in meters (6) 3x4x5*	*Available berth - length/year/ for berth in m (berth occ.rate 65% max) (7) Lx365xbocc (*)*	*Required additional berth -length/ commodity in meters (8) 8 = 0 x 9***	*Fraction of berth occupied by this cargo (9) 6 / 7*
Grain in bulk 626,500	7 260 m	15,000	8,000	1.9	42	210	16,758	47,450 (0.5)	nil	0.3
Other bulk 537,600	7 260 m	20,000	10,000	2	54	260	28,080	47,450 (0.5)	nil	0.5
Oil products 1,350,600	1-3 505 m	20,000	15,000	1.3	67	260	22,646	119,811 (0.65)	nil	0.2
General cargo 654,900	6,8,9, 527 m	3,000	900	3,3	218	150	107,910	125,030 (0.65)	nil	0.9
Containers 41,900 (4,190)	4,5 200 m	150	150	1.0	28	150	4,200	36,500 (0.5)	nil	0.10
RoRo cargo 69,750 (4,650)	5,6 187 m	150 units	100	1.5	31	195	9,068	20,477 (0.3)	nil	0.22
Total Berth requirement				**6,8,9 - 122,438**				**182,007**	**nil**	

bocc* - berth occupancy factor / **nil was applied when the calculations showed that no additional berth length was required

- ***Assumptions:*** Most areas have been rehabilitated and the productivity in the bulk and dry cargo categories improved.
- Container handling shifted to Multipurpose Terminal .
- Berth 4 & 5 (Multipurpose Terminal) construction completed .
- Intermediate RoRo cargo handling capability established in the port area. Regular services calling Batumi Port.

Conclusions:

- Bulk handling throughput nearing available capacity. Measures to increase productivity of grain in bulk necessary.
- Combined general cargo - capacity is nearly utilised in full and operational requirements in excess to be shifted to berth No 4-5

Table 3.10: Berth Demand per Commodity and in Total - 2012

Commodity mt/year (units,TEUs)	*Ass-igned Berth Nos (0)*	*Average amount of cargo per vessel mt/year, (units, TEUs) (1)*	*Average through-put per day mt/year, (units, TEUs) (2)*	*Average laytime per vessel in days (3)*	*Number of vessels per year (4)*	*Average occupied space of vessels in meters (5)*	*Required berthlength / commodity per year in meters (6) 3x4x5*	*Available berth - length/year/ for berth in m Berth occ. 65% max. (7) Lx365xbocc**	*Required additional berth -length/ commodity in meters (8) 8 = 0 x 9***	*Fraction of berth occupied by this cargo (9) 6 / 7*
Grain in bulk 1,009,900	7 260 m	15,000	8,000	1.9	68	210	27,132	47,450 (0.5)	nil	0.4
Other bulk 544,100	7 260 m	20,000	10,000	2.0	55	260	28,600	47,450 (0.5)	nil	0,5
Oil products 1,618,800	1-3 505 m	20,000	15,000	1.3	81	260	27,378	119,811 (0.65)	nil	0,2
General cargo 659,300	6,8,9,4,5 677	3,000	750	4	220	150	132,000	160,618 (0.65)	nil	0.82
Containers 65,900 (6,590 TEUs)	4,5 220 m	150 (TEUs)	190	0.8	44	150	5,280	40,150 (0.5)	nil	0.13
Roro cargo 504,000 (33,600)	6, 5 187 m	150 (units)	665 (units)	0.23	112	224	5,770	20,477	nil	0.28
Total additional berth requirement										

Assumptions:

- Multipurpose Terminal at Berth No. 4-5 established.
- At Berth No. 5 thirty meters have been exclusively allocated for the construction of RoRo handling facilities, and the berthing of RoRo vessels.
- It is assumed, that RoRo facilities will 'breed' traffic .
- RoRo vessels operating at Berth No. 5 with stern or bow, will occupy Berth No. 6 in full. RoRo vessels equipped with quarter ramps would be berthed at berth No. 4-5 or alternatively at berth No. 6 , if 4 and 5 occupied by other vessels.
- Berth No. 6 will loose 62 m due the berthing process of the RoRo vessels, which will have to be deducted from the berthing capacity for general cargo. (539-62=477)
- RoRo throughput is based on 2 calls per week each carrying discharging and loading 75 units; handling rate/hr 35 units and 21 hours working time net.
- Container traffic will be handled exclusively at the Multipurpose Terminal. Compulsory mobile handling equipment will be available.
- Productivity in all categories has reached international standard.

Conclusions:

The calculated theoretical berthing capacity indicates, that without the construction of the Multipurpose Terminal at Berths No. 4-5, the port will no longer be in position to avoid congestion in the dry cargo section.

Table 3.11: Total Demand for Shed and Open Storage Space - Year 2002

Commodity	*Throughput per year mt, TEUs, units*	*% direct*	*mt,units TEUs direct*	*% indirect*	*mt, units, TEUs indirect (T)*	*average dwelltime factor (n)*	*mt per m2 (q)*	*deduction for oper. requirements (K)*	*Total required storage space in m2 (type) (S)*
Grain in bulk	483,400	100	483,400	nil	nil	n.a.	n.a.	n.a.	nil
Other bulk	315,200	100	315,200	nil	nil	n.a.	n.a.	n.a.	nil
General cargo	660,900	80	528,720	20	132,180	36	2	0.5	3,761 (closed)
Containers TEUs	2,470	nil	nil	100	2,470	18	n.a.	incl.	3,002 (open)
Roro Units	2,000	nil	nil	100	2,000	n.a.	n.a	n.a.	8,500 (open)
Totals)									***15,263 (mix)***

Assumption :

- Rehabilitation works are under way.
- Warehouses No. 1,2,3 have been demolished and substituted by a modern building.
- General cargo 20 % for indirect delivery. Average dwell time of cargo in storage facilities 10 days.
- No of vehicles applied for the purpose of calculating the marshalling space for roro operations 100.
  100 x 85 = 8,500 m2.

Table 3.12: Additional Demand for Storage Space - Year 2002

Commodity	*Total required storage space (m2)*	*Total required storage area sheds (%) (m2)*	*Total available storage area sheds (m2)*	*Occupied fraction of shed storge space*	*Additional demand for storage space sheds (m2)*	*Total required storage area for open storage (m2)*	*Total available storage area for open storage (m2)*	*Occupied fraction of total open storage facilities*	*Additional demand for open storage*
Grain in bulk	nil	nil	nil		nil	nil	nil	n.a.	
Other bulk	nil	nil	nil		nil	nil	nil	n.a.	
General cargo	3,761	3,385 (90 %)	3,844	0.88	nil	626(q=1.5)	9,150	0.04	
Container(TEUs)	3,002	nil	n.a.	n.a.	n.a.	3,002	9,150	0.32	
Roro (units)	8,500	nil	n.a.	n.a.	n.a.	8,500	9,150	0.92	
Totals		***3,385***	***3,844***	***0.88***	***nil***	***12,128***	***9,150***	***1.28***	***2,978***

Assumptions:

- 90 % of the projected general cargo assigned for indirect delivery to be stored in sheds. 10 % to be stored in open storage areas.
- Containers storage facilities and marshalling area for vehicles to be provided in the open storage areas.

Table 3.13: Total Demand for Shed and Open Storage Space - Year 2007

Commodity	*Throughput per year mt, TEUs, units*	*% direct*	*mt/units TEUs direct*	*% indirect*	*mt/units TEUs indirect (T)*	*average dwelltime factor (n)*	*mt per m2 (q)*	*deduction for oper. requirements (K)*	*Total required storage space in m2 (type) (S)*
Grain in bulk	625,000	100	625,000	nil	nil	n.a.	n.a.	n.a.	n.a.
Other bulk	988,500	100	988,500	100	nil	28	n.a.	n.a.	n.a.
General cargo	654,900	50	327,450	50	327,450	36	2	0,5	9,096 (mix)
Containers TEUs	4,190	nil	nil	100	4,190	18	n.a.	n.a.	4,074 (open)
Roro Units	12,750	nil	nil	100	8,500	n.a.	n.a.	n.a.	8,500 (open)
Total Storage Demand									***21,670 (mix)***

Assumption :

- Roro traffic increased by 50 %
- General Cargo 50 % for direct/indirect delivery .

Conclusion:

- Total open storage demand 12,574 m2 , excluding possible bulk related areas. Additional areas needed.
- Shed space demand 9,096 m2. Additional shed space needed.

Table 3.14: Additional Demand for Storage Space - Year 2007

Commodity	*Total required storage space (m2)*	*Total required storage area sheds (%) (m2)*	*Total available storage area sheds (m2)*	*Occupied fraction of shed storage space*	*Additional demand for storage space sheds (m2)*	*Total required area for open storage(m2)*	*Total avail. area for open storage (m2)*	*Occupied fraction of total open storage facilities*	*Additional demand for open storage /commodity*
Grain in bulk	nil								nil
Other bulk	nil								nil
General cargo	9,096	7,269 (80)	3,425	2.12	3,844	3,045(q=1.5)	9,150	0.2	nil
Container(TEUs)	4,074	neglectable	n.a.	neglectable	nil	4,074	9,150	0.45	nil
Roro (units)	8,500	n.a.	n.a.	n.a.	n.a.	8,500	9,150	0.92	nil
Totals		***7,269***	***3,425***		***3,844***	***15,619***	***9,150***	***1.57***	***6,469***

Assumptions:

- Direct delivery slowly phased out by 50% .

Conclusion:

- Additional storage space needed in both, open and covered storage areas.

Table 3.15: Total Demand for Shed and Open Storage Space - Year 2012

Commodity	*Throughput per year mt, TEUs, units*	*% direct*	*mt ,units, TEUs direct*	*% indirect*	*mt,units TEUs indirect (T)*	*average dwelltime factor (n)*	*mt per m2 (q)*	*deduction for oper. requirements (K)*	*Total required storage space for commodity in m2 (type) (S)*
Grain in bulk	1,009,900	100	1,009,900	nil	nil	n.a	n.a.	n.a.	nil
Other bulk	544,100	100	544,100	nil	nil	n.a.	n.a.	n.a.	nil
General cargo	659,300	100	nil	100	659,300	36	2.5	0.5	14,651 (closed)
Containers TEUs	6,590	nil	nil	100	6,590	18	n.a.	included	6,407 (open)
Roro Units	35,000	nil	nil	100	35,000	nil	n.a.	considered	8,500 (open)
Totals									29,558

Assumption :

- RoRo traffic has increased gradually by two calls a week .

Table 3.16: Additional Demand for Storage Space - Year 2012

Commodity	*Total required storage space (m2)*	*Total required storage area sheds (%) (m2)*	*Total available storage area sheds (m2)*	*Occupied fraction of shed storage space*	*Additional demand for storage space sheds (m2)*	*Total required storage area for open storage (m2)*	*Total available storage area for open storage (m2)*	*Occupied fraction of total open storage facilities*	*Additional demand/ commodity for open storage*
Grain in bulk	nil								
Other bulk	nil								
General cargo	14,651	11,721 (80)	3,844	3.05	7,877	4,833(q=1.5)	9,150	0.52	nil
Container(TEUs)	6,407	600 (CFS)	3,844	0.15	577	6,407	9,150	0.70	nil
Roro (units)	8,500	n.a.	n.a.	n.a.	n.a.	8,500	9,150	0.92	nil
Totals		***12,321***	***3,844***	***3,20***	***8,454***	***19,740***	***9.150***	***2,14***	***10,590***

Assumptions:

- 10 % of general cargo to be stored in open storage areas. q = 1.5 has been applied for calculation of open storage space.

Bulk handling capacity of port is sufficient to cover the forecasted volumes.

Annex 4

Minutes of Meeting - Port Development Planning Batumi

MINUTES OF MEETING

DATE:	16.01.1998
FROM - TO :	15:00 hrs - 16:45 hrs
LOCATION:	HPTI Office Batumi
PARTICIPANTS:	Aslan Smirba , General Manager (not available) Djambul Ninidze, Deputy General Manager Roin Nakashidze, 2nd Deputy General Manager Nikolai Charkviani, Deputy Manager of Operations Dursun Sirabidze, Chief Operator Omari Vashanidze, Chief Engineer Valerie Bakaya, Chief of Mechanical Services Merabi Dolidze, Deputy Engineer of Civil Engineering Alexander Gurgenadze, Local Planning Expert Tengiz Varshanidze, Chief Technologist Horst Raschdorf , Port Development Expert ,TACIS-TRACECA
TRANSLATION BY:	Nelly Terdzishvili
MINUTES PREPARED BY:	H. Raschdorf
SUBJECT:	Presentation and discussion of envisaged port development projects with the purpose to arrive at joint opinions

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1. PURPOSE OF MEETING AND INTRODUCTION

The TACIS TRACECA Port Development Expert (PDE) Capt. Raschdorf welcomed the participants and outlined the purpose of the meeting. He stated, that during the meeting he would explain the findings and general ideas in connection with the development of the Municipality Port of Batumi.

For the purpose of easily following up his presentation Mr. Raschdorf had prepared a set of documents and plans for each participant of the meeting.

He then explained the objective and the phased structure of the present project and the role of the EU and TACIS - TRACECA which were financing the project. In particular the Port Development Expert pointed out, that in line with accepted port planning philosophies also this project would be carried out under the bottom line, that first existing facilities would have to be upgraded and modernised and their productivity enhanced, before embracing on extension of the port. The present phase which incorporated the drafting of the Port Development Plan was very important and therefore required the assistance and the input of the Port Management to arrive at joint proposals. The documentation , which would be a comprehensive Port Master - and Development Plan would have to be completed around the middle of February 1998. These proposals would then be presented to the EU under theTACIS - TRACECA project and to potential Donors, in order to obtain assistance in financing of the envisaged projects.

The objectives of the next phases of the project would then already be the preparation of tender documents, tendering and tender evaluation. All this pointed to not 'just another project' but something which was meant to be realised, the interest of the government and the port provided.

The planning of the development of the port had to be based on the recently performed Traffic Forecast under the current project. The forecast was based on three scenarios, the, optimistic the pessimistic and the most likely one. The planning would be based on the most likely one.

Other data which would have to be considered were the port capacity and the productivity.
The productivity would be influenced by

- The cargo pattern
- Type of delivery (direct or indirect)
- The availability of modern suitable equipment
- The availability of on-transport (rail wagons & trucks)
- The weather

All but the last two could be influenced by proper planning. The last two would have to be taken into consideration and measures to be taken to minimise their negative effects.

This would mean, to minimise the dependency on the availability of rail wagons and other means of transport by creating buffer zones sufficient in size, which would be open and covered storage facilities, and as far as applicable to provide special equipment for the same purpose. This is done in all modern European ports, where the direct delivery system had been phased out completely during the last 25 years in order to increase the productivity. This had also been observed by the first group of visitors to the European ports.

2. ZONING OF BERTHS

The Port Development Expert then presented his ideas in view of zoning of the berths in view of capacity and productivity calculations, which were discussed .

- Berths No. 1 - 3 and the offshore mooring berth for the handling of bulk oil products
- Berths No. 4 - 5 to be converted into a multipurpose terminal with a roro handling facility
- Berth No. 6 general cargo and handling of roro vessels with quarter ramps
- Berth No 7 bulk- and general cargo
- Berth No 8 bulk - and general cargo
- Berth No 9 general cargo
- Berth No 10 citrus and coastal trade , based on private operation
- Berth No 11 conventional roro traffic and passengers

Above was unanimously agreed by the participants.

3. RECONSTRUCTION AND REHABILITATION WORKS

The PDE proposed, that in order to have a structured discussion about the reconstruction and rehabilitation of the port, to deal with the aspects of each particular berth separately, which was agreed.

Berth No. 1 - 3

This berth would belong to the port but operated by the oil company . All works carried out in these berths under operational and civil engineering aspects - apart from dredging - should be carried out and paid for by that establishment.

Berth No. 4 - 5

It was proposed to convert the area of Berth No. 4-5 into a Multipurpose Terminal which should be able to handle all kinds of general cargo and containers. A roro handling facility should also be an integral part of that terminal .

The Multipurpose Terminal should also accommodate a shed to serve as transit shed, warehouse and CFS (Container Freight Station) . The ideal location of this warehouse would be at the north-westerly end of the terminal. The reason to select this location was that a possible future extension of the terminal to the north-east should not be hampered by this building.

At this stage the Local Planning Expert stated, that the port did not want a multipurpose terminal but a dedicated container terminal. The PDE suggest that the discussion with the Top Management of the port covering all concerned Departments was present at the current meeting, and a solution would be found during the discussion .

According to international experience and accepted standard the construction of a dedicated container terminal would only be justified and viable, when throughput figures of 50 - 60,000 TEUs would be reached. Mr. Raschdorf furthermore stated, that it was his dedicated opinion, that for a modern port the technical ability to handle containers is a must.

Roro ramp

The location of the roro facility had been previously selected in the previously prepared development plan at the south-easterly end of Berth No. 5, which seems to be a good place to handle roro cargo.

The question was raised , whether the roro facility should be built to handle rail ferries or conventional roro traffic. Mr. Raschdorf said, that the ramp could also be constructed to handle both types of roro cargo. In any case the construction of a dedicated rail ferry terminal would in his opinion require a study focusing on the viability of such undertaking. A rail ferry terminal would be built and is supposed to go in operation at Poti Port in late 1998. It is very likely, that the seabound rail traffic would therefore focus and establish itself on Poti as their main port of call. Furthermore it would be very unlikely that sufficient cargo potential for two rail ferry terminals at Georgian ports would be existing at this stage. Another reason which could limit the volume of seabound transport of rail wagons could be the unfavourable relation between the tara weight and size of the rail wagons and the weight and volume of the cargo actually transported by them.

When the PDE was being asked, if had only two choices either rail ferry - or conventional roro facility, which one he would the choose. Mr. Raschdorf stated, that he would opt for a conventional roro facility. It could very well be, that a traffic pattern very similar to that in the Baltic Sea would develop in the Black Sea Region , which would embody trucks, roll trailers loaded with general cargo and containers and possibly even cassette systems. The tendency could now already be observed during the citrus export season, when a conventional roro-ferry was fully loaded during several calls at Batumi.

Quay wall

The quay wall at berth No. 4 and 5 would have to be completely reconstructed with a recommended depth of not less than 12 m. This depth would allow container vessels of third generation to call the port. Furthermore it would be advisable to design the quay wall and the apron in a way that would permit the future erection of a container gantry crane and provide for the wheel - and other loads going along with the erection of such cranes and possible use of heavy duty mobile harbour cranes .

Equipment

As far as the equipment was concerned it was recommended to use freight lifters (big forklifts) with a lifting capacity of 40 mtons and reach stackers with similar lifting capacity both types of equipment also equipped with container spreaders. This apart from the compulsory fleet of forklift trucks and from other mobile equipment for lateral cargo movements like trailers, roll trailers and tugmasters.

In addition to that it was recommended to utilise mobile cranes for the stevedoring and other operations as far as the vessels calling at Batumi would not be self-sustaining. Reason for that was the great mobility which goes along which such equipment , because it could be used at any location at the berth and yard and even at other berths if so required. Purchase and maintenance costs would be higher than those for conventional cranes, but this would be set off by the greater operational flexibility and thus justify the means.

At this point the Local Planning Expert stated, that the purchase of rail mounted ' Condor ' type cranes, which would be able to lift up to 40 mtons and could be used for the handling of containers would be the better option.

General

The PDE then proposed to reopen the second gate for the railway access to the port with a line directly to the new terminal.

Regarding the existing buildings located on the envisaged site which are used by the boat building factory and Georgian Shipping Line the representatives of the Port Management stated jointly, that it would not pose a problem to demolish them. New locations could be found for them easily.

Finally the attention was drawn to the fact, that the new terminal at Berth No. 4 and 5 could also serve as a substitute to handle the traffic, which could not be accommodated at those piers, which were not available due to reconstruction and refurbishing. This would enable the port to offer uninterrupted service to its customers free of delays and avoid congestion situations during the reconstruction phase. The area accommodating abandoned oil pumping facilities at pier No. 4 had been handed back to the port, so that the area could be used to extend the dry cargo operation of the port.

The members of the Port Management stated, that they agreed to these proposals and had no further questions at this time.

All berths from Berth No. 6 to Berth No. 9

The following items were proposed and agreed in principle:

- Rehabilitation of the quay walls where deemed necessary under civil engineering aspects
- Rehabilitation of the railway track system
- Paving of the areas between the rails and behind wherever necessary and levelling with rail track, to make them freely accessible for mobile handling equipment like FLTs .
- To rehabilitate and modernise the cargo handling equipment (cranes, hoppers, elevators, forklifts)

Berth No. 6

The following was proposed .

Berth No. 6 would in the future have several functions under the aspects of establishing a roro landing facility at the area adjacent to it. The berth would be blocked by roro vessels whilst operating at the envisaged Multipurpose Terminal. In some cases containers and 'lift on - lift off cargoes' are carried on deck of such vessels. Such cargo could then be handled simultaneously either by the existing or by the mobile cranes.

Another very likely scenario was, that Roro vessels with quarter ramps would be calling at the port. In the case of non availability of a berth space at Berth No. 4 and 5 , such vessel could be moored at Berth No. 6 with its ramp lowered on the pier.

Also for this reason the apron and the open storage area behind it would have to be levelled and paved properly including the railway tracks. In this context it was proposed, to demolish the fixed separations erected in the open storage area behind Berth No. 6 and to replace them by mobile concrete structures which could be moved around and erected as the need would appear.

Workshop Buildings

In respect of the workshop buildings behind Berth No. 6 it was suggested, to demolish the bunker to gain more space for M&R activities. The M&R facilities which are now located in various buildings should be replaced by a combined new built complex and concentrated in one building in connection with refurbishing and modernising of the tools and machinery, also hosting the offices of the technical management.

Pier No. 7

Grain in bulk

This berth, is accommodating the main share of grain in bulk handling activities in addition to the handling of general cargoes. The question which was discussed, was whether or not to envisage the erection of a grain silo and/or other solutions to modernise the grain handling activities. In this context the PDE stated, and this was acknowledged by the Port Management, that the import of grain suffered continuos reductions in the course of the last years. The joint opinion was, to further monitor the development in this field, and for the time being continue with the current procedure of discharging of grain cargoes, which has proven to be cheap, and as far as the weather and the availability of rail wagons permits is still effective. In line with the phasing out of the direct delivery system however, it was considered indispensable, that provisions would also have to be made in this field to switch to a indirect delivery of bulk grain cargo to minimise the dependency on the availability of rail wagons.

As far as the erection of a silo is concerned, the port suffers a space problem, this apart from the need for a comprehensive study of the viability of such project.

Apron

In the areas behind Berth No. 7 it was proposed to demolish warehouse No. 6 and replace it by a bigger building of about 113 x 25 m of modern design and with somewhat less width at the north-eastern end. Relocate the approach of the railway tracks to the north-east end.

Demolish and rebuilt warehouse No. 7 in a bigger still to be determined size and modern design. Envisage to relocate the Stevedoring Gear Store and the Rigger Workshop or to integrate it into the new building(s). Construct a railway connection to the southern side of that shed.

Administration Building

It was proposed to replace and relocate the current old Port Administration Building by a multi-storey building possibly at the port perimeters to facilitate free access for the port's customers, free of security procedures to underline the service friendliness of the port to its customers.

Railway tracks would have to be shifted accordingly to the north-west of the building.
Above was mutually agreed in principle .

Berth No. 8

It was outlined, that this berth was being used for the handling of general cargo and furthermore for the discharging of bulk cargoes feasible for handling by the two elevators .

'Hartmann' Elevators

It was proposed and agreed to keep the two elevators in operation as long as the maintenance costs would justify such undertaking.

Administration Building & Workshop

The PDE voiced his opinion, that the location of the 4 storey building accommodating social rooms for the dockers and the office space and the adjacent workshop had been built in an very unfavourable area, which he classified as a 'potential moneymaking area' which in the future could be used as storage area generating revenue. The proposal to consider demolition in the future was rejected by the Port Management.

Berth No. 9

Berth No. 9 being a plain general cargo area would have to be modernised in the same manner as described in the summary. (Berth 6-9)

It was proposed to demolish the existing sheds No. 3,4 & 5 and to replace them by a bigger building of modern design of approximately 150 x 50 m subject to civil engineering constraints.

To gain the necessary space to erect such a shed the following supporting measures would have to be taken :

- To demolish the bunker near to the perimeter wall.
- To demolish the warehouse and adjacent buildings formerly used by Georgian Shipping Co.
- To shift the marshalling area for rail wagons to the then free area and increase the capacity to the maximum .

Berth No. 10

This berth would be used in the future in the same manner, as in the present. This meant , to maintain the private operation of coasters and passenger services for the Black Sea Region albeit on a low level. Except for the citrus export season, where the berth would be utilised to 100 % .

Safety

The PDE proposed to develop and implement the safety-measures, which were virtually non existing. The public had free access to the operational area, which posed a potential danger.

Berth No. 11

The PDE stated his opinion, that he considered the green area behind the Passenger Reception Hall as an ideal area for the establishment of an Roro - Terminal . He was however advised, that this area was 'off limits' for various reasons one of them being the construction of the Yacht Club .

The participants were asked, whether there were any further questions, which was denied.
The meeting was adjourned at 16:45 hrs.

Capt. Horst Raschdorf
Port Development Expert
TACIS - TRACECA

Annex 4 a

Minutes of Meeting, Batumi 2

MINUTES OF MEETING

DATE: 23/01/1998

FROM - TO : 14:00 - 15:55

LOCATION: Office Port Chief Engineer Batumi Port

PARTICIPANTS: Chief Engineer Batumi Port, Omari Varshanidze
Chief of Mechanical Services, Valerie Bekaya
TACIS Civil Engineering Expert, Rene v. Lierop

SUBJECT: **Follow - up meeting to the meeting on 16/01/98 covering the planning of port development**

Purpose of the meeting
After the meeting on 16/01 the Chief Engineer had voiced his agreement to 80 % of the measures proposed by the Consultant. The meeting on 23/1 should therefore serve to reach consensus about the remaining 20 %.

New Building for social rooms and stevedoring gear at Berth No. 8
The present construction works at the building located behind Berth No. 8 are meant to construct new social facilities for the Dockers. The old building between the 4 story office building and the new stevedoring gear store will be torn down and be used as open storage area.

The emergency generator set will be shifted alongside the new cargo gear store away from the apron side.

Area behind Berth No. 6
The concrete separation walls will be removed as proposed. Chief engineer proposed to construct a third railway line there to enhance the flexibility in shunting operations and to connect Shed No. 6 to that line as well.

This opinion was shared by the consultants.

Cranes
The Chief engineer proposed to rehabilitate the existing cranes, and not to purchase new ones. In his opinion and based on the information he received from manufacturers the cost of the spare parts and the necessary labour costs would be in the range of US $ 1.2 million. this would constitute only about 10 % of the money needed to purchase new cranes.

The Port Development Expert advised, that the TACIS Port Handling Equipment Expert would be at Batumi within the next two weeks, and the subject could then be discussed in depth.

Port Fleet

The Chief Engineer explained, that among other floating objects the port owns three tug boats. Two of them were powerful with 2250 hp each.

These tugs needed an complete overhaul. The cost had been estimated in the range of US $ 750,000. The hulls were still in a perfect condition, so that this was in his opinion a viable undertaking, especially under the view of the cost of a new tug of similar towing capacity, which would by around US $ 3,000,000. Last repairs were undertaken at Varna in 1995 by the Yugoslav builders of the tugs. The smaller tug which was already 35 years old still assisted in berthing manoeuvres and was based on the condition of the hull still worth to be repaired.

The Port Development Expert inquired whether, considering the age of the tug, spare parts for the engine were still obtainable. The Chief Engineer advised, that this was their smallest problem, because the engines were actually designed tank engines, which were still obtainable by the hundreds at Russia.

Area behind Berth No. 9

It was finally agreed, that no sheds would be erected at the perimeter wall adjacent to the road, but the extended shunting yard would be located there as proposed in the meeting on 16/01.

Pier No. 4 - 5

This area was earmarked for the construction of a 'Multipurpose Terminal'. The Civil Engineering Expert lined out in detail where the new pier would be located and how constructed, which was agreed. The Chief Engineer advised, that the area could even be extended to the NE. A considerable free space there was not used and it would not be a problem to get it from the Municipality.

Being asked, if the area to the NW, where no activities had been observed, would also be available, the Chief Engineer stated, he would find out.

(Remark: It became meanwhile obvious, that this will not be a realistic solution, because the area was occupied by a new oily - water separation - plant, which would go into operation once the funding for the erection for a new pipeline from the Batumi Railway Shunting Yard would be made available.)

Hoppers at Berth No. 7

The Chief Engineer advised, that the port will demolish the stationary hoppers at the apron. As they are not in use any more.

Shed behind Berth NO. 7 (Port Buildings Nos. 24,13)

The demolition of this shed would not pose a problem. The fuel station could easily be shifted to the workshop area.

'Hartmann' elevators at Berth No. 8

The Chief Engineer lined out, that these elevators were now 25 years old. They were originally designed to handle aluminium powder. The hourly productivity with this type of cargo was 150 mt.

This cargo had not been handled since 1992, and the elevators were being used for the discharge of grain, if Berth No. 7 was not available. The productivity was considerably lower in the range of 85 mt/hr. They could however still serve as a buffer when Pier No.7 was not available.
The port would like to upgrade the elevators in order to reach a higher output, because the construction was still in a sound condition, and from that point of view the investment could be viable. They had already contacted 'Hartmann' but not received any answer so far.

Remark : 'Hartmann' has closed down its operation.

The depth alongside this Pier of almost 11 m would allow such operation with reasonable sized vessels.

Erection of new Shed at Berth No. 9

The Chief Engineer advised, that in line with the construction of a new shed and demolition of the old one in the area it would have to be taken in consideration, that the Transformer station at the easterly end of the berth would have to remain.

Furthermore, the Chief Engineer proposed to extend the third railway line to Berth No.9, which was now ending at Berth No.8 .

The Port Development Expert said, that this would be in contradiction to the philosophy to get away from the direct delivery system. But it might be worth thinking about under consideration to maintain a good level of operation during the reconstruction works, and in view of shunting operations of grain vessels at Berth No. 7.

The meeting was adjourned at 15:55 hours.

Minutes prepaired by : Horst Raschdorf
Translation by : Nelly Terdzishvili (Mrs)

Batumi2.mom

Annex 5

Outline Specifications for Major Port Handling Equipment

Technical Specifications

for

1. Ship-to-Shore Container Gantry Crane (SSG)
2. Rail-Mounted Gantry Crane (RMG)
3. Rubber-Tired Gantry Crane (RTG)
4. Terminal Truck (TT)
5. Container Chassis (CC)
6. Reach-Stacker (RS)
7. 12.5-t Forklift/Empty Container Handler (ECH)
8. 10-t Forklift Truck (FLT)
9. 2.5-t Forklift Truck (FLT)
10. Wheel Loader 0.4 m^3 (Bobcat)

1. Ship-to-Shore Container Gantry Crane (SSG)

Application	container handling on panamax vessels
Rail gauge	18 m
Outreach from sea rail	32 m
Backreach	13 m
Overall length	max 23 m
Clearance under portal beam	13 m
Clearance between crane legs	17 m
Capacity under spreader	40 tons
Lifting height above rail/under spreader	25 m
Lifting height below rail	14 m
Spreader	20 - 40' telescopic type
Hoisting speed empty full	150 m/min 60 m/min
Trolley speed	150 - 180 m/min
Gantry travel speed	45 m/min
Electrical control system	WARD-LEONARD or equivalent
Number of wheels	16 on each side
Number of driven wheels	4 at each corner
Boom hoist	5 min
Wheel load per wheel	max 35 tons
Electrical control system	thyristor-controlled AC drives

Note: Upon receipt of bids, a decision is to be taken on the type of hoist system, i.e. trolley hoist/machinery house hoist, and on rope- or self-driven trolley.

2. Rail-Mounted Transtainer Gantry Crane (RMG)

Application	loading/unloading of railway waggons
Overall span	approximately 22 m
Clear width	18.5 m
Overall depth	8.5 m
Number of wheels	min 12
Lifting capacity under spreader	40 tons
Lifting height	one over two
Spreader slewing	rotating
Crane travel speed	min 120 m/min
Trolley travel speed	min 60 m/min
Hoisting speed	min 20/40 m/min
Power supply	415 V, feeder cable
Anti-sway system	
Movement	horizontal, also for eccentrically loaded containers
Rope system	synchronized
Spreader	20-40', telescopic type
Driver's cabin	mounted at the trolley, fully air-conditioned

3. Rubber-Tired Container Gantry Crane (RTG)

Application	container yard stacking
Overall span	approximately 22 m = 6 plus road way
Clear width	18.5 m
Overall depth	8.5 m
Number of wheels	8, turnable by 90°
Lifting capacity under spreader	40 tons
Stacking height	one over four 9'6"
Spreader slewing	rotating
Crane travel speed	min 120 m/min
Trolley travel speed	min 60 m/min
Hoisting speed	min 20/40 m/min
Climbing capacity	4%
Power supply	by means of a diesel-electric unit/AC motors
Anti-sway system	
Movement	horizontal, also for eccentrically loaded containers
Rope system	synchronized
Spreader	20-40', telescopic type
Driver's cabin	mounted at the trolley, fully air-conditioned

Note: For the selection of the container handling gear, the latest technical developments of rubber-tired gantry cranes should be taken into account, considering that, compared with other container handling equipment, RTG applications have sharply increased during the past years. Particularly the diesel-electric power supply unit provides several advantages compared to a diesel-hydraulic systems, i.e. less hydraulic oil spillages and lower maintenance costs and new steering control system for easy manoeuvrability.

4. Terminal Truck (TT)

Application	container chassis transport between SSG, the stacking areas and the CFS
Truck type	port terminal truck with 5th wheel lifting device, 2" "king-pin"
5th wheel load	min 25 tons
5th wheel height	min 2,150 mm
Power unit	diesel engine, 4 stroke water-cooled, 6 cylinders
Power output	min 165 kW
Wheels/tires	pneumatic type, 2 in front and 4 in the rear, size 11.00-20
Brakes	pneumatic drum brakes/wet disc brakes
Gearbox	power-shift gearbox 4/3 with torque converter
Travel speed	min 30 km/h
Driver's cabin	noise and heat-insulated, air-conditioned, swivelling seat together with instruments and steering wheel

5. Container Chassis (CC)

Application	transport of 20' and 40' containers on the CT, its stacking areas and the CFS
Trailer type	Skeleton type chassis with a 2" "king pin"
Construction type	rigid steel-frame construction (st 52-3 or similar) with four corner guides and two side guides, one fix-pin is welded to position 20' and 40' containers, rigid landing legs are required
Capacity	min 40 tons
Length	min 12,250 mm
Width	max 2,700 mm
Platform height	min 1,250 mm
Number of wheels	8
Type of tires	pneumatic, size 11.00-20
Axle type	pendular axle
Speed laden unladen	not less than 10 km/h not less than 30 km/h

6. Reach-Stacker (RS)

Application	container loading/unloading from trucks/trailers and railway waggons
Lifting capacities 1. row at 1900 mm load centre 2. row at 3950 mm load centre 3. row at 6500 mm load centre	 42 tons 24 tons 11 tons
Minimum boom angle	50
Total weight unladen, maximum	67 tons
Total weight laden, maximum	110 tons
Maximum weight on front axle laden	100 tons
Maximum weight on front axle unladen	37 tons
Engine	diesel, turbo-charged
Minimum power output	200 kW at 2,200 rpm
Driving speed	25 km/h
Lifting speed	0.25 m/s
Lowering speed	0.25 m/s
Gradability	30%
Tires	pneumatic type
Transmission	converter/power shift
Brakes - drive axle	wet disc
Brakes - steer axle	dry disc
Parking brake	disc-mechanical
Spreader rotation, minimum	-95/+185
Spreader side shifting, minimum	± 800 mm
Spreader sloping, minimum	±5
Spreader safety device	lifting only after correct locking
Cabin	fixed and closed, sound insulated, safety glass

7. Forklift/Empty Container Handler (ECH), 12.5 tons

Application	empty container handling for 5 high 9'6"
Lifting capacity	12.5 tons at 1,200 mm LC
Tire type	pneumatic
Wheels	4 in the front, 2 in the rear
Operator's cabin	closed, sound-insulated and air-conditioned
Total height, with lowered mast	max 7,000 mm
Total width	min 3,200 mm
Turning radius, outer	max 4,800 mm
Ground clearance (at middle of wheelbase)	350 mm
Travel speed	min 30 km/h
Lifting speed laden/unladen	min 0,35/0,40 m/s
Gradability	min 25%
Mast	free-view type, telescopic side frame spreader
Steering	hydrostatic power steering
Transmission	power shift 3/3 with torque converter
Service brake	min pneumatic drum brake
Electrical system	24 V
Engine	4 stroke, 6 cylinder water-cooled diesel
Power output	min 125 kW
Hydraulic system	standard system with a gear type oil pump

8. Forklift Truck (FLT), 10.0 tons

Application	heavy lifts, platform
Lifting capacity (LC)	10.0 tons at 1,200 mm LC
Tire type	pneumatic
Wheels	4 in the front, 2 in the rear
Operator's cabin	closed, sound-insulated and air-conditioned
Total height, with lowered mast	max 7,000 mm
Total width	min 3,200 mm
Turning radius, outer	max 4,800 mm
Ground clearance (at middle of wheelbase)	350 mm
Travel speed	min 30 km/h
Lifting speed laden/unladen	min 0,35/0,40 m/s
Gradability	min 25%
Mast	free-view type, telescopic side frame spreader
Steering	hydrostatic power steering
Transmission	Power shift 3/3 with torque converter
Service brake	min pneumatic drum brake
Electrical system	24 V
Engine	4 stroke, 6 cylinder water-cooled diesel
Power output	min 125 kW
Hydraulic system	standard system with a gear type oil pump

9. Forklift (FLT), 2.5 tons

Application	CFS, container loading and unloading
Lifting capacity	2,5 tons at 500 mm LC
Drive unit	Diesel or gas
Tyre type	super-elastic
Wheels	4 with 2 driving wheels
Operator's cabin	open driver compartment
Total height incl. container overhead guard	max 2,100 mm
Total width	max 1,200 mm
Turning radius	max 2,300 mm
Ground clearance at middle of wheelbase	130 mm
Travel speed	min 16 km/h
Lifting speed laden/unladen	min 0.5 m/s
Gradability	min 20 %, min 1,200 mm
Mast	min 2-stage, free lift, free visibility
Steering	hydrostatic power steering
Transmission	stepless with torque converter
Service brake	drum brake with brake booster
Electrical system	12 V
Engine	4-stroke water-cooled diesel, exhaust fume filter, catalytic converter
Power output	min 40 kW
Hydraulic system	standard system with a gear type oil pump

10. Mini Wheel Loader (Bobcat)

Application	grain handling inside of ships
Lifting capacity	0.4 m^3
Drive unit	Diesel
Tyre type	super-elastic
Wheels	4 with 2 driving wheels
Operator's cabin	closed driver compartment
Total height incl. overhead guard	max 2,100 mm
Total width	max 1,200 mm
Turning radius	max 2,300 mm
Ground clearance at middle of wheelbase	150 mm
Travel speed	min 16 km/h
Lifting speed laden/unladen	min 0.5 m/s
Gradability	min 20 %, min 1,200 mm
Transmission	stepless with torque converter
Service brake	drum brake/disc brake
Electrical system	12 V
Engine	4-stroke water-cooled diesel, exhaust fume filter, catalytic converter
Power output	min 35 kW
Hydraulic system	standard system with a gear type oil pump

Annex 6 / Приложение 6

Summary of the Existing Equipment of the Port of Poti

Резюме оценки существующего оборудования в Потийском порту

Summary of the Equipment Assessment Poti-for cranes
Резюме оценки состояния оборудования в Потийском порту-Грузоподёмных механизмов

Type of Equipment *Тип оборудования*	Manufacturer *Изготовитель*	Year of construction *Год производства*	Asset Reg. No *Рег. номер основных средств*	Current Value *Текущая стоимость*	Rehabilitation Cost *Стоимость реабилитации*	Replacement Cost *Стоимость замены*
Sokol 16t/32 m Quay Crane *Причальный кран*	Kranbau Eberswalde	1917	01	1.000.000	650.000	2.000.000
Kondor 32n/32 m Quay Crane *Причальный кран*	Kranbau Eberswalde	1984	02	805.000	700.000	2.300.000
Sokol 16t/32 m Quay Crane *Причальный кран*	Kranbau Eberswalde	1981	03	400.000	650.000	2.000.000
Sokol 16t/32 m Quay Crane *Причальный кран*	Kranbau Eberswalde	1981	04	400.000	650.000	2.000.000
Kondor 32n/32 m Quay Crane *Причальный кран*	Kranbau Eberswalde	1984	05	805.000	700.000	2.300.000
Kondor 32n/32 m Quay Crane *Причальный кран*	Kranbau Eberswalde	1984	06	805.000	700.000	2.300.000
Sokol 16t/32 m Quay Crane *Причальный кран*	Kranbau Eberswalde	1987	10	0	650.000	2.000.000
Sokol 16t/32 m Quay Crane *Причальный кран*	Kranbau Eberswalde	1985	11	800.000	650.000	2.000.000
5t/23 m Quay Crane *Причальный кран*	Ganz	1975	14	0	400.000	1.250.000.
Sokol 16t/32 m Quay Crane *Причальный кран*	Kranbau Eberswalde	1981	15	40.000	650.000	2.000.000
Sokol 16t/32 m Quay Crane *Причальный кран*	Kranbau Eberswalde	1979	16	0	650.000	2.000.000
Sokol 16t/32 m Quay Crane	Kranbau	1984	17	700.000	650.000	2.000.000

Type of Equipment *Тип оборудования*	Manufacturer *Изготовитель*	Year of construction *Год производства*	Asset Reg. No *Рег. номер основных средств*	Current Value *Текущая стоимость*	Rehabilitation Cost *Стоимость реабилитации*	Replacement Cost *Стоимость замены*
Причальный кран	Eberswalde					
Sokol 16t/32 m Quay Crane *Причальный кран*	Kranbau Eberswalde	1975	18	0	650.000	2.000.000
5t/23 m Quay Crane *Причальный кран*	Ganz	1984	20	437.000	400.000	1.250.000.
5t/23 m Quay Crane *Причальный кран*	Ganz	1984	21	0		1.250.000.
Sokol 16t/32 m Quay Crane *Причальный кран*	Kranbau Eberswalde	1988	22	1.100.000	500.000	2.000.000
5t/23 m Quay Crane *Причальный кран*	Ganz	1975	23	0	400.000	1.250.000.
Sokol 16t/32 m Quay Crane *Причальный кран*	Kranbau Eberswalde	1980	24	300.000	650.000	2.000.000
Sokol 16t/32 m Quay Crane *Причальный кран*	Kranbau Eberswalde	1981	25	0	650.000	2.000.000
Sokol 16t/32 m Quay Crane *Причальный кран*	Kranbau Eberswalde	1987	26	1.000.000	600.000	2.000.000
Albatros 10t/32m Quay Crane *Причальный кран*	Kranbau Eberswalde	1987	27	875.000	550.000	1.750.000
Sokol 16t/32 m Quay Crane *Причальный кран*	Kranbau Eberswalde	1991	28	300.000	650.000	2.000.000
5t/23 m Quay Crane *Причальный кран*	Ganz	1987	30	625.000	380.000	1.250.000
Albatros 10t/32m Quay Crane *Причальный кран*	Kranbau Eberswalde	1931	31	1.225.000	400.000	1.750.000
Sokol 16t/32 m Quay Crane *Причальный кран*	Kranbau Eberswalde	1987	32	1.000.000	600.000	2.000.000
Albatros 10t/32m Quay Crane *Причальный кран*	Kranbau Eberswalde	1975	33	0	600.000	1.750.000
Albatros 10t/32m Quay Crane *Причальный кран*	Kranbau Eberswalde	1975	34	0	600.000	1.750.000

Type of Equipment *Тип оборудования*	Manufacturer *Изготовитель*	Year of construction *Год производства*	Asset Reg. No *Рег. номер основных средств*	Current Value *Текущая стоимость*	Rehabilitation Cost *Стоимость реабилитации*	Replacement Cost *Стоимость замены*
Sokol 16t/32 m Quay Crane *Причальный кран*	Kranbau Eberswalde	1987	35	1.000.000	600.000	2.000.000
Sokol 16t/32 m Quay Crane *Причальный кран*	Kranbau Eberswalde	1988	36	1.100.000	600.000	2.000.000
Sokol 16t/32 m Quay Crane *Причальный кран*	Kranbau Eberswalde	1976	37	0	600.000	2.000.000
Sokol 16t/32 m Quay Crane *Причальный кран*	Kranbau Eberswalde	1987	38	1.000.000	500.000	2.000.000
Total				**16.177.000**	**17.630.000**	**58.150.000**

Summary of the Equipment Assessment Poti-for wheeled equipment
Резюме оценки состояния оборудованияв Потийском порту-колёсные оборудования

Type of Equipment *Тип оборудования*	Manufacturer *Изготовитель*	Asset Reg. No *Рег. номер основных средств*	Current Value *Текущая стоимость*	Rehabilitation Cost *Стоимость реабилитации*	Replace-ment Cost *Стоимость замены*
DC 10-600XL,10-t Forklift *Автопогр. Грузопод.10т*	Kalmar	201	0	10.000	100.000
5FD 15fFA4, 1.5 -t Forklift *Автопогр. Грузопод.1.5т*	Toyota	202	0	15.000	26.000
5FD 15FVA4, 1.5 -t Forklift *Автопогр. Грузопод.1.5т*	Toyota	203	0	15.000	26.000
DC 10-600XL,10-t Forklift *Автопогрузчик*	Kalmar	207		20.000	100.000
4FB 13L VF230, 1/25 t Electrical Forklift *1.25 электрический авто погрузчик*	Shinco	208	0		30.000
4FB 13L VF230, 1/25 t Electrical Forklift *1.25 т электричкский автопогрузчик*	Shinco	209	0		70.000
4FB 13L VF230, Electrical Forklift *Электрич.автопогрузчик*	Shinco	210	0		30.000
4FB 13L VF230, 1/25 t Electrical Forklift *1.25 электрический авто погрузчик*	Shinco	211	0		30.000
4FB 13L VF230, 1/25 t Electrical Forklift *1.25 электрический авто погрузчик*	Shinco	212	0		30.000
4FB 13L VF230, 1/25 t Electrical Forklift *1.25 электрический авто погрузчик*	Shinco	213	0		30.000
5FD 15FV A4, Forklift *Автопогрузчик*	Toyota	214	6.500	5.000	26.000
5FD 15FV A4, Forklift *Автопоргузчик*	Toyota	215	6.500	5.000	26.000
H 200 XL, 2-t Forklift *2-т автопогрузчик*	Hyster	216/278	0		26.000
H 200 XL, 2-t Forklift *2-т автопогрузчик*	Hyster	217	0		26.000
5FD 15FV A4, 1.5-t Forklift *1.5-т автопогрузчик*	Toyota	223	0		26.000
5FD 15FV A4, 1.5-t Forklift *1.5-т автопогрузчик*	Toyota	224	0	5.000	26.000
5FD 15FV A4, 1.5-t Forklift *1.5-т автопогрузчик*	Toyota	227	0	10.000	26.000
5FD 15FV A4, 1.5-t Forklift		228	0	10.000	26.000

Type of Equipment *Тип оборудования*	Manufacturer *Изготовитель*	Asset Reg. No *Рег. номер основных средств*	Current Value *Текущая стоимость*	Rehabilitation Cost *Стоимость реабилитации*	Replace-ment Cost *Стоимость замены*
1.5-т автопогрузчик					
5FD 15FV A4, 1.5-t Forklift *1.5-т автопогрузчик*	Toyota	229	0	3.000	26.000
DFG 16, Forklift *Автопогрузчик*	Jungheinrich	230	0	2.500	26.000
DFG 16, Forklift *Автопогрузчик*	Jungheinrich	231	22.100	2.500	26.000
DFG 16, Forklift *Автопогрузчик*	Jungheinrich	232	22.100	2.500	26.000
DFG 16, Forklift *Автопогрузчик*	Jungheinrich	233	22.100	2.500	26.000
DFG 16, Forklift *Автопогрузчик*	Jungheinrich	234	22.100	2.500	26.000
DFG 16, Forklift *Автопогрузчик*	Jungheinrich	235	22.100	2.500	26.000
DFG 16, Forklift *Автопогрузчик*	Jungheinrich	236	22.100	2.500	26.000
DFG 16, Forklift *Автопогрузчик*	Jungheinrich	237	22.100	2.500	26.000
DFG 16, Forklift *Автопогрузчик*	Jungheinrich	238	22.100	2.500	26.000
DFG 16, Forklift *Автопогрузчик*	Jungheinrich	239	22.100	2.500	26.000
DFG 16, Forklift *Автопогрузчик*	Jungheinrich	240	22.100	2.500	26.000
DFG 16, Forklift *Автопогрузчик*	Jungheinrich	241	22.100	2.500	26.000
DFG 16, Forklift *Автопогрузчик*	Jungheinrich	242	22.100	2.500	26.000
DFG 16, Forklift *Автопогрузчик*	Jungheinrich	243	22.100	2.500	26.000
2FD100,10-t Foklift *10-т автопогрузчик*	Toyota	249	0	10.000	100.000
02-5FD40FSVA4, 2.5-t Foklift *2.5-т автопогрузчик*	Toyota	255	6.500	3.000	26.000
YGF03A40TU, 4t Forklift *4-т автопогрузчик*	Nissan	256	0	2.500	40.000
YGF03A40TU, 4t Forklift *4-т автопогрузчик*	Nissan	257	0		40.000
YGF03A40TU, 4t Forklift *4-т автопогрузчик*	Nissan	258	0	2.500	40.000
25-t Ro-Ro Forklift *25-т Ро-Ро автопогрузчик*	Kalmar	281	0	40.000	170.000
25-t Ro-Ro Forklift *25-т Ро-Ро автопогрузчик*	Kalmar	282	0	50.000	170.000
843, Wheel Loader *Колёсный погрузчик*	Bobcat	506	4.000	3.000	40.000
843, Wheel Loader *Колёсный погрузчик*	Bobcat	507	4.000	1.000	40.000
843, Wheel Loader *Колёсный погрузчик*	Bobcat	508	0		40.000
843, Wheel Loader *Колёсный погрузчик*	Bobcat	509	4.000	3.000	40.000

Type of Equipment *Тип оборудования*	Manufacturer *Изготовитель*	Asset Reg. No *Рег. номер основных средств*	Current Value *Текущая стоимость*	Rehabilitation Cost *Стоимость реабилитации*	Replace-ment Cost *Стоимость замены*
843, Wheel Loader *Колёсный погрузчик*	Bobcat	510	4.000		40.000
WA 200, Wheel Loader *Колёсный погрузчик*	Komatsu	523	0	5.000	125.000
WA 200, Wheel Loader *Колёсный погрузчик*	Komatsu	524	0	5.000	125.000
WA 200, Wheel Loader *Колёсный погрузчик*	Komatsu	525	0	15.000	125.000
TR160 AL2,Terminal Tractor *Терминальный трактор*	Sisu	527	15.000	10.000	100.000
TR160 AL2,Terminal Tractor *Терминальный трактор*	Sisu	528	15.000	10.000	100.000
TR160 AL2,Terminal Tractor *Терминальный трактор*	Sisu	529	0	2.000	100.000
Total			**352.800**	**295.000**	**2.531.000**

Annex 7 / Приложение 7

Summary of the Existing Equipment of the Port of Batumi

Резюме существующего оборудования в Батумском Порту

Summary of the Equipment Assessment Batumi
Резюме оценки состояния оборудования

Type of Equipment *Тип оборудования*	Manufacturer *Изготовитель*	Asset Reg. No *Рег. номер основных средств*	Current Value *Текущая стоимость*	Rehabilitation Cost *Стоимость реабилитации*	Replace-ment Cost *Стоимость замены*
Pneumatic Grain Unloader *Пнев.разгружатель зерна*	Hartmann	11	0	300.000	4 000 000
Pneumatic Grain Unloader *Пнев.разгружатель зерна*	Hartmann	12	0	300.000	4 000 000
5-t Quay Crane *Прич. кран грузопод.5 т.*	Ganz	21	0	850.000	1.250.000
5-t Quay Crane *Прич. кран грузопод.5 т.*	Ganz	22	500.000	380.000	1.250.000.
5-t Quay Crane *Прич. кран грузопод.5 т.*	Ganz	24	0	400.00	1.250.000
10-t.Quay Crane *Причальный кран*	Kranbau Eberswalde	25	0	650.000	1.500.000
5-t.Quay Crane *Причальный кран*	Ganz	26	0	380.000	1.250.000
5-t./23m.Quay Crane *Причальный кран*	Ganz	27	0	380.000	1.250.000
5-t./16m.Quay Crane *Причальный кран*	Ganz	28	0	380.000	1.250.000
5-t Quay Crane *Прич. кран грузопод.5 т.*	Ganz	29	0	380.000	1.250.000
Albatros 10 t/32, Quay Crane *Причальный кран*	Kranbau Eberswalde	30	0	600.000	1.750.000
Albatros 10 t/32, Quay Crane **Причальный кран**	Kranbau Eberswalde	31	0	600.000	1.750.000
Albatros 10 t/32, Quay Crane *Причальный кран*	Kranbau Eberswalde	32	350.000	650.000	1.750.000
Albatros 10 t/32, Quay Crane *Причальный кран*	Kranbau Eberswalde	33	0	650.000	1.750.000
ZA 320 CUD,320m3/h Compressor *Компрессор*	Atlas Copco	35	0		
5FD15, 1.5-t Forklift *1.5-т. автопогрузчик*	Toyota	38	0	15.000	26.000
5FD15, 1.5-t Forklift *1.5-т. автопогрузчик*	Toyota	39	0	15.000	26.000
5FD15 1.5-t Forklift *1.5-т. автопогрузчик*	Toyota	40	0	10.000	26.000
5FD15, 1.5-t Forklift *1.5-т. Автопогрузчи*	Toyota	41	0	15.000	26.000
FD100, 10/600mm. 10-t Forklift *10-т. автопогрузчик*	Mitsubishi	45	0	15.000	100.000
5FD15 ,1.5-t Forklift *1.5-т. Автопогрузчик*	Toyota	47	0	15.000	26.000
3.6t Forklift *Автопогрузчик*	Still	49	0	0	40.000

Type of Equipment *Тип оборудования*	Manufacturer *Изготовитель*	Asset Reg. No *Рег. номер основных средств*	Current Value *Текущая стоимость*	Rehabilitation Cost *Стоимость реабилитации*	Replace-ment Cost *Стоимость замены*
3.6 t Forklift *Автопогрузчик*	Still	50	0	5.000	40.000
5FD15 ,1.5-t Forklift *1.5-т. Автопогрузчи*	Toyota	54	0	10.000	26.000
5FD15, Forklift *Автопогрузчик*	Toyota	55	6.500	10.000	26.000
FD40-t, Forklift *4-т автопогрузчик*	Toyota	56	10.000	5.000	40.000
5Fd15, Forklift *Автопогрузчик*	Toyota	57	65.000	10.000	26.000
H.500XL, 5-t Forklift *5-т автопогрузчик*	Hyster	58	20.625	5.000	27.500
5FD15, Forklift *Автопогрузчик*	Toyota	62	0	10.000	26.000
MT3-82.1 Tractor *Трактор*	Belarus	79		3.000	
5FD15, Forklift *Автопогрузчик*	Toyota	89	13.000	5.000	26.000
5Fd15, Forklift *Автопогрузчик*	Toyota	90	13.000	12.00	26.000
5FD15, Forklift *Автопогрузчик*	Toyota	91	13.000	10.000	26.000
5Fd15, Forklift *Автопогрузчик*	Toyota	92	13.000	3.000	26.000
5FD15, Forklift *Автопогрузчик*	Toyota	93	13.000	3.000	26.000
5Fd15, Forklift *Автопогрузчик*	Toyota	94	13.000	2.000	26.000
5Fd15, 4-t Forklift *4-т.автопогрузчик*	Toyota	95	20.000	5.000	40.000
5Fd15, 4-t Forklift *4-т.автопогрузчик*	Toyota	96	13.000	10.000	26.000
5FD100, 10-t Forklift *10-т.автопогрузчик*	Toyota	97	45.000	2.000	90.000
515B, Wheel Loader *Колёсный погрузчик*	Dresser	203	0	5.000	125.000
WA 200-1,Wheel Loader *Колёсный погрузчик*	Komatsu	204	0		125.000
WA 200-U1, Wheel Loader *Колёсный погрузчик*	Komatsu	212	7.500	3.000	125.000
51513WA 200 U-1, Wheel Loader *Колёсный погрузчик*	Komatsu	213	7.500	5.000	125.000
843, Wheel Loader *Колёсный погрузчик*	Bobcat	214	0	15.000	40.000
843, Wheel Loader *Колёсный погрузчик*	Bobcat	215	0	15.000	40.000
843, Wheel Loader *Колёсный погрузчик*	Bobcat	219	6.000	15.000	40.000
843, Wheel Loader *Колёсный погрузчик*	Bobcat	220	6.000	15.000	40.000
Total			**1.135.125**	**6.648.000**	**26.703.500**