The European Union’s Tacis - TRACECA Programme
for Azerbaijan and Georgia

Railway Transit Oil Logistical Centre

for Azerbaijan and Georgia

Progress Report no. 1
May 2003

This project is funded by
The European Union

This project is implemented by
UNICONSULT Universal Transport Consulting GmbH
HPTI Hamburg Port Training Institute GmbH
Transpetrol Internationale Eisenbahnspedition GmbH
**Project Title:** Railway Transit Oil Logistical Centre  
**Project Number:** EUROPEAID 113200/C/SV/Multi  
**Countries:** Azerbaijan, Georgia

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**Date of report:** 5 May 2003  
**Reporting period:** 23 February – 5 May 2003  
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Abbreviations and Acronyms

AIOC        Azerbaijan International Oil Consortium
ASCP        Aktau Sea Commercial Port
ASR         Azerbaijan State Railways
bbl d       barrels per day
BISP        Baku International Sea Port
bn          Billion
BOT         Batumi Oil Terminal
bp          bollard pull
BP          British Petrol Company
BTC         Baku-Tbilisi-Ceyhan pipeline
CIS         Commonwealth of Independent States
CPC         Caspian Pipeline Consortium (operator of the Tengiz-Novorossiysk pipeline)
CPT         Cost paid to (Incoterms)
CASPAR      Caspian Shipping Company
CU          Co-ordination Unit
DAF         Delivery at frontier (Incoterms)
EBRD        European Bank for Reconstruction and Development
EC          European Commission
EU          European Union
FOB         Free on board (Incoterms)
GIOC        Georgian International Oil Company
HGA         Host Government Agreement
IFI         International Financial Institution
IMO         International Maritime Organisation
LNG         Liquefied Natural Gas
LPG         Liquefied Petrol Gas
MEP         Middle East Petrol Company
mn          Million
MoTC        Ministry of Transport and Communication
NM          Nautical Miles
p.a.        per annum
PCOA        Pipeline Construction and Operation Agreement
RTC         Rail Tank Car
SOCAR       State Oil Company of Azerbaijan Republic
SPA          Supsa Port Administration
SPM          Single Point Mooring
t           metric tonnes
Tacis       The European Union’s Tacis Programme
tdw         tonnes dead weight
TML         Turkmen Maritime Line
ToR         Terms of Reference
TRACECA     Transport Corridor Europe-Caucasus-Asia
VLCC        Very large common carrier
1 Project Synopsis

<table>
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<th>Project Title:</th>
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Project objectives

According to the Terms of Reference the project consists of two Modules not directly linked to each other. Module A aims at the improvement of logistics management for the transport of oil and oil products by rail between Baku and Batumi. Module B focuses on the feasibility of establishing and promoting the Supsa Port Administration.

Specific objectives of Module A are:

a. to develop a forward looking concept for the rail transport of oil and oil products across the Caucasus;

b. to establish a network of logistic centres (points of contact and/or information).

Specific objectives of Module B are:

c. to establish an efficient management structure for the Supsa Port Administration;

d. to outline how to render services to tankers according to international standards;

e. cancelled

f. new: to identify under which conditions Supsa Sea Port Administration can reach self-sufficiency.

Project outputs

Expected outputs of Module A are

1. The transport chain of oil and oil products transported by rail across the Caucasus has been investigated and described.

2. Technical, operational and organisational weaknesses and inefficiencies have been identified and investigated.

3. A sustainable taylor-made oil transport by rail logistics concepts has been prepared. This comprises that an appropriate administrational set-up has been developed, an operations concept has been developed, communication links and interfaces have been designed, a customer-relations function has been designed, and responsibilities are efficiently attributed.

4. The concept is being implemented.

Expected outputs of Module B are

5. Supsa Port is able to establish an efficient management structure.

6. Supsa Port is able to render services according to international standards.

7. An oil terminal and tanker safety manual has been prepared and is implemented.
8. cancelled
9. cancelled
10. Navigational and vessel safety in the port and its approaches is assured
11. Pollution prevention and pollution combating measures are in place, an oil pollution contingency plan has been prepared.
12. New: Supsa Sea Port Administration knows in which cases they would be allowed to levy charges on vessels calling at Supsa port.

Project activities

Module A
1. Describe the oil transport chain from the places of production in the Caucasus via transhipment facilities to the places of destination.
2. Identify link capacities, capacity improvements, relevant stakeholders and decision makers, existing operation systems.
3. Describe available transport and storage facilities across the Caucasus, their characteristics and capacity.
4. Describe the composition of oil cargoes carried on rail, its quantities and frequencies.
5. Describe the organisational setup between all parties involved, communication links, cooperation systems, wagon tracking system (if available).
6. Elaborate a market study for oil transports by rail across the Caucasus.
7. Update the oil traffic forecasts for the rail link Baku and Batumi.
8. Identify the weaknesses in the sectors investigated above, taking into account projected growth.
9. Prepare recommendations on costs and environmental impact assessments
10. Develop and specify a sustainable taylor-made oil transports by rail logistics concepts including organisational setup, organisational and operational interfaces, communication links, allocation of responsibilities, CRM, logistics support units, operating budget requirements, staff requirements, marketing concept.
11. Discuss the concept with Project Partners
12. Assist in implementation of the concept

Module B
13. Study the institutional structural design issues of Supsa Port, prepare a critical review
14. Prepare recommendations for an efficient management structure
15. Prepare an oil tankers and terminal operations safety manual
16. Study communication and navigation equipment available in the port and make recommendations
17. Study the logistical equipment issues for Supsa Port and make recommendations
18. Advise on the issues of navigational safety
19. Advise on the issues of environmental protection and prepare recommendations for an efficient and effective environmental protection system and for pollution control and combating equipment
20. Provide pre-project studies for berth construction for the port’s auxiliary fleet
21. cancelled
22. cancelled
23. Specify training requirements in management, safety operations, safety and environmental protection
24. Assist the port administration in implementing the new administrative set-up.
25. new: Review the Host Government Agreement and the Pipeline Construction and Operation Agreement
26. new: Investigate whether there exist similar cases in other parts of the world
27. new: Investigate in how far in other parts of the world vessels and vessel owners calling at Single Point Mooring facilities are charged with vessel and port dues
28. new: Elaborate on international practice
29. new: Elaborate in how far international practice and specific examples can be transferred to the Supsa case
30. new: Elaborate in how far the existing Georgian port regulations support the SPA’s funding approach.

Target groups
Oil operators, Batumi Port, Batumi Oil Terminal, Supsa Port Administration, Georgian and Azeri Railways, Baku International Sea Port, Caspian Shipping Company

Project starting date
6 December 2002

Project duration
12 months
2 Summary of Project Progress Since Project Start

2.1 Accomplishments

2.1.1 Module A

The main accomplishments of Module A to date are as follows:

- Submission of the Inception Report in February 2003. This elaborated the project approach in detail taking into account the situation on the ground as experienced during the inception phase.
- All project partners have been visited and discussed with at least once, often several times, in order to introduce and explain the project approach, gather information on technical characteristics, organisational setup and operational procedures along the transport chain for oil cargoes between the Eastern Caspian Sea and the Georgian Black sea coast.
- Major private players involved in the organisation and operation of the transport chain have been identified and visited in order to gather information and solicit there support of the project objectives. Meetings were generally fruitful and indicated an overwhelming interest of the private sector to further professionalise operations along the line and increase transparency of information flows.
- On-site investigation of relevant infra- and superstructure facilities and preparation of comprehensive working papers concerning infra- and superstructure relevant for oil transports across the Caspian Sea and Caucasus. Main technical chokepoints and deficiencies have been identified and discussed with relevant project partners and target groups.
- Detailed analysis of the current operational procedures as well as of the organisational setup for oil transports by rail along the project route. Main operational and organisational obstacles temporarily hindering transport flows have been identified and discussed with relevant project partners and target groups.
- Preparation of a comprehensive transport flow analysis of oil transports across the Caspian Sea and the Caucasus including an outlook for further development.
- Preparatory work in connection with a proposed status meeting in Baku in July for project partners and other selected parties involved in the organisation of the transport chain through the Caucasus. The meeting is intended to streamline perception of the current problems along the corridor and discuss possible approaches to solve these problems.

2.1.2 Module B

The main accomplishments of Module B to date are as follows:

- Submission of the Inception Report in February 2003. This elaborated the project approach in detail taking into account the situation on the ground as experienced during the inception phase. This included a detailed analysis of the current problems related to the day-to day business of Supsa Sea Port Administration.
- All project partners and other parties involved in Module B have been visited and discussed with at least once, in order to introduce and explain the project approach, gather information on technical characteristics, organisational setup and operational procedures related to operations at Supsa port.
- On-site investigation of relevant infra- and superstructure facilities and navigational conditions, and preparation of a comprehensive working paper concerning infra- and superstructure relevant for oil handling at Supsa port.
Obviously, the situation concerning Module B encountered during the inception phase significantly deviated from the situation prevailing by the time of elaborating the Terms of Reference. Therefore, the consultants proposed to amendment the original Terms of Reference, which was supported by the project beneficiaries of Module B. Tasks related to investment planning and financial assistance should be cancelled in favour of tasks related to investigate the main funding base of the Supsa Sea Port Administration, i.e. the right to levy port dues on vessels calling at Supsa port. The European Commission followed the consultants’ proposal made in the Inception Report and partly amended the project tasks by reallocation of resources effective May 2nd, 2003.

With respect to a.m. amendment the consultants so far accomplished the following:

- Review of the Host Government Agreement (HGA) and Pipeline Construction and Operation Agreement (PCOA) as well as of two legal opinions provided by the terminal operator in Supsa (BP), and one by Supsa Port Administration.
- Investigation whether there exist cases similar to Supsa port (single point mooring without additional port structures), and in how far vessel and vessel owners are charged with port dues there.
- Preparation of a working paper on the general justification for levying port and harbour dues.

On request of the main beneficiary of Module B all information and documentation related to accomplishments of the new tasks are to be presented in a separate volume to be delivered in July 2003.

2.2 Issues

2.2.1 Module A

It is vital to the success of the project that all parties involved fully support the project objectives and timely provide requested information and comments. As the number of parties involved in the project, both partners and target groups, is rather large, only the continuation of a coactive approach granting access to relevant information and data secures to undertake analysis to the degree and precision desired.

The consultants will adopt a neutral position in any discussions aimed at blaming a specific party (or parties) for any defaults along the transport chain. Obstacles, as far as they are identified, are solely described and evaluated. The main objective the consultants’ work should be focused on, is merely to propose a joint solution/concept acceptable to all parties involved in the organisation of the transport chain, to the benefit of the competitiveness of the trans-Caucasian rail corridor for oil transports.

It is therefore indispensable that the exchange of information and views between the partners of the transport chain and with the consultants on how to improve the technical structures, the operational setup and operational procedures is broadened and further intensified. A first step towards initiating this desirable cooperative process shall be the organisation of a round table meeting in Baku, hosted by TRACECA Intergovernmental Commission and moderated by the consultants beginning of July.

2.2.2 Module B

The further development of Module B to a certain extent depends on the outcome of the process initiated by the amendment of the Terms of Reference. As stated above, the results of the respective new tasks will be presented to the beneficiary in a separate volume beginning of July 2003. It is indispensable that the political
bodies in Georgia will very timely decide on how to use the consultants’ results and views for further progress of the assistance to Supsa Sea Port Administration.

It should be re-stated that the consultants are transport consultants and will focus their investigations on the transport aspects of the problem between Supsa Sea Port Administration and the terminal operator in Supsa. The results and views of the consultants should be interpreted as an expert appraisal of the current situation, and can at best provide additional “ammunition” for developing new lines of argumentation. But it can by no means replace a formal legal opinion of a qualified international law firm.

3 Summary of Project Planning for Remainder of Project

3.1 Module A

3.1.1 Overall Plan

For Module A the basic overall plan for the remainder of the project has not changed since the Inception Report, except that it will be become more flexible where there is a requirement to change the style and emphasis of input. This may be the case by further promoting the cooperative approach by organising round tables/joint meetings. The outcome of the round table discussions will give further hints in how far the introduction of a new tracking and tracing software system is deemed necessary or not.

3.1.2 Main Components

- One round table in Baku will be organised to discuss and agree on the findings submitted with the present progress report. The discussions and views revealed during the meeting will serve as an indispensable input for the elaboration of a concept acceptable to all key parties involved in the planning and operation of the transport chain.
- Visits by project experts to project partners and target groups will continue to further solicit their support, to complete data where necessary, and discuss preliminary concept ideas.
- A taylor-made concept for improving the logistic chain of oil transports by rail between the Caspian and the Black Sea will be developed. The concept will take account of the existing structures and make proposals on changes to existing organisational and operational interfaces, the organisational setup (responsibilities) and communication links and requirements, most likely to improve the traffic flow.
- Whether a one-stop-shopping concept with a single entity as customer contact point will be feasible or a logistical support unit serving the participants in the transport chain will be discussed. For the preferred solution a marketing concept and staff requirements as well as human resource development activities will be elaborated.
- The concept will be presented to and discussed with the project partners and target groups most likely during a round table meeting tentatively planned for September 2003 in Tbilisi.
3.2 **Module B**

3.2.1 **Overall Plan**

For Module B the basic overall plan for the remainder of the project has changed since the Inception Report in so far as the following tasks

16. Study communication and navigation equipment in the port and make recommendations.
22. Examine issues related to attracting funds from IFIs and private investors for Supsa Port development.

have been officially and contractually replaced in order free resources for the elaboration of new tasks:

25. Review of the Host Government Agreement (HGA) and the Pipeline Construction and Operating Agreement (PCOA) with respect to any possible references affecting the right of SPA to levy charges on vessels.
26. Investigate whether there exist similar cases (SPM without additional port structures) in other parts of the world.
27. Investigate in how far in other parts of the world vessel and vessel owners calling at SPMs are charged with vessel and port dues.
28. Elaborate on international practice of levying port and vessel dues and respective basic legal foundations (possibly referring to national and international rules and regulations).
29. Elaborate in how far international practice and specific examples can be transferred to the Supsa case.
30. Elaborate in how far the existing Georgian port regulations support the SPA’s funding approach.

These changes have become necessary as further development of Supsa Sea Port Administration is heavily depending on the administrations ability to raise sufficient income for funding their own day-to day operations and future port infrastructure investments. Above new tasks have been designed to provide some clarification concerning some major aspects of this problem.

The reaction of the Georgian bodies on the results of these new task may have some bearing on the elaboration of the remainder of the project. However, for the time being, the consultants assume that the remaining tasks will be executed according to the planning provided in the Inception Report, Annexes 2b and 3b.

3.2.2 **Main Components**

- Tentative planning foresees to submit the results of tasks 25 throughout 30 in a separate report to the main beneficiary of Module B by beginning of July, and in addition to personally discuss and explain them very soon after submission in Tbilisi. The exact time schedule is currently agreed with the beneficiaries of Module B. The consultants’ results and views are intended to serve the respective political bodies in Georgia to decide on further actions concerning budgetary questions of Supsa Sea Port Administration.
- Further visits by maritime experts will take place aiming at preparing recommendations for an efficient management structure and discussing this with the SPA management.
- The consultants will prepare an oil tankers and terminal operations safety manual or alternatively advise the SPA in how far the existing manual developed by the terminal
operator in Supsa is in line with international standards and can be adopted for SPA needs (if the terminal operator agrees).

- Currently, logistical issues are more or less a topic for future development. Logistical equipment is seemingly not available under the control of the Sea Port Administration. In line with future development planning however, the consultants will make recommendations on which equipment need to be purchased depending on the stage and line of development.
- The consultants will advise on issues of navigational safety and on related issues of environmental protection. Moreover, recommendations for an efficient and effective environmental protection system and for pollution control and combating equipment will be prepared. This will also include the development of a concept for possible resource-sharing with the existing terminal operator in Supsa.
- The consultants will elaborate pre-project studies on berth construction for the port’s auxiliary fleet.
- Further development of Supsa port requires to specify training needs in management, safety operations, safety and environmental protection. The consultants will therefore conduct a manpower audit and together with SPA management develop training concepts for future port staff employed in a.m. fields.

4 Project Progress in Reporting Period

4.1 Module A

Project progress during the reporting period has generally been according to plan. The stocktaking and evaluation of technical facilities related to the transport of oil cargoes across the Caspian Sea and the Caucasus has been finalised. The operational procedures have been identified in direct discussions with the project partners and representatives of the target groups. The organisational setup of different transport chains have been identified and interfaces between the different partners involved in the organisation of the transport chain have been analysed.

Numerous bilateral meetings with project partners and target groups have been held, and discussions have generally been fruitful. Dedication of the different entities contacted by the consultants towards the project objective has naturally been determined by the entity’s direct involvement in the transport chain and own perception of (possible) problems along the corridor. Especially, differing perceptions of problems made it difficult to identify relevant chokepoints. Verification of information and integration of rendered problems into a larger picture at times has proven to be difficult as not only questioned entities but especially also interview partners have been characterised by considerable heterogeneity (in rank and detailed knowledge). The consultants have got the impression that sometimes entities perceived and rendered problems as related to corridor operation and organisation, which in fact were primarily caused by in-house inefficiencies.

Moreover, the expectation of the different entities in how far to profit from a solution of (possible) problems also influenced their interest in active participation.

Generally, institutions and companies, which in the recent past have invested large funds into the renovation and establishing of technical facilities related to the transportation and handling of oil cargoes have been more focusing on highlighting operational and organisation deficiencies of the corridor. While institutions with rather old or obsolete infra- and superstructure have stressed the need for external support to improve their own technical facilities. When asked about possible measures to improve corridor performance, tendencies to primarily identify what others can do rather than to focus on own efforts were evident. “Others” here also
refers to international financial institutions who were expected to provide more funds to improve oil transport related infra- and superstructure endowment in the region.

It is worthwhile to note that some experts and high ranking officials of the project partners have already drawn their own good ideas about how to better organise oil transports by rail along the trans-Caucasian corridor. However, these ideas seemingly are only communicated in-house. To initiate a joint approach (e.g. of the two railways) has been mentioned as a good idea but not been tackled yet. It is rather obvious that while communication between the private partners of the transport chain and between the state-owned (or institutional) partners has been stated as good and adequate respectively, communication links between the private sector and the state-owned sector leave some room for improvement.

During discussions it became quite clear that both the project partners as well as the target groups welcomed the idea of a round table of all major parties involved in the operation of the transport chain. Organiser should be an independent entity, like the consultants, and the meeting should be hosted by a respectable international or regional organisation like TRACECA IGC. In a first step, such a meeting should create a common understanding of the major and important problems related to oil transports along the corridor. Objective of the round table should not be to blame each other for any deficiencies perceived in technical characteristics, operational procedures and organisation setup, but to jointly and professionally discuss ideas how to relieve single chokepoints, and how to cooperate in setting certain standards, e.g for data and information transfer. A major success and breakthrough can be expected if the parties find a common approach how to further institutionalise similar meetings.

As a result of their work so far the consultants have rendered a clear picture on the current technical, operational and organisational chokepoints of the rail transport chain across the Caucasus.

**Technical Obstacles** are related but not entirely limited to

- **Capacity and condition of tankers and rail ferries crossing the Caspian Sea**: Part of the fleet currently calling at Baku and Dubendi has surpassed usual life span. The projected rehabilitation programme may improve the condition of the fleet if properly conducted. However, available tonnage will be temporarily reduced by shipyard times. Ordered new buildings will provide some short term relieve but given that Kazakhstan intends to provide crude oil for the new BTC pipeline, existing capacities may not meet medium term demand.

- **Capacity of the single track line Samtredia-Batumi**, aggravated by the condition of the track and power cuts, especially in winter times: Current track load in summer time is already close to maximum capacity of the single track line. In winter times, power cuts at times reduce effective track load to the operational handling capacities of Batumi Oil Terminal as of first quarter 2003. However, with the installation of a new gantry (see below) handling capacity (and demand) in Batumi will considerably increase.

- **Dimensioning and quality of unloading, storage and marshalling capacities in Batumi**: Handling limitations in Batumi have very recently been relieved by putting into operation a new gantry with 84 modern unloading trestles, able to unload also low viscosity products in winter times. However, in order to handle much larger volumes either the average storage factor (indicating how often a storage tank is filled per month) needs to be increased, or additional storage capacities have to be constructed. But even then, the existing marshalling capacities at Batumi may prove insufficient if the new facilities north of the existing yard are not finished in time.

- **Insufficient availability of RTCs with steam-jackets**: Only problematic in winter times for low viscosity cargoes. The new gantry in Batumi may solve part of this problem. However, the gantry has yet to be tested under day-to-day operations in winter conditions.
• Insufficient availability of RTC cleaning and maintenance and repair (M&R) facilities in the Caucasus: Especially in the light of the many different crude oils and products transported across the Caucasus insufficient cleaning facilities inhibit the danger of temporary non-availability of adequate RTCs. Sufficient M&R facilities are necessary to prevent a faster-than-necessary deterioration of rolling stock.

• Sensitivity of the railway networks to accidents and (smaller) natural catastrophes such as heavy rainfalls: The condition of part of the railway network makes railway transports vulnerable to accidents (e.g. derailing), flooding and wash outs etc.

In addition, there are **Natural Obstacles** such as

• weather conditions on the Caspian Sea, hindering loading activities in Aktau and unloading in Baku and especially Dubendi (Dubendi port is not as naturally sheltered as Baku port from strong Caspian winds),

• weather conditions in the Caucasus, which may affect operations along the rail track, e.g. flooding of a rail bridge as experienced in April 2003 in Azerbaijan,

• weather conditions in the Black Sea, leading to closure of the Bosporus, an thus considerable delays in vessel arrivals in Batumi,

which may hinder or even bring the transport chain to a halt. All these natural obstacles differently affect the situation along the rail transport chain. Clearly while unfriendly weather conditions on the Caspian and in the Caucasus usually leads to dripping dry Batumi Oil Terminal, the temporary closure of the Bosporus leads to massive congestion not only in Batumi but also along the rail track as obviously RTCs are loaded and sent on the Caspian side irrespective of the non-arrival or delay of vessels in Batumi.

As very important the consultants have identified the following major **Operational and Organisational Obstacles**:

• **Information process**: Lines of communication seem rather confusing, and different interview partners claimed to have the final word or at least be significantly included in decision making, even within the same institution (i.e. even parties involved cannot clearly describe the way communication works along the oil transport chain). Responsibilities within the line of communication do not seem clearly attributed. Reportedly, communication between the private operators in Baku/Dubendi and Batumi functions well, while communication with and between the railways gives room for improvement. There does not seem to exist much standardised or contractually determined communication, which makes a reliable and flexible planning rather difficult.

Moreover, the consultants have got the impression that partners do get differing information, interpret information in a different way or react on information in a different way, so that none of the transport operators have a complete picture of the traffic for the coming three to four days. Planning on a very short-term basis, i.e. maximum for the next 48 hours is extremely different for the single transport operator if only very scarce information is available. The private transport chain operators have tried to bypass this situation by establishing their own communication network which, however, has created even more communication channels.

• **Turnaround times**: A direct consequence of these gaps in the information chain seems to be that trains wait at the dispatching station for several hours (sometimes 12 hours) until they can leave for the border station. But even then, they frequently have to wait in stations for on-carriage. Often they even have to let bypass other oil trains for not always obvious reason. Thus, the journey time from leaving the terminal gate to the border station takes about 36 hours, sometimes even more. The
average roundtrip cycle Baku-Batumi-Baku is quoted with 6-8 days (one operator even quoted 10-11 days as of May 2003), however with considerable upward variance. According to information obtained from the transport chain operators about 25-30% of the RTCs travel 9 days or more (up to several weeks).

- **Price-mechanism:** The usual system-immanent price mechanism (e.g. demurrage) for delays inflicted by one of the partners along the transport chain only serves the efficient of the system if it can be enforced. So far, the consultants were given the impression that except for the operators at both ends of the transport chain, i.e. the monopolistic tanker operator in the Caspian and the monopolistic terminal operator in Batumi, no other party actually can enforce demurrage against the inflicting parties.\(^1\) The absence of an enforced price mechanism together with the perceived gaps in the information chain encourage traders to unduly use tanks and especially RTCs as cheap intermediate storage for their cargo.

- **Vessel nomination:** The “code of conduct” (if it ever was one) for not unloading cargoes respectively not loading cargoes into RTCs of customers at Baku and Dubendi who cannot present a tanker nomination in Batumi does not seem to be strictly enforced or can easily by bypassed by traders. This may be facilitated by a high percentage of transport operations other than fob Aktau/Turkmenbashi – fob Batumi. By buying transport services cpt Batumi or even daf Georgia, artificial break points are incorporated into the transport chain thus slowing down the own cargo flow, increasing round trip times and blocking scarce resources, such as RTCs. Another problem concerning a strict enforcement of the code of conduct relates to some of the major origins of cargo transshipped in Baku and Dubendi. The refinery Turkmenbashi seems to produce according to an erratic, unforeseeable production plan. Customers are sometimes notified that part of their ordered lot will be produced the coming day and they are requested to provide a vessel to receive the cargo the day after. The timing of production of the remainder of the lot is not always foreseeable. Thus, the cargo owners needs to agree with the terminal operator in Baku and Dubendi on unloading and storing the cargo until the remainder of the lot has been produced. A vessel nomination the cargo owner cannot provide as he himself will not know whether the refinery will comply with the formerly agreed production plan. Or he will have to find another solution as the terminal is not interested in long-term storage but in quickly turning the cargo in storage (if a terminal succeeds in reducing the average storage time of cargoes, it increases the throughput capacity of the whole terminal and v.v.).

- **Cargo nomination:** Also, cargo coming from the Azeri refineries is sometimes sent without proper agreement with Alegratrans/Batumi Oil Terminal. Seemingly, the key criteria is to free limited storage at the refineries for further production, however without taking into account possible storage limitations in Batumi. This cargo sometimes “vagabonds” on the line between Baku and Bjeyuk-Kjasik, and only incidentally finds its way across the border station. Once this cargo arrives in Batumi, conflicts arise between Georgian Rail and Alegratrans about unloading the RTCs, as Georgian Rail is interested to quickly turn back these RTCs to avoid paying lease fee for them, and Alegratrans not wanting to unload the cargo since it has not been scheduled for unloading (and thus not been demanded to the pulled to the terminal, see also Footnote 1).

Tracking and Tracing is not considered a problem. The railways usually roughly know where their trains and RTCs are. Only in exceptional cases, e.g. if a RTC is decoupled from a train for instant repair there exist temporary time lags during which the dispatcher loses control of this single RTC. However, almost every

\(^1\) See e.g. the legal dispute between Georgian Rail and Batumi Oil Terminal, the latter represented by their mother company Nafrans, concerning demurrage for RTCs carrying unclaimed cargoes to Batumi, which then are not unloaded and thus block Batumi station for several days or even weeks.
transport chain operator has its own tracking and tracing system, supported by staff along the track. Missing RTCs are relatively fast detected and reported to the respective company’s main server.

Tariffs do not seem a problem as actual oil transport volumes are growing fast. However, it remains to be seen if tariffs will be flexible enough if oil prices drop and additional pipeline capacities have been deployed. Whether a possible drop in the transport of crude oil volumes can be compensated by (higher-valued) oil products depends on the ability of the oil producing states around the Caspian to create additional refining capacities for exports.

Customs procedures have not been the focus of complaints of the parties involved in the transport chain, either. Most operators contract special Customs brokers who deal with Customs clearance. Only in very rare cases a train is halted longer than necessary at the border due to Customs problems. Usually, the transport chain operators send one of their staff to the border whenever one of their trains is scheduled to cross. He then takes care of any problem that may arise.

4.2 Module B

Obviously, the situation concerning Module B encountered during the inception phase significantly deviated from the situation prevailing by the time of elaborating the Terms of Reference. The consultants’ formal request to amend the Terms of Reference, which has been substantiated in the Inception Report, has been strongly supported by the Georgian Government and finally approved by the European Commission towards the end of the reporting period (effective May 2nd, 2003).

The amendment foresees that tasks related to investment planning and financial assistance should be cancelled in favour of tasks related to investigate the main funding base of the Supsa Sea Port Administration, i.e. the right to levy port dues on vessels calling at Supsa port (see above Chapter 3.2.1).

As the consultants’ proposal also included a reallocation of resources to fund the envisaged new tasks, project activities under Module B have basically been restricted to in-depth discussion with Georgian institutions on the dispute between the Georgian Government, represented by Supsa Sea Port Administration (SPA) and the terminal operator in Supsa, represented by British Petroleum (BP). Discussions centred around possible implications of failure to solve the dispute as well as different (preliminary) strategies for the Georgian side (e.g. mediation, legal case).

A time frame for the elaboration of the new tasks is about to be agreed between the consultants and the Georgian project partners of Module B. On request of the main beneficiary of Module B all information and documentation related to accomplishments of the new tasks are to be presented in a separate volume to be delivered in July 2003.

5 Project Planning for Next Reporting Period

This section refers to project planning for the next reporting period between May 6th and August 5th, 2003.

5.1 Module A

At this stage no significant changes are proposed to the broad programme of activities outlined in the Inception Report.
The consultants will discuss the results and implications of the present Progress Report on Module A with key parties involved the organisation and operation of the transport chain during a round table meeting in Baku beginning of July 2003. Based on the discussions and ideas of this meeting the consultants will start to draft a concept for improvements of oil traffic flows by rail across the Caucasus.

During the summer, the consultants will discuss certain aspects their draft concept with selected parties most affected by specific proposals to elicit their opinion and secure their support.

Moreover, if the round table in Baku proves a viable instrument to promote further cooperation between project partners and target groups, the consultants plan, provided that the European Commission consent, to organise a second meeting shortly after the end of the next reporting period. During this meeting the consultants intend to discuss their draft concept for improving corridor performance. The next reporting period will thus be also used to prepare this meeting and solicit the support of all major partners.

Depending on the results of further investigation on the necessity of introducing a new tracking and tracing system, the consultants will undertake to tender the procurement of such a system within the limitations of the project’s incidental budget foreseen for this task.

5.2 Module B

During the next reporting period the consultants will foremost concentrate their efforts on providing a written qualified opinion on options how to further proceed in the dispute between the Georgian Government and BP. This (separate) report will be submitted to and discussed with the project partners of Module B beginning of July 2003 in Tbilisi. The report is intended to support decision making of Georgian Governmental bodies expected to take place around the middle of July 2003.

It should be stresses that independent of the Governmental decision execution of project tasks as foreseen in the Terms of References can provide valuable results for further development of Supsa Sea Port Administration as it can be expected that irrespective of the resolution of the BP dispute SPA will have to fulfil tasks related to port state control, control of the aquaterritory, environmental protection, navigational safety. Thus, the consultants during the next reporting period intend to finalise the investigation of the navigational condition in and around Supsa as well as start with activities related to drafting a manual on safety of oil terminals and tanker operations.

Moreover, the consultants will start to outline a phase-wise and case-wise development of an efficient management structure for SPA.
Annexes

Annex 1  Project Progress Report
Annex 2  Resource Utilisation Report
Annex 3  Output Performance Report
Annex 4  Plan of Operations for the Next Period
Annex 5  Oil-transport Related Sea-side Infra- and Superstructure in and around the Caspian Sea
Annex 6  Oil-transport Related Storage and RTC Loading Facilities in Azerbaijan
Annex 7  Oil-transport Related Rail Facilities in Azerbaijan and Georgia
Annex 8  Oil-transport Related Terminal and Storage Facilities on the Georgian Black Sea Coast
Annex 9  Operational Procedures for Transports of Oil and Oil Products across the Caucasus
Annex 10 Cargo Flow Analysis for Oil Transports across the Caucasus
Annex 11 Environmental Aspects of Oil Transports by Rail across the Caucasus
Annex 12 Current Situation in Supsa Port
### ANNEX 1: PROJECT PROGRESS REPORT

**Project title:** Railway Transit Oil Logistical Centre  
**Project no:** EUROPEAID/113200/C/SV/Multi  
**Countries:** Azerbaijan, Georgia  
**Planning Period:** 23 February - 5 May 2003  
**Prepared on:** 3 May 2003  
**EC Consultant:** UNICONSULT-HPTI-Transpetrol Consortium

#### Project Objectives

The objective of Module A is to improve the oil flow by rail in the Caucasus by developing and implementing an alternative operational and organisational concept. The objective of Module B is to assist the Supsa Port Administration in institution building and port development.

<table>
<thead>
<tr>
<th>No</th>
<th>Activities Implemented</th>
<th>Time Frame</th>
<th>PERSONNEL</th>
<th>EQUIPMENT &amp; MATERIAL</th>
<th>OTHER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2003</td>
<td>EU Cons Planned</td>
<td>EU Cons Utilised</td>
<td>Local Cons Planned</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Describe the oil transport chain</td>
<td>XX</td>
<td>14 days</td>
<td>14 days</td>
<td>10 days</td>
</tr>
<tr>
<td>2.</td>
<td>Identify capacities, relevant stake-holders and decision makers, existing operation systems.</td>
<td>XX</td>
<td>10 days</td>
<td>10 days</td>
<td>10 days</td>
</tr>
<tr>
<td>3.</td>
<td>Describe available transport and storage facilities</td>
<td>XX XX</td>
<td>13 days</td>
<td>13 days</td>
<td>10 days</td>
</tr>
<tr>
<td>4.</td>
<td>Describe the composition of oil cargoes</td>
<td>XX X</td>
<td>15 days</td>
<td>15 days</td>
<td>15 days</td>
</tr>
<tr>
<td>5.</td>
<td>Describe the organisational setup</td>
<td>X XX XX X</td>
<td>15 days</td>
<td>15 days</td>
<td>20 days</td>
</tr>
<tr>
<td>6.</td>
<td>Elaborate a market study for oil transports.</td>
<td>X</td>
<td>5 days</td>
<td>5 days</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Update the oil traffic forecasts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Module B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Study the institutional structural design issues</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>Review of the HGA and PCOA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td>Investigate whether there exist similar cases in other parts of the world.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL:** 102 days 97 days 105 days 93 days
# ANNEX 2: RESOURCE UTILISATION REPORT

**Project title:** Railway Transit Oil Logistical Centre  
**Project no:** EUROPEAID/113200/C/SV/Multi  
**Countries:** Azerbaijan, Georgia  
**Page:** 1  

<table>
<thead>
<tr>
<th><strong>Planning Period:</strong> 23 February 2003 – 5 May 2003</th>
<th><strong>Prepared on:</strong> 3 May 2003</th>
<th><strong>EC Consultant:</strong> UNICONSULT-HPTI-Transpetrol Consortium</th>
</tr>
</thead>
</table>

**Project Objectives:** The objective of Module A is to improve the oil flow by rail in the Caucasus by developing and implementing an alternative operational and organisational concept. The objective of Module B is to assist the Supsa Port Administration in institution building and port development.

<table>
<thead>
<tr>
<th>Resources/Inputs</th>
<th>Total Planned</th>
<th>Period Planned</th>
<th>Period Realised</th>
<th>Total Realised</th>
<th>Available for Remainder</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personnel (mandays)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EU Experts</td>
<td>396</td>
<td>102</td>
<td>97</td>
<td>97</td>
<td>299</td>
</tr>
<tr>
<td>Local Experts</td>
<td>220</td>
<td>105</td>
<td>93</td>
<td>93</td>
<td>127</td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Equipment and Material</strong></td>
<td>2 PCs</td>
<td>2 b/w printers</td>
<td>2 colour printers</td>
<td>2 PCs</td>
<td>2 b/w printers</td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Other Inputs</strong></td>
<td>Euro 10,000 for purchase of tracking and tracing software</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Euro 10,000</td>
</tr>
<tr>
<td></td>
<td>Euro 20,000 for equipment of up four logistic information offices</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Euro 20,000</td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Consortium UNICONSULT-HPTI-Transpetrol  
May 2003
## ANNEX 3: OUTPUT PERFORMANCE REPORT

<table>
<thead>
<tr>
<th>Project title: Railway Transit Oil Logistical Centre</th>
<th>Project no: EUROPEAID/113200/C/SV/Multi</th>
<th>Countries: Azerbaijan, Georgia</th>
<th>Page: 1</th>
</tr>
</thead>
</table>


<table>
<thead>
<tr>
<th>Output results</th>
<th>Deviation original plan (+ or - %)</th>
<th>Reason for deviation</th>
<th>Constrains &amp; Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The transport chain of oil and oil products transported by rail across the Caucas along the TRACECA corridor (Caucasian section) has been investigated and described and an existing traffic forecast for oil transports by rail is updated</td>
<td>completed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Customs and border police timely provide information relevant for the project and do not hinder project execution.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Georgian and Azeri Railways, the ports of Baku and Batumi as well as Caspian Shipping Company timely provide relevant information and support the project.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Access to state-owned facilities (including those of state-owned companies) relevant to the execution of project work is granted.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>All parties involved in oil transport by rail (target groups as well as project partners, customs and border police) cooperate.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Procurement procedure leads to feasible offers concerning equipment and software within the given budget.</td>
</tr>
<tr>
<td>2. Technical, operational and organisational bottlenecks and inefficiencies have been identified and investigated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. A sustainable, tailor-made oil-transport- by-rail-logistics concept has been prepared and discussed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- An administrational and organisational set-up has been developed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- An operations concept has been developed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Communication links and interfaces have been designed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- A marketing concept and customer relations function has been designed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Responsibilities are clearly and efficiently attributed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 October 2003</td>
</tr>
<tr>
<td></td>
<td>5 May 2003</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. The concept is being implemented</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 December 2003</td>
</tr>
</tbody>
</table>

Consortium UNICONSULT-HPTI-Transpetrol
May 2003
<table>
<thead>
<tr>
<th>Output results</th>
<th>Deviation original plan (+ or %)</th>
<th>Reason for deviation</th>
<th>Constrains &amp; Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. The port is able to establish an efficient management structure</td>
<td>5 November 2003</td>
<td>Port management supports the development and implementation of a new structure and deploys port managers for the project to enable mutual elaboration of a new port management structure</td>
<td></td>
</tr>
<tr>
<td>6. Supsa Port is able to render services according to international standards</td>
<td></td>
<td>Harbour master department and operations manager and personnel cooperate in the implementation of the safety manual</td>
<td></td>
</tr>
<tr>
<td>7. An oil terminal and tanker safety manual has been prepared and handling safety measures are implemented</td>
<td>5 November 2003</td>
<td>Resources for this output are allocated to Output 12</td>
<td></td>
</tr>
<tr>
<td>8. The port is able to define an optimal programme of future development of the port</td>
<td>ELIMINATED</td>
<td>Resources for this output are allocated to Output 12</td>
<td></td>
</tr>
<tr>
<td>9. The port is able to attract investment for future development</td>
<td>ELIMINATED</td>
<td>Resources for this output are allocated to Output 12</td>
<td></td>
</tr>
<tr>
<td>10. Navigational and vessel safety in the port and its approaches is assured</td>
<td>5 August 2003</td>
<td>Parts of resources for this output are allocated to Output 12</td>
<td></td>
</tr>
<tr>
<td>11. Pollution prevention and pollution combating measures are in place, an oil pollution contingency plan has been prepared</td>
<td>5 November 2003</td>
<td>Results will be submitted by separate report to project beneficiaries of Module B</td>
<td></td>
</tr>
<tr>
<td>12. The Supsa Port Administration knows in what base she would be allowed to levy charges on vessels calling at Supsa Port</td>
<td>15 July 2003</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Port management supports the development and implementation of a new structure and deploys port managers for the project to enable mutual elaboration of a new port management structure. Harbour master department and operations manager and personnel cooperate in the implementation of the safety manual. Resources for this output are allocated to Output 12. Parts of resources for this output are allocated to Output 12. Results will be submitted by separate report to project beneficiaries of Module B.
### Annex 4: Plan of Operations for the Next Period

**Project Title:** Railway Transit Oil Logistical Centre  
**Project No:** EUROPEAID/113200/C/SV/Multi  
**Countries:** Azerbaijan, Georgia  
**Planning Period:** 6 May - 5 August 2003  
**Prepared on:** 3 May 2003  
**EC Consultant:** UNICONSULT-HPTI-Transpetrol Consortium

**Project Objectives:**
- The objective of Module A is to improve the oil flow by rail in the Caucasus by developing and implementing an alternative operational and organisational concept.
- The objective of Module B is to assist the Supsa Port Administration in institution building and port development.

<table>
<thead>
<tr>
<th>No</th>
<th>ACTIVITIES</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>August</th>
<th>EC Cons</th>
<th>Local Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Further update oil traffic forecast</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>5 days</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Identify and discuss weaknesses and chokepoints in operational procedures, organisational setup and technical characteristics</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>15 days</td>
<td>5 days</td>
</tr>
<tr>
<td>9</td>
<td>Prepare draft recommendations on the above and discuss them with key parties</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>25 days</td>
<td>5 days</td>
</tr>
<tr>
<td>14</td>
<td>Prepare recommendations on efficient management structure</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>10 days</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Prepare oil tankers and operations safety manual</td>
<td>X X</td>
<td></td>
<td></td>
<td></td>
<td>9 days</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Advise on issues of navigational safety</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>12 days</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Review of the HGA and PCOA</td>
<td>X X</td>
<td></td>
<td></td>
<td></td>
<td>5 days</td>
<td>15 days</td>
</tr>
<tr>
<td>26</td>
<td>Investigate whether there exist similar cases in other parts of the world.</td>
<td>X X</td>
<td></td>
<td></td>
<td></td>
<td>5 days</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Investigate in how far in other parts of the world vessel and vessel owners calling at SPMs are charged with vessel and port dues.</td>
<td>X X</td>
<td></td>
<td></td>
<td></td>
<td>10 days</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Elaborate on international practice</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>5 days</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Elaborate in how far international practice and specific examples can be transferred to the Supsa case.</td>
<td>X X</td>
<td></td>
<td></td>
<td></td>
<td>5 days</td>
<td>10 days</td>
</tr>
</tbody>
</table>

EC Consultant: UNICONSULT-HPTI-Transpetrol  
May 2003
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>X</th>
<th>10 days</th>
<th>15 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>30.</td>
<td>Elaborate in how far the existing Georgian port regulations support the SPA’s funding approach.</td>
<td></td>
<td></td>
<td>Total</td>
<td>116 days</td>
</tr>
</tbody>
</table>
ANNEX 5: Oil-transport Related Sea-side Infra- and Superstructure in and around the Caspian Sea

1 Introduction

The following gives a brief overview on the major players operating on the Caspian Sea and their “floating stock”, i.e. the vessels they deploy for the shipment of oil and oil products across the Caspian. Moreover, it provides an insight into the seaside handling facilities on both sides of the Caspian Sea. Information has been derived from interviews with Azeri and Kazakh experts as well as from previous studies elaborated within the framework of Tacis TRACECA. Moreover, the consultants have closely reviewed press releases and Caspian and international news services specialized on transport issues in order to verify and update information.

2 Ship Operators, Tankers and Rail Ferries

2.1 Azerbaijan

CASPAR, by far the most important player in the Caspian shipping market, currently owns 7 rail ferries of Dagestan Type, 33 tankers (plus one tanker registered as water carrier) of between 4,800 and 12,300 tdw, and a number of dry cargo and RoRo vessels. Some of these vessels are currently operating in the Black and/or Mediterranean Seas. The dead-weight capacity of the CASPAR fleet operating in the Caspian amounts to 350,000 tons. CASPAR vessels serve all Caspian Sea ports. It runs all rail ferry services in the Caspian Sea (Baku – Aktau/Turkmenbashi), and at the time of writing has a quasi-monopoly of carrying oil from the east coast of the Caspian Sea to Baku/Dubendi.

In 2002, CASPAR transported 7.31 mn tonnes of oil and oil products, of which 5.93 million tonnes were transported from the Caspian east coast to Baku/Dubendi, 621 thousand tonnes to Neka and 758 thousand tonnes to Makhachkala. In the first quarter 2003, CASPAR tankers carried 1.77 mn tonnes of oil and oil products across the Caspian Sea, which is an increase of almost 38 percent compared to the same period of 2002. Ninety percent (1.61 mn tonnes) of these shipments were operated between the Caspian east coast and the ports of Baku/Dubendi, eight percent (146 thousand tonnes) involved Iranian ports, the remainder was carried to Makhachkala.

The tanker fleet of CASPAR consists of basically three vessel sizes: 21 vessels with a capacity of roughly 5,000 tdw (Shikhinsky class), 9 vessels of 7,400 tdw (Absheron class), and 3 vessels of 12,334 tdw (Memmedov class). In addition there is one vessel, the Port Ilich, which has 4600 tdw. The aggregate carrying capacity of the CASPAR tanker fleet adds up about 200,000 tonnes, which should be sufficient to carry around 15-16 mn tonnes p.a. (depending on deployment routes) between the Caspian east and west coast, even though draft restrictions in Caspian seaports prevent the use of the Memmedov class tankers to full capacity.

With an average age of around 20 years the CASPAR tanker fleet can be considered rather old. CASPAR has reacted and initiated a modernisation programme for the existing tankers as well as ordered four new tankers, two of 8,000 tdw and two of 12,000 tdw. The first 8,000 tdw tanker is to be delivered in August 2003, the last 12,000 tdw tanker by the end of 2004. The new tankers will increase the annual capacity by slightly over 2 mn tonnes p.a. (limited by a.m. draft restrictions)
Of the Memmedov-type are at present three tankers listed with the Russian Register of Shipping. All three are sailing in the Caspian Sea area. Memmedov tankers are single hull, but the a.m. fleet modernisation programme intends to upgrade these tankers with double hull. By the time of writing the Shamkhor had already entered the dock, the Aslanov and Memmedov will follow suit.

Table 1: CASPAR Tankers of Memmedov Type

<table>
<thead>
<tr>
<th>Name</th>
<th>IMO No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gafur Memmedov</td>
<td>7235496</td>
</tr>
<tr>
<td>General Aslanov</td>
<td>7431296</td>
</tr>
<tr>
<td>Shamkhor</td>
<td>7610971</td>
</tr>
</tbody>
</table>

Table 2: Details on Memmedov-Type Tankers

<table>
<thead>
<tr>
<th>Class</th>
<th>Russian Maritime Register of Shipping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Tanker</td>
</tr>
<tr>
<td>Port of Registry</td>
<td>Baku</td>
</tr>
<tr>
<td>Ship owner</td>
<td>Caspian Shipping Company</td>
</tr>
<tr>
<td>Years built</td>
<td>1972 up to 1980</td>
</tr>
<tr>
<td>Flag</td>
<td>Azerbaijan Republic</td>
</tr>
<tr>
<td>Length over all</td>
<td>146.64 m</td>
</tr>
<tr>
<td>Breadth</td>
<td>17.38</td>
</tr>
<tr>
<td>Draught</td>
<td>8.00 m</td>
</tr>
<tr>
<td>GRT</td>
<td>8,521</td>
</tr>
<tr>
<td>NRT</td>
<td>3,937</td>
</tr>
<tr>
<td>DWT all told</td>
<td>12,334</td>
</tr>
<tr>
<td>No. of tanks</td>
<td>Seven</td>
</tr>
<tr>
<td>Total capacity of cargo tanks</td>
<td>14,700 m³</td>
</tr>
<tr>
<td>Pumps</td>
<td>3 x 859 cbm</td>
</tr>
<tr>
<td>Bunker</td>
<td>616 tonnes</td>
</tr>
<tr>
<td>Total fuel consumption per day</td>
<td>18 tonnes diesel (at 13 knots)</td>
</tr>
<tr>
<td>Port: generator consumption per day</td>
<td>4 tonnes diesel while discharging, 1 tonne t at port</td>
</tr>
<tr>
<td>Engine</td>
<td>Total power output 2 x 2,500 hp</td>
</tr>
<tr>
<td>Speed</td>
<td>13.7 knots</td>
</tr>
</tbody>
</table>

CASPAR owns 9 Absheron-type tankers, all of which classed by the Russian Register of Shipping. All vessels trade in the Caspian Sea. Absheron type tankers are single hull with double bottom. The projected refurbishment programme will upgrade all Absheron tankers to double hull until 2009. By the time of writing, the Khazar and Lenkoran were undergoing capital repair.

Table 3: CASPAR Tankers of Absheron Type

<table>
<thead>
<tr>
<th>Name</th>
<th>IMO No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ali Bayramov</td>
<td>8506907</td>
</tr>
<tr>
<td>Absheron</td>
<td>8404654</td>
</tr>
<tr>
<td>Araz</td>
<td>8724755</td>
</tr>
<tr>
<td>Astara</td>
<td>8724858</td>
</tr>
</tbody>
</table>
Table 4: Details on Absheron-Type Tankers

<table>
<thead>
<tr>
<th>Class</th>
<th>Russian Maritime Register of Shipping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Tanker</td>
</tr>
<tr>
<td>Port of Registry</td>
<td>Baku</td>
</tr>
<tr>
<td>Ship owner</td>
<td>Caspian Shipping Company</td>
</tr>
<tr>
<td>Years built</td>
<td>1983 up to 1989</td>
</tr>
<tr>
<td>Flag</td>
<td>Azerbaijan Republic</td>
</tr>
<tr>
<td>Length over all</td>
<td>146.88 m</td>
</tr>
<tr>
<td>Breadth</td>
<td>17.4</td>
</tr>
<tr>
<td>Draught</td>
<td>4.50; no. 5 &amp; 9: 5.30 m</td>
</tr>
<tr>
<td>GRT</td>
<td>5,944, no. 5 &amp; 9: 6,052</td>
</tr>
<tr>
<td>NRT</td>
<td>2,070</td>
</tr>
<tr>
<td>DWT all told</td>
<td>5,512 / 7,410</td>
</tr>
<tr>
<td>No. of tanks</td>
<td>3 x 3</td>
</tr>
<tr>
<td>Total capacity of cargo tanks</td>
<td>7.980 m³</td>
</tr>
<tr>
<td>Pumps</td>
<td>2 x 850 cbm</td>
</tr>
<tr>
<td>Bunker, heavy oil and diesel</td>
<td>314 / 134 tonnes</td>
</tr>
<tr>
<td>Total fuel consumption per day</td>
<td>16.8 tonnes (at 13 knots)</td>
</tr>
<tr>
<td>Port: generator consumption per day</td>
<td>2.4 tonnes</td>
</tr>
<tr>
<td>Engine:</td>
<td>Total power output 2 x 2.080 hp</td>
</tr>
<tr>
<td>Speed</td>
<td>13.3 knots</td>
</tr>
</tbody>
</table>

Table 5: CASPAR Tankers of Shikhlinsky Type

<table>
<thead>
<tr>
<th>Name</th>
<th>IMO No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.A. Bakykhanov</td>
<td>8328721</td>
</tr>
<tr>
<td>Gehreman Esedov</td>
<td>8227898</td>
</tr>
<tr>
<td>Gehreman Hajiyev</td>
<td>8507248</td>
</tr>
<tr>
<td>Gehreman Hesonov</td>
<td>7941679</td>
</tr>
<tr>
<td>Gehreman Huseynov</td>
<td>8507262</td>
</tr>
<tr>
<td>Gehreman Israfil Mamedov</td>
<td>8135021</td>
</tr>
<tr>
<td>Gehreman Khelilbeyli</td>
<td>8507274</td>
</tr>
<tr>
<td>General Abbasov</td>
<td>8727379</td>
</tr>
<tr>
<td>General Heydarov</td>
<td>8033833</td>
</tr>
<tr>
<td>General Mehmandarov</td>
<td>8133619</td>
</tr>
<tr>
<td>General Selimov</td>
<td>7833250</td>
</tr>
<tr>
<td>General Shykhlinski</td>
<td>7832854</td>
</tr>
</tbody>
</table>

CASPAR currently owns 21 tankers of Shikhlinsky-type (ex Oleg Koshevoy, improved modification of the Volgoneft type). All 21 tankers are registered with the Russian Register of Shipping, and all are sailing in the Caspian Sea. Shikhlinsky-type tankers are constructed as double hull.
Table 6: Details on Shikhlinsky-Type Tankers

<table>
<thead>
<tr>
<th>Class</th>
<th>Russian Maritime Register of Shipping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Tanker</td>
</tr>
<tr>
<td>Port of Registry</td>
<td>Baku</td>
</tr>
<tr>
<td>Ship owner</td>
<td>Caspian Shipping Company</td>
</tr>
<tr>
<td>Years built</td>
<td>1980 up to 1988</td>
</tr>
<tr>
<td>Flag</td>
<td>Azerbaijan Republic</td>
</tr>
<tr>
<td>Length over all</td>
<td>124.97 m</td>
</tr>
<tr>
<td>Breadth</td>
<td>16.63</td>
</tr>
<tr>
<td>Draught</td>
<td>4.15 m</td>
</tr>
<tr>
<td>GRT</td>
<td>4,134 up to 4,185</td>
</tr>
<tr>
<td>NRT</td>
<td>1,763</td>
</tr>
<tr>
<td>DWT all told</td>
<td>4,987</td>
</tr>
<tr>
<td>Total capacity of cargo tanks</td>
<td>5,903 m³</td>
</tr>
<tr>
<td>Pumps</td>
<td>2 x 850 cbm</td>
</tr>
<tr>
<td>Bunker, heavy oil and diesel</td>
<td>190 / 79 tonnes</td>
</tr>
<tr>
<td>Total fuel consumption per day</td>
<td>10.0 tonnes gasoil (at 12 knots)</td>
</tr>
<tr>
<td>Port: generator consumption per day</td>
<td>2.0 tonnes gasoil</td>
</tr>
<tr>
<td>Engine:</td>
<td>One engine, total power output 3,000 hp</td>
</tr>
<tr>
<td>Speed</td>
<td>12.3 knots</td>
</tr>
</tbody>
</table>

Moreover, the consultants wish to acknowledge that part of the oil transport across the Caspian Sea is operated by rail ferries from Turkmenbashi and Aktau to Baku. CASPAR owns and operates seven rail ferries (one ferry, the Mercury II has been lost in October 2002 in a violent storm), currently one to Aktau and six to Turkmenbashi on more or less regular schedule with about 12-14 departures from Baku per week.

During 2002, CASPAR rail ferries transported more than 2 mn tonnes from Turkmenbashi and Aktau to Baku, which constitutes an almost doubling of volumes compared to 2001. Main driver of this development was an increase in the shipment oil and oil products in rail tank cars from Kazakhstan and Turkmenbashi.

All CASPAR ferries are of the Dagestan type and are classed by the Russian Maritime Register of Shipping. One ferry can carry up to 28 rail cars. During the last two years the carriage of rail tank cars (RTCs) from the Caspian east coast to Baku has been the major business of the ferries.
### Table 7: Details on Dagestan-type Ferries

<table>
<thead>
<tr>
<th>Class</th>
<th>Russian Maritime Register of Shipping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>RoRo Cargo Passenger</td>
</tr>
<tr>
<td>Port of registry</td>
<td>Baku</td>
</tr>
<tr>
<td>Ship owner</td>
<td>Caspian Shipping Company</td>
</tr>
<tr>
<td>Flag</td>
<td>Azerbaijan</td>
</tr>
<tr>
<td>Years built</td>
<td>1984 and 1986</td>
</tr>
<tr>
<td>Where built</td>
<td>Yugoslavia</td>
</tr>
<tr>
<td>Minimum number of crew</td>
<td>16, actual crew on board 40 to 44</td>
</tr>
<tr>
<td>Number of passengers</td>
<td>Cabins: 84; other passengers 118</td>
</tr>
<tr>
<td>Number of persons certified to carry</td>
<td>256</td>
</tr>
<tr>
<td>Length / Article 2(8)</td>
<td>147.00 m</td>
</tr>
<tr>
<td>Length over all</td>
<td>154.50 m</td>
</tr>
<tr>
<td>Breadth</td>
<td>17.50 m</td>
</tr>
<tr>
<td>Breadth over all</td>
<td>18.30 m</td>
</tr>
<tr>
<td>Depth</td>
<td>13.45 m</td>
</tr>
<tr>
<td>Free board</td>
<td>3,281 mm</td>
</tr>
<tr>
<td>Draught</td>
<td>4.20 m</td>
</tr>
<tr>
<td>GRT</td>
<td>11,450</td>
</tr>
<tr>
<td>NRT</td>
<td>3,435</td>
</tr>
<tr>
<td>Dead-weight all told</td>
<td>3,364 to 3,985</td>
</tr>
<tr>
<td>Lane meters / rail car capacity</td>
<td>420 m / 28 standard wagons</td>
</tr>
<tr>
<td>Car carrying capacity, type Lada</td>
<td>70</td>
</tr>
<tr>
<td>Ramp</td>
<td>Stern flap, clear height 5.5 m, width 15 m</td>
</tr>
<tr>
<td>Fuel consumption per day sailing</td>
<td>30 tonnes heavy fuel at 17 knots (reduced engines)</td>
</tr>
<tr>
<td>Port: Generator consumption per day</td>
<td>1 tonne diesel per generator</td>
</tr>
<tr>
<td>Engine</td>
<td>Internal combustion engines</td>
</tr>
<tr>
<td></td>
<td>2 engines, reduced to 2 x 3.200 KW</td>
</tr>
<tr>
<td>Speed</td>
<td>17 knots</td>
</tr>
</tbody>
</table>

#### 2.2 Kazakhstan

Kazakhstan currently has one shipping operator, Kazmorthranslot, which also controls most of the oil handling operations in the only Kazakh seaport of Aktau. Kazmorthranslot does not own vessels but rather operates a total of 10 vessels in time charter reportedly from CASPAR and Russian shipping companies in the Caspian Sea, as well as through their joint venture with Novoship, Oil Stream Shipping, in the Black Sea. Moreover, Kazmorthranslot is reported to have teamed up with the Iranian Caspian operator Khazar Shipping for the purchase of new tankers for operation in the Caspian Sea. According to information obtained from the Marketing Department of Aktau port, Kazmorthranslot has already put on order for the purchase of three 12,000 tdw tankers.

In 2002, vessels chartered by Kazmorthranslot transported 3.2 mn tonnes of crude oil across the Caspian, of which 1.3 mn tonnes to Makhachkala (Russia, for on-carriage to Novorossisk), 1.4 mn tonnes to Baku/Dubendi (Azerbaijan, for on-carriage to Batumi), and 0.5 mn tonnes to Neka (for on-carriage to Teheran).
2.3 Turkmenistan

Turkmen operator Turkmen Shipping Company (based in Turkmenbashi), who has recently merged with Turkmen Inland Shipping Company, owns several dry cargo vessels of about 3000 tdw each. Beginning of 2002, the company has set sail its first tanker of 5,000 tdw, the General Atamurat Niyazov, built in Turkey, and sailing at a speed of up to 11 knots. The tanker is designated to ship crude oil between Okarem and Turkmenbashi, and Turkmen ports and Neka, where it is fed into the pipeline to Teheran refineries. Reportedly, Turkmen Shipping Company holds options for four additional tankers.

2.4 Russian Operators

Russia has a very large fleet of river-sea type ships of which the majority trades within the vast Russian system of rivers and other interior waterways. Also, many of the shipping companies operating those vessels serve traditional trading routes. However, this does not mean that their ships will never enter the Caspian Sea. A total of 200 Russian ships have Caspian ports of register, but this number includes many small vessels exclusively deployed in the domestic coastal and river trades. The consultant does not have an exact overview on how many Russian tankers are currently operating in the Caspian Sea and how much liquid bulk they transported in 2002, but it can be assumed that Russian shipping lines can make available additional capacities if demand requires.

The main Russian tanker operator in the Caspian Sea is Volgotanker, a Russian company based in Samara, owning i.a. 205 tankers (i.e. 113 tankers of Volgoneft class, and 49 of Nefterudovoz class, as well as several tankers of the smaller soviet TN and TR type). As the company name suggests, Volgotanker’s man business activity is carrying liquid bulk commodities, mainly oil and derivatives. But only a rather limited number of its suitably sized river-sea tankers is operating in the Caspian Sea. Volgotanker is also very active on the rivers Kama, Don, Dnieper, Danube and their tributaries. At the time of the consultants’ field research Volgotanker ships served all Caspian oil ports except Baku/Dubendi. Volgotanker have recently concentrated on taking oil and products from the Caspian east coast ports of Turkmenbashi and Aktau to Russian ports, especially to Makhachkala and to Iran. Thus, Volgotanker, as all other Russian tanker operator in the Caspian is currently not engaged in the operating on the TRACECA route, since calling at Baku/Dubendi is considered difficult and expensive for non-Azeri flag tankers.

Volgotanker mainly operates the Volgoneft (around 4,600 tdw) and Nefterudovoz (around 3,100 tdw) type of vessels. Those tankers are twin-screw motor vessels deployed in carrying crude oil and oil products of any grade through the Volga River system and navigable canals of the Russian Federation to the river ports and the ports of the Black Sea and Baltic Sea, as well as to the Russian ports on the Caspian Sea. Volgoneft tankers have twin hulls. Reportedly, all Volgotanker vessels comply with ISM and are having required certificates and pollution insurance. Each vessel has tier 1 pollution equipment including oil booms.

Volgotanker JSC will focus on renovation rather than newbuilding. The reason is reportedly the unpredictable federal policy in the sphere of railway tariff regulation, as the railroad is Volgotanker’s major rival on the transportation market. In order to stay competitive during the navigation period, inland shipping tariffs have to be 10-20 percent lower than railway tariffs. In 2001, the state changed the game rules by canceling the export railway tariffs, which considerably worsened the competitiveness of the river transport. According to Volgotanker management it is thus, uneconomic to invest into the construction of new tankers, as they will never pay back.

The renovation program provides for a sectional repair of tankers of the Volgoneft type: during the winter period, old sections will be replaced with new ones built by shipyards and dockyards during the summer.
period. Until 2007, around 60 units will be renovated, of which however only a limited number will be tankers, since e.g. all Volgoneft tankers are scheduled for renovation at a later date.

### Table 8: Details on Volgoneft-Type Tankers

<table>
<thead>
<tr>
<th>Class</th>
<th>Russian River Register and Russian Maritime Register of Shipping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Tanker</td>
</tr>
<tr>
<td>Ship owner</td>
<td>Majority of tankers belong to JSC “Volgotanker”</td>
</tr>
<tr>
<td>Years built</td>
<td>1967 until 1983, afterwards only a handful of tankers</td>
</tr>
<tr>
<td>Where built</td>
<td>Russia, Bulgaria</td>
</tr>
<tr>
<td>Flag</td>
<td>Russia</td>
</tr>
<tr>
<td>Minimum number of crew</td>
<td>16</td>
</tr>
<tr>
<td>GT</td>
<td>3,600</td>
</tr>
<tr>
<td>NT</td>
<td>1,760</td>
</tr>
<tr>
<td>DWT</td>
<td>4,600-5,000</td>
</tr>
<tr>
<td>Carrying capacity</td>
<td>up to 4,800</td>
</tr>
<tr>
<td>Capacity m³</td>
<td>6,562</td>
</tr>
<tr>
<td>Number of tanks</td>
<td>12</td>
</tr>
<tr>
<td>Length over all m</td>
<td>132.6</td>
</tr>
<tr>
<td>Breadth, m</td>
<td>16.9</td>
</tr>
<tr>
<td>Draught</td>
<td>3.65</td>
</tr>
<tr>
<td>Main engines:</td>
<td>2 x 1,000 hp</td>
</tr>
<tr>
<td>Bunker gasoil</td>
<td>120 tonnes</td>
</tr>
<tr>
<td>Total fuel consumption per day sailing</td>
<td>8 tonnes gasoil</td>
</tr>
<tr>
<td>Port: Generator consumption per day</td>
<td>1 tonne gasoil and 3 tonnes gasoil when discharging</td>
</tr>
<tr>
<td>Speed, knots</td>
<td>9.8 (21 empty)</td>
</tr>
</tbody>
</table>

### Table 9: Details on Neferudovoz-Type Tankers

<table>
<thead>
<tr>
<th>Class</th>
<th>Russian River Register and Russian Maritime Register of Shipping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Tanker</td>
</tr>
<tr>
<td>Ship owner</td>
<td>Majority of tankers belong to JSC “Volgotanker”</td>
</tr>
<tr>
<td>Years built</td>
<td>1968 until 1986, after 1986 three additional</td>
</tr>
<tr>
<td>Where built</td>
<td>Russia</td>
</tr>
<tr>
<td>Flag</td>
<td>Russia</td>
</tr>
<tr>
<td>Minimum number of crew</td>
<td>16</td>
</tr>
<tr>
<td>GT</td>
<td>2,600-2,900</td>
</tr>
<tr>
<td>NT</td>
<td>1,100-1,500</td>
</tr>
<tr>
<td>DWT</td>
<td>2,800-3,300</td>
</tr>
<tr>
<td>Carrying capacity</td>
<td>3,100-3,300</td>
</tr>
<tr>
<td>Length over all m</td>
<td>119-120</td>
</tr>
<tr>
<td>Breadth, m</td>
<td>13.4</td>
</tr>
<tr>
<td>Draught</td>
<td>3.8</td>
</tr>
<tr>
<td>Main engines:</td>
<td>1,320 KW</td>
</tr>
<tr>
<td>Speed, knots</td>
<td>20 (empty)</td>
</tr>
</tbody>
</table>
The Russian tanker fleet operating in the Caspian Sea is presumably on average more outdated than the Azeri fleet. Not much is known about the condition and quality of regular maintenance cycles. But to the consultant’s knowledge there have been no reports about accidents in the Caspian Sea involving Russian vessels, nor have there been complaints about the condition of the vessels from customers or port authorities. Also, there is also a limited number of more recently constructed river-sea tankers (in the 1990ties), especially operated by Lukoil (operating a tank farm in Astrakhan) and Gazprom, which may also selectively be deployed in the Caspian Sea.

2.5 Iran

The Iran does not own and operate tankers in the Caspian Sea.

3 Ports and Port Infrastructure

3.1 Azerbaijan

Dubendi
A thorough investigation into the facilities of Dubendi Port has been undertaken within the frame of the TRACECA Traffic and Feasibility Studies, Module E (here: Inception Report, Annex 4: Dubendi Facilities: Inventory and Evaluation, June 2000). The consultants therefore refrain from a detailed description of the facilities and just note changes that have occurred since the a.m. investigation.

Dubendi port was designed as an oil port designated to relieve Baku Port. It has 5 jetties, of which 2 jetties (no. 2 and 5) are not operational due to poor technical condition. Jetty no. 4 is used for berthing supply and support vessels, while jetties no 1 and 3 are operated by BISP in cooperation with Dubai-based Middle East Petroleum. Each jetty has two berths. All infrastructures are owned by BISP, while the equipment is owned by SOCAR (except for Pier 4, where also the equipment is owned by BISP). Jetties no 1 and 3 have been leased out to Middle East Petroleum, which have taken over the facilities from the former Turkish operator Caspian Transco. Middle East Petroleum has undertaken refurbishment of jetty no 1, now used for crude oil and black products, and no. 3 (finalised in May 2003), used for white products. All oil handling jetties are connected by pipeline to the adjacent Dubendi tank farm (see Annex 6), the majority of which is currently also operated and rehabilitated by Middle East Petroleum.

The current available draught in port is about 8m but a shoal in the access restricts ships’ maximum draught to about 6.5m. The elimination of the shoal is projected since years. The port offers its services all year around, but bad weather conditions usually forces the port to close down for about 30-40 days p.a. Due to the draft restrictions (which also apply to other Caspian ports), the terminal cannot make use of its full potential. Thus, the annual unloading capacity of the four berths currently under operation is estimated at around 10-11 mn tonnes. The rehabilitation of jetties no. 2 and 5, for which a feasibility study has already been prepared, may boost Dubendi’s sea-side handling capacity up to over 20 mn tonnes p.a.

It takes about 8-10 hours to turn around a 5,000-tdw tanker, 11-13 hours for a 7,000 tdw tanker, and 14-16 hours for a 12,000 tdw tanker (partly laden up 9,500 tonnes due to draft restrictions in load ports). All times include 3 hours for paper works.

In 2002, 1.72 mn tonnes of oil and oil products went through Dubendi terminal. This was a decrease of 35 percent from 2.62 mn tonnes compared to 2001 due to the opening of the CPC and the subsequent

Consortium UNICONSULT-HPTI-Transpetrol
May 2003
reduction of cargo from Tengiz oil field. Oil shipments from Kazakhstan decreased by 77 percent to 476 thousand tonnes, while Turkmen oil more than doubled to 1.18 mn tonnes. The remainder were domestic volumes shipped from Baku to Dubendi, e.g. jet fuel from the Baku refineries for Baku airport, which is connected by pipeline to Dubendi tank farm. For the year 2003, the operator expects to handle about 3 mn tonnes.

In the first quarter of 2003, Dubendi handled 550 thousand tonnes of crude oil and oil products brought by tankers to Dubendi, an increase of 100 percent compared to the same period in 2002, partly due to the mild weather and recently improved handling procedures on the transport chain between Baku and Batumi. The majority of cargo came from Turkmenistan (over 440 thousand tonnes), while Kazakh oil accounted for about 100 thousand tonnes. The remainder was Azeri cargo shipped between Baku and Dubendi.

**Baku Port**

In Baku Bay three terminals receive oil and oil products, but only one is operated by BISP, the ferry terminal. The ferry terminal is starting and endpoint for the rail ferry communication with Aktau and Turkmenbashi and has two berths equipped with rail ferry ramps. A rehabilitation project of the ferry terminal is intended to start very soon.

Currently there are about 14 - 16 departures per week, 12 - 14 to Turkmenbashi and 2 to Aktau. The number of departures to Aktau has been reduced compared to 2002, when 4-5 departures per week were offered, due to the loss of the Mercury II. In 2002 2.87 mn tonnes of cargo were handled, of which 1.68 mn tonnes were oil and oil products. 665 thousand tonnes came from Aktau, 1.02 mn tonnes from Turkmenbashi.

During the first quarter of 2003, the ferry terminal handled more than 800 thousand tonnes, an estimated 500 thousand tonnes of which were oil and oil products.

According to information obtained from the port management, ferries can be turned around within two hours, restrictions being only the paper work. Loading and unloading can be performed within 45 minutes.

**Azpetrol Sea Terminal in Baku Bay**

Azpetrol terminal in Baku started operation on April 2002 after rehabilitating the former timber terminal of BISP, thus all facilities are new and of modern technique. The seaside terminal has three berths, two of which can accommodate tankers of up to 12,000 tdw. It takes about 8-10 hours to turn around a 5,000-tdw tanker, 11-13 hours for a 7,000 tdw tanker, and 14-16 hours for a 12,000 tdw tanker (partly laden up 9,500 tonnes due to draft restrictions in load ports)

The annual unloading capacity of the terminal is estimated at 10 mn tonnes of oil and oil products. The sea terminal is connected to the adjacent Azpetrol tank farm and RTC loading station (see Annex 6)

During nine month operation in 2002 the sea terminal unloaded 4 mn tonnes of oil and oil products, about 50 percent from Aktau (crude oil) and 50 percent from Turkmen ports (50 percent crude oil, 50 percent oil products).

After opening of the new Azpetrol Terminal in Sangachal, the Baku Terminal will concentrate their business activities mainly (but not exclusively) on unloading oil products.

**Azneftyak Terminal in Baku Bay**

Adjacent to west of the Azpetrol terminal is the seaside access of the old Baku refinery Azneftyak.
Azpetrol Sangachal Terminal
The Azpetrol Sangachal Terminal will start operation in May 2003. The sea side terminal facilities consist of 2 berths for 12,000 tdw tankers (finalised), and two berths able to accommodate 15-16,000 tdw tankers (under construction). The terminal is connected to the adjacent Azpetrol Sangachal Tank Farm and RTC loading facility (see Annex 6), which is designated to handle crude oil from Kazakhstan and Turkmenistan only. The piers are equipped with modern fire-fighting and safety equipment (e.g. quick release couplings).

Given the composition of the tanker fleet currently operating in the Caspian Sea, the capacity of the seaside access is estimated at 12 mn tonnes. However, as the depth at berth is reportedly dredged to -9m, the deployment of larger vessels will also have a positive effect on the maximum capacity of the seaside terminal. The terminal has bought their own tugboat in order not to be dependent on availability of tugs from Baku port. The tug is currently under rehabilitation.

3.2 Kazakhstan
In 2002, Aktau Port handled 6.3 mn tonnes of cargo, about 5.6 mn tonnes of which were oil and oil products, an increase against 5.4 million tones of oil in 2001 and 3.4 million tones in 2000.

In April 2003, Kazmortransflot, the operator of the Aktau oil berths 4, 5 (the latter is for the moment not operational) and 9, closed down berths 4 and 5 for reconstruction of the pier. With the reconstruction of the pier the port ’s maximum oil handling capacity will increase from around 8 mn tonnes (including berth no. 10, which is operated by the port itself, and the ferry terminal) to 11 mn tonnes p.a. The closure of berth 4 and 5 will negatively affect the transshipment volumes via Aktau in 2003, so that most likely the port management’s expectation to handle up to 6 mn tonnes of oil and oil products in 2003 may not be met. In order to relieve the envisaged temporary shortcomings in oil handling facilities the port intends to use part of ferry terminal as oil terminal whenever there is no ferry berthing. A pipeline connection to the berth has already been laid.

Due to draft restrictions the largest CASPAR tankers (carrying capacity of 11,500 tonnes) can only be handled at berth no. 10, but even there they can only be uploaded to about 8,500-9,000 tonnes. The port intends to start construction of two additional oil berths (11 and 12) in 2003. However, these additional handling capacities may not be available before 2006/7.

Moreover, Kazakhstan plans to construct a new oil handling facilities near Kuryk, just south of Aktau. Kazmortransflot is currently engaged in pre-feasibility studies for the creation of an oil terminal with an annual capacity of 5 mn tonnes. However, much will depend on the cooperation of the Azeri side since it is intended to ship Kazakh oil to Baku as input for Azeri refineries, thus allowing Azerbaijan to export a higher share of their own crude oil to world markets.

3.3 Turkmenistan
Turkmenbashi
Turkmenbashi port is situated on the eastern shore of the Caspian Sea, just opposite of Baku. The port is owned and operated by the state-owned TML Turkmen Maritime Lines under the direct responsibility of the Cabinet of Ministers. TML serves as Turkmen maritime administration, and its General Manager has the rank of a Deputy Minister of Transport. For the handling and shipment of oil Turkmenbashi port offers two options, the ferry terminal and the oil terminal at Ufra.

Ufra oil terminal is located 4 NM east of Turkmenbashi city port and connected to the open sea via the same access channel as Turkmenbashi port. It comprises two old finger piers able to simultaneously
accommodate four vessels up to 7,400 tdw (Absheron class). Pier no. 1 is dedicated to unloading crude oil (for Turkmenbashi refinery situated near Ufra terminal) and loading of refined products, while Pier no. 2 handles refined products exclusively. Both piers are equipped with workable fire-fighting equipment, but oil-spill equipment and the ballast and bilge water treatment system need to be replaced res. rehabilitated.

The consultants have no detailed information on the annual capacity of the terminal, but given that all berths are still operational, and pier is dedicated to also handle incoming cargo, the terminal should be able to still export 9 mn tonnes of oil and oil products p.a.

The ferry terminal, rehabilitation of which has just been finalised, comprises two berths able to accommodate and handle rail ferries of Dagestan type. During the last two years major part of the business at the ferry terminal has been the loading of rail tank cars (RTCs) with oil from Kazakhstan onto the ferries. It is expected that this business will remain strong with high growth in 2003. The ferry terminal currently handles about 12-14 ferries from Baku per week.

According to recent figures obtained from Turkmenbashi Port Administration the port handled more than 1.8 mn tonnes of oil and oil products during the first quarter 2003. This was an increase of 58 percent compared to the same period in 2002. Also, volumes of liquid cargo shipped by ferry to Baku increased considerably to more than 400 thousand tonnes (estimate derived from total ferry cargo volumes of 660 tonnes).

Aladja and Okarem
The ports of Okarem and Aladja are mainly used for the export of crude oil to Baku and Dubendi (Azerbaijan) and Neka (Iran). Some share of the oil is also sent to Ufra for processing in the Turkmenbashi oil refinery.

Aladja receives crude oil from nearby Azizbekovo and Koturtepe oilfields. The oil is stored in the vicinity of the bay at Karagel tank farm, and then pumped to a double-sided pier able to accommodate tankers up to 5,000 tdw. For the time being the pump and pipe system does not allow for simultaneous loading of tankers. The capacity of Aladja terminal is reported to be about 3.5 mn t.p.a., mainly depending on the efficiency of clearance and documentation procedures. Plans for the modernisation of handling facilities to allow simultaneous handling are under way. The pier is fitted with a modern fire-fighting system, and can be operated day and night.

The port of Okarem mainly consists of a 20,000-m³ tank farm and an exposed 1967-built finger pier with two berths able to receive 5,000 tdw tankers. Entry to the port is via a 3-km long dredged channel. Capacity is estimated at 2.5 mn t.p.a. Fire-fighting equipment and lighting facilities are reportedly missing (no nighttime operation possible).

3.4 Russia and Iran
Outside the TRACECA route mainly two Caspian ports receive oil and oil products from Central Asia, the Russian Makhachkala and the Iranian Neka.

Makhachkala
Makhachkala, situated about halfway between Baku and Astrakhan, has the capacity to handle around 8 mn tones p.a. The oil terminal receives mainly crude oil from Turkmenistan and Kazakhstan. In Makhachkala the oil is then either fed into the pipeline to Novorossissk or, more often, carried on by RTCs to Novorossissk, the latter because customers want to avoid mixing their cargo with lower quality Russian oil from Siberia.
Makhachkala has four berths for the handling of oil and oil products. Reportedly, the oil terminal can accommodate the current Caspian max tankers (12,300 tdw, 8m draught). In 2002, the terminal handled about 3.3 mn tonnes of oil and oil products. By far the dominating origin country was Kazakhstan. Based on the first quarter 2003, during which Makhachkala handled around 700 thousand tonnes of oil and oil products, the port projects a stable business development on pre-year level.

**Neka**

Neka, situated near Nourshahr port and being administered by the Nourshahr Ports and Shipping Organisation, is the Iranian port for receiving oil shipments from Kazakhstan and Turkmenistan. Being constructed as an oil port, the port accommodates four oil berths and one multi-purpose facility. The oil berths are mostly operated by the National Iranian Oil Company (NIOC). Water depth of the access channel and along the jetties is around 5m allowing the handling of tankers up to 5000 tdw.

Limited SWAP agreements exist between traders/producers and the Iranian side which foresee the delivery of crude oil to Neka, where a pipeline connects to the oil processing plants in Teheran and Tabriz. In return Iran sells an equivalent amount of Iranian oil off Persian Gulf ports for the benefit of the trader/producer.

Iran has converted an old gas pipeline system from Neka oil terminal to Teheran into an oil pipeline. In order to increase the attractiveness of Neka port as delivery point for Caspian oil, Iran has rehabilitated and increased the capacity of the existing 324-km pipeline to 120 thousand barrels per day. The possible installation of modern pumping station may further increase the capacity to 370 thousand, and later to 540 thousand barrels per day.

### 4 Conclusion and Outlook

The transport of oil by tankers as an alternative to pipelines (which are yet to impact on the trade) has repeatedly been mentioned as the obvious solution and seems to hold most promises for the business of Aktau, Turkmenbashi, Baku/Dubendi, and other Caspian ports. However, any oil exporting country in the Caspian region wishing to enter the tanker business must realise that the venture may be short-lived since pipelines, once in operation, offer substantially lower transportation costs than small tankers. Moving oil and oil products in tankers of between 5,000 and 12,000 tdw may not seem very economic, but there do not at present appear to be any other, and more viable, alternatives, pending the advent of new pipelines. But even then, the geopolitical situation around the Caspian will not make it very likely that the creation of new piping capacities will keep pace with the expected increase in output.

The vessel capacity deployed in the Caspian Sea is generally sufficient to handle larger volumes. Provided that all CASPAR tankers are available, and additional operators will be set to call at Baku and Dubendi. Since between 1990 and 2000 only a very limited number of tanker newbuildings, if at all, entered the Caspian market there is a risk factor posed by the relatively high average age of the vessels, which generally increases the risk of downtimes due to unexpected repairs or accidents. During interviews one customer of CASPAR remarked that currently several tankers are simultaneously undergoing maintenance and repair, and the customers are already feeling a shortage of transport capacities across the Caspian Sea. Thus, either CASPAR should concentrate on tanker transports to Baku and Dubendi or additional tanker operators should be encouraged to call at Baku and Dubendi.

Since the beginning of 2002 a number of newbuildings have been already ordered or even deployed. In addition, several NVOCC (e.g. Kazmortransflot) are considering ordering their own tankers, or even are developing new shipping concepts (e.g. Alegratrans). However, it needs to be seen, whether the newbuildings, e.g. ordered by CASPAR will really serve as additional capacities or rather replace existing capacities.
A removal of competitive barriers in the East-West tanker trade to Baku and Dubendi may further spur the interest of other companies to deploy own vessels (instead of chartered capacities) and may lead to a general improvement of the standard of vessels operating in the Caspian Sea with respect to operational efficiency, safety and environmental impact.

The respective port terminal facilities can also be considered sufficient. On the eastern side of the Caspian Sea, the rehabilitation works in Aktau and the projected new construction in Turkmenbashi (SRG Terminal) and Aktau (berth 11 and 12) will create additional capacities helping to prevent even temporary chokepoints in case of e.g. seasonal peaks. New privately financed and operated terminal facilities in Sangachal, and the rehabilitated terminals in Dubendi and Baku (Azpetrol terminal) have boosted the seaside handling capacities on the western side of the Caspian Sea beyond foreseeable market demand.

The rehabilitation of the rail ferry piers in Aktau and Turkmenbashi (finalised), and Baku (about to start soon) provides an option for alternative transports across the Caspian Sea. However, it can be foreseen that with a sharp increase in 2003 the future growth perspectives of this transport alternative may already be fully exploited. Moreover, from a development perspective it may be advisable to free some of the capacities currently blocked by oil transports for the development of general cargoes.

For the future, the deployment of considerably larger tankers of up to, say, 50,000 or 60,000 tdw would require major investments into port and terminal infra- and superstructures for which funds have to be made available yet. However, there have been repeatedly initiatives investigating options for constructing large tankers in the Caspian Sea (these tankers would be captured in the Caspian Sea due to the limitations of the sole navigational outlet, the Volga-Don Channel) and establishing SPM (Single Point Mooring) facilities, e.g. in Aktau and Baku. In 1999, Shell International Trading and Shipping together with the National Iranian Tanker Company has investigated options for the transport of crude oil between Aktau and the Neka. The study comes to the conclusion that the deployment of 40-45,000 tdw tanker would be feasible (at freight cost of around USD 0.81 USD/bbl) and justify the establishment of SPMs and extension of the Neka-Teheran pipeline. Currently, a consortium around the international oil operator Alegratrans is reportedly investigating the deployment tankers (considerably) larger than 12,000 tdw in the Caspian Sea. These plans are surely also related to the construction of the BTC (Baku-Tbilisi-Ceyhan) pipeline and the possible interest of Kazakhstan to use spare pipeline capacities as an outlet for Kazakh oil to the world markets. This of course would necessitate delivering large quantities of crude oil within a short timeframe in order not to block storage facilities in Baku (Sangachal). Larger tankers are also required and possible in future perspective when the large Kashagan offshore oil field in the Kazakh part of the North-Caspian starts production (around 2008/9). Modern FPSO (Floating Production, Storage and Offloading) installations would enable to load tankers off-shore in situ where larger water depths prevail without having to invest into new costly shore-based terminal facilities.

However, carrying crude oil and especially oil products in small tankers across the Caspian Sea into Baku/Dubendi will continue, perhaps even on a larger scale than as yet, pending the settlement of a host of political issues concerning the status of the Caspian Sea. The construction of the BTC may give a substantial boost to the cross-Caspian oil tanker trade.
ANNEX 6: Oil-transport Related Storage and RTC Loading Facilities in Azerbaijan

1 Introduction

The following gives a brief overview on the existing terminals for the loading of oil and oil products into rail tank cars in Azerbaijan. Moreover, the main tank farms and storage facilities are described. Information has been derived from interviews with Azeri experts as well as from previous studies elaborated within the framework of Tacis TRACECA. Moreover, the consultants have closely reviewed press releases and Caspian and international news services specialized on transport issues in order to verify and update information.

2 Terminals and Tank Farms

Azerbaijan has a multitude of RTC loading facilities for oil and oil products since railways have traditionally been a very important means of transport for oil produced in Azerbaijan and other countries around the Caspian Sea. Aside from Baku City, major facilities relevant for transport of oil and oil products between the Caspian and the Black Sea coast are located in Dubendi, Sangachal, and Ali Bayramli.

2.1 Dubendi

A thorough investigation into the facilities of Dubendi has been undertaken within the frame of the TRACECA Traffic and Feasibility Studies, Module E (here: Inception Report, Annex 4: Dubendi Facilities: Inventory and Evaluation, June 2000). The consultants therefore refrain from a detailed description of the facilities and just note changes that have occurred since the a.m. investigation.

Storage

Dubendi Tank Farm (about 40 km northeast of Baku) is directly connected to the nearby Dubendi oil port (see Annex 5) by a pipeline system. The tank farm and its facilities have been leased from SOCAR by Dubai-based Middle East Petrol (belonging to the Teksun Group) and are operated by their subsidiary Kafkastrans.

The tank farm consists of two parts: a smaller lower part within the port area and a larger upper part on top of the cliff. The lower part comprises 16 tanks with 188 thousand m\(^3\) of storage capacity (2 x 25 thousand m\(^3\), 4 x 22 thousand m\(^3\), 10 x 5 thousand m\(^3\)) of which only the six larger tanks and four of the smaller ones (i.e. 158 thousand m\(^3\)) are actually operated by Kafkastrans. These ten tanks have been renovated and are currently used for the storage of crude oils (currently four different types: Kumkol and Buzachi from Kazakhstan, Okarem and Cheleken from Turkmenistan) as well as black products (fuel oil and vacuum gasoil) from Kazakhstan and Turkmenistan. The remaining tanks are reportedly used by SOCAR as interim storage for crude oil produced offshore near the Absheron peninsular and landed by pipeline.

The upper part of the tank farm, a completely walled area, comprises 47 tanks of 5 thousand m\(^3\) each. The tanks grouped by lots of 5 x 8 tanks and 1 x 7 tanks, with the latter group operated by SOCAR. The remaining 40 tanks (200 thousand m\(^3\)) are operated by Kafkastrans, who also is responsible for the operation of the other terminal facilities and services like pump house and security service. 32 tanks have already been rehabilitated, the remaining 8 tanks are currently under repair and will be operational very soon. The modernisation of the upper pump house has just been finalised with new powerful pumps installed; the renovation of the retention walls will be tackled soon. The upper tank farm is exclusively used...
for the storage of white products. Each of the currently operated four lots is dedicated to a specific group of products, i.e. naphtha, K4/light gasoil (diesel), AI95/AI80 (benzene), L62/L50 (gasoline).

Middle East Petrol has undertaken to renovate the pipeline system to the lower as well as upper storage tanks operated by Kafkastrans.

Gantries
The RTC loading terminal is located about 5 km southwest of the tank farm and connected to the storage area via pipelines, which have recently been reconstructed. The terminal is completely fenced and comprises one gantry consisting of two parts. The older part has 2 x 21 loading arms for handling crude oils and black products, while the newer, recently constructed part with 2 x 18 loading arms is dedicated to handling white products. Both gantries are in good condition and fully operational.

Loading of an RTC usually takes about two hours depending on weather conditions and product characteristics. In addition, preparation of RTCs and shunting takes another two hours, so that the maximum capacity of one loading section can be estimated at 4-5 trains\(^2\) per day (i.e. about 8-10 trains for the whole terminal) or

Adjacent to the terminal is a shunting yard operated by Azerbaijan State Railways (ASR). The yard serves the terminal, which has no shunting tracks of its own. The shunting yard usually accommodates 300-350 RTCs.

The operator has plans to construct a small RTC cleaning facility within the terminal area in order to increase flexibility of the use of RTCs for different products.

**Picture 1: RTC-loading Gantry in Dubendi (new part)**

\( ^2\) A train loaded in Baku carries on average 33-35 standard RTCs (standard RTC: four axles, ~60 tonnes payload), the restriction being a maximum netweight of 2,000 tonnes per train, or gross weight of 2,800 tonnes (excluding locomotive)
2.2 Baku

Azpetrol Terminal
Azpetrol terminal is situated in the eastern part of Baku City, next to the Refinery Azneftyak, and comprises storage tanks, RTC loading facilities, a marshalling area, and three berths for unloading tankers. The terminal has been opened in spring 2002 after reconstruction of the area behind the former timber terminal of Baku Port. It is operated by Azertrans on behalf of Azpetrol. The terminal is currently used for handling crude oil as well as black and white products. After opening of the new Azpetrol Sangachal terminal (see below) it is planned to shift major part of the crude oil and black products' business to Sangachal and focus more on the handling of white products in Baku.

The tank park comprises 10 x 5 thousand m$^3$ and 5 x 10 thousand m$^3$. 40 thousand m$^3$ are dedicated to handling white products, 60 thousand m$^3$ are for crude oil and black products. All tanks are equipped with a heating system and in very good order and condition. The retention walls are suitably dimensioned and seem properly maintained.

The terminal operates two gantries for 2 x 18 RTCs and 2 x 10 RTCs allowing to load about 9-10 trains or 20 thousand tonnes per day at the terminal. The gantries are new and equipped with automatic overflow prevention devices. Modern environmental safety and fire fighting installations are in place (see Annex 11).

At the marshalling area Azertrans operates their own locomotive for all rail operations at the terminal. Usually Azerbaijan State Railways deliver RTCs up to the terminal gate, where the RTCs are pulled over by the terminal locomotive and marshalled according to the operational schedule. After loading the RTCs are then pulled to the gate where they are taken over by Azerbaijan State Railways again.

The seaside terminal facilities are described in Annex 5.

Refinery Azneftyak
On the territory of the refinery there are several gantries for loading and unloading of liquid cargoes, i.a. one gantry for loading lubricants and one gantry for benzene, diesel and naphtha. Cargo loaded into RTCs is predominantly sent to Georgia for export, but also for domestic purposes to e.g. Sumgait.

Picture 2: RTC-loading Gantry within the Area of Azneftyak
Estacada no. 27
Estacada no. 27 is situated in a commercial area east of Baku Central Business District. The gantry has a capacity to handle 2 x 15 RTCs simultaneously and loads cargo coming by pipeline from the refineries Azneftyag and Azneftyanajag. The gantry is in acceptable operational condition, however fire fighting and environmental devices could not be detected.

Picture 3: RTC Gantry No. 27 in Baku City, Opposite of Ramstore

Picture 4: RTCs at Gantry No. 27
Ahmeteli

Ahmeteli station is situated in the northeast part of Baku City. The facilities are operated by Azerbaijan State Railways, and comprise eight tracks for marshalling and parking of over 300 RTCs, and 7 gantries for loading oil products. All gantries are connected to storage facilities of different refineries by pipeline.

Gantries nos. 1 and 2 each can accommodate 2 x 18 standard RTCs and are used to transship black products from the refinery Azneftyanajag. Gantries nos. 3 and 4 each have 2 x 15 loading arms and load fuel oil from the refinery Azneftya, while at the equally dimensioned gantries nos. 5 and 6 diesel and lubricants are loaded. The facilities are operational but in need of rehabilitation and modernisation. Environmental protection and operational safety measures should be reconsidered.

Gantry no 7 has only recently been constructed and handles white products from the refinery Azneftyanajag on 2 x 20 loading arms. Daily loading volumes are varying but on average about 2,500-3,000 tonnes or 40-50 RTCs are loaded in Ahmeteli per day. More cargoes could be loaded easily but reportedly loading business is hampered by non-availability of a sufficient number of suitable RTCs. All cargoes loaded are destined for Batumi. Main customers of the Ahmeteli facilities are Baglan and Middle East Petrol.

Estacada Woroshilov

Situated next to the EUPEC factory, the gantry is openly accessible, i.e. not fenced. The gantry can accommodate 1 x 12 RTCs and is used to load products from the nearby Refinery Azneftya, mainly for export via Georgia. The gantry is in poor condition but operational. Adequate environmental or fire-fighting systems could not be detected. The maximum loading capacity of the gantry was given at 72 standard RTCs or 4,300 tonnes per day. Reportedly, on average about 50-60 RTCs are loaded per day. Transports are organised by the company Baglan.

Picture 5: Voroshilov Gantry in Baku, near Azneftya Refinery
2.3 Sangachal

Azpetrol Sangachal
The newest of all RTC loading facilities in Azerbaijan has just been put into (trial) operations in Sangachal, about 40 km south-west of Baku. The terminal is operated by Azertrans on behalf of Azpetrol. The concept foresees to handle only crude oil and black products at this terminal.

The area of the terminal is completely fenced and comprises storage, RTC loading and marshalling facilities. The distance to the two piers for unloading tankers is less than 500 m. The storage capacities of Azpetrol Sangachal comprise 10 tanks of 20 thousand m³ each. All tanks are insulated and equipped with a heating system and floating roof.

Picture 6: Storage Tanks at Azpetrol Sangachal Terminal

The modern loading gantry can accommodate 70 RTCs simultaneously (2 x 35 RTCs), which allows for loading of up to 12 trains or about 25 thousand tonnes per day. The gantry is equipped with state-of-the-art environmental safety and fire fighting devices.
The rail facilities comprises two terminal entries/exits for the railway (north and south) and six lines for marshalling and parking of RTCs. Marshalling and shunting operations are carried out by the terminal’s own locomotive.

Picture 7: New Gantry at Azpetrol Sangachal

Picture 8: Rail Marshalling Area at Azpetrol Sangachal
Currently only about half of the terminal area has been equipped for operation. The remaining area has been prepared for further extension. Additional storage and loading facilities can thus be installed rather quickly if required by the development of handling volumes.

Azpetrol Sangachal may serve as an option in case Kazakhstan decides to dedicate some of its export oil to the BTC pipeline route. The close vicinity of the terminal to BP Sangachal, the starting point of the BTC enables to create a direct pipeline link between both terminals at relatively low costs. Kazakh oil may arrive by tankers, is stored at the Azpetrol terminal until an operationally suitable lot size has been collected and then fed into the pipeline if a slot is available.

BP

In about 8 km distance northwest of the new Azpetrol terminal, BP is operating a tank farm for the storage of crude oil from the Azeri, Chiraq, and Gunashli (ACG) offshore oil fields which are developed by the Azerbaijan International Oil Corporation (AIOC). Here, the oil is received by subsea pipeline, stored, and then fed into the Baku-Supsa and Baku-Novorossisk pipeline.

The terminal has four big storage tanks with a capacity of about 40 thousand tonnes (250 thousand barrels) each. In 2002 the terminal sent about 5 mn tonnes to Supsa and 2.5 mn tonnes to Novorossisk. For 2003 only slight increases in volumes (mainly to Supsa due to the increase in pipeline capacity) are expected.

Currently, an extension programme will increase the storage capacities of the terminal by constructing two additional tanks for storing 130 thousand tonnes. This extension will be necessary since the terminal will also feed ACG oil into the Baku-Tbilisi-Ceyhan pipeline (design capacity of one mn barrel per day), which is envisaged to start operations by the end of 2004.

2.4 Ali Bayramli

Adjacent to Ali Bayramli rail station two RTC loading gantries are located. One is operated by Kafkastrans (2 x 18 loading arms), for the other the operator could not be identified (1 x 15 loading arms). The gantry operated by Kafkastrans seemingly is in a better condition, even though the terminal looked deserted. Both gantries are connected to Puta pumping station and a nearby tank farm, which itself is connected by four pipelines to the port of Dubendi. All pipes are owned by SOCAR, but one of the pipes is under the control of Kafkastrans.
Kafkastrans claimed that currently they are not operating any cargo via Ali Bayramli. However, during on-site visit there were signs (RTCs seemingly waiting for loading at the station, information obtained from local station staff) that at least smaller quantities of (black) oil (products) are handled at the second gantry, even though the facility looked a bit shabby.
3 Conclusion and Outlook

The existing modern and modernised facilities provide enough capacities to handle the current demand. Even much larger volumes can be handled at the three major RTC loading and storage facilities in Baku, Dubendi, and Sangachal. These terminals together provide for about 650 thousand m³ of storage and have the capacity to load up to 30 trains, or more than 60 thousand tonnes of oil and oil products per day, which is almost three times as much as today’s daily average.

In addition, there are numerous older storage and transshipment facilities in Baku and Ali Bayramli together with a vast pipeline network between these facilities from Soviet times available, which are currently (only partly) used but in need of modernisation in order to reach internationally accepted standards with respect to environmental and operational safety. These facilities currently have the capacity to load about at least another 20-30 trains per day if demand requires, against a current demand of about 5-6 trains per day (additional to the trains sent from the three large terminals). So, even if both Baku refineries Azneftyak and Azneftyanajag are rehabilitated and refining capacities are extended, there still will be ample storage and RTC handling capacity in Azerbaijan to serve domestic markets as well as to considerably increase the export and transit of oil and oil products.
ANNEX 7: Oil-transport Related Rail Facilities in Azerbaijan and Georgia

1 Introduction

The following gives a brief overview on facilities relevant for the transportation of oil and oil products the two railway companies of Georgia and Azerbaijan, Georgian Rail and Azerbaijan State Railways (ASR) provide. Information has been derived from interviews with Azeri and Georgian railway experts as well as from on-site visits to the facilities. Moreover, the consultants have closely reviewed local press releases and international news services specialized on transport issues in order to verify and update information.

2 Railway Facilities Azerbaijan State Railway Company

2.1 Rail Tank Cars (RTCs)

ASR claims to have 4,156 RTCs for the transport of oil and oil products of which about 3,700 are four-axled (55-65 tonnes payload). Of the total 1,400 are used exclusively for domestic transports; some of them are not according to international standards, thus used for domestic purposes only. About 3,300 RTCs are dedicated to the transport of crude oil, the remainder can be used for both crude oil and oil products. The number of RTCs with steam jackets amounts to 47 only.

In addition, Azerbaijan State Railways received 102 new four-axled RTCs with on-board heating system as a grant from the EU TRACECA programme. RTCs are to be operated for carrying transit oil and oil products between Baku and Batumi only.

Picture 11: RTCs Sponsored by EU TRACECA Programme at Dubendi Marshalling Yard
Azerbaijan State Railways have rented out the majority (about 2,100) of their operational RTCs to private operators; most ASR RTCs are now controlled by Baglan, but also by Azpetrol, Middle East Petrol and Silk Road Group.

More RTCs are to be purchased in order to satisfy the increasing demand for transport capacity as well as to technically update the rolling stock park of the company (the average age of ASR RTCs is 30-35 years). The railway management gives the number of RTCs necessary to secure future operations at 1,000 additional RTCs. Relieve could bring a Euro 30 mn credit from the EBRD for modernising the railway infrastructure.

2.2 Major Marshalling Yards

Baku Tovarnaya is the biggest station and marshalling yard for cargo trains in Azerbaijan. Here also oil trains coming from the Baku ferry, from Azpetrol terminals in Baku and Sangachal as well as trains from the refineries Azneftyag and Azneftyanajag loaded at Ahmetli station, gantry No. 27 and Voroshilov gantry.

Baku Tovarnaya has 16 marshalling tracks – 7 incoming, 7 outgoing and 2 optional usable reserve tracks. The daily handling capacity is about 90 trains (all directions), capacity utilisation is currently less than 50 percent.

Trains coming from the Baku ferry are re-arranged at Baku Tovarnaya, since each ferry can only carry a maximum of 26 loaded standard RTCs, which falls short of the maximum deadweight of 2,800 tonnes (usually 33 to 35 rail tank cars). In order to make full use of the pulling capacity of locomotives, these “incomplete” trains are sent to Balajari station (see below), where additional rail cars (not necessarily RTCs) are added up to a deadweight of 2,800 tonnes. From Balajari the trains are then sent to the Georgian border.
Ahmetli station, which is also operated by Baku Tovarnaya has 8 marshalling tracks and seven gantries for loading of oil and oil products from the Baku refineries (see Annex 6).

Balajari is the main marshalling and parking yard for oil trains coming from Dubendi terminal. Moreover, since all Azeri RTC cleaning and repair facilities are located in Balajari, the yard serves as the final destination for almost all RTCs coming back from Georgia.

Alat station and the attached marshalling yard have 25 tracks with a total length of 20,013 m, i.e. they have space for roughly 1350 standard RTCs or about 40 loaded trains. 20 to 24 of the a.m. tracks have sufficient length to accommodate the usually 55-57 RTC-long empty trains coming from Batumi.

### 2.3 RTC Cleaning Facilities

ASR claims to operate the only RTC cleaning facility in the Caucasus. The facility is located at Balajari and is closely connected to the RTC repair site and Balajari marshalling yard.

The current capacity of the cleaning facility is about 100-120 RTCs per day (2 lines handling 15 RTCs each, of which one line for 15 RTCs is currently out of operation) or around 40 thousand RTCs per year, depending on the level of service required (i.e. how often the RTCs need to be washed). During Soviet times the cleaning yard handled up to 200 RTCs per day. The management informed that cleaning is executed according to GOST standards. These standards in detail prescribe how often a railcar needs to be washed until it can transport a certain other product.

According to the facility management cleaning time is as follows:

<table>
<thead>
<tr>
<th>RTC carried</th>
<th>Cleaning Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>fuel oil and shall be loaded with fuel oil</td>
<td>1.00 hr.</td>
</tr>
<tr>
<td>fuel oil and shall be loaded with kerosene</td>
<td>2.50 hrs.</td>
</tr>
<tr>
<td>diesel</td>
<td>0.45 hr.</td>
</tr>
<tr>
<td>gasoline</td>
<td>0.45 hr.</td>
</tr>
<tr>
<td>kerosene</td>
<td>1.50 hrs.</td>
</tr>
</tbody>
</table>

Cleaning is executed in two steps. Firstly, RTCs are steamed with water at 10 bar. The steam supply comes from four modern steam generators powered by gas or fuel oil. The capacities range between 8 and 10 tonnes per hour. The second step comprises cleaning with water and an added special flotation reagent. The frequency of cleaning depends on the transported products.

For cleaning an (ASR) RTC once the cleaning yard charges AzM 150,000.- (~USD 30.50)

Generally, the management stated that every RTC needs to be cleaned after minimum two roundtrips even if no change of product is foreseen (other sources explained that RTCs carrying low-viscosity crudes and products can be operated with cleaning after every fourth run if no change in products is foreseen). According to this rule the cleaning yard should have a minimum capacity of 90 thousand RTCs per year, given that ASR claims to have transported 11.5 mn tonnes of oil and oil products in 2002, including at least 8.6 mn tonnes to Batumi.

The cleaning facilities at Balajari are rather old and beyond any efficient use (for an environmental evaluation see Annex 11). Currently ASR is tendering the rehabilitation of the cleaning yard financed by an EBRD loan. It is expected that after rehabilitation the cleaning results will considerably improve, moreover a significant increase in handling capacity to 250-300 RTCs per day is envisaged.
2.4  Maintenance and Repair Facilities

ASR has five wagon depots for repairing railcars: Khislar, Alat, Qasimammed, Ganja, and Baku (Balajari). However, since regular maintenance usually requires cleaning of the RTCs, most maintenance and repair works for RTCs are executed at Balajari (see above).

The Balajari maintenance- and repair works, established in 1934 are the largest facility of this kind in the Caucasus. Here, regular control and maintenance check ups for all ASR rail tank cars (and those of private operators registered in Azerbaijan) are conducted. Usually, all RTCs undergo depot maintenance (every two years or 100,000 km, whatever is reached first)\(^3\) and general maintenance (every 8 to 10 years).

The costs for maintenance and repair are not included in the rail tariffs and are charged separately to owners/lessees other than ASR. Reportedly, for a depot check-up of a four-axle RTC private owners are charged with USD 550 while the internal clearing price for ASR RTCs is around USD 400. This tariff does not include spare parts, which are charged extra.

Repair works comprise everything from changing of worn out wheel tires to repair welding at the tank body including all kinds of measurement and tests. The annual capacity of the repair yard is about 3,000 RTCs and thus sufficient for the current RTC fleet of ASR. Repair works in case of damage and preventive maintenance at the brakes can also be executed in every major railway station that has a workshop.

In 2002, Balajari repair yard repaired 373 RTCs of ASR. In addition, 67 RTCs of other operators like Azpetrol, Middle East Petrol etc. were repaired. Sixteen 4-axle RTCs and two 8-axle RTCs can be repaired at the same time in the maintenance hall, the average total stay of an RTC was quoted at 51 hours. During the first quarter of 2003, already 166 RTCs (71 of which were non-ASR RTCs) were repaired.

2.5  Locomotives

ASR has a total of about 210 locomotives in their rolling stock park. However, the average age of locomotives reportedly is 38 years, thus it could not be verified whether all locomotives are operational for the current moment. ASR plans to purchase 20-30 new locomotives in the very near future.

2.6  Protocol of a Journey on an Oil Train from Baku-Balajari to the border station Bjeyuk-Kjasik on 8 February 2003

Courtesy of the Azerbaijan State Railway (ASR) Management the consultants were given the opportunity to travel on the locomotive of an oil train from the main marshalling yard for oil trains near Baku to the border station with Georgia Bjeyuk-Kjasik.

The oil train no. 2002 with the destination Batumi was composed of 35 RTCs loaded with oil from Azpetrol terminal Baku. The loaded RTCs had a weight of 2,807 tonnes and the locomotive had a weight of 184 tonnes. The train weight without locomotive should normally not exceed 2,800 tons, which is tantamount to a net weight of 2,000 tonnes of oil or oil products. The locomotive was in exceptional good order and condition; reportedly it is the best locomotive that ASR operates.

\(^3\) RTC-km information is recorded at the border stations and transferred online to the central RTC register in Moscow (where all RTCs operating in the CIS need to be registered). The central register gives a signal to the state railways when maintenance is due. In Soviet times maintenance has been executed annually.
Depending on the wagon payload a loaded train can consist of up to 37 RTCs, while (usually east going) empty trains have up to 57 RTCs. Oil trains coming from Turkmenbashi and Aktau by ferry usually have only 28 RTCs and are short of the maximum net weight by about 300-350 tonnes. Therefore, ASR adds a respective number of RTCs (but also conventional wagons) to the train up to the maximum gross weight of 2,800 tonnes. The decision on whether rail cars shall be added, and if yes, which rail cars shall be added, is made by the ASR dispatcher.

Usually it takes about four hours at the loading terminals to conduct RTC checks, documentation, oil loading process and the marshalling of the incoming RTCs, and an additional two hours at a maximum for the then loaded train to reach Balajari-station coming from Dubendi/Baku terminals. Thus, about six hours after the RTCs have been provided to the oil transport operators at the terminal gate, they are returned loaded to Balajari, usually already as full train.

During the journey from Baku to Bjeyuk-Kjasik the train was pulled by one locomotive. Only between Dubendi station and Balajari there is one section containing a steep slope. Here two locomotives for loaded trains (one pulling, one pushing) coming from Dubendi terminal are deployed.

The train no 2002 left for Bjeyuk-Kjasik (border) at 07:22 h, and traveled nearly without delays (see detailed travel protocol). In the stations on the way the consultants spotted were several oil-trains waiting for their passage to the border. These were in station

- Qasimammad: six oil-trains without locomotive
- Bargusad: one oil-train with locomotive
- Ucar: two oil-trains with locomotives
- Gandja: five oil-trains without locomotive
- Salahli: two oil-trains without locomotive
- Soljuk-Bulak: four oil-trains without locomotives
- Bjeyuk-Kjasik: eight oil-trains without locomotives

and in the Baku-area additional estimated 15 oil-trains parked on sidetracks. So that 43 oil-trains (about 1,300 RTCs or 80,000 tonnes of oil and oil-products) were waiting in Azerbaijan for on-carriage to their final destination, the majority of which probably to Batumi. It is to point out that the storage of oil and oil products on standard marshalling yards, stations and sidetracks causes several risks such as leakage and fire accidents.

During the journey the consultants detected several sections where tracks were in need of urgent maintenance and repair: The consultants spotted i.a. rotten wooden sleepers, nails coming up, loosed screws in concrete sleepers, battered rail joints, wheel burns, lateral track displacement, insufficient ballast shoulders and track buckling.

The train arrived at the border station Bjeyuk-Kjasik at 20:12h, after less than 13 hours travel time. Now the train would have to wait for border crossing procedures (e.g. technical check, customs etc.), which were mentioned as unproblematic, and the takeover by a Georgian locomotive, which reportedly is mainly depending on customers' order. The travel time of under 13 hours seems extraordinary fast, indicating that this trains has been given priority rights along the route. Information obtained from ASR management confirmed that once on the way a train could reach the border station in 16-20 hours.

According to information given by the station staff a daily 20 to 22 oil-trains are crossing the border at present, these are 40,000 tonnes. Even much higher volumes, say fifty trains per day would not cause any problems at the border station. Under normal circumstances the border crossing procedure takes not more
than two to three hours so that the RTCs in theory can reach the Gardabani border station on the Georgian side after a running time of 21 to 27 hours, starting with their delivery at the gates of the Baku area terminals.

It may happen that single RTCs have to be repaired on the main line and for this reason have to be decoupled from the trains. This may happen at the technical checkpoints for example at the stations Ganja and Bjeyuk-Kjasik in Azerbaijan or Gardabani in Georgia. The chassis repair of loaded RTCs does not cause any problems since lifting facilities are available along the tracks.

Table 1: Detailed Travel Protocol Balajari to Bjeyuk-Kjasik

<table>
<thead>
<tr>
<th>Station name</th>
<th>Distance between stations Km</th>
<th>Arrival time (if stop) hrs.</th>
<th>Departure time (if stop) hrs.</th>
<th>Speed km / h</th>
<th>Average speed to station km/h</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balajari</td>
<td>7:22</td>
<td>10 - 25</td>
<td>528</td>
<td>21</td>
<td>30 - 60</td>
<td>technical check</td>
</tr>
<tr>
<td>Heybal 10</td>
<td>07:50</td>
<td>10 - 25</td>
<td>518</td>
<td>21</td>
<td>30 - 60</td>
<td></td>
</tr>
<tr>
<td>Puta 8</td>
<td>08:00</td>
<td>40 - 60</td>
<td>510</td>
<td>48</td>
<td>40 - 60</td>
<td></td>
</tr>
<tr>
<td>Qaradak 12</td>
<td>08:17</td>
<td>15 - 80</td>
<td>498</td>
<td>42</td>
<td>30 - 60</td>
<td></td>
</tr>
<tr>
<td>Sangachal 14</td>
<td>08:35</td>
<td>40 - 60</td>
<td>484</td>
<td>42</td>
<td>30 - 60</td>
<td></td>
</tr>
<tr>
<td>Duvanni 9</td>
<td>08:50</td>
<td>30 - 60</td>
<td>475</td>
<td>42</td>
<td>30 - 60</td>
<td></td>
</tr>
<tr>
<td>Alat 14</td>
<td>09:05</td>
<td>50 - 80</td>
<td>461</td>
<td>36</td>
<td>30 - 60</td>
<td></td>
</tr>
<tr>
<td>Atbulag 14</td>
<td>09:25</td>
<td>20 - 55</td>
<td>447</td>
<td>42</td>
<td>30 - 60</td>
<td></td>
</tr>
<tr>
<td>Navani 12</td>
<td>09:40</td>
<td>40 - 60</td>
<td>435</td>
<td>48</td>
<td>30 - 60</td>
<td></td>
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<tr>
<td>Pirsagat 8</td>
<td>09:55</td>
<td>25 - 40</td>
<td>427</td>
<td>32</td>
<td>25 - 40</td>
<td></td>
</tr>
<tr>
<td>Qasimammad 10</td>
<td>10:15 10:38 25 - 45</td>
<td>technical check</td>
<td>417</td>
<td>30</td>
<td></td>
<td></td>
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<tr>
<td>Mugan 12</td>
<td>10:52</td>
<td>20 - 60</td>
<td>405</td>
<td>48</td>
<td>30 - 60</td>
<td></td>
</tr>
<tr>
<td>Gadjieba 14</td>
<td>11:05</td>
<td>60 - 70</td>
<td>391</td>
<td>56</td>
<td>30 - 60</td>
<td></td>
</tr>
<tr>
<td>Pidar 12</td>
<td>11:20</td>
<td>40 - 65</td>
<td>379</td>
<td>56</td>
<td>30 - 60</td>
<td></td>
</tr>
<tr>
<td>Sigirli 13</td>
<td>11:35</td>
<td>45 - 70</td>
<td>366</td>
<td>56</td>
<td>30 - 60</td>
<td></td>
</tr>
<tr>
<td>Karar 14</td>
<td>11:48</td>
<td>60 - 70</td>
<td>352</td>
<td>56</td>
<td>30 - 60</td>
<td></td>
</tr>
<tr>
<td>Kjurdamir 10</td>
<td>11:58</td>
<td>55 - 75</td>
<td>342</td>
<td>56</td>
<td>30 - 60</td>
<td></td>
</tr>
<tr>
<td>Karabudjak 11</td>
<td>12:20</td>
<td>20 - 35</td>
<td>331</td>
<td>56</td>
<td>30 - 60</td>
<td></td>
</tr>
<tr>
<td>Mjusjusli 10</td>
<td>12:33</td>
<td>35 - 60</td>
<td>321</td>
<td>56</td>
<td>30 - 60</td>
<td></td>
</tr>
<tr>
<td>Bargusad 13</td>
<td>12:50</td>
<td>45 - 50</td>
<td>308</td>
<td>56</td>
<td>30 - 60</td>
<td></td>
</tr>
<tr>
<td>Ucar 13</td>
<td>13:05 13:30 50 - 60</td>
<td>Change loco and crew, check</td>
<td>295</td>
<td>56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alikant 8</td>
<td>13:40</td>
<td>40 - 50</td>
<td>287</td>
<td>56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laki 12</td>
<td>13:53</td>
<td>55 - 70</td>
<td>275</td>
<td>56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malai 12</td>
<td>14:05</td>
<td>35 - 55</td>
<td>263</td>
<td>56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yevlax 14</td>
<td>14:20</td>
<td>40 - 55</td>
<td>249</td>
<td>56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mineacevir 11</td>
<td>14:40</td>
<td>40 - 50</td>
<td>238</td>
<td>56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goran 13</td>
<td>15:00</td>
<td>35 - 45</td>
<td>225</td>
<td>56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kurakcay 11</td>
<td>15:20</td>
<td>30 - 40</td>
<td>214</td>
<td>56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dalimanmadli 14</td>
<td>15:45</td>
<td>25 - 35</td>
<td>200</td>
<td>56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zazalis 7</td>
<td>16:00</td>
<td>25 - 50</td>
<td>193</td>
<td>56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gandja 10</td>
<td>16:15 16:30 25 - 35</td>
<td>Change crew, check</td>
<td>183</td>
<td>56</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The normal running time in Georgia can only be estimated by experience taken on a passenger locomotive travel from Tbilisi Main Station to Batumi. Usually, a passenger train from Tbilisi to Batumi runs about 8-11 hours. Starting in Tbilisi the passenger train runs two hours to Khashuri where a second locomotive for pulling across the steep pass-section to Zestaponi is coupled to the train. An oil train starting at the border station of Gardabani would run an estimated 4.30 hours to reach Khashuri. An additional hour would take the technical stop in the Khashuri station.

While passenger trains travel the pass section at a maximum speed of 50 km/h, the speed of oil trains is limited to 40 km/h. Reportedly, an oil train is scheduled to pass this section with 2.10 hours. From Zestaponi, where another technical stop is executed, to Samtredia it takes about another 1.5 hours (or 1.07 hours for passenger trains). The last part of the line to Batumi is single track. However, a priority train should be able to pass this section in no longer than 3.5 hours, so that a priority oil train supposedly can travel from the border station Gardabani to Batumi station in around 13 hours, if necessary. When in Batumi it should take about 3 hours to push the RTCs to the terminals, if required.

All in all, the journey of an oil train from Baku to Batumi can be executed in 34-40 hours (including border-crossing procedures). Instant unloading provided, a roundtrip should not take more than four days (if not decided other for operational reasons), which is very acceptable by international standards.

### 3 Railway Facilities Georgia Rail

#### 3.1 Rail Tank Cars (RTCs)

Georgian Rail has 1,441 RTCs, of which 1,328 are four-axled. For the transport of low-viscosity products the company can provide 480 RTCs with steam-jackets (included in above total). All RTCs in Georgia are owned by Georgian Rail, and almost all are used for the transport of oil and oil products from Baku (Azerbaijan) to Batumi and Poti.

Most of the RTC fleet has been leased out to private operators on a long-term base. The fleet generally needs modernisation. Very recently, the private operator Silk Road has bought some 300 steam-jacketed
RTCs for Georgian Rail and taken them directly into long-term lease. In return, Georgian rail grants favourable transit tariffs.

Georgian Rail claims that there is a marked imbalance between the number of Georgian and Azeri RTCs, which makes it difficult for Georgian Rail to operate on a profitable base. For operational reasons, Georgian Rail always has to keep a least 1,500-1,800 loaded RTCs on their network in order to guarantee a timely and flexible delivery of oil cargoes to Batumi Oil Terminal. Thus, there are always more RTCs from foreign railway companies on Georgian territory than vice versa due to the small number of Georgian RTCs. Since according to international rules Georgian Rail has to pay 13-14 SFr for every foreign RTC on their rail network, profits from rail transportation are balanced by losses from the provision of RTCs. Even more, when foreign RTCs cannot be unloaded e.g. due to weather conditions, non-availability of storage or tankers at Batumi.

3.2 Marshalling Yards

Georgia has four major marshalling yards: Tbilisi Sortiro, Lilo, Poti and Batumi. Most important for the purpose of the present project is the marshalling yard in Batumi.

The Batumi freight station with its marshalling yard is the end-point of the single-track line from Samtredia with a length of 97 km. The former automatic block system is out of order since the last civil war in Georgia; the system is current operated semi-automatic, considerably restricting the maximum number of train pairs passing through this section per 24 hours. Currently in peak times 18-19 trains (including 3 passenger trains) find their way to Batumi, with about 15-16 trains (including three passenger trains) in opposite direction. The disparity occurs since outbound empty oil trains can carry more RTCs than incoming loaded trains. According to information from Georgian Rail management this section can handle considerably higher train numbers (more than 22 train pairs) provided that power is continuously available. Especially in winter times power cuts limit the capacity of the line to 14-15 train pairs per day damage electric locomotives.

The marshalling yard has hand operated turnouts and needs major track repair. An extension by 3-5 tracks is projected. Mainly Batumi Oil Terminal with its RTC unloading gantries and Batumi Sea Port are connected to the marshalling yard. Situated in the city with the main deadlock-shunting track on one side crossing the main road, shunting is difficult and dangerous. All rail facilities are very old.

Georgian Railways claims that the Batumi marshalling yard can easily handle a least 700 RTCs per day incoming plus the same amount outgoing, in addition to the current (low) amount of dry cargo (one train per week incoming). This estimate is based on very few instances where this number of RTCs has been successfully brought into Batumi station. It is not quite clear whether Georgian Rail under today’s frame conditions can repeat such productivity on a daily base. Moreover, it needs to be taken into account that for operational reasons the main customer at Batumi (Batumi Oil Terminal) requires an unloading reserve of 400-500 RTCs, which block a considerable part of the marshalling yard. By the time of an on-site visit to Batumi at the beginning of May 2003, the marshalling yard accommodated about 600 RTCs. However, about 20-30 RTCs were parked on the territory of the port. Reportedly this happens regularly to relieve the marshalling yard and Batumi station.

3.3 RTC Cleaning Facilities

Georgian Rail currently does not have any operational facilities for cleaning RTCs other than from outside. The cleaning facility in Batumi has been out of operation for several years. Rehabilitation plans have been
stalled due to lack of funds. Thus, prior to maintenance and repair (M&R) requiring inside cleaning, the RTC is sent to Azeri Balajari for cleaning, then shipped back usually to Batumi, where M&R is undertaken.

### 3.4 Maintenance and Repair Facilities

Technical inspection and service for (loaded oil) trains is carried out during technical stops (e.g. for changing of locomotive). Usually trains stop at Gardabani border station for 90 minutes during which a routine check of 60 minutes is conducted (40 minutes for empty trains). At Khashuri (beginning of the pass section for west-going trains) and Zestaponi (end of the pass section) the trains stop for 60 minutes and 40 minutes respectively (30 minutes check at both stations). In addition, trains arriving and leaving Batumi station undergo a 30 minutes check. RTCs found fault are decoupled from the train and sent to the next small workshop along the track for repair.

Georgian Rail follows the same maintenance and repair cycles as Azerbaijan State railways, i.e. as prescribed by GOST. All Georgian Rail's RTCs are maintained and repaired at the Batumi Wagon Depot. The depot has a repair yard with a capacity of up to 1,500 RTCs per year but is currently under-utilised due to lack of RTCs. For 2003 it is envisaged to repair 970 units only.

### 4 Facilities of Other Railways and Private Operators

#### 4.1 RTCs from Central Asia

There is a considerable number of RTCs from Central Asia which carry oil and oil products in transit through Azerbaijan and Georgia. The cargo comes mainly from Kazakhstan (Kumkol, Chimkent) but also Turkmenistan (Turkmenbashi Refinery), where oil and oil products are loaded into RTCs and then shipped to Turkmenbashi port (or in exceptional cases also Aktau port). The RTCs then cross the Caspian Sea by rail ferry to Baku. This transport chain is mainly operated by Silkroad Group, who has a large number of RTCs (some 1,900 including about 300 RTCs with steam jackets) from Uzbekistan, Kazakhstan, Turkmenistan, but also from Georgia under leasing agreement.

According to multi-lateral agreements between CIS railways, RTCs need to be returned to their owners directly after unloading if not else specified. However, when there is a shortage of RTCs in the Caucasus, Central Asian RTCs are sometimes halted at Baku, loaded and sent to Batumi instead of immediately returned to Central Asia.

RTC s from ASR use for oil transportation usually do not leave the Caucasus. Russian RTCs are, if at all, very exceptional guest of the Caucasian oil logistical system.

#### 4.2 RTCs from Private Operators

There are currently three private operators, which have their own RTCs running between Baku and Batumi.

- Silk Road Group has about 300 own RTCs (including 100 with steam jackets) and is planning to bring the number up to 1,000 in the medium future.
- Another private operator is Azpetrol, a relatively young but fast growing Azeri company, which owns 650 modern RTCs and also gave 1,000 as target figure.
- Middle East Petrol currently owns about 350 RTCs and has contracted another 500.
The privately owned RTCs are not older than 5 years, on average about 2-3 years, and all are four-axled. Most of them have been constructed in the CIS. If business is growing and profit margins remain sufficient, these companies will most likely order more RTCs, mostly equipped with on-board heating system.

5 Conclusion and Outlook

Generally, the Caucasian railways are in a position to handle higher volumes than today. For example, ASR and Georgian rail together own about 4,200 RTCs for international oil transports (2,800 and 1,400 respectively). If we assume that Georgian Rail has leased out about 50 percent of its RTCs to Silkroad Group for transports originating in Central Asia, and add about 1,000 RTCs owned by Azpetrol and Middle East Petrol, this leaves 4,500 RTCs for transports between Dubendi/Baku (excluding RTCs from the ferry\(^4\)) and Poti/Batumi. Given an average payload of 60 tonnes and an average roundtrip time of 8 days (which is twice as much as the theoretical optimum and well above the current practice of 6-7 days), the annual capacity of the RTC fleet should be around 12 mn tonnes against today’s handling volumes originating in Dubendi and Baku terminals and refineries of below 8 mn tonnes. However, some technical chokepoints need to be removed as soon as possible, in order to guarantee trouble-free operation.

- Currently both railways undertake considerable efforts to repair and rehabilitate the existing rail track infrastructure. However, it is evident that this task needs large-scale investment. On some sections, the average speed of an oil train does not exceed 10 km/h due to the condition of the track. While between Baku and Samtredia the line is double track and electrified, mainly operated by semi-automatic block systems, the section between Samtredia and Batumi is single track and in severe need of modernization. Thus, this section is seen as one of the infrastructure weaknesses hampering further development of the corridor.

- Marshalling and shunting yards in and around Baku do not seem to restrict the operation of oil trains. However, the marshalling yard in Batumi needs extension and modernisation if higher volumes shall be handled under the existing operational regime of the main customer Batumi Oil Terminal.

- The majority of RTCs controlled by the two state railway companies is rather old and in need of replacement, especially for environmental reason (a considerable number of RTCs seems to be leaking if taking the oil stains on marshalling yards and between the rail tracks as an indicator). Moreover, most RTCs are not equipped with heating systems (steam-jackets), what proves to be an obstacle for unloading operations in wintertime.

- While maintenance and repair facilities seem to be sufficient to serve the RTC fleet currently operating in the Caucasus, there is a lack of RTC cleaning services both with respect to quantity and quality. It remains to be seen whether the rehabilitation of the cleaning facilities in Balajari will provide significant relief.

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\(^4\) Handling volumes (about one mn tonnes in 2002) and RTCs (about 2,200) of Silkroad Group have not been taken into account for this calculation as this traffic is subject to different frame conditions. A roundtrip Chimkent-Batumi-Chimkent takes about 30 days, thus the maximum capacity of this line is currently about 1.6 mn tonnes if all transports originate in Chimkent.
ANNEX 8: Oil-transport Related Terminal and Storage Facilities on the Georgian Black Sea Coast

1 Introduction

The following gives a brief overview on the major players operating in and around the Georgian Seaports of Batumi and Poti and the infra- and superstructure they control. Information has been derived from interviews with Georgian and EU experts as well as from previous studies elaborated within the framework of Tacis TRACECA. Moreover, the consultants have closely reviewed press releases and Caspian and international news services specialised on transport issues in order to verify and update information.

2 Ports and Terminals in Georgia

2.1 Batumi

Batumi is the major endpoint of oil transports by rail across the Caucasus. Here the oil is unloaded from rail tank cars (RTCs) into storage, and later pumped into tankers heading for the world markets.

Gantries and Storage

Since 1999, the unloading and storage facilities are operated by Batumi Oil Terminal and its marketing and logistics arm Alegratrans, a subsidiary of Naftrans. Currently the terminal has 7 gantries (including facilities of subcontractors) with a total of 107 unloading trestles. The gantries are of different size (in number of unloading trestles) and age. The limited number of unloading trestles per gantry makes it difficult to unload trainloads without significant marshalling activities. Reportedly, only 3 or 4 gantries are currently under operation. Some gantries are working with obsolete technology and are in need of modernisation, even though Naftrans has invested about USD 35 mn into the refurbishing of the terminal (including seaside facilities). The terminal has the capacity to handle on average 450 RTCs per day (300-400 RTCs in winter season, 500-550 RTCs in summer, always depending on the composition of cargo and parcel sizes), i.e. 11-15 trains per day, which sums up to a maximum handling capacity in the range of close to 10 mn tonnes. Given a handling volume of 8.6 mn tonnes (5.2 mn tonnes of crude and 3.4 mn tonnes of oil products) in 2002, the terminal is in need of extending its unloading capacity.

Alegratrans has reacted and installed a new gantry running with advanced technology. Alegratrans will now be able to unload fuel oil and high-viscosity crudes even in winter times since with the new technology the cargo will be heated and thus liquefied while unloading. The unloading time for fuel oil and high-viscosity crudes in wintertime thus reduces from 8 hours to 3 hours. The gantry has four lanes with 21 unloading trestles each, thus considerably boosting the unloading capacities of the terminal. It is intended to use the new gantry for handling crudes and black products. Start of operation is envisaged for the end of May 2003.

Reportedly, the terminal management plans to successively close down some of the older gantries rather than rehabilitate them, after starting operations with the new gantry.

According to the terminal management it is necessary for operational reason to have at least 15 trainloads or about 500 RTCs waiting for unloading at the nearby station.

5 Under normal condition unloading time for an RTC containing Kumkol oil is 1.5-2 hours, while fuel oil takes a minimum of three hours with the existing facilities.
The storage facilities are mainly located near the terminal (light products) and in Kaprechumi (11 x 10,000 m³ for crude oil and black products). The storage capacities have recently been increased from 450 thousand tonnes to a maximum capacity of 480 thousand tonnes (150 thousand tonnes for light products, and 330 thousand tonnes for dark products and crudes, including facilities of subcontractors). The size of the 124 tanks ranges from 1,000 m³ to 10,000 m³. The storage facilities currently have an average capacity utilisation of around 80%, there are always between 350-400 thousand tonnes of oil and oil products in store.

Seaside Terminal
The seaside terminal is also operated by Batumi Oil Terminal, who has leased the oil terminal for a period of 10 years in 1999 from the Port of Batumi. Instead of a fixed lease the port receives a throughput fee for every tonne handled at the sea terminal. Moreover, the private operator had the obligation to modernise the terminal, thus since the beginning of the lease agreement the operator has invested several million USD in infra- and superstructure improvement. Eventually all terminal equipment now belongs to Batumi Oil Terminal. The terminal is connected to the tank farm via a pipeline network, which has also been rehabilitated and is now owned by the terminal operator.

Picture 13: Pipeline System and Wastewater Reception Facilities at Batumi Oil Terminal

Vessel unloading is done at three berths and one SPM facility. At the SPM tanker vessels up to 140 thousand tdw can be loaded but currently the usual size is 66-70 thousand tdw. The SPM is located about 170 m from the oil pier to the sea and is connected to the storage tanks by two lines for crude oil and black products and two lines for white products. Berths 3 and 2 can handle vessels up to 25 thousand tdw while Berth 1 accommodates vessels up to 50 thousand tdw. About 30 vessels per month are handled at the oil terminal. The annual handling capacity of the seaside terminal facilities is estimated at 14-15 mn tonnes.
After privatisation of handling operation, transshipment volumes in Batumi have increased from 3.3 mn tonnes in 1998 to 8.6 mn tonnes in 2002 (of which 5.2 mn tonnes of crude oil and 3.4 mn tonnes of oil products). Oil and oil products thus constitute over 90 percent of handling volumes in the Port of Batumi. Initial planning expected figures for 2003 in the same range as 2002. However, a further increase to 9.6 mn tonnes in 2003 cannot be ruled out after several additional requests for the transshipment of Kumkol oil and some mineral products have been received. Moreover, there are constant rumours of the partial re-establishing of the former Caspian Transco chain (Tengiz oil).

Unstable weather conditions on the Black Sea and in the Dardanelles and the Bosphorus sometimes prevent tankers from reaching the Port of Batumi in time. The temporary closure of the Bosphorus forces terminal operations at Batumi to stop due to unavailability of vessels. Cargoes from storage tanks cannot be emptied into vessels in time, which of course has a negative impact on the RTC handling operations due to the limited storage facilities. Thus, from time to time RTCs are stockpiling at Batumi marshalling yard, at Beyuk-Kyasik (Azeri-Georgian border) and along the track between Baku and Batumi.

Batumi Oil Terminal purchased their own two tug boats, one of which has already been delivered, for mooring operations of tankers. The tugboats are also equipped with a water/foam cannon (400 m$^3$ per hour, 5 m$^3$ foam tanks) and sprinkler system for fire fighting. Moreover, there are six fixed land-based water/foam cannons, two at each berth.

Recently the port has developed a master plan for the construction of a new port next to the existing one (see www.batumiport.com). Together with this new port Batumi is envisaged to have oil-handling facilities with a capacity of up to 20 mn tonnes p.a.

**Refineries**

Georgia has two refineries, one in Batumi with a maximum capacity of about 5mn tonnes p.a. and a smaller one in Sartichala able to handle about 250 thousand tonnes p.a. The Batumi refinery, however, has been out of oil processing operations since about six years. There have been constant approaches to rehabilitate the refinery but so far all projects have come to naught due to lack of funds. The last attempt by Japan’s Marubeni Corporation failed due to lack of state guarantees for a Worldbank loan. Thus, Georgia is currently forced to import 90 percent of the petroleum products it consumes.
Operations at the refinery today are restricted to transshipment and storage of crude oil as subcontractor to Batumi Oil Terminal. Oil is received in RTCs from terminals at the Caspian Sea coast, unloaded, stored and pumped to tanker vessels. For these operations the refinery provides one unloading gantry for 2 x 15 RTCs and 22 storage tanks with a total capacity of about 120 thousand m³ (7 x 7,600 m³, 12 x 4,700-5,000 m³, 3 x 3,000 m³). The monthly throughput is estimated at 220 thousand tonnes plus, equivalent to about 120 RTCs per day. In addition, the refinery has leased out a smaller storage (about 15 x 3,000 m³) for white products to Batumi Oil Terminal, who has constructed a specialised unloading gantry (1 x 15 RTCs) next to these storage tanks. On demand, the refinery can also provide an additional gantry for 2 x 9 RTCs.

A pipeline connects the refinery to the Baku-Supsa pipeline near Tbilisi. The rehabilitation of the pipeline would also pose an alternative to/supplement the present rail transport chain. According to estimates from Batumi Seaport the total traffic of oil and oil products could then reach 20 mn tonnes p.a. The construction of additional refineries is envisaged (by e.g. Canadian CanArgo, Switzerland’s National Petroleum Limited, and Georgian-American JV Frontera Eastern Georgia), but none of these projects has reached a stage beyond planning, yet.

2.2 Poti

The Port of Poti has initiated an extension programme for their oil handling facilities, which is financed by an EBRD loan. Since the former facilities have been designed as an interim solution for the import of white products, the extension plan foresees to create new export facilities for crude oil and oil products. The first stage, the installation of a rail gantry and four on-shore storage tanks for white products has been put into operation in October 2002. The second stage, the construction of a second gantry and four on-shore storage tanks for crude oil and black products is to be finalised by the end of 2003. The last stage comprises the construction of a new berth the accommodation of larger tankers.

Gantries and Storage

The oil terminal facilities are operated by the Gibraltar-based Channel Energy, a joint venture between the Turkish Delta Oil and Poti Port Authority. The terminal has a two-sided unloading facility with 12 trestles per lane for light products.

The four new storage tanks, which have been designed for the export of white products, have a capacity of more than 36 thousand m³ (2 x 11,480 m³, 1 x 8,480 m³, 1 x 4,800 m³). The current maximum annual operational capacity of the export terminal, which is mainly determined by the size of the storage facilities, is about 1.2 mn tonnes of white products. An extension of the export storage park to allow additional storage of almost 80 thousand m³ (3 x 20,400 m³, 1x 16,300 m³) of crude oil and black products is envisaged for the end of this year. These storage tanks will be connected to an unloading gantry for simultaneous handling of 22 RTCs.

Moreover, there is a floating storage, an old Russian tanker vessel tied to berth 1, with a capacity of 34 thousand m³ for the import of white products. The floating storage is connected to a gantry able to handle 16 RTCs simultaneously. The floating storage will be removed after the finalisation of the second stage of the terminal extension programme to give way for the handling of crude oil and black products at berth 1.

In 2002 more than 780 thousand tonnes of oil products or 13 thousand RTCs were handled at Poti Port. Most of the cargo was transit business for Armenia. The new export facilities did not make an impact yet. According to information obtained from the port management, the oil handling business in Poti Port still exclusively concentrates on the import of white products. Though handling volumes have been falling

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6 See www.batumiport.com
between November 2002 and March 2003 (in the first quarter 2003 just about 130 thousand tonnes of white products compared to 197 thousand tonnes in 2002 were handled at Poti) the port expects to increase handling figures in 2003 compared to 2002 since on the export side both Turkmenistan and Uzbekistan reportedly intend to have their light products (petrol, paraffin and diesel) handled at Poti Port. Moreover, some Azeri products shall be handled at Poti.

Seaside
The pier can currently accommodate two tankers with a deadweight up to 25 thousand tonnes simultaneously. An additional berth for 60 thousand tdw tankers is envisaged for the third stage of the present port extension programme.

After finalisation of the third stage of the extension programme the oil terminal will allow handling of 3 mn tonnes of crude and black products as well as 1.5 mn tonnes of white products (mainly diesel, kerosene and benzene).

2.3 Supsa
Supsa Port currently consists of a single point mooring facility able to accommodate tankers up to 150 thousand tdw. The SPM is connected to an on-shore storage farm with four 50,000 m³ tanks. The storage farm receives crude oil via the Baku-Supsa pipeline, which after the finalisation of an upgrade programme in the middle of 2002 now has an annual throughput capacity of about 7 mn tonnes. Loading activities are controlled by a marine base situated on-shore opposite the SPM. All facilities are operated by BP on behalf of the Azerbaijan International Oil Consortium AIOC (for more information see Annex 12).

In 2002 about 50 tankers were loaded at the SPM facility. The throughput of the storage farm was in the range of more than 5 mn tonnes. Volumes are expected to increase in 2003 due to the increase of the exploitation rate at the ACG oilfields (Azeri, Chiraq, Gunashli), which directly connected to Sangachal Terminal (Baku), the starting point of the Baku-Supsa pipeline.

There are no unloading facilities for RTCs in Supsa. However, supported by TRACECA the Supsa Port Authority will soon start to prepare a master plan for the development of new port facilities. It cannot be completely ruled out that these facilities will also include RTC handling installations.

3 Conclusion and Outlook
The handling and storage facilities related to the transshipment of crude oil and oil products from Georgian Black Sea ports can generally be considered sufficient to handle the existing cargo volumes if all facilities (including the recently constructed installations) are operational and accepted by customers (i.e. if they offer acceptable services at competitive rates).

However, the facilities in Poti have not been targeted by transport chain operators yet, reportedly due to insufficient services and higher prices compared to the competitor in Batumi. Moreover, the storage capacities are currently seen as insufficient to handle substantial volumes of oil products. Operators are waiting for the installation of crude oil and black product facilities before they consider Poti as a serious alternative to Batumi.

Since transport chain operators are not yet using the facilities at Poti for the export of oil cargoes, Batumi is on the edge of operational capacities if not the new gantry will be put into operation in the very near future.
Moreover, the storage facilities may need to be extended if larger transport volumes shall be handled at Batumi.

Thus, given that substantial increases of handling volumes are expected, the existing facilities in Supsa and Batumi may prove to be insufficiently dimensioned to guarantee a troublefree transshipment of oil cargoes. However, much depends on the operational concepts how to deal with temporary extreme peaks in demand for storage and/or unloading capacities due to considerable delays in vessel arrivals e.g. during unfavourable weather conditions in the Bosphorus.

Competition between rail and pipeline for oil transportation from Baku to the Georgian Black Sea coast can be ruled out for the time being. Even after the opening of the Baku-Tbilisi-Ceyhan pipeline the Supsa pipeline will remain fully operational. However, there is little case for an opening to third parties since the legal base for the operating of the pipeline, the Host Government Agreement (HGA) and the Pipeline Construction and Operating Agreement) clearly state that the pipeline will be used for Azeri crude only. Any changes to these agreements need to be ratified by the Georgian Government. The Georgian Government however has no interest to loose any fees for the transit of oil by rail through Georgia. Given that the Supsa pipeline has much lower operational cost than the BTC, there will always be Azeri crude shipped through this pipeline, thus securing a double income for the Georgian State from oil transits.

The possible construction of rail handling facilities at Supsa is more or less a mid-term project, not intended to provide immediate relieve.
ANNEX 9: Operational Procedures for Transports of Oil and Oil Products across the Caucasus

1 Introduction

Oil and oil products that are transported across the Caucasus are originating at many different places in Central Asia but also Azerbaijan. Thus, a variety of different transport chains exist. A common feature of these transport chains however is that all cargoes pass through the terminals of Baku area (including Dubendi and Sangachal). Once the cargo is loaded into rail tank cars (RTCs) in Baku area, operational procedures are basically identical since here the different transport chains merge to a single stream before they part again at the Georgian Black Sea Coast (see Annex 10 for a description of oil flows).

The following Annex describes the general operational procedures of oil transports by rail across the Caucasus starting from the trans-Caspian leg of the transport chain to the loading into tankers at Batumi. Information has been obtained during several on-site visits to terminals and facilities relevant for oil transport operations as well as numerous interviews with representatives of institutions and companies involved in handling oil cargoes and organising transport chains across the Caucasus.

2 Chain 1: Caspian East Coast Port – Tanker – West Coast Port – Tank Farm – Rail – Tank Farm – Georgian Port

Partners Involved in the Transport Chain

Operational procedures as far as the context of the present project is concerned usually start with a cargo owner looking for shipment of his oil cargo from the Eastern part of the Caspian, say Aktau port, to the Georgian coast, where the cargo shall be loaded onto a large tanker destined for oil ports like Augusta or Rotterdam.

Generally, the cargo owner can choose to either organise each leg of the transport chain by himself, or tender the organisation of the complete transport chain, or organise part of the chain by himself and tender the rest. As far as oil transports across the Caucasus originating in Central Asia are concerned, the dominating option is to tender the leg fob (free on board) Caspian East Coast – fob Georgian Coast, e.g. fob Aktau – fob Batumi. However, a multitude of other options exist and are realised, e.g. fob Aktau – cpt (cost paid to) Batumi (i.e. Batumi rail station) or even daf (delivery at frontier) Georgia conditions.

Provided that the cargo is already stored in tanks in Aktau, Turkmenbashi or elsewhere along the coast the cargo owner, who decides to organise the whole transport chain across the Caucasus by himself, must deal with the following institutions and companies along the route:7

1. **Seaside terminal operator in the port of loading**: the cargo owner must agree with the operator on terms and conditions for loading the cargo into a tanker.

2. **Tanker operator**: currently only tankers operated by Caspian Shipping Company (CASPAR) are serving the ports of Baku (including Sangachal) and Dubendi. Thus, the cargo owner will have to charter tanker capacity from CASPAR and negotiate the usual (voyage) charter terms.

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7 For a description of the facilities these institutions and companies operate see Annex 5 for seaside facilities in the Caspian Sea, Annex 6 for terminal facilities in Azerbaijan, Annex 7 for terminal facilities in Georgia, and Annex 8 for railway facilities of Azerbaijan State Railways and Georgian Rail.
3. **Customs Azerbaijan**: the cargo owner must execute all necessary procedures and provide proper transit documents for his cargo. Assuming that the cargo owner will stay owner from the beginning of the transport chain in Central Asia to the final destination, Customs clearance is based on the invoice for the cargo and the non-manipulation certificates obtained during the journey from the origin of the cargo to the Caspian Sea East coast port (see also 6.). Most of all, he will have to provide a Customs deposit.

4. **Sea terminal operator in Baku or Dubendi**: the cargo owner has three options, either to call at Azpetrol Baku or Azpetrol Sangachal (both operated by Azpetrol subsidiary Azertrans) or MEP Middle East Petrol Dubendi (operated by MEP subsidiary Kafkastrans together with Baku port). As these terminals are directly connected to tank farms and RTC loading gantries operated by the respective sea terminal operator (in Dubendi only Kafkastrans is running the tank farm and RTC loading facility, Baku port is only involved in seaside operations), the cargo owner spares to contract **tank farm operator** and **RTC filling station** separately. He will have to agree with the operator of these facilities (i.e. the terminal operator) on unloading and re-loading rates, storage time, demurrage, and especially a time schedule during which unloading from tankers, storage of cargo and re-loading into RTCs needs to be executed. The terminals/tank farms have the status of a customs warehouse. Thus, Customs clearance can be executed on the area of the terminal, where also a Customs office is located. Usually, the terminal operator also offers his service in handling Customs procedures, i.a. by arranging the Customs deposit for Azerbaijan as well as for Georgia. The a.m. time frame the cargo owner must coordinate with the renting of RTCs for uploading the cargo for further shipment. Thus he needs to contact **providers of RTCs**:

7. **Providers of RTCs**: currently the cargo owner can rent RTCs either from the private terminal operators or the railway companies. Usually RTCs are rented for a certain time period. Aside from rates, terms to be agreed upon comprise i.a. point of delivery, condition of re-delivery (e.g. cleaned), renting period, demurrage. Reportedly there still are so-called “free RTCs” (a product that does not exist in western Europe anymore), which can be rented for a single voyage. Here, delivery at terminal gate and the return of empty RTCs are included in the rent.

8. **Azerbaijan State Railways**: the cargo owner has to contract ASR for receiving transport/traction services. ASR also writes the railway bills based on information (instructions) obtained from the cargo owner. The cargo owner must give four instructions to the railways a) for provision of RTCs to the terminal gate (in case RTCs have been rented from any provider other than the loading terminal), b) for providing traction to the Azeri-Georgian border, c) for transport of empty RTCs from the border back to the dispatching station, and d) for delivering them back at the end of the renting period to the point of re-delivery agreed with the owner of the RTCs. Alternatively, the cargo owner can also contract ASR to provide traction all along the way to Batumi and back. ASR will then contract Georgian Rail and offer the cargo owner a through-tariff. Similar to the terminal operator, the railways also provide assistance for Customs clearance.

9. **Customs Georgia**: the cargo owner must execute all necessary procedures and provide proper transit documents for his cargo. Most of all, he will have to provide a (significant) Customs deposit. In case the deposit has been transferred and there has been no change in ownership of the cargo, Customs procedures are fast and efficient.

10. **Georgian Rail**: the cargo owner will have to contract Georgian Rail for providing traction and marshalling of the RTCs from the border (including pulling the RTCs across the borderline) to the final destination, e.g. the terminal gate in Batumi, and for transporting the empty RTCs back to the Georgian-Azeri frontier. Procedures are identical with those of ASR.

11. **Operator of RTC unloading facility**: in case of white products there are currently two options for cargo owners to unload their cargo from RTCs: Batumi (Batumi Oil Terminal/Alegratrans) and Poti

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8 In fact, it is rather the other way around: the operators of tank farms and RTC loading facilities are also operating the maritime facilities.
(Channel Energy), in case of crude oil and black products only Batumi can provide adequate facilities. Similar to Azerbaijan, in Batumi as well as in Poti, the operator of the unloading gantries is at the same time also the

12. **Operator of the tank farm and the**

13. **Operator of the seaside terminal facilities**: Again, the cargo owner needs to negotiate handling and storage conditions, and a time schedule for unloading from RTCs and reloading into tanker.

14. **Tanker operator**: the cargo owner must charter a tanker for on-carriage of the cargo to the world markets.

At this point the transport chain as concerns the transshipment across the Caucasus ends. In fact, the Caucasian leg of the transport chain is embedded between above institutions 2 to 13. If organising the whole transport chain by himself, the cargo owner is then responsible for the timely coordination of above different institutions and companies as well as for monitoring the physical transport of the cargo. It requires considerable special and local know-how and personal contacts to operate a chain like this, know-how that the average cargo owner (e.g. an oil producing company) does not necessarily possess.

Thus, a cargo owner interested in a quick and timely transport of his cargo, e.g. a trader with a long-term contract or an oil producer, usually decides to outsource at least major part of the task, in many cases even the complete Caucasian leg by tendering fob Caspian East coast port – fob Georgian coast. In this case the cargo owner is only responsible for organising the loading of the Caspian tanker, e.g. in Aktau, and for ordering a tanker to a Georgian port, e.g. Batumi. The remainder of this leg will be organised by the transport chain operator. A further outsourcing of services to the Black Sea leg of the transport chain, e.g. of chartering tankers to call at Batumi or Poti is good practice but investigation of which would somewhat lead astray from the project objectives.\(^9\)

However, there often are also cargo owners, e.g. traders specialised in arbitrage business, who are not necessarily interested in a speedy transport of their cargo. These cargo owners earn money by buying at low price and selling at high price. In between they usually need to cover a certain time period until their expectations for higher prices fulfil. A speedy transport would be counter-productive, so these cargo owners profit from slow transport operations as these reduce the necessity to rent costly interim storage capacities.

Every day the cargo (unnecessarily) stays in terminal storage or RTCs helps. However, in order to quickly react on changing markets, these cargo owners are also interested in having their cargo near the major outlets to international markets, i.e. in our case Poti or Batumi. Thus, they prefer to have their cargo available in the Caucasus rather than somewhere in Central Asia.

Generally, arbitrage traders should not pose any problem to a functioning transport system as the cargo they control is usually small compared to regular volumes. However, a transport system inhibiting considerable chokepoints, both technically and operational, may easily come to a breakdown, if the feeble balance between arbitrage traders’ volumes and regular volumes is disturbed, and if there does not exist any mechanism to automatically counter-balance.

In case of the oil transport chain across the Caucasus, the a.m. balance could be disturbed by unexpected or ambiguous developments on the oil markets leading some traders to unusually long delay selling (and thus transshipping) their cargo, while others are encouraged to purchase additional cargo. These cargoes then block storage and RTC capacities necessary to guarantee the flow of the more regular cargo, if not a price mechanism, e.g. demurrage for RTCs or overtime storage fees are charged (and enforced) against the cargo owners.

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\(^9\) For the extension of services to the Central Asian leg see Chapter 3.
However, not all problems encountered today in the Caucasus can be related to arbitrage traders and a lack of enforcement of the price mechanism since especially the professional transport chain operators have learned from the crisis experienced in winter 2001/02. They have established administrational measures to ban cargo owners from using the Caucasus as (unpaid) storage area, which in principle are said to work relatively well if strictly implemented.

In order to detail these administrational measures and to describe the problems of the corridor which are not related to erratic arbitrage business the following gives a brief operational schedule and time frame for transport chain planning and execution. For reason of simplicity we assume that the cargo owner has decided to buy the services fob Aktau – fob Batumi from a terminal operator in Baku, a quite common practice.

Planning of the Transport Chain
The cargo owner controls a parcel of 20 thousand tones of crude oil, which he has already shipped to Aktau storage. Final destination of the cargo shall be Augusta; an appropriate tanker transporting the cargo through the Bosporus has already been chartered. Arrival date of the tanker in Batumi has been fixed. The cargo owner now approaches the terminal operator, which also acts as a transport chain operator, for a quotation for fob Aktau – fob Batumi.

The terminal operator first checks the availability of own free storage capacities at Baku terminal, and the availability of storage facilities and RTC unloading capacities at the terminal in Batumi for the indicated time period. All terminal operators in Baku area have a contractual agreement with the terminal operator in Batumi governing fixed dedicated storage capacities at Batumi Oil Terminal to secure and facilitate planning and the financial and operational conditions for unloading RTCs and loading cargo into tankers. The terminal operator in Batumi has to guarantee that up to certain volume (e.g. 50 thousand tones) all cargoes sent from the terminals in Baku area can be stored trouble-free. If the dedicated storage facilities are already blocked by other cargo, Baku terminal needs to agree with Batumi Oil Terminal on additional capacities. Planning of storage capacity utilization is organised towards the end of a month for the coming month between the terminal operators/transport chain operators in Baku area and the terminal operator in Batumi. Planning is updated on a regular base. The transport chain operators have daily information on the stock of their cargo and the availability of storage capacities in Batumi.

In parallel, the terminal operator in Baku also checks if the cargo owner has nominated a tanker vessel for Batumi at a specific date. Reportedly, there exists a code of conduct between the different terminal operators in Baku area not to unload cargo from Caspian tankers into storage for which a tanker to Batumi has not been nominated. This shall prevent cargo owners from unduly using tanks and RTCs as interim storage, as terminal and transport operators are making money on transporting cargo rather than storage. In how far this code of conduct is actually implemented is beyond verification.

Also, the terminal operator needs to secure availability of RTCs (either operator’s own RTCs or RTCs under long-term leasing agreement, see Annex 6). A contact with the railways at this stage is not necessary as there exist framework agreements with either one or both railways governing maximum number of trains and RTCs to be handled during a given time period, transport tariffs for different products, eventually discounts etc. Towards the end of a month, the terminal operator elaborates a shipping plan for the coming month indicating the number of RTCs and different products to be transported by rail. This plan is discussed (or rather simply transmitted) to the Railway companies for approval. Moreover, there exist framework agreements between the two Railway companies on the maximum daily cross-border transfer of RTCs. Currently, the number stands at 20 trains or 600-700 RTCs. The agreement also governs the monthly joint planning of cross-border shipment volumes, i.e. ASR informs GR on the demand for shipment of oil and oil...
products as uttered by the transport chain operators. GR then needs to agree whether they are willing and
able to receive the indicated volumes.

Regular updates by the terminal operator on a weekly, if necessary on a daily basis adjust the plan to
operational needs. Generally, railway transport facilities in Baku area are sufficient to guarantee a trouble-
free transport at least to the Azeri-Georgian border.

The terminal operator then approaches a tanker operator, usually Caspian Shipping Company (CASPAR),
for availability of appropriate charter tonnage. Generally, the terminal operators in Baku area have long-term
agreements with CASPAR setting the frame conditions (such as tariffs) for charter contracts.

If all checked transport and storage facilities provide sufficient spare capacities during the indicated time
period, and the tanker nomination has been confirmed, the terminal operator provides an offer to the cargo
owner.

Execution of the Transport Chain

If the cargo owner accepts the offer the transport chain operator will adjust his planning of own storage
(including dedicated storage in Batumi), and RTC capacities, and include the respective amount of loaded
RTCs into his planning schedule for the Railway companies. Moreover, he will agree with Batumi oil terminal
on a time schedule for unloading the cargo at Batumi and reloading into tanker.

Last but not least, the transport chain operator will charter several tankers (voyage charter) or one tanker
(time charter) to transport the cargo from the load port, where the cargo owner has stored his cargo across
the Caspian Sea to the facilities of the terminal operator.

A parcel size of 20 thousand tones of crude oil or oil products is tantamount to three to four tanker shipments
across the Caspian Sea and the subsequent loading of 10 trains at Baku terminal.

At Baku sea terminal the cargo is unloading from tankers (with on-board pumps) into storage. The capacity
of the oil pumps usually vary from 700-1,000 m³ per hour. Unloading of a small tanker of 5,000 tdw thus can
take up to 7-8 hours. For providing Customs clearance, the transport chain operators usually have contracts
with one or several customs brokers, who also provide the necessary Customs deposits.

Depending on the agreement with the cargo owner, the cargo is stored up to a maximum of 10 days at Baku
terminal. After this period, the cargo owner is charged with demurrage. However, allegedly it is difficult to
enforce demurrage due to the strong competitive environment the terminals and transport chain organisers
are operating in. Usually the average dwell time in storage for crude oil and black products is reported to be
around 2-3 days (sometimes even only one day), for white products it is 3-4 days.

In line with the agreements with the cargo owner and the partners along the chain to Batumi, the terminal
operator on a daily base plans the loading schedule for the coming day(s) and submits this information to the
Railways and the terminal operator in Batumi. Thus, the terminal operator in Batumi knows which trains will
be dispatched from Baku area the following day(s).

The loading procedure starts with the terminal operator ordering RTCs with ASR to be delivered to the
terminal gate or providing own RTCs railed to the loading gantry. This procedure usually takes about one
hour, the subsequent loading of the RTCs at the gantry another two hours. Depending on the size of the
 gantry the loading of a full trainload, i.e. 2,000 tonnes or around 33-35 standard RTCs can thus be finalized
within two hours. After finishing the loading procedure, parallel to finalizing documentation ASR is informed
to provide traction from the terminal gate to the next station/marshalling yard, in case of Baku terminal this is
Baku Tovarnaya. If everything is operating smoothly, the whole process from request for RTCs to the delivery of the loaded RTCs (trainload) to Tovarnaya station can be executed within 5-6 hours (including issuing of railway bills).

Delivering RTCs to the terminals and pulling them back to the station/marshalling yard is executed by yard locomotives, usually diesel powered, also used for shunting and marshalling operations (in case a full train load has not been composed at the terminal yet). Once a train is scheduled for on-carriage to the border-station, an electrified cargo locomotive takes over and pulls the train to the next hand-over point. During the journey to the Azeri-Georgian border locomotives are routinely changed several times (see Annex 7) in order to keep the locomotives within their designated operational areas.

The journey to the Azeri border station at Beyuk-Kjasik takes 13 hours up to several days, depending on the scheduled/expected arrival of the train at the final destination in Batumi or Poti. Often trains are dispatched from Baku and then parked on some sidetrack or station along the line until an acceptance order from the oil terminal in Batumi has been issued.

Ideally, at Beyuk-Kjasik the Azeri locomotive is uncoupled from the full train and coupled to a train with empty RTCs heading back towards Baku. The railway bill (usually a roll with separate railway bills for each RTC but sometimes also one document with the RTCs the train is composed of collectively noted on) is passed on from ASR station manager in Beyuk-Kjasik to his colleague on the Georgian side at Gardabani. Customs procedures for the oil cargo are executed (check for certificate of origin, invoice, transit deposit). Usually, the transport chain operator, i.e. the terminal operator in Baku, contracts a Customs broker to provide Customs clearance services at the Azeri and Georgian border station. Simultaneously, the RTCs undergo technical checks, which reportedly are jointly executed by ASR and Georgian Rail staff at Beyuk Kjasik. Finally, when the train has clearance to be pulled over to the Georgian side (which seemingly depends on the unloading schedule of the respective cargo in Batumi or Poti), a Georgian locomotive is coupled onto the train and pulls the RTCs 9 km to the Georgian border station at Gardabani.

The whole border crossing procedure takes about 3 hours if no problems occur. However, sometimes loaded trains wait several days at the border until they are pulled over. According to information obtained from Georgian Rail only trains that have been accepted for unloading at Batumi or Poti, i.e. that have clearance from the terminal operators, are pulled over the border. Since most RTCs operating in the trans-Caucasian oil transport system are non-Georgian RTCs, Georgian Rail thus tries to minimise the time foreign RTCs (for which according to international railway agreements GR must pay a leasing fee of 12-13 SFr per day) spend on the Georgian rail network.

Towards the end of the month, the terminal operator in Batumi usually informs Georgian Rail on the planned unloading volumes for the coming month. Moreover, GR is informed on the scheduled vessel arrivals in Batumi port. This planning is detailed on a daily base: The terminal operator informs Georgian rail before 18.00h on the trains/cargoes that are accepted for unloading at Batumi Oil Terminal the following day. Moreover, the trains/cargoes to be accepted the day after are also specified. Thus, Georgian Rail receives information, which trains to send to Batumi station the next two days. Batumi Oil Terminal decides according to own operational needs. These procedures are fixed in a contractual agreement between the terminal operator and Georgian Rail that is currently under re-negotiation.

In order to guarantee a timely delivery of the cargoes to Batumi, trains and RTCs scheduled for the following day usually need to be already on the network of Georgian Rail, since it takes at least 16 hours for a train to travel from Beyuk-Kjasik to Batumi (including border crossing procedures). Given the technical problems of the line (see Annex 7), GR prefers to have a certain stock of loaded RTCs near Batumi station to comply with their contractual obligations and feed the unloading facilities of Batumi Oil Terminal. According to
information from GR, there is a daily 1,500-1800 loaded RTCs on the rail net of GR (of which 600-700 directly in Batumi station); enough to keep the unloading facilities busy for about three days. It can be assumed that some of these RTCs have not been explicitly cleared by the terminal operator since the number clearly exceeds the two-day planning figures exchanged between the terminal and GR.

Once the train has been pulled over to Gardabani station, the station manager at Gardabani checks whether the train has been loaded up to maximum pull weight allowed by Georgian Rail. While on the Azeri network the maximum gross weight of a train is up to 3,000 tonnes (including locomotive) on the Georgian side it is up to 3,500 tonnes or about 40 loaded standard RTCs. Thus, if single RTCs (or other rail cars) are available at Gardabani or Tbilisi Sortiro station they are added to the train until the maximum pull weight is reached. The train is then dispatched to Batumi or Poti (for operational procedure, e.g. change of locomotive, condition of track etc. see Annex 7). Depending on whether there exists a demand/order note from e.g. Batumi Oil Terminal for the cargo the specific train is carrying the train is pulled (more or less) directly to Batumi station or put on hold at some station along the route to Batumi.

Ideally, after an ordered train has been pulled to Batumi station according to the schedule provided by the oil terminal one day ahead, the RTCs are immediately decoupled and marshaled to the unloading gantries. The RTCs are unloaded into storage, and the empty RTCs are pulled back to the marshalling yard where empty trains, usually consisting of 55-57 RTCs, are composed. The empty RTCs are sent back to Baku where they are either cleaned at Balajari RTC Cleaning Yard (if necessary, see Annex 6), or overhauled at Balajari Repair Yard (if necessary, see Annex 6), or parked at some station or terminal like Alat, Baku Tovarnaja, Balajari, Dubendi, Baku Azpetrol depending on the owner/lessee of the RTC and the next scheduled round trip.

The cargo is collected in storage at Batumi Oil Terminal until the designated vessel arrives at Batumi, and is then pumped into the tanker. After Customs clearance has been executed the responsibility of the transport chain operator for the fob Aktau – fob Batumi part of the transport chain ends.

Tracking and Tracing

Railway companies have a tracking and tracing system for trains and RTCs for internal use. Theoretically, customers can contact the railways if they want to have information on the current status of their cargo but there is no office or department offering this service as a regular standard customer service.

Tracking and tracing is done “manually”. At the railway headquarter there is a dispatchers office where all information concerning the position of the different trains are collected. Whenever a train passes a station, the station manager informs the dispatcher who is responsible for this section of the railway network by phone. The dispatcher marks the passing of the station and the respective time on graphical timetables where all trains scheduled for movement on this section of the network are listed with a train number. From the train number the railway company can derive where a specific RTC currently is, or at least has been last seen. Several times a day, all dispatchers meet, and the position of all trains on the network at a specific time is determined. ASR claimed that via Intranet all station staff has access to update information on all RTCs currently at the three border stations Beyuk-Kjasik (to Georgia), Yalama (to Russia), Baku ferry terminal (to Kazakhstan, Turkmenistan), and at Baku Tovarnaya (main station). Information comprises train number, time the train has reached the station, and for each RTC is indicated the wagon number, owner of RTC, destination, dispatching station, type of cargo, cargo weight and railway bill number. Information is updated four times a day. However, reportedly information for Beyuk-Kjasik border station sometimes considerably lags behind.

The responsibility of the railway company ends at the border station. Once the border has been crossed the railway company can does not have any information on the status and position of the RTCs even if they own
the RTCs. Moreover, this system cannot give any ad hoc information on specific RTCs that have been decoupled from a train due to default as the system is merely concentrating on operational control of train traffic. It is usually up to the transport chain operators to keep track of (missing) RTCs.

The transport chain operators all have their own tracking and tracing system, usually based on standard spreadsheet software. The system is similar to that of the railway companies: the transport operators have their staff deployed at key stations along the route. Whenever a train passes a station, the local staff checks the RTC numbers and completeness of the train and notify the main office or enter the information via Internet access directly into the company database. Moreover, the transport chain operators have established good contacts to the railway companies and are informed about the results of a.m. dispatchers meetings. The tracking and tracing system allows transport chain operators not only to provide customers such as traders and oil producers with information on the current status of their sending. All cargoes are usually detailed by products, owner/contractor, RTC number, railway bill, train number, origin, departure date and time, destination, estimated time of arrival at destination, last station and passing time. Moreover, the transport chain operator knows who owns a specific RTC, when it has been cleaned last (in case of own or leased RTCs), last/next date of scheduled maintenance, position of empties, etc. Thus, the software programs of the transport chain operator go beyond mere tracking and tracing, and serve more or less as an RTC fleet management software.

Reportedly, customers of the transport chain operators are willing to install the systems on their own computers to have access to the tracking and tracing functions provided. At least one major oil producer is currently cooperating with a transport chain operator.

Both railways have declared that they are not planning to introduce a more advanced automated tracking and tracing system, e.g. by semi-automatic message transfer to a main server with display thus making use of the new installed fiber optical cable, in the very near future. Rather, the companies plan to refurbish the existing system by profiting from improved intelligibility of the existing telephone infrastructure.

3 Chain 2: Caspian East Coast Port – Ferry – West Coast Port – Tank Farm – Rail – Tank Farm – Georgian Port

Crude oil and oil products from Kazakhstan, Uzbekistan, and Turkmenistan also arrives in Baku by rail ferry, mainly from Turkmenbashi. The majority of these cargoes are loaded into RTCs in Chimkent where not only a major Kazakh refinery is located but also a pipeline from Kumkol oil field ends. Cargo also comes from the Turkmenbashi refinery and a refinery in Uzbekistan.

The cargo is transported by rail, usually 56 RTCs per train, via the territory of Kazakhstan, Uzbekistan and Turkmenistan to the port of Turkmenbashi. RTCs are usually owned by the railway companies of Kazakhstan, Turkmenistan, Uzbekistan, Tajikistan, Kyrgyzstan and Georgia, as well as by the transport chain operator Silk Road Group. Average transport time from Chimkent to Turkmenbashi is around 10 days. At Turkmenbashi the RTCs are decoupled and pushed onto the rail ferry sailing between Turkmenbashi and Baku, often after waiting for up to 5 days. The rail ferries sailing in the Caspian Sea (Dagestan type, see Annex 5) carry 26 loaded standard RTCs (i.e. less than half a trainload) plus for operational reason two other railcars. The sailing time between Turkmenbashi and Baku is 12-20 hours depending on whether the ferry uses both her engines or only one (to save energy). Currently the six ferries deployed on the line offer about 14 departures per week, however without fixed schedule. On demand the number of departures can be increased, e.g. in January 2003, reportedly more than 20 roundtrips per week were executed. From time to time a seventh ferry that usually travels between Baku and Aktau once a week is deployed to support traffic on the line Turkmenbashi-Baku.
In Baku, the RTCs are pulled from the ferry to Baku Tovarnaya station, where they are marshalled to trains. As the number and total weight of RTCs coming from one ferry is far below the maximum operational train weight on the ASR network, usually additional rail cars are added to the train until the pulling capacity of the locomotives is efficiently used. From Baku Tovarnaya to Batumi station this transport chain underlies the same operation principles as a.m. oil transports. However, due to the longer and more vulnerable transport chain (the transport between Chimkent and Batumi takes 14-20 days), which makes it more difficult to plan the timely collection of tanker load volumes at Batumi Oil Terminal, Silk Road Group has agreed with the terminal operator in Batumi not only on dedicated storage facilities (50 thousand tonnes) but also on preferential treatment conditions for their cargoes (e.g. cargoes can be sent even if a vessel nomination is still missing).

For the return of empty RTCs to Central Asia Silk Road Group uses two alternative routes. Aside from the trans-Caspian route, i.e. the ferry to Turkmenbashi, which is sometimes partly blocked by other eastbound cargoes, there is also the possibility of using the “Russian” route around the Caspian Sea back to Chimkent. For empty RTCs the latter itinerary is competitive. However, the shipping of loaded RTCs around the Caspian is deemed to expensive. In Chimkent the RTCs are cleaned if decided by an independent surveyor.

Sometimes, Central Asian RTCs (operated by Silk Road Group) are halted on their way back in Baku if the trans-Caucasian system is experiencing a shortage in RTCs. Instead of sending them back to Chimkent the RTCs are then re-loaded in Baku and sent to Batumi against the will of Silk Road Group and without compensating them. Since the roundtrip time of an RTC is already in the range of 30 days, the a.m. practice further limits the shipping capacities of Silk Road Group along this line.

4 Chain 3: Caspian East Coast Port – Tanker – West Coast Port – Tank Farm – Pipeline – Tank Farm – Georgian Port

The transport chain established by Caspian Transco, the former operator of Dubendi facilities, for the transport of Kazakh oil from Tengiz oil field also included shipments via Ali Bayramli.

Crude was transported across the Caspian Sea by tankers to Dubendi, where the cargo was unloaded into storage, and later pumped by pipeline to storage facilities in Puta (pumping station) and Ali Bayramli terminal. In Ali Bayramli (gantry facilities) the cargo was loaded into RTCs and shipped to Batumi.

Today, major part of the facilities along the route to Ali Bayramli are owned and operated by Middle East Petrol. As the company has concentrated their investment activities on the modernisation of existing facilities in Dubendi, the transport route via Ali Bayramli is currently out of operation.

Reportedly, the second gantry in Ali Bayramli operates from time to time. However, the consultants were not able to obtain any further information on ownership, operating company, and handling volumes related to this rather old) gantry.

5 Chain 4: Baku Refineries – Rail – Tank Farm – Georgian Port

Oil products produced at the Baku refineries Azneftyag and Azneftyanajag and destined for export are primarily loaded into RTCs at the gantries in Baku area such as Ahmeteli, Gantry no. 27 or Voroshilov gantry (see Annex 6), which are connected to the storage facilities of the refineries by pipelines. After the loading process, the RTCs are pulled to Baku Tovarnaya, where they are marshalled to trains and sent to Batumi or Poti.
The majority of these transports are organised by the Azeri forwarding company Baglan. In principle, these transports follow the same operational procedures as transports starting from the terminals of Azpetrol and Dubendi.

6 Tariffs

Costs and tariffs are a very sensitive topic among transport chain operators, as they constitute an important competitive factor. Thus, detailed information on costs were not revealed to the consultants whereas information on tariffs remained scant and vague. Moreover, tariffs are depending on the type and volume (lot size) of cargo. The following information has been compiled from different sources and should be considered only a very rough estimate

- Reportedly, shipping of oil and oil products in tankers across the Caspian Sea is quoted at around 5–6 USD per tonne from Aktau and 3-4 USD from Turkmenbashi. This rate includes port and vessel dues to be paid in port but excludes cargo handling in Aktau port (about USD 1.5 per tonne) or Turkmenbashi port (about USD 1 per tonne) and Dubendi terminal (about 0.5 USD per tonne).
- The rail ferry between Baku and Turkmenbashi charges USD 30 per lane meter independent of whether the railcar is loaded or empty. Reportedly, the return fee for the empty RTC from Baku to Turkmenbashi must already be paid in advance together with the fee for the loaded RTC from when Turkmenbashi to Baku. There are no discounts. In addition, the ports of Turkmenbashi and Baku charge 25-30 USD for each RTC handled at the ferry terminals.
- Transshipment rates (including 7-10 days of free storage) Baku and Dubendi terminals range from 5.5-7.5 USD per tonne with crude oil on the lower end. In Dubendi this rate includes about USD 0.5 (AzM 2,300) handling fee charged by Baku International Seaport.
- Rail freight rates only slightly differ between Georgian Rail and ASR. Generally, for the rail transport between Baku and Batumi the transport chain operator should calculate around 10-11 USD per tonne for crude oil and 14-15 USD for oil products.
- Transshipment tariffs in Batumi reportedly range from 6-8 USD per tonne.
- In addition, there is a leasing fee per RTCs that the customers have to bear. For a private RTC the leasing fee is around USD 20-23 per RTC and day, a rate which is in line with Russian leasing conditions. The transport chain operators usually have RTCs owned by the railway companies under long-term leasing. Leasing rates for these RTCs should be considerably lower. E.g. Western European railway companies charge about Euro 15 per RTC and day if the RTC is leased out under one-year contract. The rates charged by Caucasian railway companies are expected not to deviate very much from this level as Russian practice suggests. It is however difficult to assess which rate the transport chain operators pass on to their customers as the operator must possibly calculate additional costs like cleaning, maintenance and repair, idle time etc.
- Last but not least, the transport will have to bear fees for freight forwarding, possibly demurrage, and Customs clearance services.

About 2-3 years ago, TengizChevron, the operator of Tengiz oil field was assumed to pay USD 60 per tonne for the transport of crude oil from Tengiz via Aktau and Dubendi to Batumi. Today, above indicated tariffs suggest that the transport of a tonne of crude oil fob Aktau – fob Batumi should be somewhere well below

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USD 40.\textsuperscript{11} The transport chain via rail ferry may be a little more expensive since the high ferry rates more than offset the saved transshipment (unloading/loading) costs in Baku or Dubendi.

The competing route under inclusion of railway transports is the route via Makhachkala to Novorossisk. The special transport tariff that the Russian Ministry of Transport and Communications introduced for railway haulage from Makhachkala to Novorossisk in autumn 2001 equals USD 11 per tonne. Handling tariff in Makhachkala port is USD 0.75 per tonne. No information on storage and transshipment tariffs in Makhachkala and Novorossisk could be obtained. Though closer in distance, shipping tariffs from Aktau to Makhachkala should not be significantly below tariffs to Baku as these transports are usually carried out by smaller 3,000 tdw river-sea vessels. Nothing suggests that the transport chain via Makhachkala does offer any significant advantages, neither in costs nor operations.

To compare the a.m. price for the shipment of one tonne of crude oil from Baku to Batumi with the cost of pipeline transportation from Sangachal to Supsa is rather difficult. The cost for the transport of one tonne of crude oil from Baku to Supsa is reportedly around USD 5.50 (USD 1.90 for transit fee in Azerbaijan, USD 1.20 for transit fee in Georgia, USD 2.00-2.50 for operations), thus about half the rail freight rate. However, these cost seemingly do not reflect any depreciation for the investment made in pipeline construction not any profit and risk margin. The tariff indicated seems to merely cover the variable cost leaving in order not to burden the crude oil with too many “unnecessary” costs.

\section{Problems Encountered}

Apart from Technical Obstacles related but not limited to

- dimensioning and quality of unloading, storage and marshalling capacities in Batumi;
- capacity and condition of tankers and rail ferries crossing the Caspian Sea;
- capacity of the single track line Samtredia-Batumi, aggravated by the condition of the track and power cuts, especially in winter times;
- insufficient availability of RTCs with steam-jackets.
- insufficient availability of RTC cleaning and maintenance and repair facilities in the Caucasus
- sensitivity of the railway networks to accidents and (smaller) natural catastrophes such as heavy rainfalls;

and apart from Natural Obstacles such as

- Weather conditions on the Caspian Sea, hindering loading in Aktau and unloading in Baku and especially Dubendi;
- weather conditions in the Black Sea, leading to closure of the Bosporus, an thus considerable delays in vessel arrivals in Batumi;

the consultants have identified the following major Operational and Organisational Obstacles:

- During interviews with representatives of transport operators and project partners the consultants were given the impression that no train leaves the terminals in Baku and Dubendi that has not been accepted or cleared by the terminal operator in Batumi, represented by Alegratrans. Alegratrans,

\textsuperscript{11} The consultants roughly estimate USD 6 for crossing the Caspian, USD 6 for transshipment in Azerbaijan, USD 11 for rail freight, USD 6 for transshipment in Batumi, USD 160 lease fee for a standard RTC for eight days (including return and eventual cleaning), i.e. about USD 2.7 per tonne. The quoted items sum up to just below USD 32. Additional services like freight forwarding and Customs clearance and other raw cost etc should not exceed USD 3-5 per tonne.
same as Batumi Oil Terminal, is a subsidiary of Naftrans, which has leased the facilities for Batumi Oil Terminal Ltd., the latter seemingly only being responsible for (technical) operations. The terminal operators in Baku inform Alegratrans that they intend to send a train for a specific customer with his specific cargo. Allegedly, only if Alegratrans approves, the cargo will be loaded. However, it did not become quite clear whether all transport chain operators (need to) follow this rule. E.g. trains from Silk Road Group, due to the very long travel times from Chimkent, seemingly are exempted from this procedure, as they receive priority treatment anyway.

The first thing that needs clarification is who at Alegratrans actually serves as the contact partner for the transport chain operators (and all other partners involved in the chain). Alegratrans has several offices (Batumi, Baku, Moscow, London, and Istanbul) but reportedly all capacity and operational planning for Batumi is executed at the head office in Moscow. Thus, it can be assumed that all decisions concerning which cargo shall be handled in which order is made in Moscow while Batumi and Baku only serve as source offices. From Moscow office all partners along the transport chain (starting in Baku), i.e. the railway companies, the transport chain/terminal operators get their information. All feedback information (if there is any) seems then to be addressed to Batumi, from where it is transferred to Moscow, or directly to Moscow etc.

Based on the information disseminated by Alegratrans, Georgian Rail and potentially also ASR organise their own monthly as well as day-to-day planning, including, of course, cross-border transports. Moreover, the railways receive information on transport demand from the Azeri terminals which reportedly has also been cleared with Alegratrans Batumi (and therefore also Moscow).

However, the lines of communication seem to be rather confusing, and different interview partners claimed to have the final word or at least be significantly included in decision making, even within the same institution (i.e. even parties involved cannot clearly describe the way communication works along the oil transport chain). Responsibilities within the line of communication do not seem clearly attributed. Reportedly, communication between the private operators in Baku/Dubendi and Batumi functions well, while communication with and between the railways gives room for improvement. There does not seem to exist much standardised or contractually determined communication, which makes a reliable and flexible planning rather difficult. In Georgia for example, direct communication between Alegratrans and Georgian Rail only insufficiently exists on an informal base. All communication and financial administration should be executed through a private forwarding agent named GruZhelDor Expedicija. However, this indirect way of communication bears the risk of delays, communication flaws and misinterpretations, which reportedly in the past seems to have been the rule rather than the exception. Communication between Batumi and ASR seems to be a one-way street with Alegratrans temporarily informing ASR but receiving no feedback. Reportedly, communication between Georgian Rail and ASR concerning the planning of oil trains happens on a daily base between individuals of the respective operational departments. Information concerning ASR trains at or approaching the border station is passed on to Alegratrans by Georgian Rail.

Moreover, the consultants have got the impression that partners do get differing information, interpret information in a different way or react on information in a different way, so that none of the transport operators have a complete picture of the traffic for the coming three to four days. Planning on a very short-term basis, i.e. maximum for the next 48 hours is extremely different for the single transport operator if only very scarce information is available. The private transport chain operators have tried to bypass this situation by establishing their own communication network, which, however, has created even more communication channels.
A direct consequence of these gaps in the information chain seems to be that trains wait at the dispatching station for several hours (sometimes 12 hours) until they can leave for the border station. But even then, they frequently have to wait in stations for on-carriage. Often they even have to let bypass other oil trains for not always obvious reason. Thus, the journey time from leaving the terminal gate to the border station takes about 36 hours, sometimes even more. The average roundtrip cycle Baku-Batumi-Baku is quoted with 6-8 days (one operator even quoted 10-11 days as of May 2003), however with considerable upward variance. According to information obtained from the transport chain operators about 25-30% of the RTCs travel 9 days or more (up to several weeks).

The usual system-immanent price mechanism (e.g. demurrage) for delays inflicted by one of the partners along the transport chain only serves the efficient of the system if it can be enforced. So far, the consultants were given the impression that except for the operators at both ends of the transport chain, i.e. the monopolistic tanker operator in the Caspian and the monopolistic terminal operator in Batumi, no other party actually can enforce demurrage against the inflicting parties. The absence of an enforced price mechanism together with the perceived gaps in the information chain encourage traders to unduly use tanks and especially RTCs as cheap intermediate storage for their cargo.

The “code of conduct” (if it ever was one) for not unloading cargoes respectively not loading cargoes into RTCs of customers at Baku and Dubendi who cannot present a tanker nomination in Batumi does not seem to be strictly enforced or can easily by bypassed by traders. This may be facilitated by a high percentage of transport operations other than fob Aktau/Turkmenbashi – fob Batumi. By buying transport services cpt Batumi or even daf Georgia, artificial break points are incorporated into the transport chain thus slowing down the own cargo flow, increasing round trip times and blocking scarce resources, such as RTCs. Another problem concerning a strict enforcement of the code of conduct relates to some of the major origins of cargo transshipped in Baku and Dubendi. The refinery Turkmenbashi seems to produce according to an erratic, unforeseeable production plan. Customers are sometimes notified that part of their ordered lot will be produced the coming day and they are requested to provide a vessel to receive the cargo the day after. The timing of production of the remainder of the lot is not always foreseeable. Thus, the cargo owners needs to agree with the terminal operator in Baku and Dubendi on unloading and storing the cargo until the remainder of the lot has been produced. A vessel nomination he cannot provide, as he himself will not know whether the refinery will comply with the formerly agreed production plan. Or he will have to find another solution as the terminal is not interested in long-term storage but in quickly turning the cargo in storage (if a terminal succeeds in reducing the average storage time of cargoes, it increases the throughput capacity of the whole terminal and v.v.).

Also, cargo coming from the Azeri refineries is sometimes sent without proper agreement with Allegratrans. Seemingly, the key criterion is to free limited storage at the refineries for further production, without taking into account possible storage limitations in Batumi. This cargo sometimes “vagabonds” on the line between Baku and Bjeyuk-Kjasik, and only incidentally finds its way across the border station. Once this cargo arrives in Batumi, conflicts arise between Georgian Rail and Allegratrans about unloading the RTCs, as Georgian Rail is interested to quickly turn back these RTCs to avoid paying lease fee for them, and Allegratrans not wanting to unload the cargo since it has not been scheduled for unloading (and thus not been demanded to the pulled to the terminal).

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12 See e.g. the dispute between Georgian Rail and Batumi Oil Terminal, represented by their mother company Naftans, concerning demurrage for RTCs carrying unclaimed cargoes to Batumi, which then are not unloaded and block Batumi station for several days or even weeks.
Tracking and Tracing is not considered a problem. The railways usually roughly know where their trains and RTCs are. Only in exceptional cases, e.g. if a RTC is decoupled from a train for instant repair there exist temporary time lags during which the dispatcher loses control of this single RTC. However, almost every transport chain operator has its own tracking and tracing system, supported by staff along the track. Missing RTCs are relatively fast detected and reported to the company main server.

Tariffs do not seem a problem as transport volumes have been growing. However, it remains to be seen if tariffs will be flexible enough if oil prices drop and additional pipeline capacities have been deployed. Whether a possible drop in the transport crude oil volumes can be compensated by (higher-valued) oil products depends on the ability of the oil producing states around the Caspian to create additional refining capacities for exports.

Customs procedures have not been the centre of complaint of the parties involved in the transport chain, either. Most operators use special Customs brokers who deal with Customs clearance. Only in very rare cases a train is halted longer than necessary at the border due to Customs problems. Usually, the transport chain operators send one of their staff to the border whenever one of their trains is scheduled to cross. He then takes care of any problem that may arise.
ANNEX 10: Cargo Flow Analysis for Oil Transports across the Caucasus

1 Introduction

The future development of oil transports by rail across the Caucasus is driven by a large variety of different factors. Aside from the expected further expansion of oil production and exploration especially in Central Asia and the eastern part of the Caspian Sea also the development of adequate transport and handling capacities and procedures as well as the (successful) establishing of alternative routes will have a marked influence on corridor utilisation between Baku/Dubendi and Batumi/Poti.

The following gives a brief overview on existing oil cargo volumes across the Caspian Sea and the Caucasus and provides an estimate on the future development of cargo volumes. Information has been derived from interviews with Azeri and Kazakh experts as well as from previous studies elaborated within the framework of Tacis TRACECA. Moreover, the consultants have closely reviewed press releases and Caspian and international news services specialised on transport issues in order to verify and update information.

2 Production

The prospect of potentially enormous hydrocarbon reserves is part of the allure of the Caspian Sea region (which is defined here to include Azerbaijan, Kazakhstan, Turkmenistan, and the regions of Iran and Russia that are near the Caspian Sea). The Caspian region contains 10 bn barrels of proven oil reserves (defined as oil and natural gas liquids deposits that are considered 90 percent probable). In addition, despite a string of disappointing recent drilling results, mostly in Azerbaijan, the region's possible oil reserves (defined as 50 percent probable) could yield another 233 bn barrels of oil.

Despite the lack of a multilateral agreement on the Sea, several countries are undertaking active exploration and development programs in what is generally considered to be their sector of the Caspian Sea. In particular, Azerbaijan and Kazakhstan have made substantial progress in developing their offshore oil reserves.

Azerbaijan has signed a number of production-sharing agreements - both onshore and offshore - in order to develop its oil and natural gas industries. A significant percentage of Azerbaijan's oil production comes from the Azeri-Chiraq-Gunashli mega-structure, located 60 miles off the Azeri coast, and operated by the international consortium known as the Azerbaijan International Operating Company (AIOC). The structure is estimated to contain proven crude oil reserves of 5.4 bn barrels according to the field's operator, British Petroleum. AIOC reached an average daily output of 125 thousand barrels in 2002, mostly from the Chirag-1 stationary platform. This production has been dubbed “early oil" by the company, and is currently exported through the “Western Early Oil Pipeline", which extends to the Georgian port of Supsa on the Black Sea (see below).

Although the country's oil production fell after 1991 to just 180 thousand barrels per day (bbpd) in 1997, Azerbaijan's oil production (total liquids) rebounded to 318 thousand barrels per day (bbpd) in 2002, of which approximately 310 thousand bbpd was crude oil. This represents a 4% increase over 2001 production, and builds upon five consecutive years of growth. At the same time, domestic petroleum consumption in Azerbaijan has fallen since independence, resulting in a growing margin for net petroleum exports. Azerbaijan exported approximately 178 thousand bbpd in 2002, most of which was routed to Russia, Turkey, and Italy.
Azerbaijan’s main production surge in the next decade is expected to come from the three-phase development of the ACG mega-structure. Production is slated to reach approximately 400 thousand bblpd by 2005 with the full implementation of the first phase. Later implementation of phase 2 is expected by AIOC to boost production to roughly 1 mn bblpd by 2008-09. By some industry estimates, Azerbaijan could be exporting 1 mn bblpd by 2010 (roughly equivalent to 2002 exports from Algeria). Plans for phase 3, which will complete “full field development”, are currently being investigated. The planned Baku-Tbilisi-Ceyhan Main Export Pipeline will be the main vehicle for ACG oil exports.

Central Asia’s biggest oil producer is Kazakhstan, which produced approximately 850 thousand barrels per day (bblpd) in 2002, followed by Turkmenistan (170 thousand bblpd in 2002) and Uzbekistan (140 thousand bblpd in 2002). With its bountiful oil reserves and a relatively business-friendly investment climate, Kazakhstan has attracted substantial foreign investment to its oil sector, providing a significant boost to its oil industry. International oil projects in Kazakhstan have taken the form of joint ventures, production-sharing agreements, and exploration/field concessions. Most of the current production comes from three large onshore fields: Tengiz (operated by TengizChevron), Uzen, and Karachaganak, but also from Kumkol (operated by Hurricane). In addition, preliminary drilling in Kazakhstan’s offshore sector of the Caspian has revealed bountiful oil deposits, especially in the Kashagan field, raising hopes that Kazakhstan may become one of the world’s largest oil producers.

Tengiz oil field, estimated to contain recoverable oil reserves of six to nine billion barrels, currently produces approximately 260 thousand bblpd. Given adequate export outlets, the joint venture could reach peak production of 750 thousand bblpd by 2010.

Although signed with fewer fanfares in 1997, the offshore Kashagan block being developed by the Agip Kazakhstan North Caspian Operating Company (Agip KCO, formerly OKIOC) may turn out to be more lucrative than both the Tengiz and the ACG group of deposits combined. Exploration and preliminary drilling in the Kashagan block has produced spectacular results, with analysts hailing the field as the largest oil discovery in the last 30 years. Although Agip KCO released estimates in June 2002 that the Kashagan field holds between seven and nine billion barrels of crude in proven reserves, as well as 38 bn barrels in probable reserves, both Kazakh officials and energy analysts have called that estimate “conservative.”

With new Kashagan oil field Kazakhstan expects to increase output to about 1.7 mn bblpd by 2010 and 2.5 mn bblpd by 2017.

Overall oil production in the Caspian Sea region reached approximately 1.3 million bblpd in 2001. A.m. projects, along with others currently underway, could help boost Caspian Sea region production to around 3.7 mn bblpd by 2010. The US Energy Information Agency (www.eia.doe.gov) expects production capacity from the Caspian basin to exceed 6.5 mn barrels per day by 2020.

3 Leg 1: Cargo Flows across the Caspian Sea

Oil shipments across the Caspian Sea originate from four different ports: Aktau (Kazakhstan), Turkmenbashi, Aladja and Okarem (Turkmenistan). Main end points of the oil flow are the ports Makhachkala (Russia), Neka (Iran), Dubendi and Baku (Azerbaijan).13 Shipment of oil and oil products through the Volga-Don Channel make up for just slightly over 100 thousand tonnes per year and thus shall not be considered further. Moreover, since Neka and Makhachkala do not form part of the TRACECA route, main focus shall be laid on Dubendi and Baku. Transports to Neka and Makhachkala are only interesting in

13 The Azpetrol Terminal at Sangachal has not yet been operational by the time of writing
so far they constitute alternative, competing corridors to the TRACECA route. Last but not least, shipments between national ports, e.g. between Aladja/Okarem and Turkmenbashi oil piers at Ufra as well as between Baku refinery and Dubendi (mainly bunker oil for tankers and jet fuel for Baku Airport) shall not be taken into account.

Maritime transport of oil and oil products on the Caspian Sea is conducted with tankers and rail ferries. Tankers travel between all load and discharge ports, while ferries carrying oil in rail tank cars only sail between Turkmenbashi and Baku, and Aktau and Baku.

According to recent statistics for the first four months of 2003 provided by the port of Aktau about 1.9 mn tonnes of oil and oil products were handled at the four oil berths. The majority of volumes, about 1 mn tonnes, were shipped to Makhachkala, while about 670 mn tonnes were sent to Baku/Dubendi. The remaining 230 thousand tonnes went to Iranian ports. In case of Makhachkala, these figures basically confirm the port’s planning figure of 3.3 mn tonnes for 2003 with about 90 percent of volumes coming from Kazakhstan.

Concerning the traffic allocation on Baku and Dubendi figures provided by the port of Baku suggest that about 150 thousand tonnes reached Dubendi by tankers, while 520 thousand tonnes were handled at Baku.

### Table 10: Origin-Destination Matrix for Oil Transports across the Caspian Sea 2002 (in thousand tonnes)

<table>
<thead>
<tr>
<th>Load Port</th>
<th>Baku Ferry</th>
<th>Baku Azpetrol</th>
<th>Dubendi</th>
<th>Makhachkala</th>
<th>Neka</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turkmenbashi Ferry</td>
<td>1,050</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1,050</td>
</tr>
<tr>
<td>Turkmenbashi Ufra</td>
<td>0</td>
<td>470</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aladja</td>
<td>0</td>
<td>2,500</td>
<td>296</td>
<td>500</td>
<td>50</td>
<td>3,520</td>
</tr>
<tr>
<td>Okarem</td>
<td>0</td>
<td>412</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aktau Ferry</td>
<td>75</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>75</td>
</tr>
<tr>
<td>Aktau Oil Piers</td>
<td>0</td>
<td>1,500</td>
<td>486</td>
<td>2,500</td>
<td>650</td>
<td>5,136</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,125</strong></td>
<td><strong>4,000</strong></td>
<td><strong>1,664</strong></td>
<td><strong>3,000</strong></td>
<td><strong>700</strong></td>
<td><strong>10,489</strong></td>
</tr>
</tbody>
</table>

Source: Port Statistics of BISP and ACSP, SOCAR Press Releases, Information provided by terminal operators, own estimates

Including shipments via the Volga-Don Canal about 10.7 mn tonnes of crude oil and oil products were transported across the Caspian Sea in 2002. Most of the traffic was attracted by Azeri terminals, which accounted for more than 6.7 mn tonnes (including 1.1 mn tonnes shipped via the ferry terminal). Compared to 1999-shipments to Baku/Dubendi (amounting to less than 3 mn tonnes), today’s volumes constitute an annual average increase of more than 30 percent. Crude oils amount to about 75 percent of volumes shipped to Baku/Dubendi.

The dominating cross-Caspian transport operator in 2002 was CASPAR with 8.4 mn tonnes of oil and oil products (7.3 mn tonnes in tankers and 1.1 mn tonnes by ferry) and a market share of close to 80 percent. In oil transports to Azeri ports CASPAR had a market share of 100 percent, while in transports destined for Russian and Iranian ports in the Caspian (including Volga-Don passage) CASPAR had a market share just slightly above 40 percent.
Table 11: Origin-Destination Matrix for Oil Transports across the Caspian Sea Jan-Apr 2003 (in thousand tonnes)

<table>
<thead>
<tr>
<th>Load Port</th>
<th>Baku Ferry</th>
<th>Baku Azpetrol</th>
<th>Dubendi</th>
<th>Makhachkala</th>
<th>Neka</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turkmenbashi Ferry</td>
<td>500</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>500</td>
</tr>
<tr>
<td>Turkmenbashi Ufrais</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aladja</td>
<td>0</td>
<td>600</td>
<td>650</td>
<td>100</td>
<td>50</td>
<td>1,400</td>
</tr>
<tr>
<td>Okarem</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aktau Ferry</td>
<td>25</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>25</td>
</tr>
<tr>
<td>Aktau Oil Piers</td>
<td>0</td>
<td>550</td>
<td>150</td>
<td>1,000</td>
<td>230</td>
<td>1,930</td>
</tr>
<tr>
<td>Total</td>
<td>525</td>
<td>1,150</td>
<td>800</td>
<td>1,100</td>
<td>280</td>
<td>3,855</td>
</tr>
</tbody>
</table>

Source: Port Statistics of BISP and ACSP, SOCAR Press Releases, Information provided by terminal operators, own estimates

4 Leg 2: Oil Cargo Flows in Azerbaijan

In 2002, Azerbaijan State Railways carried a total (including domestic traffic) of 11.2 mn tonnes of oil and oil products, up from 10.5 mn tonnes in 2001.

The vast majority of volumes departing from to the two large oil terminals in Baku and Dubendi is transit cargo from Kazakhstan and Turkmenistan heading for Batumi. Baku oil terminal reported handling volumes in the range of 4 mn tonnes, while in Dubendi about 1.7 mn tonnes of oil and oil products were handled. In addition slightly more than 1.1 mn tonnes of transit oil cargoes arrived in Baku by ferry (most of which crude oil from Kazakhstan). This amounted to 6.8 mn tonnes of transit traffic. 1.7mn tonnes of which were oil products. In addition, Azerbaijan exported about 2.5 mn tonnes of oil products (including about 350 thousand tonnes for Georgia). Cross-border crude oil volumes from domestic production (Shirvan Oil) are insignificant. Consequently, roughly 9.3 mn tonnes of oil and oil products have crossed the Azeri border outgoing, presumably almost exclusively by rail and via the Azeri-Georgian border. If we subtract the amount of export cargoes for Georgia, there still is a s of 450-500 thousand tonnes of oil and oil products which have left Azerbaijan but did not reach the Georgian Black Sea coast: Batumi Oil Terminal and Georgian Rail both claim to have handled only 8.5 mn tonnes in Batumi, while Poti port did not report any outgoing oil cargoes in 2002. However, other sources doubt the information from Poti port, estimating that at least half of volumes handled at Poti port are outgoing (transit) white products, not only from Azerbaijan but also from Turkmenbashi and Chimgant refinery.

In the first four month of 2003 ASR carried 4.2 mn tonnes of oil and oil products, an increase of 22 percent compared to the corresponding period in 2002. Oil transports thus accounted for about 70 percent of all ASR transports. However, according to information from ASR transit of Kazakh and Turkmen oil products only accounted for 2.6 mn tonnes, which seems rather low in the light that Azneftyag refinery between January and April 2003 exported only 325 thousand tonnes of oil products (245 of which have been diesel and 72 thousand tonnes fuel oil). It can be assumed that volumes exported by the other Baku refinery Azneftyaganag will be at about the same level. Domestic oil transports in the range of 1 mn tonnes does seem a rather high figure.

For the whole year 2003 though, total oil traffic is expected to increase to close to 12.0 mn tonnes. The terminal at Baku (including the new Sangachal terminal) expects to repeat the result of last year when they handled 4 mn tonnes, while Dubendi envisages an increase of volumes to more than 2 mn tonnes. Similar,

14 During the first quarter of 2003 Azerbaijan exported only 453 thousand tonnes of oil products. This was a decrease of 152 thousand tonnes compared to the same period of 2002.
about 1.5-1.8 mn tonnes of transit oil are expected to reach Baku by ferry from Turkmenbashi. Thus, transit volumes will likely increase to 7.5 to 7.8 mn tonnes. Given that Azerbaijan may this year export oil products in the range of 2 mn tonnes (including exports to Georgia), cross border traffic is likely to be in the range 9.5-9.8 mn tonnes. Around 9.1-9.4 mn tonnes of which are transit traffic and exports via Georgian Black Sea ports.

5 Leg 3: Cargo Flows in Georgia

According to information provided by Georgian Rail the company in 2002 carried 10.4 mn tonnes of oil and oil products. 9.8 mn tonnes were transit oil and oil products, a figure, which seems rather high given that Batumi oil terminal informed that in 2002 about 8.5 mn tonnes of crude oil (60 percent) and oil products (40 percent) were handled. The port of Poti claimed not to have received any export/outgoing transit cargo but rather handled 800 thousand tonnes of import and incoming transit oil cargoes for Armenia. Eventually, this means that Georgian Rail handled about 500 thousand tonnes of transit oil, which did not leave or enter the country via Georgian seaports. Other than the gap in ASR data, the gap in Georgian Rail data cannot be explained by dubious information from Poti port. Thus, there seems to be a transit trade/outlet, which the consultants could not identify so far.

In addition, 342 thousand tonnes of oil and oil products were imported from Azerbaijan for domestic consumption.

During the first four months of 2003, Batumi handled more than 2.8 mn tonnes of oil (1.7 mn tonnes of which were crude oils). This is an increase of 11 percent compared to the same period of 2002 and confirms the planning of handling more than 9 mn tonnes by the end of the year. For the first quarter of 2003 Poti port management still insists to record only import/incoming transit (130 thousand tonnes of white products), however the port expects that during the year the new facilities will also serve outgoing transit.

6 Pipeline Operations

Major part of the crude oil Azerbaijan produces for export is shipped via the Baku-Supsa pipeline to Supsa port where the crude oil is pumped into tankers of up to 150 thousand tdc. The pipeline as well as the two terminals at the end points of the pipeline, Sangachal (see Annexes 5 and 6) and Supsa (see Annex 8), are operated by BP on behalf of the Azerbaijan International Oil Corporation AIOC. The Supsa pipeline has a capacity to transport up to 145 thousand bpd (about 8 mn tonnes per year). According to contractual agreements between AIOC and the Georgian International Oil Corporation GIOC, who acts on behalf of the Georgian government, the pipeline can only carry Azeri oil from the ACG oilfields (Azeri, Chiraq, Gunashli). If this pipeline shall be opened also for other crudes, e.g. from Kazakhstan or Turkmenistan, the agreements need to be redrafted. For the present moment it is unlikely that the Georgian government will agree to any changes of the existing agreement as this would inhibit the danger of losing rail volumes for which Georgia currently earns transit fees to the (cheaper) pipeline.

In 2002 about 100 thousand bpd (5.5 mn tonnes per year) of Azeri crude were pumped through the pipeline. For 2003 a slight increase in transport volumes is expected. The cost for the transport of one tonne of crude oil from Baku to Supsa is reportedly around USD 5.50 (USD 1.90 for transit fee in Azerbaijan, USD 1.20 for transit fee in Georgia, USD 2.00-2.50 for operations). Thus, to bring crude oil from Baku to the Italian ports of Genoa or Augusta will cost just slightly above USD 10-11.00 per tonne (e.g. sea freight rates Supsa-Augusta should be in the range of USD 5-6.00 per tonne, depending on the parcel size).
Another outlet for Azeri crude oil (mainly profit oil from the AIOC project) is the Baku-Novorossisk pipeline (Chechnya bypass, capacity of 160 thousand bbpd including rail links from the Caspian port of Makhachkala) starting at Sangachal terminal. In Novorossisk oil is unloaded directly from pipeline into tankers due to insufficient storage facilities. Moreover, the Baku-Novorossisk pipeline links to a pipeline system carrying Russian oil from e.g. Siberia, that usually has higher sulphur grades than the high-quality Azeri oil (0.15 percent sulphur, viscosity of 34.6 degrees API). Thus, Azeri oil is mixed with lower quality oils and sold as “Urals blend” at a discount of about USD 1.80-2.00 per barrel compared to e.g. Brent. SOCAR is unhappy with the absence of an oil quality bank compensating for quality losses (like established for the CPC, see below). However, due to missing other options Azerbaijan’s SOCAR has committed itself to transport 46 thousand bbpd though the pipeline and thus in 2002 exported about 2.5 mn tonnes of crude via Novorossisk. For 2003, SOCAR plans to hold this figure constant.

Parcel sizes usually range from 80 to 140 thousand tonnes. However, discussions with Transneft on pipeline as well as berth slots are somewhat difficult. Moreover, the pipeline system as well as some of the port facilities in Novorossisk are somewhat outdated and in need of rehabilitation. Thus, planning of transhipment needs to be adjusted from time to time, also on short notice, due to downtimes of the pipeline or unavailability of berths. In March, Transneft unilaterally announced an increase of transit rates to USD 16.45 per tonne.

In order to cope with expected increases in oil production in Azerbaijan as well as to avoid an intensifying of the Bosporus conflict, the AIOC consortium has initiated the construction of the Baku-Tbilisi-Ceyhan pipeline BTC. The pipeline, operated by the BTC consortium (not identical with AIOC), will pump Caspian oil (not necessarily only Azeri oil) from Baku to the Turkish Mediterranean port of Ceyhan, thus bypassing the Bosporus and the Dardanelles. Construction works are currently under way; start of operation is scheduled for the end of 2004. The pipeline is designed to transport 1 mn bbpd at the final stage of construction. Currently the output of the ACG oilfields stand at 130-140 thousand bbpd but is expected to rapidly expand over the coming years.

The BTC Consortium is prepared to let Kazakhstan carry up to 7 mn tonnes (around 130 thousand barrels per day) of oil each year via the pipeline to Ceyhan during 2005 to 2007. Therefore, an Aktau-Baku consortium shall be established including the Kazakh shipping company Kazmortransflot, which will be responsible for shipping the cargo from Aktau to Sangachal. In general the BTC pipeline company intends to have 500-600 thousand barrels per day pumped at the beginning of the operation. Kazakhstan has stated it could commit even up to 400 thousand barrels per day. At this volume, Kazakhstan is reportedly prepared to consider even the construction of a 380-km cross-Caspian pipeline from Aktau to Baku since then it will become more economical to pump oil rather than tranship it by tankers. However, AIOC stresses that after 2008/9, Azerbaijan alone will most probably produce enough oil from the ACG fields to increase the daily flow to 1 mn barrels, the maximum pipeline capacity.

Kazakh oil for the BTC could be shipped directly to terminals in Sangachal or Dubendi, the latter being connected to the Azeri pipeline system. In Sangachal new unloading facilities, in addition to the newly constructed Azpetrol piers are envisaged in case a reliable agreement with Kazakhstan on shipment volumes can be achieved. Moreover, the Dubendi facilities currently under control of BISP may be rehabilitated and extended. Reportedly, the volumes shipped for BTC will not impede and reduce the transit flows of Kazakh crude oil that uses the rail bridge between Baku and the Georgian Black Sea coast.

Related to the BTC pipeline scheme is also the currently investigated idea of Kazakhstan to construct a new oil terminal near Aktau. This terminal should be dedicated to sell and transport Kazakh (e.g. lower quality Tengiz oil with a high degree of sulphur and high viscosity in the range of 44 API) oil to Azeri refineries, in order to free Azeri oil for export (most probably by pipeline) to the world markets. However, much depends
on the progress with the modernisation of the two Azeri refineries Azneftyag and Azneftyanajag, and of Dubendi terminal (part of Dubendi terminal has already been rehabilitated by Dubai-based Middle East Petroleum). A feasibility study has already been prepared for a.m. facilities, a decision is still outstanding. After modernisation, the refineries will have a capacity to treat 1 mn and 5 mn tonnes of crude oil respectively.

Kazakh oil from the Tengiz oil field that has been transported by rail via Dubendi and Batumi up to 2001 is now transported through the Caspian Pipeline CPC (largest shareholder is Russia) to Novorossisk where the oil is loaded onto tankers. Since both Kazakh and Russian oil will be piped via the line, creating a new “CPC blend” Kazakh oil exporters whose oil quality is diluted by the new blend will be compensated. The pipeline has a capacity of 28.2 mn tonnes per year, but is set to be expanded stepwise to 67 mn tonnes by 2014. Tengiz oil field currently produces around 300 thousand bblpd or 16-17 mn tonnes per year. Output is to be increase to 430 thousand bblpd or 24 mn tonnes per year by 2005. Rumours that part of the former volumes (in the last full year of operation around 2.5 mn tonnes) may be re-transferred to the TRACECA route so far have not been substantial. They may be seen in the light that the CPC is suffering from high fees that Russia levies on the transit rights through Russian territory. Reportedly, the cost for pumping one tonne of crude oil to Novorossisk is in the range of USD 25.15 Thus, the CPC operator may be looking for alternative routes to put pressure on the Russian government.

In order to circumvent problems related to the passage of the Bosporus, which also affects transshipment via Batumi port, alternative routes, mainly based on pipeline transport, have been developed. Interesting for (crude oil) shipments via Batumi could be the recent start of a new terminal at the Ukrainian port of Yuzhni (Odessa), which is connected to the Odessa-Brody pipeline and thus to the Central and Western European pipeline network, bypassing the sea route through the Bosporus. As a first step Ukrtransneft, the operator of the Yuzhny Oil Terminal and the pipeline Odessa-Brody, and Georgian International Oil Corporation GIOC agreed to jointly further investigate the route Baku-Supsa-Odessa. The project idea foresees to further increase the capacity of the Baku-Supsa pipeline (see above) and then deploy large tankers to ship the crude oil to Yuzhny. Georgian experts estimate that the cost for the transport between Baku and Brody will be well below USD 3.00 per barrel (Baku-Supsa pipeline about USD 1.23 USD per barrel, tanker Supsa-Yuzhny about USD 0.30 per barrel, Odessa-Brody pipeline about USD 1.00 per barrel).16

Additional export options for Caspian oil are numerous but currently far from being operational:

- Oil from Azerbaijan and Central Asia should be shipped to Novorossisk, where Caspian oil could be exported to world markets via the Russian pipeline system using Adriatic ports. By connecting the southern Druzhba pipeline with the Adria pipeline in Croatia, then reversing flows in the Adria, Russia could ship oil via the Croatian port of Omisalj, thereby allowing exporters to bypass the Bosporus Straits.
- Pipelines could be laid from Azerbaijan, Kazakhstan and Turkmenistan to Iran. A 310-km pipeline connecting to the Iranian pipeline network and the refineries has already been investigated. Further progress is depending on the Iranian position towards the division of the Caspian Sea waters. The same can be said for the proposed pipeline from Kazakhstan via Turkmenistan to Central Iran where the pipeline would connect to the Iranian pipeline network to Iran’s Gulf ports.
- Turkmenistan several years ago has signed an agreement for the construction of a one-mn-bbpd oil pipeline through Afghanistan and Pakistan. After the ousting of the Taliban, this idea has resurfaced.

15 This is still a considerable cost advantage against the former route that was estimated to cost USD 60 per tonne (see www.gasandoil.com/goc/company/cnc10896.htm, as of 30.04.2003)
16 The tariff for transshipment of crude oil through the BTC pipeline are expected to be around USD 3.0-3.8 per barrel. Transit tariff for the Russian section of the Baku-Novorossisk pipeline operated by Russian Transneft is quoted at USD 2.50 per barrel (Information obtained from Supsa Port Administration and Azer-Press (“Azeri crude will be sold together with Azeri Light”, 13 March 2003)).
However, continuing unrest in the region has stalled any further progress of the Central Asian Oil Pipeline.

- Kazakhstan is targeting the Chinese market. Reportedly, a pipeline from Kazakhstan to Xinjiang (Western China) is already under construction to substitute the current transports by rail via Druzhba station.

7 Alternative Non-pipeline Routes

Routing via the Volga-Don-Canal is first of all limited by navigational draft restrictions, allowing river-sea vessels not to use it with full draft. Only tankers carrying about 3,000 tonnes can pass the Canal without problems. Moreover, the Canal only poses an alternative route from about April until the end of September since in winter times the passageway is frozen. Last but not least, Russian considers the passage between the Black Sea and the Caspian Sea to be part of their inland waterway system due to the undecided international status of the Caspian Sea. Thus, the government reserves the right to ban non-Russian flag vessels from passage. The procedure for non-Russian flag vessels to apply for a permit is lengthy and costly, thus distorting competition on this route. Azerbaijan for example has unsuccessfully sought to increase the quota of its ships that Moscow will allow each year to use the Volga system to Astrakhan.

According to Russian transport officials the Russian river system will not be opened to foreign vessels before 2012. The Russian government is quite set to use administrative measures to protect Russian shipping lines against competition e.g. by introducing restrictions on the use of navigation equipment, requiring vessels to be made or certified in Russia, Russian language fluency for ships officers, and inspection and approval of vessels by the Russian Register (Fairplay Magazin, 10.1.2002, p 30)

The amounts of oil and oil products transported via the Volga-Don-Canal are thus rather limited to several hundred thousand tonnes only. The Volga-Don passage is currently only chosen for destinations within the Russian inland waterway system (e.g. several Russian refineries are connected to the inland waterway system) and to ports of the Azov Sea. Reportedly mainly fuel oil and other products are transported via the Canal. To give an example, during summer season Volgotanker delivers fuel oil from the Turkmenbashi refinery to the port of Kavkaz in the Kerch Strait (a 20-day sailing). However, due to a.m. draft restrictions of the Volga-Don Canal, Volgotanker transships the cargo in Astrakhan from their larger river-sea tankers into river tankers, which then carry on to Kavkaz, thus avoiding a minimum 10 percent-underutilisation of the larger tankers when passing the Volga-Don.

In addition, Georgia and Turkey reportedly are working on plans to utilise a 300-km railway line between Tbilisi and Turkish Kars that should be able transport up to 200 thousand bbpd of crude oil from the BTC to Turkish refineries. The plan will require rehabilitating an existing line from Tbilisi to Akhalkalaki as well as extending the rail line by another 130 km.

8 Future Development of Cargo Volumes

8.1 Trans-Caspian Volumes

Trans-Caspian volumes are expected to further increase. However, apart from world market demand and prices, the potential development is subject to four major influencing factors.

- Reconstruction of port facilities in the Caspian Sea
- Development of refinery capacities
- Exploration and development of new oil fields (on-shore and off-shore) near the Eastern Caspian coastline
- Establishing of new competitive outlets for Central Asian oil and oil products

8.1.1 Reconstruction of port facilities and new buildings in the Caspian Sea

For 2003, shipments from Aktau are expected to slightly decrease compared to the previous year as berths 4 and 5 are closed down for about six months due to rehabilitation. The equipment of berth 7 with oil handling facilities serving as interim solution will only insufficiently replace the currently shut down berths. However, after finalisation of rehabilitation works, Aktau will have an annual oil handling capacity of about 10 million tonnes or more. TRACECA forecasts indicate that the port will most likely handle 7.1 million tonnes in 2010 and 9.7 million tonnes of oil and oil products in 2020 (TRACECA: Pre-feasibility study for rehabilitation of Aktau oil berths n°4 and n°5, July 2001). A port extension project envisages the construction of additional piers for oil handling in Aktau. Moreover, the Kazakh shipping operator Kazmormortsflot plans to construct new port facilities for oil handling in Kuryk, south of Aktau.

Similarly, the reconstruction works on the ferry terminal in Baku will in the short term have a negative effect on ferry handling volumes. However, the reconstruction is supposed to have a positive effect on the turnaround times of ferries and thus contribute to an increased capacity utilisation at the terminal, i.e. an increased number of calls per week.

However, the transport of oil and oil products by ferry is strongly limited to about 1,600 tonnes per call. The projected construction of an oil berth for unloading RTCs into tankers in Turkmenbashi is likely not only to increase oil handling capacities but also is expected to have a reducing cost effect on the transport chain from Central Asia via Turkmenistan to Batumi, and thus, to increase the attractiveness of this route. Especially crude oil, which today is transported by ferry, may be re-routed to the projected terminal, while ferry transports will remain an option for some oil products, which come in smaller lots, anyway. In how far, additional volumes of oil products can fill the gap on the ferries largely depends on the development of new refinery capacities in Central Asia (see below), and of course on the development of world markets. The share of transport costs in world market selling price is higher for Central Asian oil products than for products from many other parts of the world, consequently leading to a lower ex-works price of the product (influencing the competitiveness of the corridor). If considered that transport prices are somewhat inflexible in the short term, fluctuations in world market prices will thus have a direct bearing on the attainable ex-works prices for oil products. A drop in world market prices may very quickly cause production to be unprofitable, or, if ex-works prices are inflexible, reduce demand.

Tanker capacities are expected to slowly increase in the medium term, thus easing temporary congestion due to shortage in suitable tonnage. CASPAR has not only ordered four additional tankers (2 x 8,000 tdw, 2 x 12,000 tdw) for delivery in 2003/04 but also initiated a fleet rehabilitation programme. Moreover, other transport (chain) operators (from Azerbaijan, Georgia and Kazakhstan) are considering deploying their own (new) tonnage on the Caspian Sea with the objective to serve Baku/Dubendi.

Though in the short term, transport volumes are expected to remain only constant or even slightly drop due to ongoing construction measures, in the medium term improved and new facilities and increased competition in and around the Caspian Sea are likely to have a clear positive effect on service quality and prices and thus also increase the attractiveness of the Caspian route via Baku/Dubendi for oil transports.
8.1.2 Development of refinery capacities

Another important factor affecting the transport of oil across the Caspian Sea is in how far and when Azerbaijan will rehabilitate their own refining capacities. If the Azeri refineries will be modernised also to handle lower quality crude from Kazakhstan and Turkmenistan, Azerbaijan then could import crude oil from Central Asia to feed their refineries and export their own higher quality crude to the world markets. The consultants expect that these imports will be additional to the existing traffic flows, thus not only increase the shipments across the Caspian Sea but also have a positive effect on rail transportation since it is very likely that part of the refined oil products will be later exported to western markets. As shown above the export of Azeri oil products contributes significantly more than 2-2.5 mn tonnes to annual traffic volumes on the Caucasian rail corridor (source: Azerbaijan national statistics). Even though part of this cargo may stay within the Caucasus (e.g. export to Georgia), it still can be expected that about 20 percent of oil cargoes handled in 2002 in Batumi have been refined products from Azerbaijan. Even though energy demand in Azerbaijan is increasing the consultants see good perspectives that in the medium term modern refinery capacities will potentially increase export of Azeri refined products by 50 percent to more than 3-3.5 mn tonnes p.a. For the development of railway transport volumes it will make no difference whether the increase in production is based in inputs of Central Asian crude or Azeri crude. In any case there will be a positive net effect as neither input volumes are currently travelling on the Caucasian rail route: As mentioned above Central Asian crude is additional, i.e. will otherwise not be routed via Baku, while Azeri crude will be shipped via pipeline to Supsa, Ceyhan or Novorossisk.

Similarly, Central Asian States, especially Kazakhstan and Turkmenistan may opt to further rehabilitate and create additional refining capacities. However, part of the upstream activities in Kazakhstan is controlled by foreign companies, which are also engaged in the refining process. Their partner refineries are usually somewhere overseas. It is rather unlikely that these companies are willing to surrender major part of their value added to regional refineries, nor are they willing to investing high sums into the construction of these facilities in Central Asia. It is thus expected that for the time being the “Black Gold” will leave Kazakhstan mainly as crude oil. Turkmenbashi refinery has recently been rehabilitated and reportedly produces higher quality products than Kazakh refineries. However, Turkmenbashi refinery is reported to produce according to an unpredictable and erratic production plan not always guided by entrepreneurial principles.

Consequently, the consultants expect that the transport of oil products from Central Asia will only very slowly be able to fill the gap on the ferry that the unloading of crude oil from RTCs into tankers in Turkmenbashi will leave. Moreover, transports of oil products via Aktau, which today is only a very small business, is not likely to experience high growth.

8.1.3 Establishing of new competitive outlets for Central Asian oil and oil products

The frequently uttered intention of Kazakhstan to provide significant quantities to fill the new BTC pipeline operational by 2005 may prove a.m. TRACECA forecast for Aktau port to be too pessimistic. Sources in Kazakhstan are quoted with up to 400 thousand bblpd, which could be sent to Baku for the pipeline in future. Turkmenistan on the other hand, faced with a similar access problem to world markets as Kazakhstan, has abstained from making any commitment offers.

It can be assumed that in order to facilitate operations of the pipeline the number of different cargoes will be restricted and the volume of a single lot should be high. Considering that from the Azeri side the BTC will be filled with crude oil from the ACG (Azeri-Chiraq-Gunashly) oil field only, i.e. with a single (high quality and high volume) product, it is very likely that the pipeline operator will only allow one or two other crude oils with similar quality to be fed into the pipeline. From Kazakhstan especially Kumkol oil would qualify for this.
If we only consider an increase of crude oil shipments from Kumkol oil field (today the most important single origin of oil for Aktau port, most of which goes to Baku) to 100 thousand bbpd up from currently about 33 thousand bbpd shipped via Aktau port, this would easily boost total oil handling volumes at Aktau port to about 9 mn tonnes within a relatively short time.

A further increase in transport volumes across the Caspian Sea can only be handled if additional loading facilities are created in time. An option (which already has been investigated in 1999 by Shell) may be the construction of single point mooring (SPM) facilities, e.g. in Aktau and Baku. These facilities are easy to establish and relatively inexpensive in construction cost. At the same time, an offshore SPM would allow to be somewhat independent of the shallow draft in Caspian ports and thus enable to deploy larger tanker units in the future.\textsuperscript{17}

However, it should be pointed out that the increase in shipment of any specific cargo across the Caspian Sea for the purpose of on-carriage by pipeline will mean that the current volumes of this specific cargo may be lost for rail transportation. In case of Kumkol oil for example not only 33 thousand bbpd cross the Caspian Sea by tankers from Aktau, but also about 17 thousand bbpd are coming by ferry via Turkmenbashi. This current 50 thousand bbpd may completely be re-routed to the pipeline and thus reduce railway business by about 2.8 mn tonnes p.a. Moreover, the larger volumes of Kazakh oil for Baku become, the more prominent voices calling for a subsea pipeline across the Caspian basin will get. However, in the medium-term the consultants do not see any concrete planning evolving. For the time being, oil and oil products to Baku will be shipped across the Caspian Sea by tankers.

On the other hand, there are numerous pipeline projects currently under concrete planning (e.g. Kazakhstan-China, Turkmenistan-Afghanistan/Iran) the majority of which competing with the Caucasus route, thus limiting the latter’s growth potential.

8.1.4 Exploration and development of (new) oil fields near the Eastern Caspian coastline

Kazakhstan is about to develop what has been considered one of the richest oil fields in the world, the Kashagan offshore oil field in the northeast of the Caspian Sea. However, start of operations is not expected before 2008. It is most likely that exploitation will be based on modern FPSO (Floating Production, Storage and Offloading) installations which enable to load tankers off-shore \textit{in situ} where larger water depths prevail without having to invest into new costly shore-based terminal facilities.

The FSOP concept would further boost the transport of oil across the Caspian Sea, most likely to Baku Bay. However, it is unlikely that the Caucasian railway route will significantly profit from it, as the expected production volumes would rather promote the construction of additional pipeline capacities.

Additional volumes relevant both for trans-Caspian as well as trans-Caucasian transportation may come from a further development of the oil fields in Western Kazakhstan, e.g. Buzachi (currently 20 thousand bbpd handled in Aktau), Karachaganak (18 thousand bbpd), and Aktybinsk (10 thousand bbpd), though the majority of the respective volumes are currently routed via Makhachkala. Moreover, there are numerous smaller on-shore oilfields in Kazakhstan, which are awaiting joint exploitation and consolidation of cargo volumes for transportation.

\textsuperscript{17} The consultants are well aware that currently there are no shipyards in the Caspian Sea able to construct tankers with a deadweight of 20,000 tons or more. Nor does the navigational restrictions and dimensions of the Volga-Don Canal allow to bring in such vessels.
Also, Turkmenistan has still potential to further develop their oil fields in Okarem and Cheleken, the majority of proceeds being other processed in Turkmenbashi refinery or exported via the Caucasian route.

8.2 Trans-Caucasian Volumes

In order to determine the volume of oil and oil products transported in future through the Caucasus by rail it is worthwhile to look at the two Caucasian countries involved in the transport chains separately.

8.2.1 Volumes in Azerbaijan

Volumes passing through Azerbaijan by rail to the Azeri-Georgian border will be mainly determined by volumes shipped across the Caspian Sea and the competitiveness of terminal operators in Baku, Dubendi and Sangachal, and Azerbaijan State Railways. Another determinant is the export capacity and performance of the Azeri refineries.

The capacities and productivity of Azeri refineries (together with the development of the domestic energy demand in Azerbaijan) will determine how much oil products can be exported to world markets. After rehabilitation of the two refineries in Baku export volumes can easily increase to 3.5 mn tonnes, as increasing domestic energy demand will partly be compensated by the expansion of gas exploration in Azerbaijan. Thus, not only costly import gas from other CIS countries can be replaced but also oil products today used for domestic energy production can be freed for export. It is very likely that the vast majority of Azeri export products will use the trans-Caucasian rail corridor, be it exports to Georgia or transit cargo to Batumi, since there are basically no other viable options to ship the cargo to main customers in Western Europe. The refineries are thus “captive” customers for Caucasian railway operators.

As mentioned above, there are good reasons to assume that transports across the Caspian Sea will considerably increase in the medium-term. However, part of the increase may well be due to the operation of new pipelines or the increase of existing pipeline capacities. It is very unlikely that railway transportation will be able to successfully compete for crude oil dedicated for the pipeline, once pipeline capacities are available. Thus, the rail route will not fully profit from increasing trans-Caspian transports. However, not all crude oils are suitable for pipeline transportation anyway, and oil products are unlikely to be fed into the pipeline. For this cargo, the Caucasian route will have to compete with other routes. As competitive routes like via Makhachkala or Neka evolve, customers will not only focus on price but also on criteria like service, reliability and safety of the transport route when planning their itineraries. Clearly, the competitiveness of the Caucasian route will then also be determined by cooperative behaviour and professionalism of the partners involved in the transport chain. The joint performance of the operators of land-based infra- and superstructure will determine what portion of Central Asian crude oil and oil products will use the trans-Caucasian rail corridor. Clearly, the recent annual double-digit growth rates of 20-30 percent in (export and transit) oil transports from and through Azerbaijan cannot serve as benchmark for future development, however, given that all partners cooperate the current positive trend will most likely be sustainable at an annual rate just below 10 percent, in the range of 8-9 percent until 2010.

Though price is very important as the trans-Caucasian leg accounts for about 75-80 percent of the price for the segment fob Aktau/Turkmenbashi – fob Batumi.
8.2.2 Volumes in Georgia

As Georgia is primarily a transit country for oil and oil products, volumes passing through the country are primarily determined by (export and transit) transports from Azerbaijan, the Georgian demand for oil products, and the Armenian demand for oil products.

The consultants expect that Georgia will continue to satisfy a considerable part of their energy demand by importing oil products from Azerbaijan. Along with positive economic development these volumes may increase from about 350 thousand tonnes in 2001 to 500 thousand tonnes in 2010. Transit volumes for Armenia (coming in via Poti) are expected to reach about the same level.

Consequently, in 2010 roughly 3 mn tonnes of oil products from Azerbaijan will transit Georgia by rail to Batumi and Poti. In addition, about 13 mn tonnes of transit oil cargoes from Central Asia will arrive at Batumi and Poti. The consultants estimate that the share of volumes going to Batumi will reach about 85-90 percent of total west-going oil cargoes.

8.3 Conclusion

All in all, the following assumptions concerning the future development of oil volumes on the Caucasian corridor can be made:

- Similar to the TengizChevron volumes which were almost instantly more than replaced by Buzachi, Aktybinsk and Kumkol volumes after Tengiz oil was re-routed to the CPC pipeline, it is expected that the gap a possible re-routing of e.g. Kumkol oil to the BTC pipeline may open, will be filled by volumes from other oil fields, especially from Kazakhstan. The current growth trend of oil shipments across the Caspian Sea will if at all only temporarily be broken. Driving force will be the development in shipment of crude oil rather than products. Improved loading/unloading facilities, storage and tanker capacities in and around the Caspian Sea are expected to not only develop at least in line with increasing traffic demand but also increase the general attractiveness of oil transports across the Caspian Sea and thus promote the Caucasian corridor. Given the current dynamic of exploration and development of oil wells in Kazakhstan, about a doubling of shipment volumes across the Caspian Sea relevant for on-carriage by rail until 2010 seems likely. For Azerbaijan this will mean a potential increase of transit volumes via Baku Bay/Dubendi terminals to around 13 mn tonnes of Central Asian crude oil (10 mn tonnes) and oil products (3 mn tonnes). Additional volumes in the range of up to 10 mn tonnes p.a. of crude oil will likely be shipped across he Caspian Sea to be fed into the BTTC pipeline.

- On the Azeri part of the Caucasian rail corridor an additional 3.5 mn tonnes of Azeri oil products (transit via Georgian ports and export to Georgia) will potentially be handled, thus the cross-border transport of oil volumes will likely amount to 16.5 mn tonnes by 2010, around 16 mn tonnes of which will be transiting Georgia and shipped to world markets via Poti (2 mn tonnes) and Batumi (14 mn tonnes). It is expected that oil products will only barely keep their share of around 40 percent in total transit volumes. Thus, in 2010 the west-going transit transport of oil products through Georgia will likely amount to 6 mn tonnes. Generally, 16.5 mn tonnes of oil and oil products (in addition to dry cargoes, which are expected to only moderately increase) can technically be handled by the existing infrastructure and facilities along the corridor. Only the section between Samtredia and Batumi needs some major improvement to guarantee an average of 18 loaded oil trains to Batumi and 13 empty trains from Batumi per day (tantamount to 650 RTCs). In peak times even up to 25 loaded trains and 18 empty trains per day (tantamount to 900 RTCs) may be expected to travel on this section.

- Needless to say that the tapping of a.m. potential will require a cooperative organisational setup involving all major parties engaged in the transport chain (but especially of the terminal operators and the railways) which at the same time will give enough room for competitive behaviour necessary to
introduce and promote efficient operational procedures and establish price and service competition. This necessitates a functioning flow of information between all parties in order to efficiently conduct pre-planning of capacities and transports as well as establishing tracking and tracing systems for trains and cargo (information procedures accompanying (physical) transports). A pre-requisite for such a cooperation is mutual trust, reliable information and agreed and transparent procedures open not only to existing traffic operators but also to potential new-comers.
ANNEX 11: Environmental Aspects of Oil Transports by Rail across the Caucasus

1 Introduction

Transhipment, transportation and storage of oil and oil products carry the risk of causing environmental damages of special concern. The hazardous character of the transported goods gives rise to particular transport risks as well as to different types of negative impacts (health impacts, pollution of water and soil, emissions to air), and therefore requires special environmental management efforts.

This Annex provides an overview of the present environmental status of the Central Asian oil transport chain from the Port of Baku (Azerbaijan) to the Georgian Black Sea Port of Batumi via tank vessel, rail ferry and rail tank cars (RTCs), and identifies the environmental characteristics of the different modes of this transport chain. Impacts of offshore oil production in Azerbaijan and the transport via pipeline from Azerbaijan to the Georgian Black Sea port Supsa are not subject of this report.

It is the objective of this Annex to give recommendation to the most pressing environmental problems. Other than environmental aspects, as for example technical and operational issues, are referred to in Annexes 5-9.

Observations and findings are based on interviews and visual inspections carried out within the reporting period (24 April to 7 May 2003). During this time the following relevant institutions and facilities related to oil transport, handling and storage have been visited:

**Azerbaijan:**
- Ministry of Ecology and Natural Resources – State Control Inspectorate for Environment and Use of Natural Resources
- Azerbaijan State Railway – Environmental Department
- Balajari – RTC cleaning station
- Port of Baku – Environmental Advisor
- Port of Dubendi – Middle East Petrol – Health, Safety & Environment (HSE) Department
- Azpetrol Baku Terminal – HSE Department
- Azpetrol Sangachal Terminal – HSE Department
- Briggs Marine Environmental Services, Baku
- RTC loading stations in Baku: Ahmeteli, Gantry no. 27; Voroshilov gantry

**Georgia:**
- Georgian Railway Ltd. Tbilisi – Department for Environmental Activities
- Georgian Railway Ltd. Batumi – Chief Engineer (responsible for environmental affairs)
- Port of Batumi – Ecological Department
- Batumi Oil Terminal Ltd. – Operational and Environmental Departments
- Oil terminal and tank field in the Port of Batumi
- Batumi – Railway shunting yard
2 Environmental Legislation and Policy Framework

2.1 Azerbaijan

Azerbaijan has signed a number of international treaties and conventions, which are directly related to environmental protection (see Table 1). By ratifying the final documents of the UN Conference on Environment and Development, Azerbaijan has confirmed its adherence to the ideas of sustainable development.

The transport of dangerous goods by rail is regulated in particular by the "SMGS-Agreement"\(^{19}\) which is valid in the Caucasus, Russia, the Baltic States, Poland and several countries in Asia.

For the regulation of the maritime transport, the most important legal basis is the MARPOL Convention, which has been signed and ratified in 1998.

Table 1: List of international conventions signed and ratified by Azerbaijan

<table>
<thead>
<tr>
<th>Years of signature and ratification</th>
<th>Name of conventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>Convention concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention)</td>
</tr>
<tr>
<td>1995</td>
<td>UN Framework Convention on Climate Change</td>
</tr>
<tr>
<td>1995</td>
<td>Vienna Convention for the protection of the Ozone Layer</td>
</tr>
<tr>
<td>1998</td>
<td>UN Convention to Combat Desertification</td>
</tr>
<tr>
<td>1998</td>
<td>International Convention for the Prevention of Pollution from Ships (MARPOL)</td>
</tr>
<tr>
<td>1999</td>
<td>Environmental Impact Assessment in the Transboundary Context</td>
</tr>
<tr>
<td>1999</td>
<td>Aarhus Convention</td>
</tr>
<tr>
<td>2000</td>
<td>Convention on Biological Diversity</td>
</tr>
<tr>
<td>2000</td>
<td>Convention on Conservation of European Wildlife and Natural Habitats (Bern Convention)</td>
</tr>
<tr>
<td>2000</td>
<td>Convention on the Protection and Use of Transboundary Watercourses and International Lakes</td>
</tr>
<tr>
<td>2000</td>
<td>Convention on Wetlands of International Importance Especially as Waterfowl Habitat' (Ramsar convention)</td>
</tr>
</tbody>
</table>

The national environmental legislation and regulations of Azerbaijan comprise, inter alia:

- The Criminal Code, which gives protection, measures for the Caspian Sea and liability for the violation of these laws. More specific:
  - Article 57 envisages the observation of actions on preservation of water balance, rational use of water and land areas etc.
  - Article 60-2 forbids use of toxic chemical agents, influencing population and nature.
  - Article 160-1 envisages penalty for among other things pollution of the sea by substances harmful to people's health or living organisms of the sea.
  - Decree No. 122: Payments for the Use of Natural Resources, Norms of Payments for Environmental Contamination (1992)
- Law On Environmental Protection and Nature Utilisation (1992)
- Regulations on the State Committee for the Environment (1992)

\(^{19}\) Multilateral Convention on International Carriage of Goods by Rail, valid only in some former Soviet Republics
• Regulation on the Evaluation of Environmental Impact (1996)
• Instruction on the Order of Transfer of Sea Environment Information
• Rules of Surface Sea Waters Protection
• Temporary Recommendations on Control Stations Establishment in the Area of Sewage Flow in the Coastal Sea Zone
• Water law(s), still to be approved.

2.2 Georgia

Georgia is signatory to the following conventions:

• International Convention for the Prevention of Pollution from Ships, 1973 (MARPOL - 1973);
• International Convention on Civil Liability for Oil Pollution Damage, 1969;
• International Convention for the Safety of Life at Sea, 1974;
• Convention on wetlands international importance especially as waterfowl habitat, 1972, 1996 April 14.

In addition, the Republic of Georgia joined a number of international conventions and treaties, among them:

Table 2: List of international conventions signed and ratified by Georgia

<table>
<thead>
<tr>
<th>Years of signature and ratification</th>
<th>Name of conventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>The Convention of the Biological Diversity signed in Rio-de-Janeiro in 1992</td>
</tr>
<tr>
<td>1994</td>
<td>Convention of Climate Change signed on May 9, 1992 in New York</td>
</tr>
<tr>
<td>1996</td>
<td>International Convention on Oil Preparedness and Response</td>
</tr>
<tr>
<td>1996</td>
<td>International Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1973 Protocol (INTERVENTION)</td>
</tr>
</tbody>
</table>

As in Azerbaijan, the transport of dangerous goods by rail is regulated in particular by the "SMGS-Agreement".

The most important national legislation and regulations for environmental protection are:

• Law on Transit and Import of Waste in the Territory of Georgia, (1994).
• Law on Environmental Permits, (1996).
• Law on Water, (1997).
3 Institutional Responsibilities

3.1 Azerbaijan

The Ministry of Ecology and Natural Resources supervises the conformance with the environmental legislation. Its responsibilities include development and implementation of the governmental ecological policy, development of recommendations for nature protection measures, supervising the observation of all standards and carrying out state control over the status and utilisation of natural resources.

Within this Ministry, the “State Control Inspectorate for Environment and Natural Resources”, employing some 60 to 70 inspectors, is responsible for enforcement of existing regulations. The inspectors have the power to enter and check plant and facilities at any time, including the inspection of vessels\(^{20}\).

3.2 Georgia

The Ministry of Environmental Protection and Nature Conservation is the highest national administrative body. The ministry has several tasks among which water management, land resources protection, waste management and marine inspection.

4 Environmental Conditions of the Oil Handling Facilities

4.1 Azerbaijan

Oil is imported by tank vessels from Turkmenbashi (Turkmenistan) and Aktau (Kazakhstan) via Baku Sea Port (Azpetrol Terminal) and the Port of Dubendi. A third oil terminal, which will mainly be used for crude oil and other dark products, has just been finalised by the company Azpetrol in Sangachal and will start operation in May 2003.

As a fourth oil terminal, oil in RTCs is transhipped by rail ferry from Turkmenbashi and Aktau to the Baku Sea Port.

4.1.1 Vessel Transport

Oil and oil products are transported from Turkmenistan and Kazakhstan to Azerbaijan either by railway ferry or by tank vessel. In 2000 several vessels involved in oil transports to Baku have been briefly surveyed by consultants. Reportedly, there have been doubts whether these vessels did meet international standards with regard to environmental protection and safety.

Deficiencies listed in the survey report were, inter alia:

- Carriage of passengers after the ship lost it's Passenger Ship Safety Certificate
- No GMDSS equipment (even though the exemption from the GMDSS requirements on one of these vessels had expired)
- Defect life buoys
- Defect fire fighting systems

\(^{20}\) verbal communication: Republic of Azerbaijan – Ministry of Ecology and Natural Resources – Chief of the State control Inspectorate for Environment and Use of Natural Resources
• Dumping of all kinds of wastes and garbage at sea
• Discharging of oily bilge water at sea
• No PPE (personal protective equipment) and no anti-static safety shoes for the tanker crew
• Low environmental and safety awareness of the crewmembers.

One of the surveyed vessels, the MV "Mercury 2", sank in stormy weather in the Caspian Sea in October 2002, five hours after sending an SOS call. The sinking left an oil slick of 15-km length and 8 km width. Search teams have rescued 13 of 56 passengers.

4.1.2 Baku Sea Port

There is no direct oil handling within the activities of Baku Sea Port. Oil is transhipped in RTCs, which are delivered by railway ferry from the Ports of Turkmenbashi and Aktau. The average throughput of RTCs loaded with oil is about 50 (2 ferries) per day.

Environmental Protection, Safety:
At the Baku Sea Port, the Environmental Department has been reduced to one single person, being in the position of an Environmental Advisor. His main duties are documentation and cooperation with the inspectors of the Ministry of Ecology who are reported to carry out their inspections at the port twice per year.

Oil Spill Contingency Planning and Equipment:
There exists an oil spill contingency plan in Russian language; however, the port has no facilities to react to any oil spill on the water. The equipment available (old oil booms of different types) is old and worn out and not functioning anymore. None of the two skimming vessels owned by the port is in operation, one of them is said to be presently under repair. However, due to the lack of funding, the repair of the skimming vessel has not yet been finalised.

For removal of oil spillages on land, the port also does not comprise sufficient means. Smaller spills are removed with the help of sawdust, a big spill has not occurred for the time being.

Reportedly, oil spill combating and cleaning activities lie within the responsibility of the chief engineer, both on land and at sea. As there is no direct oil handling within the activities of Baku Sea Port due to the fact that oil is transhipped in RTCs, the risk of big operational spills is said to be reduced. However, as the average throughput of RTCs loaded with oil is about 50 per day, accidents, as for instance the rupture of an RTC, cannot be excluded and the port needs to be prepared for this.

Agreements with companies who hold oil spill equipment on stock have not been taken.

Training:
Due to the lack of response equipment, manpower and an outdated contingency plan, training or scenario drills are not carried out.

4.1.3 Dubendi Oil Terminal

The oil terminal in Dubendi is leased for a period of 99 years to the company Middle East Petrol (MEP), and operated by Kafkastrans, a subsidiary of MEP. The facility consists of two jetties, a tank farm, and a

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21 Azerbaijan’s Turan news agency
connecting 5-km long pipeline to the gantry. MEP owns 300 new RTCs. The whole area has been rehabilitated within the last months.

**Environmental Protection, Safety:**
The company has established a HSE (Health, Safety & Environment Standard) system beginning of this year and also set a HSE policy in place with the aim to correspond to international BP standards. There are trained inspectors at all relevant areas of the facility: 2 at each terminal, 2 at the gantry, 2 at the tank farm. Additionally, pipeline inspectors are checking the pipes to the gantry for leakages. First aid is provided at the tank farm and at the terminals.

Personal protective equipment and safety instructions are provided by MEP to all employees and visitors, as well as an instruction on how to react in emergency situations. For safety reasons, the use of mobile phones and cameras is not allowed at the facilities. Internal safety training for the staff is reported to be carried out regularly. The company is preparing for an ISO 9000 certification.

At the tank farm, some of the tanks are equipped with a floating top. The earthen retention walls around some tanks are improperly constructed respectively partly missing, and therefore do not provide any protection against spillages. Reportedly, rehabilitation works are still going on and the retention walls will be reconstructed properly in due time.

An underground drainage system protects the subsoil of the pumping area from oil pollution. The drained water is said to be cleaned in an interceptor. After the treatment, the water is pumped into the Caspian Sea; the recovered oil is going back to the tanks. The surface of the area is not sealed except for the two piers, which are completely covered by concrete.

The fire fighting system obviously seems to be sufficient. For planning and installation of the fire fighting equipment, Middle East has sought consultancy by experts from BP. In order to be on the safe side, MEP has doubled the capacity of the fire fighting system at the jetties.

The area is not completely fenced; a watchservice at the entrance is 24 hours per day on duty.

**Oil Spill Contingency Planning and Equipment:**
The Middle East Petrol Tank Farm and Terminal at Dubendi has no oil spill contingency plan, equipment for oil spill recovery is not available. Being part of the Baku Sea Port, a plan in Russian language has been presented by the port to Dubendi, however, as there is no equipment available, this plan can be considered to be useless.

**Training:**
The employees are instructed individually with regard to health, safety and environmental issues. As the HSE-department has just recently been established, training courses have been carried out not yet. However, there are plans to conduct training for the employees in near future.

**Remarks:**
In general it can be stated that the MEP has spent considerable efforts and investments to improve its facilities in order to comply with international environmental and safety requirements. But still the situation is not in accordance with "best environmental practice" of today. Reportedly, rehabilitation works are going on and it can be assumed that the missing environmental protection measures will be realised in the near future.

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22 verbal communication: Head of HSE-Department, Middle East Oil Company
The company should be able to handle a Tier 1 incident.

### 4.1.4 Azpetrol Oil Terminal in Baku

The oil terminal operated by the Azeri company Azpetrol lies within the premises of Baku Sea Port. It consists of 2 piers (one deep-water pier), 2 gantries and a tank farm. Azpetrol has recently rehabilitated the area (the terminal started operation in 2002).

At present, all kinds of oil products are handled and stored at the Azpetrol tank farm in Baku. For the future, mainly light products will be stored there, whereas the dark products and crude oil will be transhipped via the new terminal at Sangachal.

**Environmental Protection, Safety:**
Construction works have been carried out according to high environmental and safety standards. All pipes are above ground; pipe and gantry area as well as the tank fields are fully contained by concrete. By this, spills and leakages are easily detected and prevented from spreading. Except for the gantry area, which is entirely sealed, contained and connected to the separation system, no spills were visible during the visit. Drained water is collected and cleaned in a separation tank equipped with an interceptor. The recovered oil is fed back into the storage tanks; the cleaned water is used for irrigation. The relevant parts of the facility (valves, pipes, etc.) are mainly computer controlled.

The tanks are partly equipped with a double bottom; some of them are constructed with a floating top. At the gantries, the loading arms are equipped with an automatic overflow protection device.

The whole area is walled; the gates are manned 24 hours per day.

**Oil Spill Contingency Planning and Equipment:**
Azpetrol has a contingency plan in place and sufficient means for handling a Tier 1 incident on its own premises. 400 m of oil booms are positioned next to the tanker pier, ready to be deployed in case of spillages on the water. Skimming devices have to be provided from an external company called "Briggs Marine Environmental Services" which is stationed south of Baku. Azpetrol has contractual arrangements with "Briggs Marine" for assistance in case of a bigger spill.

**Training:**
There are about 170 employees working at Azpetrol (the same number is envisaged to work at the terminal at Sangachal). Regular in-house training is conducted by external trainers.

**Remarks:**
Azpetrol is operating at a high environmental level and is proud of setting new standards in Azerbaijan. The facility will be audited according to the ISO 9000 standard within the next two months by Bureau Veritas.

### 4.1.5 Azpetrol Oil Terminal in Sangachal

Construction works on the oil terminal of Azpetrol in Sangachal are just being finalised. A test run of the facilities has already been carried out and operation was reported to have started in May 2003.

**Environmental Protection, Safety:**
As at the terminal of Azpetrol in the Port of Baku, high safety and environmental standards are realised on the terminal Sangachal. However, the gantries are not equipped with automatic overflow protection devices.
Pipelines, gantry area, tanks and pump house are fully contained. The pump house is equipped with gas detection system, too.

Employees as well as visitors are instructed and made familiar with the safety management practice. Personal protective equipment is provided to employees and visitors. Furthermore, instructions on how to react in case of emergency and relevant telephone numbers are provided.

First aid support and ambulance are available, mobile phones and cameras are not allowed on the company's premises.

**Oil Spill Contingency Planning and Equipment:**
In order to be prepared for emergency situations, a contingency plan is being elaborated. Furthermore, the Sangachal terminal will be equipped with a 20' container with oil spill response equipment. For both, the contingency plan and the response equipment, consultancy has been provided by Briggs Marine Environmental Services.

**Training:**
As operation on this terminal has not yet started, there has been no training to date.

**Remarks:**
This terminal will operate according to the same high environmental and safety level as the oil terminal operated by Azpetrol in Baku. Because of advanced equipment, the handling and clean-up of oil spills will even be improved. However, there will be no automatic overflow alarm at the gantry, which might increase the risk of oil spillages.

### 4.2 Georgia

The transport chain of the Caspian and Central Asian oil by RTCs ends at the Port of Batumi. At this port there is only one oil terminal operated by the Batumi Oil Terminal Ltd. However, the Port of Batumi has the responsibilities for oil spillages control.

#### 4.2.1 Port of Batumi

The Port of Batumi is a parastatal body and trusted with official duties in the field of maritime and environmental concerns.

**Environmental Protection, Safety:**
There are 17 people working at the Ecological Department of the Port of Batumi, supported by 6 part time workers who will be specially trained in future for carrying out clean up activities after an oil spill has occurred.

The Ecological Department has been founded 2 years ago and works in close co-operation with the Port Management, the Marine Inspection and the Batumi Oil Terminal Ltd. It is directly subordinated to the Ministry of Environment of Ajaria, to which it has to present regular quarterly reports. Duties of the Department are, inter alia, to carry out radiation controls and water analysis. It has also the right to inspect incoming vessels; however, as the Ecological Department is not in the position to charge any fees from vessels, MARPOL and SOLAS controls are mainly conducted by the Marine Inspection.

First aid and medical support are provided by the Ecological Department as well.
Oil Spill Contingency Planning and Equipment:
An oil spill contingency plan has been elaborated in close co-operation with the Marine Administration (which will act as the co-ordination centre in case of emergencies), the Batumi Oil Terminal Ltd. and the Port Management.

Some months ago, the Port of Batumi has ordered and financed a complete set of oil spill response equipment at the Finnish company LAMOR, of which some parts have already arrived. After being complete, this set will comprise, inter alia:

- 2 x 500 m of oil booms (LOB 750)
- 2 power packs
- 2 skimmers (1 of a capacity of 20 t/h, a smaller of a type of "brush skimmer")
- Rock Cleaner incl. Power pack

Training:
Members of the Port of Batumi have participated in a Tacis training programme on oil spill response in 1999, which was one of the origins leading to the foundation of the Ecological Department.

As soon as the oil spill response equipment will be complete (which will presumably be end of May 2003), the supplying Finnish company is conducting a special training programme on handling and maintenance of the equipment.

Remarks:
After having received the complete set of oil spill equipment, the Port of Batumi will be prepared to handle oil spills of a Tier 2 category, presumed that there are scenario drills and other suitable means in place which are carried out at appropriate intervals, in order to revise the plan and to gain the necessary experience. Procedures should also be in place for the periodic assessment of emergency equipment needs and the maintenance of such equipment in order to keep it in a ready state.

4.2.2 Batumi Oil Terminal Ltd.

The oil terminal in the Port of Batumi is operated by the company Batumi Oil Terminal Ltd. On average, 20,000 RTCs, carrying a total amount of 6,000 to 7,000 tons of oil and oil products, are handled here monthly.

An oil pier with four berths and parts of the tank field has recently been reconstructed. Furthermore, LPG is handled on the same pier.

Environmental Protection, Safety:
The Ecological Department of the Batumi Oil Terminal Ltd. has been founded 6 months ago and still consists of one single person. Despite this short time, a number of activities have been carried out: an oil monitoring system has been put in place, and emissions to water and air are registered regularly. Reportedly, the company is carrying out ecological audits, and consultancy of an independent international organisation is sought.

At present, the ecological situation on shore is said to be stable. However, as this area has been used as an oil terminal for nearly one century, there is a very high level of inherited pollution, the company is aware of. This has also been reflected during reconstruction of the facilities. As the amount of polluted soil was too big
to be completely exchanged, a special drainage system has been installed within which the drained water/oil mixture is collected and cleaned.

The new gantry is automated and said to be emission-reduced due to the close distance to the urban areas of Batumi. The ground of all new facilities is sealed and connected to an interceptor via a drainage system.

The rehabilitated tanks are contained by concrete basins and surrounded by concrete retention walls, which are sufficiently dimensioned to retain the contents of a tank in case of a rupture. All tanks have a fixed roof, and a fire fighting system with water and foam is in place.

For incoming oil tankers, which are loaded at the Batumi Oil Terminal Ltd., the company has designated three tanks of a capacity of 10,000 m³ each, in which the ballast water is collected and treated. The cleaned water, which is discharged into the Black Sea, is reported to have an oil concentration of 10 ppm.

At the pier, a tugboat equipped with a fire-fighting canon is on stand-by.

**Oil Spill Contingency Planning and Equipment:**
The company has no oil spill contingency plan and does not hold any oil spill equipment. The philosophy of the company is simple: they consider it as their duty to avoid oil spills, and the Port of Batumi is responsible for the clean-up of spillages, which are, generated by tankers and vessels the in port.

**Training:**
About 300 employees of Batumi Oil Terminal have participated in training courses on safety and environmental protection at a special training centre. No further information about the training centre and type of training could be obtained.

**Remarks:**
As described above, the facilities, which have been rehabilitated, are constructed according to high international safety and environmental standards. The consultant has had the opportunity to visit the whole facility six years before, and therefore appreciates that Batumi Oil Terminal Ltd. has made considerable efforts and expenses to reduce the environmental impacts of the old facilities.

Nevertheless, it must be pointed out that a major proportion of the Batumi Oil Terminal Ltd. (i.e. tank farm and gantries) has not yet been rehabilitated. These facilities have not been shown to the consultant, but from the previous visit it can be stated that this part of the facility is operated far below any ordinary environmental or safety standard.

The soil is still heavily polluted by oil. The explanation on how to collect this oil has been vague only. By passing a construction area close to the container terminal it was possible for the consultant to get an impression on the level of oil pollution of the soil: A hole in the ground of approximately three by three meters was completely filled with black oil which has been seeped in.

Batumi Oil Terminal Ltd. is certified according to ISO 9001 – 2000.

**5 Railway Transport**
The actual pollution problems stemming from the transport of oil products by rail are numerous and rather similar in Azerbaijan and in Georgia. Therefore, there is no need for description in separated country chapters.
The transport of oil and oil products by rail from Baku to the Azeri-Georgian border is under the responsibility of Azerbaijan State Railway (ASR).

ASR has a Department dealing with health, safety and environment issues (HSE-Department) which has already been created in Soviet times. There are 28 persons working in this department, six of them exclusively for environmental issues. They are mainly concerned with documentation.23

The consultant has been informed that each facility, which is operating in Azerbaijan, must be in the possession of an “Ecological Passport” in which technical details and rules concerning emissions discharges are described. Changes in operation or in the facility itself have to be stated in the passport and are controlled by the Ministry of Ecology.

Accordingly, each station, which is involved in loading/unloading of oil, has to have an Ecological Passport. ASR is reported to be checked by inspectors of the Ministry of Ecology every three months.

There is no central or at least comprehensive contingency plan at the ASR. Every station has its own regulation in Russian language, which gives recommendations on how to react to an emergency situation.

The Ecological Department of Georgian Railways Ltd. (GR) has been founded one year ago and is not yet fully established. The Department consists of five people and considers itself to be an intermediate/contact Department between GR and the Ministry of Environment.

The main duties up to now are:

- research
- observation
- checking of facilities
- analysis of accidents
- giving recommendations for rehabilitation works after accidents

A separate unit sector is focusing on the Black Sea coast.

Future duties will be:

- monitoring
- set up of an ecologic monitoring network of the main railway line with the help of a mobile lab
- avoidance of vibration and noise, especially in densely populated areas
- special division for investigation: transport from an ecological point of view
- design and implementation of a statute
- work out of a plan for the next 10 years

The co-operation with Ministry of Environment is on legal basis and comprises mainly documentation. GR has to take the requirements of the Ministry of Environment into consideration.

The checking of RTCs and tracks is carried out by an independent GR Department, the “Inspection of Technical Supervision”.

23 Verbal communication: Azerbaijan State Railway, HSE Department Head
The exchange of wooden sleepers by concrete sleepers is truly considered to be an improvement. However, the technical condition of many of the RTCs and tracks, as well as noise and vibrations, are by far the most urgent environmental problem.

An oil spill contingency plan does not exist. Orders are issued by the General Director in form of a set of principles to be followed. Necessary cleaning is reportedly carried out by the “Track Service Department” of GR.

Up to now there has been no oil spill training at all.

At present, the following World Bank Training Seminars (courses for safety and environment are mentioned only) are taking place for transport officials (announced at the Ministry of Transport):

- Safety Management in Transport Sector
- Environmental Impacts of Transport
- Legal implications of International Transport Rules
- Handling of Dangerous Cargoes
- Disaster Management (Spills and Sinking)
- Vehicle Safety and Standards: Vehicle Inspection and Maintenance
- Environmental Aspects of Land Transport

Individual members of the Ecological Department of GR are participating in these training courses.

Apart from the pumping stations at the oil terminals as described above (see Chapters 4.1 and 4.2), there are numerous RTC-loading stations for oil and oil products in and around Baku. The following loading stations have been visited by the consultant:

- Gantry no. 27
- Gantry Voroshilov
- Ahmeteli
- Ali Bayramli Station

In Georgia, the marshalling yard of GR in Batumi has been visited.

Findings:
At all the stations visited, a substantial soil pollution by oil or oil products could be identified at and around the tracks, primarily caused by leaking tank wagons. This refers in particularly to stop over areas of the RTCs. Here, soil pollution is accumulating, as observed at the shunting yard in Batumi (see Picture 17) or other places, where RTCs are used as temporary storage facilities.
Picture 15: Soil Pollution Caused by Leaking RTCs

Picture 16: Soil Pollution Between Rail Tracks
One reason for this extraordinary pollution is related to the fact that the major part of the rolling stock is overaged and technically insufficient (ruptures, leaking valves). Nevertheless, a significant source of this soil pollution can be attributed to the human factor rather than to technical deficiencies, as it could be observed that it is common practice to transport emptied RTCs with open flanges and open caps. By this neglect, oil residues may be leaking out (see Picture 18).
Another source of soil pollution is found at oil and fuel loading and unloading areas and gantries ("estacadas"). Most of these gantries are old, the technology is outdated. It can be assumed that most of these estacadas are not provided with an adequate drainage system, which hinders the spilled oil from penetrating the ground.

The pollution observed at the estacadas is caused by insufficient or non-existing safety features such as an overfill protection system.

**Picture 19: RTC Contaminated Due to Overfilling**

### Railway accidents

Railway accidents are a further source of oil pollution. On January 9, 2003, a bridge collapsed at the Gori-Qvakhreli railway, and about 130 tonnes of oil were spilled. On January 29, a second accident of a train carrying oil from Baku to Batumi occurred. The spill has contaminated the river Khevistskali, near Samtredia. Several weeks before, two RTCs derailed in the Gorisi region, east of Georgia.²⁴

### 6 RTC Cleaning Facility

RTCs are washed at a cleaning station at Balajari in Azerbaijan. At present, it is the only washing and steam-purging facility for rail tanks in the Caucasian area. About 100 to 120 RTCs are inside cleaned per day. In full working condition, this station can clean up to 200 RTCs per day. Reportedly, each RTC is cleaned after use, not only in case of change from crude to refined ("white") products.

The cleaning process consists of two steps: A physical cleaning by means of steam, hot water and pressure, and a so-called "chemical cleaning", i.e. washing with gasoline.

The oil-polluted sewage from the washing process is collected in a tank for a first separation. The contaminated water is further treated in a separator where it is heated. The oil from both cleaning steps is collected. As a third step, the water is treated in a flotation unit (capacity: 120 m³/d) before it is fed to the public sewage system. The waste oil is used for fuelling a locomotive, or added to asphalt, or even burnt – in relation to its quality. The wastewater treatment facility is reported to be built in 1963, the flotation unit in 1994. The water is running in circle, about 3-4 t/d of fresh water are added.

The environmental condition of the RTC Cleaning Facility can only be described as insufficient. The railway lines underneath the steam-purging gantries are soaked with waste oil (see Picture 20); the collection tank and the separator are by far outdated. During the visit, the separator was not in operation. The lab, which belongs to the facility, was obviously not working at the moment; no equipment for analysis could be identified.

**Picture 20: RTC Cleaning Facility at Balajari**
Reportedly, the facility is going to be reconstructed in order to be in compliance with the present railway tank cleaning standards and requirements. A tender for reconstruction of the steam-cleaning station has already been released and construction works are said to begin in early summer 2003. A rehabilitation of the facility will lead to considerable improvements of the station’s technical quality, and will considerably lessen the environmental pollution with the drain and oily waste.

7 Oil Spill Response/Contingency Planning

The Caspian Environment Programme (CEP), a regional programme approved by the Caspian Governments and supported by international donors such as UNDP, held several regional workshops on the development of the Caspian Regional Plan on co-operation in cases of major oil spills in the past.

Due to several reasons, mainly from the political sphere, the organisation has failed in achieving its objectives, and a regional oil spill contingency plan has not been elaborated so far.

7.1 Azerbaijan

Information on a National Oil Spill Contingency Plan of Azerbaijan could not be obtained.

According to information of the Ministry of Ecology and Natural Resources of Azerbaijan, all companies have to have a contingency plan. The Ministry has a special “fund for ecological damage” to support clean-up activities. In case of a railway crash, the railway company has to remove the spill; the chief engineer of the railway is responsible for the cleaning operations. Above all, as described in chapter 4 of this report, most

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25 verbal communication: Republic of Azerbaijan – Ministry of Ecology and Natural Resources – Chief of the State control Inspectorate for Environment and Use of Natural Resources
of the companies involved in oil transportation do not have the facilities and the knowledge to deal effectively with oil spills.

Within Azerbaijan, oil spill response equipment stockpiles and contractual arrangements for specialist personnel exist which is used to respond to oil spills resulting from regular oil and gas production and drilling activities. It should be reconsidered, in how far this equipment can be used by the oil transporting industry and the ports on a mutual aid basis.

Furthermore, Briggs Marine Environmental Services Ltd., a company specialised in oil spill recovery and based in Baku, holds a complete and comprehensive stock of response equipment, thus being able to deal with major spillages (Tier 2) on road, rail, land and water (see Picture 22). Some oil exploiting companies (e.g. BP) and oil transport companies (e.g. Azpetrol) hold contractual arrangements with Briggs Marine Environmental Services for support in case of an oil spill which cannot be handled by these companies alone. Presently, Azpetrol holds negotiations with Briggs Marine Environmental Services on building up stockpiles of oil spill equipment along the railway line from Azerbaijan to Georgia.

Picture 22: Oil Spill Response Equipment in Baku (Briggs Marine)

7.2 Georgia

It has not been possible for the consultant, to obtain detailed information on a national oil spill contingency plan for Georgia.

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26 ACG FFD Phase 1 Oil Spill Response Framework, The Azerbaijan International Operating Company (AIOC), July 2002
At the coast, oil-handling activities are at present concentrated to the Port of Batumi and the oil terminal at Supsa. The Port of Batumi will be provided with a set of oil spill response equipment in due time. The Supsa oil terminal is reported to hold oil spill response equipment, too. Contractual arrangements for mutual aid in case of a bigger oil spill should be positively considered.

8 Conclusions and Recommendations

- In Azerbaijan as well as in Georgia, there is an urgent need for environmental management with regard to oil transport. In both countries, there exists an advanced legal framework within which protection against negative consequences of such transport could be developed. This framework contains adequate legal and institutional provisions for the protection against oil transport related pollution. However, these instruments do not seem to be enforced to the extent to deal efficiently with the major environmental problems of oil transport.

- The roles and responsibilities in case of oil pollution should be clearly stated and documented. An oil spill contingency plan should be implemented on a national basis in Azerbaijan as well as in Georgia.

- Each company or facility dealing with oil (transhipment, transport, storage) should be sufficiently equipped and trained to be in the position to deal efficiently with a Tier 1 oil spill on its own premises.

- Measures need to be taken to reduce the risk of environmental pollution from transport of oil products, particularly with regard to soil pollution. The leakage of oil products from the rolling stock is an urgent matter, which needs to be brought under control as soon as possible. Practical measures, such as, for instance, keeping all valves, flanges and caps of RTCs securely closed during carriage (also those of emptied RTCs) therefore need to be enforced to reduce such leakages to the maximum possible extent.

- The problem posed by soil contamination with oil is particularly challenging for its magnitude. On the long run, the development of proper treatment procedures, such as biological treatment for the contaminated soil is unavoidable.

- In general, it was observable in both countries, that there is a low commitment to good HSE management, to a safe, efficient and effective manner to reduce incidents. "Common sense" measures, as for example, the prohibition on overfilling tank containers and instructions that no tank rail wagons is filled beyond its safe level, should be trained to all personnel involved in the transport of oil and dangerous goods.

- Inspectors of the Ministries for Environment should be provided with more executive rights. Examination, testing and certification of tanks and RTCs should be conducted in a more stringent way, and compliance with regulations should be verified by an approved person. Furthermore, it has to be inspected regularly that RTCs, filling stations and storage facilities have been adequately maintained.
ANNEX 12: Current Situation in Supsa Port

1 Introduction

The State of Georgia is bordering the eastern part of the Black Sea. The national boundaries mark the territory between the Great Caucasus and the Little Caucasus and between the Black and Caspian Sea. In the Year of 1921 Georgia became a Republic of the Soviet Union, but since 1991 it became again an independent State. Since 1995 with the new currency / monetary system the official politics have opened the doors to the western part of Europe.

Very important for Georgia is the location between Western Europe and the oil deposits around the Caspian Sea. Between the Republic of Georgia on the one hand and the European Union on the other hand several agreements on economic basis have been signed. A very important item is the ratification of an agreement of the OSCE Governments around 1999 to construct an oil pipeline between the oil wells in Azerbaijan in the vicinity of Baku to the Port of Supsa at the Black Sea around 10 NM south of the Port of Poti. This terminal is connected since 1999 with an SPM (Single Point Mooring) installation for mooring and loading of Tankers approximately 2 NM off the coast at a depth of 50 meters.

2 Situation

A Port Administration for Supsa Port with a managing director and a harbourmaster has been established, but cannot practically fulfil its tasks in its sovereign territory because of lack of own service facilities (tugs, pilots, VTS, mooring boats, etc...). As a result the acceptance of the Supsa Port Administration among SPM customers seems low, and harbour dues which have been continuously demanded by the port authority have not been paid by vessel operators. Almost all services in the port are rendered by a private company, which dispatches 50 to 60, Tankers per year of between 50.000 tdw up to 150.000 tdw. The tankers are usually ordered directly by private companies, few by agencies.

3 Supsa Oil Terminal

The Terminal comprises of

- storage tanks with pumpstation,
- a control center situated at the coastline,
- the SPM installation
- Port Service Equipment

3.1 Storage Tanks with pump station

The entire shore based installation, comprising several storage tanks with an overall storage capacity of about 160,000 tonnes equivalent to 1 mn barrels (4 tanks of 250,000 barrels each), a tank farm control centre equipped with modern installations of high technical standard, a pump station with a power of 7,500 tonnes/hour, several fire- and oil spill fighting equipment and accommodations for the service staff, is protected by a safety fence. The plant is strictly guarded day and night and can be entered only accompanied by security personnel. The entire area is in a very clean condition; technologically it is at a high international standard and is operated by well-trained personnel.
3.2 Marine Base/Control Centre

All vessel and cargo operations are organised and surveyed by a Marine Base situated on the shore directly east of the SPM. The Marine Base is the point of contact for arriving tank vessels. The installation comprises an administration building, in which are located a radio station with modern means of communication equipment, a bridge equipped with a modern radar set and VHF transmitters and receivers to observe the approach, mooring operation and departure of the tankers as well as administration equipment.

The Marine Base is operated by the private company also operating the tank farm, and also stores fire fighting and oil spill equipment as well as speedboats. In front of the Marine Base the Georgian Coast Guard monitors the waters around the SPM. No unauthorised vessel is allowed to enter the area between the Marine Base and the SPM as well as five hundred meters to the north and south.

Picture 23: Marine Base of Supsa Oil Terminal (Operated by BP)

Within the fenced and strictly guarded area fire- and oil spill fighting material, underwater welding equipment as well as a fast rubber dinghy can be supplied. This installation appears to be in very good condition and is maintained by well-trained personnel.
3.3 Single Point Mooring (SPM)

The port of Supsa today consists of an SPM facility about two nautical miles offshore for the loading of crude oil only. The crude oil comes by pipeline from Baku (Sangachal BP Terminal) and is stored in a tank farm close to the village of Supsa. Only one type of crude is piped from Azeri Chiraq and Gunashli Oilfield, in 2002 about 5 million tons. Upon arrival of a vessel, the vessel is moored to the SPM and connected to a flexible loading arm which itself connects to an underwater pipeline leading to the tank farm. The shore-based part of the connection is buried underground while the sea-based part is reportedly laid on the seabed. The SPM can receive vessels up to 150,000 tdw, which can be turned around within 48 hours. In 2002, about 50 vessels were loaded.

The SPM, moored 2 NM off the coastline at a depth of 50 meters, is well equipped with a navigational light, visible 7 NM, a RACON, an installation handling the pipe connection and an installation to establish the rope connection. Also these installations are of high international standard. An area off the coastline to the SPM with a distance of 500 meters from both sides of the underwater pipeline is marked as prohibited area and is observed day and night by Georgian Coastguard. With the exception of 2 marking buoys near the SPM, no more fairway buoys are necessary because of water depth of 20 meters up to a distance of 1 NM off the coastline. Even for VLCCs this depth is sufficient.

The pilot, at the same time loading master, remains on board during the entire loading operation and has permanent contact to the pump station. It takes about 48 hours to turn around a 150 thousand tdw tanker. The loading operation is under normal circumstances completed within 20 hours and can be executed up to wind force beaufort 7 and a swell of 3 meters height.

3.4 Mooring Service Equipment

All piloting, tug assistance, mooring and loading activities are operated by the private company. This company also provides fire fighting and oil spill services in case of need. The existing team can do Tier-1 (for fighting small oil spills). On demand the company can provide a Tier-2 team (for fighting medium oil spills).\(^\text{27}\)

\(^{27}\) A Tier-3 accident has just recently happened off the Spanish Atlantic coast.
The operation and safety equipment seemingly is in very good condition and according to international standards.

All tanker operators calling at the SPM pay to the private company for the provision of services. The tariffs were not revealed to the consultants but reportedly are in line with international levels. However, it is not reported whether the vessel operators also are charged with port dues (such as tonnage dues) by the private terminal operator.

The terminal’s mooring equipment comprises a) a multipurpose vessel and b) a service boat.

### 3.4.1 Multipurpose vessel

The multipurpose vessel possesses about every technical installations of highest standard and can be used as a tugboat for assistance of sea going vessels with 66 tons/bp and simultaneously as a fire- and oil spill-fighting vessel. The unit is tight up at non-operation at the port of Poti and is steaming up to board the pilot in time and ties up at the stern of the tanker to ease speed and keep permanently position after connection to avoid collision with the SPM. The tug keeps tight to the tanker from connection until disconnection.

### 3.4.2 Service boat

The launch will be used as a service/mooring boat and gives assistance while mooring and unmooring the tanker in towing ropes from the tanker to the SPM fixation point. The strongly motorised boat is equipped with modern communication installations as well as fire fighting and oil pollution equipment.

### 4 Conclusion

It can be stated, that the foreign private pipeline operator company also provides foreign tanker operation in state seawaters and it is obvious that operation, co-ordination and provision of floating material on high international standard is the priority of the seaport. Also the port has to provide security for customers as well for the state. All this stands for implementation of port structural and operational positions together with modern communication and navigation equipment. It should be remarked that with a very small budget and with today’s position “Supsa Port” cannot realise the above mentioned issues without financial, administrative and operational support.

The initial (low) budget allocated from state budget to the establishing of (a rudimentary) Supsa Port Administration has been used up already. All further activities of SPA are now depending on the development of other financial sources. Since it has been the clear order of the Georgian Government that SPA should be self-sustainable; no further alimentation from the state budget can be expected.

Efforts of the Supsa Port Administration to charge vessels with dues have come to naught. All claims have been denied by vessel operators, efforts to lay vessels in the chain to enforce the claim have not been successful. There reportedly have been instances where the Harbour Master of Supsa Port has been denied access to the vessels entering the waters of Supsa Port. For entering the vessel, the Harbour Master depends on the private company allowing him to use their tugboat.

The private company so far rejects all responsibilities of the Supsa Port Administration arguing that in fact Supsa Port is not a full-fledged port justifying the establishing a port administration with respective tasks, responsibilities and tariff rights. Moreover, according to the so-called Pipeline Construction and Operating Agreement (PCOA) and the Host Government Agreement (HGA) concluded between the Georgian
Government represented by GIOC (Georgia International Oil Corporation) and several oil companies involved in the exploitation of Chiraq and Gunashli oil wells, the operator of the pipeline pays to the Georgian State a transit fee for every barrel of oil piped to Supsa across Georgian territory (about USD 0.18 per barrel). The operator claims that this transit fee also includes all fees and dues related to the offshore loading of oil into tankers.28

The Georgian side argues that Supsa port has been established by presidential decree and through the existence of a loading facility, no matter if offshore or onshore, Supsa in fact serves as a port. Moreover, the Host Government Agreement covers only the fees up to the finalisation of the loading procedure, and is thus cargo related. Since neither the HGA nor the PCOA makes any explicit reference to the question of port and harbour dues, the Supsa Port Administration concludes that the vessels calling at Supsa are not included in this agreement and like in any other maritime country should be subject to the usual charges related to the utilisation of the countries maritime/port area. Thus, the Supsa Port Administration claims it has the right to levy charges on the vessels, as e.g. tonnage dues, lighthouse dues etc. It is not intended to levy charges on the terminal operator. The terminal operator seemingly defends the interests of his customers; direct talks between the Supsa Port Administration and the terminal operator reportedly have not been initiated.

The Georgian government states that the solution of this dispute is the pre-requisite for all further development planning in Supsa Port since it has an immediate impact on the funding and financing options of port development and construction. Plans and ideas currently circulating in the Georgian port sector foresee the construction of a LPG terminal as well as a rail connection to the port for the transhipment of oil.

28 PCOA, Paragraph 4.7: “Save as otherwise expressly provided in this Agreement (PCA) and the Host Government Agreement, the Tariff shall be the sole compensation payable to GIOC, its Affiliates or the Government for the use of the Facilities and the grant of rights by GIOC under Article 3 (Rights of Possession and Use) and Clause 8.4 (Right to use land, including river and seabeds).”
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