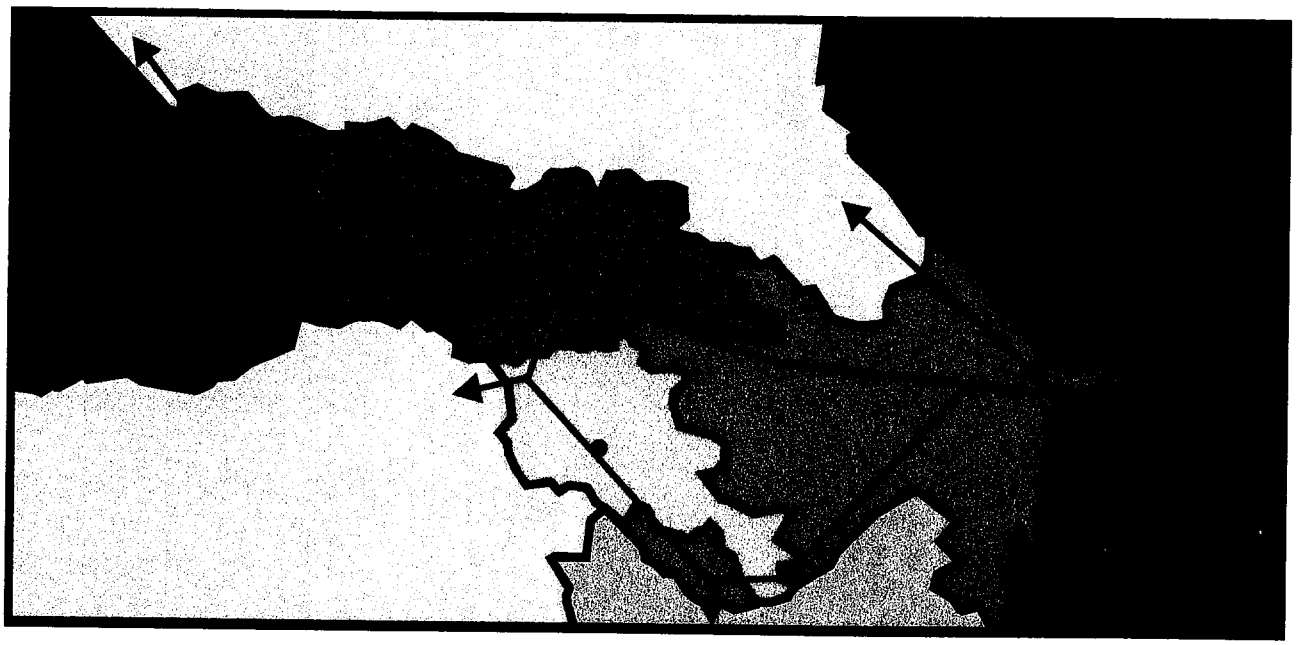
COMMISSION OF THE EUROPEAN UNION

Directorate General IA External Relations
DG IA/E/6 Tacis

Technical Assistance to the New Independent States and Mongolia
TRACECA
TNREG 939401

Joint Venture(s) for the Caucasian Railways



FINAL REPORT

Volume IVa - Annexes to Chapter 6

March 1998

TEWET
TRANSPORT EAST WEST EXPERT TEAM GMBH

in association with

DE-Consult

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Contents

Abbreviation list:

AC	Alternating Current of electrical power
AGC	European Agreement on Main International Railway Lines
AGTC	European Agreement on Important International Combined Transport Lines and Related Installations
AGZD	Azerbaijan State Railways
AICCF	International Railway Congress Association
AIM	Agreements for the International Carriage of Goods
AIOC	Azerbaijan International Operating Company (Oil production)
AIV	Agreements for the International Carriage of Passengers and Luggage
ARM	Agreement for the Communication of Traffic Restrictions for the International Carriage of Goods by Rail
ARM	Armenian Railway
ATP	Agreement on the international carriage of perishable foodstuffs and on the special equipment to be used for such carriage
BIS	Baku International Seaport
BOLT	Build - Operate - Lease - Transfer
BOT	Build - Operate - Transfer
BUS	Transformer station of railway power supply
BWRS	Baku Wagon Repair Plant
CECA	European Community for coal and steel
CEH	European Timetable Conference for Passenger Trains
CEM	European Timetable Conference for Goods Trains
CEV	European Passenger Tariffs Conference
CFS	Container Freight Station
CIM	Contracts for International Carriage of Goods by Rail
CIS	Commonwealth of Independent States
CIT	International Rail Transport Committee
CIV	Contracts for International Carriage of Passengers by Rail
COTIF	Convention for the International Carriage by Rail
CSC	Caspian Shipping Company
DB AG	Deutsche Bahn AG (German Railways)
DC	Direct current of electrical power
DCU	Uniform Regulations for Rail Transport
DEG	Deutsche Investitions- und Entwicklungsgesellschaft mbH (German Society for Investment and Development Ltd.), Cologne, Germany
DEM	Deutsche Mark (= German currency)
DIN	German Regulations of Standardisation in the Industry
DM	Deutsche Mark (= German currency)
DMU	Diesel Motor Unit
Dpt.	Department
DR	type of inspections of locomotives, wagons, coaches and EMU/DMU
DSA	European Prestressed Concrete Sleepers (type of sleepers)
DSS	Decision Support System
EBRD	European Bank for Reconstruction and Development, London, UK

EC	European Community
ECE	Economic Commission of the UN for Europe
EDI	Electronic Data Interchange
EDIFACT	Electronic Data Interchange for Administration Commerce and Transport
EDP	Electronic Data Processing
EEC	European Economic Community
EMU	Electric Multiple Unit
ESCAP	Economic and Social Commission for Asia and the Pacific
EUROP	Agreement for the Common use of Wagons
FADA	Traffic controller installations
FESA	Permanent line-side radio installations
FSU	Former Soviet Union
FTOS	Freight Transport Operation System
FZ	Financial co-operation programme (in Germany)
GDP	Gross Domestic Product
GDR	former German Democratic Republic
GOST	State Organisation of Standardisation of the former Soviet Union
GRID®	American management training system
GRZD	Georgian Railways
HERMES	German State Guarantees for Suppliers
HQ	Headquarters
HV	High Voltage
ICC	Information and Computer Centre
ICE	Inter-City-Express(-Train)
IMF	International Monetary Found
IRR	Internal Rates of Return (of investments)
ISO	International Organisation of Standardisation
JV	Joint Venture
KfW	Kreditanstalt für Wiederaufbau (= German Bank for Reconstruction), Frankfurt/Main, Germany
KR	type of repairs of locomotives, wagons, coaches and EMU/DMU
LIF	General List of Frontier Points for Rail Transport
LOI	Letter of Interest
LOU	Letter of Understanding
LV	Low Voltage
MBC	Motorised coaches
MESA	Mobile railway radio installations
MIS	Management Information System
MPS	Ministry of Railway Transport of the former Soviet Union
MTT	Uniform Transit Tariff of the OSShD
MV	Medium Voltage
nm	nautical miles
OCC	Operations Control Centre (of the railways)
OCS	Overheadline catenary system of power supply
OCTI	Central Office for International Carriage by Rail (in Bern, Switzerland)
OR	type of overhauls of wagons, coaches and EMU
OSShD	Organisation for the Co-operation of Railways
PC	Personal Computer

PCM	Personal Computer assisted Management
PFCCS	Processing and Freight Cost Calculation System
PIEx	Common Regulations for the International Carriage of Express Parcels
PIM	Common Regulations for the International Carriage of Goods
PIV	Common Regulations for the International Carriage of Passengers and Luggage
Pkm	Passenger-kilometre
POD	Port of Discharge
POL	Port of Loading
PPW	Regulation for the Use of Wagons in International Rail Transport
resp.	respective
RIC	Regulations for the International Carriage of Containers by Rail
RIC	Regulations for the Reciprocal use of railway carriages and luggage vans for International Transport
RID	Regulations for the International Carriage of Dangerous Goods by Rail
RIEx	Regulations for the International Carriage of Express Parcels by Rail
RIP	Regulations for the International Carriage of Private Wagons by Rail
RIV	Regulations for the Reciprocal use of Wagons for International Transport
RoRo	Roll-on-Roll-off
RSM	General Summary of Special Regulations for the International Goods Traffic
SBB	Swiss Federal Railway
SCADA	Supervisory, Control and Data Acquisition System
SMGS	Conventions to International Railway Transport of Goods
SMPS	Conventions to International Railway Transport of Passengers
SNCB	Belgian Rail
SNCF	French National Railway Society
SZD	former Soviet Railways
TCLE	Trans-Caucasian-Logistic-Express
TECF	Tbilisi Electro-Locomotive Construction Factory
TEU	Twenty feet container Equivalent Unit
TEWRS	Tbilisi Electro-Wagon Repair Plant
TEWS	Tbilisi Electro-Wagon Repair Plant
TIEx	Agreements for the International Carriage of Express Parcels
Tkm	Ton-kilometre
TO	type of overhauls of locomotives, wagons, coaches and EMU/DMU
TQM	Total Quality Management
TR	type of repairs of locomotives, wagons, coaches and EMU/DMU
UIC	International Union of Railways
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UTI	International Transportation Units
VAT	Value Added Tax
ZÜV	System for the supervision of train running

Annexes

to Chapter 6

Annex 6.1-1

Marketing concepts for passenger transport

The first steps for introducing a marketing concept for passenger transport should contain the following items:

A Market analysis

A.1 Analysis of selected macro-economic indicators for previous years (at least three years); e. g.,

- gross national product
- gross domestic product
- industrial production
- production of consumer goods
- energy consumption
- investment and source of financing
- supply of transport services (transport performance)
- export
- import

A.2 Assessment of selected transport indicators for previous years (at least three years); e. g.,

- supply of passenger services measured in passengers and passenger-km
  - *rail traffic*
  - *road traffic*
  - *maritime traffic (including ferries)*
  - *air traffic divided into international transport (number of total flights and flights within the CIS only), national transport (number of departures) and charter flights (in total, within the CIS only)*

A.3 Diagnosis of selected socio-economic indicators for previous years (at least three years); e. g.,

- population
- regional distribution
- social structure
- income
- travel budget
- employment market and development
- price trend, in particular for services
- inflation
- vehicle ownership (cars per 1,000 inhabitants)

A.4 Assessment of mobility needs of the population according to

trip purpose
- *trips to work*
- *business*
- *trips to school / university*
- *leisure / holiday*

modes of transport (divided into long-distance, short-distance and commuter traffic)
- *rail traffic*
- *road traffic*
- *maritime traffic (including ferries)*
- *air traffic*

destinations
- *within the country*
- *to neighbouring countries*
- *to other countries*

Recording of major events and assessment of resulting transport demand

A.5 Identification of possible market segments for rail passenger transport

B Marketing through improved customer services

B.1 Development of improved services
- at stations
- on trains

B.2 Execution of passenger surveys

preparation of questionnaires
use of suitable interviewing techniques

C Development of new or improved railway service products; e. g., special purpose trains

D Marketing by tariffs / pricing
- development of flexible tariffs
- identification of attainable prices for the railway
- special introductory offers

E Marketing of passenger services via media
- daily press (advertising, articles)
- reports and interviews (radio, TV)
- distribution of flyers / brochures

Annex 6.3-1

International conventions on railway transport

1. General remarks

1.1 There are treaties between **states** or **governments**. They are statutory law and in force for the railway enterprises of the respective states.

1.2 There are agreements between **railway enterprises**. They are contractual law. They obligate the involved railway enterprises.

1.3 Finally, there are **rules of the European Union** in the sphere of railway policy. Legally speaking, they have the same impact as the international conventions. The **regulations** are generally valid, the **decisions** addressed to railways obligate these enterprises. The **directives** are addressed to the member states and are to be converted into national rules, that means into statutory law binding upon the railways. The **resolutions** and the **recommendations** are addressed to the railways and are not binding.

1.4 All conventions mentioned are valid without limitations.

1.5 Most conventions are valid for both West and East European railways except for some of them obligating either West European railways or East European railways only.

2. Conventions of states or governments

2.1 Convention and statute concerning **the international legal system of railways**, dated 09.12.1923 and based on a resolution of the former League of Nations.

2.2 **Technical unit of railways**. Latest version of 1968, not yet in force. It is valid for West European railways with normal gauge tracks (1.435 mm) only. Caretaker is the Swiss federal government.

2.3 Agreement to the **introduction of direct railway tariffs** dated 21.02.1955. Caretaker: Commission of the European Union in Brussels. Scope: The railways of the European Union and of adjacent states.

2.4 Agreement on the **international carriage of perishable foodstuffs and on the special equipment to be used for such carriage (ATP)** dated 01.09.1970. Scope: world-wide. Drawn up by the Economic Commission of the UN for Europe (ECE) in Geneva. Caretaker: Secretary General of the United Nations.

2.5 Convention concerning **International Carriage by Rail (COTIF)** of 09.05.1980, with several amendments. Caretaker is the Central Office for International Carriage by Rail (OCTI) in Bern. Partners of the convention are all European states except the CIS and some Middle East and North African states. The scope of COTIF overlaps with the scope of SMPS and SMGS (see no. 3.10 below). COTIF comprises the contracts for international carriage of passengers and luggage by rail (CIV) and of goods (CIM), the latter with the following annexes: Regulations concerning the international carriage of dangerous goods (RID), of private wagons (RIP), of containers (RIC) and of express parcels (RIEx).

2.6 European Agreement on **Main International Railway Lines (AGC)** of 31.05.1985. Partner of the agreement are various West and East European states. Drawn up by the Economic Commission of the UN for Europe (ECE) in Geneva. Caretaker: Secretary General of the United Nations.

2.7 **International Railway Congress Association (AICCF)**, founded in 1885. Headquarters: Brussels. Caretaker: Belgian Rail (SNCB) in Brussels. Members of the AICCF are railways, organisations of railways and governments in all continents. AICCF is therefore called a "mixed organisation".

2.8 European Agreement on **Important International Combined Transport Lines and Related Installations (AGTC)** of 01.02.1991. Partners, Draft and Caretaker as at AGC.

3. Conventions of Railway Enterprises

3.1 **International Union of Railways** (UIC), founded in 1922. Headquarters: Paris. Caretaker: Secretary General of the UIC, Paris. Railway enterprises all over the world are members of the UIC. UIC issues leaflets which regulate technical, operational, commercial and juridical matters. The leaflets are generally applied and binding for the concerned railway enterprises.

3.2 **International Rail Transport Committee (CIT)**. founded in 1902. Headquarters: Bern. The Swiss federal railway (SBB) is the managing railway of the CIT. Members are all railway, navigation and road service enterprises which apply the convention COTIF with the contracts CIV and CIM. The CIT produces additional uniform regulations (DCU), common regulations concerning the international carriage of passengers and luggage (PIV) and of goods (PIM) and of express parcels (PIEx), agreements concerning the international carriage of passengers and luggage (AIV) and of goods (AIM) and of express parcels (TIEx) by rail, the agreement concerning the communication of traffic restrictions for the international carriage of goods by rail (ARM), the general list of frontier points (LIF) and the general summary of special regulations for the international goods traffic (RSM).

3.3 International societies **EUROFIMA** and **INTERFRIGO-INTERCONTAINER** with headquarters at Basel (Switzerland). Caretakers are the director-generals of the two societies.

3.4 **European Timetable-Conference for Goods-trains (CEM)**. Headquarters; Prague. Caretakers: General direction of the Czech State Railways. Members of the CEM are European railway enterprises with normal gauge tracks (1.435 mm).

3.5 **European Timetable Conference for Passenger Trains (CEH)**. Headquarters: Bern. Caretaker: General direction of the Swiss federal railways (SBB). Members are railway enterprises as at CEM.

3.6 **European passenger tariffs conference (CEV)**. Managing railway is the French national railway society (SNCF) with headquarters in Paris.

3.7 Regulations concerning the **Reciprocal use of railway carriages and luggage vans for international transport (RIC)**. Members are the railway enterprises participating in international services of wagons. The managing enterprise is changing; caretaker is the Secretary General of the UIC in Paris.

3.8 Regulations concerning the **Reciprocal use of wagons for international transport (RIV)**. Members are railway enterprises executing a public service and operating a normal gauge network. The managing enterprise is changing; caretaker: as at RIC.

3.9 Agreement concerning the **Common use of wagons (EUROP-Agreement)**. West European railways with normal gauge network are members of the agreement. Caretaker: Swiss federal railways in Bern.

3.10 Some West European railways take part in the conferences of the **Organisation for the co-operation of railways (OSShD)** as an observer when negotiating the further development of the Conventions concerning the international railway transport of goods (SMGS) and of passengers (SMPS). Azerbaijan and Georgia are members of OSShD, Armenia is not. The conventions SMGS and SMPS are applied in international transports by rail between the member states of the OSShD and between West and East European states according to the East-West-Tariff for the passenger transport, to the IDEF-regulations for the goods transport. If these tariffs are not applied, dispatch is necessary at the frontiers between West and East European states.

3.11 **AICCF** (mixed organisation, see no. 2.7).

4. Rules of the European Union in the sphere of railway policy

4.1 **Treaty of the European Community (EC)**, signed on 25.03.1957, amended by the treaty of the European Union, signed on 07.02.1992. III. Part, Title IV is "The Transport". The EC-treaty is the basis for the rules in railway policy. These rules are valid not only for the railways, but also in the legal relations between them. Legally speaking, they have the same impact as the international conventions.

4.2 **Treaty establishing the European Community for coal and steel (CECA)**, signed the 18.04.1951. It contains special rules for the carriage of coal, iron and steel.

4.3 **Regulations**

- no. 11/60 of 27.06.1960 on elimination of discriminations in the sphere of freights and transport terms.
- no. 1017/68 of 19.07.1968 containing the rules of competition in transports by rail, road and navigation.
- no. 1191/69 of 26.06.1969 on action by member states concerning the obligations inherent in the concept of a public service in transports by rail, road and navigation; amended by Regulation no. 1893/91 of 20.06.1991.
- no. 1192/69 of 26.06.1969 on common rules for the normalisation of accounts of the railway enterprises.
- no. 1107/70 of 04.06.1970 on subsidies in transport by rail, road and navigation, amended by Regulation no. 543/97 of 17.03.1997.
- no. 1108/70 of 04.06.1970 for introduction of an accountancy on the expenses for the infrastructures of rail, road and navigation.
- no. 2598/70 of 18.12.1970 enforcing the Regulation no. 1108/70.
- no. 2830/77 of 12.12.1977 on measures for the establishment of comparability of the accountancy and annual balance of railway enterprises.

- no. 2183/78 of 19.09.1978 settling uniform principles for the cost accounting of railway enterprises.
- no. 2236/95 on community contributions to Trans-European transport networks.

4.4 Decisions

- no. 65/271 of 13.05.1965 on harmonisation of certain rules affecting the competition in transport by rail, road and navigation.
- no. 82/529 of 19.07.1982 on the forming of prices in the international transport of goods by rail.
- no. 83/418 of 25.07.1983 on the independent management of the railway enterprises in the international passenger and luggage transport.
- no. 93/628 of 29.10.1993 establishing a Trans-European network for combined transports.
- no. 1692/96 of 23.07.1996 on the outline plan for the Trans-European transport network.

4.5 Directives

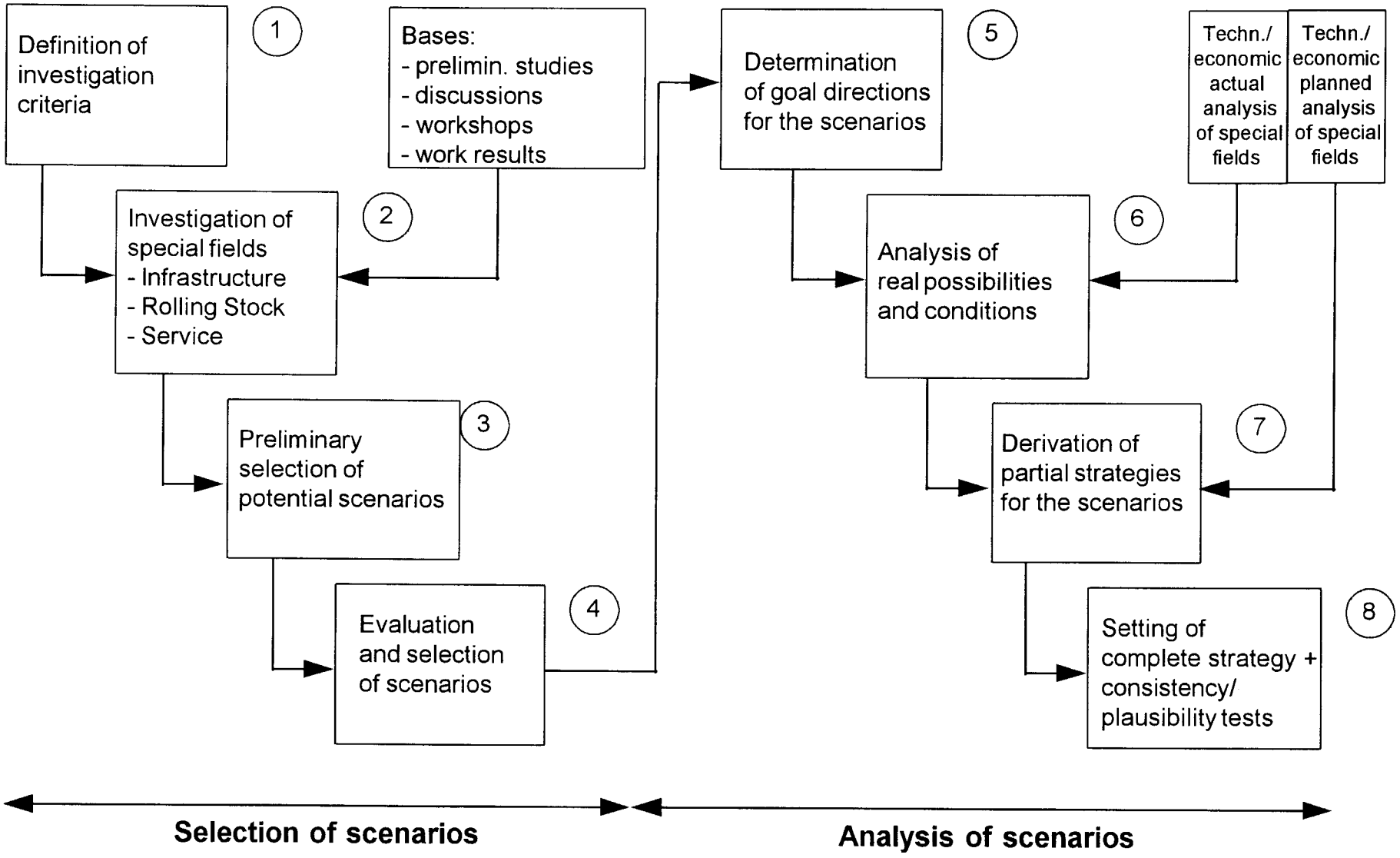
- no. 91/440 of 29.07.1991 on the development of the community railway system.
- no. 95/18 of 19.06.1995 concerning permits to railway enterprises.
- no. 95/19 of 19.06.1995 on the assignment of infrastructure capacity on railways and on the calculation of toll.
- no. 92/106 of 07.12.1992 establishing common rules for certain types of combined carriage of goods between member states.
- no. 96/49 of 23.07.1996 about the railway transport of dangerous goods.

4.6 Resolutions and Recommendations

- no. 1/61 on the publication or the announcement of freight rates and of tariffs for the transport of coal and steel.
- of 07.12.1970 concerning the co-operation between railway enterprises.
- no. 622/81 of 15.12.1981 on the railway policy of the EC.
- no. 82/922 of 17.12.1982 to the national railway enterprises on the agreement of a system for the high-quality service in the international passenger transport.
- no. 84/646 of 19.12.1984 to the national railway enterprises of the member states on the reinforcement of the co-operation in the international transport of passengers and luggage.
- of 17.12.1990 concerning the development of a European high speed rail network.
- no. 95/C169/01 of 19.06.1995 about the development of the rail transport and of the combined transport.

Annex 6.4-1

Procedure model for the evaluation and selection of scenarios



Evaluation of potential scenarios
- Armenia -

	Potential scenarios	Development and Demand Indices												Result
		Macroeconomic and transport				Financial				Technical and technological				
		Forecast	Final Rec.	Experts	Total	Forecast	Final Rec.	Experts	Total	Forecast	Final Rec.	Experts	Total	
1.	**Infrastructure**													
1.1	Production of spare parts for the superstructure	O	O	O	O	O	O	O	O	O	O	O	O	O
1.2	Sleeper plant	++	++	++	++	++	++	++	++	++	++	++	++	++
1.3	Telecommunication	++	++	++	++	+	++	+	+	++	++	++	++	++
1.4	Signal equipment	+	++	+	+	O	O	O	O	+	+	+	+	+
1.5	Repare and maintenance services for side activities of the railway	O	O	O	O	+	+	+	+	+	+	+	+	+
2.	**Rolling stock / work shop**													
2.1	Production of spare parts for transport facilities	O	+	+	+	O	+	O	O	O	O	O	O	O
2.2	Maintenance and reconstruction of electric locomotives	O	O	O	O	+	+	+	+	+	+	+	+	+
2.3	Maintenance and reconstruction of Diesel-locomotives	O	O	O	O	O	O	O	O	+	+	+	+	O
2.4	Repare of wagons and tank wagons	O	O	O	O	O	+	O	O	+	+	+	+	O
2.5	Cleaning of tank wagons, freight wagons and passenger trains	-	-	-	-	-	-	-	-	-	-	-	-	-
2.6	Production of special wagons	-	-	-	-	-	-	-	-	-	-	-	-	-

Evaluation of potential scenarios
- Armenia -

	Potential scenarios	Development and Demand Indices												Result
		Macroeconomic and transport				Financial				Technical and technological				
		Forecast	Final Rec.	Experts	Total	Forecast	Final Rec.	Experts	Total	Forecast	Final Rec.	Experts	Total	
3.	**Service**													
3.1	Sales/Marketing of multimodal and combined transport in the field of container traffic on main lines	++	++	++	++	++	++	++	++	++	++	++	++	++
3.2	Sales/Marketing of multimodal and combined transport in the field of parcel freight traffic on main lines	+	+	+	+	+	+	+	+	++	++	++	++	+
3.3	Sales/Marketing of multimodal transports for oil products	-	-	-	-	-	-	-	-	-	-	-	-	-
3.4	Sales/Marketing of services for passenger traffic (long distance traffic and urban traffic in industrial centres)	+	+	+	+	-	-	-	-	O	O	O	O	O
3.5	Marketing for other transport services and extension of the service offer of the railways	+	+	+	+	++	+	++	++	+	+	++	+	+
3.6	Development and sales/marketing of information technologies (for inst. process automatisation, information systems)	++	++	++	++	O	O	O	O	++	++	++	++	+
3.7	Leasing of wagons, tank wagons , special wagons (for inst. refrigerator wagons) and containers	O	O	O	O	+	O	+	+	+	O	+	+	+
3.8	Leasing of communication services	+	+	+	+	+	+	+	+	+	+	+	+	+

++ short-term necessary (1st priority)
+ medium-term necessary (2nd priority)
O short- and medium-term non-necessary
- not or hardly necessary

Evaluation of potential scenarios
- Azerbaijan -

	Potential scenarios	Development and Demand Indices												
		Macroeconomic and transport				Financial				Technical and technological				
		Forecast	Final Rec.	Experts	Total	Forecast	Final Rec.	Experts	Total	Forecast	Final Rec.	Experts	Total	Result
1.	**Infrastructure**													
1.1	Production of spare parts for the superstructure	+	+	+	+	+	+	+	+	O	O	O	O	+
1.2	Sleeper plant	++	++	++	++	++	++	++	++	++	++	++	++	++
1.3	Telecommunication	++	++	++	++	++	++	++	++	++	++	++	++	++
1.4	Signal equipment	+	++	+	+	O	O	O	O	+	+	+	+	+
1.5	Repare and maintenance services for side activities of the railway	O	O	O	O	+	+	+	+	+	+	+	+	+
2.	**Rolling stock / work shop**													
2.1	Production of spare parts for transport facilities	+	+	+	+	+	+	+	+	O	O	O	O	+
2.2	Maintenance and reconstruction of electric locomotives	++	++	++	++	+	++	+	+	++	++	++	++	++
2.3	Maintenance and reconstruction of Diesel-locomotives	O	O	O	O	O	O	O	O	+	+	+	+	O
2.4	Repare of wagons and tank wagons	O	O	O	O	O	+	O	O	+	+	+	+	O
2.5	Cleaning of tank wagons, freight wagons and passenger trains	++	++	++	++	++	+	+	+	+	+	+	+	+
2.6	Production of special wagons	+	+	+	+	O	O	O	O	+	+	+	+	+

Evaluation of potential scenarios
- Azerbaijan -

	Potential scenarios	Development and Demand Indices												
		Macroeconomic and transport				Financial				Technical and technological				
		Forecast	Final Rec.	Experts	Total	Forecast	Final Rec.	Experts	Total	Forecast	Final Rec.	Experts	Total	Result
3.	**Service**													
3.1	Sales/Marketing of multimodal and combined transport in the field of container traffic on main lines	++	++	++	++	++	++	++	++	++	++	++	++	++
3.2	Sales/Marketing of multimodal and combined transport in the field of parcel freight traffic on main lines	+	+	++	+	+	+	+	+	++	++	++	++	+
3.3	Sales/Marketing of multimodal transports for oil products	++	++	++	++	+	+	+	+	++	++	++	++	++
3.4	Sales/Marketing of services for passenger traffic (long distance traffic and urban traffic in industrial centres)	+	+	+	+	-	-	-	-	O	O	O	O	O
3.5	Marketing for other transport services and extension of the service offer of the railways	+	+	+	+	++	+	++	++	+	+	++	+	+
3.6	Development and sales/marketing of information technologies (for inst. process automatisation, information systems)	++	++	++	++	O	O	O	O	++	++	++	++	+
3.7	Leasing of wagons, tank wagons , special wagons (for inst. refrigerator wagons) and containers	+	+	+	+	O	+	O	O	++	++	++	++	+
3.8	Leasing of communication services	+	+	+	+	+	+	+	+	+	+	+	+	+

++ short-term necessary (1st priority)
+ medium-term necessary (2nd priority)
O short- and medium-term non-necessary
- not or hardly necessary

Evaluation of potential scenarios
- Georgia -

Nr.	Potential scenarios	Development and Demand Indices												
		Macroeconomic and transport				Financial				Technical and technological				
		Forecast	Final Rec.	Experts	Total	Forecast	Final Rec.	Experts	Total	Forecast	Final Rec.	Experts	Total	Result
1.	**Infrastructure**													
1.1	Production of spare parts for the superstructure	+	+	+	+	+	+	+	+	O	O	O	O	+
1.2	Sleeper plant	++	++	++	++	++	++	++	++	++	++	++	++	++
1.3	Telecommunication	++	++	++	++	++	++	++	++	++	++	++	++	++
1.4	Signal equipment	+	++	+	+	O	O	O	O	+	+	+	+	+
1.5	Repare and maintenance services for side activities of the railway	O	O	O	O	+	+	+	+	+	+	+	+	+
2.	**Rolling stock / work shop**													
2.1	Production of spare parts for transport facilities	+	+	+	+	+	+	+	+	O	O	O	O	+
2.2	Maintenance and reconstruction of electric locomotives	++	++	++	++	+	++	+	+	++	++	++	++	++
2.3	Maintenance and reconstruction of Diesel-locomotives	O	O	O	O	O	O	O	O	+	+	+	+	O
2.4	Repare of wagons and tank wagons	O	O	O	O	O	+	O	O	+	+	+	+	O
2.5	Cleaning of tank wagons, freight wagons and passenger trains	++	++	++	++	++	+	+	+	+	+	+	+	+
2.6	Production of special wagons	+	+	+	+	O	O	O	O	+	+	+	+	+

Evaluation of potential scenarios
- Georgia -

Nr.	Potential scenarios	Development and Demand Indices												Result
		Macroeconomic and transport				Financial				Technical and technological				
		Forecast	Final Rec.	Experts	Total	Forecast	Final Rec.	Experts	Total	Forecast	Final Rec.	Experts	Total	
3.	**Service**													
3.1	Sales/Marketing of multimodal and combined transport in the field of container traffic on main lines	++	++	++	++	++	++	++	++	++	++	++	++	++
3.2	Sales/Marketing of multimodal and combined transport in the field of parcel freight traffic on main lines	+	+	++	+	+	+	+	+	++	++	++	++	+
3.3	Sales/Marketing of multimodal transports for oil products	++	++	++	++	+	+	+	+	++	++	++	++	++
3.4	Sales/Marketing of services for passenger traffic (long distance traffic and urban traffic in industrial centres)	+	+	+	+	+	+	+	+	O	O	O	O	+
3.5	Marketing for other transport services and extension of the service offer of the railways	+	+	+	+	++	+	++	++	+	+	++	+	+
3.6	Development and sales/marketing of information technologies (for inst. process automatisation, information systems)	++	++	++	++	O	O	O	O	++	++	++	++	+
3.7	Leasing of wagons, tank wagons , special wagons (for inst. refrigerator wagons) and containers	+	+	+	+	O	+	O	O	++	++	++	++	+
3.8	Leasing of communication services	+	+	+	+	+	+	+	+	+	+	+	+	+

++ short-term necessary (1st priority)
+ medium-term necessary (2nd priority)
O short- and medium-term non-necessary
- not or hardly necessary

Annex 6.4-3

Investigation criteria for the selection of the proper enterprise form

		Limited liability company	Share holder company,open	Share holder company, closed	Company of nominal and dormant partners	Consortium
1	**Legal and juridical aspects**					
1.1	Juridical state	X	X	X	X	X
1.2	Autorised capital (kind, amount,restrictions)	monetary contribution and contribution in form of commodities, preset minimum for the authorised fund				--
1.3	Securities (guaranties etc.)	possible	possible	possible	possible	possible
1.4	Registration of enterprise	simple	expensive	expensive	simple	simple
1.5	Joint-Venture-adjustability	X	X	X	X	--
1.6	Securities for investors	foreign investments which are registrated, are principally protected				
1.7	Liability	in the value of the authorised fund	in the value of the authorised fund	in the value of the authorised fund	full responsibility or legal responsibility up to the value of shares	in agreed value
2	**Economic/taxation aspects**					
2.1	Joint-Venture-feasibility	X	X	X	X	--
2.2	Financial possibilities	given	given	given	given	low
2.3	Taxation load (kind, amount)	identical	identical	identical	identical	identical
2.4	Taxation of foreign credits	taxfree	taxfree	taxfree	taxfree	taxfree
2.5	Tax payment obligations (kind, amount)	nearly identical	nearly identical	nearly identical	nearly identical	nearly identical
2.6	National/international subsidies	--	--	--	--	--
2.7	Society acceptance	good	good	good	little known	little known
3	**Financial and technical aspects**					
3.1	Registration of foreign investments	possible	possible	possible	possible	possible
3.2	Currency stability	given	given	given	given	given
3.3	Convertibility of currency	given	given	given	given	given

Cross dependencies between partial strategies

	Partial strategy	Enterprise goals	Short and medium terms	Long terms	Tasks of enterprise	Operative	Strategic	Form of enterprise	Type	Participants	Financing	Internal funds	Borrowed capital	Organisation	Organisation of creation	Procedure organisation	EDP-Organisation
1	**Enterprise goals**																
1.1	Short and medium terms									X							
1.2	Long terms									X		X	X				
2	**Tasks of enterprise**																
2.1	Operative		X												X	X	X
2.2	Strategic			X					X	X		X	X				
3	**Form of enterprise**																
3.1	Type			X			X			X			X		X		
3.2	Participants			X			X		X			X	X				
4	**Financing**																
4.1	Internal funds								X	X							
4.2	Borrowed capital											X					
5	**Organisation**																
5.1	Organisation of creation		X	X		X	X		X								
5.2	Procedure organisation		X			X	X								X		X
5.3	EDP-Organisation		X			X	X								X	X	

Annex 6.5-1

Analysis of possible locations for prestressed concrete sleeper plants

1 General

The Caucasian railways purchased all rail materials such as rails, sleepers and rail fasteners for the rehabilitation of tracks and switches as well as for the scheduled track maintenance from central production facilities in Russia. The procedure was uncomplicated: the annual demand was registered and then checked in Moscow and delivered in time, with or without deductions. The consequence of this system was that the Caucasian railways did not have their own manufacture. Following the collapse of the Soviet Union, this source of supply was interrupted abruptly, which meant that there was not material for track rehabilitation or scheduled maintenance. This condition has prevailed for ten years now. The result is a dilapidated track network in all areas.

The rehabilitation of the track network and its restoration at a technically necessary level requires a great expenditure, which is to be reduced by creating own production plants and using own resources. The production of prestressed sleepers takes first rank as a mass product of track rehabilitation. It is the unequivocal effort of all railways and administrations to set up this production in the Caucasus.

2 Location

All railways involved are interested in a prestressed sleeper plant being set up. The supply area for the delivery of prestressed concrete sleepers is divided up into the Western and Eastern regions. The border between the Western and Eastern regions is to be fluid and overlap, roughly along the border between Azerbaijan and Georgia. The Western region comprises Armenia and Georgia and the Eastern region would comprise Azerbaijan and the northern neighbouring states. This cuts down the transportation distances and production is distributed between two plants supplementing one another. Thus, investigations were carried out to settle the issue of location according to the following criteria:

- geographical location as regards the supply area,
- rail and road access,
- use of existing concrete plants or production facilities,
- power supply,
- transport of aggregate, rail or road,
- water supply for concrete production,
- own quarry for aggregate gravel, sand,

2.1 Armenia

A privately run concrete plant in the city of Yerevan was inspected, which more or less meets all the above defined conditions. The plant is working at about 10% of its capacity at the moment and produces concrete slabs and other structural components as prefabricated parts. Reference was made to their experience of prestressed concrete parts e.g. prefabricated roof trusses. There is a disadvantage in that all aggregate has to be collected from a basalt plant 15 kilometres away. At the moment, the transport is being conducted by road, crossing the city from the basalt plant to the concrete plant, with all the disadvantages of a growing city traffic. A rail connection is available which is not being used at the moment, as this means of transport is too unreliable and difficult at present. The rail connection to the plant is not electrified and can only be serviced by diesel locomotives. The rail connection would have to be developed for the transhipment of concrete sleepers, storage areas would have to be built and be serviced by a crane. The geographical location is very unfavourable and lies at the southernmost point of the entire region to be supplied (peripheral location).

Concrete plant in Charentsavan

There is another possible location in Charentsavan, a plant producing concrete slabs. It is located at the Yerevan - Razdan line and is thus even more unfavourable geographically for the total supply area than the above mentioned city plant. This concrete plant is a public limited company called ARMAVATO, which is 100% privately owned. The current product variety comprises:

- production of industrial trucks, forklift trucks, repair of wheel-sets for locomotives, production of rail fastenings
- Armenian investigations of the business suggest the conclusion that the technology and production of prestressed concrete sleepers and the respective component groups can be introduced and organised by the plant itself.
- Good links to the road and rail networks, adequate numbers of siding tracks permit the supply of raw materials and the shipment of the finished products.
- Sand and gravel pits as well as an efficient cement plant are located in the vicinity, at Razdan.

The company assures in a letter dated August 1997 that they have all the necessary prerequisites for a sleeper production according to European standards. The company is planning to start a concrete sleeper production and is currently negotiating with large German and Dutch manufacturers on the production of prestressed concrete sleepers. ARM has guaranteed the company to accept 100,000 sleepers per year for the next five years.

2.2 Azerbaijan

Concrete plant for bridge and tunnel construction

The plant is located in the city area of Baku, with a direct rail link to the close freight station of Kishli. Production at this plant was ceased years ago due to lack of demand. Once production was stopped, the continuous maintenance and care of the buildings and machines was terminated, too, due to a lack of finance. The neglect as to maintenance and care becomes evident in the dilapidated condition of all equipment. Re-starting the production of concrete structural components or even the new introduction of a prestressed concrete sleeper production would not be feasible. All equipment would have to be repaired and renewed comprehensively, which would by far exceed the cost of setting up a new production plant for prestressed concrete sleepers. The aggregate would have to be supplied over great distances. This plant does not represent an option for a prestressed concrete sleeper production, which is also the opinion of the AGZD.

Plant for reinforced concrete products and structural elements

This plant is located in the city area of Baku, with a rail link to the freight station of Kishli. At the moment, the plant does not produce prefabricated concrete components. However, the plant is well preserved and maintained and can be restarted at a justifiable expense. There are storage areas fitted with cranes offering the possibility of loading the concrete sleepers onto railway wagons. One manufacturing hall would have to be renovated and partly restructured for the sleeper production.
Power and water supply are available. The cement silos and concrete mixing plant would have to be replaced. The aggregate is delivered by rail and has to be free of impurities, as there is no cleaning or rinsing installation for aggregate at the plant. Here, too, there was agreement not to assess this as a location of concrete sleeper production.

Dollyar - building materials plant

This plant is located 380 km west of Baku, immediately at the main line Baku - Beyuk Kyassik, directly linked to Dollyar Station. The geographical location with regard to the Eastern region of supply may be regarded as central. This central location is even more favourable as the rail link to the main line is secured from the point of signalling, and operation is possible. Shunting tracks within the plant make a train formation possible and thus render transfer journeys to and from AGZD shunting facilities superfluous. The shunting and train formation tasks are taken over by the two own shunting locomotives. The main venue for the manufacture of concrete components consists of 7 halls with the following dimensions:

- Length / width / height = 144 m / 18 m / 12 m

The row of columns is fitted with consoles for the crane track. The bridge crane and other installations have to be replaced, the same is true for the concrete mixing

plant. Cement silos and stores for the aggregate may also be used in the future. Power supply is secured. The transformer station, the rinsing installation, the pumping station, conveyor installations and other equipment necessary for the manufacture of prestressed concrete sleepers have to be checked and brought up to the required standards. There is a granodiorite quarry some 14 kilometres to the south, belonging to the plant. This quarry delivers the required rock material, which is fed to the plant owned breaker installation by road. This installation breaks the rock into four fractions:

- 0 - 5 mm
- 5 - 10 mm
- 10 - 20 mm
- 20 - 40 mm

All screenings are cleaned in the rinsing installation. This secures that no impurities impair the quality of the concrete in the various grain sizes. The rinsing works through a ring system. The soiled water is fed into a sedimentation tank, cleaned of any impurities there and then fed back into the rinsing process. Any water loss is compensated by feeding fresh water. The fresh water is taken from the nine plant owned wells. Just as in all plants, production has come to a standstill due to lack of demand. The main part of production is the manufacture of spun concrete pipes of 80 - 120 cm in diameter and 5 m in length. The production of these pipes requires a high degree of know-how on concrete technology and manufacturing techniques. The plant normally works with 250 staff, and currently employs 158, including the quarry.

The building materials plant is very well suited for the production of prestressed concrete sleepers because

- the geographical location to the supply area is ideal,
- the existing technical installations can be prepared for sleeper production with a justifiable effort,
- one of the available halls is large enough for a manufacturing line to start sleeper production
- there is a storage area serviced by a crane and
- experienced staff is available.

AGZD has approved of this location.

2.3 Georgia

Zentrolit PLC Tbilisi

Zentrolit PLC Tbilisi is located on the outskirts of Tbilisi. This is a disused smelting plant with various branches of production. The main emphasis of production was on the manufacture of steel products. One of the halls served the production of hollow blocks. This hall has the following dimensions:

- Length / width / height = 150 m / 24 m / 20 m

The working platform for the manufacture of fresh concrete is located at a height of 12 m. The production of hollow blocks was discontinued seven years ago. Since that point in time, there has been no scheduled maintenance or care of the disused technical equipment. Thus the condition of the entire installation renders it useless for any further production. The existing rail link is not operational in its current condition and has to be replaced and supplemented by additional shunting tracks. The aggregate is transported from Western Georgia, over a distance of 200 km, by road and rail. The small aggregate is supplied by the Gardabani basalt works, some 50 km east of Tbilisi. The aggregate is cleaned by the rinsing installations of the suppliers. The cement of Z 420 grade is provided by local production from Rustavi and Kaspi, some 30 to 50 km away, also by road and rail transport. Prestressing steel was not required for the production of hollow blocks.
Even though this plant is centrally located, it is not short listed for the production of concrete sleepers, as the expenses for refurbishing the production shop, the technical installations, both external and internal, would exceed the cost of a new plant.

Visotstroi Panel Frame Plant PLC in Sagess

The plant is located some 20 km west of Tbilisi with a rail link to Sagess Station. There is also a road access. The plant is dimensioned for 100,000 cubic metres of prefabricated concrete panels and, furthermore, the plant delivers ready-mixed concrete and mortar mixes for construction work. Annual production is dimensioned at 150,000 cubic metres. The transport link is so efficient that 425,000 tons of raw materials (gravel, sand and cement) can be delivered to the plant. This transport is conducted both by road and rail. According to the above mentioned production volumes and material turnover, the plant is equipped with:

- main building, consisting of four halls of 2,460 m^2 each for the manufacture of reinforced concrete components. Every hall has got two bridge cranes, a vibrator platform and steam treatment chambers.
- complete concrete mixing plant from which the production halls are supplied with fresh concrete.
- Reinforcement hall, where reinforcement for the various finished products is manufactured.
- cement store, consisting of silos with a storage volume of altogether 3,500 t, situated at the rail link and connected with the concrete mixing plant.
- store for aggregate, divided up into five separate grain sizes which are fed automatically. The storage capacity per grain size is 800 m^3.
- Store for prefabricated components serviced by a crane with transhipment possibilities for road and rail transport.
- Workshops for the internal manufacture and repairs
- plant laboratories for testing aggregate, cement and strength of prefabricated concrete products.
- boiler plant for the steam demand, fuelled by natural gas or oil.
- administrative building with social facilities
- secured power supply by the Sagess power substation.

The Sages plant just as the Dollyar plant is among the most suitable for the manufacture of prestressed concrete sleepers. The Sagess location is ideal for the Western supply area. The necessary transport of aggregate from Western Georgia is a disadvantage, as there are high transportation costs over the distance of 200 km. Furthermore, it has to be established how the operating costs of the entire plant are distributed, if only prestressed concrete sleepers are to be produced in this large plant. It is only one of the four halls which is required for sleeper production. However, if only one of the halls is being used, the operating expense of the entire plant has to be paid. These would then have to be added to the only production, that of concrete sleepers, as fixed costs. The above mentioned points should be considered in selecting a location for the production of prestressed concrete sleepers.

GRZD owned quarry

GRZD has got a quarry of its own some 50 km south of Tbilisi, with an attached gravel works. The distance to AGZD is 70 km and to ARM it is 60 km, which is a central location for the Western supply area. This plant is situated on the Tbilisi - Yerevan line with a well developed rail link. The connecting Zshradsma Station takes over shunting tasks for the plant as well as the operation of the rail link. By road the plant is only accessible via a unpaved road from the Tbilisi - Yerevan main road. The quarry is some 6 km away and at the moment it is only accessible via the road mentioned above. The delivery of broken rock is thus conducted with road vehicles. This delivery is quite cost-intensive. The connection of the quarry by rail is already in planning and is to be implemented when setting up a concrete sleeper plant.

GRZD owned plant for prefabrictaed concrete components " Dorstroi"

The Dorstroi construction trust, which belongs to GRZD, operates a plant for prefabrictaed concrete components on the eastern outskirts of Tbilisi. At the moment, this plant is primarily producing concrete slabs, parts for foundations and other large-format concrete components with and without reinforcement. The plant is situated right beside the GRZD main line of Tbilisi - Gardabani - Baku (AGZD) and is linked to Tbilisi-Sortirovotshnaya station via an own siding track.
The supply of gravel and sand is mainly conducted by rail, with the help of self-dischargers or tip-up wagons, from the above mentioned GRZD quarry and gravel plant near Marneuli/Zshradsma or from Kaspi, situated between Tbilisi and Gori to the west. The power supply is provided by the GRZD's electric network and can be thus assessed as secured. Cement silos and storage areas for aggregate of the most varied grain sizes are available.
There is a nearly completed production hall, dating from extension work started but never finished, with the dimensions of length / width / height = 78 x 18 x 12 m. This hall is fitted with two bridge crane, in need of repair, of 16 t load-bearing capacity each. The construction of a second hall of the same dimensions has been prepared right beside the first one. In front of this entire complex, there is a roofed storage area fitted with cranes, which has neither been quite completed. The running

production of prefabricated concrete parts, including the own manufacture of welded wire mesh, is conducted in separate workshops, in the immediate vicinity of this hall complex. The plant features a steam supply and testing equipment for its products.
The advantages of the Dorstroi location are:

- there is experienced staff available thanks to the running production of high-quality concrete parts,
- as the plant is part of the GRZD, there is the possibility of arranging an especially reasonably priced supply of raw materials. There are discounts on the official tariffs for transports destined for the railways, both within the country as well as using the rail networks of other CIS railways.

Even though the local conditions of the Visotstroi plant in Sagess and the Dorstroi plant are more or less comparable, the transport advantage leads to a preference of the Dorstroi plant for setting up a prestressed concrete sleeper production. GRZD also favours this location.

2.4 Summary

Two prestressed concrete sleeper plants are to be set up for the entire supply area. The reasons for this are the efficiency of operation with two smaller plants and the minimisation of transportation costs for the finished product. Thus, two supply areas were included in the investigation of a future location. In line with this approach, two locations for the future production of prestressed concrete sleepers had to be identified. They are :

- Dorstroi plant for the Western supply area and
- Dollyar concrete plant for the Eastern supply area.

3 Sleeper demand as a calculation basis for the sleeper plants

The estimate for the future medium and long-term concrete sleeper production is based on the following volumes:

- backlog of track rehabilitation along the Baku - Tbilisi - Poti and Yerevan - Tbilisi lines with subsequent transition to a scheduled track rehabilitation for the Western and Eastern supply areas
- backlog of track rehabilitation on other lines with subsequent transition to a scheduled track rehabilitation for the Western and Eastern supply areas.

The overall backlog of track rehabilitation is 1,814 km related to the main lines of the Caucasian railways. A total construction performance of:

- for ARM = 50 km per year
- for AGZD = 150 km per year
- for GRZD = 120 km per year

results in **320 km per year**. Given this possible rehabilitation performance, the backlog of track rehabilitation will have been caught up in about 6 years. After this period of time, the scheduled track rehabilitation will start, which will be adjusted to technical necessities. This will total **275 km per year** for all railways.

4 Medium-term and long-term annual sleeper production

The requirements have been established according to the maximum rehabilitation performance per year of all railways, based on the annual demand. This annual demand is the basis for determining the annual sleeper production and for dimensioning the sleeper plants. The calculations are based on the backlog on all lines operated with subsequent scheduled maintenance.

According to these results, the annual requirements are established. With the introduction of the B70 prestressed concrete sleeper with W-fastening as the future superstructure construction, there is the possibility of increasing the sleeper spacing from a current 0.54 m = 1,840 sleepers/km to 0.60 = 1,667 sleepers/km. The railways involved have agreed and will adapt the sleeper spacing in their own regulations to the standards common in Europe, with the introduction of the B 70 W sleeper. The sleeper demand per km is then reduced by 173 sleepers.

Table of sleeper demand for the Western and Eastern supply areas.

Railway administration	Sleeper demand				
	n	n + 1	n + 2	n + 3	n + 4 + ff.
ARM	83,350	83,350	83,350	83,350	75,015
AGZD	250,050	250,050	250,050	250,050	250,050
GRZD	200,040	200,040	200,040	200,040	133,360
Total	533,440	533,440	533,440	533,440	458,425

(n = year of start of rehabilitation)

The peak demand of 533,440 sleepers per year will have been provided for within four years. During the 15 following years, a long-term demand of 458,425 will develop, in so far as no new supply areas are added.

5 Dimensioning the sleeper plant

Proposal A

- maximum rehabilitation performance of all three railways = **320 km per year**
- sleeper demand for this: **1,667 x 320 = 533,440** sleepers per year
- this demand will be required for **5 years** (rounded up)
- then there will be the scheduled track rehabilitation over the next **15 years** with **275 km per year x 1,667 = 458,425** sleepers per year.

Proposal B

- this reduces only the period of the maximum rehabilitation performance of 320 km per year from 5 years to **3.5 years**.
- the following scheduled track rehabilitation will increase, however, over the next **15 years** to **298 km per year**, which is **300 km per year** rounded up, resulting in a sleeper demand of **300 x 1,667 = 500,100** sleepers per year.

The plants will be dimensioned for a production of **400 sleepers per shift**. The production will be implemented with **250 working days in a two-shift operation**. Based on proposal B, the demand is covered as follows:

- demand: 533,440 / 500,100 sleepers per year
- production: 400 sleepers per day x 250 days x 2 shifts x 2 plants = approx. 400,000 sleepers per year.

By increasing the number of working days and/or by temporary three-shift operation the yearly demand can be met.

6 Bottle-necks for the own production of prestressed concrete sleepers

High demands are posed on the cement and prestressing steel used for the production of prestressed concrete sleepers. According to the investigations, presently the Caucasian countries are neither able to produce the cement in the necessary quality of Z 45 and Z 55 according to DIN 1164, nor the prestressing steel rods of ST 1325 / 1470 N / mm^2, profiled with a nominal diameter of 9.5 mm. There is a further bottle-neck in the manufacture of the W-rail fastenings. This type of fastening is produced by the Vossloh Rail Systems GmbH company. The company has patented the production of these fastenings and enjoy utility model protection. The sleeper producers for the DB AG, Federal Republic of Germany, are supplied these fastenings from this company.

Investigations and negotiations with the managers of the Caucasian railway administrations on the possibilities of producing cement and steel have resulted in the following:

6.1 Armenia

Armenia has got a cement production of its own. The cement was used by the concrete producing industry located in Yerevan for the manufacture of prestressed concrete components. It should be verified whether this cement meets the requirements of the Z 45 and Z 55 grades. A profile of requirements has been handed over. Results and an analysis of the cement have not yet been tabled.

Armenia's steel industry delivers all types of concrete steel, also for prestressed concrete components (roof truss). The required steel, as detailed above, cannot be

manufactured at the moment. Here, too, we still await investigation results whether it is possible to manufacture the prestressing steel type 1375 / 1470 N /mm^2.

6.2 Azerbaijan

Azerbaijan has got its own cement industry in Baku. However, the cement produced there cannot be assessed as high-grade. There would have to be additional adjustments made in the plant for the production of the required cement for the prestressed concrete components. Details have not yet been provided on steps introduced so far or pertaining possibilities.

Investigations are being undertaken for the production of prestressing steel.

6.3 Georgia

The manufacture of the required cement is not possible in Georgia at present. The maximum cement grade of the Portland cement produced in the country is M - 450 - 550, Russian standards. This cement contains less than 0.6% alkaline oxides. The production is expensive and results in a monthly output of 1,000 t. Regardless of the good experience in the manufacture of high-grade cement, the production had to be terminated due to a disruption in the gas and materials supply from Russia. In an expert's report drawn up by the Technical University of Georgia, the possibility of cement manufacture of the required grade is confirmed for the cement plant of Rustavi. The prerequisites for the manufacture of this cement were established through a research project at the Technical University. The cost would amount to some US$ 150,000.

The steel works of Rustavi has agreed to check the possibilities of prestressed steel production. There has not been a result yet. The prestressing steel would have to be imported from Europe until the own manufacture of prestressing steel has been settled.

7 Rail fastenings

As mentioned at the beginning, the W-fastening produced by the Vossloh company is protected by a patent and may be produced only with a license. The own production, however, would require the procurement of a production line, which costs some US$ 7,000,000, according to the Vossloh company. The source materials (steel) for this fastening would have to be imported, until an indigenous production of special steel is possible. According to the company, such a plant would only reach profitability once 1,600,000 fastening packages are produced and ordered per year. This limit is exceeded slightly according to the long-term forecast of sleeper demand for the entire Caucasus region (533,440 sleepers = 2,133,600 fastenings packages).

Annex

Equipment for Prestressed concrete sleeper plant

	Piece	Appliance
1		**Preparation of concrete**
	1	concrete mixing 1500 l
	1	scraper
	1	steel construction
	1	star of prefabricated concrete parts
	2	cement silos
2		**Concrete equipment**
	8	vibrator with steel construction
	18	electrical vibrator with rotary frequency converter
	4	sound insulation construction
	2	concrete distributor
	2	discharging hopper with conveying belt
	2	demoulding with elevating equipment
	2	extraction of core - bars
	2	gantry crane 3.2 t carrying power, 4 m hoisting height, 9 m gauge
	2	revolving device
	2	fresh concrete calibre
	2	oil pressure tank
	2	cleaning apparatus
	2	pneumatic pressure screwdriver
3		**Mould equipment**
	4	multiple moulds complete
		spare parts
4		**Green sleeper storage**
		shelves for 1200 green sleepers
	1500	dummy sheets
	2	gantry crane, 4 t carrying power, 4 m hoisting height, 20 m gauge
	1	combined loading equipment

5		**Conveyor line assembly**
	1	sleeper car with elevation equipment and steel construction 30 m
	1	endless chain transporter with accumulating conveyor, 27 m
	1	grouting apparatus including mixer
	1	hydraulic injector beam
	1	hydraulic quadruple jacks complete
	1	beam with spring winding device
	1	autoclave
	2	tamping hammer, screwdriver
	1	width gauge
	1	fork lift truck 3 t
6		**Out door equipment**
	1	gantry crane 12 - 15 t carrying power, bearing out both sides 10 m 30 m gauge, hoisting height 16 m
	3	loading equipment for 10, 20 and 30 sleepers
7		**Core - bars manufactory**
	1	cut into lengths equipment
	1	chamfer and roller machine
	1	core - bars bending machine
8		**Additional**
		electric equipment
		small pieces
		quality assurance system
		quality test equipment

Annex 6.5-2

Goal directions of potential participants for the foundation of a sleeper production

	Goals	goal	ARM	GRZD	AGZD	GK PROM	GK AZ-Chimia	TP	BOT
1	Supply of actual demand for sleepers	E T	M	M	M	--	--	--	--
2	Use of modern technologies	T E	M	M	M	C	C	M	M
3	Independence from imports	P E	C	C	C	C	C	--	--
4	Supply mode	P E	M	M	M	C	C	C	C
5	Earning achievment (only to retain equity of production)	E	C	C	C	M	M	M	M
6	Full capacity use	E T	M	M	M	M	M	M	M
7	Reduction of costs	E	M	M	M	--	--	--	--
8	Provision of other national customers	E	--	--	--	C	C	C	C
9	Exports to neighbouring countries	E	--	--	--	C	C	C	C

P - political goal
E - economic goal
T - technological goal

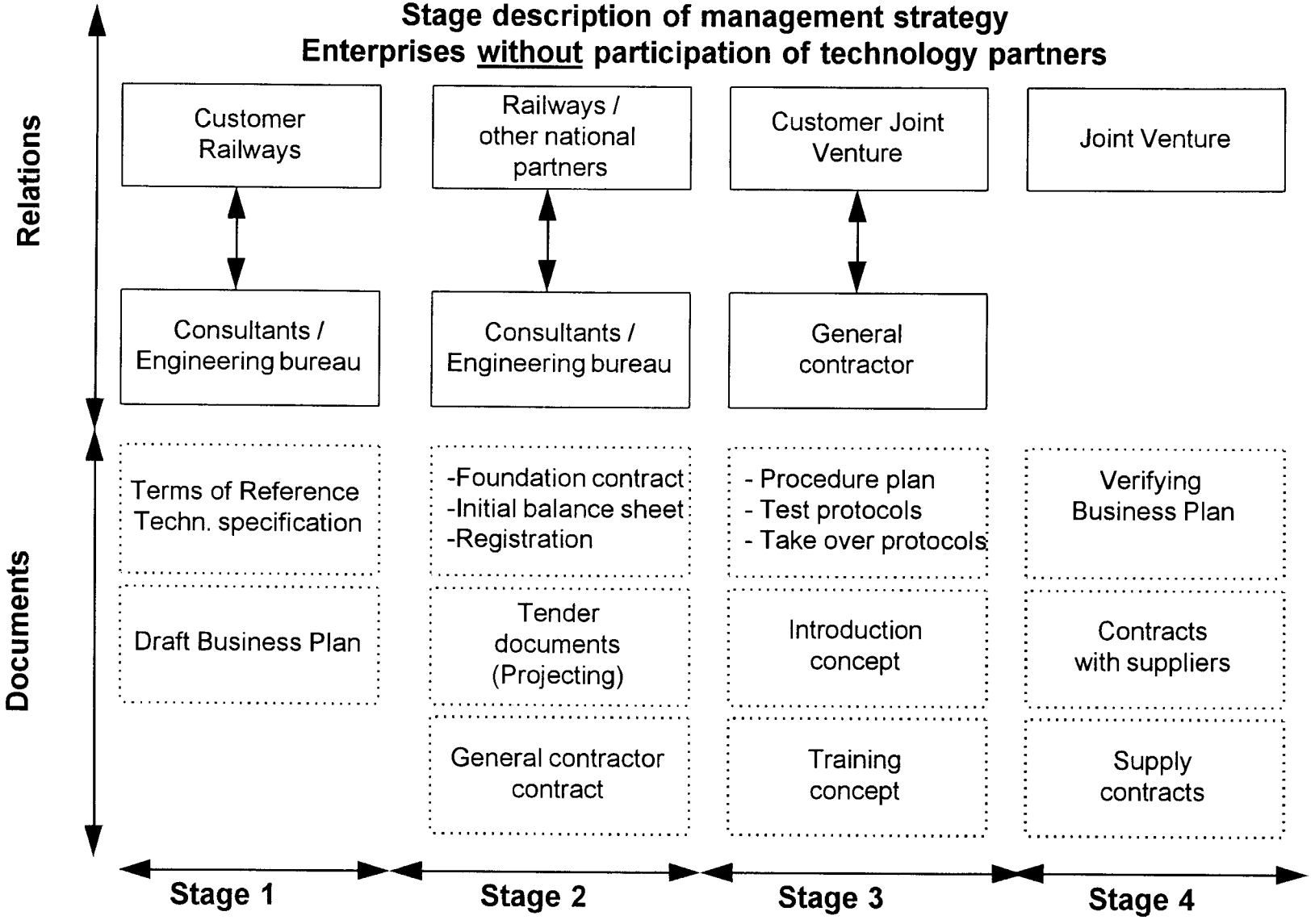
C - Can-goal
M - Must-goal

TP - technology partner
-- - not relevant

GK PROM - national building company in Azerbaijan
GK AZCHIMIA - national chemical plant in Azerbaijan
TP - Technology partner
BOT - Building - Operate - Transfer

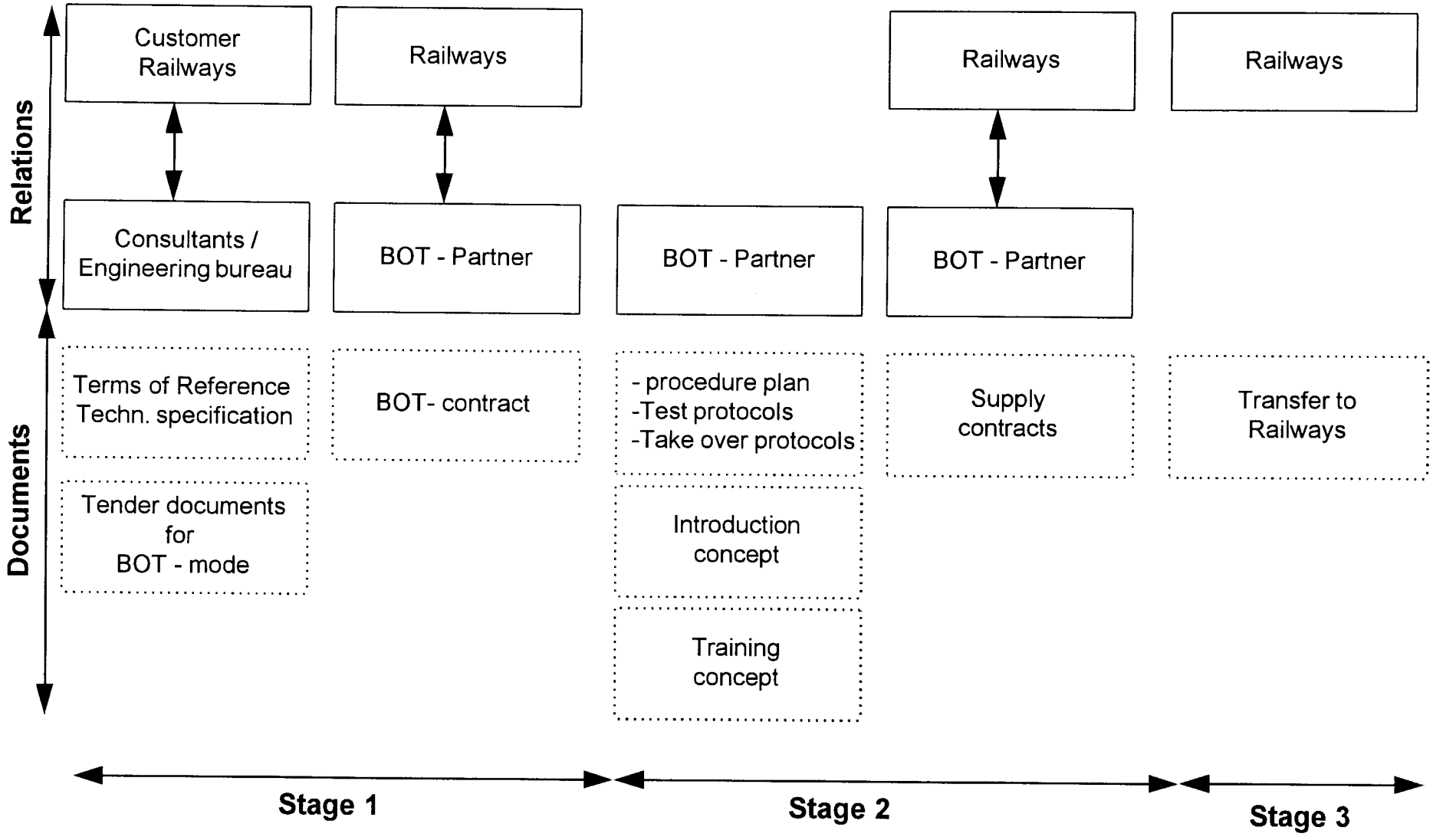
Annex 6.5-3

Stage description of management strategy
Enterprises without participation of technology partners



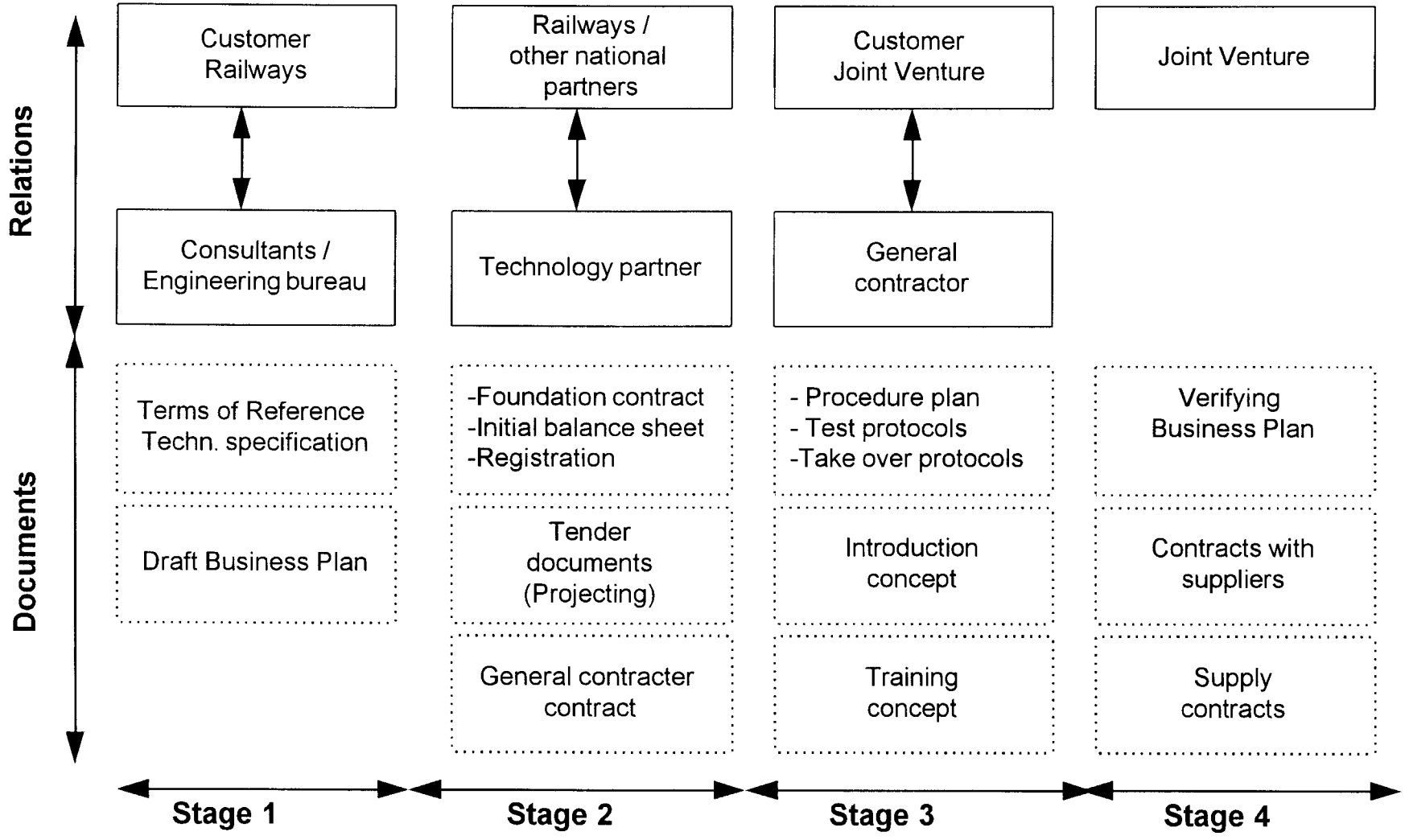
Annex 6.5-4

Stage description of management strategy of BOT - mode



Annex 6.5-5

Stage description of management strategy
Enterprises with partcipation of foreign technology partners



Annex 6.5-6

Minutes of the meetings with the final recipients on the foundation of joint ventures for the Caucasian railways

Minutes of the meeting on the foundation of joint ventures for the Caucasian railways, July 18th 1997, Yerevan

Minutes of the meeting on the foundation of a joint venture for the operation of the Logistic-Express train, July 18th 1997, Yerevan

Minutes of the meeting on the foundation of an Operatiing & Service Multimodal Transport company, Tbilisi, July 18th, 1997

Minutes of the joint meeting of representatives of AGZD and TEWET on the foundation of infrastructural joint ventures, Baku, July 22nd, 1997

Minutes of the meeting on the foundation of an Operating & Service Multimodal Transport company, Baku, July 21st, 1997

Minutes of the joint meeting of representatives of GRZD and TEWET on the foundation of infrastructural joint ventures, Tbilisi, Juli 17, 1997

Minutes

of the meeting
on the foundation of joint ventures
for the Caucasian railways,
July 18th 1997, Yerevan

Participants of the meeting:

Mr. L.G. Akopian	Deputy General Director of ARM, head of operational services
Mr. R.L. Asikian	Deputy General Director of ARM, head of the telecommunication services and the foreign trade department
Mr. Ch. Gleue	Project manager of the TRACECA project "Joint venture(s) for the Caucasian railways"
Mr. J. Schorr	Expert for joint ventures
Mrs. E. Müller	Deputy project manager for Armenia

Theme of the meeting:

During the meeting the following projects for the foundation of joint ventures were discussed:

- Joint venture of organisations using the services of the Trans-Caucasian Logistic-Express
- Joint venture for the production of reinforced concrete sleepers
- Joint venture for the reconstruction and repair of locomotives.

Mr. Akopian informed that the Logistic-Express train will be inaugurated not later as within 3-4 weeks. ARM is interested in a participation in the company for the exploitation of the Logistic-Express, however, it depends on the conditions.

Mr. Akopian made the suggestion to discuss once again the question of the location of the plant for the production of reinforced concrete sleepers. In Armenia there are good preconditions in the stock-company AO ARMAVTO in Charentsavan. He agreed a visit of the plant for the 20th of July 1997.

Mr. Akopian informed, that the ARM is ready to order the capital inspections and the capital repairs from the plant in Tbilisi if the engines will be produced in Armenia.

R.L. Akopian
Deputy
General Director of ARM

E. Müller
Deputy project manager

Minutes

of the meeting
on the foundation of a joint venture
for the operation of the Logistic-Express train,
July 18th 1997, Yerevan

1. The meeting was opened by Mrs. Dr. E. Müller.
   Mrs. Dr. Müller informed the participants of the meeting about the objectives and tasks of the project TACIS/TRACECA „Joint ventures for the Trans-Caucasian railways" and of other TRACECA projects.

2. Report on the foundation of a joint venture for the operation of the „Logistic-express train" Yerevan - Tbilisi - Poti (container train), presented by Mr. J. Schorr

   At the beginning of his presentation Mr. Schorr spoke about the experiences made in Western Europe during the work of companies operating container trains. With regard to the company for the operation of the logistic-express train Yerevan - Tbilisi - Poti he made the suggestion to select the form of a limited partnership. Operating of the container train Poti - Tbilisi - Yerevan will be the object of the activities of the mentioned limited partnership.

   The port of Poti, the Georgian and Armenian railways and one West European firm will be members (main partners).

   Forwarding agencies may participate in this partnership as limited partners (members with limited liability). Mr. Schorr emphasised the advantages for forwarding agencies, especially the question of a joint financing of the starting costs.

   The proposal was made that the head manager of the partnership should be a representative of a West European firm, transferring its know-how in the field of management and marketing.

   During the discussion of the report many questions were asked which were answered by Mr. Schorr.

   After the end of the discussion the representatives of the following firms expressed their interest in the utilisation of the services of the logistic-express and the foundation of the partnership for its operation: Arm Treks, Kavkazskiye liniii, Status, Barvil. The forwarding agency LTT-Armenia restrained itself, the Armenian railways (ARM) declared itself in favour of the logistic-express but against its participation in the partnership for the operation of the train.

3. **Concluding speech of Mr. Dr. Ch. Gleue**
   Mr. Dr. Gleue thanked the participants for the open and informal atmosphere of the meeting and informed that the interested participants will get additional materials about the partnership for the operation of the train.

I attest the correctness of the minutes.

R.L. Akopian
Deputy
General Director of the ARM

E. Müller
Deputy project manager

List of participants

of the meeting on the foundation
of a joint venture for the operation
of the „logistic-express train",
July 18th 1997, Yerevan

1.	Georgij Danielian	Deputy Director „Cole"
2.	A. Ometian	C.E.O. of „Arm Treks"
3.	Egishe Organnisian	Director TK „Status"
4.	Suliko Nakashidse	representative of „Barvil"
5.	M.M. Dshulfian	representative of „Barvil"
6.	Arman Bachudarian	department for the support of trade EC VSS
7.	Andrej Mrtshian	Deputy Director EC VSS
8.	Vasgen Katvalian	Director of the department for loading and unloading of freight of the ARM
9.	Samvel Tedevosian	Director for financial affairs „Apaven"
10.	Levon Torgomian	Senior economist of ARM
11.	Vladimir Papoian	Gen. Director of JV „LTT-Armenia"
12.	Sigfried Roither	firm Franz Welz, Salzburg
13.	Gebhard Wolf	firm Franz Welz, Salzburg
14.	Klaus Dröge	Director LTT
15.	Ratuni Asikian	Dep. Director ARM, head of the telecommunication services and the department for foreign trade
16.	L.G. Akopian	Dep. Director ARM, head of the exploitation services
17.	Ch.A. Avetisian	head of the transport department of the ARM
18.	A.Z. Kirakosian	head of the wagon department of the ARM
19.	N.A. Ter-Karapetian	head of Armsheldorekspedizia
20.	G.O. Oznezian	head of the department for freight and commercial works of the ARM
21.	V.A. Madoian	Dep. Head of the department for freight and commercial works of the ARM
22.	A.K. Galotian	Main engineer GZUU „Armgruzavtotrans"
23.	Dr. Ch. Gleue	project manager TACIS/TRACECA „Joint venture(s) for the Caucasian railways"
24.	J. Schorr	Expert of TACIS/TRACECA for the organisation of „Joint venture(s) for the Caucasian railways"
25.	Dr. E. Müller	dep. project manager TACIS/TRACECA „Joint venture(s) for the Caucasian railways" for Armenia

MINUTES

of the meeting on the foundation of an
Operating & Service Multimodal Transport company, Tbilisi, July 18th, 1997

Participants: (see Annex)

Agenda:
1. Presentation of the concept on the foundation of the Operating & Service Joint Venture.
2. Discussion
3. Conclusions

To item 1.

It has been proposed to set up two limited multimodal transport partnerships.
1. Azerbaijan-Georgia
   Founders: Port Poti, GRZD, AGZD, Port Baku, Casp. Shipping Comp., West European partner
   Limited partners: carriers/forwarders and other involved parties.

2. Georgia-Armenia
   Founders: Port Poti, GRZD, ARM, West European partner
   Limited partners: carriers/forwarders and other involved parties.

The founders will invest their capital in different forms: as funds, real estates, rolling stock. The limited partners can be corporate bodies, that invest their capital and get rebates for transportation and logistic services and obtain profit in accordance with decisions of the supervising council. Tariffs will be postulated by the partnership considering direct costs and market analysis. The company will offer services for the transport of containers from door to door. The sphere of activity will be limited to export-import transports of Azerbaijan and Georgia or Georgia and Armenia and to transit transports on the Poti-Turkmenbashi section.

To item 2.

The following main questions have been put:
- by whom and by which procedure a West European partner will be chosen
- which rebates will the limited partners get
- which rights will the railway companies retain
- which conditions exist for partners' investments
- will a monopoly arise
- how will the price and tariff development be considered
- how will the profit be distributed
- is a tender intended
- how will the activities of the partnership be financed
- who will endure losses

To item 3.

1. TEWET will send the summary of the report together with the minutes to all participants.
2. Participants' remarks will be considered in the final report.
3. A meeting of the proposed founders with the appropriate authorities has to be conducted for the final decision on the company foundation.
4. At the beginning the company activities shall be concentrated on container transport. The possibility of including also common wagon deliveries into the Logistic-Express train to increase the capacity utilisation will be taken into account afterwards.

Melkadze I.
GRZD First Deputy Head Manager
and Chief Engineer

Ch. Gleue
Project Manager

MINUTES

of the joint meeting of representatives of AGZD and TEWET on the foundation of infrastructural joint ventures, Baku, July 22nd, 1997

Participants: (see Annex)

Agenda:

1. Joint venture for the production of reinforced concrete sleepers.
2. Development of communication network
3. Joint venture for the repair and reconstruction of electro-locomotives.

To the first item

TEWET experts informed about three possible forms of joint venture property:

- the Azerbaijan and Georgian Railways, financing by credit
- BOT, i.e. the equipment supplier will be the only owner, sell sleepers to railway companies and hand over the plant to the railway company after an appropriate period of time.
- joint venture with the participation of railway companies, local companies and technical partners

Forms of company

- limited liability company
- joint-stock company
- limited partnership (supervising council, by which the capital will be invested)

On the basis of the analysis of the condition of AGZD's tracks TEWET have determined the following demand on reinforced concrete sleepers (in thousand of sleepers):

Years	1	2	3	4
	368	368	368	368

The annual demand on reinforced concrete sleepers determined by the railways amounts to 180-250 thousand units.

TEWET has handed over the description and drawings for planning of an appropriate plant for sleeper production of German type NBT83 with fastening type W.
The direct costs of production of one sleeper including the fastening amount to US$ 36.50.

Conclusions:

1. AGZD will place at TEWET's disposal approved data of guaranteed demand in written form proceeding from the consideration of 180-250 thousand sleepers.
2. The founders of the Joint Venture (Limited Liability Company type) probably will be the state concern Promstrojmateriali (Industrial Building Materials), the AGZD, the state concern Azchimia and a foreign technical partner. The foreign partner should be determined on the basis of a tender.
3. The property share of the Azerbaijan joint venture participants should not be less than 51%.
4. The AGZD and the Dollyar plant should study the submitted technological descriptions and drawings for factory planning to work out the proposals on real conditions.
5. The AGZD recommends to built one production line with annual capacity of 200 thousand railway sleepers on a 2-shift-basis on the first stage.

To the second item

In the sphere of communication, basing on the results of TEWET's analysis, it is intended to lay fibreglass cables as well as to provide appropriate transmitting equipment and multiplexers. It is intended to lay the fibreglass cables and to furnish main line stations within a period of 7 years. During

the following 10 years it should be thought over to lay additional cables on other lines, two cables for development of ring structure and exchanges on the basis of digital technology. A set of proposals has been received from Siemens and Alcatel and handed over to AGZD.

It is advisable to form joint ventures with the aim to develop the tenders, to compile the work schedule, to project the assessments of company budget offers, to prepare and to sign contracts, to monitor and to supervise the projects and to accept turnkey operations. These joint ventures should be 100% subsidiaries of railway companies and fulfil appropriate works on the basis of a contract with the railway company.

After the development of the main communication network a joint venture for communication network operation and development should be founded. This joint venture will, on the one side, guarantee rendering of appropriate communication services for railways and, on the other side, offer such services to third parties as well as extend the network permanently and update communication equipment. In accordance with the information submitted by the European Union a project for the development of telecommunication and signalisation system Georgia - Azerbaijan - Armenia has been prepared. This project foresees to provide a 503 km section of AGZD in the Frame of Unit B with fibreglass cable, to furnish transmitting equipment, multiplexing line terminals and computer devices (modems, PC) for 39 stations as well as to provide equipment for connection to Communication Department's lines. Direct financing out of the European Union Funds has been proposed.

Conclusions

1. The participants of the meeting support the forming of a joint expert group by AGZD, ARM and GRZD to co-ordinate appropriate works including development of tenders, monitoring and supervision of work execution.
2. To prepare and to realise such works executed on the basis of TEWET's estimations the AGZD supposes as expedient to found a design company for AGZD communication networks. The investments should be financed by credit.
3. The AGZD supports the foundation of a national communication joint venture proposed by TEWET. Appropriate provisions should be prepared; the date of introduction has to be put in dependence on network development.

To the third item.

Basing on the locomotive stock analysis of the Caucasian Railways TEWET has defined that it would be expedient to found joint ventures for repairing and reconstruction of electrical locomotives on the basis of the locomotive building plant in Tbilisi. Appropriate negotiations with ADtranz have been conducted, and the ADtranz company is interested in the joint venture participation under the following conditions:

1. The plant activities should cover not only repairs, but reconstruction of electric locomotives, too.
2. The Caucasian railways have to guarantee the purchasing of reconstructed electric locomotives. (Demand).
3. The financial share of ADtranz should amount to not less than 51%.
4. A syndicate contract should be signed.

The preliminary technical requirements for the development of 3 phase drive main line freight-passenger electrical locomotive on the base of the E-13 electric locomotive have been handed over and discussed.

Remark: AGZD has requested to found the locomotive repair plant on the base of the Baladshary depot.

TEWET will assess the proposed option in the final report.

Conclusion

1. AGZD is not interested in using the locomotive building plant in Tbilisi for locomotive repairs. AGZD supposes that the postulated preliminary price (US$ 300,000) is too high in comparison with the low prices offered by the Lvov locomotive building plant (US$ 195,000).
2. AGZD evaluates the proposed reconstruction with the application of asynchron 3-phase motors as premature, as the conditions for the use of such locomotives at present and in the nearest future would not exist. It assesses the called prices (US$ 3,000,000) as exaggerated.
3. AGZD will hand over its technical requirements for locomotive repairs to the GRZD.

Mekhtiev M.M.

AGZD First Deputy Head Manager
and Chief Engineer

Kranz W.

Deputy Project Manager

List of the participants of the meeting on the foundation of joint ventures " Caucasian railways infrastructure"

Baku, July 22. 1997

Surname, Name	Company / position	Telephone and telefax
1. Mehtiev M.M.	AGZD, First Deputy Head Manager	99 44 03
2. Panahov M.S.	AGZD, Deputy Head Manager	99 41 70
3. Nadjafov A.	AGZD, Deputy Head Manager	99 47 07
4. Gleue Ch.	TEWET, Project Manager	94 21 55 Tbilisi
5. Kranz W.	TEWET, Deputy Project Manager	99 50 82 Baku
6. Schorr J.	TEWET, Expert	99 50 82
7. Abbasov O.	AGZD, Locomotive Service Chief Manager	99 45 01
8. Karnitski O.	AGZD, Technical Service and Communication Chief Manager	99 46 07
9. Kuliev F.	AGZD, Railway Service Chief Engineer	99 45 28
10. Maters H.	TACIS, Monitoring expert	98 66 13
11. Mehtiev I.	Vice-president of the "Promstrojmaterial" company	
12. Rzaev F.	Dollyar Plant Head Manager	

MINUTES

of the meeting on the foundation of an
Operating & Service Multimodal Transport company, Baku, July 21st, 1997

Participants: (see Annex)

Agenda:
1. Presentation of the concept on the foundation of an Operating & Service Joint Venture.
2. Discussion
3. Conclusions

To item 1.

Speaker:
Mr. J. Schorr - economic expert
It has been proposed to set up one limited multimodal transport partnership (by corporate bodies, which invest their capital shares).

1. Azerbaijan-Georgia
   Founders:
   AGZD, Port Baku, Caspian Shipping company, Port Poti, GRZD, West European company.
   Limited partners: carriers and other involved parties.

The expert of TEWET has informed, that founders will invest their capital in different forms: as funds, real estates, rolling stock. The limited partners can be corporate bodies, that invest their capital and get rebates on transportation and logistic services and obtain profit in accordance with decisions of the supervising council.
Tariffs will be postulated by the company considering direct costs and market analysis. The company will offer services for the transport of containers from door to door. The sphere of activity will be limited to export-import transports of Azerbaijan and Georgia and to transit transports on the Poti-Turkmenbashi section.

To item 2.

Speakers: Mr. Kranz and Mr. Schorr

The following main questions had been put regarding with the foundation of an operating & service multimodal transport company:
- by whom and by which procedure a West European company will be chosen
- which rebates will the limited partners get
- which rights will the railway companies retain
- which conditions exist for partners' investments
- how will the price and tariff development be considered
- is a tender intended
- how will the activities of partnership be financed
- who will endure losses

The representative of the Ministry of Economy, Mr. Sadihov, stated that Combined transport should not be monopolised by a future operating company. Competition between different carriers and forwarders should be guaranteed under market conditions.

All participants took part in the discussion.

The meeting has decided:

1. For final decisions for the company foundation it is necessary to conduct a meeting of proposed founders with appropriate authorities.
2. Participants' remarks will be considered in the final report.

Mekhtiev M.M.
AGZD First Deputy Head Manager
and Chief Engineer

Kranz W.
Deputy Project Manager

List of the participants of the meeting on the foundation of an Operating & Service Joint Venture "Logistic Express"

Baku, July 21st, 1997

Surname, Name	Company / position	Telephone and telefax
1. Mekhtiev M.M.	AGZD, First Deputy Head Manager	99 44 03
2. Panahov M.S.	AGZD, Deputy Head Manager	99 41 70
3. Sadihov I.	Ministry of Economy, Chief of transport department	93 11 41
4. Sadihov I.	Azsheldorekspeditsia, Head Manager	99 43 51
5. Askerov V.	AGZD, Chief Engineer for freight and commercial service	99 42 12
6. Nadjafov A.	AGZD, Deputy Head Manager of Techn. Department	99 47 07
7. Ashrafov A.	Azerrail, Chief Manager of Transit Department	
8. Metzger O.	Forwarding company M&M, Head Manager	93 61 95
9. Rustamov M.	Forwarding company M&M, expert	93 83 20
10. Smolin B.	Tacis, CU, Project Manager	93 60 18 / 93 12 76
11. Kjasimov M.	Tacis, CU, expert	93 95 14 / 93 12 76
12. Wolf G.	Forwarding company "Welz"	0043 / 662 / 8585-0
13. Roither S.	Forwarding company "Welz"	0043 / 662 / 8585-0
14. Gleue Ch.	TEWET, Project Manager	94 21 55 Tbilisi
15. Kranz W.	TEWET, Deputy Project Manager	99 50 82 Baku
16. Schorr J.	TEWET, expert	99 50 82

MINUTES

of the joint meeting of representatives of GRZD and TEWET on the foundation of infrastructural joint ventures, Tbilisi, Juli 17, 1997

Participants: (see Annex)

Agenda:
1. Joint venture for the production of reinforced concrete sleepers.
2. Development of the communication network
3. Joint venture for the repair and reconstruction of electric locomotives.

To the first item

TEWET has informed about three options of joint venture property:
- Azerbaijan and Georgian railways, financing by credit
- BOT, i.e. the equipment supplier will be the only owner, should sell sleepers to railway companies and hand over the plant to the railway company after the appropriate period of time.
- joint ventures with the participation of railway companies, local companies and technical partners

Forms of company
- limited liability company
- joint-stock company
- limited partnership (supervising council, by which the capital will be invested)

On the basis of the analysis of railways upper construction state GRZD and TEWET have determined the following demand on reinforced concrete sleepers (in thousand of sleepers):

Years	1	2	3	4	next
	200	200	200	130...150	130...150

The TEWET has handed over the description and drawings for planning of appropriate plant to product sleepers of German type NBT83 with mounting type W.

The direct costs of sleeper production inclusive mounting amount to US$ 36.50.

Conclusions:

1. GRZD will place at TEWET's disposal by July 20,1997 the approved data of guaranteed demand, i.e. in accordance with possible investment volume.
2. GRZD prefers to found the joint venture with a foreign investor in Tbilisi in form of a co-operation to deliver cement and steel from Armenia. The GRZD property share should amount to 51% and profitableness to 5%.
3. GRZD will study the submitted technological descriptions and drawings for factory planning to work out the proposals depending on real local conditions.

To item 2.

In the sphere of communication on the results of analysis, conducted by the TEWET 's experts, it is intended to lay the fibreglass cables (12 lines) as well as to provide appropriate transmitting equipment and multiplexers. It is intended to lay 832 km of fibreglass cables and to furnish 75 stations within 7 years. During the following 10 years it should be thought over to lay 200 km of additional cables, 482 km of other cables for development of ring structure and communication movable equipment for 21 knots.
It is advisable to form design joint ventures to develop the tenders, to compile the works schedule, to project the assessments of company budget offers, to prepare and to sign contracts, to monitor and to

supervise the projects and to accept turnkey operations. These design joint ventures should be 100% subsidiaries of railway companies and fulfil appropriate works on the basis of contract with railway company.
After the development of the main communication network there should be found a joint venture for communication network operation and development. This joint venture will, on the one hand, guarantee rendering of appropriate communication services for railways and, on the other hand, offer such services to third parties as well as extend the network permanently and update communication equipment. The company will prepare a project of a communicational joint venture foundation, define responsibilities of the joint venture and railways as well as appropriate agreements.
In accordance with the information submitted by the European Union a project for development of telecommunication and signalisation system Georgia - Azerbaijan - Armenia should be prepared. This project foresees to provide 402 km section of Georgian Railways in the Frame of Unit A with fibreglass cable, to furnish transmitting equipment, multiplexing line terminals and computer devices (modems, PC) for 46 stations as well as to provide equipment for connection to the Communication State Department's lines. Direct financing out of the European Union Funds has been proposed.

At the calculation it has been proceeded from the necessity to build the Gardabani - Samtredia and Tbilisi - Sadahlo railway lines, so far as the European Union has already financed cables for the Samtredia - Poti / Batumi section.
In the course of discussion the GRZD has required additionally to supply Samtredia - Poti / Batumi sections with cables, as the existing equipment has been produced home-made using low power cable, that does not correspond to project requirements.

Conclusions

1. The European Union representative will verify anew the possibility to equip the Samtredia - Poti / Batumi section. The TEWET will take into consideration the additional requirement in its calculations.
2. The participants of the consultancy support the expediency of forming a joint experting group by AGZD, ARM and GRZD to co-ordinate appropriate works inclusive the development of tenders, monitoring and supervision of work execution.
3. To prepare and to realise such works executed on the basis of TEWET calculations the GRZD supposes as expedient to found a design company for GRZD communication networks. The investments for the network development should be financed by credit.
4. The AGZD does not object the foundation of a national joint venture for communication equipment and line operation. Appropriate provisions should be prepared; the date of introduction has to be put due to network development.

To item 3.

Due to the locomotive stock analysis of the Trans-Caucasian Railways the TEWET company has defined that it would be expedient to found joint ventures for repairing and reconstruction of electrical locomotives on the basis of the locomotive building plant in Tbilisi. Appropriate negotiations with ADtranz have been conducted, and the ADtranz company is interested in the joint venture participation due to the following conditions:

1. The plant activities should cover not only repair, but reconstruction of electrical locomotives too.
2. The Caucasian Railways have to guarantee purchasing of reconstructed electrical locomotives. (Demand).
3. The financial share of ADtranz should amount to not less than 51%.
4. A syndicate contract should be signed.

The preliminary technical requirements on the development of 3-phase-drive main line freight-passenger electrical locomotive on the base of the E-13 electrical locomotive have been handed over and discussed.

Conclusions

1. The TEWET will hand over to ARM and AGZD the appropriate requirements with the request to co-ordinate them with the locomotive building plant in Tbilisi and to define guaranteed demand.
2. The GRZD will assess the demand on general repairs as well as the demand on reconstructed electrical locomotives until August 1st,1997 and will take over this data to the TEWET.
3. The TEWET will request ADtranz to submit to the GRZD the main provisions of the agreement on the consortium and joint venture foundation.
4. The TEWET will request ARM and AGZD again to transmit their demand on general repairs and reconstructed electrical locomotives to the locomotive building plant.

Melkadze I.

GRZD First Deputy Head Manager
and Chief Engineer

Gleue Ch.

Project Manager

List of the participants of the meeting on the foundation of the railway joint ventures
Tbilisi, June 17th, 1997

Surname	Name	Company
Bolkvadze	Otar	Transfer - For
Isajan	Josif	Transfer - For
Dröge	Klaus	LTT
Roither	Sigfried	Welz
Shengelia	Zurab	Georgian National Expert Association
Suladze	Zurab	Sakchimtrans
Siashvili	Albert	Intercaravan
Maters	Henny	TACIS / M & E
Wolf	Gebhard	WELZ
Rostomashvili	Hodar	GRZD, foreign affairs department
Hoperija	David	GRZD
Kvernadze	Ramaz	GRZD
Tzulaja	Temur	GRZD
Buksianidze	Amiran	TRANS GEORGIA & CO
Sulava	Valeri	TRANS GEORGIA & CO
Abhasawa	David	SKOPI
Bagaturia	Georgi	GIOC - Trans
Kapirashvili	Levan	GIOC - EKAtrans
Gogelia	Tengiz	TACIS /M & E
Kvantaliani	Nodari	GRZD, building trust
Giorgadze	Djondo	Locomotive building plant
Melkadze	Igor	GRZD
Gongladze	Ushangi	GRZD, foreign affairs department
Purzeladze	Vadim	TRACECA coordination group
Gray	Mark	TRACECA coordination group
Nosadze	Candid	GRZD, track service
Tatishvili	Tengiz	GRZD, foreign affairs department
Arveladze	Genadi	GRZD, STzB service
Shelia	Vladimir	Georgian Ministry of transport, coordination department
Tziklauri	Ekaterina	GRZD
Zakaidze	Meri	GRZD
Okroshidze	Archil	BLUE WATER SHIPPING GEORGIA
Devsurashvili	Gela	Imedi
Skhirtladze	Georgi	Cautrex
Tzhovrebadze	Avtandil	Cautrex logistic
Tzihelashvili	Tamaz	GRZD, economic department
Kranz	Wolfgang	TEWET
Schorr	Jörg	TEWET
Gleue	Christian	TEWET

Annex 6.5-13

TECF - Main electric equipment reconstruction hall

Overview (within the corpus No. 2)

lenght 150 m, width 72 m, square about 11,000 m²

Preparation
3 cranes each 2 tons

Electric equipment shop
width 30 m

(details see page 3)

Electric motors stators and coils shop
width 30 m

(details see page 3)

Storing and Preparing shop
2 cranes each 1tons, 3 cranes each 2 tons
width 12 m

Annex 6.5-8

Goal directions of potential participants for the foundation of an Electric Locomotive Repair Plant

	Goals	Goal	GRZD	AGZD	TP
1	meeting the current repair demand	E T	M	M	--
2	guaranteeing transport and operational safety	T E	M	M	C
3	creating operational reserves and thus a capacity pool	T E	C	C	C
4	independence from foreign repair capacities	P E	M	M	C
5	replacing components or individual units by modern Western standards	T	C	C	M
6	increasing the independence from spare part delivery	P E	M	M	M
7	cost reduction as compared to imports	E	M	M	--
8	employing modern technologies (three-phase technology) and testing instruments	T E	C	C	C
9	increasing the reliability of rail transport	E P	M	M	--
10	reducing maintenance costs	E	M	M	M
11	decreasing energy consumption	E	C	C	--
12	cutting down on the wear and tear of the locomotives and the tracks	E T	C	C	C
13	increasing the efficiency of the locomotives	T	C	C	C
14	reconstructing or producing new electric locomotives with modern drive units	T E	--	--	C

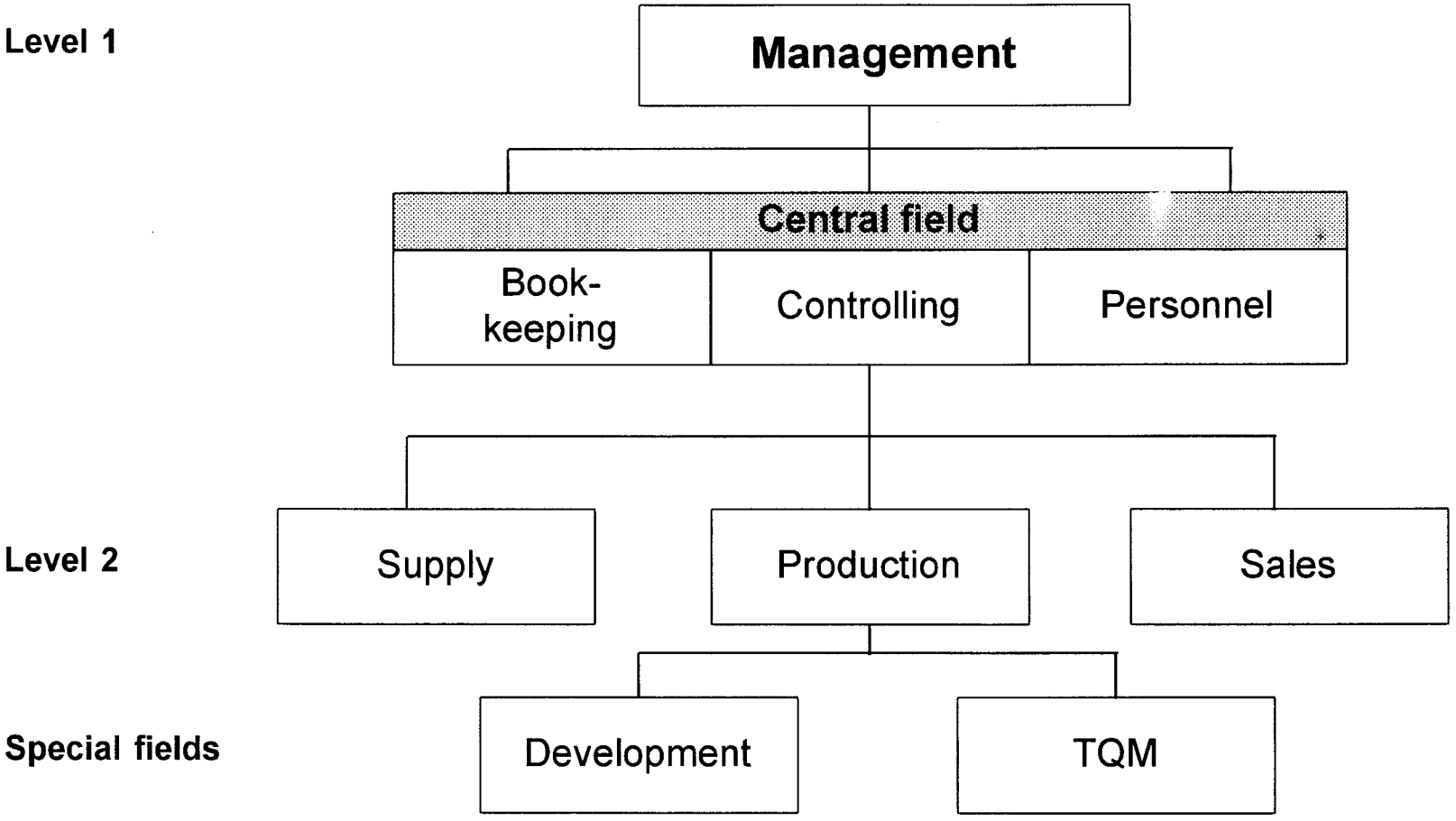
P - political goal
E - economic goal
T - technological goal

C - Can - goal
M - Must - goal

TP - technology partner
-- - not relevant

Annex 6.5-9

Electric locomotive plant - organisation



Annex 6.5-10

Cost estimation for renewing the TECF shops 1998 - 2000

No.	terms	units or squares m²	price per unit (US$)	price (US$)
1	**Civil constructions**			
1.1	**capital repair of the roof, overlights, rain tubes, etc.**			
1.1.1	Locomotive repair and reconstruction hall	20,000	15	300,000
1.1.2	Bogie and wheelset repair hall	35,000	15	525,000
1.1.3	Main electric equipment reconstruction hall	11,000	15	165,000
1.1.4	Locomotive mechanic parts production hall	12,000	12	144,000
1.1.5	Locomotive painting hall	4,600	15	69,000
1.1.6	Locomotive testing hall	1,440	15	21,600
	subtotal			**1,224,600**
1.2	**cleaning and colouring of doors, windows, floors, incl. occ. repair**			
1.2.1	Locomotive repair and reconstruction hall	20,000	1.5	30,000
1.2.2	Bogie and wheelset repair hall	35,000	1.5	52,500
1.2.3	Main electric equipment reconstruction hall	11,000	1.5	16,500
1.2.4	Locomotive mechanic parts production hall	12,000	1.2	14,400
1.2.5	Locomotive painting hall	4,600	1.5	6,900
1.2.6	Locomotive testing hall	1,440	1.5	2,160
	subtotal			**122,460**
	Civil constructions total			**1,347,060**
2	**Installations**			
2.1	**tracks occassionally repair**			
2.1.1	Locomotive repair and reconstruction hall	20,000	1.5	30,000
2.1.2	Bogie and wheelset repair hall	35,000	1.5	52,500
2.1.3	Locomotive mechanic parts production hall	12,000	1.2	14,400
2.1.4	Locomotive painting hall	4,600	1.5	6,900
2.1.5	Locomotive testing hall	1,440	1.5	2,160
	subtotal			**105,960**
2.2	**cleaning, repairing of canals, repair canal lightings and sewerages**			
2.2.1	Locomotive repair and reconstruction hall	20,000	0.75	15,000
2.2.2	Bogie and wheelset repair hall	35,000	0.75	26,250
2.2.3	Locomotive mechanic parts production hall	12,000	0.6	7,200
2.2.4	Locomotive painting hall	4,600	0.75	3,450
2.2.5	Locomotive testing hall	1,440	0.75	1,080
	subtotal			**52,980**
2.3	**repair of lighting and heating systems**			
2.3.1	Locomotive repair and reconstruction hall	20,000	0.75	15,000
2.3.2	Bogie and wheelset repair hall	35,000	0.75	26,250
2.3.3	Main electric equipment reconstruction hall	11,000	0.75	8,250
2.3.4	Locomotive mechanic parts production hall	12,000	0.6	7,200
2.3.5	Locomotive painting hall	4,600	0.75	3,450
2.3.6	Locomotive testing hall	1,440	0.75	1,080
	subtotal			**61,230**
	Installations total			**220,170**

Annex 6.5-10

Cost estimation for renewing the TECF shops 1998 - 2000

No.	terms	units or squares m²	price per unit (US$)	price (US$)
3	**Equipment**			
3.1	**Main assembly hall**			
3.1.1	procuring of lifting jacks, 40 tons	12	10,000	120,000
3.1.2	technical inspections of cranes and small repairs	17	5,000	85,000
3.1.3	repair of crane tracks	17	4,000	68,000
	subtotal			**273,000**
3.2	**Electro-machine shop**			
3.2.1	repair, capital repair, occasionally repair of turn.lath.			100,000
3.2.2	overhaul of technologic equipment for motors overh.			100,000
3.2.3	procuring new testing instruments and equipment			10,000
	subtotal			**210,000**
3.3	**Bogie repair shop**			
3.3.1	technical inspection of cranes and small repair	17	5,000	85,000
3.3.2	repair of crane tracks	17	7,000	119,000
3.3.3	capital repair of welding plac., chamber of sandblast			15,000
3.3.4	capital repair of painting chamber			10,000
3.3.5	procuring washing bloc for bogies			20,000
3.3.6	replacing flaw detectors for welding tests			15,000
	subtotal			**264,000**
3.4	**Wheelset repair shop**			
3.4.1	equipments to procure as shown in Annex 6.5-17			2,650,000
	subtotal			**2,650,000**
3.5	**Electric equipment shop**			
3.5.1	technical inspection of cranes and small repair	4	5,000	20,000
3.5.2	repair of crane tracks	4	2,200	8,800
	subtotal			**28,800**
3.6	**Electric motor stators and coil shop**			
3.6.1	repair, capital repair, occ. repair of technologic tools			200,000
3.6.2	procuring new testing instruments			10,000
	subtotal			**210,000**
3.7	**Mechanic parts shop**			
3.7.1	technical inspection of cranes and small repair	8	5,000	40,000
3.7.2	repair of crane tracks	8	600	4,800
	subtotal			**44,800**
3.8	**Mechanic parts production shop**			
3.8.1	repair, capital repair, occ. repair of different turn.lath.			100,000
3.8.2	procuring new special tools			20,000
3.8.3	procuring new testing instruments			10,000
	subtotal			**130,000**

Annex 6.5-10

Cost estimation for renewing the TECF shops 1998 - 2000

No.	terms	units or squares m²	price per unit (US$)	price (US$)
3.9	**Painting hall**			
3.9.1	repair of painting systems			20,000
3.9.2	technical inspection of the ecologic systems, repair			10,000
	subtotal			**30,000**
3.10	**Testing hall**			
3.10.1	capital repair of the scale system			30,000
3.10.2	renewing repair of the complete testing field			100,000
3.10.3	procuring new testing instruments			20,000
	subtotal			**150,000**
	Equipment total			**3,990,600**
	Costs total			**5,557,830**

Annex 6.5-11

TECF - Locomotive repair and reconstruction hall

Overview (within the corpus No. 1)

lenght 150 m, width 125 m, square about 20,000 m²

Electro-machine shop
Electric installations
width 45 m

(detail 2 see page 4)

Locomotive main assembly shop
width 42 m

(detail 1 see page 3)

Preparing shop
width 21 m

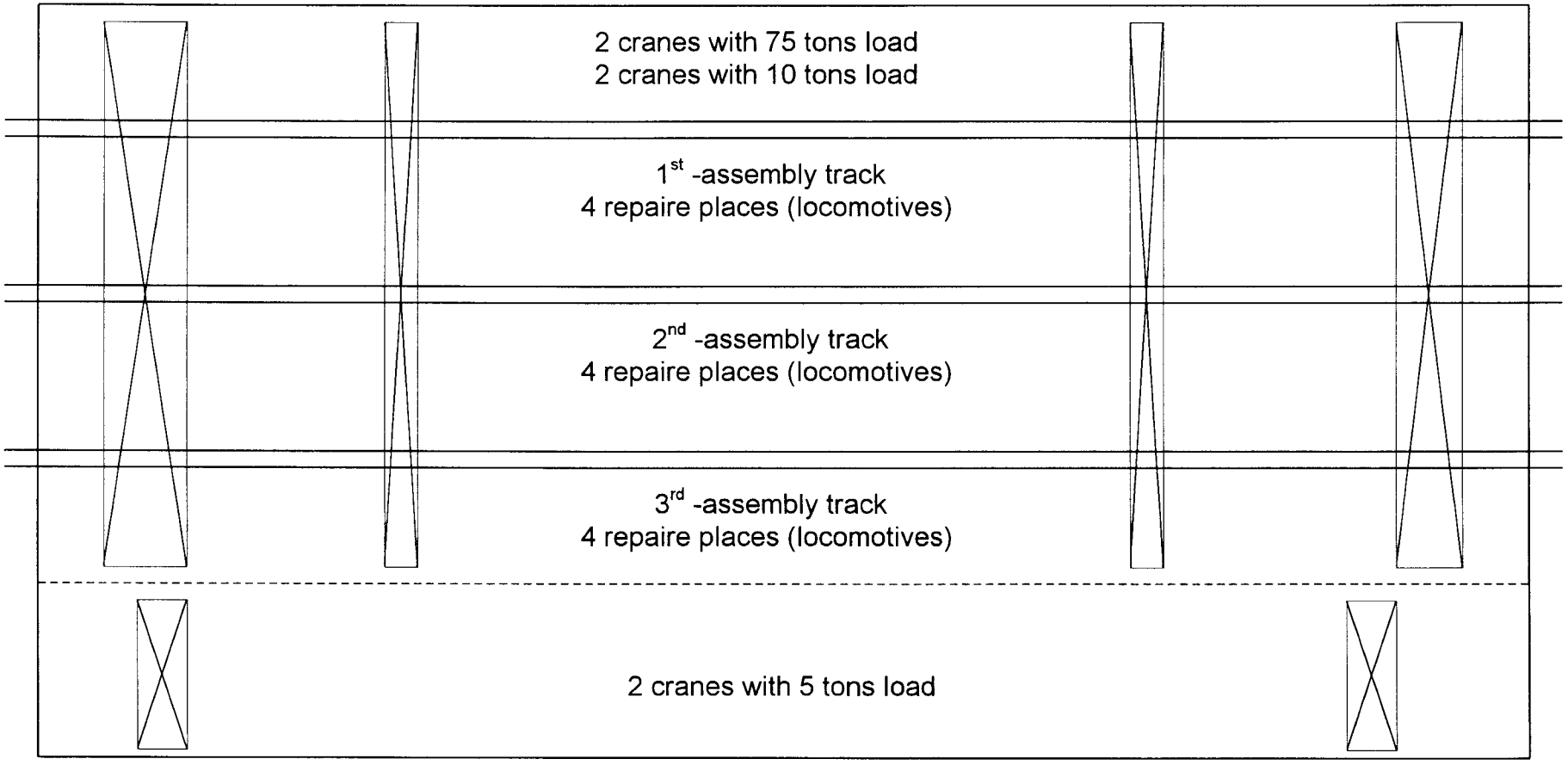
Annex 6.5-11

Needed reconstruction works for the locomotice repair and reconstruction hall

work		price per unit	price (US$)
1	**Civil construction,** 20,000m²		
1.1	capital repair of roof and overlights, rain tubes, etc.	15 US$ per m²	300,000
1.2	cleaning and colouring of doors, windows, floors incl. occasionally repair	10% of 1.1	30,000
2	**Installations**		
2.1	tracks occasionally repair		
2.2	cleaning, colouring of canals, repair canals lighting		
2.3	repair of lighting and heating systems	all 20% of 1.1	60,000
3	**Equipment in the main assembly hall**		
3.1	12 lifting jacks, each with 40 tons, to procure	10,000	120,000
3.2	technical inspection of cranes and small repairs	5,000 per crane	85,000
3.3	repair of crane tracks	20% of 1.1	68,000
4	**Equipment in the Electro-machine shop**		
4.1	repair, capital repair, occasionally repair of different turning lathes		100,000
4.2	overhaul of technologic equipment for motors as ovens, microfils, etc		100,000
4.3	procure new testing instruments and equipment		10,000
	Total		**873,000**

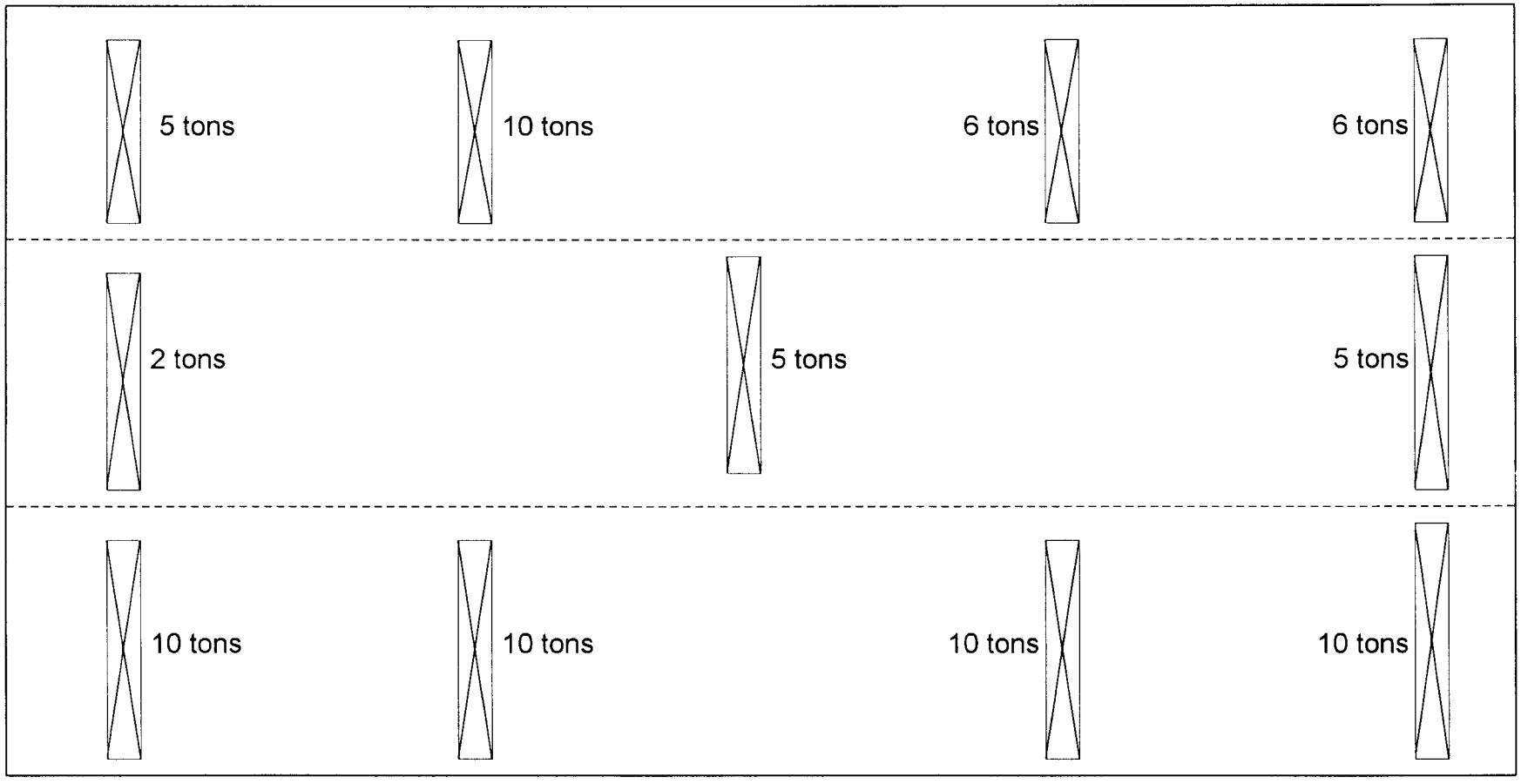
Annex 6.5-11

TECF - Locomotive main assembly shop (detail 1)
width 42 m, all 3 tracks with canals



Annex 6.5-11

TECF - Electro-machine shop (detail 2)
width 45 m

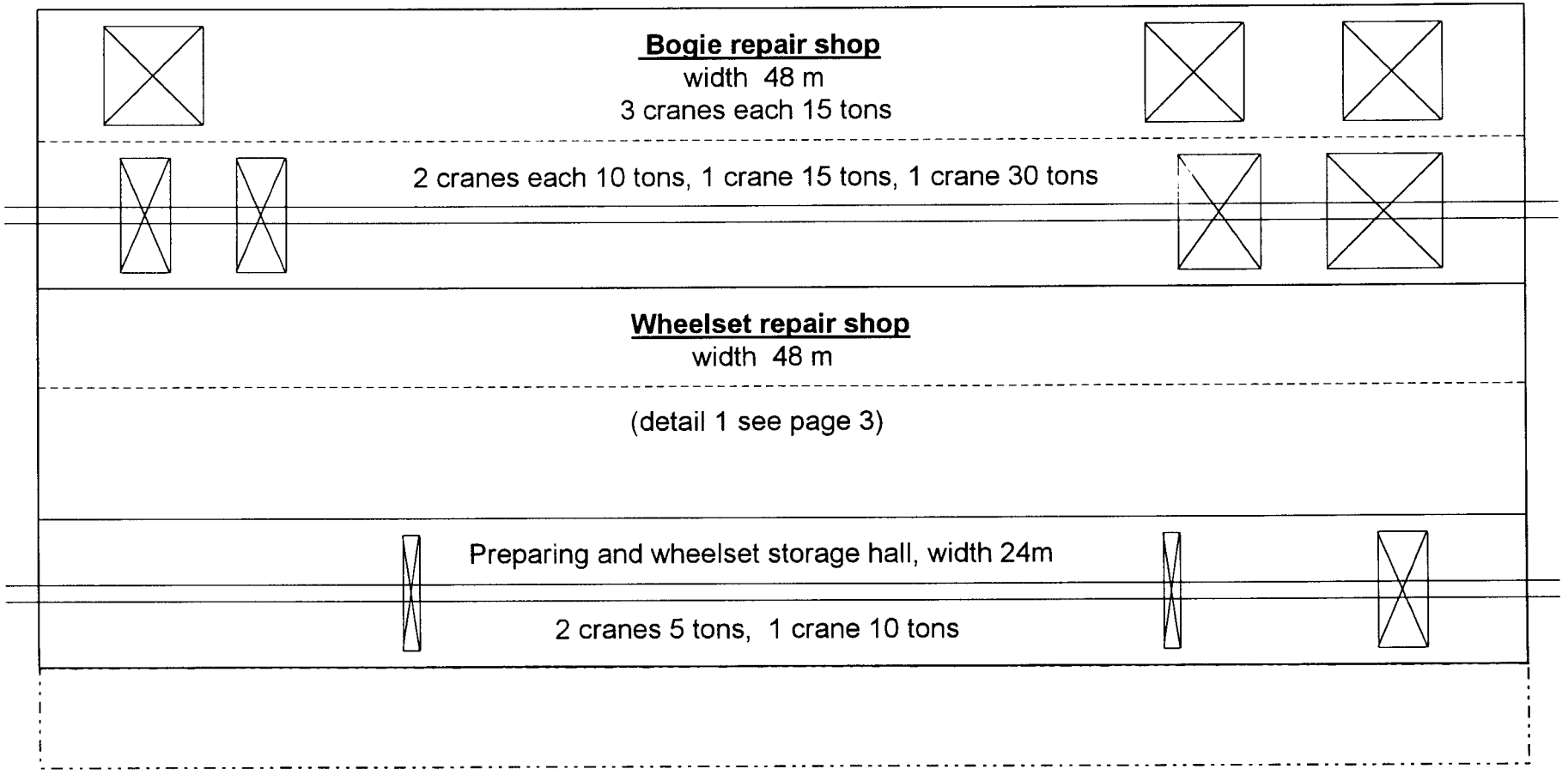


Annex 6.5-12

TECF - Bogie and wheelset repair hall

Overview (within the corpus No. 3)

lenght 216 m, width 144 m, square about 35,000 m²



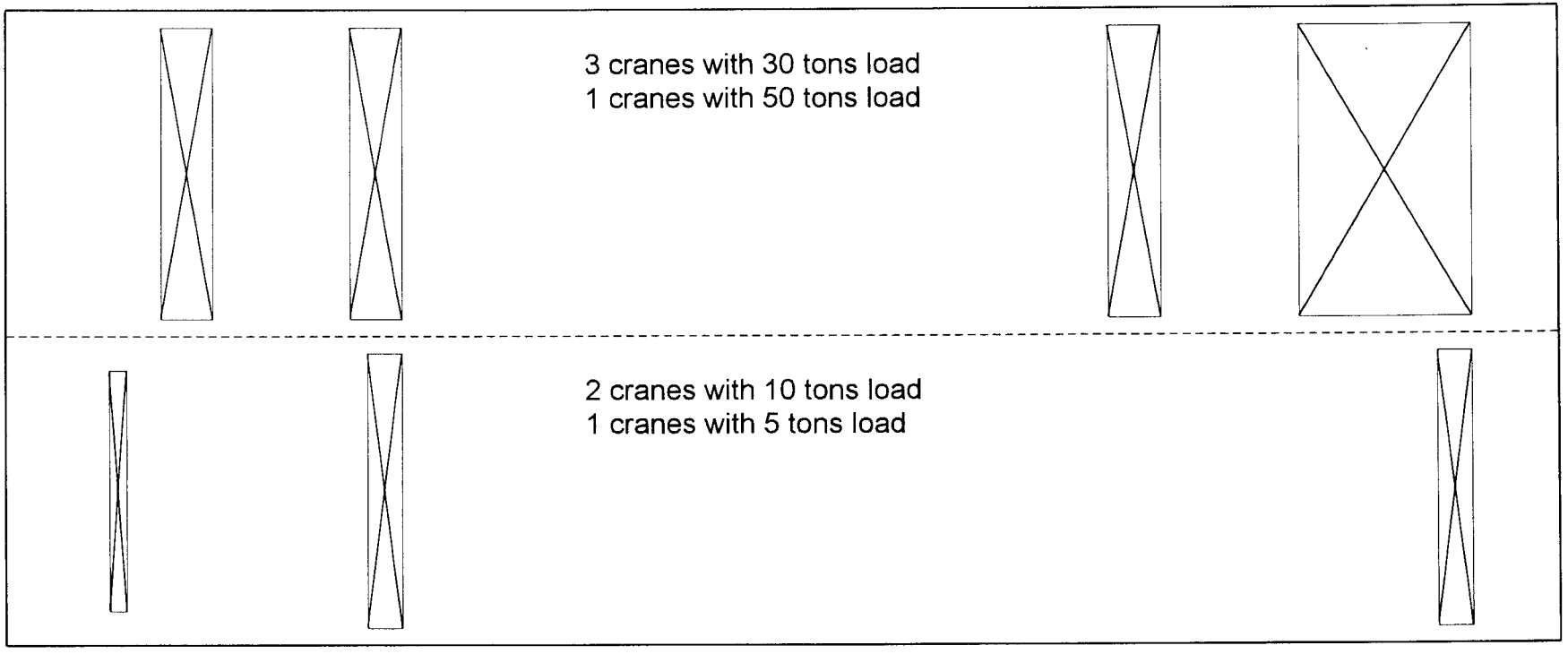
Annex 6.5-12

Needed reconstruction works for the bogie and wheelset repair hall

work		price per unit	price (USD)
1	**Civil construction,** 35,000m²		
1.1	capital repair of roof and overlights, rain tubes, etc.	15 US$ per m²	525,000
1.2	cleaning and colouring of doors, windows, floors incl. occasionally repair	10% of 1.1	52,500
2	**Installations**		
2.1	tracks occasionally repair		
2.2	cleaning, colouring of canals, repair canals lighting		
2.3	repair of lighting and heating systems	all 20% of 1.1	105,000
3	**Equipment in the bogie repair shop**		
3.1	technical inspection of cranes and small repairs	5,000 per crane	85,000
3.2	repair of crane tracks	20% of 1.1	119,000
3.3	capital repair of welding places, chamber of sandblaster		15,000
3.4	capital repair of painting chamber		10,000
3.5	to procure washing bloc for bogies		20,000
3.6	to replace defectoscops for welding tests		15,000
4	**Equipment in the wheelset repair shop**		
4.1	equipments to procure as shown in Annex 6.5-17		2,650,000
	Total		**3,596,500**

Annex 6.5-12

Wheelset repair shop
width 48 m



Annex 6.5-13

TECF - Main electric equipment reconstruction hall

Overview (within the corpus No. 2)

lenght 150 m, width 72 m, square about 11,000 m²

Preparation
3 cranes each 2 tons

Electric equipment shop
width 30 m

(details see page 3)

Electric motors stators and coils shop
width 30 m

(details see page 3)

Storing and Preparing shop
2 cranes each 1tons, 3 cranes each 2 tons
width 12 m

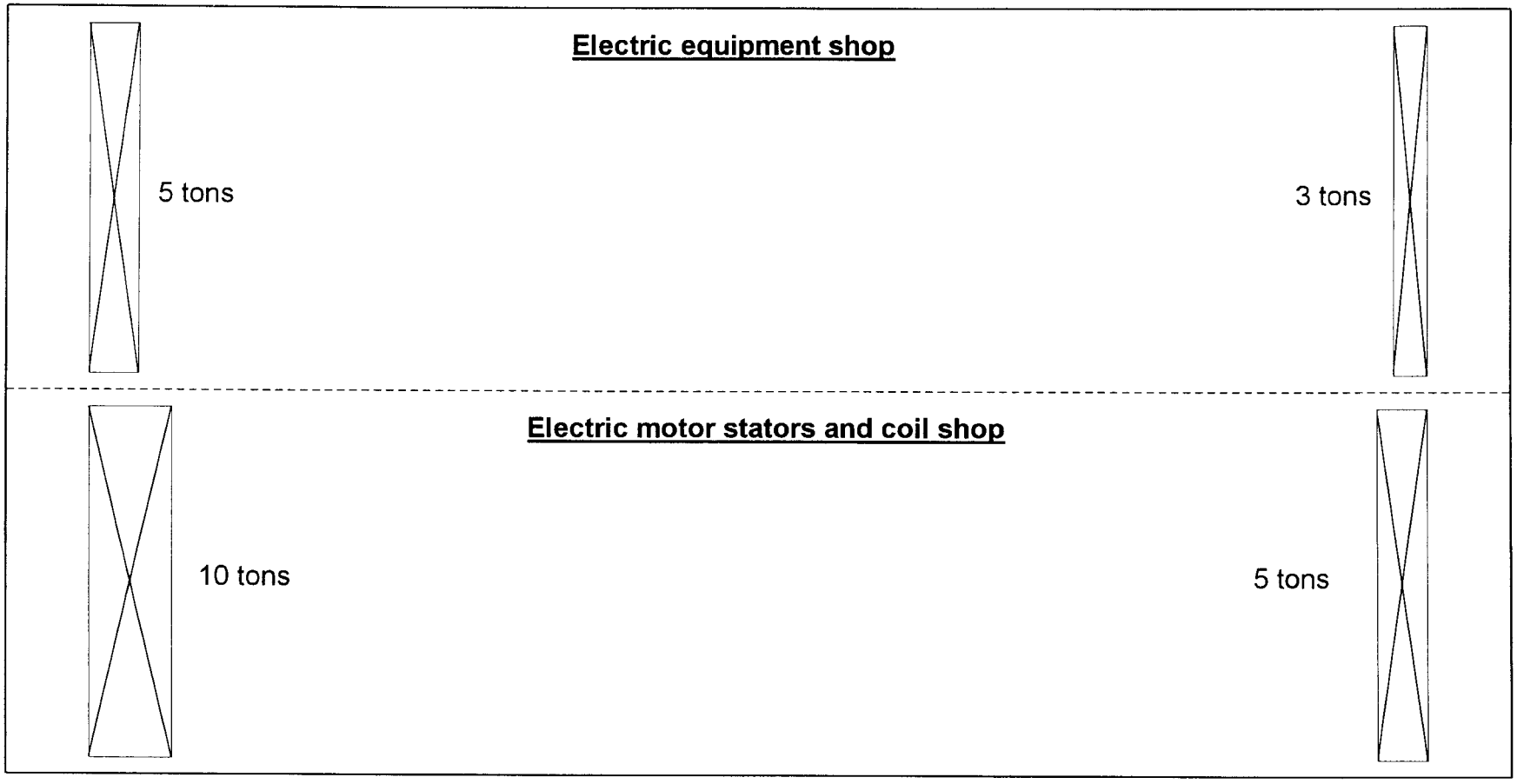
Annex 6.5-13

Needed reconstruction works for the Main electric equipment reconstruction hall

work		price per unit	price (US$)
1	**Civil construction,** 11,000m²		
1.1	capital repair of roof and overlights, rain tubes, etc.	15 US$ per m²	165,000
1.2	cleaning and colouring of doors, windows, floors incl. occasionally repair	10% of 1.1	16,500
2	**Installations**		
2.1	repair of lighting and heating systems	all 20% of 1. i	33,000
3	**Equipment in the electric equipment shop**		
3.1	technical inspection of cranes and small repairs	5,000 per crane	20,000
3.2	repair of crane tracks	5% of 1.1	8,800
4	**Equipment in the electric motor stators and coil shop**		
4.1	repair, capital repair, occasionally repair of different technologic tools		200,000
4.2	to procure new testing instruments		10,000
	Total		**453,300**

Annex 6.5-13

TECF - Main electric equipment reconstruction shops

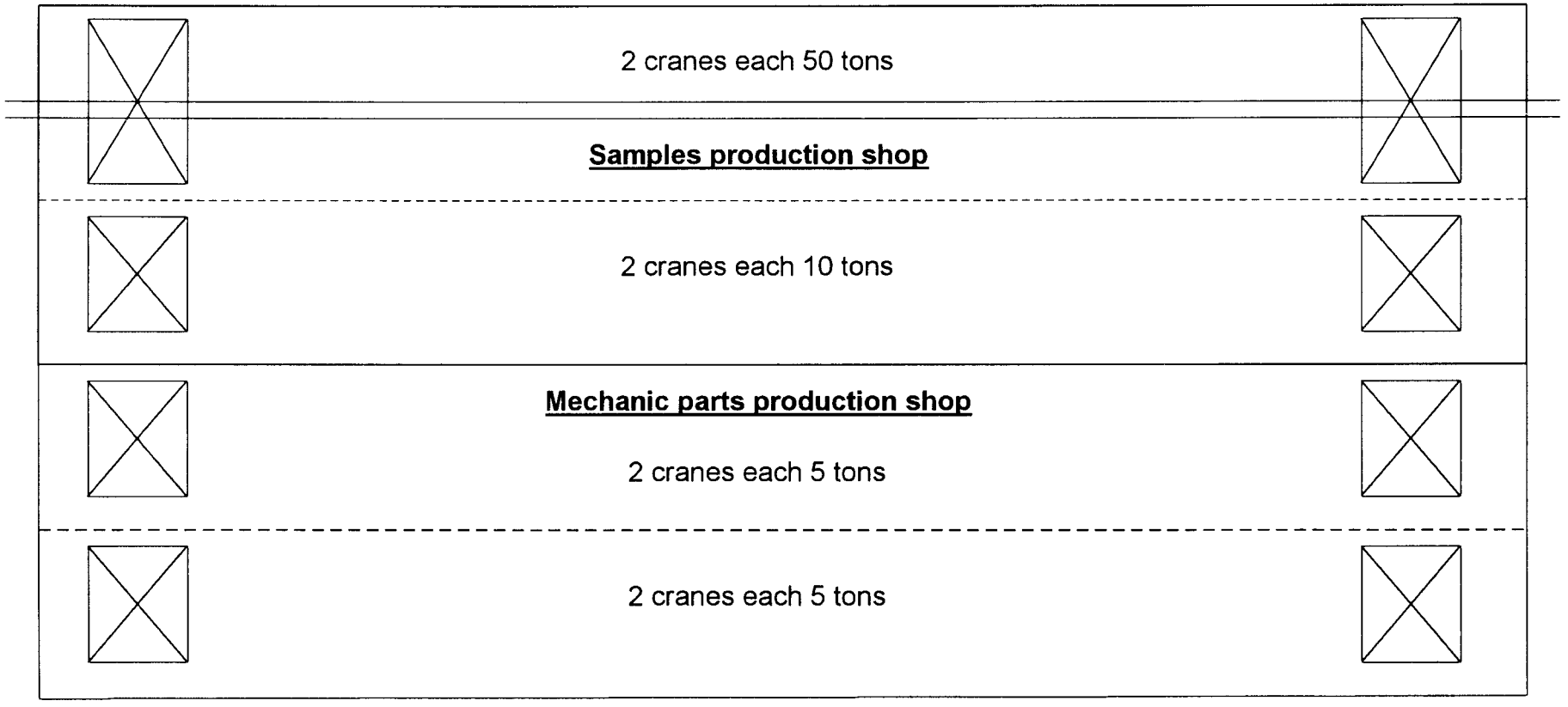


Annex 6.5-14

TECF - Locomotive mechanic parts production hall

Overview (within the corpus No. 5)

lenght 120 m, width 96 m, square about 12,000 m²



Annex 6.5-14

Needed reconstruction works for the Locomotive mechanic parts production hall

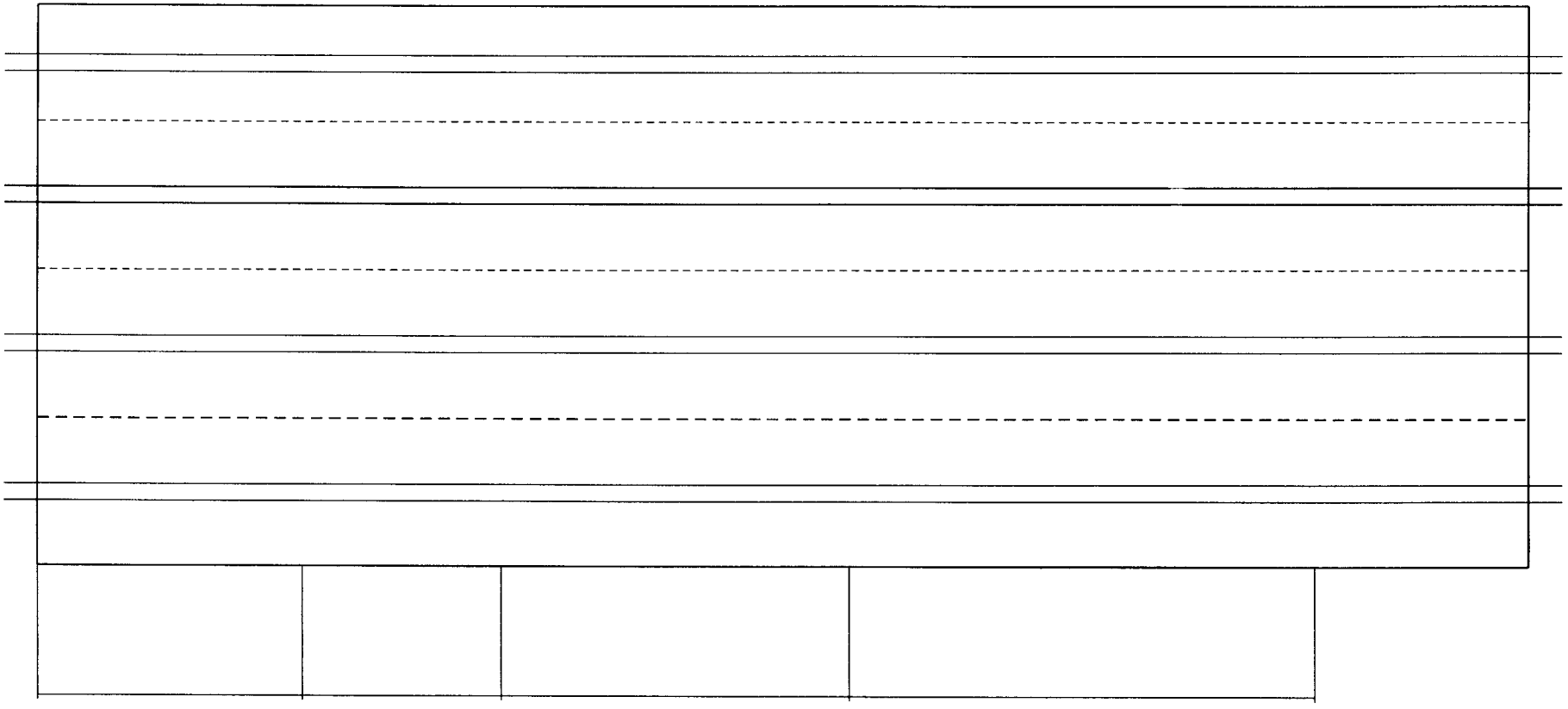
work		price per unit	price (US$)
1	**Civil construction,** 12,000m² (good condition)		
1.1	capital repair of roof and overlights, rain tubes, etc.	12 US$ per m²	144,000
1.2	cleaning and colouring of doors, windows, floors incl. occasionally repair	10% of 1.1	14,400
2	**Installations**		
2.1	repair of lighting and heating systems	all 20% of 1.1	28,800
3	**General equipment**		
3.1	technical inspection of cranes and small repairs	5,000 per crane	40,000
3.2	repair of crane tracks	5% of 1.1	4,800
4	**Equipment in the mechanic parts production shop**		
4.1	repair, capital repair, occasionally repair of different turning lathes		100,000
4.2	to procure new special tools		20,000
4.3	to procure new testing instruments		10,000
	Total		**362,000**

Annex 6.5-15

TECF - Locomotive painting hall

Overview (within the corpus No. 4 B)

lenght 128 m, width 36 m, square about 4,600 m², all tracks with canals



Annex 6.5-15

Needed reconstruction works for the Locomotive painting hall

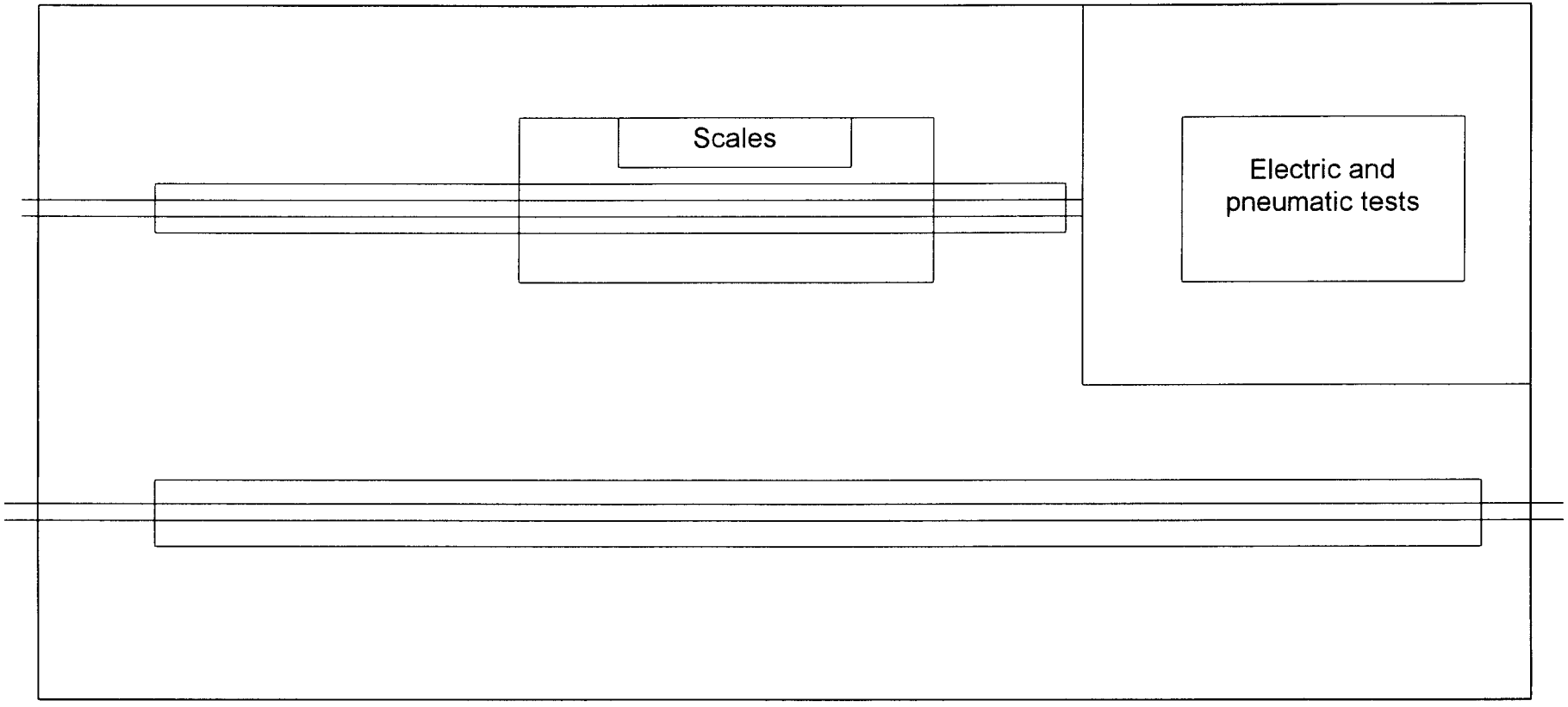
work		price per unit	price (US$)
1	**Civil construction,** 4,600m²		
1.1	capital repair of roof and overlights, rain tubes, etc.	15 US$ per m²	69,000
1.2	cleaning and colouring of doors, windows, floors incl. occasionally repair	10% of 1.1	6,900
2	**Installations**		
2.1	tracks occasionally repair		
2.2	cleaning, colouring of canals, repair canals lighting		
2.3	repair of lighting and heating systems	all 20% of 1.1	13,800
3	**Equipment in the painting hall**		
3.1	repair of the painting systems		20,000
3.2	technical inspection of the ecologic saving system, small repairs		10,000
	Total		**119,700**

Annex 6.5-16

TECF - Locomotive complete testing hall

Overview (within the corpus No. 11)

lenght 60 m, width 24 m, square about 1,440 m², all tracks with canals



Annex 6.5-16

Needed reconstruction works for the Locomotice testing hall

work		price per unit	price (US$)
1	**Civil construction,** 1,440m²		
1.1	capital repair of roof and overlights, rain tubes, etc.	15 US$ per m²	21,600
1.2	cleaning and colouring of doors, windows, floors incl. occasionally repair	10% of 1.1	2,160
2	**Installations**		
2.1	tracks occasionally repair		
2.2	cleaning, colouring of canals, repair canals lighting		
2.3	repair of lighting and heating systems	all 20% of 1.1	4,320
3	**Equipment in the testing hall**		
3.1	capital repair of the scales systems		30,000
3.2	renewing repair of the complete testing field		100,000
3.3	to procure some new testing instruments		20,000
	Total		**178,080**

Annex 6.5-17

Establishment of a wheelset repair shop in the Tbilisi Electro-Locomotive Factory (TECF)

Equipment needed for locomotive repair inside the locomotive production workshop with costs

No.	type	number	price (US$)
1	gear wheel burnishing lathe	1	200,000.00
2	wheel centre press	1	160,000.00
3	axle roller press machine	1	100,000.00
4	axle planing machine	1	150,000.00
5	wheelset counterbalancing machine	1	250,000.00
6	wheelset borer	1	200,000.00
7	wheelset adzing lathe	1	100,000.00
8	washing cabin for electro-locomotives	1	1,000,000.00
9	planning and preparation work	1	500,000.00
	Total costs		2,650,000.00

Annex 6.5-18

Technical terms of modernised electric locomotives for Caucasus region

terms	AGZD	GRZD	ARM
gauge (mm)	1.520	1.520	1.520
axles order	3o + 3o	2(BoBo)	2(BoBo)
axles	6	8	8
axle load (t)	23	23	23
total load (t)	138	184	184
voltage (kV,dc),nominal	3,000	3,000	3,000
motor	6	8	8
motor type	asynchron	asynchron	asynchron
installed power (MW), permanent	4.200	6.500	4.200
installed power per motor (kW), permanent	700	815	575
starting power (kN)		500	614
speed, max (km/h)	120	120	120
wheels diameter (mm)	1,250	1,250	1,250
length (m)	18	32.8	32
mechanic brake	brake shoes	brake shoes	brake shoes
rheostatic brake	yes	yes	yes
coupler	Russian centric coupler	Russian centric coupler	Russian centric coupler
min. curves radius (m)	250	250	180
min. curves radius (m) in mountain regions		150	
2 locos gross train load (t), 6%0		5,000	4,000
2 locos gross train load (t), 29%0		3,500	3,200
3 locos gross train load (t), 29%0		5,000	
heating	yes	yes	yes
wheels lubrication in curves	yes	yes	yes
terms of power faults	Russian, 3 kV,dc	Russian, 3 kV,dc	Russian, 3 kV,dc

Annex 6.5-19

Goal directions of potential participants for the foundation of a Telecommunication Operating Company

	Goals	Goal	GRZD	ARM	AGZD	TP
1	setting up an efficient infrastructure	E T	M	M	M	--
2	guaranteeing the transport and operational safety of rail transport	T E	M	M	M	C
3	increasing the capacity of the rail network	T E	C	C	C	C
4	employing modern information technologies (e.g. enquiry services)	T E	M	M	M	C
5	fitting the main lines with modern optical fibre cables	T	C	C	C	M
6	installing modern communication systems	T E	M	M	M	M
7	providing transmission paths for signalling technology and the management	T E	M	M	M	--
8	increasing the reliability of rail transport	T E	M	M	M	C
9	reducing energy consumption	E P	C	C	C	--
10	rehabilitation of the secondary line network	E	C	C	C	C
11	marketing services in the telecommunications area	E	C	C	C	C

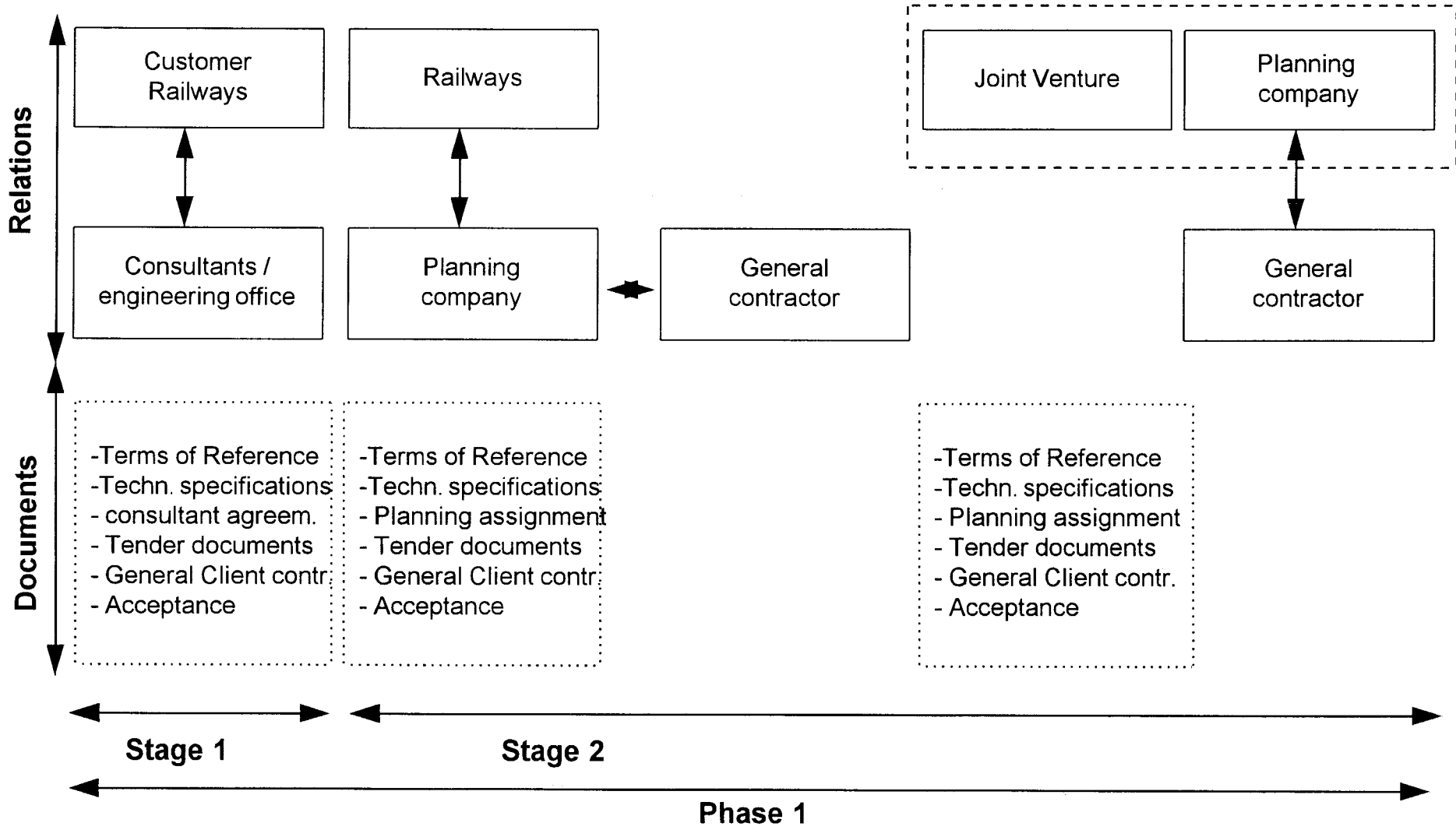
P - political goal
E - economic goal
T - technological goal

C - Can - goal
M - Must - goal

TP - technology partner
-- - not relevant

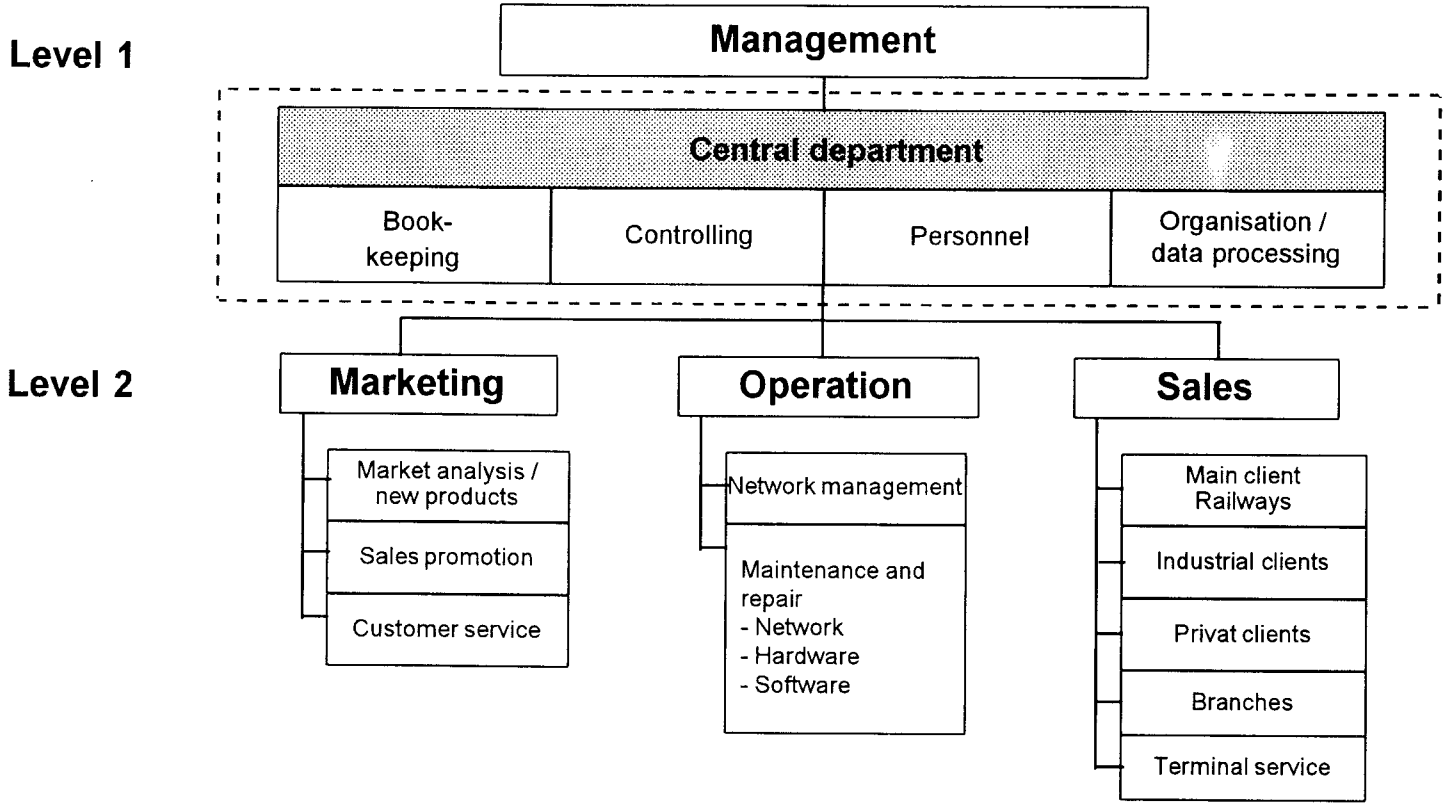
Annex 6.5-20

Stage description of management strategy for telecommunications



Annex 6.5-21

Telecommunication Operating Company Organisation



Costs and revenues of the concrete sleeper plants - case 1

Production costs

Case 1: Demand for sleepers corresponding to unrestricted sleeper replacement programme

Initial replacement programme 1999-2002:	for the Armenian network	83,000	sleepers/year
	for the Georgian network	200,000	"
	for the Azerbaijan network	250,000	"
Routine replacement:	about 86% of above figures		

Source of figures: technical part (section 6.5.1)				Sleeper factory of Georgia US$	Sleeper factory of Azerbaijan US$
Variable costs per sleeper					
Cost of materials (including VOSSLOH fastening), energy and consumables as given in technical part, however cost of electricity multiplied by the following factors to arrive at the real cost price:					
Georgia	2.0				
Azerbaijan	1.5				
				34.54	33.74
Add transport costs of additives:					
Georgia	14% of		3.49 US$	0.49	
Azerbaijan	14% of		2.33 US$		0.33
Total variable costs (per sleeper)				35.03	34.07
Fixed and partly fixed costs (annual amounts), excluding interests					
Personnel					
Gross average cost per employee:			250 US$ /month		
Number of workers for one shift			23		
Total annual personnel cost for operation in 2 shifts:				138,000	138,000
			Investm.cost US$		
Depreciation of machinery	6.00%	p.a. of	6,000,000	360,000	360,000
Depreciation of buildings	3.00%	p.a. of	1,000,000	30,000	
	3.00%	p.a. of	500,000		15,000
Maintenance of machinery	2.00%	p.a. of	6,000,000	120,000	120,000
Maintenance of buildings	2.00%	p.a. of	1,000,000	20,000	
	2.00%	p.a. of	500,000		10,000
Administrative staff	5		250 US$ /month	15,000	15,000
Other administrative costs (estimate)				100,000	100,000
Total fixed and partly fixed costs for operation in 2 shifts (per year)				783,000	758,000
Production cost per sleeper at an annual production of sleepers, excl. interests:			243,000	38.25 US$	37.19 US$

Costs and revenues of the concrete sleeper plants

Annex 6.5-22

Cash flow Georgian sleeper plant (unrestricted sleeper replacement programme)

Basis: Production of the requirements of the Railways of the three countries as stated in the technical report, performed by the two plants at equal parts

Year	Equipment & buildings US$'000	Working capital 1) US$'000	Number of sleepers produced	Fixed expens excl.interests US$'000	Costs addit. shifts 2) US$'000	Variable costs US$'000	Total cur.exp. excl.interests US$'000	Interests 3) US$'000	Profit tax (20% of prof. US$'000	Loan received US$'000	Loan repay-ments 3) US$'000	Sales at 40$ piece ex fact. US$'000	Cash flow A 4) US$'000	Cash flow A cumulated US$'000	Cash flow B 5) US$'000
1997															
1998	7,000.0	2,585.1						479.3		9,585.1			-479.3	-479.3	-9,585.1
1999			283,000	393.0	34.5	9,913.1	10,340.6	671.0	61.7			11,320.0	246.8	-232.5	979.4
2000			283,000	393.0	34.5	9,913.1	10,340.6	671.0	61.7			11,320.0	246.8	14.3	979.4
2001			283,000	393.0	34.5	9,913.1	10,340.6	671.0	61.7			11,320.0	246.8	261.0	979.4
2002			283,000	393.0	34.5	9,913.1	10,340.6	671.0	61.7			11,320.0	246.8	507.8	979.4
2003			243,000	393.0		8,511.9	8,904.9	671.0	28.8		639.0	9,720.0	-523.7	-16.0	815.1
2004			243,000	393.0		8,511.9	8,904.9	626.2	37.8		639.0	9,720.0	-488.0	-503.9	815.1
2005			243,000	393.0		8,511.9	8,904.9	581.5	46.7		639.0	9,720.0	-452.2	-956.1	815.1
2006			243,000	393.0		8,511.9	8,904.9	536.8	55.7		639.0	9,720.0	-416.4	-1,372.5	815.1
2007			243,000	393.0		8,511.9	8,904.9	492.0	64.6		639.0	9,720.0	-380.6	-1,753.1	815.1
2008			243,000	393.0		8,511.9	8,904.9	447.3	73.5		639.0	9,720.0	-344.8	-2,097.9	815.1
2009			243,000	393.0		8,511.9	8,904.9	402.6	82.5		639.0	9,720.0	-309.0	-2,406.9	815.1
2010			243,000	393.0		8,511.9	8,904.9	357.8	91.4		639.0	9,720.0	-273.2	-2,680.2	815.1
2011			243,000	393.0		8,511.9	8,904.9	313.1	100.4		639.0	9,720.0	-237.5	-2,917.6	815.1
2012			243,000	393.0		8,511.9	8,904.9	268.4	109.3		639.0	9,720.0	-201.7	-3,119.3	815.1
2013			243,000	393.0		8,511.9	8,904.9	223.7	118.3		639.0	9,720.0	-165.9	-3,285.2	815.1
2014			243,000	393.0		8,511.9	8,904.9	178.9	127.2		639.0	9,720.0	-130.1	-3,415.3	815.1
2015			243,000	393.0		8,511.9	8,904.9	134.2	136.2		639.0	9,720.0	-94.3	-3,509.6	815.1
	(residual values near 0)														

Internal rate of return: 6.00%

1) ¼ of expenses in the first year (excl. interests)
2) for work at 13.2% more than 2 shifts: 25% of the normal staff cost in two shifts = 34,500 $ per year
3) Constant repayments, interest 7% of the borrowed capital (covering the rehabilitation costs and the working capital) less repayments, duration 20 years, of which grace period 5 years; in 1998 3.0% p.a. interest during construction time (1 year) of part of the loan not yet used and 7.0% of part used, i.e. on average 5.0% of total loan
4) Cashflow A = overall financial cashflow (= loan received - repayments + sales - investments in fixed assets - investments in working capital - current expenses other than interests - interests - profit tax)
5) Cashflow B = cashflow showing the teturn on investment (= sales - investment in fixed assets - investment in working capital - current expenses other than interests)

Costs and revenues of the concrete sleeper plants

Cash flow Azerbaijan sleeper plant (unrestricted sleeper replacement programme)

Basis: Production of the requirements of the Railways of the three countries as stated in the technical report, performed by the two plants at equal parts

Year	Equipment & buildings US$'000	Working capital 1) US$'000	Number of sleepers produced	Fixed expens excl.interests US$'000	Costs addit. shifts * US$'000	Variable costs US$'000	Total cur.exp. excl.interests US$'000	Interests 5) US$'000	Profit tax (20% of prof. US$'000	Loan received US$'000	Loan repay-ments 3) US$'000	Sales at 40$ piece ex fact. US$'000	Cash flow A 4) US$'000	Cash flow A cumulated US$'000	Cash flow B 5) US$'000
1997															
1998	6,500.0	2,224.9						436.2		8,724.9			-436.2	-436.2	-8,724.9
1999			250,000	383.0		8,516.6	8,899.6	610.7	97.9			10,000.0	391.8	-44.5	1,100.5
2000			250,000	383.0		8,516.6	8,899.6	610.7	97.9			10,000.0	391.8	347.3	1,100.5
2001			250,000	383.0		8,516.6	8,899.6	610.7	97.9			10,000.0	391.8	739.1	1,100.5
2002			250,000	383.0		8,516.6	8,899.6	610.7	97.9			10,000.0	391.8	1,130.8	1,100.5
2003			215,000	383.0		7,324.2	7,707.2	610.7	56.4		581.7	8,600.0	-356.0	774.8	892.8
2004			215,000	383.0		7,324.2	7,707.2	570.0	64.5		581.7	8,600.0	-323.5	451.3	892.8
2005			215,000	383.0		7,324.2	7,707.2	529.3	72.7		581.7	8,600.0	-290.9	160.4	892.8
2006			215,000	383.0		7,324.2	7,707.2	488.6	80.8		581.7	8,600.0	-258.3	-97.9	892.8
2007			215,000	383.0		7,324.2	7,707.2	447.9	89.0		581.7	8,600.0	-225.7	-323.6	892.8
2008			215,000	383.0		7,324.2	7,707.2	407.2	97.1		581.7	8,600.0	-193.2	-516.8	892.8
2009			215,000	383.0		7,324.2	7,707.2	366.4	105.3		581.7	8,600.0	-160.6	-677.4	892.8
2010			215,000	383.0		7,324.2	7,707.2	325.7	113.4		581.7	8,600.0	-128.0	-805.5	892.8
2011			215,000	383.0		7,324.2	7,707.2	285.0	121.6		581.7	8,600.0	-95.5	-900.9	892.8
2012			215,000	383.0		7,324.2	7,707.2	244.3	129.7		581.7	8,600.0	-62.9	-963.8	892.8
2013			215,000	383.0		7,324.2	7,707.2	203.6	137.8		581.7	8,600.0	-30.3	-994.1	892.8
2014			215,000	383.0		7,324.2	7,707.2	162.9	146.0		581.7	8,600.0	2.3	-991.8	892.8
2015			215,000	383.0		7,324.2	7,707.2	122.1	154.1		581.7	8,600.0	34.8	-957.0	892.8
	(residual values near 0)														

Internal rate of return: 9.00%

1) ¼ of expenses in the first year (excl. interests)
2) nil
3) Constant repayments, interest 7% of the borrowed capital (covering the rehabilitation costs and the working capital) less repayments, duration 20 years, of which grace period 5 years; in 1998 3.0% p.a. interest during construction time (1 year) of part of the loan not yet used and 7.0% of part used, i.e. on average 5.0% of total loan
4) Cashflow A = overall financial cashflow (= loan received - repayments + sales - investments in fixed assets - investments in working capital - current expenses other than interests - interests - profit tax)
5) Cashflow B = cashflow showing the teurn on investment (= sales - investment in fixed assets - investment in working capital - current expenses other than interests)

Costs and revenues of the concrete sleeper plants - case 2

Production costs

Case 2: Demand for sleepers reduced against the unrestricted sleeper replacement programme

Initial replacement programme 1999-2002:	for the Armenian network	75,000 sleepers/year
	for the Georgian network	130,000 "
	for the Azerbaijan network	180,000 "
Routine replacement:	about 86% of above figures	

Source of figures: technical part (section 6.5.1)

				Sleeper factory of Georgia US$	Sleeper factory of Azerbaijan US$
Variable costs per sleeper					
Cost of materials (including VOSSLOH fastening), energy and consumables as given in technical part, however cost of electricity multiplied by the following factors to arrive at the real cost price:					
Georgia	2.0				
Azerbaijan	1.5				
				34.54	33.74
Add transport costs of additives:					
Georgia	14% of	3.49 US$		0.49	
Azerbaijan	14% of	2.33 US$			0.33
Total variable costs (per sleeper)				35.03	34.07
Fixed and partly fixed costs (annual amounts), excluding interests					
Personnel					
Gross average cost per employee:		250 US$ /month			
Number of workers for one shift		23			
Total annual personnel cost for operation in 1 shift:				69,000	69,000
			Investm.cost US$		
Depreciation of machinery	6.00% p.a. of		6,000,000	360,000	360,000
Depreciation of buildings	3.00% p.a. of		1,000,000	30,000	
	3.00% p.a. of		500,000		15,000
Maintenance of machinery	2.00% p.a. of		6,000,000	120,000	120,000
Maintenance of buildings	2.00% p.a. of		1,000,000	20,000	
	2.00% p.a. of		500,000		10,000
Administrative staff	5	250 US$ /month		15,000	15,000
Other administrative costs (estimate)				100,000	100,000
Total fixed and partly fixed costs for operation in 2 shifts (per year)				714,000	689,000
Production cost per sleeper at an annual production of sleepers, excl. interests:			176,000	39.09 US$	37.98 US$

Costs and revenues of the concrete sleeper plants

Cash flow Georgian sleeper plant (reduced demand for sleepers against the unrestricted sleeper replacement programme)

Year	Equipment & buildings US$'000	Working capital 1) US$'000	Number of sleepers produced	Fixed expens excl.interests US$'000	Costs addit. shifts 2) US$'000	Variable costs US$'000	Total cur.exp. excl.interests US$'000	Interests 3) US$'000	Profit tax (20% of prof. US$'000	Loan received US$'000	Loan repay-ments 3) US$'000	Sales at 40$ piece ex fact. US$'000	Cash flow A 4) US$'000	Cash flow cumulated US$'000	Cash flow B 5) US$'000
1997															
1998	7,000.0	1,893.5						444.7		8,893.5			-444.7	-444.7	-8,893.5
1999			205,000	393.0		7,180.9	7,573.9	622.5	0.7			8,200.0	2.9	-441.8	626.1
2000			205,000	393.0		7,180.9	7,573.9	622.5	0.7			8,200.0	2.9	-438.9	626.1
2001			205,000	393.0		7,180.9	7,573.9	622.5	0.7			8,200.0	2.9	-436.0	626.1
2002			205,000	393.0		7,180.9	7,573.9	622.5	0.7			8,200.0	2.9	-433.2	626.1
2003			176,000	393.0		6,165.0	6,558.0	622.5	-28.1		592.9	7,040.0	-705.4	-1,138.5	482.0
2004			176,000	393.0		6,165.0	6,558.0	581.0	-19.8		592.9	7,040.0	-672.2	-1,810.7	482.0
2005			176,000	393.0		6,165.0	6,558.0	539.5	-11.5		592.9	7,040.0	-639.0	-2,449.6	482.0
2006			176,000	393.0		6,165.0	6,558.0	498.0	-3.2		592.9	7,040.0	-605.8	-3,055.4	482.0
2007			176,000	393.0		6,165.0	6,558.0	456.5	5.1		592.9	7,040.0	-572.5	-3,627.9	482.0
2008			176,000	393.0		6,165.0	6,558.0	415.0	13.4		592.9	7,040.0	-539.3	-4,167.3	482.0
2009			176,000	393.0		6,165.0	6,558.0	373.5	21.7		592.9	7,040.0	-506.1	-4,673.4	482.0
2010			176,000	393.0		6,165.0	6,558.0	332.0	30.0		592.9	7,040.0	-472.9	-5,146.4	482.0
2011			176,000	393.0		6,165.0	6,558.0	290.5	38.3		592.9	7,040.0	-439.7	-5,586.1	482.0
2012			176,000	393.0		6,165.0	6,558.0	249.0	46.6		592.9	7,040.0	-406.5	-5,992.7	482.0
2013			176,000	393.0		6,165.0	6,558.0	207.5	54.9		592.9	7,040.0	-373.3	-6,366.0	482.0
2014			176,000	393.0		6,165.0	6,558.0	166.0	63.2		592.9	7,040.0	-340.1	-6,706.1	482.0
2015			176,000	393.0		6,165.0	6,558.0	124.5	71.5		592.9	7,040.0	-306.9	-7,013.1	482.0
	(residual values near 0)														

Internal rate of return: 1.5%

1) ¼ of expenses in the first year (excl. interests)
2) nil
3) Constant repayments, interest 7% of the borrowed capital (covering the rehabilitation costs and the working capital) less repayments, duration 20 years, of which grace period 5 years; in 1998 3.0% p.a. interest during construction time (1 year) of part of the loan not yet used and 7.0% of part used, i.e. on average 5.0% of total loan
4) Cashflow A = overall financial cashflow (= loan received - repayments + sales - investments in fixed assets - investments in working capital - current expenses other than interests - interests - profit tax)
5) Cashflow B = cashflow showing the teturn on investment (= sales - investment in fixed assets - investment in working capital - current expenses other than interests)

Costs and revenues of the concrete sleeper plants

Cash flow Azerbaijan sleeper plant (reduced demand for sleepers against the unrestricted sleeper replacement programme)

Year	Equipment & buildings US$'000	Working capital 1) US$'000	Number of sleepers produced	Fixed expens excl.interests US$'000	Costs addit. shifts * US$'000	Variable costs US$'000	Total cur.exp. excl.interests US$'000	Interests 5) US$'000	Profit tax (20% of prof. US$'000	Loan received US$'000	Loan repay-ments 3) US$'000	Sales at 40$ piece ex fact. US$'000	Cash flow A 4) US$'000	Cash flow A cumulated US$'000	Cash flow B 5) US$'000
1997															
1998	6,500.0	1,620.1						406.0		8,120.1			-406.0	-406.0	-8,120.1
1999			180,000	348.5		6,131.9	6,480.4	568.4	30.2			7,200.0	120.9	-285.1	719.6
2000			180,000	348.5		6,131.9	6,480.4	568.4	30.2			7,200.0	120.9	-164.1	719.6
2001			180,000	348.5		6,131.9	6,480.4	568.4	30.2			7,200.0	120.9	-43.2	719.6
2002			180,000	348.5		6,131.9	6,480.4	568.4	30.2			7,200.0	120.9	77.8	719.6
2003			155,000	348.5		5,280.3	5,628.8	568.4	0.6		541.3	6,200.0	-539.1	-461.3	571.2
2004			155,000	348.5		5,280.3	5,628.8	530.5	8.1		541.3	6,200.0	-508.8	-970.1	571.2
2005			155,000	348.5		5,280.3	5,628.8	492.6	15.7		541.3	6,200.0	-478.4	-1,448.5	571.2
2006			155,000	348.5		5,280.3	5,628.8	454.7	23.3		541.3	6,200.0	-448.1	-1,896.6	571.2
2007			155,000	348.5		5,280.3	5,628.8	416.8	30.9		541.3	6,200.0	-417.8	-2,314.5	571.2
2008			155,000	348.5		5,280.3	5,628.8	378.9	38.5		541.3	6,200.0	-387.5	-2,702.0	571.2
2009			155,000	348.5		5,280.3	5,628.8	341.0	46.0		541.3	6,200.0	-357.2	-3,059.1	571.2
2010			155,000	348.5		5,280.3	5,628.8	303.2	53.6		541.3	6,200.0	-326.9	-3,386.0	571.2
2011			155,000	348.5		5,280.3	5,628.8	265.3	61.2		541.3	6,200.0	-296.6	-3,682.6	571.2
2012			155,000	348.5		5,280.3	5,628.8	227.4	68.8		541.3	6,200.0	-266.2	-3,948.8	571.2
2013			155,000	348.5		5,280.3	5,628.8	189.5	76.4		541.3	6,200.0	-235.9	-4,184.7	571.2
2014			155,000	348.5		5,280.3	5,628.8	151.6	83.9		541.3	6,200.0	-205.6	-4,390.3	571.2
2015			155,000	348.5		5,280.3	5,628.8	113.7	91.5		541.3	6,200.0	-175.3	-4,565.6	571.2

(residual values near 0)

Internal rate of return: 4.5%

1) ¼ of expenses in the first year (excl. interests)
2) nil
3) Constant repayments, interest 7% of the borrowed capital (covering the rehabilitation costs and the working capital) less repayments, duration 20 years, of which grace period 5 years; in 1998 3.0% p.a. interest during construction time (1 year) of part of the loan not yet used and 7.0% of part used, i.e. on average 5.0% of total loan
4) Cashflow A = overall financial cashflow (= loan received - repayments + sales - investments in fixed assets - investments in working capital - current expenses other than interests - interests - profit tax)
5) Cashflow B = cashflow showing the teturn on investment (= sales - investment in fixed assets - investment in working capital - current expenses other than interests)

Costs and proceeds of the locomotive shop (TECF)

Proceeds including material costs*

Optimistic scenario

Source of figures: Annexes 4.2.6-1a to 4.2.6-3b and 6.5-10
Amounts in 1,000 US$
Figures for 1997 added to those of 1998

Year	Locomotives of Armenian Railways			Locomotives of Azerbaijan Railways			Locomotives of Georgian Railways			Locomotives of 3 Caucasian railways			
	Re-equipping	Maintenance	Total	Re-equipping	Maintenance	Total	Re-equipping	Maintenance	Total	Re-equipping	Maintenance	Total	
1998		575.0	575.0		1,868.8	1,868.8		1,521.5	1,521.5		3,965.3	3,965.3	
1999		575.0	575.0		2,568.8	2,568.8		1,521.5	1,521.5		4,665.3	4,665.3	
2000		575.0	575.0		2,868.8	2,868.8		1,521.5	1,521.5		4,965.3	4,965.3	
2001	1,320.0	575.0	1,895.0	960.0	3,068.8	4,028.8	3,900.0	1,521.5	5,421.5	6,180.0	5,165.3	11,345.3	**
2002	1,320.0	281.5	1,601.5	960.0	319.9	1,279.9	3,900.0	347.6	4,247.6	6,180.0	949.0	7,129.0	
2003	1,320.0	281.5	1,601.5	960.0	319.9	1,279.9	3,900.0	347.6	4,247.6	6,180.0	949.0	7,129.0	
2004	1,320.0	281.5	1,601.5	960.0	319.9	1,279.9	3,900.0	347.6	4,247.6	6,180.0	949.0	7,129.0	
2005	1,320.0	281.5	1,601.5	960.0	319.9	1,279.9	3,900.0	347.6	4,247.6	6,180.0	949.0	7,129.0	
2006	1,320.0	53.4	1,373.4	1,620.0	319.9	1,939.9	1,200.0	471.1	1,671.1	4,140.0	844.4	4,984.4	
2007	1,320.0	53.4	1,373.4	1,620.0	319.9	1,939.9	1,200.0	471.1	1,671.1	4,140.0	844.4	4,984.4	
2008	1,320.0	53.4	1,373.4	1,620.0	319.9	1,939.9	1,200.0	471.1	1,671.1	4,140.0	844.4	4,984.4	
2009	1,320.0	53.4	1,373.4	1,620.0	319.9	1,939.9	1,200.0	471.1	1,671.1	4,140.0	844.4	4,984.4	
2010	1,320.0	53.4	1,373.4	1,620.0	319.9	1,939.9	1,200.0	789.8	1,989.8	4,140.0	1,163.1	5,303.1	
2011		412.5	412.5		625.0	625.0	1,080.0	640.3	1,720.3	1,080.0	1,677.8	2,757.8	
2012		412.5	412.5		625.0	625.0	1,080.0	640.3	1,720.3	1,080.0	1,677.8	2,757.8	
2013		412.5	412.5		625.0	625.0	1,080.0	640.3	1,720.3	1,080.0	1,677.8	2,757.8	
2014		412.5	412.5		625.0	625.0	1,080.0	640.3	1,720.3	1,080.0	1,677.8	2,757.8	
2015		412.5	412.5		625.0	625.0	1,080.0	640.3	1,720.3	1,080.0	1,677.8	2,757.8	

* The material component of above revenues is about 60% on average

** This high amount comes from an overlapping of backlog repairs and the starting re-equipping programme; the locomotive shop willnot have major problems in handling this peak.

Costs and proceeds of the locomotive shop (TECF)

Costs and revenues net of direct materials

Optimistic scenario

Source of figures: Annex 6.5-10
Amounts in 1,000 US$

Year	Value of exist.assets	Rehabilitation of the shops	Working capital 1)	Labour 2)	Energy 3)	Administrat. expenses 4)	Interests 5)	Profit tax (20% of prof.)	Loan received	Loan interest + repaym. 5)	Gross margin 6)	Cash flow A 7)	Cash flow cumulated	Cash flow B 8)
1997									6.177,4			6.177,4	6.177,4	
1998	10.000,0	5.582,6	594,8	900,0	396,5	119,0	308,9	0,0			1.586,1	-6.315,6	-138,2	-6.006,7
1999				900,0	466,5	140,0	432,4	0,0			1.866,1	-72,8	-211,0	359,6
2000				900,0	496,5	149,0	432,4	1,6			1.986,1	6,6	-204,5	440,6
2001				900,0	1.134,5	340,4	432,4	346,2			4.538,1	1.384,6	1.180,2	2.163,2
2002				900,0	712,9	213,9	432,4	118,5			2.851,6	473,9	1.654,1	1.024,8
2003				900,0	712,9	213,9	432,4	118,5		411,8	2.851,6	62,1	1.716,2	1.024,8
2004				900,0	712,9	213,9	403,6	124,2		411,8	2.851,6	85,2	1.801,3	1.024,8
2005				900,0	712,9	213,9	374,8	130,0		411,8	2.851,6	108,2	1.909,6	1.024,8
2006				900,0	498,4	149,5	345,9	20,0		411,8	1.993,7	-331,9	1.577,6	445,8
2007				900,0	498,4	149,5	317,1	25,7		411,8	1.993,7	-308,9	1.268,7	445,8
2008				900,0	498,4	149,5	288,3	31,5		411,8	1.993,7	-285,8	982,9	445,8
2009				900,0	498,4	149,5	259,4	37,3		411,8	1.993,7	-262,8	720,2	445,8
2010				900,0	530,3	159,1	230,6	60,2		411,8	2.121,2	-170,8	549,3	531,8
2011				900,0	275,8	82,7	201,8	0,0		411,8	1.103,1	-769,0	-219,7	-155,4
2012				900,0	275,8	82,7	173,0	0,0		411,8	1.103,1	-740,2	-959,9	-155,4
2013				900,0	275,8	82,7	144,1	0,0		411,8	1.103,1	-711,4	-1.671,3	-155,4
2014				900,0	275,8	82,7	115,3	0,0		411,8	1.103,1	-682,5	-2.353,8	-155,4
2015				900,0	275,8	82,7	86,5	0,0		411,8	1.103,1	-653,7	-3.007,5	-155,4
	(residual values near 0)													

Internal rate of return excluding existing assets: 7,8%

1) ¼ of the material costs, which represent 60% of total proceeds
2) 500 employees at an average monthly gross cost of 150 US$/month
3) 10% of gross receipts
4) 3% of gross receipts; including consultancies and expatriate staff from the technology partner (up to 2010)
5) Constant annuities, interest 7% of the borrowed capital (covering the rehabilitation costs and the working capital) less repayments, duration 20 years, of which grace period 5 years
6) Revenue net of direct material costs (= 40% of gross revenue)
7) Cashflow A = overall financial cashflow (= loan received - repayments + sales - investments in fixed assets - investments in working capital - current expenses other than interests - interests - profit tax)
8) Cashflow B = cashflow showing the teturn on investment (= sales - investment in fixed assets - investment in working capital - current expenses other than interests)

Costs and proceeds of the locomotive shop (TECF)

Proceeds including material costs*

Pessimistic scenario

Source of figures: Annexes 4.2.6-1a to 4.2.6-3b and 6.5-10
Amounts in 1,000 US$
Figures for 1997 added to those of 1998

Year	Locomotives of Armenian Railways			Locomotives of Azerbaijan Railways			Locomotives of Georgian Railways			Locomotives of 3 Caucasian railways			
	Re-equipping	Maintenance	Total	Re-equipping	Maintenance	Total	Re-equipping	Maintenance	Total	Re-equipping	Maintenance	Total	
1998		575.0	575.0		1,368.8	1,368.8		318.3	318.3	0.0	2,262.0	2,262.0	
1999		575.0	575.0		1,368.8	1,368.8		318.3	318.3	0.0	2,262.0	2,262.0	
2000		575.0	575.0		1,368.8	1,368.8		318.3	318.3	0.0	2,262.0	2,262.0	
2001	1,320.0	575.0	1,895.0	960.0	1,368.8	2,328.8	3,300.0	318.3	3,618.3	5,580.0	2,262.0	7,842.0	**
2002	1,320.0	281.5	1,601.5	960.0	293.0	1,253.0	3,300.0	318.3	3,618.3	5,580.0	892.7	6,472.7	
2003	1,320.0	281.5	1,601.5	960.0	293.0	1,253.0	3,300.0	318.3	3,618.3	5,580.0	892.7	6,472.7	
2004	1,320.0	281.5	1,601.5	960.0	293.0	1,253.0	3,300.0	318.3	3,618.3	5,580.0	892.7	6,472.7	
2005	1,320.0	281.5	1,601.5	960.0	293.0	1,253.0	3,300.0	318.3	3,618.3	5,580.0	892.7	6,472.7	
2006	1,320.0	281.5	1,601.5	1,620.0	293.0	1,913.0	1,200.0	318.3	1,518.3	4,140.0	892.7	5,032.7	
2007	1,320.0	281.5	1,601.5	1,620.0	293.0	1,913.0	1,200.0	318.3	1,518.3	4,140.0	892.7	5,032.7	
2008	1,320.0	281.5	1,601.5	1,620.0	293.0	1,913.0	1,200.0	318.3	1,518.3	4,140.0	892.7	5,032.7	
2009	1,320.0	281.5	1,601.5	1,620.0	293.0	1,913.0	1,200.0	318.3	1,518.3	4,140.0	892.7	5,032.7	
2010	1,320.0	281.5	1,601.5	1,620.0	293.0	1,913.0	1,200.0	318.3	1,518.3	4,140.0	892.7	5,032.7	
2011		312.5	312.5		178.4	178.4	1,320.0	265.6	1,585.6	1,320.0	756.5	2,076.5	
2012		312.5	312.5		178.4	178.4	1,320.0	265.6	1,585.6	1,320.0	756.5	2,076.5	
2013		312.5	312.5		178.4	178.4	1,320.0	265.6	1,585.6	1,320.0	756.5	2,076.5	
2014		312.5	312.5		178.4	178.4	1,320.0	265.6	1,585.6	1,320.0	756.5	2,076.5	
2015		312.5	312.5		178.4	178.4	1,320.0	265.6	1,585.6	1,320.0	756.5	2,076.5	

* The material component of above revenues is about 60% on average

** This high amount comes from an overlapping of backlog repairs and the starting re-equipping programme; the locomotive shop willnot have major problems in handling this peak.

Costs and proceeds of the locomotive shop (TECF)

Costs and revenues net of direct materials

Pessimistic scenario

Source of figures: Annex 6.5-10
Amounts in 1,000 US$

Year	Value of exist.assets	Rehabilitatio of the shops	Working capital 1)	Labour 2)	Energy 3	Administrat. expenses 4)	Interests 5)	Profit tax (20% of prof.	Loan received	Loan repay-ments 5)	Gross margin 6)	Cash flow A 7)	Cash flow cumulated	Cash flow B 8)
1997									5,921.9			5,921.9	5,921.9	
1998	10,000.0	5,582.6	339.3	900.0	226.2	67.9	296.1	0.0			904.8	-6,507.2	-585.4	-6,211.1
1999				900.0	226.2	67.9	414.5	0.0			904.8	-703.8	-1,289.1	-289.3
2000				900.0	226.2	67.9	414.5	0.0			904.8	-703.8	-1,992.9	-289.3
2001				900.0	784.2	235.3	414.5	160.6			3,136.8	642.2	-1,350.7	1,217.3
2002				900.0	647.3	194.2	414.5	86.6			2,589.1	346.5	-1,004.2	847.6
2003				900.0	647.3	194.2	414.5	86.6		394.8	2,589.1	-48.3	-1,052.5	847.6
2004				900.0	647.3	194.2	386.9	92.1		394.8	2,589.1	-26.2	-1,078.7	847.6
2005				900.0	647.3	194.2	359.3	97.7		394.8	2,589.1	-4.1	-1,082.8	847.6
2006				900.0	503.3	151.0	331.6	25.4		394.8	2,013.1	-293.0	-1,375.8	458.8
2007				900.0	503.3	151.0	304.0	31.0		394.8	2,013.1	-270.9	-1,646.8	458.8
2008				900.0	503.3	151.0	276.4	36.5		394.8	2,013.1	-248.8	-1,895.6	458.8
2009				900.0	503.3	151.0	248.7	42.0		394.8	2,013.1	-226.7	-2,122.3	458.8
2010				900.0	503.3	151.0	221.1	47.5		394.8	2,013.1	-204.6	-2,326.9	458.8
2011				900.0	207.7	62.3	193.4	0.0		394.8	830.6	-927.6	-3,254.4	-339.3
2012				900.0	207.7	62.3	165.8	0.0		394.8	830.6	-899.9	-4,154.4	-339.3
2013				900.0	207.7	62.3	138.2	0.0		394.8	830.6	-872.3	-5,026.7	-339.3
2014				900.0	207.7	62.3	110.5	0.0		394.8	830.6	-844.7	-5,871.4	-339.3
2015				900.0	207.7	62.3	82.9	0.0		394.8	830.6	-817.0	-6,688.4	-339.3

(residual values near 0)

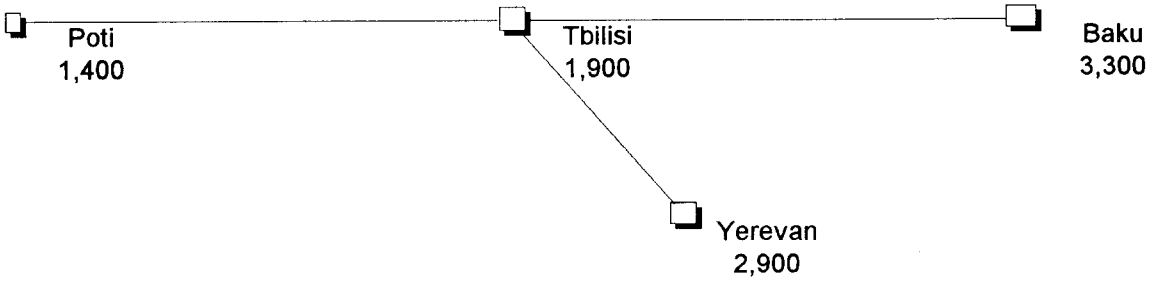
Internal rate of return excluding existing assets: negative

1) ¼ of the material costs, which represent 60% of total proceeds
2) 500 employees at an average monthly gross cost of 150 US$/month
3) 10% of gross receipts
4) 3% of gross receipts; including consultancies and expatriate staff from the technology partner (up to 2010)
5) Constant annuities, interest 7% of the borrowed capital (covering the rehabilitation costs and the working capital) less repayments, duration 20 years, of which grace period 5 years
6) Revenue net of direct material costs (= 40% of gross revenue)
7) Cashflow A = overall financial cashflow (= loan received - repayments + sales - investments in fixed assets - investments in working capital - current expenses other than interests - interests - profit tax)
8) Cashflow B = cashflow showing the teturn on investment (= sales - investment in fixed assets - investment in working capital - current expenses other than interests)

Costs and revenues of the telecommunication systems

Basis of calculation

Distribution pattern of the commercial connexions:



This would make a total of 9.500 connexions, of which are

3,300 in Georgia
3,300 in Azerbaijan
2,900 in Armenia

It is assumed that the telecommunication administrations pay the Railways a contribution oriented to the potential receipts, which are

	20	US$ per month per connexion as a fixed fee
+	90	US$ per month per connexion, being half the average use related fee*
=	110	US$ per month per connexion

= per year	for Georgian Railways	4,356,000 US$
	for Azerbaijan Railways	4,356,000 US$
	for Armenian Railways	3,828,000 US$

This level will be reached gradually over a period of 5 years, starting with 50% in 2003, along with the building up of the cable system on the main lines.

* One half of the connexions belong to administration and business, the other half to private households. Telephone bills (use related fees) of administration and business are five times higher than those of private households.

Average use related fee paid by households	60 US$ per month net of VAT
Average use related fee paid by admin. and business	300 US$ per month net of VAT
Weighted average per connexion:	180 US$ per month net of VAT

Costs and revenues of the telecommunication systems (contind.)

According to chapter 4.1.2, the investments for the telecommunication systems are scheduled as follows:

Year	Georgian R. US$'000	Azerbaij. R US$'000	Armenian R. US$'000
1998	2,791.5	2,489.8	1,645.0
1999	2,791.5	2,489.8	1,645.0
2000	1,492.0	2,551.0	1,815.0
2001	1,492.0	2,551.0	1,815.0
2002	1,492.0	2,551.0	1,815.0
2003	1,492.0	2,551.0	1,815.0
2004	1,492.0	2,551.0	1,815.0
2005	1,826.0	2,077.4	1,268.2
2006	1,826.0	2,077.4	1,268.2
2007	1,826.0	2,077.4	1,268.2
2008	1,826.0	2,077.4	1,268.2
2009	1,826.0	2,077.4	1,268.2
2010	1,826.0	2,077.4	1,268.2
2011	1,826.0	2,077.4	1,268.2
2012	1,826.0	2,077.4	1,268.2
2013	1,826.0	2,077.4	1,268.2
2014	1,826.0	2,077.4	1,268.2
2015			

It is proposed that EU finances the following parts of above costs as a grant:

1998	2,791.5	2,489.8	1,645.0
1999	2,291.5	2,489.8	1,645.0
2000		877.0	577.5
2001			
Total	5,083.0	5,856.5	3,867.5
=ECU'000	4,600.0	5,300.0	3,500.0

1 ECU =
1.105 US$

Costs and revenues of the telecommunication systems (contind.)

Considering the current expenses (especially those for maintenance), the cashflows of the 3 Railways regarding telecommunication would therefore be as follows:

Georgian Railways

Year	Investment expenses (net of EU grant) US$'000	Receipts from telecom administr. US$'000	Expenses for maintenance, energy and operation * US$'000	Cashflow before profit tax US$'000	Cashflow after profit tax (20%) ** US$'000	Cumulated cashflow US$'000
1998	0.0		0.0	0.0	0.0	0.0
1999	500.0		139.6	-639.6	-639.6	-639.6
2000	1,492.0		279.2	-1,771.2	-1,771.2	-2,410.7
2001	1,492.0		353.8	-1,845.8	-1,845.8	-4,256.5
2002	1,492.0		428.4	-1,920.4	-1,920.4	-6,176.8
2003	1,492.0	2,613.6	503.0	618.7	288.0	-5,888.9
2004	1,492.0	3,049.2	577.6	979.7	590.3	-5,298.6
2005	1,826.0	3,484.8	652.2	1,006.7	558.7	-4,739.9
2006	1,826.0	3,920.4	743.5	1,351.0	850.7	-3,889.2
2007	1,826.0	4,356.0	834.8	1,695.3	1,142.8	-2,746.4
2008	1,826.0	4,356.0	926.1	1,604.0	1,086.3	-1,660.1
2009	1,826.0	4,356.0	1,017.4	1,512.7	1,029.9	-630.2
2010	1,826.0	4,356.0	1,108.7	1,421.4	973.4	343.2
2011	1,826.0	4,356.0	1,200.0	1,330.1	917.0	1,260.2
2012	1,826.0	4,356.0	1,291.3	1,238.8	860.5	2,120.8
2013	1,826.0	4,356.0	1,382.6	1,147.5	804.1	2,924.9
2014	1,826.0	4,356.0	1,473.9	1,056.2	747.7	3,672.5
2015	0.0	4,356.0	1,565.2	2,790.9	2,517.2	6,189.8
		IRR=		13.91%		

* 5% of the investments implemented so far (including those financed by the EU grant)

** Profit is the difference between the receipts, the expenses of the previous column and the depreciation of the investments implemented so far (including those financed by the EU grant) at the rate of 4.545% p.a. (average time life assumed 22 years).

Costs and revenues of the telecommunication systems (contind.)

Azerbaijan Railways

Year	Investment expenses (net of EU grant) US$'000	Receipts from telecom administr. US$'000	Expenses for maintenance, energy and operation * US$'000	Cashflow before profit tax US$'000	Cashflow after profit tax (20%) ** US$'000	Cumulated cashflow US$'000
1998	0.0		0.0	0.0	0.0	0.0
1999	0.0		124.5	-124.5	-124.5	-124.5
2000	1,674.0		249.0	-1,923.0	-1,923.0	-2,047.5
2001	2,551.0		376.5	-2,927.5	-2,927.5	-4,975.0
2002	2,551.0		504.1	-3,055.1	-3,055.1	-8,030.1
2003	2,551.0	2,613.6	631.6	-569.0	-850.6	-8,880.7
2004	2,551.0	3,049.2	759.2	-261.0	-581.0	-9,461.6
2005	2,077.4	3,484.8	886.7	520.7	162.3	-9,299.3
2006	2,077.4	3,920.4	990.6	852.4	446.5	-8,852.8
2007	2,077.4	4,356.0	1,094.5	1,184.1	730.8	-8,122.0
2008	2,077.4	4,356.0	1,198.3	1,080.3	666.6	-7,455.4
2009	2,077.4	4,356.0	1,302.2	976.4	602.4	-6,853.0
2010	2,077.4	4,356.0	1,406.1	872.5	538.2	-6,314.9
2011	2,077.4	4,356.0	1,509.9	768.7	474.0	-5,840.9
2012	2,077.4	4,356.0	1,613.8	664.8	409.7	-5,431.2
2013	2,077.4	4,356.0	1,717.7	560.9	345.5	-5,085.7
2014	2,077.4	4,356.0	1,821.6	457.0	281.3	-4,804.3
2015	0.0	4,356.0	1,925.4	2,430.6	2,294.5	-2,509.8
		IRR=		1.75%		

* 5% of the investments implemented so far (including those financed by the EU grant)

** Profit is the difference between the receipts, the expenses of the previous column and the depreciation of the investments implemented so far (including those financed by the EU grant) at the rate of 4.545% p.a.(average time life assumed 22 years).

Costs and revenues of the telecommunication systems (contind.)

Armenian Railways

Year	Investment expenses (net of EU grant) US$'000	Receipts from telecom administr. US$'000	Expenses for maintenance, energy and operation * US$'000	Cashflow before profit tax US$'000	Cashflow after profit tax (20%) ** US$'000	Cumulated cashflow US$'000
1998	0.0		0.0	0.0	0.0	0.0
1999	0.0		82.3	-82.3	-82.3	-82.3
2000	1,237.5		164.5	-1,402.0	-1,402.0	-1,484.3
2001	1,815.0		255.3	-2,070.3	-2,070.3	-3,554.5
2002	1,815.0		346.0	-2,161.0	-2,161.0	-5,715.5
2003	1,815.0	2,296.8	436.8	45.1	-247.6	-5,963.1
2004	1,815.0	2,679.6	527.5	337.1	2.6	-5,960.5
2005	1,268.2	3,062.4	618.3	1,176.0	799.5	-5,161.0
2006	1,268.2	3,445.2	681.7	1,495.3	1,066.6	-4,094.4
2007	1,268.2	3,828.0	745.1	1,814.7	1,333.6	-2,760.8
2008	1,268.2	3,828.0	808.5	1,751.3	1,294.4	-1,466.4
2009	1,268.2	3,828.0	871.9	1,687.9	1,255.2	-211.2
2010	1,268.2	3,828.0	935.3	1,624.5	1,216.0	1,004.8
2011	1,268.2	3,828.0	998.7	1,561.1	1,176.8	2,181.6
2012	1,268.2	3,828.0	1,062.1	1,497.7	1,137.6	3,319.2
2013	1,268.2	3,828.0	1,125.5	1,434.3	1,098.4	4,417.6
2014	1,268.2	3,828.0	1,188.9	1,370.9	1,059.2	5,476.8
2015	0.0	3,828.0	1,252.4	2,575.7	2,288.2	7,765.0
		IRR=		15.05%		

* 5% of the investments implemented so far (including those financed by the EU grant)

** Profit is the difference between the receipts, the expenses of the previous column and the depreciation of the investments implemented so far (including those financed by the EU grant) at the rate of 4.545% p.a.(average time life assumed 22 years).

Annex 6.6-1

Goal directions of potential participants for the foundation of Operating companies

	Goals	Goal	ARM	GRZD	AGZD	Poti Port	Baku Port	Casp Ship. Comp	TP
1	economical operation of container trains	E T	M	M	M	M	M	M	M
2	providing transport services in combined transport	T E	M	M	M	M	M	M	M
3	providing customer and market oriented transport service offers	P E	M	M	M	M	M	M	M
4	private service provider for all forwarding companies or other clients	P E	--	--	--	--	--	--	M
5	establishing a company for combined transport for rail - road -sea along the respective relation	T E	C	C	C	C	C	C	M
6	comprehensive service	E	M	M	M	M	M	C	C
7	increasing railway share in total container transport volume	P	M	M	M	--	--	--	--
8	reliable and inexpensive connection between conurbations	P E	C	C	C	C	C	C	--
9	offering a reasonably priced, permanently competitive alternative, to road transport	T E	M	M	M	--	--	--	M
10	improving environmental quality	P E	C	C	C	C	C	C	C
11	reducing overall transport costs along the main relations	P	M	M	M	M	M	C	C
12	increasing the competitiveness of the relations as compared to alternative routes for transit traffic	P E	C	C	C	C	C	C	C
13	increasing the economic significance of transportation services for the GDP	E P	C	C	C	--	--	C	--

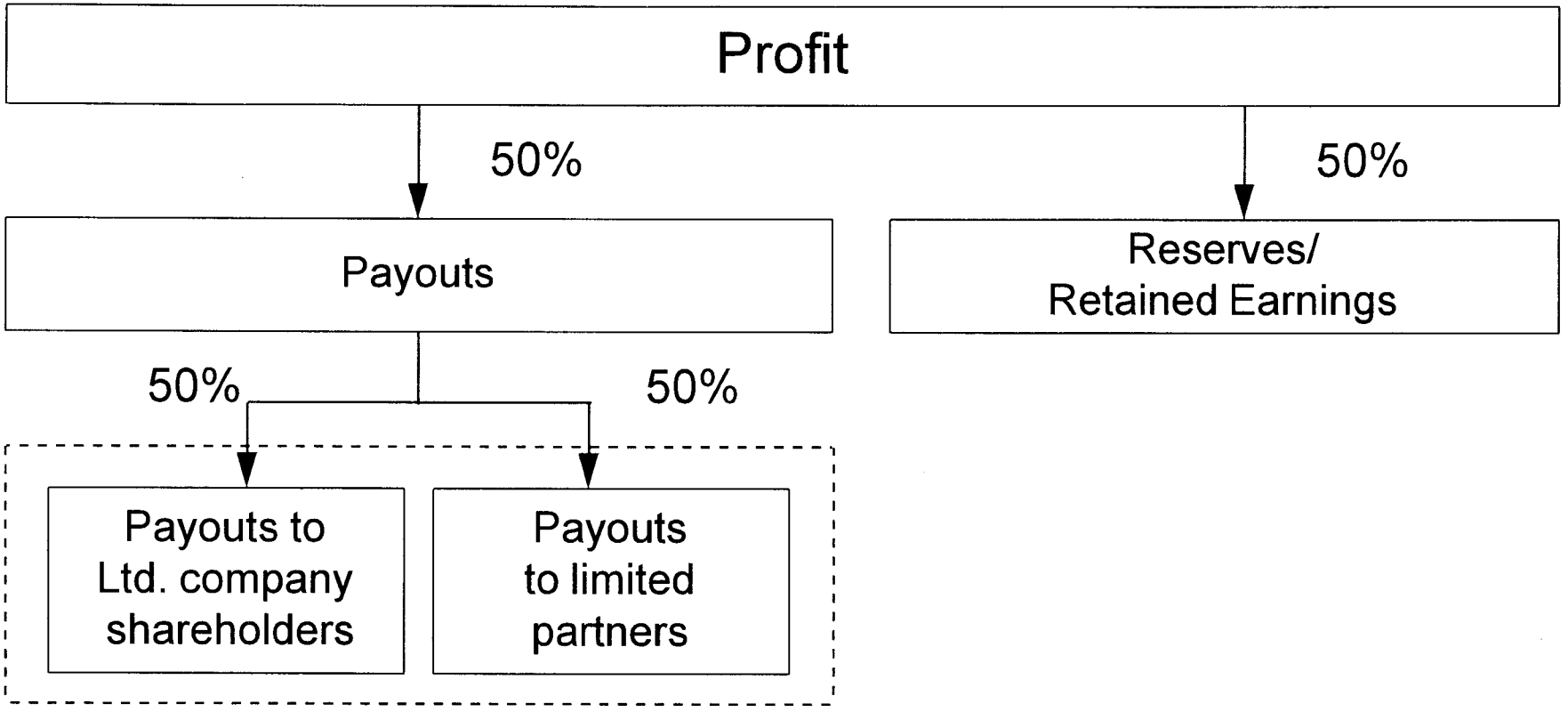
P - political goal
E - economic goal
T - technological goal

C - Can - goal
M - Must - goal

TP - technology partner
-- - not relevant

Annex 6.6-2

Distribution of profits within the limited company in a limited partnership



Cash flow for operating companies (container trains)

1. Georgian - Armenian Joint Venture for the operation of a container train between Poti and Yerevan, via Tbilisi

Assumptions
Distance about 650 km
Average duration of a rotation at present conditions: 10 days (of which Poti - Yerevan 6 days).
Average duration of a rotation with new operating company: 4 days (of which Poti - Yerevan 2 days)
One train has 30 wagons with a carrying capacity of 3 TEU* each.
There is varying degree of utilisation of the capacity of the train; the average supposed is 75%.
From their final destination, which is generally Yerevan, the major percentage of the containers are returned empty. For simolification, it is supposed that this is the case for all of them. It is further supposed that the number of containers transported is about the same in both directions.

Cost considerations of the Railways (price arrangement on a per-container basis)

Costs and possible cost savings of the railways

Mean total costs of the railways (for the two considered railways, at real costs as stated in the overall cost calculation in section 5 (scenario 2, year 2000)**)	0.05295	US$/t.km
of which variable	0.01010	US$/t.km
It can be assumed that due to the intervention of the private operating company and related increased business, the railways will save part of this costs.		
A saving of 10.0% of the total costs =	0.00530	US$/t.km
is assumed, although a higher percentage should be achievable.		

Price charged by the railways

The railway`s basis of billing and acounting for a loaded container is 20 t/TEU (the average cargo weight being only 12 - 13 t /TEU) and half that for an empty one.		
20 + 10 / 2 =	15.00	t
In line with the proposals for an increase of the tariffs under section 5 and under 6.1.2, it is supposed that the railway`s charge for this roundtrip is 1.5 times the present rate (of 450 US$ for a loaded container and half that amount for an empty one), with however giving a discount corresponding to the saved costs	1,316,250	t.km.
of 0.00530 US$/t.km x 15.00 x 1,300 =	103.25	US$/TEU*

which makes

	US$/TEU
One way loaded	675.00
Return empty	337.50
Both ways, average	1,012.50
Minus cost saving	103.25
=	909.25

Assessment of the railways` cost situation at various degrees of utilisation of the container trains

Calculation for a utilisation rate of 75% (assumed to be the normal average)

On the considered roundtrip Poti - Yerevan - Poti, having a lenghth of 650 x 2 = 1,300 km, a container train represents an accounted performance of		
15.00 x 1,300 x 30 x 3 x 0.75 =	1,316,250	t.km
(where 0.75 is the overall average degree of capacity utilisation).		
The corresponding variable costs are:	13,294	US$
At above rates, the proceeds of the railways from operating a container train with the Georgian - Armenian Joint Venture Company will be:		
909.25 x 3 x 30 x 0.75 =	61,374	US$

Calculation for a utilisation rate of 25%

If instead of a utilisation rate of 75% only one of 25% is achieved, the price to be paid to the railways for one train and one roundtrip is only 61,374 x (0.25/0.75) =	20,458	US$

This means that if a utilisation rate of only 25% is performed, the railways would still cover their variable costs; the agreement with the railways can therefore stipulate that the train shall work even if its capacity is utilized at only 1/3, which corresponds to 30 TEU*.

* TEU is for transport equivalent unit, which represents a 20 ft container or half a 40 ft container
** Present costs are lower

Cash flow for operating companies (container trains) 1. Georgian - Armenian Joint Venture (contind.)

Finding of a reasonable price level for the operating company
Note: Handling and other side costs which are the same for railway transport (with or without operating company) and for truck transport are not considered here.

Costs to the user of one roundtrip of one TEU* between Poti and Yerevan (empty container at the return)

			Present transport by train	US$	Transport by road	US$	Transp.by logist.express	US$
Calculation basis:								
Present tariff for normal transport (not special tariff for logistic train):	Rail, US$	Road, US$**						
One way (650 km)	675.00	487.50						
Return (650 km)	337.50	325.00						(reasonable price level)
Total freight	1012.50	812.50		1,012.50		812.50		1,000.00
Road user charges and fees						250.00		
Cost of time:								
Value of goods contained in a 20 ft container:	US$	Weight						
Beverages: 10.000 bottles à 0,50 US$ =	5,000	40%						
Consumer goods, average	5,000	30%						
Cigarettes 1 million packets à 0,30 US$ =	300,000	15%						
Other goods	3,000	15%						
Weighted average	48,950							
say	50,000							
Value of time for transport at an interest rate of 10% p.a. 50,000 x 10% x 1/365 = 13.70 US$ per day			(6 days)	82.19	(2 days)	27.40	(2 days)	27.40
Demurrage 30 US$ per day (in excess of 7 days for the roundtrip)			(3 days)	90.00				
Delivery to final destination				100.00				100.00
Unofficial costs, road fines (estimation)				100.00		100.00		0.00
Total				1,384.69		1,189.90		1,127.40

* TEU is for transport equivalent unit, which represents a 20 ft container or half a 40 ft container
** Net of value added tax, which can be deducted by the client

Cash flow for operating companies (container trains)
1. Georgian - Armenian Joint Venture (contind.)

Container traffic by rail to Armenia
The following numbers correspond to the traffic forecast (chapter 3.1), mean between optimistic and pessimistic

	Nr. of TEU per rail per year	of which by logist.express p. year (90%)
1997	1,795	1,615
1998	2,323	2,090
2000	3,379	3,041
2010	6,370	5,733
2015	7,963	7,166

The average number of containers transported by a train being
3 x 30 x 0,75 = 67.5 TEU*
above numbers correspond to respectively 31 trains in 1998, 45 in 2000, 85 in 2010 and 106 in 2015.

Gross margin per TEU (net of VAT):

	US$ / TEU*	US$ / TEU*
Revenue per TEU* and roundtrip =	1,000.00	
Minus price paid to the railways	909.25	
= gross margin per TEU*		90.75

Annual expenses

Personnel costs

Nr. of staff	Designation	Monthly gross unit cost, US $	Total annual cost, US $
2	Management team**	2,500	60,000
2	Dispatchers/forwarders	500	12,000
2	Accountants	500	12,000
2	Secretaries	200	4,800
8	Total		88,800

Operating and administrative costs

	per month US $	per year US $	
Room rents	3,000	36,000	
Travel costs	3,000	36,000	
Other costs	2,000	24,000	Total:
Total		96,000	184,800 US$ per year

* TEU is for transport equivalent unit, which represents a 20 ft container or half a 40 ft container

** Shared with the Georgian - Azerbaijan joint venture company; this amount, which is an average, includes an expatriate manager.

Cash flow for operating companies (container trains)
1. Georgian - Armenian Joint Venture (contind.)

Initial investment costs	US$
Office equipment	100,000
Computer system	50,000
Cost of establishment	50,000
	200,000

Cash flow

Year	Number of TEU	Expenses Investm. etc.* US$	Operating US$	Receipts US$	Profit tax (20% of prof.) US$	Cash flow US$	Cash flow, cumulated US$
1997		200,000				-200,000	-200,000
1998	2,090	173,791 **	184,800	189,709	982	-169,864	-369,864
1999	2,566		184,800	232,848	9,610	38,438	-331,425
2000	3,041		184,800	275,987	18,237	72,950	-258,475
2001	3,240		184,800	294,052	21,850	87,402	-171,073
2002	3,452		184,800	313,299	25,700	102,800	-68,274
2003	3,678		184,800	333,806	29,801	119,205	50,931
2004	3,919		184,800	355,656	34,171	136,685	187,616
2005	4,175		184,800	378,935	38,827	155,308	342,924
2006	4,449		184,800	403,738	43,788	175,151	518,075

* Covered by share capital
** Working capital for one month (1/12 of annual expenses and of annual payments to the railways)

Cash flow for operating companies (container trains)

2. Georgian - Azerbaijan Joint Venture for the operation of a container train between Poti and Baku (and also to Turkmenbashi)

Assumptions
Distance about 900 km
Average duration of a rotation at present conditions: 8 days (of which Poti - Baku 5 days).
Average duration of a roundtrip with new operating company: 4 days (of which Poti - Baku 2 days).
One train has 30 wagons with a carrying capacity of 3 TEU* each.
From their final destination, which is generally Baku (or one of the big towns in Turkmenistan and Uzbekistan), the major percentage of the containers are returned empty. For simplification, it is supposed that this is the case for all of them. It is further that the number of containers transported is about the same in both directions.

Note concerning the operation up to Turkmenbashi
No extra calculation is made for the containers continuing from Baku to Turkmenbashi (on wagons), as the costs of this transport will be charged to the clients without adding a major margin. It is supposed the commission which has to be granted by Caspian Shipping Lines will just cover the additional costs of this activity.

Cost considerations of the railways (price arrangement on a per-container basis)

Direct costs
Mean total costs of the railways (for the two considered railways, at real costs stated in the overall cost calculation in section 5 (scenario 2, year 2000)**) 0.03812 US$/t.km
of which variable 0.00962 US$/t.km
It can be assumed that due to the intervention of the private operating company and related increased business, the railways will save part of this costs.
A saving of 10.0% of the total costs = 0.00381 US$/t.km
is assumed, although a higher percentage should be achievable.

Price charged by the railways
The railway`s basis of billing and acounting for a loaded container is 20 t/TEU* (the average cargo weight being only 12 - 13 t /TEU) and half that for an empty one.
The average tonnage equivalent of one TEU* for one roundtrip is therefore
20 + 10 / 2 = 15.00 t
In line with the proposals for an increase of the tariffs under section 5 and under 6.1.2, it is supposed that the railway`s charge for this roundtrip is 1.5 times the present rate (of 678 US$ for a loaded container and half that amount for an empty one), with however giving a discount corresponding to the saved costs
of 0.00381 US$/t.km x 15.00 x 1,800 = 102.92 US$/TEU*
which makes

	US$/TEU
One way loaded	1,017.00
Return empty	508.50
Both ways, average	1,525.50
Minus cost saving	102.92
=	1,422.58

Assessment of the railways` cost situation at various degrees of utilisation of the container trains

Calculation for a utilisation rate of 75% (assumed to be the normal average)
On the considered roundtrip Poti - Baku - Poti, having a lenghth of 900 x 2 = 1,800 km, a container train represents a performance of
15.00 x 1,800 x 30 x 3 x 0.75 = 1,822,500 t.km
(where 0.75 is the overall average degree of capacity utilisation).
The corresponding variable costs are: 17,532 US$
At above rates, the proceeds of the railways from operating a container train with the Georgian - Azerbaijanian Joint Venture Company will be:
1,422.58 x 3 x 30 x 0.75 = 96,024 US$

Calculation for a utilisation rate of 25%
If instead of a utilisation rate of 75% only one of 25% is achieved, the price to be paid to the railways for one train and one roundtrip is only 96,024 x (0.25/0.75) = 32,008 US$

This means that if a utilisation rate of only 25% is performed, the railways would still largely cover their variable costs; the agreement with the railways can therefore stipulate that the train shall work even if its capacity is utilized at only 1/3, which corresponds to 30 TEU*.

* TEU is for transport equivalent unit, which represents a 20 ft container or half a 40 ft container
** Present costs are lower

Cash flow for operating companies (container trains) 2. Georgian - Azerbaijan Joint Venture (contind.)

Finding of a reasonable price level for the operating company
Note: Handling and other side costs which are the same for railway transport (with or without operating company) and for truck transport are not considered here.

Costs to the user of one roundtrip of one TEU between Poti and Baku (empty container at the return)

			Present transport by train	US$	Transport by road	US$	Transp. by logist.express	US$
Calculation basis:								
Present tariff for normal transport (not special tariff for logistic train):	Rail, US$	Road, US$**						
One way (900 km)	1,017	1,000						
Return (900 km)	509	500					(reasonable price level)	
Total freight	1,526	1,500		1,525.50		1,500.00		1,600.00
Road user charges and fees						450.00		
Cost of time:								
Value of goods contained in a 20 ft container:	US$	Weight						
Beverages: 10.000 bottles à 0,50 US$ =	5,000	40%						
Consumer goods, average =	5,000	30%						
Cigarettes 1 million packets à 0,30 US$ =	300,000	15%						
Other goods	3,000	15%						
Weighted average	48,950							
say	50,000							
Value of time for transport at an interest rate of 10% p.a. 50,000 x 10% x 1/365 = 13.70 US$ per day			(5 days)	68.49	(2 days)	27.40	(2 days)	27.40
Demurrage 30 US$ per day (in excess of 7 days)			(1 day)	30.00				
Delivery to final destination				100.00				100.00
Unofficial costs, road fines (estimation)				100.00		100.00		0.00
Total				1,823.99		2,077.40		1,727.40

* TEU is for transport equivalent unit, which represents a 20 ft container or half a 40 ft container
** Net of value times the price of the Railways

Cash flow for operating companies (container trains)
2. Georgian - Azerbaijan Joint Venture (contind.)

Container traffic by rail to Baku
The following numbers correspond to the traffic forecast (chapter 3.1), mean between optimistic and pessimistic

	Nr. of TEU* per rail per year			of which by logistic express p.year (90%)
	Poti - Baku	Poti - Baku - Turkmenbashi	Total	
1997	693	90	783	705
1998	1,202	359	1,561	1,404
2000	2,219	897	3,116	2,804
2010	4,723	1,466	6,189	5,570
2015	5,904	1,833	7,736	6,962

The average number of containers transported by a train being
3 x 30 x 0,75 = 67.5 TEU*,
above numbers correspond to respectively 23 trains in 1998, 46 in 2000, 92 in 2010 and 115 in 2015.

Gross margin per TEU (net of VAT):

	US$ / TEU*	US$ / TEU*
Revenue per TEU* and per roundtrip =	1,600.00	
Minus price paid to the Railways	1,422.58	
= gross margin per TEU*		177.42

For the costs and the revenues pertaining to the containers operated between Baku and Turkmenbashi: see the "note concerning the operation up to Turkmenbashi" at page 1 of this annex.

Annual expenses

Personnel costs

Nr. of staff	Designation	Monthly gross unit cost, US $	Total annual cost, US $
2	Management team**	2,500	60,000
3	Dispatchers/forwarders	500	18,000
2	Accountants	500	12,000
2	Secretaries	200	4,800
9	Total		94,800

Operating and administrative costs

	per month US $	per year US $	
Room rents	4,000	48,000	
Travel costs	4,000	48,000	
Other costs	3,000	36,000	Total:
Total		132,000	226,800 US$ per year

* TEU is for transport equivalent unit, which represents a 20 ft container or half a 40 ft container

** Shared with the Georgian - Armenian joint venture company; this amount, which is an average, includes an expatriate manager.

Cash flow for operating companies (container trains)
2. Georgian - Azerbaijan Joint Venture (contind.)

Initial investment costs	US$
Office equipment	100,000
Computer system	50,000
Cost of establishment	50,000
	200,000

Cash flow

Year	Number of TEU	Expenses Investm. etc. US$	Operating US$	Receipts US$	Profit tax (20% of prof.) US$	Cash flow US$	Cash flow, cumulated US$
1997		200,000				-200,000	-200,000
1998	1,404	185,395 **	226,800	249,183	4,477	-167,488	-367,488
1999	2,104		226,800	373,336	29,307	117,228	-250,260
2000	2,804		226,800	497,488	54,138	216,550	-33,709
2001	3,003		226,800	532,834	61,207	244,827	211,118
2002	3,217		226,800	570,691	68,778	275,113	486,231
2003	3,445		226,800	611,238	76,888	307,551	793,781
2004	3,690		226,800	654,666	85,573	342,293	1,136,074
2005	3,952		226,800	701,179	94,876	379,503	1,515,577
2006	4,233		226,800	750,997	104,839	419,358	1,934,935

* Covered by share capital

** Working capital for one month (1/12 of annual expenses and of payments to the railways)