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**RESTRUCTURING AND REVITALIZING THE KALININGRAD REGION*
(PHASE I-A)**

TF/RUS/94/001 and US/RUS/93/134

RUSSIAN FEDERATION

Technical report: Study on machine building and electronics sector**

Prepared for the Kaliningrad Administration
by the United Nations Industrial Development Organization

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Contents

	Page
Introduction	4
Executive Summary	5
Recommendations	7
1.0 Background	8
1.1 Objectives	8
1.2 Scope of Work	8
2.0 Present Situation	15
2.1 Facts	15
2.2 Current State	17
2.3 Analysis of Strengths and Weaknesses	19
3.0 Ambitions	23
4.0 Strategy and Development Areas	23
5.0 Project Concept	24
6.0 Specific Project Proposals	25
6.1 Development Programme Outline	25
6.2 Implementation	25
6.3 Notes on Project Proposals	26
7.0 Concluding Remarks	30

LIST OF TABLES

		Page
1.	Enterprises established 1945-56 (Section 1.3)	10
2.	Stage 2 Enterprises, established 1957-62 "	12
3.	Enterprises and Activity in 1990 "	14
4.	Production Type and Value 1994 (Section 2.1)	18
5.	Summary of Survey of Enterprises (Section 2.2)	22
6.	Enterprise Project Analysis (Appendix 4)	99

LIST OF APPENDICES

1.	Consultant Terms of Reference	31
2.	Respondents to the Survey	33
3.	Company Profiles :	35
	3.1 Gasautomatika	35
	3.2 Fakel	44
	3.3 Vagonostroitel	51
	3.4 Kvartz	58
	3.5 Baltkran	66
	3.6 Stroydormash	73
	3.7 Sudoremash	80
	3.8 Yantar Shipbuilding	88
4.	Preliminary Screening of Enterprise Projects	95
5.	Assistance Project Proposals	101
	5.1 Manufacturers' Association and Rationalisation	101
	5.2 Assistance with Enterprise Projects and Management Development	103
	5.3 Programme to Introduce ISO 9000 Accreditation.	105

INTRODUCTION

Russian industry is in deep crisis because of the breakdown of the former USSR economic system. To survive, all enterprises must look to new programmes, especially in the machine building and electronics industries, which are a major part of the Kaliningrad economy. The machine building and electronic industry development strategy is therefore important for the Kaliningrad region. The exceptional geopolitical position of Kaliningrad and its remoteness from sources of raw material must be taken into account.

This Report is concerned with the development of strategy for the sector. The work is undertaken within the 'Restructuring and Revitalisation of the Kaliningrad Region' programme (Phase 1), UNIDO Project US/RUS/93/134, March to October 1995. Following analysis of the sector, the prospects for the survival and development of the main mechanical engineering and electronic enterprises of the region are considered and actions proposed.

The Report covers the following content:

- Background
- Present situation
- Vision/Ambitions
- Strategies/Development Areas
- Project Concept
- Concrete Project Proposals
- Application.

Information has been obtained from official sources, media, expert evaluation and directly from staff of the enterprises, by means of both questionnaires and interviews.

EXECUTIVE SUMMARY

1. A survey of the Kaliningrad Region Machine Building and Electronics sector was carried out during June-August 1995, by a UNIDO consultant working closely with a national counterpart.
2. The work was carried out by a review of published data, detailed discussions with selected enterprises, government departments and institutions. Eight of the stronger enterprises were investigated in more detail.
3. The sector is made up of some 30 enterprises manufacturing a diverse range of products, embracing all levels of technical sophistication, from basic railway vehicles to positioning thrusters for advanced space craft. In former times, the sector employed some 40,000 staff, with a high proportion of engineers and technicians. University and college based vocational training is well established. Enterprises were generally smaller at 500-2,500 employees, with two exceptions than has been the practice in other regions of the FSU, promising greater flexibility for the future.
4. In the main, enterprises are well equipped in terms of productive plant and machinery which includes CNC types and some machines of western origin. A full range of casting, forging, metal fabrication, machining and assembly facilities exists in many firms. Good facilities exist for the production of Printed Circuit Boards. Whereas Russian GOST Standards apply, some firms have experience of Lloyds and Norske Veritas procedures and quality standards. Laboratory and testing facilities are generally good.
5. Although the sector has a sound, diversified manufacturing base, the general standard of product, with few exceptions, is unconvincing. Design details, appearance and surface finish can be improved by application and at low cost.
6. Because of the nature of the manufacturing processes undertaken, the impact of the sector on the environment is only slight. Metal melting is mostly by means of electric induction furnaces. Wastes, for example, from galvanising processes, are subject to disposal procedures, supervised by City authorities. Greater attention needs to be given to health hazards to operatives, in terms of protection of eyes, ears and lungs. Apart from intermittent demands for electric melting, the sector is a relatively low energy user.
7. With the decline in the domestic economy, most firms are working below 50% capacity and many, in the region of 15-20%, and suffer low productivity levels. Lack of 'live' cash in the system means that much effort is absorbed by the elaborate barter networks which have developed.
8. Despite these apparent incentives, progress in restructuring has been very slow. Organisations are cumbersome, top heavy and often unrelated to the new market conditions. Knowledge of markets and trends relating to the enterprises' main products is weak. The lack of understanding of the marketing concept is worsened by very limited international business experience.

9. Because the business fundamentals are not being addressed in any depth, the enterprises' plans for product development lack credibility. The companies need assistance in formulating forward strategies and preparing business and investment project plans. In the meantime, management effort is diluted by continuing social responsibility in terms of schools, housing, farms, guest houses and medical care.
10. In the former system, linkages related to parent organisations, such as Ministries or other combinats, often located in Moscow. Linkages between companies in the region are still almost non-existent, yet all face similar problems. There is a need for a strong local association which would represent the interests of the enterprises in terms of general policy, industry promotion, government relations and enable the most effective use of the combined manufacturing facilities.
11. The results of the survey show that with a determined programme to develop marketing and business planning competence, the sector can be successful in securing profitable growth for the future. With the involvement of foreign partners where appropriate, export prospects are attractive but the sector must also be ready to compete in its domestic market, as the Russian economy recovers.

RECOMMENDATIONS

To address the weaknesses in the sector, identified in the survey, a determined programme is needed both to complete the restructuring which is in its early phases, and to provide for sustainable development in the future. Such a programme should include:

At Industry level -

1. The establishment of an organisation representative of the interests of the sector, and through this;
2. Rationalisation of manufacturing facilities of the member enterprises to improve quality, utilisation and development prospects.

At Enterprise level -

3. Technical assistance in researching, evaluation, preparation and presentation of business plans and 'bankable' reports for the selected projects related to the enterprises - Baltkran, Kvartz, Vagonostroitel, Yantar and Stroydormash.
4. Provision of in-house training of managers in marketing, business planning and management accounting, using principally the vehicle of business planning above.

At Institutional level -

5. Development of distance learning in co-operation with the Technical University, for directors and Managers providing formal instruction in marketing, business planning, information systems and quality assurance.
6. Design and implementation of procedures enabling enterprises to be accredited to the international quality assurance standard ISO 9000.

Implementation

Since Kaliningrad has very few engineers and managers experienced in international engineering business, the assistance of the aid agencies should be sought to provide suitable experts. As in Phase 1 of Kaliningrad 2000, national counter-parts should work with the experts in carrying out the programme.

To regenerate forward momentum, the enterprises urgently need practical assistance in business planning and fund raising. Because of this urgency, we propose that recommendations 3 and 4 should be included in Phase 1B of the project.

1.0 BACKGROUND

1.1 Objectives

Regeneration of the mechanical engineering sector of the Kaliningrad region, on the basis of utilisation of competitive technology (see appendix 1). This key objective was addressed by:

- i) Identification of machine building and electronic industry product sectors, having development potential.
- ii) Development of an outline strategy for the development of the machine building and electronics sector.
- iii) Identification of strategic business projects and development of proposals for implementation to be achieved.

1.2 Scope of Work

The programme has covered:-

- Research in the general field of machine building and electronics industry, including:
 - Statistical data
 - Published data
 - Information obtained at enterprises (see Appendix 2)
 - Analysis of data provided by enterprises

Enterprises have been visited to obtain information through interviews and questionnaires. This information has been analysed, including aspect of:

- Statistics
- Finance
- Production
- Level of management and marketing
- Personnel
- Level of competitiveness
- Assessment of Strengths and Weaknesses

The findings of the survey provide the basis for:

- Evaluation of the present situation
- Strategic recommendations
- Specific enterprise projects.

1.3 History and Trends

During fifty years of Kaliningrad Region's existence, the machine building and electronics industry has undergone four stages, each different in their development phase, management method and results achieved.

Stage 1

1946-1956. A period of establishing and integrating with the main industrial complex of the USSR.

At that time, state industrial Ministries strove to use damaged German enterprises and other buildings for solving their departmental tasks, mainly the manufacture of articles, either not previously manufactured in the region, or in short supply.

A brief description of the then newly established machine building and metal working enterprises is shown in Table 1.

The only newly established activity which matched its facilities was for shipbuilding. The rest of the buildings and facilities were obsolete and not suitable for the allocated production.

In almost every case, the age of processing equipment, mechanical handling and power equipment was over 10-15 years old. During much of the period there was no delivery of new equipment, except the so-called 'special delivery' (equipment dismantled at German enterprises as retribution for war losses).

At first enterprises were staffed with skilled personnel and non-productive workers, transferred from other enterprises in the region. Later, non-production staff was drawn from High School graduates. 3-4 years later the enterprises had developed a capable staff, ready to manufacture the new higher quality articles such as for military ships, road equipment and lighting equipment. Production increased at an annual rate of 10-12%. At the end of this period, exports made up 5-8% of production. Technological levels in the enterprises corresponded to the general level of the country at that time. Machine building in the region was not integrated, each enterprise fulfilling only its own narrow, departmental tasks.

ENTERPRISES ESTABLISHED 1945 - 1956		TABLE 1	
ENTERPRISE TYPE	MINISTRY	SPECIFICATION OF LOCATION	PRODUCT SPECIFICATION
1 Shipbuilding	Minsudprom	Military Shipyard	Military Ships
2 Wagon building	Mintransmash	Small wagon manufacturing plant	Dump wagons. Electric lift trucks (since 1951)
3 Road Mechanical Engineering	Minstroidonnash	Steam Engine Repair plant	Boilers, Vibro-Rollers, Road Transporters
4 Paper Making Mech. Engineering	Minkhiznasmash	Artillery plant	Process plant and Equipment
5 Automobile Spare Parts	Minavtoprom	Cartridge Manufacturing plant	Spare Parts to ZIL Auto Plant
6 Trade Mechanical Engineering	Minlegpischemash	Military Hospital	Slot-machines, Electric Heaters and other Thermal Equipment and Devices
7 Foundry	Minstroj	Handycraft Shops	Tower Cranes, Travelling Gantry Cranes
8 Foundry	Minrybprom	Domestic Industry	Trawler Winches
9 Ship Repairing (Kaliningrad)	Minrybprom	Ship Repair Shops	Small and medium capacity Fishing Vessel Repair
10 Ship Repairing (Svetly)	Minrybprom	Vacant Site	Fishing Vessel Repair Facility
11 Nail and Wire Mesh Manufact'g	Minchermet	Accommodated Premises	Nails and Wire Mesh
12 Engine Laboratory	USSR Academy of Sciences	Premises of Shipbuilding Plant	Secret remit
13 Lighting Equipment	Minelektro	Accommodated Premises	Low Voltage Generators

Stage 2

1957-1962 - the period of industrial administration, by region. The Kaliningrad Soviet of National Economy was charged with the following tasks :-

- a) Increasing the volume of machine building production with a simultaneous increase in the level of technology;
- b) Creating additional employment, particularly for women workers, in the main industry of the region, i.e. fishing;
- c) Increasing machine building and electronic production participation in the regional development.

The Council of the National Economy led the work on organising new manufacturing through branch departments of the State Planning Commission. At that time all planning and financing of production development was carried out by the State Planning Commission. Emphasis was given to the production of high quality, labour intensive, metal economic products. New factories and design offices were established. (See Table 2).

As a rule, the newly created enterprises were based on unsuitable products; but unlike the first period, there now started the singling out of specialised technical areas. The most effective developments related to national programmes, e.g. machines for electronic component production and automated control devices for gas pipelines.

Newly organised central design offices were created with their own industrial experimental bases. At the electronic machine building enterprises, strong design groups were formed. Great attention was paid to improvement of the facilities and the tool making base of the engineering industry.

Specialised and increased production capacities for cast and forged components at the wagon building plant and Stroydormash supplied other enterprises. A centralised section for pit prop production was also created at Stroydormash.

The production of castings, including pressure die cast methods was specialised at the plants of the Trade machine building, Lighting engineering armature, Wagon building and Paper making equipment. The specialised production of plastic goods was started at the Sudzapchast plant producing spare parts for ships.

Specialised and fast developing tool making sections promoted increased productivity in manufacturing new products. The production growth rate during this period was 12-15% per annum, and for some new enterprises, up to 20%.

ENTERPRISES ESTABLISHED 1957 - 1962 **TABLE 2**

ENTERPRISE	SUB-SECTOR	MAIN PRODUCTION
1 Electronic/Mechanical Engineering	Electronic Equipment	Vacuum Pumps, Plasma Spraying
2 Gas Pipeline Automatic Equipment	Gas Industry	Automatic Equipment
3 "Microdvigatel"	Electrical Engineering	Motors for Domestic Equipment
4 Welding Equipment	Electrical Engineering	Welding Transformers, Resistance Welding Machines
5 High tech. Mechanical Eng'g	Kummunmash	Non-standard Equipment
6 Spare Parts for Ships	Fishing Industry	Fuel Equipment, Spare Parts for Diesel Engines
7 Central Design Office of Fishing Industry	Fishing Industry	Fish Dressing and Fish Packing Machines
8 Central Design Office (Electric Fork Lifts)	Electrical Engineering	Electrical Fork Lift Trucks

Stage 3

1962-1990, the return to national sector management. During this period progress in technical development between enterprises was irregular. High tech plants such as Kvarztz, Gazautomatika, Systema and Mikrodivigatel were developing faster as their engineering potential had been increased. A design office to produce equipment for the banking sector was established. The engine laboratory was turned into a unique space engineering design office for the Fakel company. The design office for the fishing industry equipment was transformed into Scientific Production Amalgamation Rybtekcentr. A design office for electric fork lifts was set up as VNII Elektrotransporta.

A considerable number of Kaliningrad machine building enterprises became leaders in their sector and some became single suppliers in the USSR system. This period saw the formation of Kaliningrad's contemporary capability in the machine building and electronic industry. The annual volume of production of goods of the sector reached Rs.760 m. (December 1989), production assets Rs.485.5 m. and employment numbers 43,000. Machine building in the region ranked second only to the fish processing industry. The enterprises' specialisation and numbers of employees are given in Table 3. This information gives an indication as to the scale, earlier capability and possible future scope of the industry.

Stage 4

From 1990 till now, as in the rest of Russia, there was a decline in industrial production and volumes were greatly reduced in 1994. In spite of financial difficulties at the Kaliningrad enterprises, work is continuing to finding ways to adapt to the new market economy.

SUMMARY MANUFACTURING ACTIVITY OF MACHINE BUILDING AND METAL WORKING ENTERPRISES IN KALININGRAD REGION (1990) TABLE 3

Enterprise	Volume of Production Rbs.'000	Numbers of Workers	Commodity	Production in Units or Rbs.'000
1 Yantar*	916,567	6,012	Military Vessels	n/a
			Fishing Vessel Repair	R 7,174
			Consumer Goods	R19,527
2 Vagonostroitel	151,149	2,331	Dump Wagons	2,626 units
			Electric Fork Lifts	1,853 "
			Consumer Goods	R2,919
3 Stroidormash	68,692	1,819	Military Eng. Equipment	
			Vibro-Rollers	1,200 units
			Consumer Goods	R6,549
4 Kaliningradbummash	18,154	1,242	Military Eng. Equipment	
			Equipment and Spare Parts for Wood-Pulp and Paper Industry	R10,265
			Consumer Goods	R2,542
5 Stroimekhanizatsii	36,624	623	Travelling Gantry Cranes	130 units
			Tower Cranes	60 "
6 Autoggregat	17,608	909	Automobile Spare Parts	R8,183
7 Technological Mechanical Eng.	17,184	1,155	Non-Standard Equipm't	
			Consumer goods	R4,750
8 Pilot Plant of Fishing Industry	16,678	796	Fishing Equipment	R13,698
9 Rybtekhcentr.	13,209	969	Fishing Equipment	R4,380
			Plastic Packaging for Consumer Goods	R2,681
10 Kvartz	187,709	8,606	Computers	R66,529
			Electronic Component Processing Equipment	R64,979
			Consumer Goods	R26,600
11 Fakel	1,593	2,465	Equipment for Space Ind	n/a
12 Soyuzgazautomatika	27,953	1,512	Automatic Devices for Gas Industry	n/a
13 Systema	47,745	2,458	Trade and Public Catering Equipment	R41,085
			Banking Equipment	n/a
			Consumer Goods	R6,800
14 Sudoremashautomatika	38,163	2,010	Fishing Equipment	R7,982
			Marine Control Equipment Repair	R10,614
			Consumer Goods	R2,010
15 Lighting Engineering Armature	65,488	2,730	Lighting Eng. Equipment	R52,353
			Low Voltage Equipment	n/a
			Consumer Goods	R1,163
16 Mikrodvigatel	57,353	1,757	Domestic Equipment	
			Motors	R33,897
17 Elektrosvarka	31,184	741	Electric Welding Equip't	6,660 units

Notes: * Statistics of 1992. Earlier data was not available.

1. by the end of 1990 from the base of KVARTZ, 3 independent enterprises were founded KARAT, AVANGARD, RADUGA, ISTOCHNIK. The volume of production of these amounted to R90m during the first half of 1991 Employees 3,009

2. 3 Firms produced metal goods (pumps, trade equipment, metal furniture) to the amount of about R.60m, of which consumer goods were R.22.3m.

2.0 PRESENT SITUATION

2.1 Facts

The machine building and electronics industry in Kaliningrad is of sufficient scale to have formed firm foundations. In aggregate this sector produces more than 16% of the total volume of regional output, and concentrates more than 15% of basic industrial funds. It includes about thirty large and medium scale enterprises, approximately 25% of the total number in the region and employs about 40% of the region's industrial production personnel.

Table 4 sets out the nomenclature of the products, scale of output and numbers of workers for the most significant enterprises in the sector. These enterprises relate to differing industry and product sub-sectors. Links with each other are weak and do not provide cohesion. In a number of products in mechanical and electronic production, Kaliningrad plays a leading role in Russia, for example in plasmic electro-jet engines, vacuum equipment for coating, machines for road surface repair, electric fork lift loaders, tower and travelling gantry cranes and equipment for banking mechanisation.

The major part of production is supplied to the Russian market - 60% to 100% for different companies. Deliveries in the region are minimal and generally not more than 1-2% of the total production volume. After losing markets in Eastern Europe, export deliveries are small. In 1992, exports of machines and equipment were little more than 3% of the total exports of the region.

Current demand from the Russian market for machine building in the Kaliningrad region does not utilise the available capability. In 1994 capacity utilisation for the major enterprises was as follows:

-	Vagonostroitel	30%
-	Stroydormash	60%
-	Kvartz	10-60%
-	Systema	40-96%
-	Fakel	up to 85%

There is therefore, scope to increase production volumes.

The suppliers of raw materials and accessories, like the main customers of these enterprises, are located outside the region. The machine building and electronic industry is not energy intensive, but there are no real power and water reserve resources. A solution is also needed for the disposal of galvanising process waste. The enterprises are served by adequate infrastructure. Rail and road communications and the availability of an ice-free port, minimises transportation expenses.

The sector has about 11,000 people employed in staff positions. Training courses are provided for mechanical qualifications at the Kaliningrad State Technical University (KSTU) and for technician qualifications at the Machine Building College. There are several research and design offices, including Fakel, VNII Elektrotransporta and Rybtekhcentr dealing with advanced technologies.

Table 4 illustrates that the machine building sector is made up of two groups of enterprises, differing from each other by their level of technology. The first group includes enterprises of mechanical engineering type, including basic and medium machine building, transport, construction and road building. As a rule the products of these enterprises are metal intensive and with relatively low labour content. Up to the beginning of the 1990s they prospered in both export and domestic markets. Some of these enterprises occupied, and still maintain leading positions as single suppliers to Russian domestic markets.

The characteristics of these enterprises include:

- good basic manufacturing facilities
- casting of ferrous metals, capacity of 5-6,000 tonnes per annum
- production of forgings and pressure die castings
- metal working production capacity up to 15-18,000 tonnes p.a.
- competent level of metal machine technology
- substantial capacity of automatic turning machines (up to 15%)
- well developed jig welding for fabricated structures
- competent production engineering functions
- technological departments and offices, staffed with qualified specialists
- utilisation of computers in technological design
- good capability in tool making for technological equipment production

These capacities are sufficient not only to meet the production requirements of the Kaliningrad region, but also to supply export markets.

The major weak points of the medium and heavy engineering enterprises include:

- poor physical state of some buildings, particularly manufacturing sections
- relatively obsolete production equipment - more than 40% is older than ten years.

The second group of companies in the sector comprises those engaged in precision engineering and electronics. Their products, particularly those produced by Fakel and Kvartz, are based to a considerable extent on high technologies. Each of these Kaliningrad based enterprises is head or one of the leading firms in this sector in Russia. The production potential of these companies is conditioned by the following factors:

- new purpose built buildings for manufacture and assembly
- relatively young high precision equipment (up to 70% less than 10 years old)
- developed technology for small precision castings in aluminium alloy and steel
- good metal machining capability and capacity
- good capacity of automatic lathes for mass production of small parts and chucking semi-automatic machines for batch production of medium sized parts.
- significant machining capacity with programmed numerical controls, including multi-functional types
- comprehensive galvanising facilities, partially automated
- use of electrophysical and electrochemical technologies for fine internal detail
- high temperature welding of metals for thin walled components
- availability of research and development base, staffed with highly qualified personnel.

In Table 4, the shipbuilding enterprise, SC Yantar belongs to the first group, since it has a well developed mechanical engineering base.

2.2 Current State

From the beginning of 1990, the machine building and electronics industry, as in the rest of Russia, experienced a substantial slump and consequent reduction in production personnel. The volume of production fell by 34% from 1990 to 1992 (in comparable prices), and continued to decline to the current level. Compared with 1990, the contribution of the machine building sector to the total regional industrial production fell from 16.5% to 11.2%. This negative tendency remains unchanged. Compared with 1992, output volume was 69.5% in 1993 and 32% in 1994. The productivity of labour as compared with 1993, was an average of 40.6%.

With the reduction of production volumes, the numbers of personnel in the region fell on average 21.3% in 1994. Leading firms such as Fakel, Systema, Kvartz and Karat were all similarly affected. The resulting unbalance in employment has further dampened production efficiency, which is operating at only 20-60% capacity.

Economic and financial difficulties, lack of solvent customers, price rises of utilities and raw materials and custom's barriers have brought several enterprises to the edge of bankruptcy. The situation is aggravated by inflexibility on the part of many enterprises and by their :

- lack of planning, administrative and financial experience of working under market conditions
- limited access to international marketing intelligence.

PRODUCTION TYPES AND VALUES (DECEMBER 1994) - TABLE 4			
Type of Production	Actual	Prod'n	Jan-Dec 1994
	Jan/Dec 1994	Jan/Dec 1993	Jan-Dec 1993 % Ratio
1 Medical Technology (Rs.'000)	5,285		*
Kvartz	3,939		*
Fakel Pilot Design Department	1,346		*
2 Electro-Welding Equipment (Pcs.)			
ESVA	517	1,586	33
3 Diesel Spares (Rs.'000)			
Sudoremashautomatika	28,692	145,784	20*
4 Production Equipment and Spares for Food and Fishing Inds. (Rs.'000)	158,307	790,539	20*
Mateo	6,221	193,176	3*
Sudoremashautomatika	3,627	72,644	5*
Rybtehtcentr.	101,709	464,000	22*
Yantar	n/a	n/a	
Fakel	n/a	n/a	
Mechanical Repair Plant	46,750	55,591	84*
5 Loaders (Pcs.)	98	250	39
6 Rail vehicles (Broad Guage)	131	386	34
7 Trestle Cranes (Pcs.)	17	121	14
8 Vibro-Rollers (Pcs)	371	823	45
9 Tower Cranes (Pcs.)	3	24	13
10 Lighting Equipment (Rs.'000)	540,572	454,140	119*
11 Umbrellas (Pcs.)			
Avangard	74,140	222,794	33
12 Spares for Wood/Pulp/Paper Rs.'000	0	90,615	*
13 Equipment for Trade and Public Nutrition Rs.'000			
Systema	341,143	103,381	in 3.3 times

Note: * Data for a month.

Those enterprises producing electronic components are now in a very difficult situation as the demand for printed circuit boards and computer engineering has collapsed. This is due to cuts in defence programmes and lowering of import tariffs allowing imports of IBM compatible PCs.

The smaller enterprises in the electronic sector are weak. This is due to poor direction and limited technical and technological know-how. The regional government is giving attention to the problems of these smaller enterprises.

Privatisation, by which most of the machine building enterprises recently transferred ownership from the state, has not provided the level of financial investment hoped for and has had practically no beneficial effect on the enterprises' hard currency situation. The newly formed Joint Stock Companies (JSCs) are discouraged from pursuing profits because of heavy taxation. Only a few companies, such as SC Baltkran and Kaliningradgasautomatika, have achieved some success with improved exports or greater internal market share through co-operation with foreign partners. With internal investment, diversification has begun at Kaliningradbummash, with the intention of introducing new products.

During the course of the mission, appraisal visits were made to the above companies. Profiles on each are included in the Appendix. A summary is shown on table 5.

2.3 Analysis of Strengths and Weaknesses

2.3.1 Strengths

1. Established base for machine building and electronic production, in terms of land, buildings, facilities, equipment and infrastructure.
2. Personnel experienced in machine building design and production; there are more than 40,000 specialists in the sector, 25% of whom have qualifications as engineers or technicians.
3. Complex engineering products which are important to the industrial development of Russia.
4. High technologies and 'know-how' (e.g. Fakel, Kvartz, KSTU, KSU etc.).
5. Location of Kaliningrad region, facilitating technology transfer and development of co-operation with western partners.
6. Competitive price levels for engineering products in world markets, due to low manpower costs and economic material supply from CIS.

7. Facilities in machine building give opportunity for flexible organisation and re-orientation of production. Most companies have capacity to aid re-orientation (Kvartz, Systema, Vagonostroitel, Stroydormash, Yantar, Sudoremashautomatica and other enterprises).
8. Availability of scientific staff, on-going development in machine building and the training of engineers and technicians in Kaliningrad State Technical University and the Secondary Machine-Building College.
9. Developed marine, railway, communications and ice-free port minimises expenses for shipping engineering products and completed products.

2.3.2 Weaknesses

1. The current depressed state of the machine building sector.
2. Lack of sufficient internal and invested funds for innovative products and product development.
3. Absence of identity of the sector and organisation to promote the development and interests of the enterprises.
4. Top heavy organisation structures in management and sluggishness of enterprises.
5. Low labour productivity and morale because of staff reduction programmes. Presence of concealed unemployment.
6. Utilisation of production capacities of only 20-60% leading to deterioration of facilities.
7. Multiplicity of basic functions, such as casting, forging and tool making, between several enterprises; diluting effective development.
8. Insufficient level of know-how in the field of planning, finance and production management.
9. Lack of experience in market conditions and low level of business know-how. The Marketing Concept is lacking.
10. Limited access to international marketing, technology, patent data bases and lack of experience of technology transfer.
11. Lack of equitable wage/salary structures.
12. Poor State of repair of basic assets, especially buildings and facilities at the older enterprises of the region (Yantar, Stroydormash, Vagonostroitel).

13. Products suffer in general from poor surface finish and appearance.
14. Lack of accreditation in most companies to International Quality Standards.
15. Diversion of management effort to social responsibilities in the areas of housing, healthcare and education.

2.3.3. Potential

1. Large domestic and CIS markets, where the products of the Kaliningrad engineering industry are in good demand.
2. Export markets, the study and exploration of which is just commencing.
3. Availability of production capacity for expansion of sales volumes and machinery markets.
4. Introduction of new products possible, due to the comprehensive range of capabilities and technology of the machine building sector.
5. Use of the economic advantages of the location of the region.

2.3.4 Hazards

1. Shortage of financing
2. Long distance from the main Russian and CIS markets
3. Ageing of manpower
4. High level of business risk, stimulated by inflation, economic and political instability and heavy taxes
5. Lack of response to competition from international and domestic producers of analogous products.

SUMMARY OF SURVEY OF ENTERPRISES - TABLE 5								
Enterprise	Equity	Products	Facilities	Management	Restructure Progress	Strength	Weakness	Comments
Gasautomatika	51% Promgas	Gas Controls	Good	Fair	Poor	Market Position	Marketing	Good basis for development (Project: Auto system)
Kvartz	20% State 80% Empls.	Vacuum Coating Consumer Goods	Fair/Poor PCB line Good	Fair	Poor	Vacuum Technology	Marketing	Fragmented Market
Fakel	100% State	Space Dynamics	Not visited	Not known	Poor	High Tech. Plasma	Marketing	(Projects to view (2)) Surgery Plasma Heating System
Sudoremash	25% State	Marine Repair Parts Food Processing	Good	Fair	Poor	High Precision Standards	Diversity of Products	Develop 1) Food Machinery 2) Precision (Project: M/c Tool)
Vagonostroitel	60% Chairman	Rail Dump Wagons Fork Lift Trucks	Poor	Good	Accelerating	Management	Marketing	Develop Fork Lift (Project: Containers)
Stroydormash	20% State	Road Rollers Road Markets Truck Cranes	Fair	Poor	Poor	General Capability	Marketing	Develop Existing Product
Balktran	20% Lukoil 20% German	Cranes	Fair	Good	Good	Partner	Capacity	(Project: Container Crane)
Yantar	56% State	Ships up to 18,000 Ts. Ship Repairs	Fair	Fair	Fair	General Capability	Marketing Design	

3.0 AMBITIONS

The ambition is the regeneration and profitable growth of the sector and, based on its strengths to:

- maintain and strengthen the traditional market positions of Kaliningrad machine building and electronics products, within Russia and the CIS;
- improve the export performance of the region's industry to 10-15% of output;
- develop a balanced sector, with capability in heavy, medium, precision and electronics engineering;
- develop new products based on the needs of domestic and regional markets;
- maintain and develop high technology products.

4.0 STRATEGIES AND DEVELOPMENT AREAS

The means by which the Ambitions above can be achieved will include:

- the development of a clear identity for the sector and the promotion of its interests
- concentration of effort on active markets for existing products (e.g. domestic gas, steel, mining and export)
- introduction of products new to the sector
- introduction of international quality standards
- co-operation with foreign interests for product, quality, market and financial advancement
- determined application of new business projects
- training of senior managers, engineers and economists in engineering business management in the market economy.

5.0 PROJECT CONCEPT

Any project or programme proposed for the regeneration of the machine building and electronics sector must, with the broad ambition in view:

- build on the sector's strengths
- eliminate or avoid the effort of weaknesses
- counter, as far as possible, threats to development and most important,
- take full advantage of the opportunities presented.

To build on the strengths, the sector must organise itself as an effective, cohesive force; able to promote itself, the sector's products and to secure optimum working conditions within the community and its markets. Individual enterprises must be encouraged to move forward on its development projects.

The main weakness in the enterprises is due to lack of experience in competitive markets and the need for credible profitable performance on an on-going basis. Practical and formal training is needed.

Within the enterprises' control, the main threat is that of a failure to respond to competition, particularly from overseas. Confidence will be greatly enhanced with implementation of international quality assurance regimes, well within the range of many companies in Kaliningrad.

Most companies have a good appreciation of their potential market position and with improved technique flowing from this project concept, will be better equipped to exploit their opportunities.

The development project, in taking into account the analysis of strengths and weaknesses, is structured with industry, enterprise and institutional level involvement.

6.0 SPECIFIC PROJECT PROPOSALS

6.1 Development Programme Outline

To address the weaknesses in the sector, identified in the survey, a determined programme is needed both to complete the restructuring which is in its early phases and to provide for sustainable development into the future. Such a programme should include:

At Industry Level -

1. The establishment of an organisation representative of the interests of the sector and through this;
2. Rationalisation of manufacturing facilities of the member enterprises to improve quality, utilisation and development prospects.

At Enterprise Level -

3. Technical assistance in researching, evaluation, preparation and presentation of business plans and 'bankable' reports for selected enterprise projects: Baltkran, Kvartz, Vagonostroitel, Yantar and Stroydormash.
4. Provision of in-house training of managers in marketing, business planning and management accounting, using principally, the vehicle of business planning above.

At Institutional Level -

5. Development of distance learning, in co-operation with the Technical University, for Directors and Managers giving formal instruction in marketing, business planning, information systems and quality assurance.
6. Design and implementation of procedures enabling enterprises to be accredited to the international quality assurance standard ISO 9000.

6.2 Implementation

Since Kaliningrad has very few engineers and managers experienced in international engineering business, the assistance of the aid agencies should be sought to provide suitable experts. As in Phase I of Kaliningrad 2000, national counterparts should work with the experts in carrying out the programme.

6.3 Notes on Project Proposals

6.3.1 Establishment of Representative Organisation (Ref 6.1.1.)

(i) An organisation of enterprises already exists, but the findings of the survey show strong reservations as to its effectiveness. Its current involvement with trading matters is criticised particularly.

(ii) It is recognised that the engineering manufacturing sector is unlikely to yield sufficient volume of firms to form a strong union. Considerable should also be given to inviting other manufacturers in such fields as textile, garments, leather and other light industries to participate.

(iii) In outline, the activities of the association might include:-

Industry Policy	-	Co-ordination of product/technology development
	-	Rationalisation of production facilities
Government Liaison	-	Influence issues on tax, duties, investment incentives and relevant legislation
Promotion	-	Inward investments, Joint venture partners, export and domestic selling
Commercial	-	Market and economic data, trade terms, conditions, shipping and insurance
Employment	-	Salary and wage structures, health and safety issues
Training	-	Management, engineer, technician and artisan needs
Development	-	Focus for technical assistance from Aid Agencies.

(iv) The main steps in the project might include:

- 1) Short survey to establish needs and priorities of the enterprises.
- 2) Design, approval and legalising of constitution, including method of funding.
- 3) Supervision of selection of executive board.
- 4) Agenda preparation for initial 'business'.

- 5) Monitoring initial series of meetings and formation of task groups for specific needs and problems (e.g. rationalisation of facilities, 6.3.2 below).

6.3.2 Rationalisation of Manufacturing Facilities (Ref. 6.1.2)

- i) This project falls under the 'Industry Policy' activity noted in 6.3.1., and should be treated as a priority.
- ii) Currently the industry is made up of enterprises, each having an 'integrated' manufacturing cycle. Hence there is much duplication of foundries, forges, fabrication, die-casting, tool making and manufacture of nuts, bolts and other fixing details. Low utilisation means high unit cost. The likelihood of the separate companies generating sufficient income to allow progressive upgrading of these facilities is remote, even with a return to improved output levels.
- iii) The main steps in the project might include:-
 - 1) Selection of the basic functions for consideration
 - 2) Organisation of detailed audit of firm's capability/capacity
 - 3) Selection of optimum facilities to be retained to meet anticipated product specifications
 - 4) Preparation of alternative schemes to achieve 'core' facilities
 - 5) Review of cost/financial aspects
 - 6) Implementation plan, including possible specialised service companies, jointly owned where appropriate.

6.3.3 Management Training and Assistance with Project Plans (Ref. 6.1.3 and 4)

- (i) Five investment projects at enterprise level have been selected from a total of ten identified during the survey. Selection has been made using a screening method, fully described in Appendix 4. Each of the projects selected appear to have considerable merit.
- (ii) Where written proposals exist, these are incomplete, lacking both market and financial justifications. It is proposed that, by using the preparation of a business plan as the focus, each of the five enterprises should be given 'hands on' assistance to prepare 'bankable reports', through logical phases, including their presentation to potential funders.
- iii) This approach invokes each facet of the business including markets, marketing, production analysis and costing, financial projections and funding. The investigative preparatory work would be undertaken by enterprise staff, who also would be given formal instruction in the basic disciplines, both in-house and in the class room (see 6.3.5 below).

6.3.4 Management Training by Distance Learning (Ref. 6.1.5)

- (i) Whereas there is an urgent need for retraining of senior managers, there is equally a need for on-going training to underpin the concept of 'sustainable future development' of the enterprises, for a broader range of managers and engineers.
- (ii) During the survey, discussions with government, other institutions and the enterprises, provide strong indications that the Technical University is the most appropriate educational unit best suited to undertake training by distance learning.
- (iii) The proposal is that engineers and managers should receive formal instruction in the basic topics, such as marketing, business planning, management accounting and quality assurance, by attendance for say a day or half day per week, over say an 8-10 week period. Class sizes would be limited to about fifteen, to allow case studies, role playing and specific situation study methods to be used.
- (iv) the Technical University is able to provide lecturers in most of the fields, but it is important that these are supplemented by individuals experienced in international engineering business. Teaching would be essentially of a practical nature and related to current economic conditions.
- (v) The main steps in the project would include:-
 - 1) Preliminary discussions with enterprises, individuals and the University as to scope and subject content of courses.
 - 2) Design and approval of overall teaching plan, including objectives, expressed in behavioural terms.
 - 3) Preparation of course materials and, in parallel, promotion to industry, individuals and firms.
 - 4) Selection of counterparts.
 - 5) Implementation, undertaking say two terms by experts, to include training reports on individual development.

6.3.5 Introduction of International Quality Assurance Standard ISO 9000 (Ref. 6.1.6)

- (i) Whatever the claimed merits and demerits of the GOST standards, the rapidly growing perception of quality in international markets is that embraced by the Quality Assurance system, designated ISO 9000. Programmes for the introduction of this system are now in implementation, particularly in engineering firms, in the Urals Area. ISO 9000 relates to the integrity of operations of the whole enterprise, rather than to the characteristics of specific products.
- (ii) For both export and domestic markets, ISO 9000 will become increasingly important in the future. Several firms already work to the DIN standards, or are subject to inspection by international agencies. Transition to accreditation under ISO 9000 in these cases, should be relatively straight forward.
- (iii) the main steps of the project leading to accreditation to ISO 9000 would be :-
 - a) Selection of say 10-12 enterprises, to be considered for accreditation.
 - b) Detailed audit of companies' organisation, methods, quality procedures, laboratory and testing equipment.
 - c) Selection of enterprises for 'fast track' or 'normal' progress towards accreditation, dependent upon their need and state of readiness
 - d) Preparation of adjustment plans for systems, documentation procedures and equipment.
 - e) Training of key personnel where necessary in quality assurance procedures.
 - f) Assistance to enterprises as needed, with procedures/documentation modifications and preparation of Quality Manuals.
 - g) Review of operations to ensure readiness for accreditation.

7.0 CONCLUDING REMARKS

The machine building and electronics sector has much to do to secure its future. However, there are encouraging signs that restructuring will be successful.

The introduction of new, determined managers, the development of effective working relationships with foreign firms, the established positions in domestic markets, all augur well for regeneration of the industry.

But for much of the sector, forward strategies have yet to be formulated and the pace of restructuring is too slow.

The development programme set out in this report will make a significant contribution to the sector's profitable participation in the recovery of the region and the Russian economy.

APPENDIX 1

Project TF/RUS/94/001/11-54 - Terms of Reference

Purpose of Project: To prepare a detailed regional development survey of the Kaliningrad region, identifying industrial investment projects, and advising on policy and institutional measures to be taken by the Government for restructuring and revitalising the Kaliningrad region.

Duties: The consultant will work with the Kaliningrad Regional Administration under the guidance of the Steering Committee and the Project Co-ordinator.

He/she will closely co-operate with the other national and international consultants of the UNIDO team and contribute to the preparation of a detailed regional development survey.

The consultant will be expected to produce a detailed study on the machine building industrial sub-sector.

More specifically, the consultant will be expected to:

1. Analyse the resource base of the machine building, including electronics sub-sector.
2. Analyse the actual technological level of machine building, including electronics industries in terms of productivity, energy consumption, environmental impact, quality, etc. and of the need to upgrade the technologies.
3. Analyse the R & D basis available in the region and the human resource development capacities for restructuring the machine building, including electronics industries.
4. Assess the competitiveness of machine building, including electronics industries.
5. Analyse the problems and constraints of the machine building, including electronics industries to achieve a high competitiveness with respect to the prices and the quality of products.
6. Identify future requirements with respect to roads, railways, shipping facilities, water and energy supply, telecommunications and other infrastructural facilities.

7. Formulate and screen specific investment projects (new expansion or rehabilitation) for the machine building, including electronics industries, using the investment project profiles.
8. Identify potential new industrial activities in machine building, including electronics enterprises to be set up, including those with foreign direct investment.
9. Analyse the market situation in the field of machine building, including electronics industries.
10. Analyse the efficiency of management in machine building, including electronics enterprises and the support those enterprises receive or require from regional institutions.

The consultant will also be expected to prepare a final report, setting out the findings and recommendations on further action which might be taken.

APPENDIX 2

Respondents to the Survey

PDD "FAKEL"	General Director Head of Marketing Plasmic Medical Equipment Designer
SC "KVARTZ"	Chief Engineer Chief Technologist Head of Marketing
SC "YANTAR"	General Director Deputy Director Chief Economist Head of Machine-Building Production
SC "VAGONOSTROITEL"	Chairman of the Board Chief Engineer Head of Marketing
SC "KALININGRADGAZAVTOMATIKA"	Director Chief Designer Chief Technologist Chief Engineer Head of Planning
SC "STROIDORMASH"	General Director Chief Engineer Chief Designer Chief Economist
SC "BALTKRAN"	General Director Chief Economist
SC "SUDOREMMASHAVTOMATIKA"	Technical Director Chief Engineer Head of Marketing
SC "ELEKTROSVARKA"	General Director Chief Engineer

SC "VNII ELEKTROTRANSPORT"

General Director

SMALL STATE ENTERPRISE "ARENA-ELEKTRIK"

General Director

SC "KALININGRADBUMMASH"

Holder of controlling block of shares

PRINTED CIRCUIT BOARDS PLANT

Co-owner and shareholder of 46.7%

COMCON LTD, CONSULTING BUREAU

President

COMMITTEE OF EDUCATION AND SCIENCE

Vice Chairman

KALININGRAD REGIONAL PROPERTY FUND

Consultant

APPENDIX 3.1

Company Profile - Kaliningradgazautomatika (KG)

A. General Background

KG was founded in 1961 and is part of the Joint Stock Company Gazautomatika of Moscow (MG). Gazautomatika has wide interests in gas exploration and system development and has several enterprises, only two of which, KG and one at Seratov, being involved in manufacturing. MG is owned 51% by the state controlled Gazprom Corporation, which is itself now a joint stock company. The balance of MG's shares are held 5% by its Directors, 25% by employees by allocation, 10% by employees by sale and 9% will be auctioned during 1995.

KG plays an important role within the Russian gas industry, manufacturing and supplying valves and control systems for a range of gas transmission and distribution applications. For some 75% of its product range, KG is the sole Russian supplier. Manufacturing is undertaken at KG's main plant in Kaliningrad and at a small subsidiary at Baltisk, with a total of 750 employees, having fallen from about 2,000 employees in 1990. Currently sales output is the equivalent of \$4.0m per annum (Rs.1.5 bn/month) which, although lower than 1980s levels, represents a marked increase in productivity.

Some 95% of KG's output is sold to gas supply companies throughout the Federation, thus benefiting during this transition period from the Government's incentives to the gas sector. Principal products include:

- | | | | |
|---|--|------------------------|---|
| - | Electro-magnetic Valves | 30% of sales (approx.) | |
| - | Instrumentation for measurement of flow, pressure, temperature | 25-35% | " |
| - | Electronic control systems e.g. for compressor stations | 10% | " |
| - | Telemechanics e.g. pipeline monitoring/control | 25-30% | " |

In the former Soviet Union (FSU), KG were supplying to about 250 customers, mainly the "Transgaz" companies (e.g. Uraltransgaz) through the regions. With the formation of the CIS, new market patterns are emerging. Competition comes from manufacturers in the Ukraine and Kazakhstan, yet these countries are still ordering from KG. Within Russia, competition is expected to come in the future from a few of the "conversion" enterprises. International suppliers, particularly Italian and German, will gain market share through joint venture development projects, already in planning.

The balance of output, some 3-5% of sales, is made up with petrol to gas fuel conversion systems for automobiles. KG provides kits of parts for Lada, Volga and Moscovitch cars, using propane or butane gas cylinders. Sales are mainly local, but efforts are being made to establish markets in Poland. A project is in hand to develop a natural gas fuel system, which may be encouraged by future Government directives.

Although spread through an unusual number of small buildings, KG's manufacturing facilities are generally good, covering a comprehensive range of capability. The toolroom is equipped with several vertical tool millers of West German manufacture and produces all moulds and dies needed for punching, die-casting, plastics and rubber extruding. The quality of the toolroom work is evident in the high quality finish of the components thus produced. A small jobbing foundry has capability in Iron, aluminium and bronze materials. Programmable machines, again of West German origin, are used in the sheet metal and the bar lathe machine shops. Electro-plating facilities are in place for galvanising, chrome and nickel, as needed. Because of the relatively low volume, printed circuit boards are prepared using mainly manual methods. Housekeeping standards are generally satisfactory.

The company purchases supplies from some 70 sources, e.g. metals, wire, paints, mainly from Russia, but a few from neighbouring countries, such as chemicals from Lithuania. Key components are manufactured in-house, but even so, about 70% are purchased outside also. With a group of six other enterprises, special barter arrangements are in place, to the extent of 60% of turnover.

Some first steps have been taken in restructuring the enterprise. The organisation structure has been rationalised and functions previously provided elsewhere, such as engineering design and accounting have been established in-house. On the other hand, the social responsibilities for kindergarten, school and resort houses have been retained. More important restructuring facets will need attention and particularly, the marketing function. Sales promotion material is poor. Knowledge of market trends, both international and national, is essential, to guide product development and the introduction of new products. Further, with increasing overseas competition, the need to conform to international quality standards is clear. The company should now be working towards accreditation under an internationally accepted quality assurance system such as ISO 9000.

Overall, KG has made a creditable start to its transition to the market economy. Credible actions have been taken, resulting in the present profitability.

B. Company Details**NAME:**

Kaliningradgazautomatika, part of Joint Stock Company Gazautomatika

LOCATION:

Gvardejsky Ave., 15, Kaliningrad 236000, Russia

SHAREHOLDING:

51% Gazprom Corporation; 25% employees allocation; 10% employees sales; 5% Directors, 9% to be auctioned during 1995

GENERAL DIRECTOR:

Karapysch Machail Lavrentjevich. Tel: (7-0112) 43 63 47

TYPE OF PRODUCTION:

Automatic controls and electronics for gas distribution industry

FILIALS:

Machine shop is located at Baltijsk in the Kaliningrad region.

STRUCTURE OF ENTERPRISE:

4 basic shops, comprising radio assembly, gas cylinder and locking equipment assembly, machining and 3 auxiliary shops for toolmaking, electro-mechanical and transport.

FINANCES:

Stable position. Sales income 1st quarter 1995 Rs. 520 m.

Factor of liquidity: 1.5/2.0

PRODUCTION:

Type of equipment	Annual output in selling prices Rs.ms.			
	1993	1994	(5 mths) 1995	(F'cast) 1995
Automatic equipment and spares	1,293	4,411	5,045	-
Other production	772	1,511	154	-
Total	2,065	5,992	5,199	17,900

**% Growth of Commodity Output
(Rs.ms)**

Year of output in Comparable Prices		% Prior Year	Output in Comparable Prices		% Prior Year
1993	1994		5 mths. 1994	5 mths. 1995	
7,921	5,922	74.4%	4,430	5,199	117.4%

PRODUCTION:

The enterprise produces more than 70 different products. Usage of capacity: Current 68%.

Production processes: pre-fabrication, machining, forging, pressure die-casting, punching (reactopolymers), galvanising, printed circuit boards, locksmith assembly, electroradio assembly, painting.

Production areas: Site - 40,800 sq.m. Production area 19,807 sq.m.

Productivity of Labour: 1st Quarter 1995 130.7% compared with 1994.

Age of Equipment on 26 May 1995:

Equipment	0-5yrs.	5-10yrs.	10-20yrs.	20yrs.+	Total
Metal cutting (incl. automatic and semi-auto) Machines	37	95	92	90	314
Spark Erosion	-	2	1	1	4
Forges	8	15	24	12	59
Casting	1	2			3
Wood Process'g	-	3	2	1	6
Total	63	152	145	109	469

Average age of equipment: 9.6 years

68 items of equipment were imported, made up of 28 for machining and the remainder for electro works, in 1983. About 50% of the technological equipment is physically and technically obsolete.

Quality of Production: To Russian standards and technical specifications. The Gas Cylinder plant has quality certification to the Russian GOST Standard.

WORKFORCE:

Number of Production Personnel	:	687
including: Engineers		198
Operatives		489

Skill of workers: High, on an average 4 Grade.
Average age of workers: 45 years.

ORGANISATION AND MANAGEMENT:

Management structure: ratio of managing/technicians is 1:3.43

Research and Design: Design carried out by own designers or other organisations. For the period 1990 to 1995, 98 products were designed.
Capacity of engineering design: on 1 June 1995, 45 personnel, including 15 designers.

MARKETING:

Market Share: 75%

Reputation: Satisfactory. Level of service, also satisfactory.

Prices: Moderate, compared with principal competitors

Customers: Various firms of RAO "Gazprom".

Competitors: Conversion enterprises; "Gazpriborautomatica" (Moscow), Rjazan enterprise - automobile equipment.

Main Suppliers: Enterprise DZM "Ordzjonidze" of Kolchugino, AO "Sameco" of Samara, "Vils" of Moscow, Magnitogorsk metallurgical combinat, Urals, Kamensk, Urals, Tube Works and others.
In total, more than 30 basic suppliers.

C. Analysis of Strengths and Weaknesses

Strengths

1. Strong technical base and experience of automatic systems for gas industry.
2. Competitive in Russian markets
3. Solvent customer base
4. Gas industry R.O "Gazprom" parentage
5. Diversification potential due to wide range of production equipment
6. Good location in relation to rail and road infrastructure
7. Surplus production capacity
8. Efficient production
9. Stable financial position
10. Positive management attitude

Weaknesses

1. Uncompetitive in external markets, due to weak design and lack of accreditation to international standards
2. Insufficiently developed in-house technological base
3. 50% of equipment obsolete (lathes, planers, mechanical and hydraulic presses)
4. Insufficient investment for re-equipping for innovative projects
5. Limited level of know how in marketing and financial management in new market conditions
6. Lack of experience of working with foreign partners
7. Problems with introduction of modern painting methods
8. Wastage of key skilled personnel, high average age of workforce

Opportunities

1. Production capacity for increased sales volumes
2. Development in Russia (including Kaliningrad region) and CIS countries of compressed gas fuel, possibilities for automotive transport
3. Export markets

Threats

1. High level of risk due to Russian economy instability
2. Competition from foreign manufacturers

D. Strategy

Joint stock company "Kaliningradgazautomatic" is the main Russian manufacturer of control equipment for the gas industry. The enterprise has solvent customers and a stable financial position. The base strategy of the company is to modernise its production with the aim of lifting its competitiveness and expanding its markets.

To modernise the basic production, the company needs to strengthen its in-house design and technology base. It also needs to reduce costs, whilst at the same time, accord with international quality standards.

One way of increasing the technological level of the enterprise would be by adopting a 'screwdriver' approach for manufacturing new products. Through co-operating with German or Italian firms, new products could include heating boilers and gas meters; or electrical distribution equipment of low and middle voltage with firms such as Merlin Gerain of France. The company's marketing department needs to search for foreign partners and identify likely new products.

Currently, most innovative efforts are directed towards gas apparatus for transport, using compressed natural gas as fuel. The Russian Government has outlined a programme for the use of liquid gas. Markets would be very large. Production could be set up in a separate branch of the company. Participation in the next strategic industry innovation project is suggested.

E. Project Proposal

Description: the creation by Kaliningradgazautomatica of a regional centre for the production, assembly and servicing of automotive gas cylinder apparatus, working on compressed natural gas.

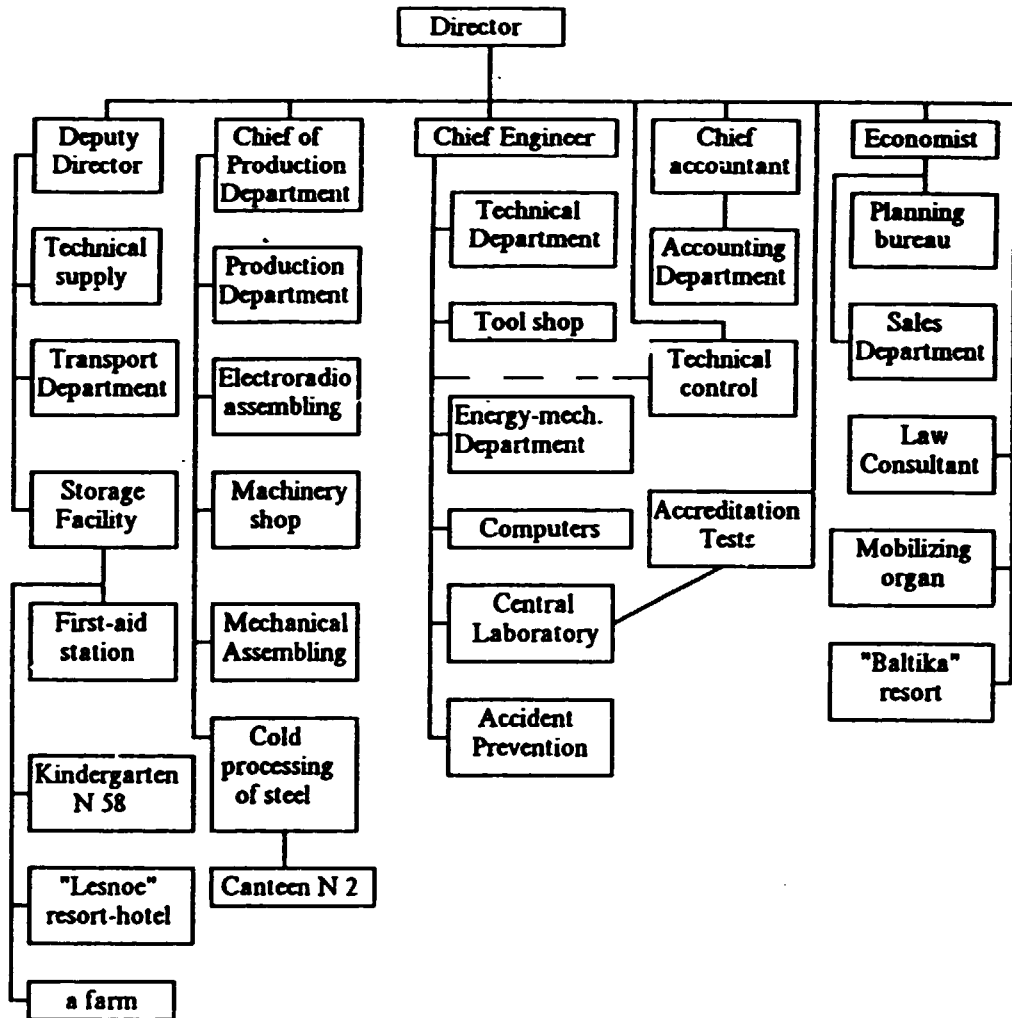
Aims and Basic Parameters: the project is based on the conversion of transport vehicles from using liquid to compressed natural gas. Such fuel would be approx. 50% cheaper than benzene or liquid gas. Russia is one of the largest producers of gas but using small amounts. The economic expediency of such a development appears attractive.

The project claims such positive advantages as increasing engine efficiency by 40% and increasing the period of service of spark plugs by four times and motor oil by 1.5 times. Gas fuel would reduce by 3 to 4 times the exhaust of carbon oxides, 15-20% the nitrous oxide and by 8 to 10 times the oxides of exhaust gases from diesel engines.

Gas Cylinder Equipment	1996	1997	1998	1999	2000	Total
Production Programme (Thousand pieces)	-	3	6	9	12	
Income/Expenses (Rs.m.)						
Volume of output	2.25	6750	13500	20250	27000	67502
Expenses	3291	6080	10900	16200	21600	58071
Income (excl. capital expenses)	0.45	1350	2700	4050	5400	13500
Income (incl. capital expenses)	- 3289	670	2600	4050	5400	9430
Rentability	- 99.9	11	23.8	25	25	

The investment according to the schedule is covered in 2.4 years. The firm has a good production base and experience for the programme and is interested in participation in a regional programme for the conversion of automobile facilities from liquid to gas fuel. Calculation of the efficiency of this project will be considered during a later stage. Future elaboration of the project is needed.

STRUCTURE OF THE 'KALININGRADGAZAVTOMATIKA' ENTERPRISE



APPENDIX 3.2

Company Profile - Experimental Design Bureau "FAKEL"

A. General Background

Fakel is 100% government owned, being part of the Russian Space Agency, which in turn has some 40 centres spread through the Federation. Fakel's speciality is the design and manufacture of plasma fuelled jet thrusters, used for manoeuvring space craft in flight. The Bureau is one of 3-400 such units, each having a particular specialism in research and development in all embracing a wide range of applications. As elsewhere, reductions in staff have been made in the last four years, to the current level of 1,800 employees, but at the same time, claiming a 36% increase in productivity.

In joint venture with companies in France and the USA, Fakel has been developing a new thruster design which is now coming into production. Whereas several countries have future space programmes, these are generally undetermined and vague. Hence the bureau has been working on diversification projects as the means to secure its future. Two such projects were described to UNIDO mission.

The first is for a compact heating system which is thought to be ideal for domestic and office applications. Investment needs are said to be about \$100m and Fakel is at an advanced stage of negotiation with potential Russian and foreign partners.

The second project is based on developments with plasma technology and its application to surgery. Using Argon or air plasma beams, rather than helium, the product enables the surgeon to control bleeding quicker and more cheaply than by present systems. 40 such units are in use in Russia, including those in Chechnya, and initial feed-back is very encouraging. Fakel believes that the system will find good acceptance in Western markets, and has received a positive opinion from a British expert in this field. Patents have been taken out in several European countries. A partner is now sought to help with appearance design, manufacture and marketing.

Recognising that foreign firms are reluctant to come to joint shareholding arrangements with Government owned enterprises, Fakel has already set up 'Contact Enterprise', an intended holding company, having a 91% private shareholding.

B. Company Details

NAME:

Experimental Design Bureau "FAKEL".

LOCATION:

Moscowsky Ave., 181, Kaliningrad 263001, Russia

SHAREHOLDING:

Federal ownership. Capital value on 1/12/94 was Rs 155m. Value of basic production funds on 1/7/95 was Rs. 60.3m.

GENERAL DIRECTOR AND PRINCIPAL DESIGNER:

Bober Aleksandra Samuilovich. Tel: (7-0112) 461964

TYPE OF PRODUCTION:

Machine building for space technology. Basic production, manufacture of electro-jet engines. Plasmic sources for space and other technological applications.

STRUCTURE OF THE ENTERPRISE:

Designing/testing complex; experimental production; testing base "Neman" and departments for auxiliary services.

FINANCES:

Profitability for 1994 - 151%.

Factor of relation of loaned and proper means -0.02

Factor of absolute liquidity 1.05.

The Bureau now has financial difficulties caused by state customer debtors.

PRODUCTION:**Production Volume (Rs.m)**

	1992	1993	1994	1995 (1st qu.)
Scientific and Commercial Space Activity	21.7	27.6	69.0	21.2
Conversion Programme	4.2	4.6	9.3	4.4
Exports	33.3	18.7	5.0	11.4

Besides space production, Fakel produces also plasmic sources and plasmic surgical apparatus. Both these kinds of production are spin offs from space know how. Also using these technologies, production includes a range of small sized boiler plant, modular hot houses, electro radiators, safes and infra red drying apparatus for vegetables and fruits.

Usage of production capacity:

In 1994, 53%, output of production from 1 sq.m. : in 1994 - Rb 239000, in 1995 - Rs.421000.

Production Processes:

Metal machining, including machining of stainless steel, titanium, refractory alloys, ceramics with manual and programmed precision machining for very small components. Welding including Argon-arc welding; diffusion; laser and electron-welding. Vacuum soldering, gas/thermal and plasmic. Forge (hydraulic and crankshaft presses with force from 6.3 to 630 tonnes, magnetic-impulse punching, thermoplast automats). Locksmith, assembly and electrical assembly. Heat treatment and galvanising.

Age of Equipment:

Average age is 12 years. Besides the technological equipment, the experimental unit contains:

- complex of test benches for thermovacuum and fire testing of EJE
- vacuum chambers: volume 17-44.4m³, cryogen pumping, static vacuum 2 x 10⁻⁵ to 2 x 10⁻⁴ mercury column
- complex of test benches for mechanical testing.

Quality of Production:

Engines have been designed and manufactured in Fakel for more than 20 years, and are used successfully on domain connection and communication satellites.

In 1995, Fakel will complete the ground certification of a stationary plasmic engine (SPE) to western standards. It has already completed 7,000 hours testing. This is to assure 15 years in satellite service in stationery orbit.

Many kinds of 'conversion' products are made using space technologies and know how, all to international standards.

WORKFORCE:

Number of production personnel:	1,579
including:	
Engineers	651
Operatives	517
Auxiliary workers	264
Managers and Supervisors	147

Skills, experienced in research, manufacture and testing of high tech diminutive and precision production, needing wide application of vacuum techniques, of special kinds of welding, soldering of different materials (refractory metals, ceramics etc.).

Average age of workers:	38 years
" " production workers:	35 years

ORGANISATION AND MANAGEMENT:**Management structure:**

Is given on the scheme. Claimed to be very effective, confirmed by results over the years.

RESEARCH & DESIGN:

Fakel was founded in 1955 and is the leading enterprise on the design and manufacture of electro-jet engines and engine plants, space travel apparatus and of plasmic sources for space application. The enterprise undertakes a full cycle of design and testing, beginning from research and finishing with manufacture. Fakel has strong ties with the Russian Scientific Centre "Applied Chemistry", Moscow Aviation University, the Research Institute of Applied Magnetic Hydrodynamic, Charcov Aviation University, the Institute of Applied Mechanics and others.

MARKETING:

Market share enjoyed by the enterprise in its main field is 100%.

REPUTATION:

It is now more than 20 years that Russian space apparatuses have been used, including meteorological, connection and communication systems "Meteor", "Meteor-Priroda", "Kosmos" and "Luch".

In 1994 in Russia a new telecom satellite "Gals" was launched and began its normal work in orbit. The satellite is using a third generation SPF-100 electro rocket engine.

In 1992 Fakel and the US firm Space System Loral formed a joint venture called "International Space Technology Inc" (ISTI) with the aim of designing, marketing and selling engines on the world market. Later, the firms SEP (France) and Atlantic Research Corp. (USA) joined with ISTI.

PRICES:

Competitive, in Russian and world markets.

COMPETITORS:

None.

MATERIALS:

Materials and components are from Russia, and a few are from Ukraine.

CUSTOMERS:

Various firms in the Russian space programme, and to France and the USA.

C. Analysis of Strengths and Weaknesses**Strengths**

1. Strong, leading company in Russia and the world in their field. "Brain centre" for design of electro-jet engines and plants for space flying apparatus.
2. Exceptional range of equipment for producing and testing small components with high reliability.
3. Monopoly position in main product sectors.
4. Competence in production of small size plasmic techniques.
5. Experience of working with Western partners.

6. Ability to diversify due to wide spectrum of different technological equipment.
7. Spare production capacity.

Weaknesses

1. Non-payment by State customers
2. Shortage of proper and investment resources for innovative projects.
3. Limited level of business know how in market conditions.
4. Small quantity production

Opportunities

1. Capacity for increasing sales volume.
2. Markets in Russia and CIS for new products.
3. Export markets.

Threats

1. Shortage of financing.
2. Crisis of cash famine in Russia and CIS.
3. High level of business risk due to economic and legal instability.

D. Strategy

Fakel is the leading Federal enterprise in design and manufacture of jet engines of low thrust. Nevertheless, the company has financial difficulties due to non-payment by State customers.

The strategy of the enterprise is outlined below:-

1. Maintain the strong position in the Russian market for jet engines. To be achieved by supporting the existing level of quality; design of plasmic engines of a new generation (together with the French company SEP); design of engines of larger capacity for inter-orbital tugs and space flight to far space; design of ionic engines.
2. Extend Western markets by completing qualification of engine AO "Fakel", designed in conjunction with the US firm SS/L.
3. Develop new products on both the existing base and on a new industrial base. It will be necessary to attract investments for this.

Participation in the next strategic industry innovation project is suggested.

E. Project Proposal

Aim of Project:

It is claimed the use of plasmic surgical apparatuses APH "Plasar" and APHB "Gemoplas" is an efficient way of achieving gemostas, cutting tissues with minimum thermal damage and with a minimal risk of infection.

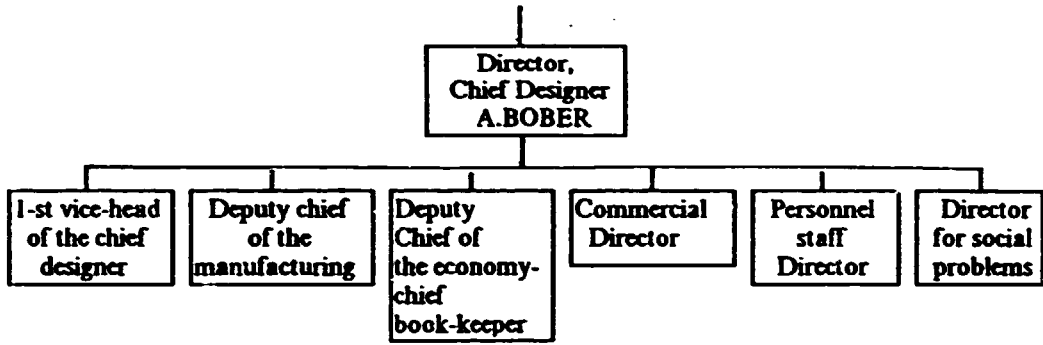
APH "Plasar" and APHB "Gemoplas", due to simplicity, ease of use and relatively low price are able to compete with foreign systems. These medical apparatuses are based on an invention with author certificate of USSR 1317712. Industrial specimen APH "Plasar" is protected by patent of Russian Federation 39615, registered on the 30.08.1993.

Annual volume of production projected:	\$8.3m
of which exports projected	\$1.6m.
Cost of project:	\$0.33m
Investment needed:	\$0.33m
Duration of investment phase:	12 months
Period of repayment of investment	36 months
Period to receive first income	12 months

Customers for plasmic surgical apparatuses can be any medical institution (clinics, hospitals and medical departments) having surgical departments. Also medical institutes with surgical training faculties. In Russia, these number 3,000 and in CIS, the customer base would be more than 4,000 (based on data from AO VNIIMP-VITA).

Capacity for production at Fakel is limited and additional expenditures are needed for development.

STRUCTURE OF THE 'FAKEL' ENTERPRISE



APPENDIX 3.3

Company Profile JSC Vagonstroitel (VS)

A. General Background

VS first became a joint stock company in 1992, when managers and employees acquired 51% ownership, the remainder staying with the State Property Board. In the early transition period, the company declined sharply in morale and performance. In competition with banking interests, a Mr. M.D. Kozin secured a controlling interest and in May 1995, a new joint stock company emerged, he being the main shareholder with a 60% interest and the 40% balance of shares owned by employees. The company is therefore on the threshold of a new, and what promises to be, dynamic, phase of restructuring under new management.

While the factory buildings are very much older, VS operations started in the early 1950s. The main products are railway dumping trucks and battery driven fork lift trucks for industrial use. During the late 1980s, total employees numbered 3,500, but this has now reduced to 1,200. With current projected output, plans are in hand to reduce numbers further to about 600 employees. The factory site is located close to the centre of Kaliningrad, adjacent to river, docks and with easy rail access.

The rail dump trucks are of the type used extensively in the coal and steel industries. VS shares the domestic market with a competitor firm in Saratov, whose prices are thought to be higher. Output in the late 1980s was about 2,500 vehicles per annum, but in 1994, only 130 were produced. The market population is estimated to be about 10,000 units. Because wear and damage rates are high, annual demand, as the economy recovers, should be about 1,000 trucks per annum. Currently an order for 500 is in hand, pending cash and barter arrangements. There are export possibilities, though no formal plans have yet been initiated.

In former times, VS produced some 3,500 fork lift trucks each year. In 1993/4, with the collapse of most industrial markets, very few were produced. Production has been restarted in recent months and the thinking is to sell these through Kozin's service company organisation, which has twenty branches through the Federation. An explosion-proof version of the standard truck is sold to applications in hazardous areas, such as chemical plants. In this product group, VS are currently at least, sole manufacturers in Russia. Through a working relationship with a German truck manufacturer, it is planned to introduce a diesel version of the fork lift in the near future. Vs already supply components, e.g. truck bodies, to the German firm, currently to the value of about DM 250,000 per annum. For complete trucks, of comparable type, selling price comparisons indicate the German product to be 7 to 8 times more expensive than that of VS. Detailed design and appearance, reflects the differential.

VS's manufacturing facilities are not impressive. The main rail truck shops and spacious and adequate; but elsewhere there are many small shops. Buildings are not in good repair. Installed machinery, mostly of FSU origin, is, with a few exceptions, ageing. The grey iron foundry, equipped with two 10 ton/hour cupolas, sand mixing plant and several moulding machines, has not needed to be operated for 12 months,

whilst previous stocks of parts are used up in production. Hot and cold pressing, shearing and welding forms the basis for fabricating vehicle bodies. The machine shops, processing parts for lift trucks and actuating cylinders for both lift and rail products, has some automatic and programmable machines, but again, these are of early design.

The policy is to purchase materials, as far as practicable, from CIS sources. Hence, for the rail dump trucks, major components such as wheel sets and cast steel bogie frames are bought in from plants in Moscow and Bransk. Purchases for lift trucks include batteries and tyres. Beyond these, every effort is made to achieve self sufficiency by manufacturing in-house.

With the new management, restructuring of operations is likely to be accelerated. Several Deputy General Director posts have been withdrawn and a survey to establish the organisation structure, for the immediate future, is in progress. VS has in-house design capability for both main product ranges. However, it is certain that development of the marketing and commercial functions will be necessary, to guide future policies. Knowledge of markets appears to be weak, so that advertising material, currently being prepared for the fork lift product, can be only partially effective. In recent months, the operation has shown a profit for the first time. Sales for the first half of 1995 were Rs. 4.37 bn. (\$994,000), with a margin of Rs. 0.079 bn. (\$18,000).

In addition to the existing product ranges, the company is planning to introduce new products. The first of these is for truck recoverable refuse skips, used in a variety of building, municipal and scrap metal operations. Production has already started and early sales have been made to a Germany firm in the sector, with whom VS now have a working arrangement. A project to build production to 10-15,000 skips per annum, is envisaged, involving investment of about \$2m., mainly for plant and production equipment, working to German standards.

The second, more ambitious scheme involves the manufacture of international containers in 40 ft. and 20 ft. configurations. Kozin already owns a 10,000 sq.m. partially completed factory building, which could be used. The project is based on original proposals made by an Italian engineering design firm, in collaboration with Yantar Enterprises. Preliminary indications of support have been received from EBRD, from an earlier submission, but the estimated project cost of some \$24m, sounds very high. Project plans are expected to be completed by the end of August. It is likely that VS will invite Yantar to participate. (See appendix 3.8).

VS recognises that whatever development plans are evolved, the introduction of modern equipment will be necessary.

B. Company Details**NAME:** Vagonostroitel**LOCATION:** Carriage-building str.1., Kaliningrad 236010, Russia**GENERAL DIRECTOR:**

M.D. Kozin. Tel: (0112) 21 52 30

SHAREHOLDING:

Joint stock company with \$14m capital. M.D. KOZIN - 60% shares, Employees remainder.

STRUCTURE OF ENTERPRISE:

7 main shops: wagon assembly, mechanical assembly, bogie shop, wood treatment, casting, machining and cylinder production. 3 prefabrication shops: sheet metal, forge and welding shops. 4 auxiliary shops: toolmaking, mechanical repair, building repair and electrical.

FINANCES:

Has difficulties caused by lack of payment by principal customers.

PRODUCTION: (Data as at 1st January, 1995)

Value of production: Rs.5,501,101,000.

Including other production Rs.1,565,584,000

Volume of normal production:	Dump wagons	131 units (capacity 1030)
	Battery Fork Lifts	98 " (capacity 2000)

Production Processes: The production cycle includes casting, forging, machining, welding, wood processing, plastic extrusion, assembly, test and painting.

Production Areas: Site area - 89,312.8 sq.ms.
 Production area - 53,388.9 sq.ms.
 There is scope for building extension.

Age of Equipment: Average - 12 years. Equipment for casting and welding is more contemporary. 70% of the machine shop equipment is computer programmed. forging equipment is more than 20 years old.**Productivity of Labour:** Rs. 3,977,000 per direct employee.**Quality:** To Russian standards and technical specifications.**Labour Force:**

Number employed:	1,240
of which production:	986
operatives:	726
managers/supervisors	293
Average age of workforce.	45 years

ORGANISATION AND MANAGEMENT

Management Structure:

Shown in the diagram 'Structure of the Vagonostroitel Company'.

Ratio of administrative/technical personnel to working is 3:73

RESEARCH AND DESIGN:

The Design Office, together with the experimental manufacturing shop are concerned with the introduction of new products. Documentation follows normal practice. The section also provides jigs and tools and methods data. Vagonostroitel claim to have the only designs in Russia for wagon dumpers. Designs for fork lift trucks originate from the nearby Joint Stock company VNIELECTROTRANSPORTA.

Marketing:

Market shares of national manufacturers : Dump wagons - 90%
 Battery Fork Lifts - 75%

Reputation in the market is good. Customer service is provided from regional service centres.

Selling prices (on 1/7/95):	Dump Wagons Model 31-675	Rb. 110,000,000
	" " " 33-677	Rb. 220,000,000
	Fork Lift Trucks	Rb. 7,500,000

Principal Customers:

Wagons	-	metals, mining, coal, railway, roads and building industries.
Fork Lifts	-	chemical, oil and gas industries, power stations, various industrial and commercial enterprises.

Competition:

In Russia there is one competitor in the Dump Wagon sector. In Ukraine there are plants in the cities of Stachanov, Dneprodzerginsk. For Fork Lifts there are competitors in Russia in Kanash and Yekaterinburg.

Materials:

Suppliers of rolled metal and components include the main enterprises in metallurgy and chemicals in Russia and the CIS.

C. Analysis of Strengths and Weaknesses

Strengths

1. Unique design competence for dumper wagons.
2. Products well established in respective markets.
3. Associations with owners' of other business organisations for servicing logistics.
4. New determined management

5. Flexible manufacturing base for new products
6. Spare production capacity
7. Good location, adjacent to road, railway and ports.

Weaknesses

1. Cash shortage in principal markets.
2. Bulky enterprise structure, with relatively small usage of production capacities.
3. Age of buildings and equipment
4. Limited investment resources for innovative projects.
5. Limited level of know how in management, production and finances in the market conditions.
6. Low level of business know how
7. Low level of productivity

Opportunities

1. Capacity for increasing volume of sales
2. Russian and CIS demand for Dump Wagons for mining industries
3. Untapped export markets, particularly in mining sectors e.g. Argentina, Ecuador, South Africa.

Threats

1. Shortage of financing
2. Payment crisis in Russia/CIS.
3. Business risk due to Russian economic instability
4. Competition from foreign manufacturers.

D. Strategy

VS is the largest Russian supplier of Dump Wagons. These products are expected to be in strong demand with the stabilisation of the economy. The existing population in use is old. Fork lift trucks will also benefit with the return of stable economic conditions.

Increased demand for Fork lifts is already being seen from atomic power stations. Components are also being bought by German firms. This is part of the company's strategy for survival, and to improve quality standards.

Immediate plans include the design and manufacture of wagons with improved load capacity of 105 tonnes; fork lifts with a load capacity of 2 tonnes and improved ergonomics. To become more competitive, the company is seeking co-operation with Western European partners. It will be expedient to provide U.I.C. standard brake systems for export purposes. Alternatively, Wagon bodies could be supplied to Germany. The production of diesel variations of the fork lift trucks with German assistance is another priority development.

Efficiency in manufacture can be achieved by reorganising the company into separate divisions for Dump Wagons, Fork Lift Trucks and other products

Participation in the next strategic industry investment project is suggested.

E. Project Proposal

Description: production of detachable containers for carrying waste material and substances.

Characteristics: range of containers to international quality standards, having volumes from 3 to 30 cubic metres.

Estimated Investment: \$2,000,000

Source of Investment: 75% Vagonostroitel, 25% investor.

Form of co-operation: investment and returns from product sales. Subject to negotiation. Approximate time to first sales from investment, 12 months.

Volume of Production: beginning 1996, 1,200 per annum

Price per Unit: \$2,900, 80% exports/20% domestic market.

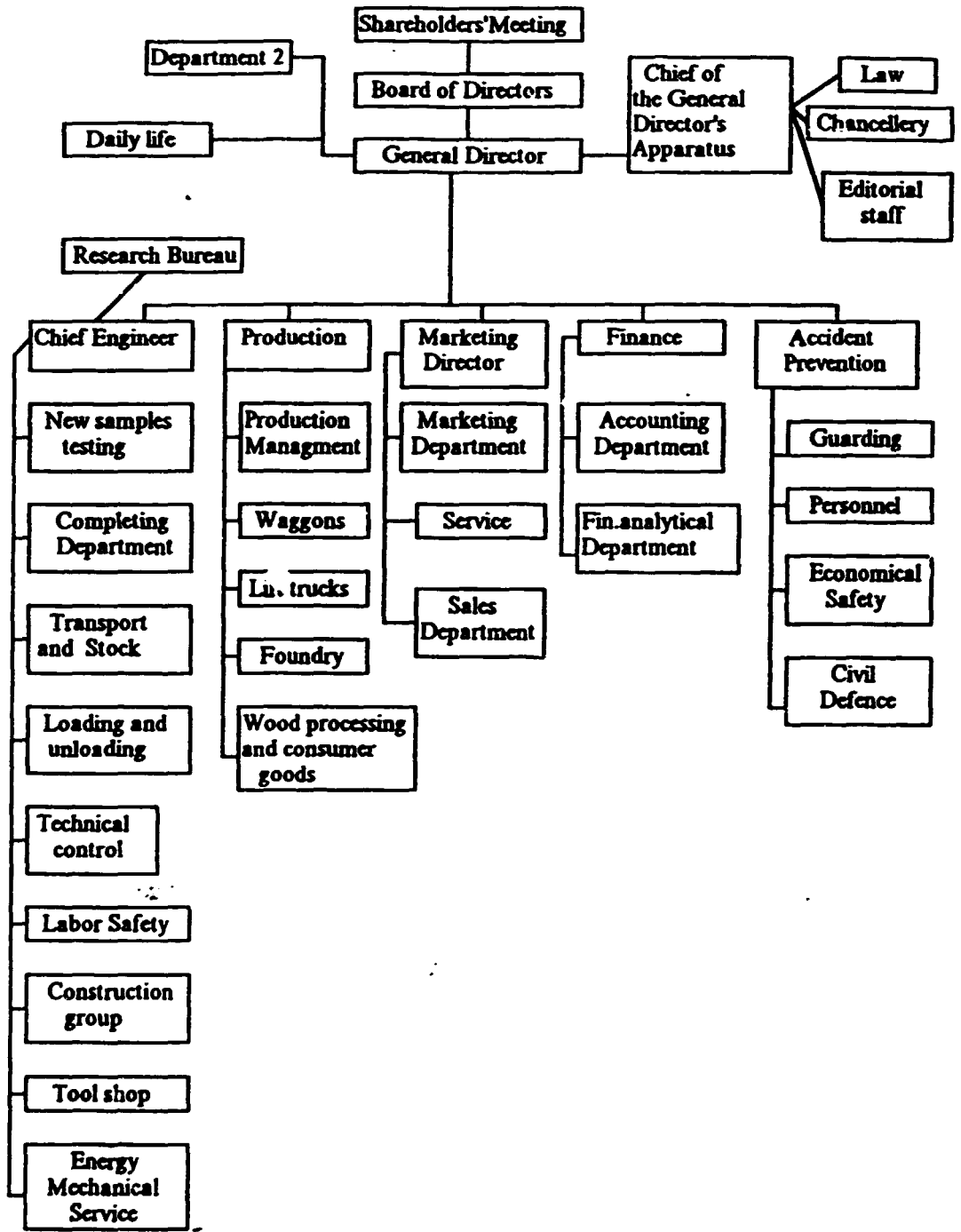
Cost of Metal: \$500 per tonne

Monthly Wages: \$150 per employee

Total Personnel: 30

Additional Expenditures: construction of cleaning/painting shop area of 1,000 sq.m.

STRUCTURE OF THE 'VAGONOSTROITEL' COMPANY



APPENDIX 3.4

Company Profile - Joint Stock Company "KVARTZ"A. General Background

KVARTZ, founded in 1959, was formerly part of a Production Association, having four other subsidiary companies. Each of the organisations have recently been transformed into Joint Stock companies. KVARTZ itself is now owned 20% by the State and 80% by KVARTZ EM (sister enterprise) and employees. Operations are carried out on a single site in the centre of Kaliningrad.

The company was previously a major contractor to the defence industry, in the manufacture of mainframe computers and in parallel, equipment used in the manufacture of electronic components. With the retraction of defence requirements, the computer activity has discontinued and the demand for equipment seriously curtailed. Efforts are being made to introduce new products, so far mainly in the consumer area. Nonetheless, 1990 output levels of about \$50m per annum (at present day values), have fallen to about \$5m per annum. The number of employees has reduced from 5,000 to some 1,700 in the same period.

Currently, sales output is made up broadly as follows:

- Automatic vacuum coating machines, used in electronics and many other industries:	15-20%	\$1.0m approx.
- Food Processing equipment, including vacuum packaging machines	25%	\$1.2m. "
- Consumer Goods, manufacture and trading	55%	\$2.7m. "

Although the vacuum machines were originally developed for the production of electronic components, the same techniques can be used for a range of hardening, protective or decorative coatings. The hardening of metal cutting tools by the application of Titanium Carbide is one example. It is likely that marketing application of these machines to selected specific industry sectors, will provide sound medium term growth for the company. The machines have a single chamber configuration, but proposals are in hand to produce a high volume, four stage unit. A second development aims at coating much larger components, such as glazing for the building industry. With the basic units, some success has been achieved in supplying to markets in Hong Kong, Korea and Taiwan.

The main products in the Food Processing group are the vacuum packaging machines, manufactured in several sizes and capacities. These are used in a number of applications, where hygiene is an important factor. Hence food processing, pharmaceuticals and the medical supplies fields represent the main customers with good future potential. Potential for dough kneading machines and sausage stuffing machines may be less attractive.

The consumer goods category includes a wide range of items the company has found possible to manufacture in-house, including washing machines, stove air cleaners, water mixers, hot plates, domestic pumps, security safes, furniture and roofing sections. Not all the designs are attractive and because of low volumes, it is unlikely that much of this range can be competitive. However, in parallel, the company also trades imported consumer hardware products including for example, domestic sanitary ware and bathroom fittings. Both product ranges, manufactured and factored, are sold through the company's own retail shops on site. This yields a ready source of cash such that unlike most other Russian manufacturing enterprises, use of barter arrangements are minimal.

KVARTZ's production facilities are spread through a number of separate buildings. Some of these could now be available for rent. A self contained impressive production line for printed circuit boards was installed in the 1980s, using British, German, Italian and American equipment. This facility, with a capacity of some 4,000 sq.m. per annum, being associated with computer manufacture, is not now in use.

With few exceptions, the remaining workshop equipment for working metals and plastics, is made up of older models of FSU manufacture. The machine shops are equipped with early Ivanov machining centres and the toolroom with mainly older machines, includes a 1990 spark erosion machine of Swedish origin. Aluminium die castings, steel castings, using the lost wax method and plastics extrusions, show an acceptable quality of mould and die manufacture. CNC punch presses are used in the sheet metal shop. Basic spray paint methods are the norm but a move to electrostatic power technology is planned during this year, particularly important for the surface finish on consumer goods. A comprehensive electro-plating facility was installed to serve all the companies in the previous combinat, so that utilisation is now very low.

Most purchases of raw materials and components are sourced within the Federation, but a small and growing percentage is now purchased from neighbouring countries, particularly Poland.

KVARTZ has clearly made strenuous efforts to restructure within the best of its ability. In the transition, profits have been minimised by interest payments on a credit loan, taken out two years ago and now costing 180% per month. Company organisation has been adjusted, but does not reflect the differing natures of the several types of business with which it is involved. Equally, the company recognises that its wide diversity of activity may not be sustainable in the longer term. The short term nature of much of the business is reflected by the lack of even an outline business plan for the future. There is a need to develop the marketing function, particularly for the vacuum coating technology, to guide both product development and selling effort.

B. Company Details**NAME:**

Joint Stock (open) Company KVARTZ

LOCATION:

Musorgskogo Str. 10, Kaliningrad 236000, Russia

GENERAL DIRECTOR:

Shchepkin Vadim Anatolievich. Tel: (0112) 21 66 49

SHAREHOLDING:

Joint stock company. Capital Rs. 147.7m. Kvartz EM (sister company) 49.2%, State 20%.

TYPE OF PRODUCTION:

Electronic component machinery ; electronics and technical consumer goods.

STRUCTURE OF THE ENTERPRISE:

Competent machine capacity, equipped with both universal and special equipment for special steels and materials. Painting facilities. Metal casting production (mainly precision) and polymeric and rubber casting. Galvanising coating plant. Printed circuit board production line, manufacturing double-sided, multi-layered (up to 24 layers) boards. Assembly areas for electronic equipment. Toolmaking shop for manufacturing special jigs, tools and dies.

FINANCES:

Profits after Tax in 1994 (Rs.m)

Total 1994	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1221.3	136.8	212.5	327.5	544.5

Factor of absolute liquidity: 1.19

Enterprise has financial difficulties, caused by non-payment by principal customers.

PRODUCTION:

Volume of production is approx. Rs 1,600,000,000 per month (as on 1st May, 1995).

Production Mix: equipment for electronic manufacturing industry and coating trades for strengthening, anti-corrosion, decorative, optical and other coatings. Vacuum packing machines; Gas Generators; Washing Machines; Kitchen Air Cleaners; Water submersible Electric Pumps; Electric Toasters; Fire Resistant Safes; Electric Fires and Roofing Sections.

Output Analysis: Production Type	Annual Output Rb.m.		
	1995	1994	Exports in current yr.
Special equipment	12900	2160	436
Consumer Goods	15894	1586	-
Others	7706	3811	23
Total	36500	7557	459

Usage of production areas: 45-50%

Production areas: site area 96,000 sq.m. Area available for expansion of product is about 40,000 sq.m.

Age of equipment:

Metal cutting	up to	15 years
Galvanising	"	10 "
Forge	"	15 "
Casting	"	10 "
Special Technological	"	10 "

Workforce: Total number 1780, including 200 engineering staff.

Average age: 43 years.

ORGANISATION AND MANAGEMENT:

Functional departments are shown on the diagram.

Ratio of managing/technical personnel to operatives is 1:8

RESEARCH AND DESIGN:

The Design Group has 40 personnel. There are good working arrangements with leading scientific organisations and manufacturers in Russia and the CIS, e.g. with the Institute of Vacuum Technics by Vekshinsky in Moscow, and the Research Institute for Semi-conductor Equipment in Voronizh.

MARKETING:

The company has a market share amongst Russian manufacturers of 45% for special equipment and 10% for consumer goods. Their reputation in the market is satisfactory. Prices and service are competitive.

Customers:

Include firms in Korea, Hong Kong; the electronics industry in Russia and CIS; the Academy of Sciences; The Institute of Cybernetics; Design Bureaux and enterprises in the defence and space industries.

Competitors:

Enterprises in Russia manufacturing similar products in the cities of Toliatty, Tchaicovsky, Voronizh, Moscow, Tula and others. Their only competitor in the field of advanced vacuum technology is an enterprise based in Belarussia.

Suppliers:

Main suppliers are intermediary firms, either local or specialist firms throughout the CIS. The main raw materials are ferrous metal, stainless steel, polymers, varnish, paint, paper, wood and chemicals.

C. Analysis of Strengths and Weaknesses**Strengths**

1. Advanced technological and scientific know how.
2. Competence in the production of vacuum processing equipment and electronics.
3. Wide spectrum of manufacturing equipment and tooling capability.
4. Good design base.
5. Experience of working with foreign partners.
6. Spare production capacity.

Weaknesses

1. Lack of ability to pay on the part of its customers.
2. Unwieldy organisation structure.
3. Limited level of business know how
4. Limited level of know how in management and finance in market conditions

Opportunities

1. Capacity for increasing sales volumes.
2. Untapped markets in Russia and CIS for new competitive products.
3. Export markets for existing vacuum equipments.

Threats

1. Shortage of financing
2. Crisis of non-payment in Russia and CIS.
3. High level of business risk, due to Russian economic instability
4. Wastage of skilled work force.
5. Competition from foreign manufacturers.

D. Strategy

KVARTZ is one of the largest enterprises in Kaliningrad and has a reputation as a leading company in the electronic industry. This company has 30 years experience in designing and manufacturing, technically complex electronic and other technical products.

The reduction in defence programmes has caused a sharp reduction in demand. The strategy is to stabilise their trading and financial position and preserve their skill base.

E. Project Proposals (2)

DESCRIPTION OF PROJECT 1:

The design and production of a single installation for coating large components.

Project Aim:

Market development by application of vacuum technology. A single installations is projected which would deposit strengthening and optical coatings on larger components. Applications would include light absorbing and light reflecting coatings; heat absorbing and heat reflecting coatings, with the aim of improved economy of energy.

Overall dimension of treated components 2m x 3m. Two components can be treated simultaneously. Productivity of process - 6m. per hour.

Minimum pressure of Vacuum Chamber: 1 x 10⁻⁴ (mm of merc.col.)

Dimensions of working area: Diameter: 3.0 m.

Length: 4.5m.

Projected Values (Units/\$'000).

Production Type	1995	1996	1997
Unit coating installation	10/3000	10/3000	10/3000
Coating processing	-/750	-/750	-/750

Projected cost of unit installation:	\$300,000
Projected cost of project	\$500,000
Investment cost:	\$500,000
Period to start of project:	8 months
Income:	\$1,000,000

DESCRIPTION OF PROJECT 2:

The design and manufacture of a universal process flow installation for:

- a) coating under vacuum, micro-electronic components
- b) other industrial applications.

Project Aim: the equipment would consist of four chambers, subject to superhigh vacuum. The design would deposit metallic, dielectric and optical coatings, by means of oxidized films of metal alloys. The unit would also be used for coatings in jewellery, watch making and car industry applications. Technological and decorative coatings represent a new method of improving the characteristics and quality of product surfaces. Cost effectiveness of the four chamber installation, would be achieved through high productivity in comparison with existing, expensive installations.

Project Volume of Sales/Year

Installations:	Total	1995	1996	1997	1998
Installations:					
Units	41	-	13	12	16
Value (\$ms)	14.760	-	4.680	4.320	5.760

Projected price of installation on internal and external market: \$360,000

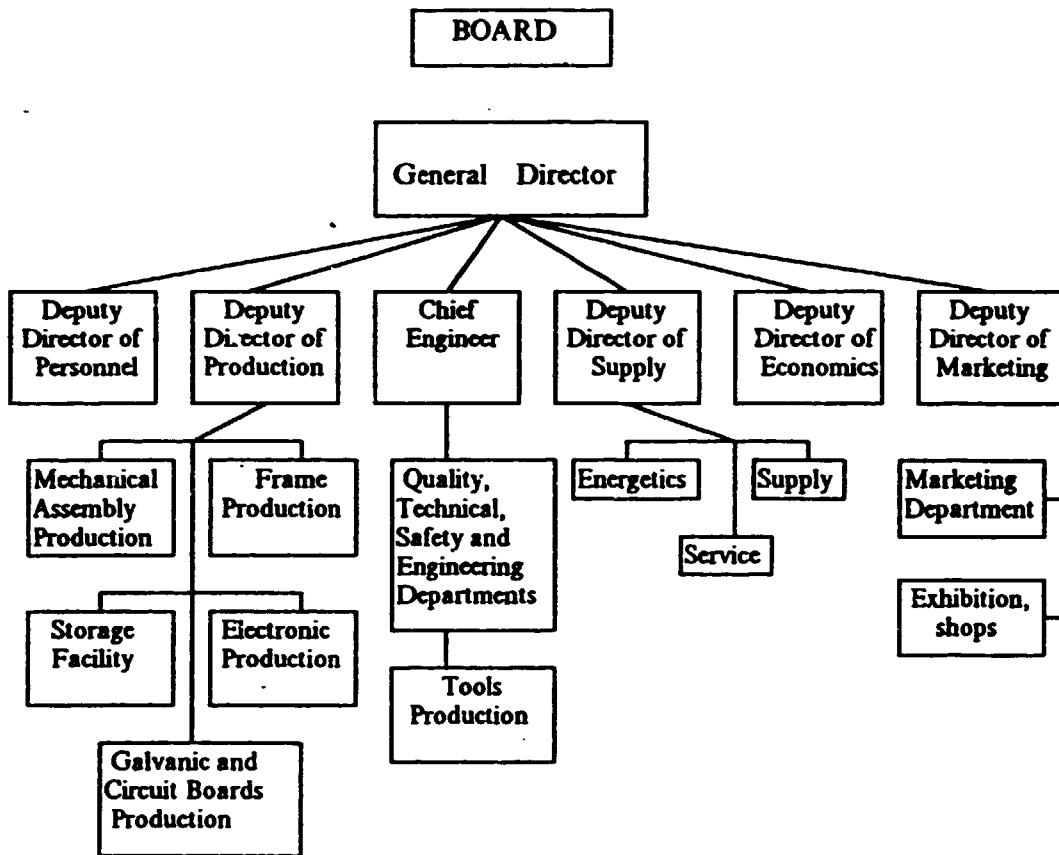
Investment Requirements:**Investment Sources**

	Project Sponsor	Investor
Total \$2.3m	\$500,000 in the form of buildings, equipment workforce.	\$1.8m.

Period of recoupment of project: 2 years.
 Anticipated profit: \$745,000 per annum

Form of participation of investor: Joint venture and participation in joint stock capital.

STRUCTURE OF THE 'KVARTS' COMPANY



APPENDIX 3.5

Company Profile: JSC BALTKRAN (BK)

A. Company Background

The original firm was founded in 1945 as a crane manufacturer for the extensive Soviet reconstruction programme, then coming into effect. BK emerged as a Joint Stock Company in 1993. Assets are now some Rb. 12-13 bn., owned 30% by employees, 20% Lukoil, 20% a German partner firm and the balance by other corporate investors. Since the early inception, over 10,000 cranes have been delivered. Now, 520 staff are employed on the main site in Kaliningrad and a small subsidiary located 12 kms. from the city.

About 7% of output is accounted for by beam pumps, used in oil production; in competition with several other firms in the Federation, particularly in the Urals. In the main activity, crane designs embrace a range of configurations, including gantry, tower and crawler mounted. Both tubular lattice and profile structures are used. Soon after formation, BK formed an association with a German crane maker, now holding 20% Equity, such that through German marketing, exports have built up to about 70% of output over a three year period. Products have been shipped to Germany, Singapore, New Zealand, South Africa and Taiwan. Through working to German DIN Standards, BK is able to meet approval at Norske Veritas, such approval being a prerequisite in international markets. In this field, competition includes such firms as Krupp, Kone, Morris and Demag.

In 1994 Sales were approx. \$1.3m, about 60% of capacity. This year production is up by some 30%. With a twelve month order book, ways to secure additional capacity are being sought. Meanwhile, production facilities are being upgraded with the assistance of the German partner. New CNC plate cutting and modern welding equipment have been installed. Paint facilities need to be modernised both to meet Western coating standards and to overcome current environmental shortcomings, at a projected cost of \$1.2m. Other capital investments needed in equipment amount to a further \$0.5m. Part of this can be funded from cash flow, since profit/sales is about 20%, and very limited barter is involved. The firm has a good basic machine shop, including gear cutting facilities and a foundry, able to produce both grey iron and chrome alloy steel castings. Grey iron castings are provided on a regular basis to another German firm.

BK regularly use steel plate of German supply, although this is more expensive than that from Ukraine, which is also used. Steel from Federation sources is only a third choice.

BK has made very good progress in restructuring in a relatively short space of time. The benefits of the foreign partner relationship are clear, both in terms of marketing and quality upgrading. The assistance in training welders to certified standards is invaluable. The setting up of a Service department for installation and maintenance in CIS, demonstrates awareness of new market conditions.

Management are now making plans to introduce a new product aimed at the container handling market. This development will stimulate consideration as to the longer term dependence BK should place on any one partner, particularly as the domestic market is beginning to recover.

B. COMPANY DETAILS

NAME:

JSC Baltkran

LOCATION:

A. Nevskogo Str., 165, Kaliningrad 236008, Russia

GENERAL DIRECTOR:

Ermolaev Oleg Fillipovich. Tel: (7-0112) 43 27 72

SHAREHOLDING:

Joint stock company with participation of foreign capital. Capital Rs. 15,049 m. Additional Capital (on 1/4/95) Rbs. 20,011,456,000. shareholders: Lukoil-Kogalymneftegas (Russia) 20%, Noell GmbH (Germany) 20%, Employees 30%.

TYPE OF PRODUCTION:

Tower Cranes; Lifting Cranes; Beam Pumps for oil extraction. Iron and Steel Castings.

FILIALS:

Mechanical assembly shop is located 12 km. from main plant.

STRUCTURE OF ENTERPRISE:

4 main shops : mechanical assembly, casting, machining and metal fabrication.
3 auxiliary shops: maintenance and toolroom, transport and building maintenance.

FINANCES:

Financial position is stable. Investments during the period 1993-4, amounted to about \$1m.

PRODUCTION:

Production	1994	1995 (expected)
Value (Rbs.m) Total	5,434	23,540
Production Type (Units)		
Cranes		
MKKC-32M	15	15
MKKC-12.5	2	-
Tower Cranes		
MKPC-300	3	8
Container Cranes		
MKKC-42K	-	1
Bench-Swing	24	24
Crane Beam Lift		
Capacity 2-5 tonnes	21	21
Parts for container cranes depot.	5	22

Utilisation: Shift loading is 1.35

Production Processes:

Includes casting, prefabricating works (cutting, punching), machining, assembly, welding and painting.

Production Areas:

Site area, 1,449,000 sq. Production area 75,000 sq. Area for expansion 50,000 sq.

Age of Equipment (as at 26.5.95)

Type of Equipment	0-5 Yrs.	5-10 Yrs.	10-20 Yrs.	20+ Yrs.	Total
Metal cutting	31	62	21	11	125
Forge	1	10	11	6	28
Casting	6	10	2	1	19
Welding	46	34	-	-	80
Wood processing	3	1	11	5	20
Load Lifting	8	20	16	10	54
	95	137	61	33	326

Quality of Production:

Most welders and two engineers are certified in welding to international standards. Technical inspections are undertaken by Norske Veritas, Lloyds and customers such as Port of Hamburg, Germany and Port of Dunkirk, France.

Workforce:

The total number of personnel is	:	520
including:		
engineering		116
operatives		186
auxiliary workers		218

Average age of Workforce: 40.5 years.

ORGANISATION AND MANAGEMENT:

The structure of the management is given in the Table.

Ratio of managing-technical personnel to operatives is 1:3:5

RESEARCH AND DESIGN:

Use own designs. Design team sometimes work on other organisation's projects.

22 engineers have higher education, and periods of employment 10-25 years.

A C.A.D. system is currently being installed.

MARKETING:

Baltkran's market share is about 30% amongst Russian manufacturers. Reputation is high and the trade mark is recognised in most regions of Russia and CIS.

Prices:

Competitive, analysed on all tenders. Principal customers are the enterprises in the northern production region of Russia (Lukoilkogalymneftegas).

Competitors:

Joint Stock Company Crane of Uzlovaja; Lenpod 'Jemtransmash' of St. Petersburg and Production Union Metromash of Moscow.

Suppliers:

The main suppliers of materials and components are the enterprises of ferrous metallurgy including the city of Mariupol in Ukraine and the Russian cities of Vyksa and Nignij Tagil; ETA Dinamo, Joint Stock Company Kraskaelectr of Moscow, Joint Stock Company Bavlensky plant Electrodivigatel, plants of welding materials in Moscow and Kaliningrad and the Joint Stock Company AGA-KAS of Kaliningrad.

C. ANALYSIS OF STRENGTHS AND WEAKNESSES

Strengths

1. Knowledge and experience of international standards and competitive production.
2. Solvent customer base, through foreign partner to export markets.
3. Good order book and range of products.
4. Stable financial position.
5. Good design and technology.
6. Licence from Gostechnadsor for design, production, assembly and repair of load carrying structures.
7. International certification for welding.
8. Efficient production.
9. Experience with foreign partners and attracting investment.

Weaknesses

1. Low level of know how in direct marketing.
2. Limited funding for innovative projects.
3. High competition in mechanical handling sector.
4. Limited production capacity.
5. Part of production plant and equipment is obsolete.

Opportunities

1. Increase in demand from Russia and CIS as economy recovers.
2. Further export market development.

Threats

1. High level of business risk due to Russian economic instability.
2. Competition from foreign manufacturers.

D. STRATEGY

Balkran has a stable financial position due to its outlet to international markets. The principal strategy is to develop sales in world markets. Export volume is now 70% of the total. To maintain this position and develop further, Balkran needs a modern paint shop, welding and gas cutting capacity.

Future prospects for the markets in Russia and abroad are related to the beginning of container traffic in the FSU. Saturation point in internal markets with existing products is too low. Railway depots, ports and warehouses will all be potential customers for container handling equipment.

Participation in the next strategic investment project is suggested.

E. PROJECT PROFILE**Description:**

Design and production of container handling cranes, to international quality standards.

Basic Parameters:

Projected volumes of sales are as follows:-

Production Type	1995	1996	1997	1998	1999
Container crane for railroad	1	3	5	7	10
Container crane for port	-	1	5	5	5

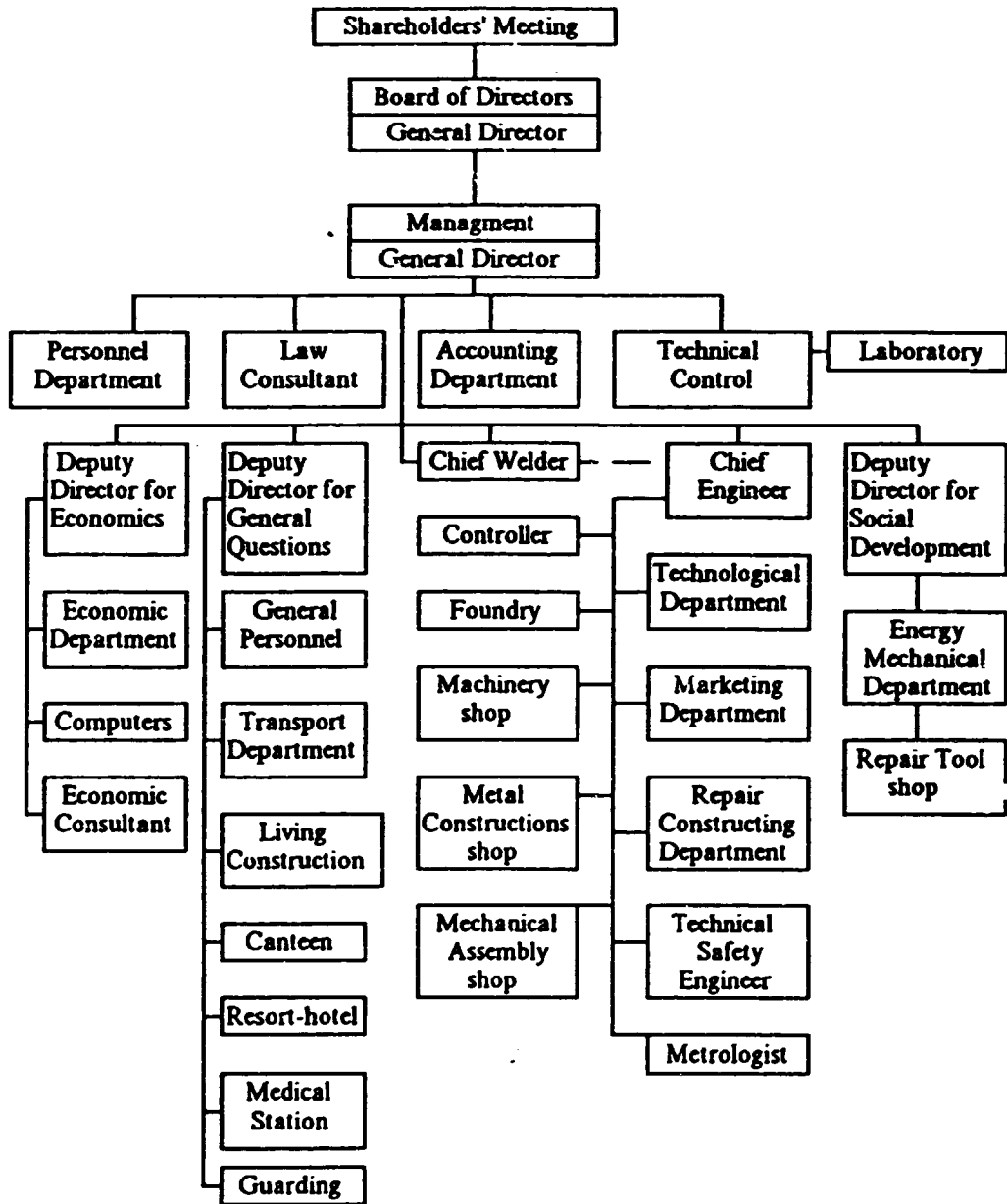
Investment level: \$1,700,000

Recoupment time for project 4 years

Form of participation: Investment Loan of \$1,700,000.

The Loan will be paid off during 1998-1999 in four equal payments per year, from profits at company level.

STRUCTURE OF THE 'BALTKRAN' COMPANY



APPENDIX 3.6**JSC Stroydormash (SDM)****A. GENERAL BACKGROUND**

SDM was founded in 1956 and is now a Joint Stock Company, owned 51% by employees, 20% by the State and the balance by other outside corporate investors. Some 900 staff are currently employed on a single site, near to the centre of Kaliningrad. The product range over the years has included steam boilers and for the military, bridge systems and tank carriers. Currently, the main products are vibrating rollers and marking machines used in road making, introduced progressively since the 1960s. More recently, a hydraulic crane designed for truck mounting, has reached the first batch production stage.

Some 40 road rollers per month are now being produced against DSM'S potential capacity of 1,200 per month. Road markers have a lower demand, so that production of 2-4 units per month represents a small percentage of the 400 per month capacity. The company is still operating on a conversion programme loan, while efforts are being made to establish direct market contacts, all within the Federation.

Basic designs for equipment are prepared by the appropriate Institute in Moscow, with detailed development undertaken in-house. The road Rollers use engines of USA and Italian origins, introduced following unsatisfactory performance of Russian suppliers, in terms of spares and service.

Because of uncertainty of demand and the seasonal nature of the current products, SDM is considering possible new products. UK and Swedish firms have shown some preliminary interest and a proposal to a German company to take up a shareholding in SDM awaits a formal response.

The site was formally used as a steam locomotive repair shop, now with a number of separate buildings, mostly in a poor state of repairs. Plant and equipment is however, in good working order, offering a good range of general engineering capabilities. SDM buys in its castings, but has a heavy forge, plate and welding shop. The machine shop is of 1960s technology, but there is some use of programmable machines, together with a good basic gear cutting section. Paint finish and appearance are unsatisfactory.

SDM has started the restructuring process later than many other enterprises and much needs to be done if survival is to be assured. Projects currently in preparation include the introduction of a new model of road making machines of German origin and the assembly of buses from kits, to be supplied by a Polish firm. Both proposals need careful evaluation.

B. COMPANY DETAILS**NAME:** Stroydormash**LOCATION:**

Sudostroitel'naja Str. 75, 236066 Kaliningrad, Russia.

GENERAL DIRECTOR:

Jasinsky Anatolij Alexandrovich. Tel: (7 0112) 44 27 46

SHAREHOLDING:

Joint Stock, mixed. The State 20%, 4 individuals 49%, and balance is held by employees.

TYPE OF PRODUCTION:

Machine building. Production of road building and marking machines.

STRUCTURE OF ENTERPRISE:

4 main shops consisting of forge, prefabrication, machining and assembly/welding.

4 auxiliary shops for toolmaking, mechanical repair, transport repair and electrical repair.

FINANCES:

Difficulties caused by non-payment by principal customers.

PRODUCTION:**Units of Production**

Equipment Type		1994	1995 (expected)
Vibro Road Roller	54M1		371
" "	54M2	14	450
" "	72	37	150
Marking Machines	54M1	4	-
" "	54M1	9	20
" "	54M1	13	35
Repairers		2	5
Tractors	MS-1	4	30
Manipulators	CMT-6131	8	15
Potato Harvesters		10	-

The company also produces some consumer goods such as heat generators, boilers, stoves for summer houses, carts, wheelbarrows and other gardening implements.

Utilisation of capacity: 30% approx.

Production Processes:

Sheet and profile rolling, punching, forged and welded structures are passed to the machine shop or directly to assembly. Assembled products are subject to test, painting and sent to finished stores. There is modern equipment for machining of hydro-cylinders and details; good toolmaking and forge, with an area of 16,000 sq. m. Annual capacity of forge is 406 tonnes and of punching 2,850 tonnes.

Production Areas: (Thousands of sq. metres).

Site area: 120.6. Production area: 40,000. Auxiliary area: 20,000. Administrative area 15,600. Site for expansion 20,000 sq. mts.

Age of Equipment:

Type of Equipment	0-10 yrs.	10-20 yrs.	20+ yrs.	Total
Metal cutting	86	161	79	326
i) in basic production	61	114	49	224
ii) in auxiliary "	25	47	30	102
Forge	28	31	24	83
i) in basic production	28	21	20	69
ii) in auxiliary "	-	10	4	14
Totals:	114	192	103	409

Quality : meets Russian standards and technical specifications.

Workforce:

total number of personnel: 820

including: Engineers 274

Operators 250

Auxiliaries 296

Average age of workforce: 45 years.

ORGANISATION AND MANAGEMENT:

The management structure is shown on the diagram

Ratio of managing/technical personnel to operatives is 1:2

A computer system is used for planning and production control.

Research and Development:

There is an experimental shop which is used for development work. Experimental products and consumer goods are in design on a regular basis. Number of designers - 18.

MARKETING:

The market share has not been evaluated. Data provided by an Eastern European consulting group, defines Stroidormash as one of the largest manufacturers of Road Rollers in Russia.

Reputation:

Good reputation in the market. Level of service to customers is satisfactory. Service centres are provided in the regions for repair and maintenance of products.

Prices:

Low compared to those of similar Western European products.

Main Customers:

Road building and repair firms in Russia and CIS.

Competitors:

Enterprises in Bellarussia which produce Road Rollers of a similar type.

Suppliers:

Principal suppliers for materials and components are Urals' enterprises, Vladimir tractor works and Novgorodsky automobile works.

C. ANALYSIS OF STRENGTHS AND WEAKNESSES**Strengths:**

1. Experience of production of a wide range of road building machines.
2. Single supplier position for some products in road roller and marking machine market sectors.
3. Competence in production of hydraulic equipment.
4. Computerised planning and production control.
5. Ability to diversify manufacture by good toolmaking facility and prefabrication.
6. Spare production capacity.

Weaknesses

1. Lack of liquidity in traditional markets.
2. Unwieldy structure of enterprise, with low capacity usage (less than 30%).
3. Age and condition of production buildings and some equipment.
4. Lack of investment for innovation.
5. Limited level of know how in management, production and finance in the market conditions.
6. Lack of experience with Western partners
7. Low efficiency of production processes.
8. Over staffing of engineering management functions.
9. Low level of labour productivity.
10. Wastage of skilled personnel.

Opportunities:

1. Production capacity for increasing sales volume.
2. Russian demand for road building and repair.
3. Low cost of production in comparison with competitors.
4. Untapped export market.

Threats:

1. Lack of financing.
2. High level of business risk due to Russian economy instability.
3. Competition from foreign manufacturers.

D. STRATEGY:

Stroidormash is the largest Russian manufacturer of Road Rollers and Marking machines for the construction and repair of road surfaces and Hydraulic Actuators. Because of the constant necessity for road construction and repair in Russia and CIS, demand will increase steadily with the stabilisation of the economy. In the present situation, the company has to maintain their current production policy, concentrating on improving quality standards.

With the aim of facilitating financing, future projects should concentrate on products for competitive road building techniques. These include the design and production of thermo-repairers for pot holes using asphalt coating (cost of project Rbs.1.5m); equipment for road coating markings (Rbs.3.2m); and a Vibro-roller with two vibrating rollers of 0.6-1 tonnes mass (Rbs.1m.). Production must be aimed at international standards and competitive prices. It will be necessary to restructure the balance sheet.

The cost of forgings and hydraulic cylinders are 30-40% lower than international levels. Some export sales are therefore possible, with effective marketing.

Improving management efficiency and reducing overhead expenses could be achieved by reorganisation. It is necessary to develop the Marketing department.

To improve technical levels and product competitiveness, it could be beneficial to consider joint production with leading Western firms such as "Gofman", "F+F", "Bomag" of Germany, "Dinapak" of Sweden and "Farmi" of Finland. Now free from defence order commitments, it is possible that the introduction of "screwdriver" technology may be worthwhile.

Participation in the next strategic industry innovation project is suggested.

E. PROJECT PROPOSALS

Project (1) Description :

The objective is to upgrade technical levels and product competitiveness, thus to find outlets in export markets. The proposed product will be a modern road marking machine with a boiler volume of 2 cubic ms.; speed of marking up to 6-8 km/hour, using the design and technology of the firm "Gofman".

Projected sales volumes of the experimental model in 1997 are 10 units, and 100 units annually for the years 1998 to 2000. The projected selling price per unit is \$24,000.

The calculated cost of the project is \$360,0000 in 1995, \$540,000 in 1996 - making a total of \$900,000. the payback period is projected at 2 years.

Project (2) Description:

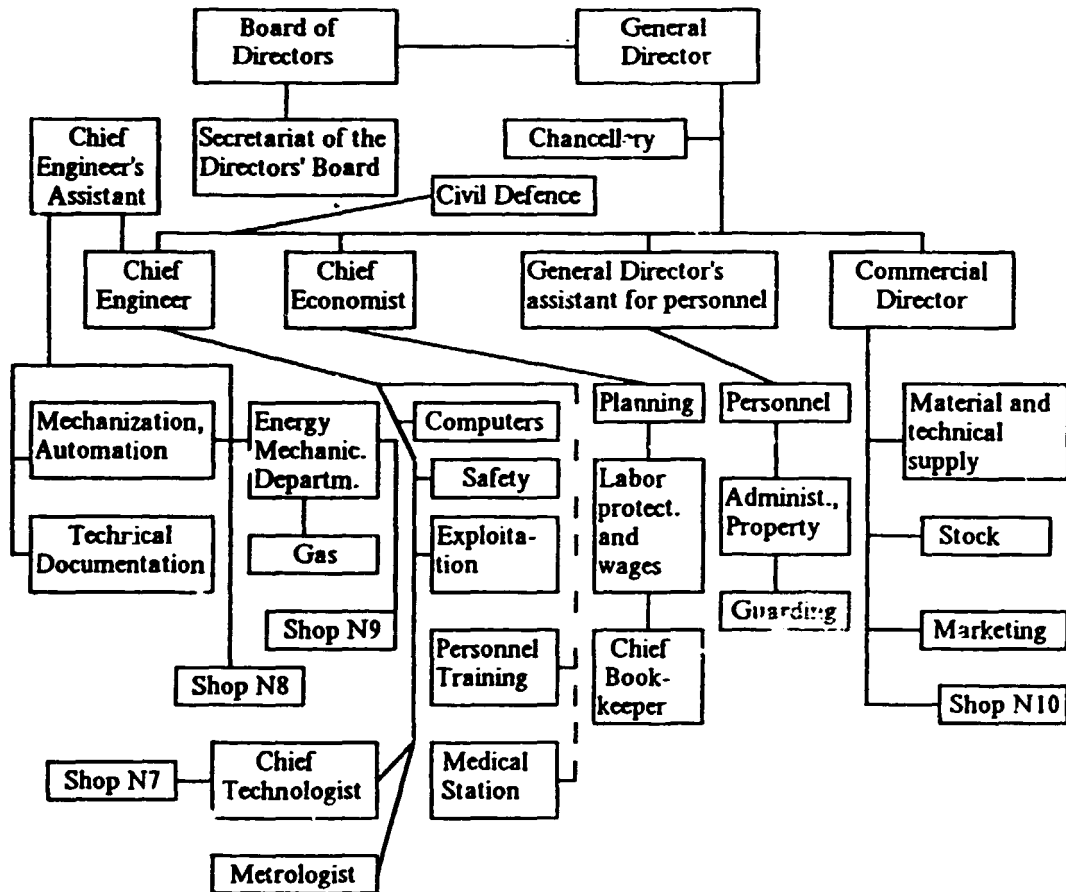
Production of buses, of the type Elch 120M in co-operation with the Polish automobile company "East-Trade".

There is a preliminary agreement on the possibility of producing city buses with this Polish company. The base model is the Elch-120M, capacity up to 110 passengers; also with the possibility of transporting invalid chairs. a preliminary joint programme is seen in three stages, as follows:-

Stage 1	assembly
Stage 2	production of detailed parts, and
Stage 3	complete production.

An investment of approx. \$900,000 is required, subject to the preparation of detailed plans.

STRUCTURE OF THE 'STROIDORMASH' COMPANY



APPENDIX 3.7**J.S.C. Sudoremmash Automatic (SA)****A. General Background**

SA was founded in the early 1960s, to provide engineering repair services to shipping and particularly, the fishing industries. In former times, as well as the headquarters and main workshops in Kaliningrad, the company operated twelve marine repair centres, from Murmansk in the north to Novorossijk in the south. With the advent of the CIS, only two centres remain, these being in Arkhangelsk and Murmansk. With these two subsidiaries, since 1991, the company has been owned 51% by employees, 25% by Government and the balance by key customers in the fishing industry. Employees were 2,500 in the 1980s, but now total approx. 600.

In addition to general overhaul and repair services for ship's equipment, the current product range can be categorised into four groups:

- Fish processing machinery for slitting, can filling, packaging.
- High precision components, notably diesel injectors, valves and push rods.
- General components for marine, agricultural machines, construction equipment and railways.
- Industrial and domestic plastics.

Originally designed for on-ship installation, the fish processing machinery has now been sold throughout Western FSU. Recently, a sale has been made to Japan and efforts are being made for Norway and Czechoslovakia. A 'Western' version of the can filling machine, making greater use of stainless steel is now available, offered for sale at approx. \$100,000 per unit. The company is trying to develop a working relationship with a German firm, also providing machinery. Before 1990, SA produced up to 120 units per annum, and this is now reduced to 15-20 units. The need to generate promotional effort is recognised.

The high precision parts activity is one normally associated with the original manufacturers of diesel engines, fuel pumps and injectors, rather than a repair facility. Because of SA'S particular skills in this area, it is possible that offering services to these manufacturers, particularly for spare parts for non-current production, could generate additional work.

In the general component business, the current emphasis is on parts for agricultural machinery, both to domestic markets and into EU, through an agent based in Holland. This is relatively low in value and is not likely to hold much future potential. Similarly, the manufacture of polyethylene containers and sundry domestic items, is unlikely to withstand viability analysis.

New product possibilities include machine tool attachments, using a novel mode of metal cutting, translated as 'rotating chisel'. The idea has been developed in Kaliningrad Technical University and is said to be ready now for commercial exploitation. The proposal is reviewed separately in this report, Section E.

SA's manufacturing facilities are impressive, particularly in respect of the clean room precision machines (surface 0.0-0.05 micron) of German manufacture, and the auto-CNC multihead lathes of Swiss origin. The general machine shops are unremarkable but also have some earlier CNC profile lathes and a large gear hobbing section. Sheet metal shops are basic, as is the forge, equipped with older machines. Of note are the laboratories for measurement, mechanical and chemical checking of materials and finished components.

The laboratory equipment is needed, not least, to meet the regulations of shipping insurance and the regular inspections carried out by Lloyds. For the food processing equipment, SA work to DIN Standards. The benefits of moving to accreditation under the ISO 9000 quality assurance system are not yet fully appreciated. All design work, where needed, is undertaken in-house and as elsewhere in Russia, the quality of product appearance and detail is lacking.

Progress in restructuring has been made in some areas, but much remains to be done. The organisation does not reflect the differing businesses being carried on and there is an urgent need to develop the marketing function. Future plans exist only in sketchy outline, so that day-to-day decision making, may or may not be helpful to the future of the company.

B. Company Details

NAME:

Sudoremashautomatica

LOCATION:

Garazraja Str. 2, Kaliningrad 236040, Russia.

DIRECTOR GENERAL:

Avdeev Nicolay Nicolayevich. Tel: (7-0112) 21 77 35

SHAREHOLDING:

Joint stock mixed, open type company. Capital Rbs.23.8m. Government 25%, Juridical subjects 8%, Individuals 67% (of which employees hold 51%).

TYPE OF PRODUCTION:

Spare parts for marine diesels; equipment for processing fish; packaging machines; articles in polymer, parts for electronics; repair and servicing of marine controls.

FILIALS:

Firm "Elmor", repairer of controls on ships of fishing fleet.
Polymer shop is located separately at 6 K. Nasarova Street.

STRUCTURE OF THE ENTERPRISE

4 main shops for machining, machine assembly, polymer and automatics
3 auxiliary shops for Toolmaking, repair and transport.

FINANCES:

Financial difficulties because of non-payment by customers of Kus. 1.5 bn.

PRODUCTION:

Sales for the year ended 1 April 1995 amounted to about \$2m. Product mix included: spare parts for diesels of foreign production, including fuel injectors; equipment for food canning; polymer containers (barrels, bottles, jars, jerrycans).

Plant utilisation:

Metal cutting equipment 30%; Polymer production 45% production of equipment 20%.

Production Processes:

Machining and assembly; casting; extruding of polymers; punching; welding; heat treatment; galvanising. There is a good thermal department which can produce cementation hardening of fast-cutting steels and hardening of components for fuel injectors.

Production areas: (thousands of sq. metres)

Site area: 83.8, including 20,800 sq.m. on Garznaja Str., 17,200 sq.m. on Nasarova Str and 45,800 sq.m. on Rzevsky.

Total covered area is 25,838 sq.m., including a production area of 9,999 sq.m. and auxiliary areas of 3,500 sq.m.

Age of Equipment:

Metal cutting (426 units, including automatics)	-	30% up to 10 years remainder 15-20 years
Forge (52 units)	-	50% up to 10 years remainder 15-20 years
Casting - Thermoplastic automatics (25 units)	-	8-10 years
- Extruders (5 units)	-	10-15 years
Welding (43 units)	-	6-15 years.
Thermoprocessing (15 units)	-	up to 10 years
Galvanising (7 units)	-	15-20 years.
Cranes (2 units)	-	5-12 years.

Quality of Product:

Meets Russian standards and technical specifications.

Workforce:

Total number of personnel:	650
including: Engineers:	155
Operatives:	495
Average age of workforce:	43 years.

ORGANISATION AND MANAGEMENT:

Structure of management is given on the Table.

Ratio of management/technical personnel to operatives: 1:4:19

RESEARCH AND DESIGN:

In-house design bureau. In 1995 an order was designed for a packaging machine for Norway, together with a machine for sealing packages. Strength of the design base is 18 persons.

MARKETING:

The market shares for each activity are estimated as follows:

- Packaging Machines 75% in Russia/CIS
- Fuel apparatus for diesels 30% in Russia/CIS
- Plastic extrusions 15-20% local markets, Kaliningrad region.

The reputation for the products is good and the level of service satisfactory.

PRICES:

Products and services are competitive.

CUSTOMERS:

The canning and packaging equipment is exported to the Far East, Ukraine, Czechoslovakia and Norway.

Spare parts for diesels are supplied to Murmansk, Kaliningrad, Far Eastern shipping bases, Archangelsk River Steam Navigation and locomotive depots in Kaliningrad, Penza and Moscow.

Plastic containers are purchased by Kaliningrad trading enterprises and food producers.

Exports making up approx. 20% of the total volume are made to Poland, Germany, Norway, Czechoslovakia and the Far East. The principal exports are fish processing machines and services.

COMPETITORS:

The enterprise AO "Rybtchzentr" of Kaliningrad, AO Charkov Diesel Works, Chuguev and Chlebnikov Fuel Equipment Works and AO Murmansk Shipyard.

SUPPLIERS:

Main suppliers are Korov Works of St. Petersburg and steel works in the Ukraine.
Other suppliers are not constant.

C. ANALYSIS OF STRENGTHS AND WEAKNESSES

Strengths:

1. Modern equipment and experience of heat treatment of metal.
2. Experience with foreign partners.
3. Export demand for certain products.
4. Precision machining equipment and competence.
5. Experience in production with rotor cutting tools.
6. Ability to diversify manufacturing, with good toolmaking facility, CNC machines and contemporary pre-fabricating equipment.
7. Spare production capacity.
8. Experience of inspection procedures to Lloyds and DIN Standards.

Weaknesses:

1. Poor liquidity of customers
2. Unwieldy structure, with low usage of capacities.
3. Productive buildings and part of the equipment obsolete.
4. Limited investment for innovation.
5. Limited level of know how in management, production and finance in market condition.
6. Diversity of product range.
7. Low level of labour productivity.
8. Wastage of skilled personnel.

Opportunities:

1. Spare capacity for increasing sales volume.
2. Markets in Russia and CIS as economy recovers.
3. Export market prospects.

Threats:

1. Lack of financing
2. Crisis of non-payment in Russia and CIS.
3. High level of business risk due to Russian economy instability.
4. Competition from foreign and Russian manufacturers.

D. Strategy

Sudoremashautomatica has financial difficulties. The strategy must be for survival. In the absence of a coherent technological structure, products for consideration are:

- Fuel apparatus and spare parts for imported diesels (Series NVD of the firm SKL Diesel, firm MAN etc.)

Internal markets are depressed but with equal quality and better prices other markets could be fruitful. Development in this direction will demand serious marketing efforts in Western markets.

- Production of machines for packaging fish products. The demand from the internal market has reduced because of payment problems. For external markets it is necessary to upgrade the quality of production to international standards.

Co-operation with foreign firms to supply complete lines to fish processing enterprises would enable the company to take full duties in designing and manufacturing.

- In view of the abilities in toolmaking and using effective rotor cutting tools, participation in the next strategic innovation project is suggested.

E. Project Proposal

Description:

Production of rotary tools, design and transfer of technologies of rotational cutting equipment to different branches of the metal processing industry.

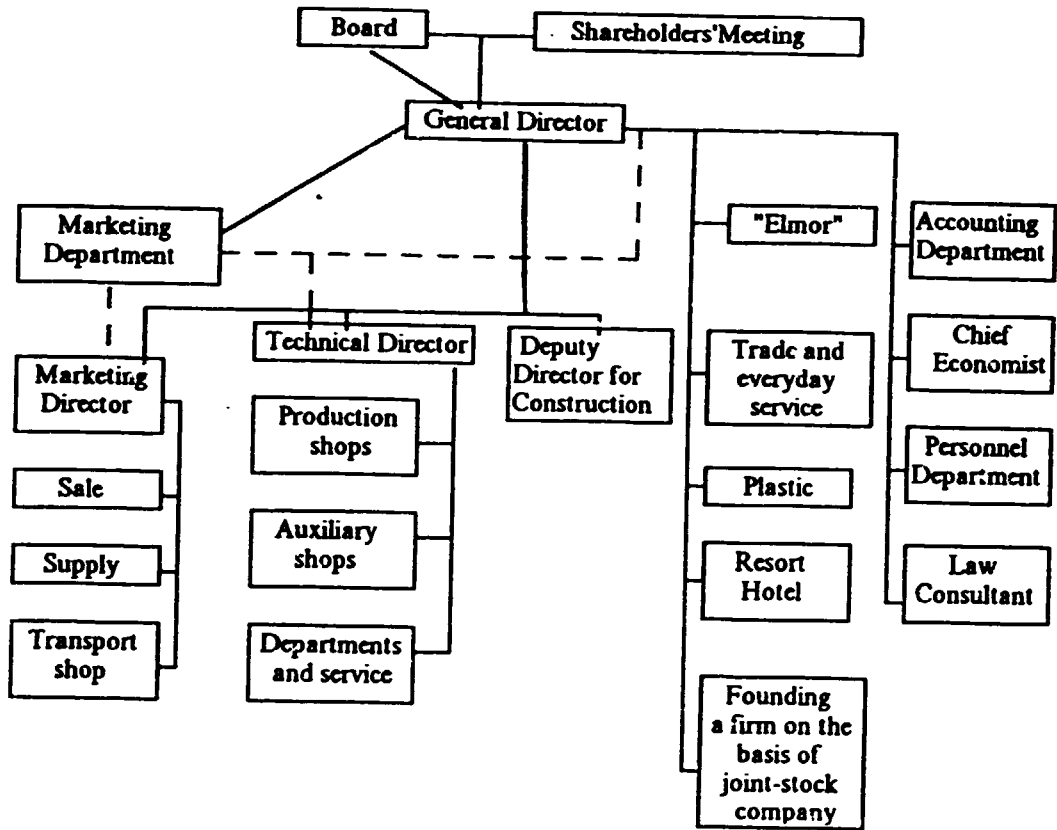
Project Aim:

Rotational cutting is based on changing the normal contact interaction between tool and work detail from sliding to rolling-sliding. The process assures new perspectives and possibilities. Use of rotary tools increases, by many times, the efficiency of machining (including hard processing materials and stainless steels). To date, these progressive technologies are not widely applied.

The designer of this technology is the laboratory of rotational cutting at Kaliningrad State Technical University. Serial manufacturing of rotary tools has not yet been taken up internationally. The project could create niche opportunities in both internal and external markets.

The economic basis for project justification is in course of preparation.

STRUCTURE OF THE 'SUDOREMMASHAVTOMATIKA' ENTERPRISE



APPENDIX 3.8

Yantar Shipbuilders

A. General Background

Yantar's shipbuilding activities started in 1946 and since that time, some 490 vessels have been built, nearly 400 of these for the Russian Navy. As an engineering base, the site adjacent to the river and Kaliningrad, dates from 1882; the main activity in the intermediate years being the manufacture of steam locomotives. The facilities allow the construction of vessels up to 20,000 tonnes. In former time, employment levels reached about 10,000. This has since declined, but after the cessation of military orders in 1993, employment was reduced to 4,000, and currently some 2,000 are employed effectively.

Vessels built for the Navy included destroyers, frigates and more latterly, specialised submarine hunters. Small vessels included patrol boats and landing craft. For the civil sector, the range includes bulk carriers, tankers, general cargo ships and ferries. Current work in progress includes two 18,000 tonne bulk carriers for Estonia and three warships for which funds are not available to allow completion. In addition to new building, Yantar undertakes ship repairs, whose owners include both the Navy and commercial operators.

Production facilities, although made up mainly by earlier generations of machine plant, are generally in good condition. The main functions include forge, bronze and brass foundry, heavy machine shops and extensive plate fabrication shops. Various forms of welding are used, including CO₂ Argon, with some partial automation. Hull assembly and welding is carried out in one of two launching lines. Stern sections only are built under cover. Superstructures and 'topping out' are completed after launch. Components manufactured in the yard include propeller shafts, bearings, pipework, lifting gear and hydraulics. The remaining 50% of typical vessel cost comprising engines, auxiliary systems, pumps, electrics and controls, being purchased. The main components are sourced in Russia, but the yard is increasingly seeking alternative competitive suppliers. The cost of steel from Poland is \$450/tonne, and from the Urals \$470/tonne, plus 2,000 km of transport costs. Poland delivers in one month, the Urals in three months.

Under the Soviet system, Yantar was dependant for vessel designs on the Marine Institutes and particularly that in St. Petersburg. The establishment of a full design capability in-house is seen to be important for future flexibility, and accordingly, steps are in hand to achieve design independence. The matter of standards is also being taken seriously. A start has been made and about 50% of the welders have already been certified under Lloyds. The aim is to achieve full accreditation for ISO 9000 by October 1996, proceeding on a shop by shop basis.

For the immediate future, Yantar is concentrating on export prospects for commercial vessels. Working funds to finance work-in-progress has been a particular problem. However, against a recent German contract, funding is to be made available from Dresdner Bank, working through a Russian counterpart. Hence the 180-200% interest

rates of local banks, will be avoided. Similar arrangements are likely against other prospective contracts. Collateral for the loans is stated to be company 'property', but with Yantar's official balance sheet value at only Rbs. 1 bn (\$0.28m), some revaluation of assets is needed. Compared with comparable concerns elsewhere, the yard might be valued at \$80m.

Yantar's objective for the medium term is to become "the most modern shipyard in the world". Recognising that much of the older machines and equipment must be replaced, a \$50m investment plan is envisaged over a five year period. Projected output is twelve vessels a year, totalling annual sales of \$180m. Vessel tonnage would be increased to 25,000 tonnes. Norwegian consultants have been engaged to prepare a detailed business plan, which will also take into account the future of the State's 51% shareholding in the company. This is an ambitious plan, but if Yantar can meet the market's "fixed price and on time" creed, then the Kaliningrad cost of engineering is competitive enough to yield acceptable profitability.

Proposals have also been drawn up for the manufacture of steel containers to ISO standard, in conjunction with an Italian design partner and a steel manufacturer in Kazakhstan. Project cost is estimated at over \$30m. Having received an expression of interest from EBRD for one third of the investment, the partners have failed to provide the necessary commitment. Yantar's main shareholder is undecided whether to proceed. Certainly, the start of a new activity with new methods and tempo on a site with established work practices, geared to other products, is not desirable. The initiative for the container scheme has been taken up by the neighbouring company, Vagonostroitei and Yantar is likely to be invited to participate (see Appendix 3.3).

B. Company Details:

NAME:

Yantar Enterprises

LOCATION:

10 Transportnyy tupik, Kaliningrad 236002, Russia

GENERAL DIRECTOR:

Leonid Zmachinskiy. Tel: (0112) 44 59 85. Fax: (0112) 44 85 36

TYPE OF ACTIVITY:

Production of warships, bulk carriers, general cargo vessels and ferries.
Engineering machinery.

SHAREHOLDING:

Equity Capital on 1 January 1995, Rbs. 215m. Government 56.12%, Financial company 'Rosto' more than 15%, the balance held by the employees

FINANCE:

Profitable during 1994. Balance of profit on 1/1/95 was Rbs.537m.
Certain financial difficulties, due to non-payment by Government customers.

PRODUCTION:

Sales Volumes for 1994:

Activity	Sales in Rbs.m.	% of Sales
Shipbuilding	2,834	76
Ship repair	7,826	21
	150	0.4
Other	<u>835</u>	2.3
Total:	37,151 m	

Usage of Production Capacity:

Shipbuilding in 1994, 31.75. Machinery production (capacity 60 prop shafts/year), 2-4 units per annum.

Production Areas: (Thousand sq.m.)

Construction areas 600.2 and 317. Maximum size of ship to be built depends on the size of the floating dock area 170 x 26 ms., depth 8 m.

Considerable development area available at the enterprise.

Age of Equipment:

Type of Equipment	Units	%		
		Up to 10 yrs.	10-20 yrs.	20 yrs. +
Lathes	169	32	85	52
Turn drilling	132	19	74	39
Grinding	89	9	47	26
Milling	82	9	47	26
Other metal cutting	70	5	31	34
Forge	130	21	48	61
Total:	672	19	323	250
		14.7%	48%	37%

The scope of the enterprise, in terms of engineering machinery is considerable. A considerable number of the machine tools are of larger sizes, including lathes, as shown under:

Lathe 165B

Lathe KS 1626

Lathe Waldrich W50-120 - able to machine components up to 2,000 mm diameter, length up to 8,000 mm and weight up to 20,000 kg.

Lathe Waldrich W50-70 - able to machine details up to 1,000 mm diameter, length up to 16,000 and weight up to 13,000 kg.

Lathe Waldrich - able to machine components up to 1,200 mm diameter, length 9,000 mm and shafts up to lengths of 20,000, weight up to 20,000 kg.

Quality of Production:

Meets Russian standards. 50% of welders certified to Lloyds standard.

Workforce:

Total number of employees on 1/1/95 was	4,100
of which, Operatives were	2,078
Direct Production workers	1,592
Machine shop	137

Average age of workforce: 45 years.

ORGANISATION AND MANAGEMENT:

The management structure is shown on the Table.

RESEARCH AND DESIGN:

the Design department, comprises the following personnel:

- Design office	114
- Manufacturing and Methods	200
- Metrology	12
- Repair and Maintenance	48

MARKETING:

The market share of the enterprise has not been estimated.

Reputation:

The reputation of the products in the market is high.

Prices:

Production prices are competitive.

Customers:

Main customers are civil and military.

Competition:

Competition comes from the shipyards of Poland, Lithuania, Ukraine and other CIS countries.

Suppliers:

Main suppliers are the metals and engineering enterprises of the Urals and Ukraine.

C. ANALYSIS OF STRENGTHS AND WEAKNESSES**Strengths:**

1. Highly qualified manufacturing engineers and machine tool operators.
2. Range of production equipment and processes.
3. Spare production capacity.
4. Flexible engineering manufacture.
5. Good working relationships with major component and metal suppliers.
6. Understanding of the need for future development planning.

Weaknesses:

1. Lack of liquidity for innovation.
2. Wastage of qualified staff.
3. Cumbersome enterprise structure.
4. Ageing of some one-off equipments.
5. Limited know how in management and finance in market conditions.

Opportunities:

1. Production capacity for expanding production volumes
2. Joint venture for ISO container production
3. Markets in Russia and CIS for new and competitive products.
4. Untapped export markets.

Threats:

1. Insufficient financing.
2. High risks in maintaining profit margins because of high value of 'bought in' equipments.
3. Uncertainty of defence orders.

D. Project Proposals**PROJECT 1 - I.S.O. CONTAINERS PRODUCTION**

Main production - 40 ft. and 20ft. ISO containers.

Annual output proposed - 20,000 units (of 20 ft equivalent).

Shareholders: the partners, noted below, respectively offer design and technology, supplies of steel and manufacturing management :

- MONETA Imp'yanti, Italy
- Metallurgical Plant Karaganda, Kazakhstan
- Yantar

The region will allow low cost access to foreign markets.

The project will enable:

1. Manufacture of products in steady demand in world markets.
2. Acquisition of modern technology and equipment.
3. Increase in employment.
4. Expansion of traffic through the port of Kaliningrad.

The estimated cost of the project is \$37m. The European Bank for Reconstruction and Development (EBRD) has viewed the project and indicated preliminary agreement to partial funding (up to 35%). A major part of production (up to 60%) will be exported. The project payback period is 4.5 years from start up.

PROJECT 2 - PRODUCTION OF PROPELLER SHAFTS FOR SHIPS:

The project is to be carried out by the Yantar company.

The range of products will include: Propeller shafts, diameter 130-140 mm, length up to 16,000 mm and two part shafts up to 20,000 mm length.

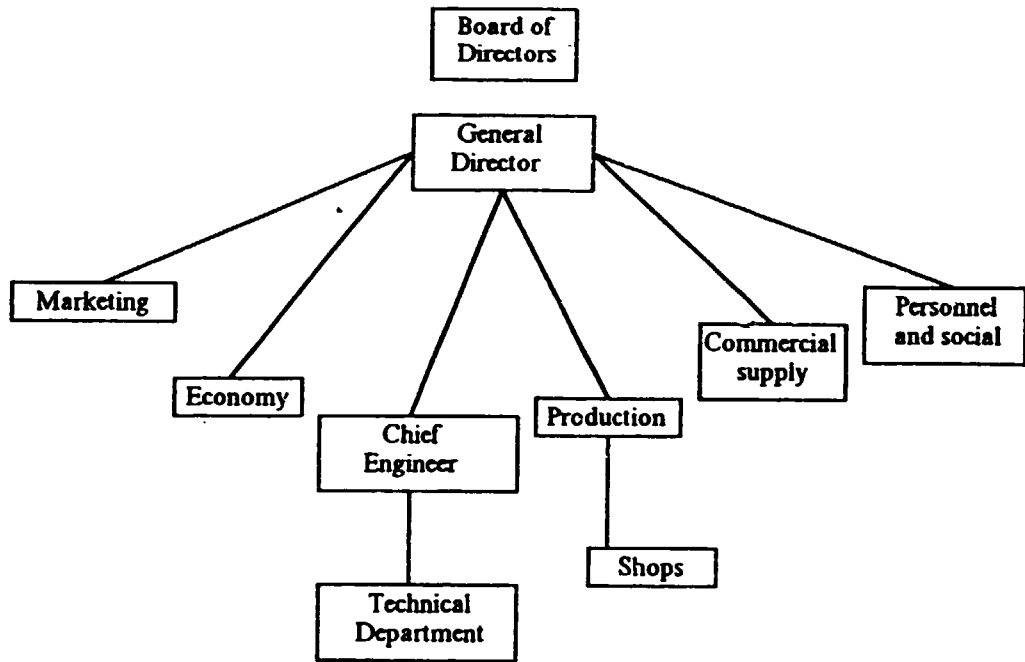
Annual output proposed is 60 units.

The project will allow the manufacture of competitive products for domestic and export markets; improve the use of existing capacity and provide financing for further development of engineering production.

Prices of shafts will depend on size and quality. For example, a two-part shaft having a diameter of 220 mm, length 11,200 mm with half-muff and with four facings will cost approx. \$18,410.

Annual turnover is projected at \$1.1m.

STRUCTURE OF THE 'YANTAR' COMPANY



APPENDIX 4

Preliminary screening of Enterprise Projects

1.0 INTRODUCTION

During the course of the survey, more than twenty projects at enterprise level were identified. Of these, none were insufficiently advanced or were proposed by companies not realistically able to benefit. Eleven projects were brought forward for preliminary screening, described in the company profiles in Appendix 3.

Summary list of Enterprises:

Gasautomatika	Automotive fuel systems, Natural Gas
Fakel	Surgical equipment
Vagonostroitel	<ul style="list-style-type: none"> i) Waste handling Skips ii) I.S.O. Containers (See Yantar)
Kvartz	<ul style="list-style-type: none"> i) Large Component Coating Plant ii) Automated Coating Line
Baltkran	Container Handling Cranes
Stroydormash	<ul style="list-style-type: none"> i) Road Marking Machine ii) Bus Production
Sudoremash	New Metal Machining system
Yantar	<ul style="list-style-type: none"> i) I.S.O. Containers (see Vagonostroitel) ii) Marine Propeller Shafts.

Each of these projects was evaluated using a rough grading method, using the key criteria set out below:

2.0 NOTES OF ASSESSMENT CRITERIA

Criteria	Grade Score Points
Scale of Investment	0 - 10
Timing	0 - 10
Established Market	0 - 10 x 2
Export Potential	0 - 10
Established Technology	0 - 10
Added Value	0 - 10 x 2
Suitability for Enterprise	0 - 10 x 2
Total	100

Note that special emphasis is given to the availability of markets, product added value and suitability or 'fit' to the enterprise, and hence the scores for these are weighted by a factor of two. Amplification of the project screen criteria follows below:-

Scale of Investment (0 - 10 points)

On the basis of securing funding from say, EBRD, ideal project investment is assumed to say \$5m - \$15m. Investment levels moving away from this band become progressively more difficult to achieve.

Timing (0 - 10 points)

This factor is to give acknowledgement to the time by which earnings can be expected to flow. Important both to Kaliningrad and the investor.

Established Market (0 - 20 points)

To reflect whether established markets exist, level of competition and whether markets have to be developed.

Export Potential (0 - 10 points)

Until recovery of domestic markets is well under way, the saleability of the product in export markets is an important facet.

Established Technology (0 - 10 points)

This is a reflection of the risks involved in the technology of a product, and where this may be new to the enterprise.

Added Value (0 - 20 points)

The real work content in the proposed product, gives an indication of its complexity and therefore, the level of margins which may be expected.

Suitability for the Enterprise (0 - 20 points)

Suitability includes factors such as availability of appropriate production facilities, workforce skills, knowledge of the product field or industry sector and management ability.

3.0 RESULTS OF PROJECT SCREENING

The results of the preliminary screening is summarised in Table 4. A brief commentary on each project follows:-

Vagonostroitel - Waste Handling Skips. SCORE 70

A sound project, using basic technology and established market contacts. Can be mobilised quickly, for early cash flow. Entirely suited to the enterprise.

Baltkran - Container Handling Cranes. SCORE 77

A logical development step in known technology, also involving upgrading of facilities. Good working arrangements established with German equity shareholder, with access to export markets.

**Gasautomatika - Natural Gas Automotive Fuel Systems.
SCORE : incomplete**

The market is dependant on future environmental directives from Government and the development of a national distribution network for the fuel. The technology is not yet proven. There must be doubts as to the firm's ability to operate successfully in the automotive field. Judged to be in a 'pre-project' phase.

Fakel - Surgical Equipment. SCORE 67

As a 'fractional' spin off from space technology, the investment level is low. The product needs to be placed with a firm already established in the surgical equipment field. Fakel can deal with this directly.

Sudoremash - Metal Machining System. SCORE 66

The relatively low score reflects manufacturing gains only. In practice, the system would be sold on a consultancy basis, the hardware being a relatively small part. This is not, therefore, an industry project as such, and needs a different approach.

Kvartz - Automated Coating Line. SCORE 76
- Large Component Coating. SCORE 70

Both these projects score well because they are logical developments to Kvartz's existing vacuum technology. In the first case, markets are similar to those current; and in the second project, some technological work is necessary and new applications found. Some doubt must exist that these profiles should take priority over the determined marketing of existing products.

Stroydormash - New Model of Road Marking Machine. SCORE 73.
- Bus Assembly. SCORE 48.

Again, the first project is a natural development to the firm's existing activity, using largely existing facilities and therefore scores well. Adherence to German designs will, in parallel, introduce experience of working to international quality standards.

The score for the bus project reflects several doubts as to the likely viability of the project. Markets are, at best, uncertain and the product is new to the enterprise. Margins are expected to be low.

Yantar/Vagonostroitel - I.S.O. Containers. SCORE 69

The likely demand in domestic markets and technology known to both firms, indicate the general soundness of the project. Relatively low margins associated with this class of work prevent a better score. Both firms are interested in such a project. A sponsorship arrangement needs to be evolved. The investment levels appear to be high.

Yantar - Marine Propeller Shafts. SCORE 63.

This project scores well on technology and suitability, since it entails expansion of a well tried activity. Market demand is very doubtful and is also likely to be very competitive. Marketing costs would be high.

PROJECT ANALYSIS - TABLE 6

Enterprise/Project	Investment	Timing	Market x 2	Export	Technology	Added Value x 2	Suitability x 2	Score	Rank	Comments	
Vogonostroitel		7 10		13	7	10	3 20	70	5	German Market connections established	
Skips	\$2m	6m	Good V. competitive		Basic	Poor	Excellent				
Baltkran		7 9		14	7	10	10 20	77	1	German equity partner in position	
Container Handling	\$1.7m	9m	Good, competitive		Medium	Medium	Excellent				
Gasautomatika		10 2	To be completed		To be developed	Medium	Fair	12	n/a	n/a	Pre-project phase
Auto Fuel System		2-5 yrs.									
Fakel		4 8		10	5	8	20 12	67	7	High Tech Spin-off from Space Programme	
Surgical Equipment	\$0.5m	12m	To be made		Tested	Good	JV Partner				
Sudoremash		4 10		10	5	9	14 14	66	8	Needs consultancy approach to markets	
M/c. Tool Attachment	\$0.6m	3m	To be made		Tested	Fair	Good				
Kvartz		7 8		10	6	9	16 20	76	2	Logical development of existing Process	
Automated Coatings	\$2.3m	12m	To be made in part		High, proven	Good	Excellent				
Kvartz		4 9		12	6	7	16 16	70	4	Wider application of existing Technology	
Coating Large Components	\$0.5m	8m	Competitive process		New	Good	Good				
Stroydormash		5 8		14	6	10	10 20	73	3	German Design already identified	
Road Marking	\$0.09m	12m	Good		Medium	Medium	Excellent				
Stroydormash		5 10		8	2	9	4 10	48	10	Polish partner identified	
Bus assembly	\$0.9m	3m	Poor		Basic	Poor	Fair				
Yantar/Vogonostroitel		6 8		16	7	10	6 16	69	6	High volume, low margin business	
ISO Containers	\$30m	12m	Good, competitive		Basic	Low	Good				
Yantar		3 8		3	4	10	10 20	63	9	Extension of existing activity but doubtful market	
Propeller Shafts	\$0.4m	12m	Weak, competitive		Well known	Medium	Good				

4.0 RECOMMENDED ENTERPRISE PROJECTS

As a result of the screening carried out, those projects selected for detailed attention should include:

Vagonostroitel	i) Waste handling Skips ii) I.S.O. Containers (See Yantar)
Kvartz	i) Large Component Coating Plant ii) Automated Coating Line
Baltkran	Container Handling Cranes
Stroydormash	i) Road Marking Machine
Yantar	i) I.S.O. Containers (see Vagonostroitel)

APPENDIX 5.1 - ASSISTANCE PROJECT PROPOSAL

- a) **Formation of Manufacturers' Association (Report Section 6.1.1.)**
- b) **Rationalisation of Manufacturing Facilities (Report Section 6.1.2)**

1. Background

- a) In the FSU, enterprise linkages were vertical, to central combinats, Ministries and Planning Authorities. Each enterprise was set up to be self sufficient in basic manufacturing capability.
- b) On a regional basis, there now exists much duplication in foundry, forge, fabrication etc.; work is fragmented through small inefficient units.

2. Problem or Opportunity Definition

- a) Lack of cohesive body to represent interests of the sector (Report Section 2.2.c).
- b) Need to rationalise manufacturing facilities, to improve utilisation, quality and unit costs and to make possible, effective future development. (Report Section 2.2.g).

3. Objective

- a) Effective promotion of the sector's interests through a strong Association, undertaking policy development, liaison with Government, marketing, investment promotion, employment and training initiatives.
- b) Higher efficiency in basic manufacturing operations in the short term and high efficiency in the medium term, through investment in plant.

4. Method

- (a) & (b) By assistance from an external consultant, acting as catalyst, co-ordinator and industry expert.

5. Project Activities

- a)
 - Survey to establish needs and priorities of the enterprises
 - Design of constitution, gaining acceptance and legal status
 - Advice on composition of Executive Board
 - Preparation of Agenda for action, monitoring initial meetings
 - Assistance in formation of specific task groups, including facility rationalisation.
- b)
 - Definition of facilities to be considered
 - Audit of enterprises' facilities and product needs

- Forecast of likely future needs and selection of optimum facilities
- Review of costs and cost/benefits of selection
- Implementation Plan.

6. Project Participants and Responsibilities

- (a) & (b) All enterprises in the sector will be invited to participate, plus other larger manufacturers in the light industry sector.

Consultant 1 : Industry Expert in Machine building and Electronics.

Consultant 2 : Engineer/Administrator with good Trade, Employer or Manufacturers' Association experience.

Sponsor Organisation: Industrial Policy Committee or Property Fund,
Regional Government

Counterpart: Not relevant.

7. Funding

- a) Administrative facilities for the Manufacturers' Association would be provided by members, but applications for grant assistance would be made to Government, Aid Agencies such as TACIS, USAID and overseas engineering employer groups.

- b) Minor costs only are envisaged, within members' normal expenses.

8. Resources, Costs and Budgets

Consultant 1 : 4 man/months, split over say 6 months

Consultant 2 : 2 " " " " 4 months

6 man/months at \$20,000 \$120,000
(incl. fees, per diem, travel)

Study Tour: 4 x \$2,500 \$ 10,000

Total: \$130,000

9. Timing and Activity Plan

Six month programme, detail subject to discussion and agreement with Sponsor.

10. Comment

See Report Section 6.3.1 and 6.3.2.

APPENDIX 5.2 - ASSISTANCE PROJECT PROPOSAL

- a) Assistance with Development of Business Plans and Preparation of 'Bankable' Reports for Specific Enterprise Projects. (Report Section 6.1.3)
- b) In-house training for General Directors, Deputy Gen. Directors and Managers (Report Section 6.1.4)
- c) Formal Training in Co-operation with Technical University (Report Section 6.1.5)

1. Background

General Directors and Managers of enterprises in the FSU were exempted from the business functions, essential to successful participation in a competitive, market economy.

2. Problem or Opportunity Definition

Lack of know how and experience in marketing, business planning, management accounting and raising of finance, within enterprise's senior management. There is a lack of momentum in most enterprises, due to their inability to attract funding. (See Report Sections 2.2b,f,h,i,j of Strengths and Weaknesses).

3. Objective

- To
- attract investment for the sector's development projects.
 - improve enterprise performance by training of senior management
 - establish awareness of the practice of management in engineers and managers, embracing Marketing, Business Planning, Management Accounting and Quality Assurance.

4. Method

During the UNIDO survey, five projects have been selected from a preliminary screening. By 'hands on' assistance through the development of a Business Plan and 'Bankable Report' for specific, actual project. Instruction will also be provided:

- through in-house seminars and lectures
- through distance learning courses at the Technical University

5. Project Activities

- a) Critical review of project plans, identification of weak areas.
- b) Instruction in areas of weakness, through the spectrum of marketing, production, cost and financial aspects; methods of presentation.
- c) Supervision of compilation of Business Plans and 'Bankable' Reports and identification of funding sources.
- d) Assistance with presentations to funding sources.

And in parallel:

- e) Define distance learning course content and teaching plan
- f) Preparation of course materials, adapted to industry's needs.
- g) Implement course, possibly both 3/4 day intensive courses and 1 to 1½ days per week over 4 weeks.

6. Project Participants and Responsibilities

Multi-disciplined team of 4/5 personnel at each selected enterprise, given responsibility for generation of 'Bankable' report, as a priority.

Consultant 1: Industrial Engineer expert, experienced in senior management

Consultant 2: Industrial Financial expert, " "

National Counterparts: From individual enterprises and Technical University.

Sponsors: Regional Development Committee or Department of Industry, Technical University.

7. Funding

Funding for the investment projects is anticipated to include such sources as EBRD, USAID, TACIS, foreign joint venture partners, national industrial groups and Development Banks.

8. Resources, Costs and Budgets

Consultant 1:	4 man/months, spread over	9 months
Consultant 2:	2 " " "	9 months
=	6 man/months @ \$20,000	\$120,000
Counterparts:	6 man/months @ \$3,000	\$ 18,000
Study Tour:	5 x \$2,500	<u>\$ 12,500</u>
Total	(inc.fees, per diem, travel)	\$150,500

9. Timing and Activity Plan

The programme for each enterprise is to be based on the findings of the first critical analysis of the project plans. Visit programmes are to be established, setting enterprises deadlines for completion of work phases. Programmes at the Technical University would be tailored to fit.

10. Comment

Based on the findings of the UNIDO study, it is strongly recommended that this assistance project be included in Phase 1b. See Report Section 6.3.3 and 4.

APPENDIX 5.3 - ASSISTANCE PROJECT PROPOSAL

Programme to Introduce ISO 9000 Quality Assurance Accreditation (Report Section 6.1.6)

1. Background

Russian enterprises work to established GOST standards and there is no equivalent to ISO 9000. Firms in other regions, notably the Urals, are moving quickly to achieve ISO 9000 rating.

2. Problem or Opportunity Definition

Lack of credibility of product quality in international markets and increasingly in future domestic and CIS markets. (Report Section 2.2.n)

3. Objective

To ensure enterprises achieve ISO 9000 accreditation at the earliest practical dates, at reasonable cost.

4. Method

By advising and assisting enterprises to adapt organisation, responsibilities, procedures and documentation to accord with ISO 9000 quality assurance requirements.

5. Project Activities

- a) Selection of say 10-12 enterprises to be included in the programme.
- b) Audit of methods, procedures, laboratory and testing equipment.
- c) Selection of two groups for either 'fast track' or normal progress, towards ISO requirements.
- d) Training of personnel in Quality Assurance practices and procedures.
- e) Assistance to enterprises in adapting/introducing documentation and procedures and preparation of Quality Manuals.
- g) Review of operations, pre-accreditation application.

6. **Project Participants and Responsibilities**

Selection of 10-12 enterprises, nominated quality teams.

Consultant 1: Industrial Engineer Expert

Consultant 2: Industrial Engineer Quality Assurance Specialist

Consultant 3: " " " " " " " "

National Counterparts: In individual enterprises and from Technical University.

Sponsor: Independent organisation to be identified; possibly the Department of Education and Science.

7. **Funding**

Accreditation survey fees will be to the account of the enterprises.

8. **Resources, Costs and Budgets**

Consultant 1: 4 man/months, over 15 months

Consultant 2: 6 man/months, over 15 months

Consultant 3: 6 man/months, over 15 months

	16 man/months @ average \$18,000	\$288,000
Counterparts:	16 " " " " \$ 3,000	<u>48,000</u>
Total:	(Including fees, per diem, travel)	\$336,000

9. **Timing and Activity Plan**

Subject to audit of enterprises and findings as to state of readiness and time estimates to achieve accreditation.

10. **Comment**

See Report Section 6.3.5.