

**Appendix-1: Model Enterprises /  
Outline, Evaluation, and  
Suggestions**



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|---|--|------------------|
| A-1 Company name: AZTM (Almaty Heavy Machine Building Co.)  |  | Location: Almaty |
| <b>1. Current Company Conditions</b>  |  |                  |
| Background  | <ul style="list-style-type: none"> <li>• The forerunner of the existing plant was established in 1941, when a small-scale machinery factory was transferred to Almaty from Ukraine with the aim of manufacturing arms and explosives. It expanded operations and started producing non-military product products in 1944.</li> <li>• Number of employees (end of 1997): 2,500 (4,500 at the start of 1990)</li> <li>• Operating rate of equipment: 25%</li> </ul>  |                  |
| Overview of products  | <ul style="list-style-type: none"> <li>• Large-scale machine processed parts for use in industrial machinery (in particular, rolling mill equipment parts for steel manufacturing companies).</li> <li>• The company's prime products are machines used for manufacturing non-ferric and iron wire and high precision pipes.</li> <li>• Other main products are stainless steel, molybdenum and titanium alloy products and aluminum, copper and zinc alloy parts used in the automobile industry and electrical appliances such as refrigerators, etc.</li> </ul> |                  |
| General survey of the Product   | <ul style="list-style-type: none"> <li>• Main export destinations: Russia and Ukraine (80% Russia)</li> <li>• Other export destinations: UK, Germany, India, China, Japan, Argentina</li> <li>• Demand from the domestic building construction sector is declining.</li> </ul>   |                  |
| Financial situation   | <ul style="list-style-type: none"> <li>• Sales turnover (1997): 750 million Tenge/month</li> <li>• The company accounts appear to be in the black.</li> </ul>  |                  |
| Plant production equipment  | <ul style="list-style-type: none"> <li>• Of the plant's machine processing equipment and casting, forging, heat treatment and other equipment, the condition of machine processing equipment is better than the average level in Kazakhstan.</li> </ul>  |                  |
| Business management   | <ul style="list-style-type: none"> <li>• Having had experience of exporting to Japan, the company has confidence in the competitiveness of its products.</li> <li>• The company is modest about advertising its technical capability and has a negative approach towards developing the domestic market.</li> </ul>  |                  |
| <b>2. Study Team's Assessment</b>   |  |                  |
| <ol style="list-style-type: none"> <li>1. In view of the company's export performance and its links with the military sector, expectations can be held regarding its level of technology.</li> <li>2. The company currently produces a wide variety of high quality parts in small lots.</li> </ol> |  |                  |
| <b>3. Proposed Improvement Measures</b>   |  |                  |
| Proposals from the view point of Industrial restructuring   | <ol style="list-style-type: none"> <li>1. The company should pursue the localized production of key parts such as transmissions and driving mechanisms for wheel tractors.</li> <li>2. Since the company is capable of supplying parts to the agricultural machinery, mining machinery and other sectors, it should assume leadership in the parts manufacturing sector in promoting exchange of market information and information on product quality standards.</li> </ol>   |                  |
| Proposals from the view point of company business improvement   | <ol style="list-style-type: none"> <li>1. The company should conduct more positive marketing in the agricultural machinery and mining machinery markets.</li> <li>2. The company should promote the sale and scrapping of casting equipment with a low operating rate.</li> </ol>  |                  |

A-2 Company name: Pavlodar Tractor Location: Pavlodar

I. Current Company Conditions

|                               |   |
|-------------------------------|---|
| Background                    | <ul style="list-style-type: none"> <li>• Established in 1966</li> <li>• Composition of capital: 90% government, 10% employees</li> <li>• Number of employees (end of 1997): 8,300 (22,000 in 1991). The company possesses four agricultural machinery design engineers and a sales department, but it has no experience of marketing.</li> <li>• Operating rate of equipment: 10%</li> </ul>  |
| Overview of Products          | <ul style="list-style-type: none"> <li>• Crawler tractors, DT-75 agricultural (base machines), DT-75 bulldozers (with attachments)</li> <li>• The company only supplies casting parts for frames and transmissions but orders processing and sub-assembly to external suppliers.</li> <li>• In 1992 the company revised designs that had been used since 1954. In particular, 16 changes were made to suspension devices and cabins. The original designs from Volgograd were transferred to this company in 1996.</li> <li>• The company is currently considering the local production of parts that are currently imported from CIS countries. It finds it too costly to manufacture parts of the old type. It currently considers harvester parts that can be sold domestically and to CIS countries to be a better alternative.</li> <li>• The company is currently developing a new model T-95 tractor. It aims to achieve better competitiveness through giving this tractor a high output and low fuel consumption engine. It plans to manufacture 10 of the second prototype tractors in 1998.</li> </ul> |
| General Survey of the Product | <ul style="list-style-type: none"> <li>• The company usually supplies 80% of its tractors to Russia and 20% to the local market, CIS countries and Turkey, etc.</li> <li>• It supplied 9,000 tractors to China from 1989 to 1994, but this was discontinued following deterioration of the Chinese economy.</li> <li>• Six companies in Russia and Belorussia are competitors in the tractor market. Four of these produce crawler type tractors, and two produce wheel type tractors.</li> </ul>   |
| Financial Situation           | <ul style="list-style-type: none"> <li>• Sales to the agricultural market at home and in Russia are currently almost non-existent and conditions are as bad as can be.</li> <li>• Between 20-25% of the company's subcontractors have been forced to suspend operations.</li> <li>• 70% of the company's income in 1997 came from the sale of approximately 2,000 DT-75 tractors (220 to the local market and the rest to Russia). Prices range from US \$ 21,000 in the case of barter trading to US \$ 10,000-14,000 in the case of cash sales. Farmers purchase tractors by paying in kind with cereals.</li> <li>• Purchased parts are obtained through barter trading. One tractor is equivalent to 26 radiators.</li> <li>• In 1997, the company received approximately 2 billion Tenge (US \$ 26,500,000) under a government lease program and managed to sustain operations by using this money as operating capital.</li> </ul>  |

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| A-2 Company name: Pavlodar Tractor Location: Pavlodar  |  |
| Plant production equipment   | <ul style="list-style-type: none"> <li>• Total building area: 96,000 m<sup>2</sup> (including the die and tool plant building which covers approximately 10,000 m<sup>2</sup>).</li> <li>• Machine processing shop: Six Russian-made automated parts processing lines</li> <li>• Stamping shop: 26 German-made 160-800 ton machine presses, four lines (10 presses on two of these lines were renewed in 1991).</li> <li>• Sheet metal welding and sub-assembly: Driver's cabin semi-automatic manufacturing line (made in the 1950s, using specialist machines)</li> <li>• (The die and tool plant is described separately).</li> </ul>   |
| Business management  | <ul style="list-style-type: none"> <li>• The company's management believes that business improvement cannot be achieved unless the local demand for agricultural machinery is established and that the current situation is the fault of the government and not the company.</li> </ul>  |
| <b>2. Study Team's Assessment</b>  |  |
| <ol style="list-style-type: none"> <li>1. The Team considers that the company's crawler tractor development and manufacturing technology and part of its manufacturing equipment and facilities should be utilized as business resources in the future.</li> <li>2. The casting and forging plant is a massive facility, however, it has not undergone any technical improvement at all in the past 30 years and its process technology is now at a low level. With a melting process that simply melts materials and conducts no refining, it is thought that the only products that can be produced for external sale are balls for use in mining.</li> <li>3. The die and tool plant currently conducts some meager external sales, however, this should be made into a separate company so that it can conduct its own marketing and secure a wider market.</li> </ol> |  |
| <b>3. Proposed Improvement Measures</b>  |  |
| Proposals from the view point of Industrial restructuring  | <ol style="list-style-type: none"> <li>1. The Team considers that the company's crawler tractor development and manufacturing technology and part of its manufacturing equipment and facilities should be utilized as business resources in the future.</li> <li>2. The casting and forging plant is too extensive to consider scrapping. Although it was a top level facility in the world 30 years' ago, technical improvements have not been carried out at all since then and its process technology is now too low. With a melting process that simply melts materials and conducts no refining, it is thought that the only products that can be produced for external sale are balls for use in mining.</li> <li>3. The die and tool plant currently conducts some meager external sales, however, this should be made into a separate company so that it can conduct its own marketing and secure a wider market.</li> </ol> |
| Proposals from the view point of company business improvement  | <ol style="list-style-type: none"> <li>1. Concerning the T-95 currently under development, the company needs to achieve its set quality targets and complete the development project.</li> <li>2. The company should concentrate its marketing efforts on the promising market for medium agricultural tractors (including wheel types). It should be noted that the district where the share of crawler types compared to wheel types is highest is the Kostanai region. The company needs to respond in detailed fashion to the required specifications of customers.</li> <li>3. Concerning the casting and forging equipment and facilities that have been inoperable for a long time, the company should boldly proceed with scrapping.</li> </ol>  |

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| A-3 Company name: Die & Tool Plant, Pavlodar Tractor Location: Pavlodar  |  |
| 1. Current Company Conditions  |  |
| Background   | <ul style="list-style-type: none"> <li>The die and tool plant came to possess its own bank account and became a subsidiary in 1995.</li> <li>Composition of capital: 49% employees, 51% Pavlodar Tractor</li> <li>Number of employees (end of 1997): 800 (at one point the company possessed 1,500 employees working in three shifts)</li> <li>Operating rate of equipment: 15%</li> <li>The company's originally intended function of supplying dies, tools and formed parts, etc. for the parent company is almost at a standstill.</li> </ul> |
| Overview of products   | <ul style="list-style-type: none"> <li>The company's main products are dies and tools, but it also makes its own seals (O-rings, etc.) and formed parts for use in tractors.</li> </ul>  |
| General survey of the Product  | <ul style="list-style-type: none"> <li>The company aims to supply 70% of die and tool products to the parent company and 30% to external customers.</li> <li>The company received an order for, and has developed and commercialized, an automatic molding machine for making can lids. This sells for 3 million Tenge.</li> <li>The company receives orders for and produces FRP bath tub moldings.</li> </ul>  |
| Financial situation  | <ul style="list-style-type: none"> <li>When the company was first established, it received external orders for plant equipment and employed a work force of 1,500 employees working three shifts. At this time it earned 20 million Tenge per month and sales to the parent company accounted for 70% of turnover.</li> </ul>  |
| Plant production equipment   | <ul style="list-style-type: none"> <li>The company has a good range of machine tools for making dies. Its machining center and electro-chemical machines, etc. are idle. The electro-chemical machines, etc. were purchased in the mid-1980s.</li> <li>The company possesses a few injection molding machine sets and equipment for producing other formed parts.</li> </ul>   |
| Business management  | <ul style="list-style-type: none"> <li>The company operates on an independent accounting system and is a separate profit center from the parent company, however, top management responsibility does not appear to be clearly set.</li> </ul>  |
| 2. Study Team's Assessment   |  |
| <ol style="list-style-type: none"> <li>Many of the production line engineers are thought to possess ample capability and experience for designing in-house dies and tools, however, the company should utilize external sources when designing and developing various types of products for external sale.</li> <li>The company does not conduct external advertising or market development activities.</li> </ol> |  |
| 3. Proposed Improvement Measures   |  |
| Proposals from the view point of Industrial restructuring  | <ol style="list-style-type: none"> <li>The company should enter into a cooperative work arrangement with companies like October Machine that possess strong product planning and design capacity, and it should produce batch-ordered system products for plant facilities and food processing, etc.</li> </ol>  |
|  | <ol style="list-style-type: none"> <li>Concerning the company's strong point of die and tool products, it should build a setup for widely supplying to other machinery manufacturing companies and plastics companies in addition to the parent company, but at the same time it should maintain 70% sales to the parent company.</li> </ol>   |
| Proposals from the view point of company business improvement  | <ol style="list-style-type: none"> <li>The management should adopt a higher awareness of company independence by changing the company name, establishing a company quality policy and thoroughly enforcing this among all employees.</li> <li>As a new concern, the company should advertise itself to related industries and create opportunities for exchanging market information.</li> </ol>   |



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| A-4 Company name: Pavlodar Machine Factory Location: Pavlodar |   |
| 1. Current Company Conditions                                 |   |
| Background  | <ul style="list-style-type: none"> <li>• This company was originally established in 1961 as part of a network of construction machinery repair workshops supervised by the Ministry of Construction.</li> <li>• The company was privatized in 1993.</li> <li>• Number of employees (end of 1997): 420 (expected to rise to 600 in 1998. The company currently possesses four engineers, of whom three are electrical engineers).</li> <li>• Operating rate of equipment: 10%</li> </ul>   |
| Overview of products  | <ul style="list-style-type: none"> <li>• The company makes the only hydraulic telescopic boom crane for use in 20-ton trucks in the CIS, but many of its products are for Russian-made 10-15 ton trucks. The company plans to locally produce parts that are currently made in Russia.</li> <li>• Mixers: Large 1 m<sup>3</sup>, small 0.25 m<sup>3</sup></li> <li>• The company also makes building fittings and small wind power generators for general consumers, but these account for just 5% of sales.</li> <li>• The company is considering production of building elevators and is currently conducting a market study.</li> </ul>  |
| General survey of the Product                                 | <ul style="list-style-type: none"> <li>• Truck crane (new product) production plan: (Two units produced in 1992) 1998: 30-120 units, 1999: 300 units. Sales are forecast as 50% to Russia and 50% to the domestic market. The company expects to expand activities to the oil-related market in 1999 and is also studying other markets.</li> <li>• The company sells products via agents that operate as marketing agents.</li> <li>• Demand exists in the agricultural, mining, railway and government sectors. However, the company cannot expect to benefit from a lease program. Much is expected of an aluminum factory newly established in Pavlodar because American capital has been invested.</li> </ul>  |
| Financial situation   | <ul style="list-style-type: none"> <li>• Sales turnover (first half of 1998): 12 million Tenge/month</li> <li>• In 1996, the company obtained a government loan at an annual interest rate of 6% to finance its crane development costs, and it plans to repay this in three years (the exact amount of the loan is unknown).</li> <li>• Materials are purchased through barter trading and 40-50% of cash income is diverted to employees' wages, taxation and repayment of the government loan.</li> <li>• The company's profit ratio of 30% is high compared to that of other companies (roughly 10%).</li> <li>• The company sometimes uses consumer goods to pay wages and also uses mixers in barter trading. The wage level is the same or slightly lower than that of other companies in the Pavlodar area, but far lower than the general wage level in Europe (although higher than in Uzbekistan).</li> <li>• Russian products are expensive but still provide stiff competition.</li> <li>• The trade account receivable and trade account payable from the era of state control are still a problem. The company was only recently able to process US \$ 1 million of account receivable.</li> </ul> |

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| <b>A-4 Company name: Pavlodar Machine Factory Location: Pavlodar</b>   |   |
| <b>Plant production equipment</b>  | <ul style="list-style-type: none"> <li>• The company mainly possesses equipment made in Russia and the former East Germany</li> <li>• There is thought to be no problem concerning the quality of metal materials.</li> <li>• A building (4,000 m<sup>2</sup>) to house a new crane is scheduled for completion in 1998.</li> </ul>   |
| <b>Business management</b>   | <ul style="list-style-type: none"> <li>• The current president assumed office in August 1998 and company organization was reformed in October. Results are said to have taken a turn for the better in the final quarter.</li> <li>• The company's immediate goal is to achieve a sales turnover of 50 million Tenge (US \$ 700,000). The company has a choice of maintaining current prices or reducing prices with a view to raising market share.</li> </ul>   |
| <b>2. Study Team's Assessment</b>  |   |
| <ol style="list-style-type: none"> <li>1. The Team was impressed with the positive nature and specific content of the president's business approach.</li> <li>2. It would a good pattern of development for the company to grow as a manufacturer of its own products using the technical capacity it has developed in its repair workshop.</li> </ol> |   |
| <b>3. Proposed Improvement Measures</b>  |   |
| <b>Proposals from the view point of Industrial restructuring</b>   | <ol style="list-style-type: none"> <li>1. The company needs to achieve the product development and market introduction of truck cranes. It is also desirable for the company to merge with an agricultural machinery sales and service network.</li> <li>2. By reviving the subcontracted manufacture of parts for Pavlodar Tractor and so on, the company should join the support sector for agricultural machinery manufacturing companies and build a relationship where companies mutually compliment component parts.</li> </ol> |
| <b>Proposals from the view point of company business improvement</b>   | <ol style="list-style-type: none"> <li>1. As a manufacturer, the company should continue improving management of production lines starting from plant tidying and housekeeping and build a product quality assurance setup.</li> </ol>  |

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|---|---|
| A-5 Company name: October Lathe Location: Pavlodar  |   |
| 1. Current Company Conditions   |   |
| Background  | <ul style="list-style-type: none"> <li>• Composition of capital: 30% employees, 39% Krand's Company (private company), 31% government</li> <li>• Number of employees (end of 1997): 100</li> <li>• Operating rate of equipment: 20%</li> </ul>  |
| Overview of products  | <ul style="list-style-type: none"> <li>• The company receives orders for designing and manufacturing products. Recently it has handled domestic goods, toys, building fittings and small food processing machines (noodles machines, etc.).</li> </ul>  |
| General survey of the Product   | <ul style="list-style-type: none"> <li>• The company was originally involved in designing and manufacturing product testing equipment (tractor final inspection equipment, frame strength testing machines, etc.) for Pavlodar Tractor and also conducting consigned testing.</li> <li>• The company has also been consigned to perform testing by the Ministry of Agriculture.</li> </ul>  |
| Financial situation   | <ul style="list-style-type: none"> <li>• Sales turnover: 6.3 million Tenge/month</li> <li>• The government claims the company has liabilities of 150 million Tenge (US \$ 2 million), but the details of this are unknown.</li> </ul>   |
| Plant production equipment  | <ul style="list-style-type: none"> <li>• A large part of the formerly successful engineering department has been closed down.</li> </ul>  |
| Business management   | <ul style="list-style-type: none"> <li>• The company management (thought to consist of engineers) has no clear plans with respect to overcoming the current financial situation and setting marketing targets.</li> </ul>   |
| 2. Study Team's Assessment  |   |
| 1. Since many of the design engineers released by the company are still searching for work, it is thought that the company can utilize latent design and development capacity and its know-how of testing technology. |   |
| 3. Proposed Improvement Measures  |   |
| Proposals from the view point of Industrial restructuring   | <ol style="list-style-type: none"> <li>1. The company should supply product inspection and testing devices for key product manufacturers and provide technical know-how on testing.</li> <li>2. The company should pursue the design and development of food processing machines.</li> </ol>  |
| Proposals from the view point of company business improvement   | <ol style="list-style-type: none"> <li>1. In order to build a stable corporate base as a machinery design engineering company, efforts should be made to maintain the company's testing facilities and preserve and improve design capability (including currently laid off employees).</li> <li>2. The company should seek to create business opportunities through introducing food processing sector technology and obtaining information concerning the state of machinery imports by food processing manufacturers.</li> </ol> |

| A-6 Company name: PZTM (Petropavlosk Heavy Machinery) Location: Petropavlosk |   |
|--|---|
| I. Current Company Conditions  |   |
| Background   | <ul style="list-style-type: none"> <li>The company was originally established as a defense products manufacturer.</li> <li>Composition of capital: 10% employees, 90% government</li> <li>Number of employees (end of 1997): 2,000 (10,000 at the peak time)</li> <li>Operating rate of equipment: 15%</li> </ul>   |
| Overview of products   | <ul style="list-style-type: none"> <li>The company's main products are supply and repair parts for power and mining-related equipment and machinery.</li> <li>Secondary products include small repair parts for railways, lighting fixtures for prisons, small agricultural machinery used in dacha, zips (technology introduced from Italy), bicycles for small children (12 years and under), meat processing machines, vegetable oil squeezing machines, furniture fittings, oil field repair units, plastic cups, plates and so on.</li> <li>80% of sales turnover in 1997 was accounted for by the following products:               <ol style="list-style-type: none"> <li>Hydraulic railway line adjustment units</li> <li>Bicycles</li> <li>Electric power-related equipment and machine parts</li> <li>Hand tractors and cultivators (3.5 hp), etc.</li> </ol> </li> <li>The company produces 500 meat processing machines. These are officially recognized to be compliant with the CIS standard, which is necessary in Kazakhstan.</li> <li>The company has the potential to make its own tools.</li> <li>The company has experience of producing truck cranes (75 units) fitted with telescopic booms.</li> </ul> |
| General survey of the Product  | <ul style="list-style-type: none"> <li>The company mainly sells to the domestic market, and almost all of its exports are directed to CIS countries.</li> <li>The company recently added a marketing department to its organization with the aim of working on products for energy and railway-related sectors and general consumers in particular.</li> </ul>  |
| Financial situation  | <ul style="list-style-type: none"> <li>Sales turnover (1997): 30 million Tenge/month</li> <li>95% of sales are performed through barter trading.</li> <li>Employees' wages are paid in kind and average approximately 6,500 Tenge (US \$ 86) per month.</li> <li>Average profit ratio: 5-7%</li> </ul> <p>Example: Small power motors: Sale price 30,000 Tenge (US \$ 400)<br/>         Production cost: Approximately 28,000 Tenge (US \$ 310)<br/>         Profit: Approximately 2,000 Tenge (US \$ 30)</p>   |
| Plant production equipment   | <ul style="list-style-type: none"> <li>Plant site: 93 ha or 256,000 m<sup>2</sup>. Production area: 175,000 m<sup>2</sup></li> <li>Equipment and machinery: 2,800 units including 256 specialized machines for the machine processing and casting shop and 37 processing lines. Most equipment is 5-15 years' old and was made in the former Soviet Union and East Germany.</li> <li>Shops carry out forging, iron and non-ferric casting and machine processing, welding, plastic molding and tool manufacture.</li> <li>Annual production capacity of castings: 800 tons ordinary cast steel, 500 tons non-ferric castings</li> <li>Labor safety control is insufficient in the forging shop (ear plugs and safety glasses are not used, etc.).</li> <li>Materials suppliers: Domestic sources (Karaganda region) and Russia. Payment is done through barter.</li> <li>The company maintains its plant equipment, machinery and facilities in good condition compared to other factories in Kazakhstan.</li> </ul>  |

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| A-6 Company name: PZTM (Petropavlosk Heavy Machinery) Location: Petropavlosk   |  |
| Business management  | <ul style="list-style-type: none"> <li>• The company adopts a product strategy that targets widespread markets and does not accept financial support from the government.</li> <li>• Barter trading is a problem common to all CIS countries and is regarded as unavoidable.</li> </ul>  |
| <b>2. Study Team's Assessment</b>  |  |
| <ol style="list-style-type: none"> <li>1. The Team was impressed with the company's plans to start producing automobiles and its efforts in achieving a monthly turnover of US \$ 400,000 by independently seeking demand for electric power and mining machinery parts, railway line laying tools, bicycles and hand tractors (3.5 hp), etc., despite operating at approximately one-fifth of its peak equipment capacity and work force.</li> <li>2. Machine processing equipment is thought to be in good condition compared to other companies in Kazakhstan. Even if the company cannot use all of its 256 specialized machines, it should make effective use of its 120 NC machines and 73 machining centers.</li> </ol> |  |
| <b>3. Proposed Improvement Measures</b>  |  |
| Proposals from the view point of Industrial restructuring  | <ol style="list-style-type: none"> <li>1. Concerning machine-processed components and parts for key products, for example, parts for wheel tractor power lines and drive units, etc., the company should participate in the production localization plans of finished product manufacturing companies by promoting the local production of parts.</li> <li>2. Concerning diverse products such as food processing machines and hand tractors, etc., the company should support small and medium enterprises such as Almatyu Pisheremdash (specialist maker of foodstuff processing machinery) by supplying development technology and key parts, and also cooperating in marketing activities. In this way, the company should aim to expand operations by building a marketing setup with limited investment.</li> </ol>  |
| Proposals from the view point of company business improvement  | <ol style="list-style-type: none"> <li>1. Concerning the defense sector-related business, the company should dispose of surplus equipment and facilities and quickly achieve an appropriate operating scale upon closely monitoring changes in the market environment.</li> <li>2. It is desirable for the company to become a supplier of important quality parts for key products. It should make use of its precision casting technology to supply parts that require high performance processing machinery and measuring instruments.</li> <li>3. Concerning diversification of operations to other products, the company should place greater emphasis on marketing as compared to its manufacturing technology improvement efforts. A marketing department has been established to work on oil and railway-related products and consumer goods, however, a more varied approach should be adopted according to the character of each product line. The company should consider work tie-ups with other companies, division and mergers.</li> </ol> |

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| A-7 Company name: Petropavlosk ZIKSTO |  | Location: Petropavlosk |
| I. Current Company Conditions         |  |                        |
| Background                            | <ul style="list-style-type: none"> <li>• In 1941 the plant moved from Moscow to Petropavlosk.</li> <li>• Composition of capital: 10% employee-held shares, 90% held by the State Assets Council</li> <li>• The company is planning to reconstruct its production facilities by disposing of surplus production equipment through open tender.</li> <li>• Number of employees (end of 1997): 2,500 (7,000 in the past)</li> <li>• Operating rate of equipment: 20%</li> </ul>   |                        |
| Overview of products                  | <ul style="list-style-type: none"> <li>• Agricultural machinery accounts for approximately 30% of products. Main products are tractors and truck-pulled trailers, which it started producing from the start of the 1990s.</li> <li>• 6-ton trailers for use with automobiles, and special trailer bodies which have been modified for carrying agricultural materials such as cotton and grapes, etc.</li> <li>• Through developing trailer base feeders for the oil industry sector, etc., the company aims to become able to produce multipurpose trailers.</li> <li>• Small portable bread making machines for making 24 loaves (1 pound units) and frying cabinets for steaming and frying food.</li> <li>• The company started producing a new 22 m wide cultivator in 1996.</li> <li>• The company has received an order from Almaty Railways to produce line connection bolts, nuts and spring nuts, etc. and it is considering a production development program for railway-related products.</li> <li>• The company previously considered entering the railway rolling stock repair business, however, it decided to postpone this because large investment is required to beat off stiff competition.</li> </ul> |                        |
| General survey of the Product         | <ul style="list-style-type: none"> <li>• The company has previously sold trailers to agricultural producers in CIS countries, Moldova, Ukraine and China.</li> <li>• The quality standard for the company's main products, i.e. 6 ton trailers, was established by the former Soviet Union. (state-approved quality).</li> <li>• This quality certification should be recognized throughout the world, however, countries outside the former Soviet bloc do not accept the company's trailers. One exception is Minsk Tractor of Belorussia.</li> <li>• The company currently produces trailers according to the Hungarian standard in the hope that this will lead to compliance with world standards, however, the Hungarian standard is subject to numerous revisions and will probably change in the future.</li> <li>• Regarding the company's automobile trailers, the Moscow Institute has issued the design and international standard.</li> </ul>   |                        |

| A-7 Company name: Petropavlosk ZIKSTO   |  | Location: Petropavlosk |
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| Financial situation   | <ul style="list-style-type: none"> <li>• Sales turnover (1997): 300 million Tenge/month</li> <li>• Due to the overall agricultural slump and inability of small-scale farms (established following the breakup of agricultural cooperatives) to make payments, the decline in demand for agricultural machinery has been extreme.</li> <li>• 70% of production cost is spent on purchasing imported chassis.</li> <li>• 50% of sales are done through barter trading and the remaining 50% through cash trading.</li> <li>• Since the company manufactured and supplied hydraulic folding cultivators under the government's lease program for agricultural machinery (part of its policy for supporting agriculture), it will continue to manufacture this product in 1998. Agriculture-related work accounts for around 30% of the company's work load.</li> </ul> |                        |
| Financial situation   | <ul style="list-style-type: none"> <li>• Since it is forecast that customers will demand sale on credit in 1998, retailing funds are a problem. Concerning product development for the railway sector, the investment risk is high because three domestic competitors have already commenced work.</li> </ul>  |                        |
| Plant production equipment  | <ul style="list-style-type: none"> <li>• Plant site: Approximately 40 ha</li> <li>• Plant operations were suspended as a result of power failure in November 1997.</li> <li>• As of 1996, the company possesses approximately 700 items of plant equipment and machinery mostly made in Russia and the former East Germany.</li> <li>• The company has difficulty obtaining supply parts for Soviet specification and outdated machinery.</li> </ul>   |                        |
| Business management   | <ul style="list-style-type: none"> <li>• It seems that the company management has not changed its approach to running the company in 30 years. There is no vitality concerning the implementation of financial plans designed to pursue marketing, new product design or technical reform.</li> </ul>  |                        |
| <b>2. Study Team's Assessment</b>   |  |                        |
| <ol style="list-style-type: none"> <li>1. Since this is the only plant to have long-term experience of mass producing all-wheel heavy vehicles, it is viewed as the prime candidate in the country for carrying out the local assembly of wheel tractors and production of sheet metal parts.</li> <li>2. Since the company's 6 ton trailers, which have been its main product since the days of the Soviet Union, are heavy duty full trailers fitted with turntables for dumping, the company should be skilled in making thick sheet metal frames and drive units for wheel tractors.</li> <li>3. The company side, in reference to military truck bodies, stated that it wasn't interested in products for which 70% of cost is spent on purchasing. Therefore, it is thought that the company also possesses technology for producing thin sheet metal of varying types in small quantities.</li> <li>4. 50% of trading is done in cash, which is thought to be a relatively high ratio for Kazakhstan. In view of the company's participation in the government's agricultural policy lease program and its partial export of trailers, it is considered that the government regards it as an important concern.</li> <li>5. The company management is very confident with regard to the assembly and successive local production of medium wheel tractors, but is hesitant with respect to large wheel tractors. This is clearly because it does not think highly of the K-700. This thinking may change if the company succeeds in producing medium tractors and becomes able to introduce a better large-scale model.</li> </ol> |  |                        |

A-7 Company name: Petropavlosk ZIKSTO

Location: Petropavlosk

3. Proposed Improvement Measures

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| <p>Proposals from the view point of Industrial restructuring</p>     | <ol style="list-style-type: none"><li>1. The company should be responsible for manufacturing and selling medium wheel tractors and satisfying demand for products to take the place of imported agricultural tractors.</li><li>2. The company should pursue local production of tractor components and parts since it has the capacity to do so. However, concerning components that require special production equipment and new technology, it should foster outside suppliers rather than pursue internal production.</li><li>3. The company should continue producing cultivators by switching from production on order to stock production, and it should expand its production lines to include tractor-pulled agricultural machinery.</li><li>4. Rather than internally producing standard components and expendable parts for agricultural machinery, the company should purchase from specialist makers or develop external suppliers.</li></ol> |
| <p>Proposals from the view point of company business improvement</p> | <ol style="list-style-type: none"><li>1. The company should appropriately downsize its trailer assembly lines and sheet metal welding shop. Moreover, it should dispose of surplus equipment and facilities including those in its medium wheel tractor department.</li><li>2. The company should conduct marketing of agricultural tractors and cultivators and organize a setup for promoting the development of medium wheel tractors development and localization projects.</li></ol>   |



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| A-8 Company name: Petropavlosk Kirov Plant |  | Location: Petropavlosk |
| 1. Current Company Conditions              |  |                        |
| Background                                 | <ul style="list-style-type: none"> <li>• The company was established roughly 70 years' ago in the late 1920s.</li> <li>• Composition of capital: 10% employees, 90% government priority shares. The company employees are currently seeking to purchase the government-held shares for approximately US \$ 10 million and the company management believes this to be an appropriate price.</li> <li>• The plant building area is 65,000 m<sup>2</sup>, which mainly consists of the machine processing and assembly shops. Plant observation was not possible because of the company's involvement in the defense sector.</li> <li>• Number of employees (end of 1997): 700 (6,500 prior to 1990, 20 design engineers)</li> <li>• Operating rate of equipment: 25%</li> </ul>  |                        |
| Overview of products                       | <ul style="list-style-type: none"> <li>• 10 years' ago, the company was planning a joint venture with JVC (Japan Victor) to locally produce 100,000 cassette players per year for five years, however, despite completing an integrated production plant (for conducting case forming to plating), this plan never materialized. This plant is currently used for producing combine harvester feed mechanisms and meters for home use, etc.</li> <li>• With respect to agricultural machinery parts and supply parts, the company produces electrical equipment and power transmission unit parts (sprockets, etc.) for not only combine harvesters but also tractors.</li> <li>• The company also repairs tractor engines.</li> </ul>   |                        |
| General survey of the Product              | <ul style="list-style-type: none"> <li>• The company sells its main products (electrical and machine parts including those for military uses, which are undisclosed) to the domestic market and Ukraine, Belorussia, Russia and other CIS countries. In the past it exported to Turkey, UAE, Poland and Hungary.</li> <li>• Domestic demand targets only tractor parts, for which the company management believes there to be no external demand. However, domestic customers do not have the purchasing power to buy even these products. The company previously concluded a supply contract with Pavlodar Tractor, however, this was not executed because Pavlodar Tractor did not possess the necessary funds.</li> <li>• The company has plans to supply John Deere tractor supply parts via Ken Dala, but these have not yet been executed.</li> <li>• Tractor production should be possible if a few companies in Petropavlosk group together, and the company management believes that this plant is capable of producing hydraulic parts.</li> </ul> |                        |
| Financial situation                        | <ul style="list-style-type: none"> <li>• Sales turnover (1997): 14.2 million Tenge/month</li> </ul>  |                        |
| Plant production equipment                 | <ul style="list-style-type: none"> <li>• The Team was shown an assembly plant for making light electrical parts and this did not contain any special items of note.</li> </ul>   |                        |

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| A-8 Company name: Petropavlosk Kirov Plant   |  | Location: Petropavlosk |
| Business management  | <ul style="list-style-type: none"> <li>• The management approach is slightly negative.</li> <li>• It seems that the company management has not changed in a long time. (This was the impression as of November 1997, but a new president was appointed in the first half of 1998).</li> <li>• Since the Team was unable to view the plant, many points are left unclear.</li> </ul>  |                        |
| <b>2. Study Team's Assessment</b>  |  |                        |
| <ol style="list-style-type: none"> <li>1. The employees including some business managers are still imbued with technology from the Soviet age and product quality levels are generally high (not only main products).</li> <li>2. The company places priority on continuing production of main products, for which external markets such as Russia and Turkey have been relied on for many years, and it does not consider there to be much market potential for machinery industry products in Kazakhstan.</li> </ol> |  |                        |
| <b>3. Proposed Improvement Measures</b>  |  |                        |
| Proposals from the view point of Industrial restructuring  | <ol style="list-style-type: none"> <li>1. The company should be responsible for manufacturing and improving components and parts (in particular, electrical parts and control unit parts) which affect the quality of tractors and other finished key products.</li> <li>2. Concerning the introduction of technology for combine harvesters, the company should directly participate in projects for achieving the localization of key component production.</li> </ol>   |                        |
| Proposals from the view point of company business improvement  | <ol style="list-style-type: none"> <li>1. The company should revise its business approach to one of positively participating in the support sector for producing specialized components for tractors and industrial heavy machinery.</li> <li>2. Concerning production equipment for its main products, the company should closely monitor changes in the internal and external markets for such products and carry out appropriate downsizing and readjustment with a view to flexibly responding to the wishes of domestic industrial machinery manufacturers.<br/>For example, when tractor manufacturers state their requirements concerning the supply of tractor parts, the company needs to prepare a production setup that allows these manufacturers to minimize their investment.</li> </ol> |                        |

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| A-9 Company name: Akmolascelmash Location: Astana |   |
| <b>1. Current Company Conditions</b>              |   |
| <b>Background</b>                                 | <ul style="list-style-type: none"> <li>• This company was established in 1942, when part of a factory moved from the western part of the country to Astana. The plant originally manufactured supply parts for agricultural machinery, but it started to produce simple machines and successively expanded operations to include the manufacture of high level machinery.</li> <li>• In the 1970s, when wind-caused soil erosion became a problem in Russia and Kazakhstan, the company developed and produced a special cultivator and fertilizer spreader. These products were also exported to France, the former East Germany and Canada.</li> <li>• Exports to Russia, Ukraine and other CIS countries suddenly declined in the 1990s and the company started to manufacture plows.</li> <li>• Following this, the government liquidated the original company and reestablished the existing company by using two-thirds of the assets.</li> <li>• Composition of capital: 90% Rehabilitation Bank, 10% employees</li> <li>• Number of employees (end of 1997): 1,000 (6,500 four years' ago)</li> <li>• Operating rate of equipment: 15%</li> </ul> |
| <b>Overview of products</b>                       | <ul style="list-style-type: none"> <li>• Main products are 3-5 types of plows and cultivators.</li> <li>• The company also handles three types of disc plows and potato machines following the introduction of technology from the Netherlands.</li> <li>• Trucks for use in construction and agriculture are manufactured in a joint venture with a company in Moscow.</li> <li>• The company also manufactures approximately 300 types of consumer products.</li> </ul>   |
| <b>General survey of the Product</b>              | <ul style="list-style-type: none"> <li>• The domestic and Russian markets are the largest followed by Ukraine.</li> <li>• There are no other manufacturers in Kazakhstan that compete in the same product lines.</li> </ul>   |
| <b>Financial situation</b>                        | <ul style="list-style-type: none"> <li>• Sales turnover (1997): 20.7 million Tenge/month</li> <li>• A proposed technical agreement for cereal combine harvesters has been presented by John Deere Co. via the government. This contract stipulates minimum annual localization rates and production quantities for five years and the government has guaranteed to pay the initial fee and license fee. The company has not yet entered discussions of this contract, but if it signs its operating rate will increase to 100%. The company's engineering department plans to develop reaper attachments suited to the work environment in Kazakhstan and fit these to John Deere machinery.</li> <li>• Current transactions are paid in cash (15%) and by barter trading (85%).</li> <li>• Since the company was able to raise production through a government lease program in the second half of 1997, it was able to pay wages in cash for a period.</li> </ul>   |

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| A-9 Company name: Akmolaselmash Location: Astana  |  |
| Plant production equipment  | <ul style="list-style-type: none"> <li>• Site area: 58 ha, total building area: 38 ha (including the part released in liquidation)</li> <li>• Casting and forging shop, four sheet metal and welding shops, coating shop and die and tool shop</li> <li>• Raw materials are procured domestically or from Russia only.</li> <li>• Equipment and machinery are imported from Russia, Czechoslovakia, Hungary and Yugoslavia.</li> </ul>   |
| Business management   | <ul style="list-style-type: none"> <li>• The company is currently preparing as business plan with assistance from the Rehabilitation Bank.</li> <li>• The company is relying totally on the government to vitalize the agricultural sector and thus stimulate product demand.</li> </ul>   |
| <b>2. Study Team's Assessment</b>   |  |
| <ol style="list-style-type: none"> <li>1. The company is maybe the top specialist manufacturer of agricultural cultivators.</li> <li>2. The company still maintains links with tractor test stations, particularly the test station in Astana, and sends new model machines to such facilities for authorization.</li> <li>3. Production technology is not especially advanced, but the company has no problems as an assembly maker of cultivators.</li> </ol> |  |
| <b>3. Proposed Improvement Measures</b>   |  |
| Proposals from the view point of Industrial restructuring   | <ol style="list-style-type: none"> <li>1. The company should expand and improve its hauled cultivation machinery (cultivators and sowers) and in the long term develop and produce self-running combine harvesters.</li> <li>2. The company should widely expand its domestic retailing and service network and conduct marketing closer to markets, giving priority to the northern grain producing belt especially.</li> <li>3. The company should rely on specialist makers to produce component units and parts for its agricultural machinery.</li> </ol>   |
| Proposals from the view point of company business improvement   | <ol style="list-style-type: none"> <li>1. A product manager should be appointed to the sales department to promote exchange of market information between the development and production departments and the sales and service network.</li> <li>2. The quality assurance department should successively analyze and take countermeasures for, in order of priority, important quality problems such as differences in performance compared with imported machinery, functioning rates, breakdown frequencies and customer costs, etc.</li> <li>3. The downsizing and rebuilding of equipment and facilities currently being implemented should be continued.</li> </ol> |

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| A-10 Company name: Gas Apparatus Location: Astana   |   |
| <b>1. Current Company Conditions</b>  |   |
| Background  | <ul style="list-style-type: none"> <li>• Established in 1964</li> <li>• Composition of capital: 10% employees, 90% government</li> <li>• Number of employees (end of 1997): 148 (870 immediately prior to restructuring)</li> <li>• Operating rate of equipment: 10%</li> </ul>   |
| Overview of products  | <ul style="list-style-type: none"> <li>• Gas cylinders: Annual production capacity 400,000</li> <li>• Gas stoves: Annual production capacity 150,000</li> <li>• Gas ranges: Annual production capacity 400,000</li> </ul>   |
| General survey of the Product   | <ul style="list-style-type: none"> <li>• Main sales destinations used to be the domestic market and Russia, but in recent years the company only sells small quantities of cylinders almost exclusively to the domestic market.</li> <li>• For the first time in a long while, the company recently received orders from Russia for 50,000 cylinders and 12,000 ranges.</li> <li>• There are no competitors in Kazakhstan, but there were previously 18 rival companies in Russia.</li> <li>• The company and investors are interested in developing new product lines.</li> </ul>  |
| Financial situation   | <ul style="list-style-type: none"> <li>• Sales turnover (1997): 4 million Tenge/month</li> <li>• Investors from Germany, Italy and Japan, etc. seem to be showing an interest in the company.</li> </ul>  |
| Plant production equipment  | <ul style="list-style-type: none"> <li>• Plant equipment and machinery was made in the former Soviet Union, East Germany and Czechoslovakia and is in fair condition. There is no problem regarding the supply of equipment parts.</li> </ul>   |
| Business management   | <ul style="list-style-type: none"> <li>• The current president was appointed in September 1997.</li> </ul>  |
| <b>2. Study Team's Assessment</b>   |   |
| <ol style="list-style-type: none"> <li>1. The company has 30 years of experience in making gas cylinders. It conducts welding according to specifications, performs X-ray inspections and pressure testing on all products, and also implements destruction tests on random samples.</li> <li>2. The company possesses a second plant with a site area of 6 ha and three plants with high span cranes (12 m). Combined with the company's sheet metal welding technology, these constitute effective business resources.</li> </ol> |   |
| <b>3. Proposed Improvement Measures</b>   |   |
| Proposals from the view point of Industrial restructuring<br>Proposals from the view point of company business improvement  | <ol style="list-style-type: none"> <li>1. The company should take part in the manufacture of storage tanks and other equipment and facilities used in agricultural product distribution and the foodstuff processing industry.</li> <li>2. The company is said to be currently advancing a strategy of diversification into the natural gas transmission business, but it should also take an interest in the agricultural product distribution and the foodstuff processing sectors and start marketing related products through promoting exchange with these sectors.</li> </ol> |

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| A-11 Company name: Tselinenergmont Location: Astana  |  |
| <b>1. Current Company Conditions</b>   |  |
| Background   | <ul style="list-style-type: none"> <li>• Established in 1985</li> <li>• The company was fully privatized in 1992. 34 people own 75% of the company shares with the current president owning a large enough share to have control of business affairs.</li> <li>• Number of employees (end of 1997): 800</li> <li>• Operating rate of equipment: 30%</li> </ul>   |
| Overview of products   | <ul style="list-style-type: none"> <li>• The company's major product (work) is repairing worn shaft parts by means of plasma adhesion of linings. The company claims that its objective is to restore (not increase) the country's energy supply to its required level.</li> </ul>   |
| General survey of the Product  | <ul style="list-style-type: none"> <li>• The company possesses two service stations in Astana, one in Petropavlosk and one more in Kokshatau, all located close to power stations, and it specializes in providing maintenance services and repairing parts.</li> <li>• The company is determined not to become involved in developing new products.</li> </ul>  |
| Financial situation  | <ul style="list-style-type: none"> <li>• Sales turnover (1997): 44 million Tenge/month</li> <li>• The company records profits of 25% and its financial situation continues to be good.</li> <li>• Employees' wages (approximately US \$ 150/month) are paid in cash. Moreover, an incentive plan introduced by the company has resulted in improved productivity.</li> </ul>   |
| Plant production equipment   | <ul style="list-style-type: none"> <li>• The president believes that 50% of equipment and machinery should be gradually renewed.</li> <li>• Construction of a new warehouse and shop using external funds was suspended before completion.</li> </ul>  |
| Business management  | <ul style="list-style-type: none"> <li>• The president is a very active businessman who supports the market economy, and he is also very keen on research as demonstrated by the fact that he has a doctorate in metal technology. He served as a business manager for 10 years and has been president for three years.</li> </ul>   |
| <b>2. Study Team's Assessment</b>  |  |
| <ol style="list-style-type: none"> <li>1. The company is building a new processing line for carrying out repair of worn shaft parts by means of plasma adhesion of linings.</li> <li>2. As indicated by the company's adoption as a pioneering vendor as a specialist pipeline plant for power stations, it takes a positive approach to introducing advanced applied technologies.</li> <li>3. The president's past experience gives him a deep understanding of the issues involved in responding to issues arising from the transition to a market economy. He has written a book entitled "Economic Reform on the Microscopic Level."</li> </ol> |  |
| <b>3. Proposed Improvement Measures</b>  |  |
| Proposals from the view point of Industrial restructuring  | <ol style="list-style-type: none"> <li>1. The company should become a specialist maker of machine parts where certain types of special metal processing technology have a critical effect on product quality. For example, it should consider manufacturing sower feed sections and articulate parts for wheel tractors.</li> <li>2. The company should handle stainless steel welded parts for use in food processing machinery.</li> </ol> |

| A-12 Company name: Eikos Location: Almaty  |  |
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| <b>1. Current Company Conditions</b>   |  |
| Background   | <ul style="list-style-type: none"> <li>• The company was established as a private concern in 1990. It is a venture enterprise of the president, who possesses special technical know-how.</li> <li>• Number of employees (end of 1997): 140 (350 including those in Moscow)</li> <li>• Operating rate of equipment: 20%</li> </ul>   |
| Overview of products   | <ul style="list-style-type: none"> <li>• This company is the only specialist manufacturer of water purifying trains and related instruments in Kazakhstan.</li> <li>• The company makes approximately 400 kinds of products, half of which are concerned with environmental adjustment.</li> <li>• This is the only company in Kazakhstan to possess a vodka plant and distillery.</li> <li>• The company has received European awards on numerous occasions for the excellent quality of its products.</li> <li>• The company prepares a good range of product catalogues and materials.</li> </ul> |
| General survey of the Product  | <ul style="list-style-type: none"> <li>• The company is also active in exporting to countries such as Canada, Sri Lanka, Peru and Russia, etc.</li> <li>• The company possesses high internal capacity for managing patents.</li> <li>• The company allocates a large budget to overseas marketing.</li> </ul>   |
| Financial situation  | <ul style="list-style-type: none"> <li>• Sales turnover (first half of 1998): 2 million Tenge/month</li> <li>• The company is operating in the black and has no debts.</li> <li>• There are many orders, but the company is holding back on investment to expand operations.</li> </ul>  |
| Plant production equipment   | <ul style="list-style-type: none"> <li>• The company has two plants: one in inner Almaty and one on the outskirts. It also possesses two chemical experimentation laboratories.</li> </ul>   |
| Business management  | <ul style="list-style-type: none"> <li>• The business approach is market-oriented and positive.</li> </ul>   |
| <b>2. Study Team's Assessment</b>  |  |
| <ol style="list-style-type: none"> <li>1. The company owner is a talented researcher and has succeeded in steadily developing products from his research findings.</li> <li>2. Much is expected from the company's research and development and product range expansion activities, and it is anticipated that the company will contribute to promotion of the domestic agricultural product processing industry.</li> </ol> |  |
| <b>3. Proposed Improvement Measures</b>  |  |
| Proposals from the view point of Industrial restructuring  | <ol style="list-style-type: none"> <li>1. Concerning the manufacture of foodstuff processing equipment and plants, the company should expand operations through concluding technical tie-ups and cooperating with engineering companies.</li> </ol>  |
|  | <ol style="list-style-type: none"> <li>2. The company should exchange information with related industrial groups and, concerning collection of information on foodstuff processing equipment and plant import trends, it should utilize machinery industry promotion functions that are supported by the government.</li> </ol>  |
| Proposals from the view point of company business improvement  | <ol style="list-style-type: none"> <li>1. The company should adopt a business approach that places emphasis on research and development.</li> <li>2. The company should consign the manufacture of instruments and parts that do not require patent know-how to external suppliers.</li> </ol>   |

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| A-13 Company name: Almaty Pisheremdash Location: Almaty   |  |
| 1. Current Company Conditions   |  |
| Background  | <ul style="list-style-type: none"> <li>• This company has been manufacturing large refrigerators and freezers for the foodstuffs industry since the 1970s. Imports to CIS countries increased to 75% of sales at the start of the 1990s.</li> <li>• The company was fully privatized in 1995. 20% of shares are held by employees including three company managers.</li> <li>• Number of employees (end of 1997): 150</li> <li>• Operating rate of equipment: 20%</li> </ul> |
| Overview of products  | <ul style="list-style-type: none"> <li>• Cold storage boxes and stores for general foodstuffs, beverages, chicken meat and dairy products, etc.</li> </ul>   |
| General survey of the Product   | <ul style="list-style-type: none"> <li>• 75% of products are sold on the domestic market and the remaining 25% are exported to Russia and other CIS countries.</li> <li>• The company is planning to diversify into the cold storage and freezing and bottling businesses.</li> </ul>  |
| Financial situation   | <ul style="list-style-type: none"> <li>• Sales turnover (1997): 3 million Tenge/month</li> <li>• After exchanging a letter of intent, the company has presented a business plan to the EBRD concerning the local subcontracted implementation of bottling for Coca Cola.</li> </ul>  |
| Plant production equipment  | <ul style="list-style-type: none"> <li>• The production line currently only operates irregularly when orders are received.</li> <li>• The company has recently been involved in talks with Japanese companies with a view to introducing PET bottle production technology.</li> </ul>  |
| Business management   | <ul style="list-style-type: none"> <li>• The president is relatively active and serious about business development.</li> </ul>   |
| 2. Study Team's Assessment  |  |
| <ol style="list-style-type: none"> <li>1. This is an important company in that no other companies in Kazakhstan have 25 years of experience in operating as specialist manufacturers of foodstuffs-related equipment.</li> <li>2. It is desirable to see the company make effective use of its new plant. This has good flooring and a number of booths fitted with cranes, and its installed equipment includes three Hitachi precision horizontal spindle lathes and one Amada punch press. This equipment was installed for a chicken broiler equipment manufacturing project.</li> <li>3. The president is active in planning business development by himself, but it is thought that the company will struggle so long as it remains solely as an equipment maker. A number of avenues should exist for providing administrative support to enable the company to build good working relationships with foodstuffs processors and distributors (including importers and exporters).</li> </ol> |  |
| 3. Proposed Improvement Measures  |  |



| A-13 Company name: Almaty Pisheremmash Location: Almaty       |   |
|---|---|
| Proposals from the view point of Industrial restructuring     | <ol style="list-style-type: none"> <li>1. The company should pursue localization of dairy product raw materials storage, conveyance and processing plants, product storage and conveyance equipment, and weighing and sanitary devices for use between processes.</li> <li>2. The company should pursue localization of fruit juice and vegetable juice raw materials storage, conveyance and processing plants, product storage and conveyance equipment, and weighing and sanitary devices for use between processes.</li> </ol>  |
| Proposals from the view point of company business improvement | <ol style="list-style-type: none"> <li>1. The company should accumulate technology and secure markets through taking opportunities to cooperate with, and perform subcontracting work for, storage and distribution operators and mass producers of dairy products, exporters of primary processed semi-finished fruit juice and vegetable juice, and users of food processing-related equipment considered to have high future market potential.</li> <li>2. When receiving orders for system products, the company should concentrate on overall design, assembly and manufacture of main component sections, while purchasing general units such as conveyance systems and measuring devices from external suppliers as much as possible.</li> </ol> |

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|--|---|
| A-14 Company name: Kostanai Diesel Engine Location: Kostanai   |   |
| 1. Current Company Conditions  |   |
| Background   | <ul style="list-style-type: none"> <li>• In 1985 a project was started by the Ministry of Defense of the former Soviet Union to construct a plant for mass producing diesel engines for use in Kamaz trucks and Ural tractors.</li> <li>• The plant was completed in 1992 as a joint venture based on government and German capital.</li> <li>• Number of employees (end of 1997): 600</li> <li>• Operating rate of equipment: 10% or less</li> </ul> |
| Overview of products   | <ul style="list-style-type: none"> <li>• Engine designs are used under license from Deutz AG (originally Kloeckner-Humbolt-Deutz AG), and pistons have been designed to low temperature specifications (-65 °C) of Marey in Germany.</li> </ul>   |
| General survey of the Product  | <ul style="list-style-type: none"> <li>• The plant is in reality not operating, and this situation has continued since 1995.</li> <li>• For some reason or other the company is hardly making any effort to promote sales.</li> </ul>   |
| Financial situation  | <ul style="list-style-type: none"> <li>• Sales turnover (1997): 10 million Tenge/month</li> </ul>   |
| Plant production equipment   | <ul style="list-style-type: none"> <li>• The transfer line for processing cylinder blocks, crank shafts and cam shafts was designed by KHD.</li> <li>• Most of the main machine tools were made in Germany but some are Japanese-made. Marposs inter-process inspection devices are installed at numerous points on the line.</li> </ul>  |
| Business management  | <ul style="list-style-type: none"> <li>• Mr. Gortz appears to be a very dynamic president. It is desirable to see the establishment of a clear quality policy.</li> </ul>   |
| 2. Study Team's Assessment   |   |
| <ol style="list-style-type: none"> <li>1. This is a specialist plant for making engines, however, judging from its range of high precision machine processing equipment and newness of installation, the level of equipment quality and maintenance in the company would appear to be top class for Kazakhstan.</li> <li>2. The plant can handle a wide variety of product specifications, ranging from Deutz 120 mm Boa Series serial 6-cylinder engines to 12-cylinder engines, and it has the potential to develop various industrial machinery mounting applications.</li> <li>3. The company has no experience of mounting engines in mass produced tractors, and no such development projects are currently underway. However, the company catalogue claims that it aims to develop a V-8 engine for use in K-700 and T-150 tractors.</li> </ol> |   |

|   |   |
|---|---|
| A-14 Company name: Kostanai Diesel Engine Location: Kostanai  |   |
| 3. Proposed Improvement Measures                              |   |
| Proposals from the view point of Industrial restructuring     | <ol style="list-style-type: none"> <li>1. The company should aim to satisfy the domestic demand for mounting, supplementation and replacement of diesel engines (from 75 hp to 300 or 400 hp) for all applications in Kazakhstan, i.e. trucks, tractors, generator sets, compressors and pump stations, etc. used by all types of machinery manufacturers.</li> <li>2. The company should develop domestic and foreign supply sources of casting and forging materials for cylinder blocks and crank shafts, etc.</li> </ol>  |
| Proposals from the view point of company business improvement | <ol style="list-style-type: none"> <li>1. The company should implement, in order of priority, application development with a view to selecting models and setting performance levels of engines that can be mounted in key products and engines that satisfy market requirements in sectors of the industrial machinery industry where market potential is high.</li> <li>2. The company should bolster its setup for researching and developing engine applied technology and also strengthen its personnel organization and test and research facilities.</li> <li>3. The company should review its present production lines and readjust its equipment and machinery in order to achieve the most effective setup for responding to engine model selections and product sales strategies.</li> </ol> |

A-15 Company name: Agroremmashzavod Location: Almaty

1. Current Company Conditions

|                               |   |
|-------------------------------|---|
| Background                    | <ul style="list-style-type: none"> <li>• This company was established in 1934 as a state-owned agricultural machinery maintenance and repair plant. It later became part of the agricultural machinery maintenance network of the Soviet Union.</li> <li>• The company was privatized in 1992.</li> <li>• The company is a member of the Kazakhstan Agricultural Machinery Repair Association, which is also a shareholder.</li> <li>• Number of employees (end of 1997): 90</li> <li>• Operating rate of equipment: 20%</li> </ul> |
| Overview of products          | <ul style="list-style-type: none"> <li>• The Kazakhstan Agricultural Machinery Repair Association hopes that the company will introduce technology from foreign agricultural machinery makers and carry out local production.</li> <li>• In addition to industrial machinery, the company produces various sheet metal products and parts on order.</li> </ul>  |
| General survey of the Product | <ul style="list-style-type: none"> <li>• The company still has large stocks of sower drill units with hoppers attached, however, it is making no effort to independently market agricultural machinery-related products.</li> <li>• The company sells bread which it makes from flour crushed in a flour mill that it made.</li> <li>• The company has started to undertake automobile repairs in recent times.</li> </ul>  |
| Financial situation           | <ul style="list-style-type: none"> <li>• Sales turnover (1997): 2 million Tenge/month</li> <li>• The company always pays wages on time and has no liabilities.</li> </ul>   |
| Plant production equipment    | <ul style="list-style-type: none"> <li>• The agricultural machinery and tractor repair shop is currently used to carry out sheet metal work on railway crossings, refrigerators and building fittings such as metal doors.</li> <li>• One building is used as the flour mill plant and almost all the equipment in this plant has been manufactured by the company.</li> </ul>  |
| Business management           | <ul style="list-style-type: none"> <li>• The president still hopes to revive the company as an agricultural machinery and tractor repair shop.</li> <li>• The president of the Kazakhstan Agricultural Machinery Repair Association places high expectations on the company president.</li> </ul>   |

2. Study Team's Assessment

1. In accordance with the marketing direction of agricultural machinery manufacturing companies, it is hoped that this company acts as a central sales and service base in the Almaty region.
2. The small-scale integrated flour mill and bread making plant is viewed as a promising product suited to remote rural areas.

|   |   |
|---|---|
| A-15 Company name: Agroremmashzavod Location: Almaty          |   |
| 3. Proposed Improvement Measures                              |   |
| Proposals from the view point of Industrial restructuring     | <ol style="list-style-type: none"> <li>1. In order to become an established retailing agent of agricultural machinery, the company should select products of domestic and foreign makers and conclude agency contracts upon conducting market study.</li> <li>2. In cooperation with the Kazakhstan Agricultural Machinery Repair Association and other agricultural machinery repair companies (for example, machinery and tractor stations), the company should play a part in enhancing the sales and service center network of agricultural machinery manufacturing companies.</li> </ol> |
| Proposals from the view point of company business improvement | <ol style="list-style-type: none"> <li>1. The company should strengthen its sales capacity with respect to a wide range of agricultural machinery products. At the same time it should acquire the capability to implement quality assurance for manufacturing companies.</li> <li>2. The company should commercialize the flour mill and bakery system upon conducting market study, and it should manufacture and sell this as a sideline to manufacturing sheet metal parts for agricultural machinery.</li> </ol>   |

M-1 Company name: Almaty Lathe Co. Location: Almaty

I. Current Company Conditions

|                               |  |
|-------------------------------|--|
| Background                    | <ul style="list-style-type: none"> <li>• This company was established in 1934 as a manufacturer of agricultural hand tools.</li> <li>• Following the end of World War II, when it was producing agricultural tools, the company reverted to production of agricultural machinery.</li> <li>• The company switched to producing machine tools (lathes, etc.) in 1961.</li> <li>• Casting operations, etc. are partially suspended at the moment.</li> <li>• The company is currently under the supervision of the Rehabilitation Bank.</li> <li>• Number of employees (end of 1997): 100</li> <li>• Operating rate of equipment: 10%</li> </ul> |
| Overview of products          | <ul style="list-style-type: none"> <li>• Manually operated lathes (mainly the 16D25)</li> <li>• The company previously manufactured NC, but these operations have now stopped.</li> <li>• Spare parts made by the company consist of railway parts in particular.</li> <li>• The company is developing a market for small agricultural products via a joint venture.</li> </ul>  |
| General survey of the Product | <ul style="list-style-type: none"> <li>• The market for the company's main products (lathes) has totally collapsed and the company was only able to sell 25 units in 1996. The company has no stocks.</li> </ul>   |
| Financial situation           | <ul style="list-style-type: none"> <li>• Sales turnover (1997): 14 million Tenge/month</li> <li>• The company is under the control of the Rehabilitation Bank, however, it has managed to obtain some funds recently and has reduced its debts to 76 million Tenge.</li> <li>• Company assets are currently in excess of liabilities, however, some of the company stocks are more than three years' old and may not be disposable.</li> </ul>   |
| Plant production equipment    | <ul style="list-style-type: none"> <li>• As a result of plant expansion conducted in 1985, machinery is new and the plant has enough capacity to produce 8,000 lathes per year. (Only 25 lathes were sold in 1996).</li> <li>• The casting shop has been closed for more than two years.</li> <li>• The company possesses no design capacity. Design work is consigned to Novosibirsk and other companies.</li> </ul>  |
| Business management           | <ul style="list-style-type: none"> <li>• The company is dependent on government support.</li> <li>• It is aiming to survive by forming a small joint venture.</li> <li>• The company is striving to avoid the reality of bankruptcy by selling equipment to raise funds for making agricultural machinery parts in a new small-scale company.</li> </ul>   |

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| M-1 Company name: Almaty Lathe Co. Location: Almaty  |  |
| 2. Study Team's Assessment   |  |
| <ol style="list-style-type: none"> <li>1. The only machine tool maker in Kazakhstan, this company possesses excellent measuring equipment and is suited to producing relatively high class components.</li> <li>2. The company first needs to further advance the policy of downsizing currently being implemented.</li> </ol> |  |
| 3. Proposed Improvement Measures   |  |
| Proposals from the view point of Industrial restructuring  | <ol style="list-style-type: none"> <li>1. This company should be treated as a candidate for developing and producing transmissions for use in mining machinery and agricultural machinery.</li> <li>2. Consideration should be given to utilizing the company's measuring equipment for training purposes at the Machinery Technology Promotion Center.</li> </ol> |
| Proposals from the view point of company business improvement  | <ol style="list-style-type: none"> <li>1. The company should sell off its surplus machine equipment which was installed some 20 years' ago and its casting plant which is practically closed down.</li> <li>2. As an emergency countermeasure, top priority lies in the continued strengthening of financial management.</li> </ol>                                |

M-2 Company name: AZTM (Almaty Heavy Machine Building Co.) Location: Almaty

**1. Current Company Conditions**

|                               |               |
|-------------------------------|---------------|
| Background                    | (Same as A-1) |
| Overview of products          |               |
| General survey of the Product |               |
| Financial situation           |               |
| Plant production equipment    |               |
| Business management           |               |

**2. Study Team's Assessment**

1. The company possesses technology and a scale of operations suited to the manufacture of large-scale mining machinery parts.
2. The company seems to be making a profit, albeit small, and has the potential to carry out business expansion by itself.
3. The company appears to possess research and development capability and it should promote and expand exports to advanced countries to which it has exported in the past (50% of exports are currently biased towards Russia).

**3. Proposed Improvement Measures**

|   |  |
|---|--|
| Proposals from the view point of Industrial restructuring     | 1. The company should expand production of gears and shafts for use in large-scale mining machinery speed transmission.  |
| Proposals from the view point of company business improvement | <ol style="list-style-type: none"> <li>1. Starting from study of the domestic and foreign markets, The company needs to adopt a priority-oriented approach to the selection and production of a wide variety of products.</li> <li>2. The company should promote the sale and scrapping of casting equipment with a low operating rate.</li> </ol> |



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| M-3 Company name: Karaganda Grumash Location: Karaganda |  |
| 1. Current Company Conditions                           |  |
| Background  | <ul style="list-style-type: none"> <li>• This company was established in 1970 following the amalgamation of three companies by the Ministry of Coal.</li> <li>• Control of the company was recently transferred to the Kargormash-Ittexx corporation. The composition of capital is 49% state and 51% private persons. The government has promised to provide support to improve the financial makeup of the company.</li> <li>• The transfer contract was completed with the handover of business management rights to Ittex, however, the government appears to hold the right of veto.</li> <li>• Ittex is a Canadian company, but its dealings are mainly concentrated in Russia.</li> <li>• The company seems to be having a struggle with business management. Its headquarters suffered from two fires in March.</li> <li>• Number of employees (end of 1997): 1,300</li> <li>• Operating rate of equipment: 20%</li> </ul> |
| Overview of products                                    | <ul style="list-style-type: none"> <li>• The company's main products are stanchions for longwall mining.</li> <li>• It also produces hydraulic parts.</li> </ul>   |
| General survey of the Product                           | <ul style="list-style-type: none"> <li>• The market for coal mining equipment faces harsh conditions and the prospects for recovery are not good.</li> <li>• The company is pinning hopes on talks concerning the loan of new machinery to West Siberia. The Russian Gold and Platinum Bank plans to finance this venture.</li> <li>• The company is aiming to expand its market for other hydraulic machinery.</li> <li>• The company is planning to enter the oil and gas equipment business.</li> </ul>   |
| Financial situation                                     | <ul style="list-style-type: none"> <li>• Sales turnover (1997): 80 million Tenge/month</li> <li>• The company claims that all debts which were shifted to the government's Disposal Committee have been removed as a result of company restructuring.</li> <li>• However, unpaid wages amounting to 60 million Tenge seem to have remained as liabilities.</li> </ul>  |
| Plant production equipment                              | <ul style="list-style-type: none"> <li>• Inactive parts of the plant have been closed down.</li> <li>• Other plants except for the casting plant are operating in normal condition.</li> <li>• The company has no automatic welding machinery, which is important for high tension equipment, but quality control seems to be satisfactory.</li> <li>• The company possesses design capability, but there is little hope of further company development.</li> </ul>  |

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| <b>M-3 Company name: Karaganda Grumash Location: Karaganda</b>   |  |
| <b>Business management</b>   | <ul style="list-style-type: none"> <li>• The company has a certain degree of competitiveness and understanding of the current state of the market.</li> <li>• The company side was uncooperative with the survey.</li> </ul>   |
| <b>2. Study Team's Assessment</b>  |  |
| 1. The company possesses technical capacity for the manufacture of hydraulic parts. This has been fostered through production of coal mine stanchions. |  |
| <b>3. Proposed Improvement Measures</b>  |  |
| <b>Proposals from the view point of Industrial restructuring</b>   | 1. The company should be developed as a core company manufacturing not only mining machinery but hydraulic equipment (cylinders, pumps, motors) for all sectors.   |
| <b>Proposals from the view point of company business improvement</b>   | <ol style="list-style-type: none"> <li>1. It is necessary to improve welding technology, which is indispensable for manufacturing high tension parts, and it is particularly necessary to introduce automatic welders.</li> <li>2. Downsizing of casting equipment is required.</li> </ol> |

|   |  |
|---|--|
| <b>M-4 Company name: KAMZ (Karaganda Casting and Mechanical Plant) Location: Karaganda</b>  |  |
| <b>1. Current Company Conditions</b>  |  |
| <b>Background</b>   | <ul style="list-style-type: none"> <li>• This totally private company was only recently established in August 1997 by one major corporation and a number of other small companies.</li> <li>• Establishment was conditional on the company not having to inherit liabilities of the former company such as five months' unpaid wages (decision of the regional parliament).</li> <li>• Number of employees (end of 1997): 750</li> <li>• Operating rate of equipment: 15%</li> </ul> |
| <b>Overview of products</b>   | <ul style="list-style-type: none"> <li>• Repair of combine harvesters</li> <li>• Remodeling of hydraulic cylinders and pistons</li> <li>• Repair of gears and shafts, etc.</li> <li>• Sheet metal products: building metal plate, etc.</li> </ul>  |
| <b>General survey of the Product</b>  | <ul style="list-style-type: none"> <li>• Development of new machinery markets is necessary.</li> <li>• The company hopes to diversify into the oil and gas sectors, but it hasn't formulated any measures to achieve this.</li> <li>• Based on its present technology, it appears that the company will directly compete with Kargormash in numerous markets.</li> </ul>   |
| <b>Financial situation</b>  | <ul style="list-style-type: none"> <li>• Sales turnover (1997): 25 million Tenge/month</li> <li>• Sales are continuing to decline.</li> </ul>  |
| <b>Plant production equipment</b>   | <ul style="list-style-type: none"> <li>• The company's machinery is relatively old but is average compared to the local level.</li> <li>• The casting plant was reopened in the spring of 1998. This is located in the outskirts of Karaganda.</li> <li>• Hydraulic devices are important products for the company, but its equipment is inferior to that possessed by Kargormash.</li> </ul>  |
| <b>Business management</b>  | <ul style="list-style-type: none"> <li>• The manager at the time of the visit in November 1997 was young and market-oriented, but he had little plant experience.</li> <li>• The new manager at the time of the visit in March 1998 had plant know-how.</li> <li>• There is doubt whether the company has the capacity to respond to market forces with its current setup.</li> </ul>  |
| <b>2. Study Team's Assessment</b>   |  |
| 1. The hydraulic cylinders which the company supplies to agricultural machinery makers contain packing, and the company has the potential to become an international maker of cylinders if it makes the necessary effort. |  |
| <b>3. Proposed Improvement Measures</b>   |  |
| <b>Proposals from the view point of Industrial restructuring</b>  | <ol style="list-style-type: none"> <li>1. As an important maker of hydraulic cylinders, the company should supply to all sectors.</li> <li>2. The company should establish repair and recycling operations comprising repairs of coal mining combines and recycling of hydraulic cylinders, etc.</li> <li>3. The company should expand production of composite resin products by making use of its injection molding machines.</li> </ol>  |
| <b>Proposals from the view point of company business improvement</b>  | <ol style="list-style-type: none"> <li>1. The company is financially unstable and management strengthening is required in this area.</li> <li>2. Consideration needs to be given to establishing separate accounting systems for different sectors (manufacture of iron plate for the construction sector) and the company's materials processing department.</li> </ol>   |

|   |  |
|---|--|
| M-5 Company name: Vostokmashzavod Location: Ust-Kamenogorsk |  |
| 1. Current Company Conditions                               |  |
| Background  | <ul style="list-style-type: none"> <li>• This company was originally established in 1958 as part of the Ministry of Mining and Metallurgy.</li> <li>• The company is now privatized and is efficiently run by the company management.</li> <li>• The company has conducted diverse business operations for more than four years.</li> <li>• Number of employees (end of 1997): 2,200</li> <li>• Operating rate of equipment: 30% or more</li> </ul>  |
| Overview of products  | <ul style="list-style-type: none"> <li>• Heavy machinery such as ball mills, crushers and flotation processing systems, etc. for mines and mineral processing plants.</li> <li>• Heavy machinery for use in metallurgy plants</li> <li>• Retorts for titanium separation</li> <li>• Drill tools</li> <li>• Drill bits</li> <li>• Loaders</li> <li>• Small-scale brewing equipment</li> <li>• Small-scale drilling machines</li> </ul>  |
| General survey of the Product                               | <ul style="list-style-type: none"> <li>• The market for drilling machines has declined and moved to Kazakhstan following disappearance of the market in Russia.</li> <li>• The titanium retort market is promising for the future.</li> <li>• The drill bit market is active, but the company needs to expand production to include large bits for the oil industry.</li> <li>• There are no sales of loaders and drill rigs. Entry into these markets is difficult.</li> <li>• Since the mining company Kazzinc has purchased a machinery plant, this poses a threat to the market in this region.</li> </ul> |
| Financial situation   | <ul style="list-style-type: none"> <li>• Sales turnover (1997): 120 million Tenge/month</li> <li>• The company is operating in the black.</li> <li>• Almost all profits are consumed in company assets (mainly Sanatorium).</li> <li>• Except for accumulated losses of 180 million Tenge, the company has cleared most of its liabilities. The company has the funds to pay off the accumulated losses, but it prefers to retain them for now.</li> </ul>   |
| Plant production equipment                                  | <ul style="list-style-type: none"> <li>• The plant is relatively well equipped compared to the general standard in Kazakhstan.</li> <li>• The company has the potential to carry out the low cost casting of manganese steel.</li> <li>• The company possesses excellent stainless steel manufacturing technology and has the potential to develop new markets in the chemicals and food processing machinery sectors.</li> </ul>  |

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| <b>M-5 Company name: Vostokmashzavod Location: Ust-Kamenogorsk</b>   |  |
| <b>Business management</b>   | <ul style="list-style-type: none"> <li>• Judging from current standards in Kazakhstan, the company has a good understanding of current market conditions.</li> <li>• The company appears to place priority on technology.</li> </ul>   |
| <b>2. Study Team's Assessment</b>  |  |
| <ol style="list-style-type: none"> <li>1. The company has the capacity to produce heavy equipment centering around minerals processing machinery; the plant operating and management conditions are relatively good; and the company also has experience of manufacturing underground loaders.</li> <li>2. The company has a diverse product range, but strengthening of management in each department is required. The company is particularly skilled in manufacturing stainless steel and has the potential to advance into the chemicals and food processing machinery sectors.</li> </ol> |  |
| <b>3. Proposed Improvement Measures</b>  |  |
| <b>Proposals from the view point of Industrial restructuring</b>   | <ol style="list-style-type: none"> <li>1. The company should develop operations centering around minerals processing equipment for mines.</li> <li>2. The company should utilize its underground loader technology to develop and produce ground wheel loaders.</li> <li>3. The company should also manufacture food processing machinery such as small beer manufacturing plants, etc.</li> </ol> |
| <b>Proposals from the view point of company business improvement</b>   | <ol style="list-style-type: none"> <li>1. The company's operations are very diversified. It should select priority areas and carry out strengthening of financial management through introducing a division system and establishing independent accounting systems.</li> </ol>   |

M-6 Company name: Karaganda Parhomenko Plant Location: Karaganda

I. Current Company Conditions

|                               |  |
|-------------------------------|--|
| Background                    | <ul style="list-style-type: none"> <li>• This company was transferred from Ukraine in 1941.</li> <li>• The company was almost idle for two years until October 1997.</li> <li>• It has now been totally privatized according to the policy laid down by the president.</li> <li>• Number of employees (end of 1997): 310</li> <li>• Operating rate of equipment: 15%</li> </ul>  |
| Overview of products          | <ul style="list-style-type: none"> <li>• The company repairs underground coal digging machines. Most of the equipment it handles is not technically advanced.</li> <li>• Main products are Ispat spare parts.</li> <li>• The company has developed grain storage elevators, etc. based around coal digging machines, but it has yet to retail these products.</li> <li>• In future the company plans to manufacture coal combines designed by a local company.</li> </ul>  |
| General survey of the Product | <ul style="list-style-type: none"> <li>• Demand for coal digging machines is poor.</li> <li>• The company's market is currently limited to Karaganda Ispat.</li> <li>• The market in Karaganda has declined to between one-third and one-quarter of its former size.</li> <li>• The company is only able to sell three or four combines per year, making it difficult to develop new manufacturing equipment. It is thought that the company will struggle to compete with Ukrainian products in markets outside of Kazakhstan.</li> </ul> |
| Financial situation           | <ul style="list-style-type: none"> <li>• Sales turnover (1997): 10 million Tenge/month</li> <li>• The company claims that it has cleared almost all its debts, but payment of employees' wages is two or three months in arrears.</li> <li>• In contrast to sales, the company has stocks of semi-finished and finished products worth 260 million Tenge.</li> <li>• The company has concluded a contract to supply coal combines.</li> </ul>  |
| Plant production equipment    | <ul style="list-style-type: none"> <li>• Much of the company's machinery is very old-fashioned. Much of it dates back to the 1950s.</li> <li>• The quality of casting products judging from external appearance is poor.</li> <li>• Processing quality is poor due to abrasion of machinery.</li> <li>• It appears that all design work is consigned to external companies.</li> </ul>   |
| Business management           | <ul style="list-style-type: none"> <li>• The company's operations are market-oriented.</li> <li>• The company realizes that its plant equipment is not good enough.</li> <li>• The company seems to be relying on government assistance in order to promote sales.</li> </ul>  |

|  |   |
|--|---|
| M-6 Company name: Karaganda Parhomenko Plant Location: Karaganda   |   |
| 2. Study Team's Assessment   |   |
| <ol style="list-style-type: none"> <li>1. The company's operations are limited to technically low level underground coal digging machines, and its market is restricted to Kazakhstan. The company should pursue repairs and parts manufacturing.</li> <li>2. The company is planning the development of new sectors such as electrodes, etc., but it needs to conduct investment and profit and loss management and pursue these interests under a separate accounting system.</li> </ol> |   |
| 3. Proposed Improvement Measures   |   |
| Proposals from the view point of Industrial restructuring  | <ol style="list-style-type: none"> <li>1. The company should repair and manufacture replacement parts for mineral processing machinery and coal digging machines.</li> </ol>  |
| Proposals from the view point of company business improvement  | <ol style="list-style-type: none"> <li>1. The company faces some financial concerns (delayed payment of wages). Moreover, in view of the large stocks of semi-finished and finished products, strengthening of financial management and production management is necessary.</li> <li>2. The company needs to improve the production environment through disposing of deteriorated machinery and promoting the tidying and housekeeping of production lines, etc.</li> </ol> |

|   |  |                  |
|---|--|------------------|
| R-1 Company name: Rysty-AECRW   |  | Location: Almaty |
| <b>1. Current Company Conditions</b>  |  |                  |
| Background  | <ul style="list-style-type: none"> <li>• Established in 1943</li> <li>• Composition of capital: 90% government, 10% employees</li> <li>• Preparing to manufacture new passenger coach ( PC ) under direction of Ministry of Transportation and Communications and KTZ</li> <li>• Number of employees (end of 1997): 1900</li> <li>• Operating rate of equipment: 40~50% of total capacity</li> </ul> |                  |
| Overview of products  | Railway rolling stock concerned company <ul style="list-style-type: none"> <li>• Heavy repair of PC</li> <li>• Wheel-set repair</li> <li>• Traction motor repair</li> <li>• Brake shoe casting</li> </ul>  |                  |
| General survey of the Product   | <ul style="list-style-type: none"> <li>• Order of KTZ occupies 80% of the total</li> </ul>   |                  |
| Financial situation   | <ul style="list-style-type: none"> <li>• Total sales amount (1997): 90 million Tenge/month</li> </ul>  |                  |
| Plant production equipment  | <ul style="list-style-type: none"> <li>• Total land area: 22 Ha, Building area: 4 Ha</li> <li>• For new PC production, prepared building is 120m(length) x 60m(width). Depending on demand, area is possible to be enlarged</li> </ul>   |                  |
| Business management   | <ul style="list-style-type: none"> <li>• Very active company</li> <li>• Number of employees is 1889 and that of production section is 67% of the total</li> </ul>  |                  |
| <b>2. Study Team's Assessment</b>   |  |                  |
| <ol style="list-style-type: none"> <li>1. Equipment is surplus against production capacity, and machines are very old and manually operated</li> <li>2. Working environment is not good and unfinished products are found here and there</li> </ol> |  |                  |
| <b>3. Proposed Improvement Measures</b>   |  |                  |
| Proposals from the view point of Industrial restructuring   | <ol style="list-style-type: none"> <li>1. As for new PC production, initial investment cost is small owing to existing usable facilities, but management control system such as quality control, etc. should be introduced. Present business will be continued</li> </ol>  |                  |
| Proposals from the view point of company business improvement   | <ol style="list-style-type: none"> <li>1. Number of employees of production section should be more than 80% of the total</li> <li>2. To keep working environment good</li> <li>3. To introduce production control system to decrease number of unfinished products</li> </ol>  |                  |



|   |  |
|---|--|
| R-2 Company name: Pavlodartractor Company Location: Pavlodar  |  |
| 1. Current Company Conditions   |  |
| Background  | (Same as A-2)  |
| Overview of products  |  |
| General survey of the Product   |  |
| Financial situation   |  |
| Plant production equipment  |  |
| Business management   |  |
| 2. Study Team's Assessment  |  |
| 1. As for production of spare parts for railway rolling stock, the Company has capability to make them, if he wants it. |  |
| 3. Proposed Improvement Measures  |  |
| Proposals from the view point of Industrial restructuring   | <p>1. The Company could make much demanded coupler and wheel-set for railway rolling stock. As for wheel-set, ZIKSTO, one of PZTM Group for new PC production in Petropavlovsk, may be in charge of it, but competition between two companies may be recommendable. Both coupler and wheel-set, however, are very important parts (which have close relation with possible serious accident) and high production technology for making them is needed. Therefore, it is necessary to introduce foreign technology for the production.</p> <p>2. As for manufacturing coupler and wheel-set of rolling stock which passes through Russian Railway, acquisition of license issued by Russian Ministry of Railway is necessary. Trial production and test should be repeated to obtain the license.</p> |
| Proposals from the view point of company business improvement   | (Same as A-2)  |

|  |  |
|--|--|
| R-3 Company name: PZTM (Petropavlovsk Heavy Machinery Company)<br>Location: Petropavlovsk  |  |
| 1. Current Company Conditions  |  |
| Background   | (Same as A-6)  |
| Overview of products   |  |
| General survey of the Product  |  |
| Financial situation  |  |
| Plant production equipment   |  |
| Business management  |  |
| 2. Study Team's Assessment   |  |
| <p>1. As for new PC production project, the enterprise is leading company of the Group and vacant building of 191m (length) x 144m (width) is prepared. The Group have capability to make new PC.</p> <p>2. Initial investment cost may be much larger than that of Rysty-AECRW in Almaty. From a long term point of view, the Group may occupy the position as an important railway rolling stock manufacturer.</p> |  |
| 3. Proposed Improvement Measures   |  |
| Proposals from the view point of Industrial restructuring  | 1. In order to make new PC, additional facilities are necessary, and PC manufacturing technology and production control technology should be introduced from foreign country, because the Group have no experience of repair and manufacture of railway rolling stock. |
| Proposals from the view point of company business improvement  | (Same as A-6)  |

|   |  |
|---|--|
| R-4 Company name: SBP (Stepnogorsk Bearing Plant) Location: Stepnogorsk   |  |
| <b>1. Current Company Conditions</b>  |  |
| Background  | <ul style="list-style-type: none"> <li>• Founded in 1976</li> <li>• Composition of capital: 50% for company 44% for personnel</li> <li>• Number of employees (end of 1997): total 3,700 (Eng. 657, Female 40%)</li> <li>• Average age: 35~40</li> <li>• Average salary: 10,000 tenge (cash, sometimes barter)</li> </ul>   |
| Overview of products  | <ul style="list-style-type: none"> <li>• Bearing only for railway rolling stock</li> </ul>   |
| General survey of the Product   | <ul style="list-style-type: none"> <li>• Share: 70% of bearings for CIS countries' railway rolling stock</li> </ul>  |
| Financial situation   | <ul style="list-style-type: none"> <li>• Sales turnover (1997): 260 million Tenge/month (Kaz 8%, Foreign 92%)</li> <li>• Payment by barter: 95% (Metal sheet, Spare parts, Electric power, etc.)</li> </ul>  |
| Plant production equipment  | <ul style="list-style-type: none"> <li>• Land: 57Ha, Building: 16Ha</li> <li>• Production capacity of bearing: 2mln per year</li> <li>• 10 automatic production lines for railway rolling stock bearing</li> <li>• 2 automatic production lines for tapered bearing are under construction</li> <li>• Machining center for production of Dupont type bearing retainer</li> </ul> |
| Business management   | <ul style="list-style-type: none"> <li>• 75% of employee are stock holder of the company</li> <li>• Looking for foreign good partner</li> <li>• Incentive for production increase and cost down</li> </ul>   |
| <b>2. Study Team's Assessment</b>   |  |
| <ol style="list-style-type: none"> <li>1. Production lines are idling due to demand decrease</li> <li>2. Produce bearings only for railway rolling stock</li> </ol> |  |
| <b>3. Proposed Improvement Measures</b>   |  |
| Proposals from the view point of Industrial restructuring   | <ol style="list-style-type: none"> <li>1. Production of general bearing</li> </ol>   |
| Proposals from the view point of company business improvement   | <ol style="list-style-type: none"> <li>1. In case one CNC ( Computerized Numerical Control ) lathe is placed in an actual production line, the line could produce many kind of bearings, besides cylindrical and tapered roller bearings for railway rolling stock use</li> <li>2. Acquisition of ISO 9000 certification is recommended</li> </ol>                               |

|   |  |                  |
|---|--|------------------|
| R-5 Company name: AWRZ ( Akmola Wagon Repair Company )  |  | Location: Astana |
| <b>1. Current Company Conditions</b>  |  |                  |
| Background  | <ul style="list-style-type: none"> <li>• Established in 1949</li> <li>• Composition of capital: 90% for company, 10% for personnel</li> <li>• Sole open type wagon repair company in Central Asian Countries</li> <li>• Number of employees (end of 1997): 820</li> <li>• Operation rate of equipment: 20%</li> </ul>  |                  |
| Overview of products  | <ul style="list-style-type: none"> <li>• Wagon repair such as open, flat, hopper and dump wagons ( capacity: 4900 wagons per year )</li> <li>• Wheel-set repair ( 3714 sets in 1996 )</li> <li>• Oxygen production ( capacity 700,000 cub.m. per year )</li> </ul>   |                  |
| General survey of the Product   | <ul style="list-style-type: none"> <li>• KTZ is main customer. Other Central Asian Railways do not entrust the repair due to their fund shortage now</li> </ul>  |                  |
| Financial situation   | <ul style="list-style-type: none"> <li>• Sales turnover (1997): 45 million Tenge/month</li> </ul>  |                  |
| Plant production equipment  | <ul style="list-style-type: none"> <li>• Total land area: 27.7 Ha, Building area: 3.3 Ha</li> <li>• Facilities are enough but aged</li> </ul>  |                  |
| Business management   | <ul style="list-style-type: none"> <li>• For production increase, spare parts production, repair contract increase, repair of other type wagon, etc. are under negotiation with KTZ</li> <li>• Jigs for wagon repair are devised by workers</li> <li>• Oxygen is produced not only for the company use, but also for outside sales to central heating plant, hospital, etc.</li> </ul> |                  |
| <b>2. Study Team's Assessment</b>   |  |                  |
| <ol style="list-style-type: none"> <li>1. Working environment is not good and unfinished products are found here and there</li> <li>2. Welding skill is not good</li> <li>3. There are many idle spaces due to working volume decrease</li> </ol> |  |                  |
| <b>3. Proposed Improvement Measures</b>   |  |                  |
| Proposals from the view point of Industrial restructuring   | <ol style="list-style-type: none"> <li>1. The company could carry out not only repair but also new production of wagon by a little additional investment, in case restructuring of the actual idle repair lines is done</li> </ol>   |                  |
| Proposals from the view point of company business improvement   | <ol style="list-style-type: none"> <li>1. To keep working environment good</li> <li>2. To introduce production control system to decrease number of unfinished products</li> <li>3. To introduce quality control system to improve welding skill</li> </ol>  |                  |

|   |   |
|---|---|
| R-6 Company name: DZMK( Dzhambyl Metal Construction Company ) Location: Taraz   |   |
| 1. Current Company Conditions   |   |
| Background  | <ul style="list-style-type: none"> <li>• Established in 1969</li> <li>• Number of employees (end of 1997): 470 (total)<br/>100 (Engineers), 370 (Workers)</li> <li>• Operation rate of equipment: 25~30%</li> </ul>   |
| Overview of products  | <ul style="list-style-type: none"> <li>• Tank wagon ( small repair and remodeling )</li> <li>• Some kind of general tank</li> <li>• Construction machinery</li> </ul>   |
| General survey of the Product   | <ul style="list-style-type: none"> <li>• KTZ orders remodeling work of 675 tank wagons using surplus open type wagon</li> <li>• Oil and gas industries</li> <li>• Construction industries (1997)</li> </ul>   |
| Financial situation   | <ul style="list-style-type: none"> <li>• Sales turnover: 15 million Tenge/month (1998 plan — 600 million Tenge/year)</li> </ul>   |
| Plant production equipment  | <ul style="list-style-type: none"> <li>• Total land area: 57 Ha, Building area: 47 Ha</li> <li>• Almost all facilities are for metal work and welding</li> <li>• Two types of bending roller for tank making</li> <li>• Facilities are in good condition</li> </ul>   |
| Business management   | <ul style="list-style-type: none"> <li>• As for number of employees, production section is 79% of the total. It is much improved in comparison to USSR days</li> <li>• Chief engineer of the company is eager to renewal and repair not only tank wagon, but every kind of freight wagon</li> <li>• The company has constructed TV tower of Almaty</li> </ul> |
| 2. Study Team's Assessment  |   |
| <ol style="list-style-type: none"> <li>1. The company is very active</li> <li>2. he company has fundamental facilities and enough spaces for production of general tank, besides tank for tank wagon</li> </ol> |   |
| 3. Proposed Improvement Measures  |   |
| Proposals from the view point of Industrial restructuring   | <ol style="list-style-type: none"> <li>1. Capable to repair and renew general wagon</li> </ol>  |
| Proposals from the view point of company business improvement   | <ol style="list-style-type: none"> <li>1. According to restructuring of tank production lines, general tank for both high and low pressures, tank for container wagon and tank for lorry could be produced. It is useful for business increase.</li> </ol>  |



## **Appendix-2: Guideline for Technical Alignment**





## GUIDELINE FOR TECHNICAL ALIGNMENT

For Kazakhstan machinery industry reformation, as well as for development of the total state economy, the introduction of foreign technology from other countries would urgently be required to start the development projects for localizing at least 3 items of key products. But neither the production system of local manufacturing enterprises nor the market structure is well organized yet, enough to attract the prospective international manufacturers who would naturally expect the satisfactory return on investment in licensing arrangement. In the meantime on Kazak side, the prospective manufacturers, or the licensees to be, are still attempting to promote the total machinery industry by using the existing huge production facilities in maximum. But a big part of those facilities is almost useless. The management of those enterprises should recognize that the only valuable assets they have is the technical expertise and experiences of their production engineers, and not the production facilities. What licensors would expect on a project of the production localization, would be development of new market in the territory of a licensee and new product applications as well as cost reduction, in a short term. As the result in a long term, that would be a prospective future of the market expansion by contribution of licensee. Unless the licensors could have such a prospect, successful technical cooperation agreement would never be concluded.

The key to the success of the project for technology introduction and localization development lies in the project planning stage. In particular, production equipment and facilities planning based on thorough analysis of product demand is essential. Regarding impediments to the sound growth of production plant operations, there are few cases of manufacturing problems relating to the transfer of technology causing production not to go to plan, however, there have been numerous examples in East Europe and China, etc. where business sustainability has been threatened by discrepancies between production plans and actual sales as a result of poor demand forecasting.

In section 1 (Reexamination of the Basic Concept of Localization), it is recommended that the technology introduction and localization development project be formulated based on the most detailed, specific and thorough short term product demand analysis possible and in accordance with the master plan for industrial restructuring. Section 2 (Strategy for the Introduction of Foreign Capital) deals with foreign capital policies by the state, so items for examination are only listed. Section 3 (Basic Points of Technical Licensing Contracts) raises important points to remember in contract discussions.

## **1. Reexamination of the Basic Concept of Localization**

### **(1) Confirmation of the Propriety of the Technology Introduction Plans (4 Agricultural Machines) in the Proposed Master Plan**

- **Local medium crawler tractors:** Concerning the T-95 under development, the final assembly product basic design technology belongs to Pavlodar Tractor. The Russian D442 was the best engine for the first prototype, but eventually engines made by Kostanai Diesel shall be installed. Transmissions and electrical parts shall be locally produced. The issue of whether or not it is necessary to introduce hydraulic equipment technology needs to be examined.

- **Medium wheel tractors:** Contracts shall be concluded for the knock-down importing of currently imported wheel tractors (T-150 Series, MTZ-80 Series) and for the localization of component production. The issue of whether or not it is necessary to introduce transmission, hydraulic equipment and electrical parts technology needs to be examined. Any technical licensing contracts required for components shall be concluded.

- **Large wheel tractors:** Contracts shall be concluded for the knock-down importing of currently imported wheel tractors (K-700 Series) and for the localization of sheet metal and machine-processed part and component production. When the market for large tractors has been properly gauged, a licenser capable of supplying tractors most suited to the required specifications shall be selected and the necessary licensing contract concluded.

- **Combine harvesters:** Contracts shall be concluded for the knock-down importing of currently imported combine harvesters (Enisey, Niba, Don) and for the localization of sheet metal and machine-processed part and component production. New type combine harvesters and attachments that satisfy specifications required by the market shall be developed, and licensing contracts necessary for local production and improved development shall be concluded.

### **(2) Market Requirements Regarding Agricultural Machinery Specifications and Scale of Demand**

- **Estimation of operating numbers based on import clearance statistics:** Concerning the T-4 and equivalent medium crawler tractors, the MTZ-80 and T-150 and equivalent medium wheel tractors, the M-F86100 and K-700 and equivalent large wheel tractors, and all combine harvesters; import quantities for every year from 1993 shall be grasped

and future demand estimated. (The figures obtained by the study team cannot be used because they are not classified according to traction horse power for tractors of 75 HP and over).

- Demand projection by sampling: Taking the example of a joint farm in the northern cereal producing region of Akmola, for a cultivated area of 1,700 ha (2,000 ha farmland with 15% left fallow), two sets of K-700 hauled 6-gang seeders and four combine harvesters (Enisey and Niba) are used to carry out sowing and harvesting work, which determines the production volume. The machinery fleet of this farm also includes another K-700 and one T-75 and two MTZ-82 medium tractors, which are thought to be required for tillage, fertilizer spreading and chemical spraying work, etc. Since the yield rate of farmland in this region is said to be roughly 600 kg of wheat per hectare, the expected wheat yield from this farm will be approximately 1,000 tons this year. It is necessary to gather similar cases of agricultural machinery use and verify demand forecasts for tractors and combine harvesters. The more samples the better, but it is at least desirable to sample multiple farms in each region of the northern and central grain belt.

- Necessity of seeder technology introduction: There are plans to introduce various types of seeder technology, for example, seeders that distribute seeds by air pressure into drills. Introducing the latest technology is desirable, but it is also necessary to sufficiently verify technical superiority in the Kazakh market and investment effect.

### (3) Size of Demand for Wheel Loaders

- Mine loading and infrastructure construction: Generally speaking, the annual operating times of mining machinery are far greater than the annual operating times of agricultural machinery. Wheel loaders are used in mines and, by simply changing the bucket, can also be widely used for infrastructure and general construction and snow clearing, etc. together with excavators produced by Kentau Excavator. Accordingly, high demand can be anticipated.

- Repair parts and components: In order to encourage demand for locally produced wheel loaders, it is necessary to expedite the supply of repair parts and components. An effective and realistic means of achieving this is to introduce technology for designing and manufacturing power lines, components and hydraulic equipment, etc. (by similar item) to each specialist maker. Such specialist component makers must be developed with the capacity to respond to the demand for large and medium agricultural wheel tractors.

## 2. Strategy for the Introduction of Foreign Capital

(1) There are cases where the licensee is a local company, is in a joint venture with the licensor, or where the joint venture company does not carry out manufacturing. (There are also cases of tripolar joint ventures with trading companies).

|         | Product Manufacturing License | Parts Manufacturing | License Retailing License |
|---------|-------------------------------|---------------------|---------------------------|
| Type 1) | Mfg. KZ                       |                     |                           |
| Type 2) | Mfg. KZ                       | Mfg. KZ             |                           |
| Type 3) | Mfg. KZ                       |                     | Sls. JV                   |
| Type 4) | Mfg. JV                       |                     |                           |
| Type 5) | Mfg. JV                       | Mfg. JV             |                           |
| Type 6) | Mfg. JV                       |                     | Sls. JV                   |

Mfg. KZ: Local Manufacturing Company

Mfg. JV: Joint Venture Manufacturing Company

Sls. JV: Joint Venture Retailing Company

- Concerning technical licensing, too, bargaining according to supply and demand is the same as in the case of general goods. In cases where, for example, slightly old technology is seen as a good purchase in advanced markets, Type 1) is the only available option. There are small companies which sell technology for new products that have not yet been commercialized to willing sellers.
- If high future potential is envisaged in the technology export market, it is desirable that Types 4), 5) and 6) account for a high share.
- During the 1950's and 1960's when Japanese machinery industry makers were introducing technology, Types 4) and 3) accounted for half all license contracts each. This is because Japan was viewed as a rapidly growing market at that time.

### (2) Legislative Measures for Promoting Technology Introduction

- Foreign capital law: Positive measures designed to promote the introduction of foreign capital are required.
- Tariffs: Implement preferential measures to promote technology introduction. In particular, in the transition stage of full localization projects, tariffs should be abolished and free customs passes issued for the import of related parts and components.

### **3. Points for Attention Concerning the Basics of Technical Licensing Contracts**

Below are listed the main items that should be considered by the licensee side.

(1) Background and purpose of contract binding: The prospective licensor "A" should be already concerned with and have sufficient know-how regarding the manufacture and retailing of the target product, and it should have possession of related patents, etc. The prospective licensee "B" should make clear its desire to manufacture and sell the target product under license from A.

(2) Definition of Terms: The definition of terms such as "contract product", "improved product", "technical information", "patents", "contract target area", "net sale price" and "effective date", etc. should be clarified. Improved products are treated in the same way as newly developed products, for example, the ownership of patents in improvement development activity should be made clear. Concerning the definition of technical information, secret technical data, technical standards, drawings, specifications and procedures, etc. are laid down in detail. The definition of patents includes industrial new designs and copyright in registered designs, and covers those possessed at the time of contract binding and those that may be obtained in future. Concerning the net sale price, deductible items are clearly laid out. The effective date of the contract is also established.

(3) Consent of enforcement rights: The enforcement rights holder, i.e. the licensee, should clearly indicate that it has been consented the right of sole enforcement, i.e. the sole right to manufacture, use and sell the product. Since the issue of whether the licensee's suppliers have the permission to manufacture component parts for the product may be a problem, consent of re-enforcement rights (sub-license) should be clearly stated in the contract.

(4) Provision of technical information: A limit for obtaining technical information (drawings, etc.) after the contract becomes effective should be set. It is desirable to set such a limit for information concerning new technology that may be developed or acquired by the licensor in future. Concerning the transfer of technical information at plants and other facilities of the licensor, stipulations regarding the dispatch and acceptance of trainees and duration of training, etc. should be specifically set. As for the transfer of technical information at plants and other facilities of the licensee, the costs to be borne for dispatching technical instructors (travel and accommodation expenses, daily allowance, etc.) should be established.

(5) Consent to use of trade marks: The licensee acquires the sole right to use licensor's trade marks in the subject territory.

(6) Payment and reporting: Payment of a set rate royalty based on the initial and net sales turnover is stipulated. The base date for payment (reference date for sale) is made clear. In addition demands for an annual minimum and additional royalty during the setup period may be made, but these should be eliminated as much as possible. Since the licensor's aim in demanding a minimum is to promote production and sale of the contract product and thus secure income from royalties, the outcome of contract negotiations is determined by the degree to which the licensee can advance appropriate and effective plans for the market introduction of the contract product. When assessing the countervalue of technology, it is desirable to consider total payment over the whole contract period. The method of reporting royalty estimation based on the product-separate sales volume, gross invoice price and net retail price (price after packing cost, wages and taxes, etc. have been deducted) should be stipulated.

(7) Improved technology: Since applied technology that is developed in response to new markets based on the licensed technology is viewed as valuable improved technology for both parties, both sides are obligated to mutually report this. However, it should be clearly stated that the party which develops the technology possesses the ownership rights to it.

(8) Secrecy: Secrecy obligations are clearly stated. However, it should also be stated that drawings and other technical information can be disclosed as necessary to subcontractors.

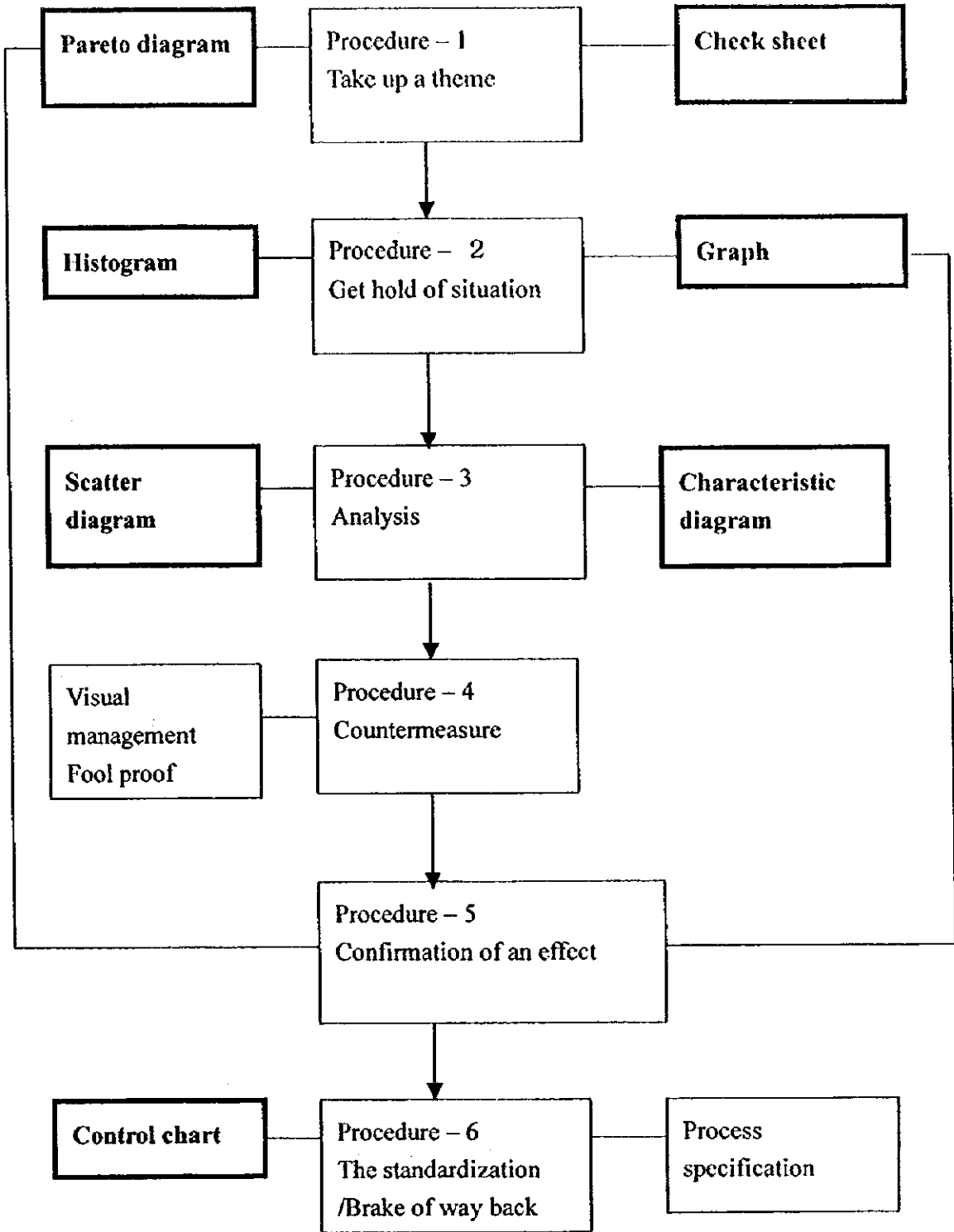
(9) Period and cancellation: Where patents exist, the contract period should be set in consideration of the period of patent continuation, so that troublesome patent problems do not arise at expiration of the contract. Concerning the transfer of know-how, the contract period should be determined upon carefully examining how long the required period for acquiring technology can be set under what kind of acceptance setup. In the contract, the expiration date should be set and the period automatically extended providing there is no advance notice six months prior to the expiration date. Violation of contract by either party is sufficient cause for cancellation prior to the expiration date, but an amended period should be set in such cases. Moreover, in cases where the contract is canceled as a result of violations by the licensee, a fair length should be set for prohibition of manufacture. The contract should stipulate the way in which manufacturing and selling rights and royalty payments, etc., should be handled following contract expiration.

**Appendix-3: 7 Instruments of  
Quality Control**






**7 Instruments of Quality Control**



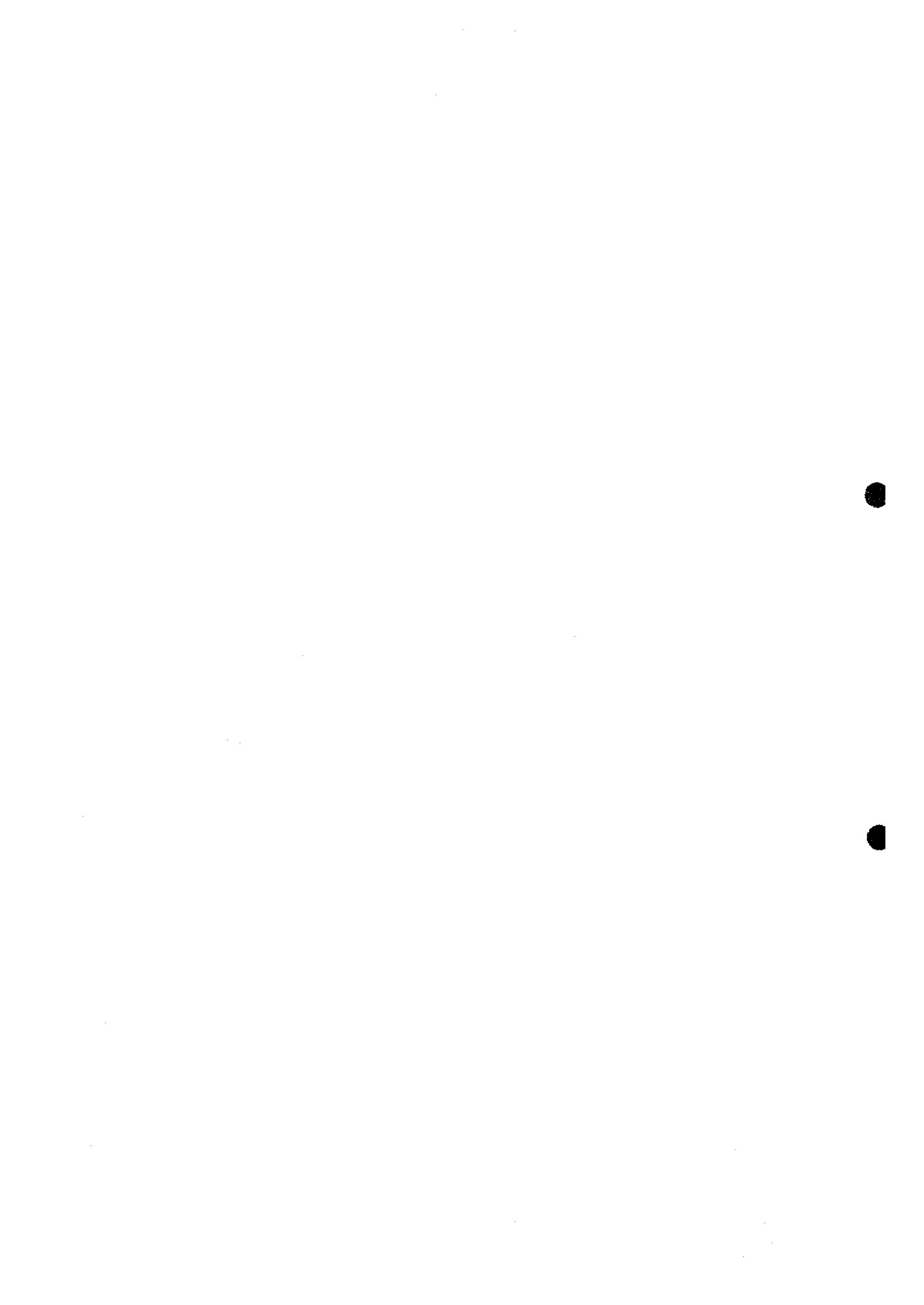
Note:

 :7 Instruments (see next page for description)

**Kinds of QC 7 piece Instruments and the way to make**

| No | Instrument             | Contents   | The way to make   | Purpose  |
|----|------------------------|--|---|--|
| 1  | Pareto diagram         | Problem is classified in terms of a cause different, a phenomenon and expresses in a line graph or a bar graph where arranged the number of cases and an amount in the order of size | <ol style="list-style-type: none"> <li>① Collecting data and aggregates it in terms of the item.</li> <li>② Arranging in the order of size and calculate the sum and ratio of accumulation.</li> <li>③ Drawing a graph</li> <li>④ Carry out ABC analysis</li> </ol>   | <ul style="list-style-type: none"> <li>● Defective analysis</li> <li>● Sales amount analysis</li> <li>● Parts number analysis</li> <li>● Decision of a Control/improvement items</li> <li>● Confirmation of an effect</li> </ul> |
| 2  | Check listing          | Check the result and a product of a job. Write the result with a symbol. It is data to take confirmation.  | (Item) <ol style="list-style-type: none"> <li>① Purpose of check</li> <li>② Object/item of check</li> <li>③ Method of check</li> <li>④ Check person</li> <li>⑤ The result of check</li> <li>⑥ Circulation route</li> </ol>  | <ul style="list-style-type: none"> <li>● Item of inspection</li> <li>● Everyday inspection</li> <li>● 5S Inspection</li> </ul>   |
| 3  | Graph                  | A line graph or a bar graph radar chart etc. to made it easy to understand and make a view   | <ol style="list-style-type: none"> <li>① Clarify purpose</li> <li>② Collect and process data</li> <li>③ Decision of the title</li> <li>④ Decision of graph</li> <li>⑤ Decision of design</li> <li>⑥ Drawing figures</li> <li>⑦ Comment entry</li> </ol>   | <ul style="list-style-type: none"> <li>● Change of defective ratio</li> <li>● The number of Proposal</li> <li>● Comparison in terms of an item</li> </ul>  |
| 4  | Histogram              | When there are a lots of maximum data are Classified and the classification is expressed   | <ol style="list-style-type: none"> <li>① Collect the data (n)</li> <li>② Maximum value (L) and minimum value (S) are</li> <li>③ Class width (L-S <math>\sqrt{n}</math>) is</li> <li>④ Make a frequency table and a</li> </ol>   | <ul style="list-style-type: none"> <li>● Analysis of quality</li> <li>● Delivery analysis</li> <li>● Determination of</li> <li>● Decide the control</li> </ul>   |
| 5  | Characteristic diagram | A problem is showed the relation between characteristic (quality, performance, cost) and factor in a figure systematically.  | <ol style="list-style-type: none"> <li>① Decides what is Characteristic.</li> <li>② Write factors with brainstorming</li> <li>③ Classify factors to 4~5 large bones.</li> <li>④ Classify factors to middle bone or small bone.</li> <li>⑤ Select the factors that makes much influences to the result.</li> </ol> | <ul style="list-style-type: none"> <li>● Defective counterplan</li> <li>● Counter-measures for calamities</li> <li>● Process delay</li> <li>●</li> </ul>   |
| 6  | Scatter diagram        | Two kinds of data that consisted of to a pair are made a graph and this shows the relation of data.  | <ol style="list-style-type: none"> <li>① Collection of data</li> <li>② Decide maximum value and minimum value</li> <li>③ Plot the data on a graph</li> </ol>  | <ul style="list-style-type: none"> <li>● Analysis of a quality characteristic</li> <li>● Check correlation</li> <li>● Decide the Range for control</li> </ul>  |
| 7  | Control chart          | Plot the data on graph (radar chart, line graph, bar graph a graph it does to), and made it easy to show condition.  | <ol style="list-style-type: none"> <li>① clarify the purpose</li> <li>② Collection and processing of data</li> <li>③ Decision of the title</li> <li>④ Decision of a kind of graph</li> <li>⑤ Entry a comment</li> </ol>   | <ul style="list-style-type: none"> <li>● Change of defective</li> <li>● The number of proposal</li> <li>● Item comparison</li> </ul>   |

**Appendix-4: Rolling Stock Plan  
of KTZ**



## Rolling Stock Plan of KTZ (1)

### 1. Current situation of rolling stock

#### (1) Number as at December, 1996

| Rolling Stock | Name of manufacture and country    | Age (years) |               |                 |       | Total  |
|---------------|------------------------------------|-------------|---------------|-----------------|-------|--------|
|               |                                    | ~10         | 11~20         | 21~30           | 30~   |        |
| EL            | NECP, Russia                       | 111         | 329           | 188             | 24    | 652    |
| DL            | RUGANSK, Ukraine                   | 71          | 1,017         | 277             | 74    | 1,439  |
| PC            | TVERI, Russia<br>AMENDORF, Germany | 845         | 812           | 509             | 179   | 2,345  |
| FC            | Russia, etc                        |             | ~15<br>41,800 | 16~30<br>56,000 | 1,100 | 98,900 |
| SDL           | Russia, Ukraine, Chech             | 91          | 257           | 305             | 22    | 675    |

Remarks : ① EL Electric Locomotive PC Passenger Coach SDL Shunting Locomotive

DL Diesel Locomotive FC Freight Car

② EL and DL 2sections SDL 1 section

#### (1) Average availability during past 3 years

| Rolling Stock | Availability       |                    |                   |
|---------------|--------------------|--------------------|-------------------|
|               | 1995               | 1996               | 1997              |
| EL            | 393/738(53)        | 361/652(55)        | 354/652(54)       |
| DL            | 517/1,595(32)      | 477/1,439(33)      | 465/1,439(32)     |
| PC            | 1,882/1,882(100)   | 2,345/2,345(100)   | 2,345/2,345(100)  |
| FC            | 55,480/104,523(53) | 50,930/102,210(50) | 51,330/98,874(52) |
| SDL           | 446/733(61)        | 410/675(61)        | 379/675(56)       |

### 2. Rolling stock plan

#### (1) Condemnation plan

| Rolling Stock | Year<br>2000 | 2005   | 2010   |
|---------------|--------------|--------|--------|
| EL            | 60           | 94     | 94     |
| DL            | 886          | 242    | 240    |
| PC            | 510          | 325    | 325    |
| FC            | 18,290       | 20,450 | 20,450 |
| SDL           | 216          | 276    | 150    |

(2) Supply plan

| Year<br>Rolling<br>Stock | 2000  | 2005   | 2010   |
|--------------------------|-------|--------|--------|
| EL                       | -     | 23     | 185    |
| DL                       | 7     | 409    | 922    |
| PC                       | 1,325 | 2,115  | 2,905  |
| FC                       | -     | 28,560 | 62,520 |
| SDL                      | 58    | 350    | 517    |

(3) Holding plan(Necessary / Condemnation / Supply)

| Year<br>Rolling<br>Stock | 2000            | 2005                 | 2010                  |
|--------------------------|-----------------|----------------------|-----------------------|
| EL                       | 499/60/0        | 520/94/23            | 653/94/185            |
| DL                       | 560/886/7       | 720/242/409          | 893/240/922           |
| PC                       | 3,160/510/1,325 | 3,625/325/2,115      | 4,090/325/2,905       |
| FC                       | 75,180/18,290/0 | 88,690/20,450/28,560 | 102,200/20,450/62,520 |
| SDL                      | 577/216/58      | 533/276/350          | 550/150/517           |

3. Rolling stock procurement plan

KTZ have no rolling stock procurement plan now, and are studying on the necessary number of rolling stock to meet transport demands in 1998, 1999 and 2000. After that, it will be planned to procure new rolling stock or to take other measures in consideration of necessary, holding and condemned numbers of rolling stock. Other measures are as follows.

PC Rehabilitation of old PC

DL Old engine will be replaced by new GE engine.  
7 old engines will be replaced by the end of 1997.

Tank wagon Surplus open wagons are remodelled to tank wagons. Remodelling works for 675 tank wagons are already ordered to Dzambul Metal Construction Plant (DZMK).

SDL There is no other way than new procurement.

EL It is surplus until 2000 and new procurement is not necessary.

4. Construction plan of rolling stock manufacturing factory

It is intended to build a plant to produce new PC in the site of PC repair company(AECRW) in Almaty, keeping to continue present work such as heavy repair (KP-1 and KP-2) of PC and repair of traction motor of EL and DL.

Design and Research Institute of KTZ (KAZGIPROJELDORTANS) had preliminary studies on the construction of new plant in cooperation with DE-Consult of Germany and Tuwasash of Turkey.

There is no other project on the construction of new PC manufacturing factory.

5. Equipment and parts

Spare parts of rolling stock are mainly procured from Russia, CIS countries and Germany. In the former Soviet Union days, the spare parts have been systematically

provided based on the state budget. However, at present, procurement of spare parts depends on the funds. There is no long term procurement plan of spare parts for lack of funds and some companies in Kazakhstan casually make them in a small lot. Depots of KTZ and rolling stock repair companies (Rysty-AECRW in Almaty and AWRZ in Akmola) can make simple spare parts in a small lot only for urgent needs. Rysty-AECRW produces brake shoes and repairs wheel-sets.

## 6. Current situation of rolling stock heavy repair (KP-1, KP-2)

### (1) Execution in Kazakhstan

| Rolling stock | Repair period (km or year) |           | Workshop             | Repair capacity per year |      | Required days or hours per car             |  | Repair cost per car (US\$) |        |
|---------------|----------------------------|-----------|----------------------|--------------------------|------|--|--|----------------------------|--------|
|               | KP-1                       | KP-2      |                      | KP-1                     | KP-2 | KP-1                                       | KP-2   | KP-1                       | KP-2   |
| EL            | 80,000                     | 2,400,000 |                      |                          |      | 11.5                                       | 14.0   |                            |        |
| DL            | 680,000                    | 1,360,000 |                      |                          |      | 10.0                                       | 12.0   |                            |        |
| PC            | 5 years                    | 15 years  | AECRW                | 500                      | 100  | 10.6<br>(in shop 24)                       | 17.0<br>(in shop 30)<br>32.0<br>(in shop 42) | 15,630                     | 15,800 |
| Coal wagon    | 5~10 years                 |           | AWRZ                 |                          |      | 3  |  | 3,938                      |        |
| Box wagon     | 10 years                   |           | Designated FC Depots | 6000                     |      | Open wagon 41hours<br>(in shop 46.3hours)  |  |                            |        |
| Open wagon    |                            |           |                      |                          |      |  |  |                            |        |
| Tank wagon    | 4~10 years                 |           |                      |                          |      | Tankwagon 30.2hours<br>(in shop 49.6hours) |  |                            |        |
| Special wagon | 10~15 years                |           |                      |                          |      |  |  |                            |        |
| SDL           | 7.5 years                  | 15 years  |                      |                          |      |  |  |                            |        |

### (2) Entrusting to foreign country

| Rolling stock | Name of foreign country   | Repaired number per year (section) |      | Required days per section |                   | Repairing cost per section (US\$) |         | Required days for Transportation/one way  | Transportation fee (US\$)                 |
|---------------|---|------------------------------------|------|---------------------------|-------------------|-----------------------------------|---------|---|---|
|               |   | KP-1                               | KP-2 | KP-1                      | KP-2              | KP-1                              | KP-2    |   |   |
| EL            | Russia  | 6                                  | 15   | 11.5                      | 14                | 160,000                           | 210,000 | 8~10                                      | About 10,000                              |
| DL            | Ukraine<br>Latvia   | 34                                 | 57   | 10                        | 12                | 75,000                            | 76,000  | 8~10                                      | About 10,000                              |
| PC            | Russia  | 2                                  | 22   | 10.6<br>(in shop24)       | 17<br>(in shop30) | 21,000                            | 42,000  | 8~10                                      |   |
| FC            | Carried out only in Kazakhstan: Coal wagon by AWRZ and the other FC by designated depots of KTZ |                                    |      |                           |                   |                                   |         |   |   |
| SDL           | Russia,<br>Ukraine,<br>Latvia   | 5                                  | 6    | 9.5                       | 9.5               | 70,000                            | 75,000  | Russia 4~6<br>Ukraine 8~10<br>Latvia 8~10 | About 5,000<br>About 6,000<br>About 6,000 |

## 7. Construction plan of rolling stock repair workshop

The construction work of PC repair workshop is proceeding by the OECF loan. The construction of EL, DL and tank wagon repair workshops is planned. KTZ are going to commit the feasibility study on the new workshop construction plan to KAZGIPROJELDORTTRANS.

EL : Atbasar EL Depot  
DL : Shu DL Depot  
Tank wagon : Atyrau FC Depot

#### 8. Current situation of railway rolling stock industry

Rolling stock has been procured from CIS countries and other foreign countries until now, because there is no rolling stock manufacturing company in Kazakhstan.

EL : Russia  
DL : Russia, Ukraine  
PC : Russia, Germany  
FC : Russia, Ukraine

There are only two companies in Kazakhstan to carry out heavy repair of rolling stock.

PC : Rysty—AECRW in Almaty  
FC : AWRZ(coal wagon) in Akmola

Daily inspections are carried out in the following depots.

42 Locomotive Depots  
21 FC Depots  
3 PC Depots

#### 9. Future plan on railway rolling stock industry

Refer to items 4 and 7.

#### 10. Tentative selection of model enterprises

PC manufacturing : Russia (Tver)  
EL manufacturing : Russia (Novocherkassk)  
DL manufacturing : Russia (Kolomensk, Bryansk, Ludinovsk)  
Ukraine (Lugansk)  
FC manufacturing : Russia (Ural)  
EL repair : Russia (Ulan-Ude)  
DL repair : Ukraine (Dnepropetrovsk, Izumsk)  
Uzbekistan (Tashkent)  
Russia (Astrahan)  
PC repair : Kazakhstan (AECRW)  
FC repair : Kazakhstan (AWRZ)



1. Average running distance of Locomotive(1996)

|                                  | EL         |            | DL         |            | Shunting locomotive |
|----------------------------------|------------|------------|------------|------------|---------------------|
|                                  | Freight    | Passenger  | Freight    | Passenger  |                     |
| Loco-km                          | 42,395,341 | 15,090,680 | 52,123,115 | 34,163,542 | 14,065,495          |
| No.of locomotives                | 290        | 100        | 346        | 167        | 355                 |
| Average running km of locomotive | 146,191    | 150,907    | 150,645    | 204,572    | 39,621              |

Remarks: Running-km in 1997 is about 10% less than that in 1996

2. Procurement price of rolling stock (  $\times 10^3$ US\$)

(1) EL

VL65(Russia, Novochoerkask) 1360(1997)

Possible price of other type 2000(1997)

(2) DL

Russia, Kolomensk; Ukraine, Lugansk 1600~1700(1997)

(3)PC(Germany) about 800

(4)FC

Tank about36(1997)

about30(1994)

Open 32~34(1997)

about15(1994)

Box 20~22(1994)

Flat about20(1994)

Remarks: As for PC price, the following information is given by some company.

Germany make  $260 \times 10^3$  US\$

Turkey make  $120 \times 10^3$  US\$

Judging from international price information, these prices are reliable.

