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Report No. 288a-YU

APPRAISAL OF

IMT TRACTOR FACTORY EXPANSION PROJECT

YUGOSLAVIA

January 28, 1974

Industrial Projects Department

CURRENCY EQUIVALENTS

Except where otherwise indicated, all figures are quoted in Yugoslav Dinars (Din).

US$1	=	Din 15.5
Din 1	=	US$0.0645
Din 1,000	=	US$64,516

WEIGHTS AND MEASURES

All units are metric.

1 metric ton	=	1,000 kilograms (kg)
1 metric ton	=	2,204.6 pounds
1 kilometer (km)	=	0.62 miles
1 cubic meter (m^3)	=	35.32 cubic feet (cu ft)

PRINCIPAL ABBREVIATIONS AND ACRONYMS USED

FMK-Knjazevac	=	Motorcultivator and Agricultural Implements Factory Knjazevac
FOB	=	Fabrika Odlivaka Beograd
IMR	=	Industrija Motora Rakovica
IMT, the Company	=	Industrija Masina i Traktora
SAS	=	Social Accounting Service
UMI	=	Udruzena Metalska Industrija
CKD	=	completely knocked down
ha	=	hectare
hp	=	horse power
PKD	=	partly knocked down

Fiscal Year

January 1 - December 31

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This report was prepared by Miss Haug and Mr. Jaffe of the Industrial Projects Department with contributions from Messrs. Rao, Kitching, and Wilcox (consultants).

YUGOSLAVIA

IMT TRACTOR FACTORY EXPANSION PROJECT

SUMMARY AND CONCLUSIONS

i. This report appraises the expansion of Industrija Masina i Traktora's (IMT) plant in New Belgrade. IMT is the largest producer of wheeled tractors, tractor accessories and farm implements in Yugoslavia, and operates a tractor factory in New Belgrade, a motorcultivator plant in Knjazevac and a service and repair center in Dobanovci. This expansion is designed to increase the production capacity of IMT's New Belgrade plant from about 15,000 to 35,000 tractors per annum by 1976, including two new tractor types (20-25 hp and over 100 hp units), and almost triple the output of tractor accessories and agricultural implements to about 67,000 units per year. In the first stage of the project, to which the Bank loan would apply, the necessary production facilities will be installed, whereas the second stage, tentatively scheduled for 1978-79, comprises the further expansion of administrative and storage buildings. Civil and structural work was started in August 1973 and the scheduled completion date for the project (Stage I) is the second half of 1975.

ii. Total financing required for the project is estimated at US$87.6 million equivalent, comprising US$55.1 million for fixed assets, US$24.6 million for working capital and US$7.9 million for interest during construction. The foreign exchange component would be equivalent to US$24.6 million.

iii. The proposed Bank loan of US$18.5 million would finance the full cost of approximately 75% of the equipment and would cover the cif cost of imported items and the ex-factory cost of locally manufactured equipment and spares. The loan would be for 14 years, including 3 years of grace. The effective interest rate to IMT would be 9% per annum, including a guarantee fee of 1-3/4% to the Republic of Serbia where the project is located. The remainder of the financing required for the project will be covered by loans from the Belgrade Bank (US$46.1 million), local suppliers' credits (US$1.1 million), bilateral credits from clearing countries (US$1.0 million) and internal cash generation (US$20.9 million).

iv. Equipment and spare parts to be financed by the proposed loan would be divided into 76 packages and would be procured through international competitive bidding in accordance with Bank guidelines. For the purpose of bid comparison, Yugoslav bids would be given the standard preference of 15 percent or actual customs duty whichever is less.

v. The project has high priority for the Yugoslav Government, since the Agreement for the Development of Agriculture ("Green Plan") envisages a 3%-5% per annum productivity increase in agriculture during the seventies and this target requires rapid growth of farm mechanization in the social and private sectors. To meet the growing domestic demand for agricultural machinery, the Yugoslav Government encourages the expansion of competitive domestic industries such as IMT. Although exports are not expected to account for more than 9% of IMT's total revenue and average US$9 million a year over the 1973-1983 period, average net foreign exchange savings to the economy

resulting from the project are expected to be US$22 million per year, offsetting in about one year the entire foreign exchange cost of the project. Faced with mounting debt service obligations on short and medium term suppliers' credits, and an increasing gap in the balance of trade, Yugoslavia needs to save foreign exchange through the expansion of competitive industries.

vi. IMT has achieved a dominant market position among Yugoslav tractor manufacturers because of its comprehensive product range and widespread dealer organization. IMT's selling prices are on average about 20-30% below the border prices of comparable imported tractors from convertible currency countries. The standard tractor types are well designed, reliable and technically competitive on the world market. The Company's nationwide sales and services network is well established and assures the supply of spare parts and matching farm implements. The project is designed to expand IMT's capacity in line with domestic demand thus enabling the Company to maintain its market share. In view of the good quality of the IMT tractors, the Company's general services and the federal price control of tractors in Yugoslavia, IMT's expansion of domestic capacity can be considered an acceptable means of meeting Yugoslav tractor demand at the least cost to the Yugoslav economy.

vii. The project is primarily oriented towards meeting domestic demand for tractors in agriculture, about 34,000 units per year during the coming decade. Exports and domestic tractor sales for nonagricultural use will respectively account for 4,000 and 3,500 units per year. The market projections assume that the Yugoslav economy will aim at a level of farm mechanization of 1 hp/ha by 1980 in order to reach the agricultural growth target established by the Green Plan. Although financing of tractor sales is not a problem at present, the availability of credit for the projected level of sales, primarily for private farmers, will be crucial for maintaining growth in farm mechanization and assuring IMT's domestic market.

viii. IMT's management is young and dynamic and has implemented three major expansions of its factories since 1966. The Company is headed by an experienced General Manager who was elected for a 4-year term in 1971 and who is supported by capable team of executives. In practice, the management takes all major decisions and has the full support of the Workers' Council.

ix. The Company's projected long-term financial position is strong, and could allow the financing of the Stage II expansion (US$12.9 million) in 1978/79 by internal cash generation. Of total debt and equity employed, debt reaches a peak of 56% in 1975 but decreases to 30% by 1979, while debt service coverage remains adequate throughout the forecast period.

x. The project has high financial and economic rates of return of 21% and 16% respectively. These rates are very sensitive to changes in operating costs and revenues; however, under foreseeable adverse conditions, the economic rate of return is unlikely to drop below 8%, or the financial rate of return below 10%. The project is expected to provide additional permanent employment for about 1,440 people and have a major employment generating effect on the supplier industries, since IMT predominantly machines and assembles local components and parts and the direct import content of IMT's products will be less than 10%.

xi. Appraisal of the project was completed before the onset of the energy crisis. The likely impact on the project was reviewed with IMT management in early January, 1974 and is thought to be slight. The capital cost of the project is not expected to increase by so much as would necessitate a change in the provision for price escalation and, in any event, any additional need for funds, whether caused by an increase in project cost and/or shortfall in internally generated funds during project implementation, would be covered by the Belgrade Bank. Furthermore, energy represents only 3% of IMT's direct operating costs and it can be assumed that any fuel-related increase in the Company's manufacturing costs, whether resulting from higher component prices or higher direct costs, could be passed on in the form of higher selling prices. Finally, since Yugoslavia enjoys a favorable position in respect of energy supply vis-a-vis other industrialized countries in Europe, it is unlikely that the manufacturing costs of those foreign tractors against which IMT's products would compete will be affected to a lesser extent than IMT's own costs.

xii. Based on agreements reached during negotiations on necessary assurances, as summarized at the end of this report, the project is suitable for a Bank loan equivalent to US$18.5 million.

I. INTRODUCTION

A. General

1.01 This report appraises the proposed expansion project of Industrija Masina i Traktora (IMT), the largest producer of wheeled tractors, tractor accessories and agricultural implements 1/ in Yugoslavia. This expansion is designed to increase the production capacity of IMT's New Belgrade plant from about 15,000 to 35,000 tractors per annum by 1976, including two new tractor types (20-25 hp and over 100 hp units), and almost to triple the output of tractor accessories and agricultural implements to about 67,000 units per year. Total financing required for the project, including interest during construction and incremental working capital, is Din 1,356.9 million (US$87.6 million equivalent) of which Din 381.2 million (US$24.6 million) would be in foreign exchange. The proposed Bank loan of US$18.5 million would cover 75% of the foreign exchange cost.

1.02 Following an industrial identification mission to Yugoslavia in 1971, eight industrial projects were submitted in May 1971 to the Bank for financing. IMT was one of the five projects selected. The project has high priority for Yugoslavia, especially in the context of the Government's "Green Plan", which emphasizes farm mechanization and productivity increases in agriculture. In addition, the IMT expansion will stimulate the country's engineering industry through purchases of engines, castings, forgings, tires and electrical equipment. Some of the enterprises in these sub-sectors have already started their expansions in anticipation of IMT's increased demand for raw materials and component parts. One notable example is the expansion program of Fabrika Odlivaka Beograd (FOB), located adjacent to IMT, which will increase its annual foundry capacity from 33,000 to 90,000 tons per year.

1.03 This loan to IMT would be the third direct loan to industry in Yugoslavia. The first loan to the iron foundry Livnica Zeljeza i Tempera-Kikinda (Report No. 218a-YU, dated October 19, 1973) was approved by the Bank's Executive Directors on November 20, 1973. The second loan concerning the FOB iron foundry (Report No. 256a-YU, dated January 28, 1974) will be presented together with this IMT proposal.

1.04 The appraisal of the IMT project included a market mission in June/July, 1973 consisting of Messrs. Glenday and Wilcox (consultant) followed by the main appraisal mission which visited Yugoslavia in August 1973, and which consisted of Mr. Jaffe (Chief) and Miss Haug of the Industrial Projects Department and Mr. Swamy Rao (consultant - UNIDO/IBRD Cooperative Program). A description of technical terms is given in Annex 1.

1/ Trailers, rotovators, plows, seed drills, cultivators and disc harrows.

B. The Role of the Bank

1.05 The Bank's involvement in industry in Yugoslavia has been described in the Kikinda Iron Foundry and FOB Iron Foundry Appraisal Reports.

II. THE COMPANY

A. Background

2.01 IMT, the 50th largest enterprise in Yugoslavia, operates three separate plants - a factory in New Belgrade consisting of tractor and implements assembly facilities and a machine shop, a motor cultivator factory (FMK) in Knjazevac which was acquired in 1970 and a service and repair center in Dobanovci which merged with IMT in 1956 (Map IBRD 10716). 1/ The Company's existing facilities are described in Annex 2-1. IMT Belgrade which will be expanded under the project was founded in 1947, to produce pipes, tubes and bolts. In 1955, the Company started to manufacture tractors after acquiring a Massey-Ferguson (UK) license. Since then, IMT has undertaken a number of expansion programs increasing its annual tractor production to 4,000 units in 1961, 12,000 units in 1968 and 15,000 units in 1972. As the Company's engineering and design capability increased, the manufacture of 35 hp tractors under Massey-Ferguson license was discontinued, and IMT introduced in 1968 its own tractor line (35, 55, 72 and 80 hp units) with corresponding tractor attachments and agricultural implements.

2.02 The Company had operated since 1953 a foundry and pattern shop located adjacent to IMT's production facilities in Belgrade. In 1971, this foundry and pattern shop were established as a separate company (FOB), but the close technical and supply relationships between IMT and FOB have been maintained. Both companies are members of Udruzena Metalska Industrija (UMI), an association of seven metal working companies in the Belgrade area. UMI was founded in 1969 and is the 15th largest industrial group in Yugoslavia.

B. Relationship with UMI

2.03 Details on the composition and organization of UMI are given in the FOB Iron Foundry Appraisal Report.

2.04 Although UMI enterprises have a common development and marketing strategy which sets out broad objectives, each member company is a separate legal entity and is autonomous in the implementation of its production program and the marketing of its goods. All members have to contribute

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1/ FMK Knjazevac and the Service and Repair Center Dobanovci accounted for 5.1% and 3.6% respectively of IMT's sales volume in 1972.

annually a percentage 1/ of their net income to a Joint Reserve Fund and a Joint Development Fund established by UMI. The former is available for interest-free loans to cover possible losses of member companies, whereas the Joint Development Fund finances research and development programs benefiting the entire group, and advances interest-free loans for investments by member enterprises. Moreover, UMI's approval is necessary for annual investments exceeding Din 1 million by any member company (Annex 2-2). During negotiations confirmation was obtained that UMI has approved the IMT project and will, until the completion of the project, limit its requests for contributions from IMT.

C. Organization and Management

2.05 IMT consists of four subsidiary entities, i.e. IMT Belgrade, FMK-Knjazevac, the Service and Repair Center Dobanovci and the Workers Restaurant, Belgrade. 2/ Each entity has a manager and labor unit council which manage independently within the framework of the production program and policy guidelines laid down by the General Manager and the Workers' Council. After project completion, a new and fifth entity will be created by dividing IMT Belgrade into two entities - IMT Tractor Production and IMT Implements Production.

2.06 IMT - as is normal in Yugoslavia - is managed by its workers. The self-management system is explained in Annex 2-2. Annex 2-3 gives an organization chart. The supreme managing body of the Company is the Workers' Council consisting of 45 members elected by the workers for a period of two years. This body formulates the enterprise's general policy, and approves major investment plans, annual budgets and distribution of income as well as production programs within the overall plans developed by UMI for the group as a whole. It also elects the General Manager and his deputy.

2.07 IMT's General Manager, Mr. Radovic, who is simultaneously plant manager of IMT Belgrade, has had 22 years experience with the Company in various managerial and technical positions including manager of tractors and implements production. Mr. Radovic was elected as General Manager in June 1971 for a 4-year term and can be re-elected for another term. As General Manager he is in charge of day-to-day operations of the enterprise and is responsible only to the Workers' Council. In practice, the management makes all major decisions and has the full cooperation of the Workers' Council. The General Manager is assisted by a collegium of the Company's top executives, by two advisers and an ad-hoc expert council which is formed from time to time if major policy issues arise.

1/ This percentage is determined by UMI's Workers' Council. It has been varying between 1.0% and 1.5% p.a. during the past years.

2/ The cafeteria of the IMT factory in Belgrade has been set up as a separate legal entity to facilitate day-to-day operations of this unit.

2.08 Most of the sales and export-import responsibilities have been delegated to the Deputy Manager, Mr. Anastasijevic, while the General Manager concentrates on the operations and future development of the Company. IMT has a young, well trained and dynamic management team which is supported by an adequate number of qualified staff.

D. Plant Facilities at New Belgrade

2.09 The existing facilities of IMT Belgrade consist of a complex for the production of tractor components, tractor assembly lines, an implements assembly bay, a scaffolding shop and miscellaneous facilities for storage, maintenance and supporting services. They are described in detail in Annex 2-1. The plant is presently used at capacity. The major problems facing the New Belgrade factory are lack of space for storage, inadequate materials flow and internal transport, some obsolete machinery and poor working conditions. The latter concern the antiquated heating, lighting and ventilation systems, insufficient social facilities (restrooms, cafeteria), and conditions in the paint shop which do not meet minimum health standards. The proposed expansion project is designed to overcome these bottlenecks and shortcomings.

2.10 Due to the overcrowded working conditions, proper safety measures have not been observed and thus the incidence of work-related accidents has been high. As greater attention needs to be paid in this area, the Bank obtained assurances from the Company during negotiations that it will institute and maintain appropriate industrial safety practices.

E. Past Growth and Financial Results

2.11 Details of IMT's past production and product lines by plant are given in Annex 2-4 and historical income statements for the past five years (1968-1972) in Annex 2-5. The following table shows the trend of sales and net income of IMT since 1969:

Trend of Sales and Net Income /1

	1969	1970	1971	1972
Sales Volume (units)				
Tractors	7,032	9,328	12,386	14,202
CKD & PKD Tractor Sets /2	2,160	1,400	365	200
Implements	1,715	1,814	2,867	6,117
Accessories	5,618	6,527	6,980	10,612
Sales and Earnings (Din million)				
Net Sales	416.5	497.1	746.7	1,030.9
Net Income	7.5	24.1	57.8	73.1
Net Income as % of Sales	1.8	4.8	7.7	7.1

/1 Figures do not include results from FOB operations.
/2 CKD - completely knocked down units.
PKD - partly knocked down units.

2.12 The Company's sales history is characterized by a steady increase of sales of all IMT tractor models (35, 55, 72 and 80 hp) and the introduction of new implements (plows, seed drills, cultivators and disc harrows) in 1971/72. This is the result of substantial investments in 1967/68 and 1971/72. The 35 hp tractor is IMT's most important product, accounting for about 51% of the Company's net sales revenues in 1972. Over 90% of IMT's sales originates from its Belgrade plant.

2.13 IMT's net income more than doubled in 1971 reaching Din 57.8 million, following a 50% increase in revenues. Yet, while sales in 1972 increased by another 40%, net income as a percentage of net sales decreased to 7.1% from 7.7% in 1971. This is due to the high cost of operating on three shifts and the charging of start-up expenses and interest during construction of the 1971/1972 expansion (Annex 2-4) to the income statement.

2.14 IMT's exports over the past five years have been constant in absolute terms, but declining in relative terms and amounted to Din 53.8 million or 5.2% of net sales in 1972. This trend, however, does not reflect IMT's competitiveness; on the contrary, its tractors are highly competitive both technically and cost-wise as will be discussed in more detail in Chapter VI and Annex 3. However, because of the continuing shortage of tractors and agricultural implements in Yugoslavia, the Company has chosen to export only such quantities as were required to earn its needed foreign exchange through the retention quota system. 1/ Although IMT plans to step up its exports (Annex 6-1), export strategy will be largely determined by the future

1/ Yugoslav enterprises can use 20% of the foreign exchange from their annual export earnings, i.e., their retention quota, without restriction.

domestic demand for the Company's products. The record of production, sales and earnings indicates that IMT is a technically competent and profitable company.

F. Recent Financial Position

2.15 Historical balance sheets for the past five years (1968-72) are given in Annex 2-6 and recent results summarized below:

IMT - Summary of Balance Sheet
(Din million)

	1969	1970	1971	1972
ASSETS				
Current Assets	236.5	236.3	263.9	401.7
Net Fixed Assets	86.0	71.5	67.9	146.9
Financial Assets	3.2	37.0	36.0	31.0
Other Assets	33.3	39.5	62.1	94.9
Total	359.0	384.3	429.9	674.5
LIABILITIES				
Current Liabilities	174.8	190.5	151.3	167.5
Long-Term Debt	67.6	57.9	60.5	81.3
Equity 1/	116.6	135.9	218.1	425.7
Total	359.0	384.3	429.9	674.5
Current Ratio	1.3	1.2	1.7	2.4
Debt/Equity Ratio	37:63	30:70	22:78	16:84

/1 "Equity" includes Business Funds, Collective Consumption Funds, Reserve Funds and compulsory loans; these terms are explained in Annex 2-7. Nearly 30% of the equity increases in 1971 and 1972 are due to revaluations of fixed assets which seem justified in view of the 20-25% p.a. inflation rates Yugoslavia experienced during the late sixties. For projection purposes it has been assumed that measures now being taken to curb inflation will be successful and that no revaluation of fixed assets will become necessary in the foreseeable future.

2.16 The Company has a sound financial structure. The debt/equity ratio of 16:84 at the end of 1972 is satisfactory. The current ratio has since 1971 been at a satisfactory level, because the Company has been taking conscious steps to reduce its receivables and accounts payables while maintaining a minimum level of cash.

III. THE MARKET

3.01 A detailed analysis of the market for tractors and farm implements is attached as Annex 3.

A. Supply and Demand for Tractors

1. Recent Trends

3.02 The Yugoslav tractor fleet has increased three-fold from 42,730 units in 1962 to about 120,500 units in 1972, thereby reaching a level of farm mechanization of 0.45 hp/ha of arable land. However, farm mechanization varies greatly between regions and types of farms: (i) in Croatia and Slovenia a level of farm mechanization of more than 0.6 hp/ha has been reached compared with less than 0.2 hp/ha in Kosovo, Macedonia, Montenegro and Bosnia, and (ii) social sector farms average 0.86 hp/ha with tractors in the 50 hp range, whereas private farms have reached 0.36 hp/ha with an average 32 hp tractor.

3.03 As shown in the following table, during the 1968-72 period domestic sales increased by 53% and domestic production by 41%. Imports are determined annually by the Yugoslav trade commission in the light of the domestic supply and demand gap.

Supply and Demand Comparison of Tractors /1 in Yugoslavia
(Units)

	1968	1969	1970	1971	1972
Production	10,927	10,810	12,048	16,046	18,423
Imports	3,969	2,727	5,460	9,281	12,760
Supply	14,896	13,537	17,508	25,327	31,183
Domestic Sales	14,259	13,117	16,996	24,012	30,001
Export	637	420	512	1,315	1,182

/1 Includes other agricultural machinery such as motorcultivators, but excludes CKD/PKD tractor sets and components.

2. IMT's Competitive Position

3.04 IMT is the largest Yugoslav manufacturer of tractors accounting for 85% of the domestic capacity. The Company produces tractors of its own design which was developed on the basis of a Massey-Ferguson license.

It relies on Yugoslav suppliers for more than 90% of its raw materials and components. In contrast, the five other tractor producers 1/ merely assemble imported components. In view of the existing supply and demand gap and the growing trend towards farm mechanization in Yugoslavia, several companies besides IMT plan to expand their manufacturing plants, thereby increasing domestic tractor production capacity more than two and a half times to about 47,500 units by 1977.

3.05 IMT's dominant market position is the result of a competitive product line:

(i) IMT tractors are well designed, reliable and easy to maintain. The Company has updated its product line progressively, so that the standard 30-65 hp models are technically competitive on the world market. In regard to the IMT 75 and 85 hp tractors, comparable European models have superior convenience features and a better hydraulic system. IMT plans to improve the characteristics of its large hp models, in order to present in this range as well an internationally competitive product.

(ii) Matching implements are readily available for IMT tractors, in contrast to imported models, where lack of spare parts and implements has led to diseconomies and underutilization.

(iii) The nationwide sales and services network is well established and has been strengthened concurrently with IMT's production expansion. The Company's reliable maintenance and repair facilities constitute a definite competitive advantage over its competitors.

1/ T. Vinkovic; Ruen Kocani; Gorenje Velenji; Torpedo and IMR Rakovic (Annex 3, para 10).

3.06 A price comparison of IMT tractors with imported units is detailed in Annex 3, para 22 and summarized below:

Tractor Price Comparison - August 1973
(Dinar)

Model	Base Price /1	Model	Base Price /1
IMT-533 (35 hp)	40,723	IMT-575 (72 hp)	89,972
Steyr (32 hp), Austria	63,278	John Deere (72 hp), U.S.	115,380
Deutz (35 hp), Germany	56,885		
IMT-558 (55 hp)	58,673	IMT-585 (85 hp)	101,582
Steyr (52 hp), Austria	80,556	Deutz (85 hp), Germany	129,300
John Deere (52 hp), U.S.	80,230		

/1 Ex duties and taxes: cif border prices for imported tractors and IMT ex-factory price.

The above table shows that IMT's ex-factory selling prices are still 20-30% below the border prices of comparable imported tractors from convertible currency countries; 1/ i.e., the Company does not need the protection of the present 29% tariff on imported tractors.

3.07 Clearly, IMT has achieved a dominant position in the Yugoslav market, by offering good, reliable and price competitive tractors and implements. The project is designed to expand IMT's capacity in line with domestic demand, thus maintaining its domestic market share. In view of the fact that (i) tractor prices in Yugoslavia are determined annually by a Federal Commission, i.e., IMT will not be able to exploit its market position by increasing prices arbitrarily; (ii) the quality of the IMT tractors is good; and (iii) the Company's service and repair network is reliable, it is unlikely that the Yugoslav economy would benefit from increased competition and thus further proliferation among domestic and foreign tractor manufacturers at this time.

3. Market Forecast

3.08 The "Green Plan" projects an annual growth of aggregate agricultural production of 3.2% until 1975 and 5% in the 1976-1983 period. To reach this target Yugoslavia will have to increase significantly the level of farm mechanization of private and social farms. How farm mechanization in Yugoslavia compares with that in other countries is shown below:

1/ Border prices of Eastern European tractors have been 5-20% below IMT's selling prices; however, they have been arrived at in barter agreements.

Level of Farm Mechanization - Selected Data

	tractor fleet	ha per tractor	hp per ha
Canada	800,000	54.3	0.91
France	1,250,000	15.5	3.2
Italy	480,000	31.1	1.6
South Africa	220,000	54.8	0.91
USA	4,600,000	38.3	1.3
UK	350,000	20.6	2.4
Yugoslavia	120,500	84.3	0.45
Social	25,100	59.4	0.86
Private	95,400	90.8	0.36

Source: FAO, 1972

The above table indicates that developed countries with large farms and extensive farming have reached a mechanization level of at least 1.0 hp/ha, and the mechanization levels of countries with more intensive farming such as France, Italy and the UK range between 1.6 - 3.2 hp/ha. Therefore, in the market projections it has been assumed that Yugoslavia will have achieved full mechanization in agriculture at a level of about 1.0 hp/ha on the large farms in the social sector and approximately 2 hp/ha on the small private farms (Annex 3, para 27).

3.09 In addition to the level of farm mechanization outlined above, the projections for the Yugoslav tractor demand in agriculture assume that:

(i) following a worldwide trend average hp size of tractors will increase from 51 hp to 60 hp on social farms and 32 hp to 38 hp on private farms by 1983;

(ii) the replacement market will be 8% of the tractor fleet (12.5 years) until 1980 and 6% (16 years) thereafter, since with improved mechanical skills and repair services in Yugoslavia the useful life of tractors will be expanded and the large number of imported tractors will be phased out (Annex 3, para 30); and

(iii) about 10% of the power requirements of private farms and the mechanization of vineyards and orchards will be met by motorcultivators (5-12 hp).

On the basis of these assumptions the projected tractor parc and replacement needs for the private and social sectors are presented in Annex 3, Table 5. The forecast indicates a domestic market for tractors in agriculture of 34,000 units per year over the next 10 years of which about 2,000 units would be in the social sector.

3.10 A domestic demand of 3,500 tractors per year for non-agricultural use has been projected. This level is in line with experience in Western European countries and takes into account the widespread use of tractors for haulage, construction and forestry work in Yugoslavia.

3.11 The following table summarizes the projected supply and demand situation in Yugoslavia in a typical year between 1977 and 1983:

Projected Average Annual Supply/Demand Comparison for Tractors

	18-30 hp	31-50 hp	51-60 hp	61-90 hp	91 hp and over	Total
Production /1	4,600	27,900	3,650	3,300	550	40,000
of which IMT	3,000	25,000	3,300	3,300	400	35,000
Imports	-	1,800	800	100	50	2,750
Total Supply	4,600	29,700	4,450	3,400	600	42,750
Domestic Demand	4,100	26,800	3,850	2,350	400	37,500
Exports	300	2,900	600	200	-	4,000
Surplus (Deficit)	200 /2	-	-	850	200	1,250

/1 For capacity expansions see Annex 3, page 6.
/2 Not including 7,500 units of riding motorcultivators which also compete with the 18-30 hp tractors.

3.12 The export figure of 4,000 units/year is a realistic target and reflects the minimum number of tractors the Yugoslav manufacturers will have to export to earn their retention quota. IMT can be expected to account for most of these exports without having to resort to marginal pricing since (i) IMT products are not only competitive technically and price wise on the world market, but (ii) the Company has experience in exporting assembled tractors or tractor sets to developing countries, and (iii) the association with Massey-Ferguson facilitates the supply of spare parts and components to that firm. Sufficient export credits on suitable terms are available and are therefore not considered a constraint on exports. In the Yugoslav context

of import regulation, imports of tractors are meant to supplement domestic supply. It can be expected that Yugoslavia will continue importing at least 2,000 tractors per year in order to satisfy barter arrangements and needs for special tractors which are not produced locally.

3.13 The above supply/demand comparison indicates possible oversupply for two market segments:

(i) in the 18-30 hp category, total tractor demand of 4,100 units per year compares with an annual domestic capacity of 4,600 small tractors of 20-25 hp and 7,500 units of the Pasquali riding motorcultivators (18.5 hp). While part of the supply can be expected to be absorbed by the specific market for motorcultivators, the new IMT tractor will face considerable competition in this product category.

(ii) in the above 60 hp category, there is likely to be an oversupply, if IMT produces 3,700 units per year and Torpedo 150 tractors per year. Only in the short term may the social farms absorb the excess supply when switching to higher horsepower units.

3.14 IMT is aware of domestic competition, particularly for the small tractor market, and possible market constraints in the above 60 hp categories. As explained in para 4.06, IMT's production facilities will allow flexibility to shift emphasis among different models and spare parts production. Therefore, the Company will monitor closely the production cost and market success of its various products in order to adjust the production volume and model choice accordingly.

4. Availability of Credit

3.15 Availability of credit has not been a constraint to tractor sales in the past, since social farms have had ready access to credit institutions and the private farmers who purchased tractors disposed of sufficient income from workers remittances, sales of work animals, and on and off farm work to pay cash. However, to reach the projected level of farm mechanization, credit will have to be channeled to private farmers, who may require up to Din 400 million per year in credit (Annex 3, paras 33-35) after 1976. To this end IMT plans to make available about Din 75 million per year for the 1976-78 period from its annual cash surplus and intends to channel to its dealers an additional Din 100-120 million per year through on-lending of credits from the Belgrade Bank. As to Government funds, the "Green Plan" as known to date indicates that, while some funds will be made available in the form of agricultural credit for farm mechanization, no specific amount is earmarked for private farmers.

3.16 Since private farmers account for nearly 80% of the projected tractor demand and the farm income of the average private holding may not allow cash purchases of tractors, the domestic demand for tractors can be expected to become very sensitive to the availability of credit to private

farmers, as soon as the present excess demand is satisfied. Therefore, during negotiations, it was agreed that IMT would submit to the Bank by mid-1975 a 5-year program for financing sales of IMT tractors and agricultural implements, which would support IMT's production program in the long-run, and provide information on ways and means of channeling the required funds to private farmers as well as the social sector. The Government also stated during negotiations that adequate credit to private farmers would be available as part of the objectives of the Green Plan.

B. Supply and Demand for Agricultural Implements

3.17 An acceptable level of tractor utilization can only be reached if implements are available in numbers, types and sizes required to match the sale of tractors. Contrary to tractor production and the manufacture of rather sophisticated implements such as disc harrows and seed drills which require design expertise and high toolage costs, manufacture of standard implements (trailers, plows) can easily be taken up. As a result, there are besides the tractor companies about 20 small producers of farm implements in Yugoslavia.

3.18 IMT's implement line is of good design and quality (Annex 2-4) and offers a wide range of product types according to tractor size and farm implements. The Company has subcontracted the manufacture of the majority of tillers, mowers and plows and is steadily expanding its implements line. However, agricultural implements for imported large tractors have been in short supply resulting in an under-utilization of tractors on social farms.

3.19 The market projection for major farm implements are summarized below:

Average Annual Requirements and IMT Production of Major Farm Implements in Yugoslavia (1977-1983)

	Market			IMT Production Program (1977)	IMT Market Share /1
	Social Sector	Private Sector	Total		
	Units				%
Trailers	660	15,600	16,260	7,800	48
Plows	1,125	18,000	19,125	12,000	63
Cultivators	300	9,000	9,300	1,200	13
Seed Drills	300	3,000	3,300	2,000	61
Disc Harrows	600	6,000	6,600	4,000	61

/1 Including sales by sub-contractors.

Until the early eighties the demand for the 3 major implement types (trailers, plows and disc harrows) will amount to 50-75% of the number of tractors sold to new customers, whereas more specialized equipment such as planters, seed drills and cultivators will account for not more than 20%. In contrast to tractors, implements have a useful life of about 15 years and obsolescence is of lesser importance. The above projections take into account that, based on a percentage of tractor sales, the market for implements relative to tractors will be higher in the social sector than in the private sector, since the social sector will switch to larger tractors (60 hp and above) which require new large size semi-mounted or pull type implements.

3.20 IMT's proposed production program and subcontracting arrangements for implements are adequate and should maintain the utilization of IMT tractors at an appropriate level.

C. IMT's Marketing Organization

3.21 IMT's marketing operations are directed by the Sales and Service Department in Belgrade, which has established a nation-wide sales and services network in Yugoslavia (Map IBRD 10716) and a training center in Belgrade. The present sales organization consists of 26 dealers and 100 sub-agents, which are not yet exclusive distributors of IMT tractors, implements and parts. Export sales are handled by the export division in Belgrade which uses established dealer networks of other manufacturers for the distribution and servicing of IMT tractors in foreign countries. The maintenance and repair service relies primarily on 146 existing service workshops, which have direct contracts with IMT. The Service and Repair Center in Dobanovci specializes in tractor overhaul, while serving also as maintenance and repair workshop in its district.

3.22 Due to the past and present demand-supply gap for tractors in Yugoslavia, IMT's dealer network undertakes promotional functions only to a minor extent. The Company is aware of the need for more intensive marketing activities after project completion. To this end, IMT plans to (i) initiate a training and information program for dealers and customers, and (ii) establish exclusive dealerships. In parallel, the maintenance and repair system will be strengthened by (i) establishing regional training centers for servicing personnel, and (ii) subcontracting new workshops.

3.23 The continued strengthening of the sales and service organization is essential in order to maintain IMT's dominant market position and good quality repair service. Accordingly, during negotiations, the Company agreed to submit to the Bank by mid-1975 a 5-year program for the expansion of its local and export marketing and servicing organization.

IV. THE PROJECT

A. Technical Description

4.01 A detailed technical description of IMT's expansion program is given in Annex 4-1. Preparation of the project and detailed engineering was undertaken by the Company with the assistance of experienced local engineering firms. 1/ The proposed project relates only to the Belgrade plant, and is designed to increase the Company's annual production capacity to 35,000 tractors, 27,000 units of agricultural implements, and a proportionate number of accessories and spare parts. 2/ The new production program will include the design and manufacture of two new tractor models - one of 20-25 hp and one above 100 hp.

4.02 The expansion will be carried out in two phases. Phase I, or "the project," includes all production facilities necessary to reach the proposed output target by 1976/77. Phase II will provide a tools and maintenance shop, additional storage, offices and general service buildings. The Company plans to implement the second phase (estimated cost Din 200 million or US$12.9 million equivalent), no earlier than 1978-1979, i.e. about two years after completion of the project when internal cash generation and foreign exchange surpluses are expected to allow such an investment.

4.03 More specifically, the project (Phase I) of the expansion program consists of the construction of (i) a new tractor parts machine plant; (ii) a new tractor assembly plant; (iii) rehabilitation and reorganization of the existing plant in order to improve work conditions and health standards and to accommodate the implement assembly lines and the maintenance and tool shop, including the dismantling of the present implements production bay; (iv) construction of an office building with space for the Production Department, a cafeteria, locker-rooms, etc.; and (v) construction of storage facilities for raw materials, parts and supplies. The plant layouts (Annex 4-2) illustrate the physical facilities to be constructed under the project. The plant design, materials flow and the equipment selected for the project are considered satisfactory.

4.04 A major objective of the project will be to improve the materials flow by creating sufficient storage areas and rationalizing the internal transport systems. To this end, the Company intends primarily to use conveyors and forklift trucks.

1/ MASINOPROJEKT and SRBIJA PROJEKT, Belgrade.

2/ Assuming one shift working in the assembly plants and two shifts in the tractor parts production shop.

4.05 The Company intends to produce about 400 tractors above 90 hp by 1976 and 3,000 tractors of 20-25 hp by 1977. The new 100 hp models will include a maximum number of components and design characteristics of the existing models, but for economical reasons incorporate imported gearlinks (Annex 2-4, para. 11). Prototype production was scheduled to start in January 1974, by which time IMT also intended taking a final decision on the type, possible licensing arrangements and development strategy for its new 20-25 hp tractor. The Company's Research and Development Department is well equipped and has sufficient and experienced staff to justify the projected time schedule for bringing the new models into production. During negotiations, an assurance was obtained that the Company will keep the Bank informed of the status of product development for its new tractors.

4.06 Because of the interchangeability of parts, the production of tractors inherently has a high degree of flexibility in respect of product mix. For example, by appropriate production scheduling the Company can adjust the output of different tractor types or components. As regards volume, IMT could, by working three shifts, increase its tractor output to an annual rate of approximately 50,000 units per year. In contrast, by changing the product mix, and manufacturing more implements, accessories and spare parts than presently planned, the Company could economically reduce tractor production to 25-30,000 units per year.

4.07 Satisfactory plans for infrastructure - power, gas, roads, compressed air, water and heating - have been developed in cooperation with FOB. A major investment is required for a new transformer station and transmission lines, since IMT's electricity consumption will nearly triple after project completion. During negotiations, the Company provided documentary evidence that it has obtained commitments from the respective authorities for the timely development of infrastructure facilities.

B. Manpower and Training

4.08 In April 1973, IMT employed 3,524 people, 2,905 of whom worked at the Belgrade factory. Additional employees needed after the expansion are estimated at 1,445 including 532 in the services departments. Details are given in Annex 4-3. As mentioned earlier, IMT is today operating on a three shift basis. After expansion, i.e. in 1976, the tractor assembly plant is expected to operate one shift, the implement assembly and tractor parts machine shop two shifts and heat treatment facilities three shifts. Plant layout and equipment selection indicate that the project relies primarily on semi-automatic and standard machines rather than on fully-automatic transfer lines and assembly operations. This labor-intensive approach results in considerable direct employment generation and is economically justified (Annex 6-3) in view of Yugoslavia's relatively low wage rates.

4.09 The Company has elaborated a program of manpower needs and a recruitment schedule (Annex 4-3) which foresees direct recruitment of workers and staff as well as training of the present labor force in IMT's school, at Belgrade University or in Yugoslav technical institutions. IMT does not anticipate any difficulties in recruiting the necessary personnel for various

skill levels. The Company is well known in Yugoslavia for its technical excellence and employee benefits and has always been able to attract good applicants.

C. Ecology

4.10 A new Federal law for environmental and pollution control stipulates that all enterprises must conform to certain minimum pollution standards by the end of 1973 and meet all set standards by 1977. In general, IMT's production is a clean operation with no adverse effects on the environment, and thus special measures to achieve compliance with Yugoslav laws or other reasonable pollution standards are not required. One exception is the effluent water from the surface protection, paint and hardening facilities. To overcome potential problems, the Company neutralizes all water used on the plant site before discharging it into the treatment facilities of the Belgrade Water Supply Company.

D. Project Execution

4.11 IMT will have the major responsibility for project execution. During the past five years, the Company has implemented three sizeable expansion projects (Annex 2-4) and is well experienced to carry out the project. The main burden will rest with IMT's Expansion Department, a unit which was created in April 1973 to assure adequate preparation and supervision of the project. Mr. Predragovic, 63, an experienced engineer, is in charge of the Expansion Department and is assisted by a qualified staff of about 25, including engineers familiar with network analysis and other planning tools and economists experienced in cost control.

4.12 Since the Company has no previous experience of international competitive bidding procedures, especially in the preparation of bid documents in English, IMT has contracted a local firm "RAPID" which has dealt with procurement of foreign equipment to assist it in this task. Documents submitted to the Bank to date indicate that this arrangement is satisfactory and one that will permit orderly and timely preparation of equipment specifications and bid evaluations.

4.13 The civil construction contract was awarded to the Yugoslav contractor RATKO MITROVIC in March 1973 after competitive bidding limited to local construction companies. Construction work started in August 1973 and is proceeding on schedule. Local and foreign equipment suppliers will provide assistance in erection and start-up and the usual performance guarantees. The Company's own Construction and Technical Departments will be responsible for the relocation of existing machinery. Similar arrangements have proven satisfactory in the Company's past expansions. The project can be implemented without interfering with existing production until final equipment erection and relocation of existing machinery. The financial projections assume a minimal production loss of one month in 1975.

E. Project Timing

4.14 Project completion is planned for the last quarter of 1975 in accordance with the implementation schedule shown in Annex 4-4. This schedule is considered realistic. Construction of the new production bays has already begun and is expected to be completed by October 1974. Design and engineering of the equipment for the project is well advanced. Orders for equipment with delivery times of more than 18 months are already being placed and will be financed by the Company. Procurement action for foreign equipment to be financed by the Bank has been initiated. It is expected that the first firm orders for Bank financed equipment will be placed in April 1974.

V. CAPITAL COST, FINANCING PLAN AND PROCUREMENT

A. Project Cost

5.01 The capital cost of the project is detailed in Annex 5-1 and summarized below:

Summary of Capital Cost Estimates

	Din million			US$ million			
	Local	Foreign	Total	Local	Foreign	Total	%
Civil Construction	173.0	-	173.0	11.2	-	11.2	12.8
Equipment & Spares	85.9	287.8	373.7	5.5	18.6	24.1	27.5
Erection & Installation	16.4	-	16.4	1.1	-	1.1	1.3
Transport & Insurance /1	27.6	-	27.6	1.8	-	1.8	2.0
Duty and Taxes	103.8	-	103.8	6.7	-	6.7	7.7
Engineering, Pre-operating and Start-up Expenses	7.0	-	7.0	0.5	-	0.5	0.6
Physical Contingency /2	34.5	27.2	61.7	2.2	1.7	3.9	4.4
Price Escalation /2	49.8	40.2	90.0	3.2	2.6	5.8	6.6
TOTAL FIXED ASSETS	498.0	355.2	853.2	32.2	22.9	55.1	62.9
Incremental Working Capital	380.7	-	380.7	24.6	-	24.6	28.1
TOTAL PROJECT COST	878.7	355.2	1,233.9	56.8	22.9	79.7	91.0
Interest During Construction	97.0	26.0	123.0	6.2	1.7	7.9	9.0
TOTAL FINANCING REQUIRED	975.7	381.2	1,356.9	63.0	24.6	87.6	100.0

/1 For imported equipment only; the cost of domestic equipment and spares is given on a delivered basis.

/2 For detailed rates, see para 5.03.

5.02 Civil construction costs are based on the contract signed in May 1973 with RATKO MITROVIC (para 4.13). Equipment cost estimates are derived from actual prices prevailing in 1973 and from quotations received in the last quarter of 1972 or first half of 1973 from potential European and US suppliers. The prevailing import duties and taxes on the cif value (Yugoslav border) of imported equipment have been added. The estimates for engineering, pre-operating and start-up expenses reflect IMT's recent experience.

5.03 The cost estimates include physical contingencies equivalent to 10% for civil construction and equipment to be purchased from hard currency countries, 2% for equipment from clearing countries and 3% for locally procured equipment based on the assumptions detailed in Annex 5-1. These provisions are considered adequate in view of the advanced stage of project preparation and IMT's familiarity with the equipment to be procured. In addition, price contingencies equivalent to an escalation rate of 6% per annum have been applied to the cost of foreign equipment including import duties and taxes. As for local equipment, construction and erection costs, escalation rates have been forecast declining from 10% to 6% per year during the construction period. These rates are based on the assumption that the measures now being taken in Yugoslavia to curb inflation will succeed. Assumed physical and price contingencies, therefore, amount to 17.8% of total fixed assets, a proportion not unlike those used for the Kikinda and FOB foundry projects. The capital cost estimates are considered satisfactory.

B. Working Capital

5.04 The Company's present working capital is satisfactory. Incremental working capital required due to the project for the 1973-76 period is estimated at Din 380.7 million (US$24.6 million) and will be covered by a Din 80 million medium-term loan and a Din 300 million long-term loan from Belgrade Bank. Details of IMT's working capital needs are given in Annex 5-2. Should actual working capital requirements be higher than anticipated, the Company is expected to finance them with short-term credits.

C. Financing Plan

5.05 An estimated Din 1,356.9 million (US$87.6 million) will be required to cover the project cost, including Din 123.0 million (US$7.9 million) for interest during construction. Internal cash generation will provide Din 323.5 million (24% of the total), credits from the Belgrade Bank Din 714.3 million (53%), credits from local suppliers Din 17.2 million and credits from clearing countries Din 15.2 million. The proposed Bank loan of US$18.5 million would cover the remaining 21% of the financing requirements, equivalent to about 75% of the equipment cost. A summary of sources and applications of funds (Annex 7-2) follows:

Summarized Sources and Applications of Funds
1973-1976
(Din million)

SOURCES		APPLICATIONS	
Cash from Operations	506.0	Fixed Assets:	
		for Project	853.2
Loans		for Replacement	5.0
IBRD	286.7		858.2
Belgrade Bank	714.3	Interest during construction (IBRD)	20.4
Credit from clearing countries	15.2	Debt repayment	171.6
Local suppliers	17.2	Increase in working capital: /1	
	1,033.4	for Project	380.7
		for Yugoslav regulations	39.5
			420.2
		Financial Assets /2	69.0
Total Sources	1,539.4	Total Applications	1,539.4

/1 Annexes 5-2 and 2-7.

/2 Power and construction deposits and long-term loans to suppliers and customers.

5.06 The Bank loan would be for 14 years, including a grace period of 3 years, at an assumed interest rate of 7-1/4% plus a guarantee fee of 1-3/4%, payable to the Republic of Serbia 1/, thus bringing the effective Bank lending rate to IMT to 9%. The loan agreement, already signed, between IMT and the Belgrade Bank stipulates 11% interest per annum for a period of 14 years including 3 years of grace; it also provides a guarantee for the IBRD loan.

5.07 Agreements on the local suppliers' and bilateral credits from clearing countries are currently being completed. During negotiations, assurances were obtained that the Company will receive guarantees from the Belgrade Bank for these loans on terms and conditions satisfactory to the Bank.

5.08 Additional local or foreign resources needed for project completion 2/, irrespective of whether the need for such additional funds is caused by a cost

1/ The Federal Government, the Guarantor of the Bank loan, cannot accept such a fee. It will ask the Republic of Serbia, where the project is located, to receive the fee.

2/ On this context, project completion would require production and sales over 6 consecutive months at 90% of rated capacity and equivalent working capital build-up (minimum current ratio of 1.3:1).

overrun or a shortfall in cash generation, would be provided by the Belgrade Bank on terms acceptable to the Bank. The Company provided documentary evidence of this completion and overrun guarantee during negotiations.

5.09 The proposed Bank loan of US$18.5 million equivalent would cover the cost of approximately 75% of the equipment and spare parts. It would finance the cif cost of imported goods and the ex-factory cost of locally manufactured equipment and spares. A detailed list of the items to be procured under the Bank loan is shown in Annex 5-3. These items will be divided into 76 packages, all of which will be submitted to international competitive bidding in accordance with the Bank's Guidelines for Procurement. For the purpose of bid comparison, bids containing at least 20% domestic value added will be given the standard preference of 15% or actual customs duty whichever is less.

5.10 For most of the domestic equipment (estimated at Din 111.5 million to be financed by the Company, suppliers' credits or loans from the Belgrade Bank), quotations have already been received from various suppliers and orders are now being placed. This equipment will be of the requisite quality, competitively priced and supplied in accordance with the requirements of the project implementation schedule. As to equipment imported from clearing countries (estimated at Din 22.0 million), the Company intends partly to invite bids from selected Eastern European suppliers and partly to rely on sole source procurement.

5.11 The estimated disbursement schedule for the Bank loan is shown in Annex 5-4. It is based on detailed estimates of order placements, payment schedules and expected delivery times for equipment in line with the construction schedule (Annex 4-4).

VI. REVENUE, SUPPLIES AND OPERATING COST

A Escalation in the Financial Projections

6.01 To provide a reasonably accurate picture of IMT's liquidity position during the forecast period, the Bank's financial projections have been expressed in current terms. Expected rates of cost increases were discussed with the Company and Yugoslav authorities and assume that the measures now being taken in Yugoslavia to curb inflation will succeed. The financial projections assume (i) a 12.3% per annum increase of wage rates until 1978 and 8% per annum thereafter (Annex 6-3, page 2), (ii) escalation of material costs by 6% per year, and (iii) price increases as set out in Annex 6-1, page 2. Depreciation and financial charges are not escalated, since they relate to capital costs that remain on the books at historical values. The assumed price increases of 8% in 1974 and 6% in 1975 are realistic, but subsequent price assumptions for the 1976-1983 period are conservative in relation to operating cost increases and intended to demonstrate that IMT can remain financially viable even if its prices rise at a slower rate than the average rate of the Company's operating costs.

B. Sales Revenues

6.02 The implementation schedule foresees the start-up of (i) the tractor assembly plant in August 1975, (ii) the implement assembly shop in November 1975, and (iii) full production of the tractor parts machine plant by the end of 1975. The projected sales prices and revenue build-up are shown in Annex 2-3, para 8 and Annex 6-1, and are summarized below:

Sales and Revenue Build-up - Selected Data

	1972 (actual)	1973 /1	1974 /1	1975 /1	1976	1977
Sales (Din million)	1,031	1,285	1,388	1,781	3,045	3,419
Tractors (units)						
20-25 hp		-	-	-	1,000	3,000
IMT-533/40	11,926	13,600	13,600	16,400	22,500	22,000
IMT-558/60	1,812	1,600	1,600	2,150	2,900	3,300
IMT-575	275	650	450	550	1,600	1,800
IMT-585	47	-	200	350	1,200	1,500
above 100 hp	-	-	-	-	300	400
Total	14,060	15,850	15,850	19,450	29,500	32,000
Implements (units)	6,117	8,650	8,650	8,650	22,250	27,000

/1 Construction period.

6.03 Sales revenues have been calculated in current terms acording to the escalation rates detailed in Annex 6-1, page 2. As sales incentive, the Company intends to sell its 1976 production at 1975 prices and increase the dealer discount from 3.25% to 3.8%. Due to the expansion project net sales will increase by 57% in 1975 (over 1974) and another 66% in 1976 reaching Din 3,045 million.

6.04 Presently, exports to convertible and clearing areas account for about Din 53.8 million or 5% of total sales. The share of exports is expected to rise to 8.9% in 1977, of which Din 132.7 million (3.9%) would be to convertible currency countries and Din 174.3 million (5%) to the clearing area. Export projections have been based on the expected domestic market for IMT's products which receives priority and the export revenues required to earn a certain retention quota (Annex 2-7, para 17). In view of the Company's competitiveness on the world market (Annex 3), the export projections understate the actual export potential.

C. Raw Materials, Parts and Supplies

6.05 Timely economical supply of raw material (steel), parts (engines, forgings, castings, tires, bearings, etc) and supplies are crucial for IMT's production which is primarily a machining and assembly operation. The Company is taking adequate measures, detailed in Annex 6-2, to minimize bottlenecks during and after expansion. Major items such as engines, castings, pressings and wheels are supplied by other UMI member companies which have coordinated their respective production programs. Imports of materials amount at present to no more than 7-10% of total material costs and are projected to decrease to around 5-8% by 1976. 1/ No problems are foreseen in regard to the Yugoslav import regime and the availability of foreign exchange for imports of raw materials and components. As detailed in Annex 7-4 and Annex 8-2, IMT is expected to have adequate foreign exchange to meet possible shortfalls in domestic raw materials and parts supply through imports.

D. Operating Costs

6.06 Operating cost projections are detailed in Annex 6-3 and summarized below. IMT's internationally competitive cost structure is in large part the result of prevailing low wage rates in Yugoslavia; i.e., in 1972 IMT's labor cost amounted to 14.5% of total operating cost compared to 25-30% in Western European companies with a similar product mix.

Operating Cost Projections - Selected Data

	1972		1975	1976	1977	
Production (units)						
Tractors	14,402		19,450	29,500	32,000	
Implements	6,117		8,650	22,250	27,000	
Operating Cost (current Din million)		%				%
1. Production						
Material	775.1	81.5	1,305.6	2,180.0	2,392.0	78.3
Labor	72.1	7.6	140.0	230.0	269.0	8.8
Sub-Total	847.2	89.1	1,445.6	2,410.0	2,661.0	87.1
2. Maintenance and Repair	30.4	3.2	55.0	86.9	93.9	3.1
3. Administration and Selling	44.5	4.7	82.0	140.5	156.1	5.1
4. Depreciation	25.5	2.7	76.0	110.1	110.1	3.6
5. Others	2.9	0.3	7.6	30.0	32.3	1.1
Total	950.5	100.0	1,666.2	2,777.5	3,053.4	100.0

1/ At present imported components for the standard 533-558 models amount to about 4% of material cost compared to 45% for the 575/585 models (Annex 6-7).

6.07 IMT's supply and operating cost situation is not expected to be substantially affected by the current energy shortage. Yugoslavia's power stations rely primarily on domestic natural gas and lignite and hydropower. In addition Yugoslavia imports 3.0 million tons per year of oil (approximately 25% of total consumption) from the USSR. As to potential direct and indirect cost increases, the Company should be in a good position to absorb such increases, since (i) energy costs amount to only 3% of IMT's operating costs, and (ii) nearly 90% of IMT's raw materials and finished products are obtained from and sold to local suppliers and customers.

6.08 Because the project would expand in-house machining and implements production capacity the Company's value added is expected to increase from 22% in 1972 to 27% in 1977. Unit costs for the standard tractor models (IMT 533/558) are estimated to go up by 28% during 1972-77, which is equivalent to a 3% cost decrease in constant prices. Economies of scale in the manufacture of tractors accrue mainly in the production of components. Therefore, by expanding its tractor production capacity from 15,000 units to 35,000 units per year, IMT is unlikely to reduce its operating cost in real terms by more than 3-5% during the first 5 years after project completion, because (i) IMT will continue primarily to machine and assemble components produced by suppliers that account for nearly 90% of material cost; (ii) administration and selling expenses per unit will remain at the present level, since IMT has to strengthen its marketing, development and production scheduling activities; and (iii) the profit margin for the new 20-25 hp and over 100 hp models will be in the 2-5% range as compared to approximately 10% for the standard models (Annex 6-3). The Company realizes that the profit margins for the newly introduced models will be less than for the standard type. The reason for IMT's producing both 20-25 hp tractors and above 100 hp units is prompted by the Company's goal to establish itself in all segments of the tractor market so as to be in a position to react rapidly to changed in demand by the farmers.

VII. FINANCIAL ANALYSIS

A. Future Profitability

7.01 Detailed income and cash flow forecasts through 1983 are shown in Annexes 7-1 and 7-2, and selected items are summarized below:

Selected Profitability Indicators
(Din million)

	1972 (actual)	1973	1975	1976	1977	1979	1981
Net Sales	1,031	1,285	1,781	3,045	3,419	3,769	4,076
Operating Profit	81	93	115	268	366	307	223
Net Income After Taxes:	73	79	95	129	231	192	151
% of net sales	7	6	5	4	7	5	4
% of average equity	18	17	15	17	25	14	9
Cash Generation	61	92	136	195	283	246	217

7.02 IMT's net income which was Din 73.3 million in 1972 was expected to rise to Din 78.6 million in 1973; the increase of depreciation charges due to the completion of the interim expansion (12,000 tractors to about 15,000 tractors/ year) was offset by additional sales proceeds. As a result of the project, net income is projected to go up to Din 129.3 million in 1976 and reach Din 231.3 million in 1977. The fact that net income increases less rapidly than sales after the start-up of the project in late 1975 and even declines after 1977 in absolute terms is due to (i) the higher escalation rates assumed for production cost inputs as compared to selling prices, and (ii) the 10% increase of depreciation charges in 1980 after the completion of the Phase II expansion (para 4.02), which would not result in notable capacity increases or cost reduction. Since a major portion of net income after taxes will be needed to help finance the project, agreement was reached during negotiations that the Company will - until the project is completed - distribute income to its workers only to the extent that annual depreciation plus allocations to the Business Fund during that period would cover the requirements of the project.

B. Financial Position

7.03 Balance sheet projections for 1973-1983 are contained in Annex 7-3 and significant indicators given below. For comparison purposes, IMT's income statements and balance sheet projections without the proposed expansion are given in Annexes 7-1 and 7-3 respectively.

Selected Indicators of Financial Position
(Din million)

	1972 (actual)	1973	1975	1976	1977	1979	1981
Current Assets	402	432	652	968	1,022	1,057	1,241
Current Liabilities	168	118	284	369	358	416	412
Net Working Capital	234	314	368	599	664	641	829
Long-Term Debt	81	171	877	903	802	611	434
Equity	426	504	677	806	1,038	1,435	1,739
Current Ratio	2.4:1	3.7:1	2.3:1	2.6:1	2.9:1	2.5:1	3.0:1
Debt/Equity Ratio	16:84	25:75	56:44	53:47	44:56	30:70	20:80

7.04 The Company's long-term debt/equity ratio, which was satisfactory in 1972, is expected to rise during project implementation to a maximum of 56:44 in 1975. Thereafter, as full production is reached following completion of the expansion, repayment of loans causes steady improvements in the debt/equity ratio and, by 1981, IMT will have only 20% in debt. This projected ratio is based on the assumption that the Company by 1978/79 will have proceeded with implementation of Phase II and that there will be no income distribution to the workers in excess of the 12.3% annual increase in earnings per employee until 1978 and 8% thereafter.

7.05 The Company's liquidity position remains satisfactory throughout the life of the project. As is the normal practice in Yugoslavia, net profits in excess of the funds required for the project or for operations would be distributed to the workers. In order to maintain the Company's sound financial position, agreement was reached during negotiations that IMT will not, without the prior consent of the Bank, (i) distribute and/or make cash outlays other than for normal operations if the current ratio were to fall below 1.3:1 in any year after such income distribution and/or cash outlay; (ii) undertake, until the completion of Phase II, additional capital investments in excess of Din 50 million equivalent in any one year other than for the project and Phase II; and (iii) incur, until the completion of Phase II, any indebtedness in excess of Din 50 million equivalent in any one year other than for the project. In addition, it was agreed, that, after the completion of Phase II, IMT will not undertake any investment or assume any indebtedness in amounts exceeding in any one calendar year Din 120 million equivalent without prior consultation with the Bank.

C. Financial Rate of Return and Major Risks

7.06 The project provides an incremental financial rate of return of 21.0% at real prices. Detailed assumptions for the calculation and the incremental cost/benefit streams are given in Annex 7-4.

7.07 An analysis has been carried out to determine the sensitivity of the projected rate of return to various changes in basic assumptions. The results of the sensitivity analysis are shown in Annex 7-4 and summarized below:

Sensitivity Test on Financial Rate of Return

Case	Description	Rate of Return (%)
1	Base Case	21.0
2	Six Months Delay in Project Completion	17.3
3	Capital Cost Increase 10%	18.3
4	Operating Cost Increase 10%	3.1
5	Sales Revenue Decrease 10%	-1.6

7.08 The sentivity tests indicate the type of financial risk associated with investments in assembly operations such as IMT: (i) the project is not capital intensive, so that a capital cost increase of 10% results only in a drop of the rate of return to 18.3%, (ii) the return, on the other hand, is extremely sensitive to changes in operating costs and sales revenues. If operating costs were to increase by 10%, which could mean either a 12.5% increase of material cost or a 50% increase of labor cost, the rate of return would drop to 3.1%. However, the probability of a significant cost increase for materials and parts without at least partially offsetting price increases of IMT products is low.

7.09 If revenues drop by 10%, ceteris paribus, the return would become negative. Such a case is also very unlikely to happen since, as mentioned above, there is a direct correlation between tractor and component prices. A revenue drop of 10% would be likely only if accompanied by a drop in materials and parts prices, which would go a long way towards restoring the financial rate of return to at least 10-12%. If, however, the drop in sales revenue was caused by a slackening of demand and a consequent reduction in sales volume, the Company would cut back its production of tractors and implements. Since variable costs account for over 70% of total operating costs, a reduction in output to 90% of rated capacity would not decrease the financial rate of return below 10%. Clearly, the financial risk of the project depends to a high degree on IMT's management, especially its ability to control operating costs, react to shifts of demand and maintain the leverage to pass on cost increases to consumers under competitive conditions. The financial risk of the project is acceptable in view of the Company's satisfactory management (Annex 2-1) and favorable cost structure compared to international standards (para 6.08 and Annex 6-2).

D. Debt Service Coverage

7.10 The long-term debt service coverage based on the above financial projections and the proposed financing plan is adequate. It falls to a low of 1.9 times covered in 1979, because of the high repayment obligation for medium and long-term loans during those years. The subsequent rise of the debt-service coverage is offset by decreasing net income.

Debt-Service Coverage Projections

	1974	1975	1976	1977 /1	1979	1980	1981
Times Covered	2.4	2.5	2.0	2.0	1.9	2.0	2.1

/1 First year of repayment of Bank loan.

7.11 In addition to traditional debt-service coverage, IMT is required, according to Yugoslav regulations, to generate sufficient foreign exchange in convertible currencies to service its convertible currency debt. Funds available to the Company up to 1983 and IMT's convertible currency requirements for interest and amortization are shown in Annex 7-5. Analysis indicates that there would be sufficient accumulated funds to meet projected needs, but hard currency funds generated by the Company in 1975 and 1978 barely match those years' requirements. The Belgrade Bank agreed during negotiations that it will make foreign exchange funds available to the Company to the extent that the convertible currency generated by IMT through retention and depreciation quotas is insufficient to meet the Company's convertible currency debt service obligations.

E. Break-even Points

7.12 In 1978, the first full year of repayment of the Bank loan, the profit break-even point would be about 80% of the Company's production

program, which is equivalent to 28,175 tractors and a proportionate mix of accessories, implements and parts. The cash break-even point in 1978 will be slightly lower than the profit break-even point in that year, since annual depreciation is higher than debt repayment. Further details on break-even are given in Annex 7-6.

F. Auditing Requirements

7.13 The Company's accounting system follows Yugoslav regulations and procedures for accounting and economic/financial indicators. The accounts of Yugoslav enterprises are reviewed annually by the Social Accounting Service (SAS). The review primarily ensures that the enterprises' financial transactions comply with Yugoslav law, but does not represent an audit in the normal sense nor does SAS provide a report on the accounts. SAS has initiated a training program under which its staff will be trained by Coopers & Lybrand of the U.K. in auditing methods consistent with Bank requirements. During negotiations it was agreed that the Company will invite SAS to undertake an annual audit of its 1974 and 1975 accounts as part of SAS's on-the-job training program in collaboration with Coopers & Lybrand. In the event that SAS is not, thereafter, able to achieve a consistent and satisfactory standard of auditing, IMT would retain, if the Bank so requested, an experienced independent auditing firm.

VIII. ECONOMIC JUSTIFICATION

A. Economic Rate of Return

8.01 Economic projections have been made in real value terms and are given in Annex 8-1. Costs have been based on the financial estimates with adjustments for taxes and duties. In view of the present and projected economic situation in Yugoslavia, no shadow pricing of labor and foreign exchange rates has been employed. The calculation of sales revenues takes into account import prices (excluding taxes and duties) of comparable tractors and agricultural implements. The incremental economic rate of return for the project is about 16% in real terms. Economic sensitivity tests are illustrated in Annex 8-1. Because of the lower level of economic operating cost and benefits the economic rate of return is slightly less sensitive to operating and sales revenue changes than the financial rate of return. A 10% increase in capital cost lowers the economic return to 12.2%; a combination of 10% higher capital costs and 10% higher operating costs would reduce the return to 0.8% and a 10% loss in sales revenues would result in a negative economic rate of return. Nevertheless, the probability of operating cost changes without counteracting revenue changes is low, so that under foreseeable circumstances the economic rate of return is likely to be in the 8-15% range.

B. Farm Mechanization and Agricultural Development

8.02 During the past decade agricultural development in Yugoslavia was disappointing (Annex 3): (i) total crop production fluctuated without regaining the high 1961 level; and (ii) the agricultural trade surplus dropped

continually during the sixties when Yugoslavia had to import large quantities of food grain and feed for livestock. Furthermore, the Yugoslav agricultural situation was aggravated by the loss of farm labor, since an estimated 500,000 people from rural areas migrated to Western Europe.

8.03 To reduce the need for imports and increase agricultural output and productivity, the Republics and Autonomous Provinces have recently concluded an Agreement for the Development of Agriculture, "Green Plan". The Plan stresses farm mechanization and modern agricultural methods as a means to achieving greater productivity both in the social and private sectors.

8.04 The IMT expansion project is important for the smooth implementation of the "Green Plan". It will permit an increase in import substitution for tractors and agricultural implements, which minimizes the cost to the farmer and the economy as a whole. In addition, the Company has an established sales and services network (Map IBRD 10716), which can facilitate the channeling of credit. If the demand for new tractors were met entirely from imports, this would not only result in a substantial drain of foreign exchange to the economy, but would also continue the proliferation of types and makes of imported tractors and agricultural implements. This, in turn, would make the provision of adequate service facilities more difficult.

C. Employment Effects

8.05 As detailed in Annex 4-3, the project creates directly 1,440 jobs at an investment cost of US$36,000 per employee which compares favorably with about US$60,000 per employee in similar factories in the U.S. and Western Europe. The Company selected relatively labor-intensive production methods for the project, since Yugoslav enterprises have a substantial comparative labor cost advantage. For example, at present the average wage rate per man-hour in IMT is US$0.70 as compared with US$3.50 in the Federal Republic of Germany.

8.06 In addition to the direct creation of new employment, the project has backward and forward linkages which contribute significantly to Yugoslav employment. As for forward linkages, rapid farm mechanization can maintain sustained agricultural growth in the face of the diminishing agricultural labor force, and will cause tractor dealers and service stations to recruit additional personnel. In regard to existing backward linkages expansion of an assembly-type operation such as IMT is characterized by growth and employment stimulating effects on suppliers and sub-suppliers. Furthermore, the Company intends to procure locally nearly 95% of its requirement of raw material, parts and supplies after project completion thus concentrating indirect employment creation almost exclusively in Yugoslavia.

D. Foreign Exchange Effect

8.07 Faced with the mounting debt service obligations on short and medium-term suppliers' credits, and an increasing gap in the balance of trade, Yugoslavia has a critical need to raise its foreign exchange earnings from exports. The direct net foreign exchange earnings of the project are given in Annex 8-2. They are estimated to amount to Din 1,728 million

(US$111 million) over the 1973-1983 period or an average of US$10 million a year. The annual figure implies that the foreign exchange component of capital investment in the project, US$24.6 million, will be covered in about 2-1/2 years of operation. Furthermore, the Yugoslav economy realizes considerable foreign exchange savings. If IMT were not to expand, the incremental domestic demand for tractors would have to be met from imports. Foreign exchange savings for 1977 have been estimated at Din 340 million (US$22 million), so that the total net foreign exchange effect in that year would amount to Din 505 million (US32.6 million).

IX. AGREEMENTS REACHED DURING NEGOTIATIONS

9.01 During negotiations the following assurances and agreements were reached with the Yugoslav Government, the Belgrade Bank and the Company.

A. The Belgrade Bank will, on terms and conditions satisfactory to the Bank:

(1) provide a project completion and overrun guarantee (para 5.08);

(2) make foreign exchange funds available to the Company in the event the latter's foreign exchange funds are not sufficient to cover its obligations (para 7.11);

(3) guarantee local suppliers' and bilateral credits on terms and conditions satisfactory to the Bank (para 5.07).

B. IMT will:

(1) introduce and maintain appropriate industrial safety practices (para 2.10);

(2) submit to the Bank by mid-1975 a 5-year program for financing sales of IMT tractors and agricultural implements, which would support IMT's production program in the long-run, and provide information on ways and means of channeling the required funds to private farmers as well as the social sector (para 3.16);

(3) submit to the Bank by mid-1975 a 5-year program for the expansion of its local and export marketing and servicing organization (para 3.23);

(4) provide information on a regular basis on the status of product development of the 20-25 hp tractor and the above 100 hp tractor (para 4.05);

(5) allocate adequate internally generated funds for the project (para 7.02);

(6) observe certain financial covenants to maintain a sound financial position (para 7.05);

(7) arrange for an external audit (as specified in para 7.13).

9.02 Based on the foregoing commitments and agreements, the project provides a sound basis for a loan to IMT of US$18.5 million equivalent for 14 years, including a 3-year grace period.

Industrial Projects Department
January 28, 1974

YUGOSLAVIA - IMT FACTORY TRACTOR EXPANSION PROJECT

DESCRIPTION OF TECHNICAL TERMS

CKD Tractor	Completely knocked down tractor for export and assembly in an overseas tractor assembly shop.
Disc Harrow	A disc harrow is a tractor attachment designed for primary tillage and preparation of a field in readiness for planting and seeding. It consists of a series of hardened steel discs, that may be conical and angled in relation to the direction of travel, attached to a steel frame which is hitched to the tractor.
Full Cycle Time	Total time required for the completion of an operation, including machining time as well as material handling and machine setting time.
Heat Treatment and Surface Protection	Thermal and/or chemical treatment of metal parts to secure desired hardness.
Motorcultivator	A power driven tiller used for soil tillage and for planting, bed shaping, chemical incorporation or cultivating for row crops.
PKD Tractor	Partly knocked down tractor.
Rotavator	A rotary tillage machine working the soil through the medium of blades mounted on a flanged rotor. The machine may be mounted or trailed behind a tractor.
Scaffolding	Tubular poles and couplings which can be assembled to provide a temporary platform for workmen, such as bricklayers and painters, to stand on when working at a height above ground.
Seed Drill	A seed drill is a tractor attachment designed to plant seed at precise spacing and predetermined depth. It consists of a container with openers in the bottom feeding press drills, which meter and place the seed in the required position.

Stroke	Output frequency; i.e., 26 strokes for the assembly of a tractor model means that every 2.6 minutes an assembled tractor leaves the assembly line.
Transfer Machine	An automated complex machine capable of doing machining as well as machine setting up and inspection operations.
Trumpet	A bell-shaped, machined casting which houses the rear axle.

Industrial Projects Department
November 1973

YUGOSLAVIA - IMT TRACTOR EXPANSION PROJECT

DESCRIPTION OF EXISTING FACILITIES

1. IMT's existing facilities are:

a) the main production unit "IMT Tractor and Agricultural Machinery Factory"; located in the new industrial area of Belgrade (population 1.2 million) about 12 km from the city center. The total labor force of 2,900 produces tractors, tractor implements, accessories and spare parts (for detailed production program see Annex 2-3).

b) "FMK-Motorcultivator and Agricultural Machinery Factory, Knjazevac"; located on the outskirts of Knjazevac, Serbia, about 280 km southeast of Belgrade and 40 km from Zajecar near the Yugoslav-Bulgarian border (see Section B below and Map IBRD 10716);

c) the IMT Service Center--Dobanovci; located in Dobanovci about 15 km northwest of Belgrade and conveniently linked to its service area by highway and rail (See Section C below and Map IBRD 10716.

A. IMT Factory Belgrade

2. According to new zoning regulations dated January 1, 1973, IMT's total property in Belgrade (168,500 m^2) has been earmarked as an industrial area. About 100 families have been living in small houses on the plant site. They will be relocated and the houses dismantled as soon as feasible.

3. IMT's production processes focus on machining operations, heat treatment, painting and assembly. Castings, forgings, stampings, electrical equipment, hydraulic accessories, tires, hardware and other components are supplied by local and foreign sub-contractors. Consequently, the plant consists of three main production units--the tractor parts machine shop, the tractor assembly shop and the implements production shop--which are located in separate buildings, as shown in the plant layout (Annex 4-2). The existing principal facilities of the IMT Belgrade factory include:

a) the main building (18,000 m^2); constructed in 1954 and housing the tractor parts machine shop (9,800m^2), the tractor assembly shop (5,665 m^2), storage areas, the cafeteria and offices for the sales and services, production planning & inventory control departments.

b) the implements production shop (7,480 m^2); located on FOB's property and which has to be dismantled by 1975 to make room for FOB's expansion.

c) several small single storey; houses built during 1940-1948 and covering about 8,130 m^2, with offices for the industrial engineering, finance, personnel and development departments.

d) 8 separated sheds (7,879 m^2); without heating and technical equipment, for the storage of raw material and components, and an open storage area for finished goods.

e) the annex building(8,641 m^2); housing the maintenance shop, laboratory, social services and instruction room and garage.

To achieve the current production target of 15,850 tractors/year, the heat treatment installation is operated on a 3-shift basis, whereas all other production facilities operate on 2 - 2-1/2 shifts per day.

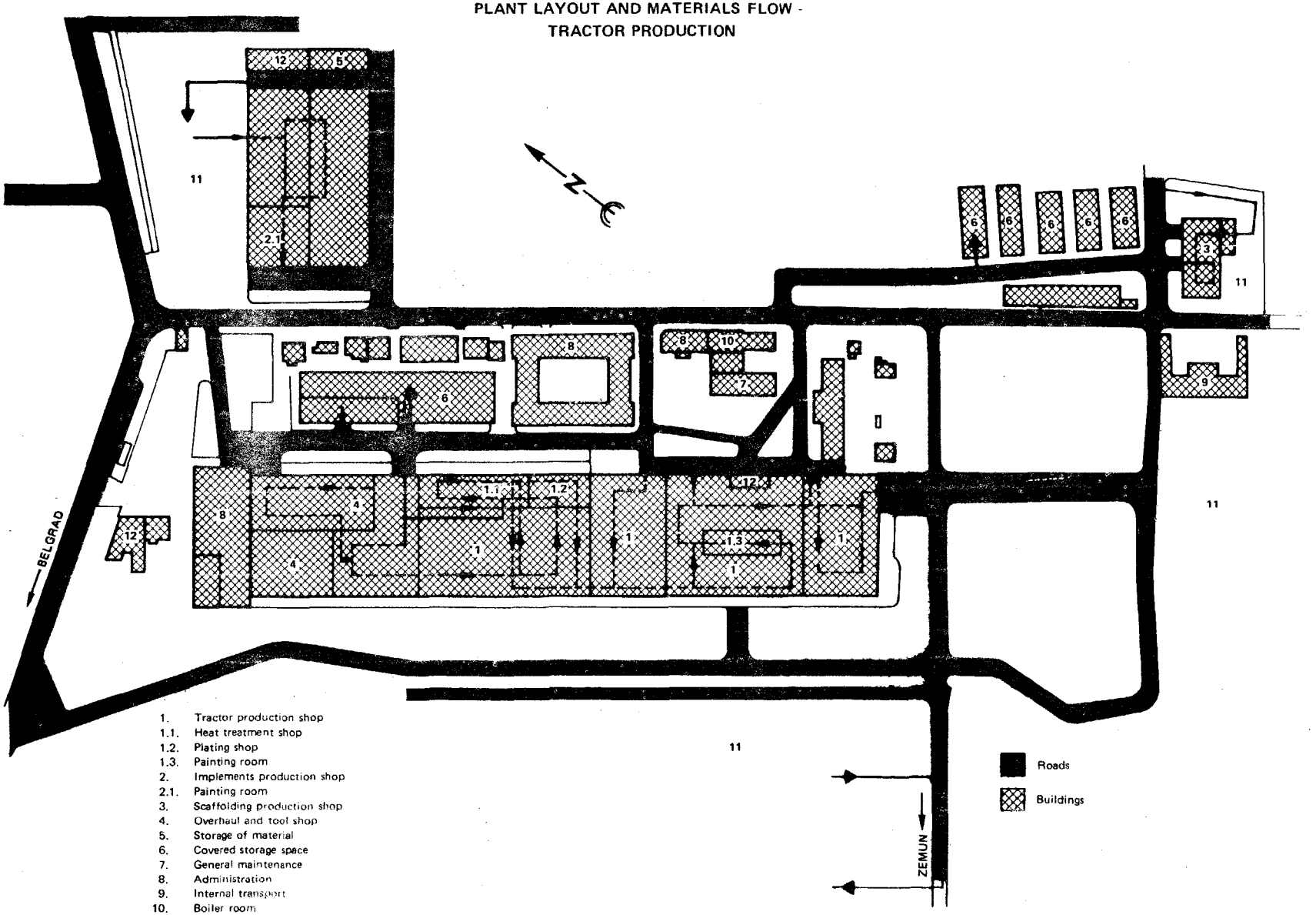
Tractor Parts Machine Shop

4. The machine shop is divided into heavy and light machine sections, the tool room, the heat treatment installation and surface protection facilities. Machining of hydraulic pump components is handled in an attached annex building. Heat treatment and surface protection facilities are used for tractor parts as well as implement parts.

5. Machining is carried out by 333 machine tools of which 65 are high-productivity machines and 68 are obsolete. Because of lack of space and machine tools the operations are arranged in 21 lines. This leads to machining of technically dissimilar parts on the same line and so results in increased machining and set-up time. During the 1972 production capacity expansion from 12,000 to 15,000 tractors/year, new machine tools (worth Din 43 million) were installed. However, the floor area was increased by only 720 m^2, aggravating the already overcrowded conditions in the machine shop.

6. Trumpet Housing Machining. After loading and transporting of the components on roller conveyors from the transit store to the machine shop, the operation consists of (a) rough machining of flanges and bores, i.e., the final machining of bores, and (b) drilling of flange holes on two way multi-spindle radial drills. This system requires 10 machines, 7 workers and 8 minutes machine time/trumpet housing, which is inefficient. A transfer line for trumpet housing machining can decrease the required machining time to 5.2 minutes/trumpet housing, including inspection, and will be installed in the project.

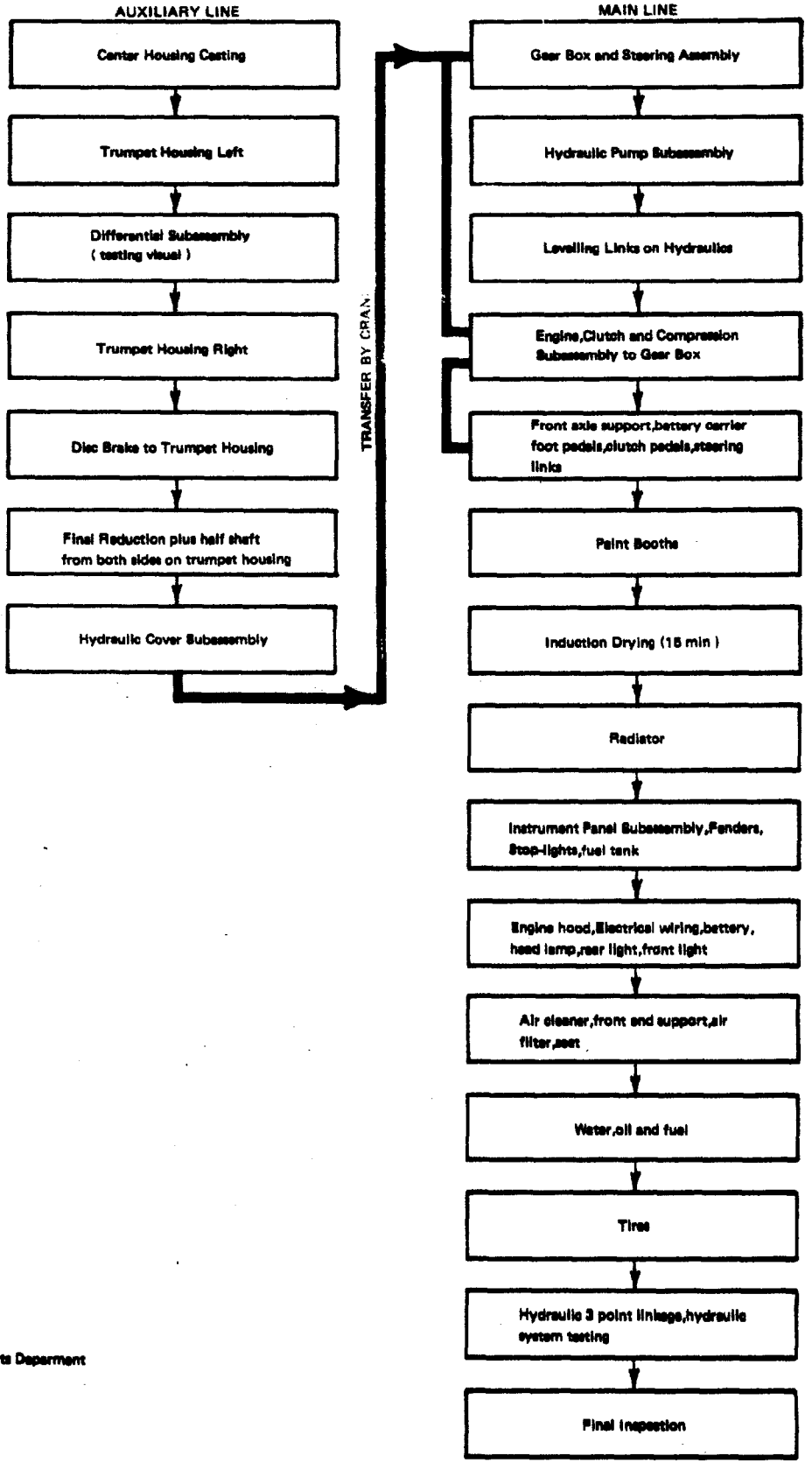
YUGOSLAVIA - IMT EXPANSION PROJECT
PLANT LAYOUT AND MATERIALS FLOW - TRACTOR PRODUCTION



1. Tractor production shop
1.1. Heat treatment shop
1.2. Plating shop
1.3. Painting room
2. Implements production shop
2.1. Painting room
3. Scaffolding production shop
4. Overhaul and tool shop
5. Storage of material
6. Covered storage space
7. General maintenance
8. Administration
9. Internal transport
10. Boiler room
11. Open storage space
12. Workers' restaurant

World Bank—8006

YUGOSLAVIA– IMT TRACTOR EXPANSION PROJECT
Flow Chart of IMT Tractor Assembly System- (1973,15,000 Tractor / Year)



Industrial Projects Department
September 1973

7. Heat treatment of tractor and implement parts requires carburation, nitriding, induction hardening, straight hardening and washing. In 1972, a new Degussa carburation furnace and ignition hardening equipment were installed, resulting in the following capacities for the existing heat treatment facilities:

	tons/year
Gas Carburation	
--Degussa	600
-- Chambered furnaces	1,000
Ignition Hardening	300
Nitriding	80
Direct quenching	1,500
Rotating furnaces and quenching presses	1,100
Induction Hardening	500
Sand blasting	2,800
Annealing	2,500
Salt Baths	600

This capacity will be insufficient for IMT's production volume after implementation of the proposed project. The facilities will then remain at the present site and be used for treatment of implement parts only.

8. Observations. The production bay has been repaired many times, the roof leaks, heating and electrical lighting are insufficient and inadequate ventilation in the heat treatment area creates unhealthy conditions. Besides bad working conditions the major production bottlenecks are (a) lack of space for storing parts before and during machining and (b) overcrowded arrangements of the machine lines. Machined parts pile up in the working and transport areas and impede the production flow.

Equally, for lack of space, a number of heavy machines have had to be installed in the light machine area, resulting in increased machine and components movement. In addition, the nickel and chrome plating sections are overloaded for the present production capacity.

The facilities of the tractor parts machine shop, including floor space, machine tools, inside and outside storage, are presently being used to the maximum extent and do not allow any further increase of production without expansion.

Tractor Assembly Shop

9. The tractor assembly shop located in the main production bay consists of two paint and drying shops, the main assembly line and six subassembly lines. The flow chart in this Annex shows the present assembly system for an annual production of 15,000 tractors. The assembly line produces one IMT-533 tractor every seven minutes.

10. Observations. Although the assembly procedure is acceptable for a 15,000 units/year tractor production, the present facilities have been stretched to a maximum and it will not be possible to achieve any significant increase in the present production volume. The major bottleneck is inadequate internal transport of tractor parts and the lack of a proper conveyor system between the auxiliary and main lines also: (a) Storage space for production components is lacking, as sheet metal components are transferred by overhead conveyor lines; (b) There is insufficient space for subassembly lines, inefficient placing of tools and no systematic feeding of sub-assemblies through conveyors to the main line. Conditons particularly in the paint shop, do not meet minimum health standards: (a) the paint booths have no fluid curtain (water fall) system for absorption of spray and possible recycling of paint and (b) there is no airconditioned, dust-proofed cabin for the hydraulic pump and system.

Tractor Attachment and Implement Production Shop

11. Tractor implements and accessories are produced in the temporary production bay (7,480 m^2) on FOB's property. For heat treatment, surface protection and painting the facilities in the main production building are used. The implement shop is crowded and lack of space impedes a more productive work organization and higher productivity. To achieve an increased production volume a reorganization of the material flow and assembly lines of all implement types as well as additional floor space and equipment are mandatory.

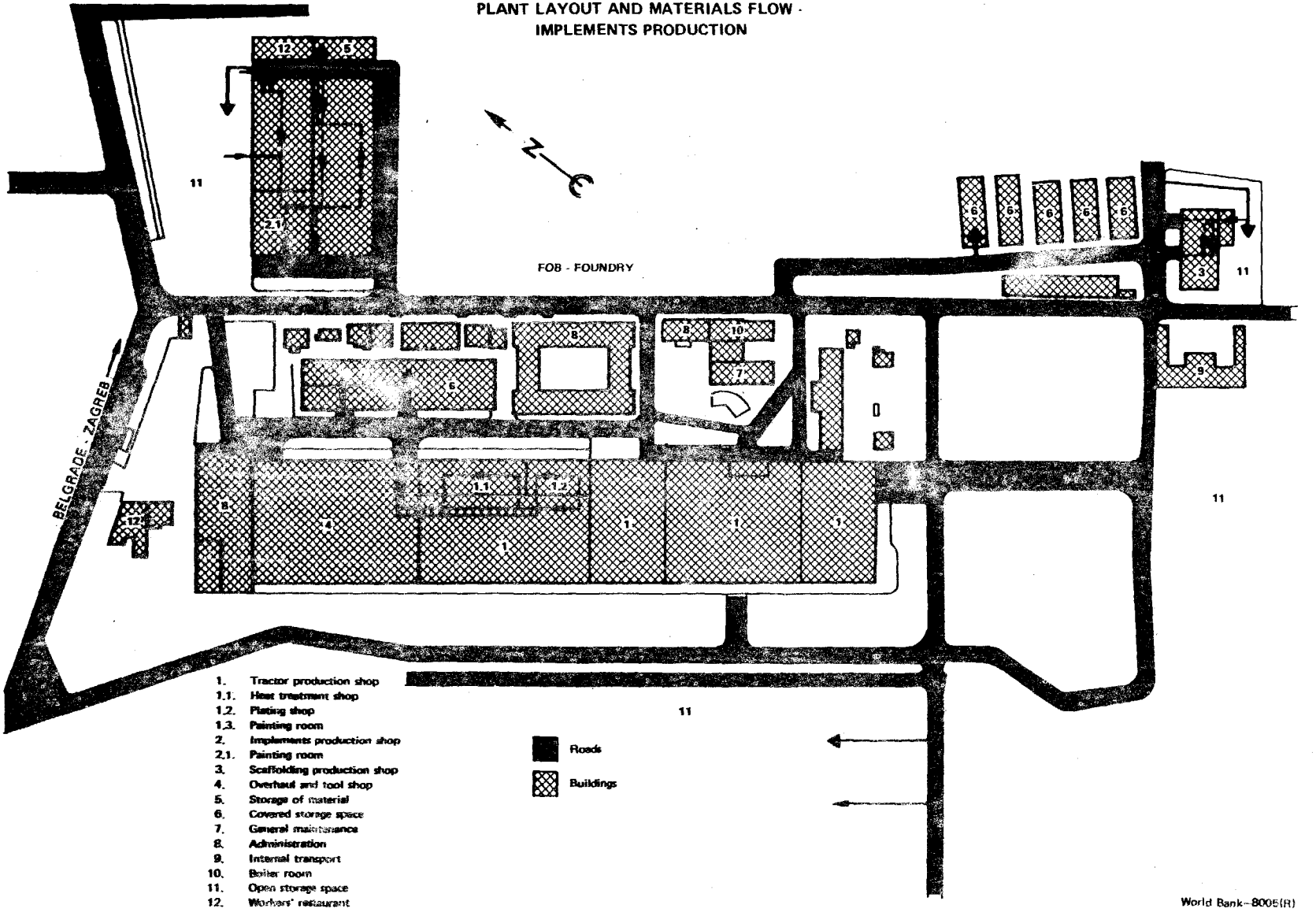
Quality Control

12. The present quality control systems consist of (a) inspection of purchased raw materials and supplies by sampling, (b) control of 5 products from 20 work places per hour and (c) final inspection. The material flow of the existing assembly shops does not allow adequate quality control and will be improved under the project. IMT owns machanical, physical, metallographic testing equipment which is located in FOB's laboratory. The project includes additional quality control and testing equipment which will be needed for the increased production volume.

Scaffolding Production

13. The Scaffolding is produced partly in the implement production shop and partly in a separate building adjacent to the storage sheds. After project implementation the implement production shop will be dismantled, restricting scaffolding production to one building. Since no increase of scaffolding output is planned for 1976 the project does not envisage any extension of the production facilities.

YUGOSLAVIA - IMT EXPANSION PROJECT
PLANT LAYOUT AND MATERIALS FLOW - IMPLEMENTS PRODUCTION



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Storage and Other Facilities

14. The existing storage facilities for raw materials and parts are scattered over the property, consisting of an old building adjacent to the tractor production shop and several small wooden sheds. For lack of space, deliveries of raw material and parts are dumped on internal roads, are piled up in front of entrances to and between various buildings restricting the transport on the factory site and requiring extensive cleaning before machining and assembling.

15. The existing general service facilities (locker-rooms, toilets, cafeteria, meeting rooms, parking, etc.) and offices were planned and built for a total labor force of 2,000. With regard to the present IMT labor force of 2,900 men, these facilities are grossly inadequate and contribute to substandard working conditions in the plant and office areas.

Utilities

16. For details of existing and planned facilities, see Annex 4-1, para. 22-27.

B. FMK - Knjazevac

16. FMK - Motorcultivator and Agricultural Machinery Factory in Knjazevac employs about 450 people and produces motorcultivators in the 5-9 hp range, a 2-axle (18.5 hp) tractor and a variety of implements under license from the West German Company "AGRIA WERKE" (for detailed production program see Annex 2-3, para. 4).

17. In 1971 IMT began an expansion of the existing facilities of FMK investing Din 41.2 million in fixed assets. Building construction and erection of new machines are scheduled to be completed by December 1973 and will increase FMK's capacity of motor cultivators, small tractors and the required number of implements.

18. The factory located on a 13,000 m^2 site consists of a 6,400 m^2 production shop, an open storage area for raw materials and parts, adequate restaurant, office and services areas, a garage and ambulance annex, covered finished goods store (1,000 m^2), boiler and transformer station and special storage facilities for storage of inflammable liquids. After completion of the project facilities at FMK will be adequate and are not expected to require any additional investment during the eighties.

C. IMT Service Center-Dobanovci

19. The service center in Dobanovci was founded in 1954 and merged with IMT in 1956. The service and repair facilities were expanded during the 1966-1968 period and presently employ about 170 people. The production program includes:

a) industrial overhaul of tractors (1,500 units/year), engines (5,000 units/year) and motor vehicles (120,000 cars/year);

b) service of IMT tractors, IMR engines, DPA and fuel pumps (IPM, CAB, BOSCH) as well as TAM and FAP cars during and after the warranty period; and

c) sale of spare parts and repaired tractors.

Industrial Projects Department
September 1973

YUGOSLAVIA - IMT TRACTOR EXPANSION PROJECT

ORGANIZATIONAL AND MANAGERIAL STRUCTURE

A. IMT - UMI Relationship

1. Industrija Masina I Traktora (IMT) is approximately the fiftieth largest industrial company is Yugoslavia. In 1970 IMT, together with six other metal manufacturing and processing enterprises located near Belgrade, formed the Associated Metal Industry (Udrverna Metalska Industrija-UMI), which is now the 15th largest industrial group in Yugoslavia.

The following companies are members of the UMI group: (a) Iron Foundry "FOB", Belgrade; (b) Diesel Engine Factory "IMR", Rakovica; (c) Vehicle and Vehicle Parts Factory, "Ikarus", Zemun; (d) Agricultural Machinery Industry, "Zmaj", Zemun; (e) Automobile Engine Factory "DMB", Rakovica; (f) Manufacturer of Precision Instruments "IPM", Belgrade; and (g) "IMT".

2. UMI's main management body is the Workers' Council which includes representatives of the seven member enterprises. The Workers' Council guides and coordinates the activities of the member companies, while a General Manager is in charge of day-to-day operations.

A special committee formed by UMI's Workers' Council selects the General Manager from candidates proposed by the Workers' Councils of the member enterprises. An Executive Board assists the General Manager in drafting the development and work programs of UMI and determining the use of UMI funds. At present, the administrative staff consists additionally of a secretariat, a planning division, a development division and a division for financial analysis which prepare long-term, medium-term and yearly plans for UMI member companies.

3. UMI's operations are financed, inter alia, by Joint Reserve Funds and Joint Development Funds created by contributions of member companies. In 1970 each firm contributed a certain percentage of its net income to the Joint Reserve Fund and 0.3% of the 1969 Business Fund to the Joint Development Fund. However, subsequent annual payments have varied according to the rates specified in UMI's annual economic plan. The Joint Reserve Fund provides interest-free loans in order to help cover losses incurred by member companies. The main objectives of the Joint Development Fund, on the other hand, are to organize cooperative programs of research and development, conduct market studies, and set up joint sales offices for the UMI group. This Fund could also be used to provide interest-free loans to member firms for expansion and development.

4. Currently, all annual investments by member companies of more than one million Dinars require prior approval from UMI. Future developments will show if this provision hinders the progress of orderly expansion or whether, in contrast, it coordinates and facilitates common as well as individual expansion plans.

B. IMT - Self-Management Organization

5. The IMT enterprise consists of four entities which joined together under a self-management agreement in March 1973. These are:

(i) the Tractor and Agricultural Implements Factory, New-Belgrade;

(ii) the Workers' Restaurant, New-Belgrade;

(iii) the Motorcultivator and Agricultural Implements Factory, Knjazevac;

(iv) Service and Repair Center, Dobanovci.

The General Services Departments of the Tractor and Agricultural Implements Factory, i.e., the Financial, Sales and Services, Development and Personnel Departments, are in charge of the relevant activities in all four entities. After completion of IMT's expansion project, it is planned to separate the Tractor and Agricultural Implements Factory and establish two separate bodies for Tractor Production and for Implements Production.

6. As is common in Yugoslavia, IMT is managed internally by its workers. Through this system workers participate both directly and indirectly in decision making. The major organizational units for direct participation are the Labor Units and the Workers' Assembly, whereas indirect participation is guaranteed by the Workers' Councils and by the General Manager.

7. Labor Units and Labor Units Council

Labor Units are departmental and functional units within the enterprise. They have the right to determine the distribution of personal income within the unit and sanction the unit's production targets. The chief of every Labor Unit, as well as other directly elected members, form the Labor Units Council which pays particular attention to work incentives, productivity improvement and social standards. The Labor Units Council is led by a President and Vice-President elected by its members. In case of dispute among the Labor Units, an arbitration commission is appointed whose decision is final.

8. Workers' Assembly

The Labor Units Council is responsible to the Workers' Assembly of the relevant IMT entity, in which the employees participate directly in

making decisions on key issues. This Assembly can be convened any time on the initiative of at least one tenth of all workers.

9. Workers' Council

In the organizational framework of the Yugoslav self-management system, the Workers' Council is the most important management body. The Workers' Council of IMT has 45 members, elected proportionately from IMT's four entities. Each year, half the Council members are replaced by newly-elected members who serve a two-year term. Nobody can be elected to the Council for two consecutive terms. The Council determines the Company's policy by approving major investments, the annual investment plan and the appropriation of net income. In addition, its responsibilities include: (a) coordination of IMT's development plans with those of the UMI group, (b) decisions on business loans to UMI members, (c) organization of referenda to decide key issues such as mergers, integration and technical cooperation with other enterprises, change of location, and change of name, and (d) election and dismissal of members of executive bodies, commissions to deal with specific issues. The Workers' Council of IMT also forms special committees such as the Immunity Commission, the Committees for Production Problems, for Commercial-Economic Problems, and for Organizational-Judicial Problems.

10. General Manager

The General Manager, as well as his deputy, are elected by the Workers' Council on the basis of a publicly-announced open competition. Election is for a four-year term with the possibility of re-election. The Council sets up a committee to consider all applications and make recommendations. Based on these recommendations, the Council elects the candidates who are considered to be the best qualified. Minimum requirements for the position of IMT's General Manager are (a) a university degree and six years management experience, (b) a high school education combined with 12 years of experience in management.

11. The General Manager is independent in his day-to-day operations and is responsible only to the Workers' Council. However, he can overrule the decision of the Workers' Council only if its decision conflicts with Yugoslav law. Any elected company official, and in particular the General Manager and his deputy, can be relieved of their duties before the expiration of their term if they have lost the confidence of the Workers' Council.

12. IMT's General Manager is assisted in his function by his deputy, two Advisors, and the Collegium. The General Manager may also appoint an Expert Council consisting of Company or outside experts if special problems arise on which he seeks advice. The Collegium consists of IMT's General Manager, his deputy, the Plant Managers of the four IMT entities and the Directors of all departments of the Tractor and Agricultural Implements Factory, New-Belgrade. They meet regularly once a week to discuss operational problems.

C. Management

13. The present General Manager of IMT is Radosilav Radovic, 42, a mechanical engineering graduate of the University of Belgrade. He joined IMT in 1950 and, prior to his selection as General Manager in June 1971, has worked in various positions, including plant engineer, assembly line manager, chief of production preparation and Director of tractor production.

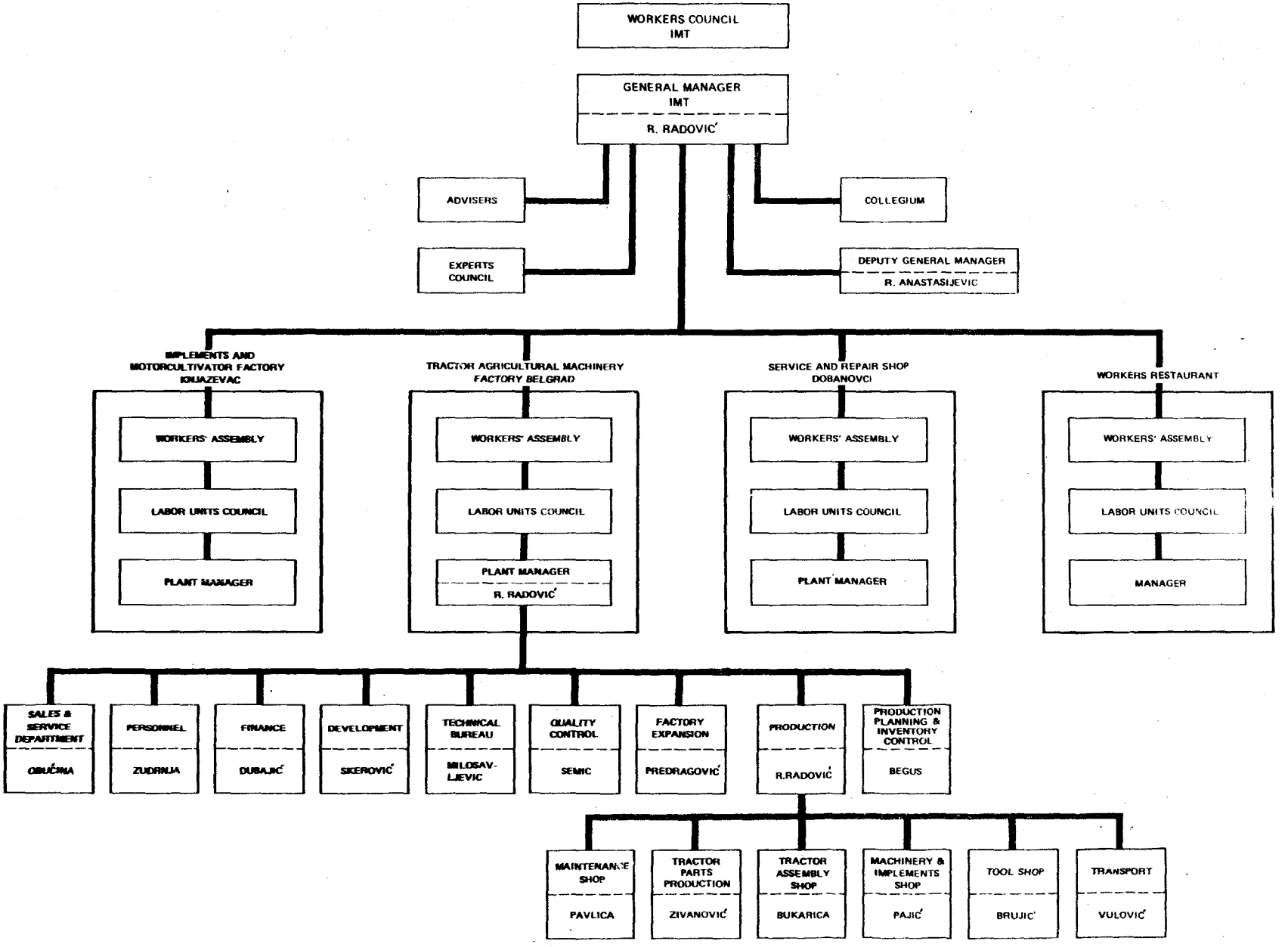
14. The Deputy General Manager, Mr. R. Anastasijevic, 39, joined IMT in 1953. He is an economist and was in charge of Spare Parts Service and later the Export Division. After his election as Deputy General Manager in March 1972 he has mainly been responsible for export-import arrangements, foreign currency and commercial-financial questions.

15. The Directors of IMT's various departments were elected in June 1971 or March 1972 for a 4-year term. They report to the General Manager and are responsible through him to the Workers' Council. The mission has the impression that IMT can count on a competent and experienced management team; specifically, the Financial Director, Mr. P. Dubajic, 40, the Director for Production Planning and Control, Mr. D. Begus, 40, and the Director in charge of the Expansion Project, Mr. M. Predragovic, 63.

Industrial Projects Department
September 1973

YUGOSLAVIA - IMT EXPANSION PROJECT

ORGANIZATION CHART



Industrial Projects Department
August 1973

World Bank—8007(R)

ANNEX 2-3

YUGOSLAVIA - IMT TRACTOR EXPANSION PROJECT

IMT PRODUCTION AND PRODUCT LINE

Production History

1. Industrija Masina i Traktora (IMT), of Belgrade, was founded in 1947, but started manufacturing agricultural machinery only in 1955 after acquiring a Massey-Ferguson tractor license. Until 1956, IMT assembled TE 20 (20 hp) tractors, but in 1957 changed over to MF-135 (35 hp) tractors. The initial program of assembling imported tractor parts was gradually replaced by PKD-CKD 1/ tractor production.

2. The Company's engineers were trained in foreign Massey-Ferguson plants and developed IMT's tractors on the basis of the licensing agreement. However, the present IMT product line, although similar to the Massey-Ferguson family, does not depend on licenses. The dependency on Massey-Ferguson had decreased continuously when switching from PKD/CKD to act or assembly to the purchase of specific components, and IMT's in depend introduction of a 35-85 hp tractor line in 1969. There does not exist any manufacturing relationship between IMT and Massey-Ferguson, in contrast IMT acts as MF's sales and servicing agent in Yugoslavia. IMT's growth has been characterized by the following product range developments and capacity expansions:

(a) First Expansion: In 1961, the IMT-533 tractor (35 hp) was introduced and manufacturing facilities were expanded to permit a production of 4,000 units/year, together with spare parts and machine tools. During 1963-1964, IMT developed and began manufacture of a 50 hp tractor (IMT-555).

(b) Second Expansion: During 1966-68, IMT's production capacities were increased to 12,000 tractors/year, together with implements and accessories. The product line included an improved IMT-533 model, but the IMT-555 was discontinued and replaced by a 55 hp model (IMT-558). In 1966, IMT developed its first series of agricultural machinery independently of the Massey-Ferguson licenses. The new product line included 4 types of tractors IMT-533 (35 hp), IMT-555 (55 hp), IMT-575 (72 hp) and IMT-585 (80 hp), as well as a wide range of tractor implements and accessories (see para 4). In addition, IMT assembled 100 hp Massey-Ferguson Tractors.

(c) Third Expansion (1971-1972) consisted of an increase of IMT's production capacity from 12,000 tractors/year to 15,850 units/year (see Annex 2-4), and additions to IMT's implements product line.

3. IMT's Belgrade plant maintained the following production schedule during the 1968-73 period:-

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1/ PDK - partly knocked down; CKD - completely knocked down.

Production Program - IMT Belgrade (1968 - 1973)
(units)

		1968	1969	1970	1971	1972	1973 (Est.)
I.	Tractors 1/						
	IMT - 533	6,003	5478	8,003	10,526	11,926	13,600
	IMT - 558	315	1,472	1,150	1,300	1,812	1,600
	IMT - 575	-	-	100	230	142	250
	IMT - 585	-	-	-	150	275	400
	Over 100 hp	-	82	75	180	47	-
II.	Tractor Sets CKD 2/	2,500	2,160	1,400	365	200	1,000
	Sub-total	8,818	9,192	10,728	12,751	14,402	16,850
III.	Tractor Implements						
	Trailer 3/3 T	1,157	1,600	1,688	2,667	4,503	5,500
	Trailer 5/3 T	67	65	26	-	-	500
	Rotavator	50	50	100	100	164	450
	Plow	-	-	-	-	1,000	1,500
	Seed Drill	-	-	-	-	150	150
	Cultivator	-	-	-	-	100	150
	Disc Harrow	-	-	-	100	200	400
	Sub-total	1,274	1,715	1,814	2,867	6,117	8,650
IV.	Tractor Accessories						
	Pulley	661	1,085	1,002	402	974	2,150
	Automatic Drawback	845	2,225	1,549	2,106	2,846	5,950
	Cab	-	-	97	776	950	1,500
	Stabilizers	806	505	1,702	613	2,410	3,000
	Weights	216	200	832	1,391	1,620	2,500
	Seat	-	1,603	1,345	1,692	1,872	2,500
	Others	-	-	-	-	-	600
	Sub-total	2,528	5,618	6,527	6,980	10,672	18,200
V.	Spare Parts & Components (million Dinar)	21.5	31.6	46.7	31.9	43.6	55.3
VI.	Scaffolding (million Dinar)	22.9	27.1	30.6	38.3	32.2	47.9

1/ For hp of tractor types, see para 8.
2/ Export of tractor sets CDK (without tires, electrical equipment and engines) to TAFFE - India.

4. FMK - Motor Cultivator and Agricultural Implements Factory. Knjazevac and IMT, Belgrade merged in 1970. FMK Knjazevac produces motorcultivators in the 5-9 hp range, 18.5 hp tractors, implements (rotavators, ridgers, plows, trailers, harrows, cultivators, potato planters and snow clearing machines), weights and parts. FMK's implement production is sufficient to cover demand and offers a wide choice of designs. Product design for the FMK line is based on a licensing agreement with the (F.R.) German Agria-Werke, which was signed in 1967.

Production Program - FMK Knjazevac (1970-1973)
(units)

		1970	1971	1972	1973
I.	Motorcultivators and Tractors				
	Motorcultivator AGRIA 2100 (5 hp)	20	50	70	50
	Motorcultivator IMT - 505 (5 hp)	440	410	401	1,000
	Motorcultivator IMT - 506 (6 hp)	300	450	804	3,534
	Motorcultivator IMT - 507 (7 hp)	60	65	110	100
	Motorcultivator IMT - 509 (9 hp)	30	40	70	80
	Tractor AGRIA 4800 (18.5 hp)	50	50	20	-
	Subtotal	900	1,065	1,475	4,764
II.	Implements				
	For AGRIA 2100	748	1,170		
	For IMT - 505	5,300	7,840		
	For IMT - 506	3,700	5,045		
	For IMT - 507	786	680		
	For IMT - 509	368	700		
	For AGRIA 4800	30	39		
	Subtotal	10,932	15,474		
III.	Parts for AGRIA-Werke	23,750	90,000		
IV.	Weights	6,100	7,000		

During 1970-1972, FMK Knjazevac initiated an expansion program designed to triple the company's capacity by 1975 (for details, see Annex 2-4, para 16-18). From a manufacturing point of view, the IMT tractor models produced in Belgrade incorporate a desirable degree of standardization and component integration.

7. A detailed review of tractor design specifications does not suggest specific improvements which need be incorporated at the present time. However, changes may be needed on a continuing basis according to market demand and farmers' preferences. IMT is aware of the need for on-going model improvement. The Development Department is currently testing improved tractor features (air brakes, safety cords) and has started the development of a road transport gear box and a higher capacity hydraulic pump and system. The program of the Development Department and the existing optional tractor specifications indicate that IMT should be equipped to meet changing market requirements by regularly introducing a number of design innovations.

Future Tractor Product Line

8. The project proposes an increase of total tractor production in Belgrade to 35,000 units per annum, as well as changes in product range and product design improvements:

IMT Belgrade Tractor Production
(units)

	1973	1974	1975 1/	1976 1/	1977
IMT - Tractor (20-25 hp)	-	-	-	1,000	3,000
IMT - 533/40 (35-42 hp)	13,600	13,600	16,400	22,500	25,000
IMT - 558/60 (55-60 hp)	1,600	1,600	2,150	2,900	3,300
IMT - 575 (72 hp)	650	450	550	1,600	1,800
IMT - 585 (80 hp)	-	200	350	1,200	1,500
IMT - Tractor over 100 hp	-	-	-	300	400
Total	15,850	15,850	19,450	29,500	35,000

The product line changes and design innovations which have been tested and will be introduced before project completion are:

(a) Partial replacement of the IMT-533 (35 hp) tractor by the IMT-540 (42 hp) model and the IMT-558 (55 hp) by the IMT-560 (60 hp). These additions involve minor technical changes; e.g. Diesel engines with higher rpm; newly styled head and rear lamps and sheel metal parts (fenders, hoods, radiator cover, grill); the introduction of higher hp models is a worldwide trend in tractor marketing;

(b) improvement of models IMT-575 and IMT-585 by adding newly styled sheet metal parts. Both models will continue to have the same A-4.248 Perkins 4 cylinder 4 stroke Diesel engine (72 hp at 2,000 rpm and 80 hp at 2,250 rpm);

1/ Completion of the assembly facilities in September, 1975.

In addition, the project foresees the development and marketing of a new 20-25 hp tractor and of a tractor in the above 100 hp range.

9. 20 - 25 hp Tractor: IMT intends to produce about 3,000 tractors in the 20 - 25 hp range by 1976. IMT has, with the AGRIA 18.5 hp tractor and the IMT-533, tractors up to 18.5 hp and of 35 hp but no unit in the 20 - 30 hp range. As indicated in the market analysis (Annex 3), an important part of tractor demand by private farmers will be in this range. IMT therefore intends to enter this market as soon as possible, in order to build up its competitive position vis-a-vis the Pasquali tractor which "Ruen", Macedonia, plans to assemble in Yugoslavia. From a marketing point of view, the 20-25 hp tractor is an important addition to IMT's product line.

10. As for the type of 25 hp tractor, IMT is considering to introduce a) a special type of four-wheel tractor for vineyards and hop culture, and/or b) a classic small tractor to be used in hill areas. The Company is still discussing if the latter tractor should be a smaller version of its IMT-533 (35 hp) model or the Massey Ferguson 25 hp tractor which had been assembled by IMT in the past. License negotiations with Massey Ferguson are currently underway. A definite decision and development plan is expected by December 1973. In view of the work still required the production build-up and financial projections assume production of 1,500 tractors in the 25 hp range in 1976 and 3,000 units in 1977.

11. Over-100 hp Tractors. Since 1969, IMT has assembled a limited number of Massey Ferguson 100 hp tractors. However, in 1976, IMT anticipates the production of its own above-100 hp tractors. Prototype production for the over 100 hp tractor is scheduled to begin in January 1974. The design of the new tractor relies on maximum inter-changeability of parts with IMT's 85 hp tractor and includes the newly developed transmission case, pumping and hydraulic system. The tractor will have a Perkins P6/354 engine which is already in serial production in Yugoslavia (IMR, ZMAJ, 14 October). For the proposed annual production of 400 over 100 hp tractors it is not economical to develop the required heavier gearlinks; therefore, IMT has initiated negotiations to import this item from Danfors. Currently, domestic demand for tractors in this horsepower range is entirely supplied by imports. IMT's planned production volume of 400 tractors over 100 hp could fill about 70% of domestic demand after 1976.

Tractor Implements and Accessories Production

12. Implements: IMT's implement production in 1973 consists of 3 - 5 ton trailers (6,000 units), rotavators (450 units), plows (1,500 units), disc harrows and a small number of seed drills and cultivators. All implements that are being manufactured were developed by IMT, and their design

and performance characteristics are good. Owing to lack of production capacity, IMT manufactures only a limited number of implements needed for its tractors. To assure an adequate level of implement availability for its customers, IMT has established subcontracts and trade agreements with other producers. In 1973, IMT expects to realize Din 78.3 million through sales of its own implements and about Din 120 million through sales of units supplied by cooperating implement manufacturers.

13. The 1976 manufacturing program proposes production of 16 types of implements, totaling 27,700 units of various models, i.e., seed drill/fertilizer planters (3 maize and 3 beet models), seed drill, trailer (2 models), mold board plow (11 models including 3 reversible types), disc plow (3 models), disc harrow heavy duty (4 models), one gang disc harrow, offset disc harrow, heavy duty mounted disc harrow (5 models), rotavator (3 models), tillers (8 models). Owing to the high degree of integration of components, the proposed production of such a variety of models should not pose any problems. Although implement production will be tripled by the project, the total volume detailed below will remain modest (about 1 implement per tractor):

Tractor Implements
IMT Belgrade - Implements Production Projections
(units)

	1973	1976	1977
Trailer 3/3T	5,500	6,500	6,500
Trailer 5/3T	500	1,300	1,300
Rotavator	450	450	200
Plow	1,500	8,000	12,000
Seed Drill	100	1,000	2,000
Cultivator	200	1,000	1,000
Disc Harrow	400	4,000	4,000
Total (units)	8,650	22,250	27,000
Other Implements (million/Din)	71.7	89.4	105.3

14. In addition to the proposed implement line, IMT is considering to developing and manufacturing such items as post hole diggers, cranes, jig cranes, loaders, manure spreaders and grind mixers which could be powered by IMT tractors. To facilitate maximum utilization of IMT tractors, IMT is discussing the possibility of long-term agreements with other Yugoslav farm implement manufacturers for development and supply of mowers, sprayers, threshers and harvesters.

15. Accessories: The production of tractor accessories (pulleys, draw backs, cabins, stabilizers, weights, seats) has increased fivefold since 1968, but accounts for only 4.5% of IMT's 1973 projected sales. The

accessories are well designed and by 1976 IMT will supplement its product line by a high speed road transport gear box and higher capacity hydraulic and pump systems which are currently being developed. The proposed 1976 production program reflects IMT's tractor production increase and the associated increase in demand for accessories:

Tractor Accessories - Production Projections
(units)

	1973	1976
Pulleys	2,150	2,800
Automatic Drawbacks	5,950	7,700
Cabins	1,500	25,700
Stabilizers	3,000	1,400
Weights	2,500	700
Seats	2,500	2,100
Others	600	1,100

Scaffolding

16. IMT has traditionally been a producer of scaffolding. Although it does not directly fit into the Company's product line, IMT intends to maintain the present production level in the future.

Spare Parts Production

17. Spare parts amounting to an estimated Din 48.0 million or 4% of total sales in 1973 have been a minor part of IMT's production program. Under the project the company's spare parts production will increase according to the requirements of the growing size of the IMT tractor fleet. In addition, the company believes there is significant export potential, particularly in components for Massey-Ferguson tractors.

Industrial Projects Department
September 1973

YUGOSLAVIA - IMT TRACTOR EXPANSION PROJECT

Historical Income Statements (1968-1972)
(Din million)

	Years Ending December 31	1968	1969	1970	1971	1972
I.	Sales Revenues					
	Domestic Sales	217.2	307.5	334.7	574.2	793.9
	Export	52.8	38.2	62.8	53.6	53.8
	Others	-	70.8	99.6	118.9	183.2
	Net Sales --	270.0	416.5	497.1	746.7	1,030.9
II.	Cost of Goods Sold					
	Materials, Supplies, Utilities	188.0	273.7	340.2	530.3	776.7
	Labor	12.6	21.6	40.2	55.5	72.1
	Inventory Changes	11.8	35.8	10.6	2.9	(1.6)
III.	Gross Profit	57.7	85.4	106.1	157.9	183.7
IV.	Operating Expenses					
	Maintenance & Repair	11.8	11.9	16.1	23.1	30.4
	Selling & Administration	24.5	37.9	26.6	37.8	44.5
	Depreciation	9.7	10.3	18.4	22.6	25.5
	Others 1/	3.2	1.5	2.1	2.0	2.9
IV.	Operating Profit	8.5	23.8	42.8	72.4	80.5
	Other Income	10.2	7.4	8.8	8.7	12.7
	Financial Charges	15.4	19.3	23.6	22.7	19.2
VI.	Income before Taxes and Contributions	3.3	11.9	28.0	58.4	74.0
	Taxes & Contributions	3.3	4.4	3.9	.6	.6
VII.	Net Income	-	7.5	24.1	57.8	73.3
VIII.	Distribution of Net Income					
	Appropriation to the Reserve Fund	-	2.6	.9	1.2	4.0
	Appropriation to the Collective Consumption Fund	-	4.9	8.1	18.3	27.6
	Compulsory Loans	-	-	.6	5.8	6.1
	Appropriation to the Business Fund	-	-	14.3	32.5	35.5
	- for fixed assets	-	-	10.9	28.3	14.3
	- for current assets	-	-	3.4	3.5	21.2

1/ Including land and water taxes, insurances, contributions to association and chambers of commerce.

NOTE: For explanation of terms see Annex 2-7.

Industrial Projects Department
October 1973

YUGOSLAVIA - IMT TRACTOR EXPANSION PROJECT

Historical Balance Sheets
(million Din.)

Year Ending December 31	1968	1969	1970	1971 1/	1972 1/
ASSETS					
I. Current Assets					
Cash and Banks	10.6	1.2	10.6	2.7	25.4
Receivables	115.2	91.9	49.9	60.2	102.5
Inventory	128.1	143.4	175.8	201.0	273.8
Sub-total --	253.9	236.5	236.3	263.9	401.7
II. Fixed Assets					
Gross Fixed Assets	148.9	138.9	140.1	247.9	355.9
less: accumulated depreciation	49.3	52.9	68.6	180.0	209.0
Net Fixed Assets 2/	99.6	86.0	71.5	67.9	146.9
III. Financial Assets	11.6	3.2	37.0	36.0	31.0
IV. Other Assets	26.0	33.3	39.5	62.1	94.9
TOTAL ASSETS --	391.3	359.0	384.3	429.9	674.5
LIABILITIES					
I. Current Liabilities					
Accounts Payables	48.2	54.6	83.5	71.5	96.2
Short term debt	142.5	105.3	88.0	58.0	53.1
Current Portion of Long-term Debt	14.8	14.9	19.0	21.8	18.2
Sub-total --	205.5	174.8	190.5	151.3	167.5
II. Long-term Debt	79.7	67.6	57.9	60.5	81.3
III. Equity					
Reserve Fund	8.9	10.8	8.8	10.1	18.6
Collective Consumption Fund	17.2	22.5	30.7	49.0	76.3
Compulsory Loans	-	-	.6	6.4	12.5
Business Fund					
--for fixed assets	42.2	42.0	55.1	85.5	211.5
--for current assets	37.8	41.3	40.6	64.1	106.8
Sub-total --	80.0	83.3	95.8	149.6	318.3
Total Equity --	106.1	116.6	135.9	218.2	425.7
TOTAL LIABILITIES	391.3	359.0	384.3	429.9	674.5
Current Ratio	1.2	1.35	1.2	1.7	2.4
Debt/Equity Ratio 3/	43:57	37:63	30:70	22:78	16:84

Note: For explanation of terms see Annex 2-7

1/ Revaluation of fixed assets included
2/ Including works in progress
3/ Equity is defined in this context as Business Fund, Reserve Fund, Collective Consumption Fund and Compulsory Loans.

Industrial Projects Department
August 1973

YUGOSLAVIA - IMT EXPANSION PROJECT

DEFINITION OF TERMS USED IN FINANCIAL STATEMENTS

A. INCOME STATEMENT

1. Depreciation of fixed assets has been calculated at the legal minimum rate of 7% until 1971. In view of the exceptional use of the facilities by increasing tractor output from 12,000 to 15,000, IMT has adopted the following depreciation rates for the 1971-75 period:

(a)	Land	0%
(b)	Buildings	3.5%
(c)	Machine tools and equipment	20.7%
(d)	Transport equipment	11.0%
(e)	Others	19.6%

However, after the completion of the expansion project new and existing fixed assets will be depreciated at:

(a)	Land	0%
(b)	Buildings	1.9%
(c)	Machine tools and equipment	14.0%
(d)	Transport equipment	10.0%
(e)	Others	6.4%

2. Taxes and Contributions include (a) contributions to personal income as decided annually by the Workers' Council, (b) transportation, rent and vacation subsidies for employees, (c) a contribution for the Development of Disaster-hit areas, amounting to 0.75% of the gross personal income and, until December 1971, (d) a tax in form of a 3.5% interest payment on the Business Fund.

B. BALANCE SHEET

3. Cash includes cash in hand, bank deposits and special funds for small investment (e.g., for repairs and maintenance, etc.). The account includes funds which can only be used for current assets or for fixed assets or can be exchanged into convertible currency.

4. Receivables include receivables from domestic customers, advance payment for imports not covered by commercial bank credits, and prepayments for maintenance, worker's travel, etc.

5. Inventory includes raw materials and parts, semi-finished products, finished products and stores. On December 31, 1971, inventories were revalued as part of the general revaluation of assets.

6. Gross Fixed Assets include land, buildings, machinery and equipment, fixed assets under construction, license fees, etc. Under the Yugoslav accounting system, interest during construction and pre-operating and start-up expenses incurred by the Company are not capitalized; they are shown as cost items and deducted from sales revenue in the income statement. On December 31, 1971, there was a complete revaluation of fixed assets (excluding land).

7. Depreciation: The legal minimum depreciation rate on machinery in Yugoslavia continues to be 7%. But since 1969 companies have been allowed to use higher depreciation rates. IMT's past and future rates are given in para. 15. The accumulated depreciation was also revalued on December 31, 1971.

8. "Other Assets" include collective consumption assets (e.g., cash from rent, credit to workers for housing, current value of assets such as canteen, business office, etc.) and reserve fund assets.

9. Financial Assets include investments in other enterprises, banks and chambers of commerce as well as time deposits for more than 12 months, such as (a) compulsory loans (see para. 13), and (b) the electric power deposit, i.e., a long-term loan to the power authorities amounting to 20% of any investment which is repaid after three years in 10 yearly installments.

10. Accounts Payables to suppliers, and short-term credit from other enterprises. Credits from commercial banks to cover receivables from foreign buyers as well as to make advance payments on raw materials imports for export production are excluded. (These items are netted out from both sides of the balance sheet).

11. Current Portion of Long-Term Debt includes repayment of principal due within the next 12 months to creditors - both domestic and foreign.

12. Long-Term Debt includes all outstanding debt (domestic and foreign) excluding current maturities.

13. Reserve Fund can be used to cover losses, to pay wages and salaries to employees in case of liquidity problems and to comply with court decisions to pay overdue debts. Annually, 2% of "Dahodak" (i.e., net sales minus cost of materials, supplies, and utilities as well as depreciation is allocated to the Reserve Fund from the net income ("Dobit").

14. Collective Consumption Fund receives minimum annual allocations from net income of 4% of gross personal income. Higher allocations can be decided upon by the Workers' Council. In case the net income does not cover the legally required appropriations to the Collective Consumption and Reserve Funds, the allocation to the Collective Consumption Fund has priority. In case of losses, no appropriations are obligatory.

The Collective Consumption Fund is mainly used to build houses and recreational facilities for workers, to meet travelling expenses during vacations, to defray hospitalization charges and to pay scholarships. However, the Company can borrow without interest from this Fund up to one year for the following purposes: (a) to pay wages and salaries in times of liquidity problems; (b) to comply with court decisions to pay off overdue debts; and (c) to finance inventories and short-term credit sales in case of working capital shortage. In such cases of borrowing from the Fund, the Company has to contribute 2% of the amount to the Fund for the Development of Underdeveloped Regions.

15. Compulsory Loans include since 1971 (a) a loan to the Yugoslav State for the Development of Underdeveloped Regions. It amounts to 1.95% of the Business Fund, and is to be repaid after 3 years in 8 equal installments and at 4% p.a. interest, (b) a loan to the SFYR of 1.5% of the Business Fund, and (c) until 1975, a loan to the Mutual Reserve Fund of 3.5% of the "DAHODAK." These contributions to the Mutual Reserve Fund are at the disposal of the Local and Provincial Government for industrial development. However, when a Company faces a severe working capital shortage and/or when it cannot get adequate external resources for expansion, it can approach both the Local Commune and the Provincial Government for loans. Credit to cover losses is not available from the Mutual Reserve Fund.

16. Business Fund is comprised of net income, after appropriations to the Reserve Fund, Collective Consumption Fund and Compulsory Loans. Consequently, the Business Fund constitutes the main part of equity of an operating company. At the end of 1971, the Business Fund was revalued along with fixed assets. Business Fund appropriations are again earmarked for current assets and fixed assets. From January 1, 1973 on, Yugoslav legislation requires enterprises to finance at least 80% of their inventory by 1975 and 100% from 1976 through accumulated current asset appropriations to the Business Fund, or through bank loans with at least five years maturity.

C. SOURCES AND USES OF FOREIGN EXCHANGE

17. Retention Quota: Yugoslav enterprises can use 20% of their annual export earnings without restrictions.

18. Depreciation Quota: Companies can change 10% of their total annual depreciation value into foreign exchange at the National Bank to repay and service foreign credits and/or to import equipment and spare parts.

Industrial Projects Department
September 1973

YUGOSLAVIA - IMT TRACTOR EXPANSION PROJECT

MARKET ANALYSIS

A. AGRICULTURAL SETTING

1. The Yugoslav agricultural sector contributed about 20% to GNP in 1972. Crop production 1/ has been declining during the sixties, but reached the 1961 level of 57 million tons again in 1972. Yugoslavia is a traditional exporter of agricultural products. However, despite a steady increase of farm prices, the value of agricultural exports fluctuated marginally around Din 4 million during the 1965-1972 period. Beginning 1970 the agricultural trade surplus decreased by more than 60% because of required import of feed for livestock.

Regional Characteristics and Development

2. Yugoslavia is predominantly a mountainous country. Of the total territory of 25.6 million hectares, 14.6 million hectares are recorded as agriculturally productive, while the rest is taken up by forest, rivers and lakes. The fertile plain of Vojvodina, Croatia and Slovenia in the north-east represent only one-sixth of the country's total area, but contain nearly a third of arable land and produce more than half of the country's output of wheat and maize and over three-quarters of its sugarbeet. The hills (land up to 500 meters in altitude) covering much of Serbia, Slovenia and Bosnia are important for livestock raising and fruit production. The mountain region covering 44 percent of the country is generally unfavorable for crop production, but extensive up-land pastures make possible livestock raising. There are considerable regional differences in yields, which may vary up to 100 percent for cereals between the less favored areas of Kosovo and Montenegro and the most favored areas of Vojvodina, Slovenia and Croatia. The differences are less pronounced for fodder crops and potatoes. In the breeding sector, there are also wide disparities: in Bosnia-Herzegovina and in Montenegro the average weight of slaughtered cattle is only about half the national average.

Farm Population Trends

3. Farm population has undergone a marked shift both in numbers and structure. Following a worldwide trend, the Yugoslav agricultural labor force is decreasing in absolute and relative terms because of migration to urban areas and Western European countries.

1/ Primarily wheat, maize, potatoes and sugarbeets.

Yugoslavia - Agricultural Labor Force
(million)

Labor Force in Agriculture	1953 Number	1953 %	1961 Number	1961 %	1971 Number	1971 %
Social Farms	.2	4.0	.4	9.0	.3	7.9
Private Farms	5.2	96.0	4.3	91.0	3.6	92.0
Total	5.4	58.3	4.7	56.3	3.9	47.4
Total Labor Force	7.8	100.0	8.3	100.0	8.3	100.0

Migration resulted in an increasing age of farm labor; for example, in 1971: (i) 39% of the active males were over 50 years of age; and (ii) over 50% of the farms were without youths. In addition, the 1970 agricultural survey showed that about 44% of the labor force living on farms had either permanent or part-time employment off the farm. This indicates the difficulty of generating sufficient income to support a family on a holding.

The Social and Private Sector in Agriculture

4. One of the important characteristics of Yugoslav agriculture is the separate existence of two sectors viz, social and private with different farm structures. The social sector has its origin in the postwar collectivization policy, and received further impetus by the Agrarian Reform of 1953, which limited the size of private, individual holdings to 10 hectares of cultivable land and 25 hectares of forest land, and brought 276,000 hectares of additional land under the social sector. Since then, the land resources of the social sector, consisting of: (i) agro-industrial "kombinats", (ii) agricultural estates, and (iii) general agricultural organizations have almost doubled due to reclamation, purchase and lease from private holders. The social sector in 1972 held about 14.5 percent of the total arable land, employed 4 percent of total agricultural manpower, produced 29 percent of the agricultural product and 44 percent of the marketed production. The major problems of social agricultural units at present are: (i) relatively high monetary obligations, (ii) unsatisfactory equipment, and (iii) shortage of skilled personnel.

5. On the other hand, the private sector covers about 86 percent of the cultivable land, and has 2.6 million individual holdings with an average of 3.9 hectares per holding. It employs about 96 percent of the farm population and accounts for 71 percent of the share of the agricultural product. Due to inheritance customs, fragmentation has led to a decrease in average farm size. However, only about 60 percent of the total land in the private sector is in holdings of 5 - 10 hectares. At the same time about 50 percent of the private holdings are in the mountainous regions where the conditions are less favorable for agriculture. The main constraints of further development of agriculture in the private sector are: (i) lack of capital, (ii)

lack of credit facilities, for the purchase of better quality seeds, fertilizers and tractors, (iii) poor mechanization, and (iv) lack of extension services.

6. The relative importance of the social and private farms are illustrated by the following investment and production data.

Private and Social Holdings - Selected Data

I. Investment	Social Farms Million Din	Social Farms %	Private Farms Million Din	Private Farms %
1947-1956	2.4	50	2.5	50
1957-1960	6.7	70	2.9	30
1961-1965	9.4	74	3.3	36
1966-1971	9.1	71	3.8	29

II. Crop Production (1972)	Social Farms %	Private Farms %
Wheat	36.4	63.6
Maize	18.7	81.3
Sugarbeet	57.9	42.1
Sunflower	66.0	34.0
Fruit	4.6	95.4
Grapes	17.0	83.0
Meat	31.8	68.2
Milk	14.5	85.5
Eggs	37.3	62.7
Total Production	29.0	71.0
Market Production	44.0	56.0

III. Cultivable Land	Million hectares	%	Million hectares	%
	1.5	14	8.7	86

IV. Farm Mechanization (1972)		
Number of tractors	25,100	95,400
Average hp	51.3	32.5
hp per hectare	0.86	0.38

7. Cooperation between the private and social sector is viewed in Yugoslavia as a means of improving productivity in both sectors. It takes the form of provision of services by the social sector, such as supply of fertilizers, harvesting, cultivation, marketing and credit and the contracting of joint production. Although the number of cooperative arrangements

declined from 1.3 million in 1964 to 0.9 million in 1970, farmers cooperating with social farms showed consistently higher average yields than independent private farmers during the same period. 1/

Agricultural Prospects and the "Green Plan"

8. The social development plan for 1971-75 projects an annual growth of aggregate agricultural production of 3.2 percent per year, with the social sector growing at 5 percent and the private sector at 2.8 percent per year. This target assumes a significant acceleration of growth in the private sector. To this end the Yugoslav Government has recently enacted a "Green Plan" to be carried out during 1973-85. The Plan stresses farm mechanization and modern agricultural methods to improve output and productivity and allocates for 1974 and 1975 annually Din 750 million (US$50 million) in financial assistance to the private and social sector. Although the legislation passed as to date states that the development target set by the "Green Plan" requires annual investments at not less than Din 1,290 million in private holdings, the plan does not propose ways and means of generating and channelling the necessary funds.

B. THE MARKET FOR TRACTORS

Structure of the Industry

9. Yugoslav tractor production increased steadily over the past decade. However, the domestic production of tractors cannot accurately be determined since the available statistical material does not distinguish between tractors, motorcultivators and other agricultural machinery such as mowers, crawler tractors, etc.

1/ Partly because small farmers in the underdeveloped mountainous regions have no access to social sector agricultural organizations.

Trends in Production of Agricultural Machinery /1
(Units)

	1961	1965	1968	1969	1970	1971	1972
Yugoslavia	4,290	6,340	10,927	10,810	12,048	16,046	18,425
IMT-Belgrade/2	2,288	3,329	4,816	6,989	9,325	12,236	14,202
IMT Market Share /3	56%	53%	44%	65%	77%	76%	76%

/1 Including tractors, motorcultivators and similar agricultural machinery, but no CKD-PKD tractor sets.
/2 Not including CKD-PKD tractor sets.
/3 Tractors only.

Source: SFRY Statistical Bulletin and IMT

It has been estimated that the production of motorcultivators and miscellaneous agricultural machinery increased from about 850 units in 1965 to 3,500 units in 1972.

10. At present, IMT is the largest Yugoslav manufacturer of motorcultivators and tractors accounting for 85% of the domestic production capacity of tractors and for 55% of the domestic motorcultivator capacity. 1/ The company manufactures units of its own design relying to more than 95% on Yugoslav sources for raw materials and components supplies; the five other producers are essentially assemblers of imported components. In view of the growing trend for farm mechanization in Yugoslavia, several companies are planning to expand their capacities or to enter the tractor assembly business. A number of these investment plans are still under discussions, so that the projected capacities presented below can give only a tentative idea of the future structure of the industry.

1/ IMT added motorcultivators to its product line in 1970 by acquiring the Motorcultivator and Agricultural Implements Factory, FMK Knjazevac.

Annual Production Capacity of Tractors and Motorcultivators

		1972 (Actual) Units	%	1977 (Projected) Units	%
I.	Motorcultivators				
	IMT-Knjazevac	2,500	55	12,000	73
	Gorenje Velenje/1	2,500	45	3,000/4	18
	Ruen Kocani	-	-	1,500	9
	Subtotal	4,500	100	16,500	100
II.	18-25 hp tractors				
	T. Vinkovic/2	2,000	98	3,000/4	25
	Ruen Kocani/2	-	-	4,500	37
	IMT-Belgrade	-	-	3,000	25
	IMT-Knjazevac	50	2	-	-
	Gorenje Velenji/1	200	-	1,600 /4	13
	Subtotal	2,250	100	12,100	100
III.	Over 30 hp tractors				
	IMT-Belgrade	15,000	94	32,000	90
	IMR Rakovic	500	3	500	1.5
	Torpedo/3	150	1	500	1.5
	Gorenje Velenje	300	2	2,400	7.0
	Subtotal	15,950	100	35,400	

/1 Steyr license.
/2 Pasquali license.
/3 KHD license.
/4 Not yet finalized; the expansion of IMT Knjazevac has been completed, IMT Belgrade and Ruen Kocani are under construction, whereas the expansions of the other companies are still in the planning phase.

From a capacity point of view IMT can be expected to remain the dominant producer of motorcultivators and tractors in the above 30 hp range. However, four manufacturers of 18-25 hp tractors are planning to expand their total production capacity to about 12,000 units/year which may result in considerable competition in this product range.

11. The above table distinguishes between motorcultivators, 18-25 hp tractors and above 30 hp tractors; they constitute in the Yugoslav context separate market and production categories. On the one hand, motorcultivators (5-12 hp) serve a special market segment, because they are the only feasible and economical 1/ means of mechanization for orchards, vineyards and small holdings, but they require physical labor to operate. On the other hand, the present and projected production of 18-25 hp units in Yugoslavia include tractor as well as motorcultivator types: the Pasquali tractor (18.5 hp) can be described as riding motorcultivator, whereas the Steyr and planned IMT 25 hp tractors are small, less costly and maneuverable versions of a standard tractor.

Users of Tractors

12. Tractors are primarily used for farming. However, equipped with special implements they have been employed for transport, construction and semi-industrial work as well as in the forestry field. Light industrial units - front end shovel loaders, rear mounted back hoes, etc. - are used primarily in the construction industry. These units are developed from standard agricultural tractors, the main changes usually being a heavier front axle, heavier tires, a high capacity hydraulic pump mounted at the front of the engine crankshaft, the agricultural 3 point hitch and hydraulic system deleted and often a shuttle reverse added between the standard clutch and transmission. No information on total usage of tractors for non-agricultural purposes in Yugoslavia is available, but IMT sold during the 1969-1972 period annually about 120 tractors for forest mechanization, 100 tractors to construction companies and about 300 units for general transport and haulage work.

Supply and Demand Pattern

Farm Mechanization in Yugoslavia

13. The Yugoslav tractor fleet has increased three-fold from 42,730

1/ The 1972 average price of a 7 hp motorcultivator in Yugoslavia was Din 13,000 compared to Din 28,000 for a 18.5 hp tractor and Din 38,000 for a 35 hp model.

units in 1962 to about 120,500 units in 1972.

Yugoslavia - Tractors on Farms (1962-1972)
(Units)

	1962	1964	1966	1968	1970	1971	1972
Social Farms	35,287	40,284	38,785	31,642	27,402	25,747	25,087
Private Farms	7,446	9,812	12,180	30,090	50,297	68,617	95,400
Total -- Yugoslavia	42,733	50,096	50,965	61,732	77,699	94,364	120,487

Source: Federal Secretariat for Agriculture.

Thereby, Yugoslavia reached a level of farm mechanization of 0.45 hp/ha which compares with the level of mechanization of Romania and the USSR (Table 1, page 9). In contrast, western European countries such as Italy and France have reached 1.6 hp/ha and 3.2 hp/ha, respectively.

14. The trend towards a higher level of farm mechanization in Yugoslavia shows five distinct characteristics:

(i) the absolute and relative size of the tractor fleet varies considerably among regions. As shown in Table 1, Croatia and Slovenia have reached about 0.65 hp/ha whereas Montenegro is at a low of 0.05 hp/ha;

(ii) mechanization in the social sector is far more advanced than in private farming (0.86 hp/ha compared with 0.36 hp/ha);

(iii) the average size of a tractor used in Yugoslavia at present is about 38 hp. However, the average size of tractors on social farms in 1972 was 51 hp compared to 32 hp on private holdings (Table 2, page 27);

(iv) the number of tractors on social farms decreased continuously starting 1967, due to a switch to higher horsepower tractors; and

(v) the notable increase of the Yugoslav tractor fleet since 1969 is due to accelerated mechanization of private holdings; i.e., the number of tractors in the private sector increased by about 30% annually. The main factors strengthening private demand were the elimination of excise taxes on tractors and fuel in 1970, the availability of cash through workers' remittances and the considerable increase of farm prices after 1969.

Size Distribution of Tractors on Social Farms

hp	1962 Units	1962 %	1972 Units	1972 %
Up to 25	2,182	6.2	327	1.3
26 - 35	14,242	40.4	4,622	18.4
36 - 50	13,064	37.0	7,567	30.2
Over 50	5,799	16.4	12,571	50.1
Total	35,287	100.0	25,087	100.0

Source: Federal Secretariat of Agriculture.

15. Sales of tractors and other agricultural machinery between 1969 and 1972 have more than doubled. However, domestic production accounted for a declining share of domestic sales (57% in 1972 as compared to 63% in 1967). This indicates that the demand for tractors in Yugoslav, stimulated by the drive towards farm mechanization, increased at a faster rate than the Yugoslav tractor industry was able to expand its production capacity.

Sales and Production of Agricultural Machinery/1 (1967-1972)

	Domestic Production (Units)	Export/2 Units	Export/2 % of Production	Import Units	Import % of Sales	Apparent Domestic Sales (Units)
1967	8,793	588	7	4,822	37	13,027
1968	10,927	637	6	3,969	28	14,259
1969	10,810	420	4	2,727	21	13,117
1970	12,048	512	4	5,460	32	16,996
1971	16,046	1,315	8	9,281	39	24,012
1972	18,423	1,182	6	12,760	43	30,001

/1 Including tractors, motorcultivators and similar machinery.
/2 Not including CKD and PKD tractor sets or components.

Source: UMI and SFRY Statistical Yearbook.

Imports

16. To meet excess demand, Yugoslavia has increased its import of tractors from about 5,460 units in 1970 to 12,760 units in 1972. Import quotas are determined annually by a specialized Government agency to balance domestic demand and production. Nearly 65% of tractor imports during the past five years came from clearing countries, mainly because of bilateral trade agreements and the price competitiveness of East European tractors (para. 20). However, the proliferation of imports to meet Yugoslavia's growing tractor demand has created serious problems and diseconomies: Yugoslavia imported between 1965 and 1972 41,000 tractors or 304 different models from 21 countries and 53 manufacturers. Even though a supply of spare parts and implements comes with the tractor, it is unlikely to meet the need during the entire life of the tractor. In addition, the variety of types requires a high level of maintenance and repair skills. Consequently, utilization and useful life of imported tractors has been lower than of domestic units.

17. In the Yugoslav context of trade regulations, tractor imports are meant to supplement domestic production. After the planned local production increase, imports can be expected to drop sharply, but may remain at a minimum level to account for (i) arrangements with clearing countries, (ii) direct import by workers returning to Yugoslavia and (iii) special models which are not produced locally.

Exports

18. Yugoslav enterprises have to export a minimum amount to earn the foreign exchange necessary for their operations through the retention quota system (Annex 2-7, para. 17). However, IMT accounts for nearly 98% of Yugoslavia's past export of agricultural machinery. The other producers export components or assembled parts under their license agreements.

19. Table 4 illustrates IMT's total tractor export by country. The heavy concentration of sales to India resulted from an agreement with TAFFE, the Massey-Ferguson license holder in that country. Sales began as whole tractors then gradually shifted to a partly knocked-down (PKD) and later to a completely knocked-down (CKD) basis as TAFFE increased its production of components. Sales to other countries represent complete tractors. IMT has made new commitments for 500 tractors each to India and Uganda in 1973 and won an IDA tender in Pakistan for 2,000 units. Due to the priority of domestic needs, the Company has been unable to merchandize exports aggressively.

Supply-Demand Gap

20. Despite the growing volume of imports in the face of increased domestic production, there is still a considerable supply-demand gap for tractors that has been estimated as high as 5,000 units annually. Indications for an existing excess demand are

(i) IMT's increased sales on a deferred delivery basis of as long as 10 months

Deferred Delivery Sales - IMT

Year	Number
1970	578
1971	734
1972	1,528
1973 (to 5/31)	1,135

(ii) a willingness on the part of farmers to make five-year time deposits to secure tractor loans for the full cost of the tractor, roughly double the time deposit but repayable in full in two or three years.

(iii) the purchase of IMT bonds for DM 20 million repayable in Dinars to secure preferential delivery of tractors.

Prices, Tariffs and Competition

21. IMT's dominant position in the tractor market in Yugoslavia relative to other domestic and foreign producers underlines the competitiveness of its product line. This is mainly due to:

(i) a good design and a product line well prove from the standpoint of performance and reliability;

(ii) a long history of successful and continually expanding production;

(iii) ready availability of spare parts and matching implements;

(iv) a record of progressive product updating and improvement and additions to the product lines so that the current IMT line compares favorably in range of models and design with most major manufacturers worldwide (Annex 2-3);

(v) Efficient production leading to low production costs with resulting very competitive retail prices (Annex 6-2, and para. 20);

(vi) a nationwide sales and service network which has been expanded and strengthened concurrently with expansion of production (para. 51) of this Annex).

22. The domestic prices for tractors are initially determined by the manufacturing firm, but annual price increases have to be approved by the Federal Council for Prices. Export prices can be set freely by the enterprises. Imports of tractors are controlled and the official customs duty of 18% plus 9% import duty and 1% custom evidence give an additional price protection of 29%. Prices of locally sold tractors compare as follows:

Tractor Price Comparison August 1973
(Din)

Type	Base Price per hp	Base Price /1	Tariffs 29%	Selling Price (Yugoslavia)
30-40 hp tractor				
IMT-553 (35 hp) -	1,163	40,723	-	40,723
ZETOR (35 hp) - CZSR	1,057	37,000	10,730	47,730
URSUS (40 hp) - Poland	905	36,200	10,490	46,690
Steyr (32 hp) - Austria	1,977	63,278	26,366	89,644
Farmer ID (34 hp)-England	1,777	60,438	24,687	85,125
Deutz-KHD (35 hp) - FRG	1,625	56,885	23,235	80,120
50-60 hp tractor				
IMT-558 (55 hp) -	1,066	58,673	-	58,673
ZETOR (56 hp) - CZSR	861	48,220	13,984	62,204
Steyr (52 hp) - Austria	1,549	80,556	32,904	113,460
John Deere (52 hp) - USA	1,542	80,230	31,010	111,300
70-80 hp tractor				
IMT-575 (72 hp)	1,249	89,972	-	89,972
URSUS (75 hp) - Poland	1,122	84,150	24,360	108,510
MTZ (70 hp) - USSR	750	52,500	15,225	67,725
John Deere (72 hp) - USA	1,602	115,380	34,460	149.840
80-90 hp tractor				
IMT-585 (85 hp)	1,195	101,582	-	101,582
MTZ (80 hp) - USSR	783	62,680	18,177	80,857
Deutz (85 hp) - FRG	1,521	129,300	37,497	166,797

/1 ex factory for IMT, cif Yugoslav border prices for all other units.
/2 18% customs duty, 9% import tax and 1% customs evidence.

Source: IMT Industry Survey.

23. IMT selling prices are about 6-15% below those for comparable tractors from Eastern European countries and about 35-100% below prices for Western European tractors. A notable exception are the Russian MTZ tractors in the 70-80 hp range which are sold 10-15% cheaper than the equivalent IMT tractor. 1/ However, Eastern European price quotations

1/ In the past, this has not impaired IMT's competitiveness since farmers prefer locally produced tractors for ease of supply of spare parts and repair facilities.

relate partly to barter agreements. Taking into account the 29% tariff protection the Company still maintains its considerable domestic price competitiveness vis-a-vis Western European countries. As to export prices IMT has maintained its domestic selling price in foreign markets. In order to allow for transport charges, the Yugoslav Government supports exports by paying a transport subsidy of 21% to developing countries and Japan, 15% to the USA and 7% to Western European countries.

24. As to qualitative difference between IMT tractors and foreign units, the IMT 30-60 hp models are (i) fully competitive with Western European and US models from a design and performance point of view and (ii) have a clear advantage in regard to the supply of matching implements and spare parts. For tractors in the 70-90 hp range, the IMT models meet the quality standards of Eastern European tractors, whereas Western European and US models offer more convenience features and advanced design. IMT's present development program is designed to overcome this shortcoming by introducing the newly developed transmission case, pumping and hydraulic system before 1975, and offering a wider choice of tractor accessories after project completion in 1976.

C. PROJECTED TRACTOR DEMAND

Domestic Market for Tractors Used in Agriculture

25. In developing a market forecast for tractors and farm machinery in a country, the following factors must be considered: h(i) hp/hectare required to provide an acceptable level of mechanization; (ii) size range (hp) of tractors required to permit effective and economic tractor utilization according to the size of farms and types of crops produced and degree of cooperation; (iii) replacement (useful life) period; (iv) obsolescence factor: (v) cash generating capacity of farms and/or availability of credits; (vi) alternative means of farm mechanization (motorcultivator); and (vii) historical pattern of domestic sales and existing fleet.

26. The last point has been described above; the other considerations and assumptions for the market forecast are discussed in the following paragraphs as they apply to Yugoslavia.

27. Projected Level of Farm Mechanization. The hp required to achieve full mechanization in agriculture varies according to the predominant type of farming - intensive or extensive - the main crops grown and the size of farm operating units. In countries which might be considered at a medium stage in agricultural development tractor power is on the average in the order of 0.5 hp per hectare of cultivable land. Where agriculture is virtually completely mechanized hp per ha. ranges from 1.0 in countries with large farms up to 3 hp per ha. in countries where farms are mainly small but where agricultural production is on a very intensive basis (Table 1). In line with the above in Yugoslavia full agricultural mechanization would be achieved at a level of approximately 1.0 hp per ha. on the large farms in the social sector and approximately 2.0 hp per ha. on the small farms in the private sector.

28. Size Range (hp). In 1972 the average hp of tractors in the social sector was 51.3 compared with 32.5 hp in the private sector (Table 2). In the social sector there is a definite trend to tractors with considerably higher hp since on the large farms and big fields in this sector tractors of 80-100 hp can be used very effectively, particularly for heavy tillage work. There will always be a considerable requirement, however, for tractors in the 40-60 hp class for general haulage, seeding and planting and general chores work. The projections assume an increase of tractor sizes on social farms to an average of 60 hp. In the private sector, it has been assumed that the average tractor size will reach 38 hp by 1980, and average 40 hp per ha thereafter. The main reasons for this are (i) a worldwide trend to higher hp units in agriculture, (ii) the use and an increasing availability of second-hand tractors for small holdings which otherwise would use motorcultivators or 18-25 hp tractors, and (iii) the possible spread of cooperative ownership or custom line work by private farmers with standard 40-50 hp tractors. 1/

29. Replacement of tractors or their useful life varies with the intensity of agriculture and the available maintenance and repair services. In countries whose agriculture is considered to be completely mechanized the total tractor market is equivalent to the replacement market as shown below:

Tractor Replacement Market in Highly Mechanized Countries

	Tractor parc	ha. per Tractor	hp per ha.	Annual Sales (Estimated)	Sales - % of Tractor parc
Canada	800,000	54.3	0.91	25,000	3.1
France	1,250,000	15.5	3.2	70,000	5.6
Italy	480,000	31.1	1.6	35,000	7.3
S. Africa	220,000	54.8	0.91	15,000	6.8
USA	4,600,000	38.3	1.3	150,000	3.2
UK	350,000	20.6	2.4	30,000	8.5

Source: FAO Yearbook 1972

1/ A tractor is generally considered an economically sound investment, if employed in productive work for a minimum of 1,000 hours per year, which is about equivalent to the work of a 40 hp tractor on 40 ha. land. In Yugoslavia a private farmer and owner of a 40 hp tractor with only 10 ha. of land would need to work that tractor on neighboring farms either on a hire or cooperative basis for 75% of the hours of use each year. At present, cooperative machine work on approximately 12% of the cultivated area in the private sector. The trend in most countries is for a decrease in cooperative use of machinery, but to a significant increase in custom hire use; however, Yugoslavia levies excise taxes on tractors and fuel when used for custom hire work on farms making the latter a less economical proposition.

30. In countries where agriculture is on an extensive basis, as in the US and Canada, the replacement market is low in relation to the existing tractor parc whereas in Europe, where farming is much more intensive, replacement is higher. In all areas the rate of replacement is dropping, because of the better quality and thus longer life expectancy of tractors produced in recent years, and also because of the increasingly better maintenance and repair services. Taking into account the level of mechanical skill in Yugoslavia, the useful life of a tractor can be expected to vary between 10 years and 18 years. For the market projections it has been assumed that replacement amounts to 8% of tractor sales (12.5 years) until 1980 and 6% (16.6 years thereafter.

31. Obsolescence rather than wear-out is a major factor in tractor demand. Obsolescence also becomes of increasing importance as the level of mechanization in the market area increases. Most tractors are traded in not because they are worn out but because new models with improved performance, durability and particularly convenience features have come on the market. The average farmer also invariably trades for a slightly higher hp unit. This is an important consideration for a manufacturer even if he does not have any significant competition. Unless tractors are continually and progressively updated the market will never reach the volume that it otherwise would.

Motorcultivators

32. To mechanize the private sector (8.6 million ha. cultivable land) to a level of 2.0 hp/ha., about 17.3 million hp are required. It has been assumed that about 10% of the power requirements 1/ of private farms will be in the form of motorcultivators (5-12 hp), because of the large number of holdings below 3 ha (1.9 million ha), vineyards and orchards (about 464,000 ha) in Yugoslavia. In view of the capacity expansions of motor cultivators (para. 10) Yugoslavia can be expected to have a motorcultivator parc of 200,000 units averaging 9 hp by 1993 which is equivalent to a farm mechanization level of 2 hp/ha for this market segment.

Availability of Cash and Credit

33. In the social as well as private sector the availability of cash or credit does not restrict total tractor demand in Yugoslavia at the present. Social farms receive tractor loans for 3 year, at 12% interest p.a. and with a 50% downpayment through the Agricultural Development Bank (Poliobanka) and regional credit institutions. However, the majority of private farmers have been making cash purchases. The private farmers, are able to do this, because they supplement their farm income shown below, by off farm labor, sales

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1/ At present, about 15% of hp units in the private sector are motorcultivators. This percentage is expected to decrease with the overall trend to hp tractors and the introduction of small, maneuverable tractors competing with motorcultivators.

of their working animals 1/ or workers remittances of relatives or friends.

Farm Size and Income - Private Sector
(1971)

	Farms (Number)	Area (ha.)	Average Household Income Per Farm (Dinar/year) Total	From Farm	Off Farm
Under 3 ha.	1,429,000	1,914,000	11,885	5,442	6,443
Under 5 ha.	1,964,000	4,065,000	12,611	6,584	6,027
Over 5 ha.	670,000	5,941,000	17,723	13,102	4,630
Total	2,634,000	10,006,000			

Source: SRY Agricultural Survey.

34. To continue the rapid growth of farm mechanization, the less affluent farmers will have to be reached, which will in the future require credit facilities. From 1976 onward, almost 100% of tractor sales to social farms and 50% to private farmers may require financing of at least 50% of the sales price. This would result in annual credit requirements of Din 400 million for the private sector and Din 65 million for the social sector. 2/ IMT as well as the Yugoslav Government are aware of the need for agricultural credit in the near future. To this end, (i) IMT will make available from its projected cash supplies Din 75 million p.a. in credit for the 1976-78 period and Din 150 million thereafter, (ii) IMT intends to borrow from the Belgrade Bank up to Din 80-100 million for onlending to its dealers and customers, if the market situation so requires, and (iii) the "Green Plan" (para. 8) with its emphasis on farm mechanization will provide for such additional funds as may be required. However, the likely bottleneck will be the total amount of credit available, as well as the adequate channeling of credits to private farmers. Whereas the credit system for social farms is well established, private farmers, have in the past, 3/ received loans only indirectly through cooperation with social

1/ In 1969 there was a total of 2.5 million work animals on farms in the private sector (Table 3). In the last four years approximately 200,000 have been replaced by tractor power, leaving about one animal for each 3.75 ha of cultivable land. The proceeds from the sale of an animal has been sufficient to make the down payment on a tractor. It must be noted that the produce from approximately 25% of the land that an animal works is required to feed throughout the year. The replacement of work animals by tractor power thus significantly increases the marketable production of the farm.

2/ Assuming an average tractor price of Din 50,000 and annual sales of 32,000 units in the private sector, and Din 65,000 and 2,000 units in the social sector.

3/ One notable exception is Croatia and Slovenia, where agricultural credit is channelled to both sectors through banks and Agro-service organization.

sector organizations. Special attention should be given in setting up a nation-wide administrative system which would make available on a continuous basis loans for purchases of agricultural machinery.

Demand Projections

35. The projected tractor parc and replacement needs for the private and social sector are presented in Table 5. They indicate a total domestic market for tractors in agriculture of 34,000 units per year during the next 20 years. In particular:

(a) for the private sector, assuming (i) a 12.5 year replacement cycle until 1981 and 16 years thereafter, (ii) an increase of average hp per tractor from 32.5 hp to 38 hp until 1983 and 40 hp thereafter, and (ii) a farm mechanization level of 1 hp/ha by 1980 and 2.0 hp/ha in 1993, about 32,000 tractors will be needed annually during the concerned period.

(b) for the social sector, assuming (i) a 12.5 year replacement cycle until 1981 and 16 years thereafter, (ii) an increase of average hp per tractor from 51.8 hp to 60 hp, and (iii) 1 hp/ha by 1980 to meet the planned production increases, annual tractor sales of 2,000 units will be needed until 1981; thereafter, the replacement market requires an addition of 1,500 units per year.

The annual demand by size category can be forecast as follows:

Yugoslavia - Projected Average Annual Demand of

Tractors in Agriculture by Size Range /1
(1976-1983)

hp Category	Social Sector		Private Sector		Total	
	%	Units	%	Units	%	Units
18-30	2.5	50	12.5	4,000	11.9	4,050
31-50	12.5	200	80.3	25,700	76.2	25,950
51-60	20.0	400	6.1	1,950	6.9	2,350
61-90	50.0	1,000	1.1	350	4.0	1,350
91 and over	15.0	350	-	-	1.0	350
Total	**100.0**	**2,000 /2**	**100.0**	**32,000**	**100.0**	**34,000**

/1 For the size distribution of the existing tractor parc, see Table 2.
/2 1,500 units after 1983.

Export Market Projections

36. IMT appears to be the only tractor manufacturer which currently or in the foreseeable future is capable of exporting agricultural machinery to a notable extent (para. 10). The export market includes exports of (i) tractors, (ii) CKD or PKD tractor sets, and (iii) components and spares. Past exports (Table 4 and para. 17) give limited indication for the future, since IMT restricted exports to meet local demand. Regarding the export of assembled tractors, IMT is in a competitive position price- and product-wise (para. 19-21) on markets in Western Europe and the developing countries. Sufficient credits will be made available by Yugoslav banks to facilitate export sales. However, to maintain a sizeable market share in any foreign country IMT is aware that it would have to establish permanent sales and services organizations or cooperative agreements with other manufacturers and dealers.

37. The major and continually increasing export market to developing countries is for CKD and PKD tractor sets, rather than completely assembled tractors. Usually the developing country grants a manufacturing license to a limited number of foreign manufacturers on the basis that the manufacturers will progressively increase the percentage of locally produced parts so that within a 10 year period the tractor will have at least 50% local content. In turn the developing country by imposing high import duties on imported tractors gives their local licensees a virtual monopoly on the market. IMT's successful long-run exports to TAFFE, India, was such an arrangement and the Company has shown increasing expertise in providing a training program as part of exports to developing countries. The level of exports of tractor sets which IMT can expect depends on how thoroughly it develops such manufacturing agreements during the coming 2-5 years.

38. Regarding the export of components, IMT has a good potential in supplying parts and components to Massey Ferguson for use in its assembly plants worldwide, if design and quality control can be maintained to Massey Ferguson standards.

39. IMT's product line has considerable market potential. The future export market can be expected to range between 3,000 and 8,000 units annually depending on IMT's marketing strategy and effort for the different export market segments. This study assumes IMT's export market at 4,000 tractors or tractor equivalents per year, since during the coming 3-5 years the Company's staff will concentrate primarily on domestic expansion instead of initiating a massive export promotion program.

Demand Projections for Non-agricultural Uses

40. In Western Europe and North America the market for light industrial units is approximately 10% of the agricultural tractor market. A 10% market share can be considered conservative in the Yugoslav context: Tractors are widely used for haulage and transportation of material, since the available

quantities of specialized equipment is not sufficient to allow to substitute tractors with specialized equipment to the same degree as in the developing countries. In addition, IMT has developed close cooperation with the Federal Center for Forest Mechanization in Yugoslavia and forecasts an annual tractor demand of 150 units in this field. In view of these market segments in Yugoslavia, an annual demand of at least 3,500 tractors for non-agricultural uses has been projected.

Total Tractor Market and IMT Prospects

41. The following table summarizes the total projected tractor market per year and IMT's production program after expansion.

Yugoslavia - Projected Annual Tractor Market

(1977-1983)

hp category	Agricultural Use	Non-Agricultural Use	Export	Total Market	IMT Production Program (1977) (units)
18-30	4,050	50	300	4,500	3,000
31-50	25,900	800	2,900	29,600	25,000
51-60	2,350	1,500	600	4,450	3,300
61-90	1,350	1,000	200	2,550	3,300
91 and over	350	50	-	400	400
Total	34,000	3,500	4,000	41,500	35,000

Tractors in the 31-50 hp range are forecast to continue to be the dominant sector of the market (67%) and of IMT's production program (71%). After 1983 it is likely that a considerable part of sales in this hp range will shift to units in the 51-60 hp category at the expense of tractors in the 31-40 hp range.

42. The above market forecast results in the following supply/demand comparison:

PROJECTED ANNUAL SUPPLY/DEMAND COMPARISON FOR TRACTORS
(1977-1983)

	Hp Category					
	18-30	31-50	51-60	61-90	91 and Over	Total
Production /1	4,600 /2	27,900	3,650	3,200	550	39,900
Imports	-	1,800	800	100	50	2,750
Total Supply	4,600	29,700	4,450	3,300	600	42,650
Domestic Demand	4,100	26,800	3,850	2,350	400	37,500
Exports	300	2,900	600	200	-	4,000
Surplus (Deficit)	200 /2	-	-	850	200	1,150

/1 For capacity expansions see Annex 3, page 6.
/2 Not including 7,500 units of riding cultivators which do also complete with the 18-30 hp. tractors.

It has been assumed that import will continue to supplement domestic production to meet local demand and about 150 tractors in the above 65 hp range, will be imported to account for special equipment which are not locally produced.

43. To sell its projected tractor production IMT would have to establish an overall market share of 84% which is in line with the Company's present market position among domestic producers. However, a comparison of the market forecasts with the projected capacity expansion of all Yugoslav tractor manufacturers indicates two possible problem areas:

(i) In the 18-30 hp category, total tractor forecast of 4,150 units per year compares with a likely domestic capacity of about 12,000 units. Although this figure includes the Pasquali riding motorcultivator (para. 11), which may supply also to a certain extent the motorcultivator market, there will be considerable competition in this product category for the new IMT tractor.

(ii) In the above 70 hp category, projected tractor demand of 2,550 units compares with IMT's production program of 3,600 units. This discrepancy results from the underlying assumption that the social sector will reach full farm mechanization at 1 hp/ha and average 60 hp per tractors. The actual demand could be higher, if the social sector requires a higher hp/ha level for adequate mechanization and/or the trend to even higher average hp units

accelerates. IMT can expect minimal domestic competition in this product category, but some import competition from Eastern European countries. The Company should monitor closely this market segment in order to adjust the production program to the actual demand.

44. IMT is aware of the increasing domestic competition and possible market constraints in the 18-30 hp and above 70 hp categories. Although the projected profit margin for these tractor types are below those of the standard models (Annex 6-2), the Company plans to enter the 18-25 hp and above 100 hp market in order to strengthen its market position by offering the full range of tractor products. It will be important for the Company to follow up closely on production cost and market success of the new models in order to incorporate changes or delete these product types if they prove uneconomical.

D. THE MARKET FOR AGRICULTURAL IMPLEMENTS

45. An acceptable level of tractor utilization can be achieved only if implements are available in the numbers, types and sizes required to match sales of tractors in the various hp categories and for the different types of soil, climate and cropping conditions prevailing in the country. It is important therefore that any expansion in tractor production be accompanied by a similar level of expansion in implement production. This is of particular importance in an expanding market, where tractors are replacing work animals since animal-drawn implements cannot be adapted for use with tractors. When the tractor market reaches a static level and is basically a replacement market, however, the market for implements usually decreases significantly since (i) their useful life is longer than that of tractors, and (ii) the obsolescence factor is not as important.

Structure of the Industry

46. From the standpoint of engineering development and production implement manufacturing presents an entirely different situation than the tractor business. A tractor is a sophisticated machine with a very high ratio of cost-to-weight, and where all design specifications and production tolerances are measured in thousandths of an inch or the metric equivalent. Implements on the other hand have a low cost-to-weight ratio and design specifications and production tolerances are measured only in fractions of an inch. Tractor production consists mainly of precision machinery, while implement manufacturing is welding and the assembly of welded sections to rough castings and/or forgings. A good tractor engineer is therefore usually not successful in designing low cost, functional implements. Also in production, there is only a limited opportunity for the transfer of labor between, or the utilization of, the same facilities for tractor and implement production. Compared to tractor production, implement manufacture is characterized by higher need for diversity, greater ease of innovations and greater ease of entry into production. The latter is illustrated by the fact that there are about 20

manufacturers of agricultural implements in Yugoslavia, but only 3-4 producers of tractors. However, the possibility of entering the implements market varies according to the type of implement. The production of the rather sophisticated implements - plows, disc harrows, seed drills and crop planters requires expertise in design and relatively high toolage costs which cannot normally be provided by small manufacturers.

Demand and Supply Pattern

47. Agricultural implements have been in short supply in Yugoslavia, particularly for the imported tractors. According to the present relatively low level of mechanization and use of modern farming techniques in Yugoslavia, demand and supply in the private sector has been concentrated on basic implements such as trailers and plows. However, social farms require a broad range of implements and types which match the larger hp units.

48. There are no continuous statistics on implements production and sales in Yugoslavia. 1/ The following table summarizes the available information:

Major Agricultural Implements - Selected Data
(1973 estimated units)

Type	Number on Farms	Production per year IMT	IMT Cooperatives	Others	Imports	Total Sales
Plows	60,000	1,500	500	500	800	3,300
Trailers	40,000	6,000	500	600	1,320	8,420
Disc Harrow	45,000	400	20	100	120	640
Seed Drills	20,000	100	20	50	150	320

Source: Agricultural Institute and IMT.

According to Yugoslav experts the supply of implements for IMT tractors has been adequate because of cooperative agreements with other implement manufacturers, and IMT's recent expansion of its implements line. (Annex 2-3, Para. 12).

1/ According to the Statistical Bulletin, implements production in Yugoslavia increased from 15,100 tons to 22,302 tons, but such information provides limited insight since weight and sales mix of farm implements vary widely.

Market Projections

49. Future demand for implements must be analyzed on a sectorial basis. In the social sector the average of tractors is moving from approximately 50 hp to 60 hp. However, tractors of more than 60 hp cannot effectively utilize the small 3-point hitch mounted implements used on smaller tractors which they replaced. Tractors in the over 60 HP class require large size semi-mounted or pull type implements of proportionately greater weight and strength per hp of power requirement. In the private sector where tractors in the under 50 hp range will continue to predominate, tractor 3-point hitch mounted implements will be the type required; and this market segment can be expected to absorb used implements from the social farms. Stated on the basis of a percentage of tractor sales, therefore, the market for implements relative to tractors should not be as great in the private as in the social sector.

50. The table below indicates the average annual sales of implements which can be anticipated in the period 1976-1983. This is based on average annual sales of tractors in that period of approximately 32,000 to the private sector and 2,000 to the social sector. Sales can be expected to peak and maintain high volumes in the period 1978-1983 but fall off by 20-50% after 1983 when the implements market becomes basically one of replacement.

Yugoslavia - Market for Major Implements 1976-1983
Average Annual Requirements

	Social Sector		Private Sector		
	Number	% of Tractor Sales	Number	% of Tractor Sales	Total Number
Trailers 3 tons	60	4	15,000	50	15,600
Trailers 5 tons	600	40	600	2	1,200
Plows	1,125	75	18,000	60	19,125
Cultivators	300	20	9,000	30	9,300
Seed Drills	300	20	3,000	10	3,300
Planters	300	20	3,000	10	3,300
Disc Harrows	600	40	6,000	20	6,600

51. IMT expects to sell about 60% of the projected implement requirement, of which 70% would be produced by IMT, Belgrade, after project completion, and the balance subcontracted to its affiliated producers.

Major Agricultural Implements - Projected Annual Production
IMT Market Share

	Projected Market Units	IMT Production	IMT Cooperatives	Market Share	%
Trailers	16,800	7,800	1,200	9,000	54
Plows	19,125	12,000	2,500	14,500	63
Cultivators	9,300	1,000	1,800	2,800	30
Seed Drills	3,300	1,000	1,500	2,500	76
Disc Harrows	6,600	4,000	600	4,600	70

IMT's production projections can be considered realistic in view of the structure of the implements industry. An adequate supply of IMT tractors with implements can be assumed if IMT assures the supply of 50% of required trailers or cultivators and 75% of the more sophisticated implements as disc harrows, plow and seed drills. Since the above production volume will be assembled in two shifts after completion of Phase I, and in one shift after the Phase II expansion, IMT could increase its own implements production if the market so requires. The Company intends to monitor the development of the implements market closely in order to adjust the product volume and design if necessary.

E. IMT's MARKETING AND SERVICE ORGANIZATION

52. IMT's marketing operations are directed by the Sales and Services Department which includes separate divisions for export, domestic sales, inventory and distribution, and service and spare parts. The department is assisted by the marketing research and advertising group of the UMI staff.

Sales Organization

53. Over the past 15 years IMT has established a wide ranging dealer network in Yugoslavia for the distribution of tractors, agricultural implements and spare parts. This consists of (i) 26 dealers (Map: IBRD 1050 3R) relating directly to IMT, and (ii) 100 sub-agents who work with IMT only through its respective dealer. The number of sub-agents per dealer varies from 2 to 12 depending on the size and agricultural importance of the area. IMT does not own any sales facilities in Yugoslavia or abroad.

54. The sales organizations are not exclusive dealers for IMT products, but distribute about 90% of agricultural machinery available for the Yugoslav market, i.e., about 30,000 tractors in 1972 and a proportional number of implements and spare parts. Accordingly, the dealer network has been handling nearly twice IMT's sales volume and can be expected to channel without notable adjustment problems 35,000-45,000 tractors per year after the completion of the IMT expansion.

55. The present dealer network fulfills only distribution functions instead of sales and promotion tasks due to the demand-supply gap for tractors during the past year. The Company is aware of this situation and realizes the need for more intensive marketing activities by its agents after the expansion. To this end IMT will:

(i) make available to its dealers and customers medium-term credits in the range of Din 75-150 million per year;

(ii) initiate a training program for dealers and customers. The training program foresees 2-4 week courses for about 100 dealers per year and the IMT sales personnel at the IMT service school in Belgrade. In addition, informatory courses and instruction for potential customers and technical personnel will be organized by IMT and its dealers at regular intervals; and

(iii) establish exclusive dealerships during the 1978-1980 period. It can be expected that the Yugoslav market for agricultural machinery will become a buyers' market in the 1980s, so that IMT intends to have selected and trained, by that time, exclusive dealers who can adequately promote IMT's products.

Services and Repair Organization

56. IMT-Belgrade directs the activities of the Yugoslav service and repair facilities and acts as servicing agents for Massey-Ferguson tractors in Yugoslavia. The service and repair organization consists of:

(a) the Repair Center in Dobanovci, which is part of IMT (Annex 2-4, para. 19). It provides at present industrial overhaul of about 1,500 tractors per year. With increasing supply of new tractors the overhaul function is expected to decrease and Dobanovci will be equipped to handle the increasing service requirements and sales of spare parts for the IMT tractor fleet in its area;

(b) 146 service workshops which are classified according to equipment and work program in 45 Type I workshops, 64 Type II workshops, and 37 Type III workshops. All workshops are independent entities which have signed service contracts with one of IMT's 26 dealers. The distribution, size and number of workshops have been continuously increased according to the increase of IMT's tractor fleet.

57. The dealer allocates the service and repair of IMT products to the workshops in his district, supplies spare parts, and settles warranting claims and on-the-spot emergency repairs; whereby, Type I workshops also perform general overhaul functions and render services to Type II and Type III workshops - if more sophisticated personnel and equipment is required.

58. The repairs and servicing system has worked satisfactorily in the past. To prepare for the increasing servicing requirements after project completion IMT intends (i) to strengthen the existing workshops through training of its maintenance personnel, and (ii) encourage its dealers to sub-contract new workshops if needed. The training program is expected to start in 1975 and will involve (i) 2-6 week courses for about 100 instructors of regional training centers, and for about 100 agricultural engineers of socially owned farms, at the IMT service school in Belgrade; and (ii) 1-4 week courses for about 3,000 repair and maintenance people per year in 50 regional training centers.

Industrial Projects Department
November, 1973.

Table 1

YUGOSLAVIA

IMT TRACTOR EXPANSION PROJECT

Levels of Mechanization - Selected Countries

Country	Cultivable Area (ha x 1000)	Wheeled tractors 1/ in use	ha/ tractor	hp/ha 2/
Albania	556	6,000	92	0.53
Africa (total)	205,000	366,650	559	0.08
Canada	43,400	800,000	54	0.91
Czechoslovakia	5,334	139,000	38	1.3
France	19,265	1,240,000	15	3.2
Hungary	5,594	60,250	92	0.53
Italy	14,930	482,340	30	1.6
India	160,000	100,000	1,600	0.03
Japan	5,510	278,000	19	1.26
Kenya	1,670	5,890	283	0.17
Poland	15,326	205,150	74	0.66
Rumania	10,512	107,290	97	0.48
S. Africa	12,058	220,000	54	0.91
S. America (total)	84,000	406,440	206	0.24
UK	7,261	352,000	20	2.42
USA	176,440	4,600,000	38	1.30
USSR	232,809	1,977,500	117	0.42
Yugoslavia	10,153	120,500	84.3	0.45
a) Sector				
Private	8,664	95,400	59.4	0.86
Social	1,489	25,100	90.8	0.36
b) Republic (Private Farms)				
Bosnia and Herzgovina	1,451	6,057	239	0.13
Montenegro	166	280	592	0.05
Croatia	1,733	34,594	50	0.62
Macedonia	482	3,180	151	0.20
Slovenia	547	11,500	47	0.65
Serbia (Total)	3,821	39,789	96	0.32
Close	2,464	20,389	121	0.26
Vojvodina	1,029	18,000	57	0.54
Kosovo	328	1,400	234	0.13

1/ 1970 data except for Yugoslavia sector where 1972 figures were used.

2/ Based on average of 50 hp per tractor except for Japan (25 hp) and Yugoslavia (51 hp - social sector; 31 hp - private sector).

Industrial Projects Department
September 1973

Table 2

YUGOSLAVIA

IMT TRACTOR EXPANSION PROJECT

TRACTOR POPULATION, BY SIZE RANGE (1972)

A. Social Sector

HP Category	Average HP	No. Tractors	Total HP
18-30	25	327	8,175
30-50	40	12,189	487,560
50-80	60	11,317	679,020
Over 80	90	1,254	112,860
Total	51.3	25,087	1,287,615

B. Private Sector

HP Category	Average HP	No. Tractors	Total HP
18-30	20	14,310	286,200
30-40	33	71,550	2,361,150
40-50	45	7,632	343,440
Over 50	60	1,908	114,480
Total	32.5	95,400	3,105,270

C. SFRY Total

Total HP	No. Tractors	Average HP
4,593,225	120,487	38.12

Source: Federal, Secretariat for Agriculture

Industrial Projects Department
September 1973

Table 3

YUGOSLAVIA

IMT TRACTOR EXPANSION PROJECT

WORKING ANIMALS ON PRIVATE FARMS IN SFRY

	Total Working Horses	Oxes	Working Buffalos	Working Mules	Donkeys	Working Cows
Total	937.796	609.066	12.129	16.125	138.553	794.103
to 0,5 ha	11.501	4.235	149	1.248	15.077	5.215
0,5 - 1	20.997	11.769	385	1.763	18.180	16.138
1 - 2	74.547	52.661	2.352	3.036	32.545	90.575
2 - 3	106.920	76.064	2.769	2.455	22.247	146.148
3 - 4	109.335	78.322	2.047	1.774	14.081	132.795
4 - 5	127.129	74.552	1.395	1.234	9.359	112.045
5 - 6	110.396	61.919	977	880	6.522	79.848
6 - 7	90.761	49.605	745	704	4.831	57.017
7 - 8	65.745	38.732	439	534	3.469	41.114
8 - 9	59.134	30.307	284	369	2.552	27.642
9 - 10	57.573	27.920	303	325	2.321	23.189
10 - 15	67.892	61.213	188	1.016	4.543	43.771
15 - 20	18.216	22.580	61	340	1.592	12.116
Over 20 ha	17.941	19.349	29	530	1.319	6.482

Source: SFRY Agricultural Survey

Industrial Projects Department
September 1973

Table 4

YUGOSLAVIA

IMT TRACTOR EXPANSION PROJECT

EXPORTS OF IMT TRACTORS, TRACTOR SETS AND COMPONENTS
(units)

Type of Tractor and Country	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
IMT-533										
India	1,043	1,570	1,952	2,118	2,590	2,912	3,818	2,310	1,493	1,315
CDR	3	-	3	302	352	300	1	-	-	-
Holland	-	-	-	-	203	100	115	70	-	-
Cyprus	-	-	-	-	3	74	60	64	60	24
Lybia	-	-	-	-	-	15	325	52	39	4
Pakistan	-	-	-	-	-	-	-	-	135	152
Other Countries	2	3	3	18	120	74	19	3	-	2
Sub-Total:	1,048	1,573	1,958	2,438	3,265	3,475	4,338	2,501	1,730	1,497
IMT-555										
India	-	-	-	-	-	-	2	-	359	352
Other Countries	-	-	-	6	20	171	107	81	1	-
IMT-558										
Other Countries	-	-	-	-	-	-	-	29	22	10
Grand Total:	1,048	1,573	1,958	2,444	3,285	3,646	4,547	2,611	2,112	1,959

Source: IMT Market Study

Industrial Projects Department
September 1973

YUGOSLAVIA - IMT EXPANSION PROJECT

Table 5

TRACTORS IN AGRICULTURE - PROJECTED YUGOSLAV REPLACEMENT MARKET AND TRACTOR PARC

	Private Sector				Social Sector			
Year	Sales	Replacement 1/	Tractor Parc	hp/ha 2/	Sales	Replacement 1/	Tractor Parc	hp/ha 3/
1972			95,400	0.38	-		25,087	0.86
1973	30,000	7,632	117,768		2,000	2,007	25,080	
1974	30,000	9,421	138,347		2,000	2,006	25,074	
1975	30,000	11,068	157,279		2,000	2,006	25,068	
1976	32,000	12,582	176,697		2,000	2,005	25,063	
1977	32,000	14,136	194,561		2,000	2,005	25,058	
1978	32,000	15,564	210,997		2,000	2,005	25,053	
1979	32,000	16,879	226,118		2,000	2,004	25,049	
1980	32,000	18,090	240,002	1.0	2,000	2,004	25,045	1.0
1981	32,000	19,202	252,800		2,000	2,004	25,041	
1982	32,000	15,168	269,632		1,500	1,502	25,039	
1983	32,000	16,178	285,454		1,500	1,502	25,037	
1984	32,000	17,127	300,327		1,500	1,502	25,035	
1985	32,000	18,020	314,307		1,500			
1986	32,000	18,858	327,449		1,500	1,502	25,034	
1987	32,000	19,647	339,802		1,500	1,502	25,032	
1988	32,000	20,388	351,414		1,500	1,502	25,030	
1989	32,000	21,085	362,329		1,500	1,502	25,028	
1990	32,000	21,740	372,589		1,500	1,502	25,024	
1991	32,000	22,355	382,234		1,500	1,501	25,023	
1992	32,000	22,994	391,240		1,500	1,501	25,022	
1993	32,000	23,474	399,766	2.0	1,500	1,501	25,021	
1994	32,000	23,985	407,781		1,500	1,501	25,020	
1995	32,000	24,470	415,310		1,500	1,501	25,019	

1/ 15 years or 64% of previous years' parc
2/ at average 32.5 hp in 1972, 38 hp until 1980 and 40 hp thereafter
3/ average of 51 hp per tractor in 1972 and 60 hp in 1980

Industrial Projects Department
November 1973

YUGOSLAVIA - IMT TRACTOR EXPANSION PROJECT

Detailed Project Description

1. The project is to increase the capacity of IMT's Belgrade factory to an annual production volume by 1976 of 35,000 tractors, 27,000 implements and a proportionate number of accessories and spare parts. The new facilities will allow, in addition to the present IMT product range, the manufacture of about 3,000 20-25 hp tractors/year and 400 above-100 hp tractors/ year.

A. IMT Expansion Program

2. IMT's overall program for the Belgrade factory foresees an expansion in two stages. It will increase the plant facilities as follows:

IMT Belgrade - Area and Facilities
(m^2)

		Existing	Phase I	Phase II
1)	Total area	168,500	388,250	388,250
2)	Production covered			
	Implement production	6,100	10,535	15,535
	Tractor parts machine shop	9,870	21,600	21,600
	Tractor assembly shop	5.665	16,200	16,200
	Sub-total	21,635	48,335	53,335
3)	Offices			
	a) administration + production planning	1,690	6,835	6,835
	b) development + laboratory	2,650	2,650	3,800
	c) Sales + Finance Department	1,848	1,848	8,000
	d) others	1,095	1,095	included in above
	Sub-total	7,283	12,393	18,635
4)	Covered storage area			
	a) cellar	1,450	1,450	1,450
	b) raw material stores	2,300	9,995	9,995
	c) other stores	3,423	4,340	8,980
	Sub-total	7,173	15,785	20,425
5)	Open storage area	36,000	36,000	36,000

Expansion Phase I ("The Project")

3. The first expansion phase (or the project) is designed to enable the Company to meet the production targets stated in para. 1. The main factors characterizing the IMT project are the following:

(a) Construction of a new tractor parts machine shop (21,600 m^2) with additional 5,400 m^2 of auxiliary floor area. Heat treatment and surface protection facilities will be installed, as well as 690 machine tools (265 existing and 425 new) which will be arranged in 50 production lines. The existing 265 machines including the tools store will be shifted to the new building. However, some tractor parts, particularly welded components, will be produced in the implements shop.

(b) Construction of a tractor assembly plant (16,200 m^2) with additional 4,050 m^2 auxiliary floor area. The existing usable machines will be shifted to the new building and supplemented by new transfer lines, conveyors and paint shops.

(c) Construction of a front and side annex (5,145 m^2), with connection to the existing production bay, which will include offices for the Production Planning and Quality Control Departments, a cafeteria, locker-rooms, etc.

(d) Reorganization and rehabilitation of the existing tractor production and assembly plant into a main implement production and assembly area. The existing heat treatment facilities will remain and be used exclusively for implements. The existing maintenance and tools shop will also remain and more machine tools will be added. The new layout will improve work conditions and health standards to the acceptable level. The present implements shed, which had been built on the property of FOB, will be dismantled.

(e) Construction of three Dutch barns (3,800 m^2), an oxygen bottle shed (40 m^2), underground fuel and lubrication store (500 m^2) and raw material stores (7,695 m^2) with appropriate storage equipment facilities.

(f) Building of access roads within the factory area.

(g) Installation of electronic data processing equipment for production planning, inventory control and accounting.

(h) Installation of additional laboratory equipment (test rig equipment, microfilm equipment, vibration exciter, etc.).

(i) Compressor station (350 m^2) and annex to the old production hall (2,000 m^2).

4. The plant layout (Annex 4-2, page 1) illustrates the proposed expansion. Production on a one-shift basis in the tractor assembly plant and two shifts in all other production facilities will permit the manufacture of 35,000 tractors, 27,000 implements, various attachments and spare parts.

The proposed project includes a high degree of flexibility in product range. By producing in 3 shifts IMT could increase its tractor output to 50,000-70,000 units/year. On the other hand, by changing the product mix and manufacturing more implements, accessories and spare parts than presently proposed, the Company could economically decrease the tractor production to 20-25,000 units.

Expansion Phase II

5. Preliminary planning for Phase II has been completed in the framework of the overall expansion program. Phase II will primarily consist of the construction of new buildings to improve the working conditions of the administrative and service departments:

Expansion of Facilities (Phase II)

		m^2
1.	Tools & maintenance shop	6,500
2.	Development Department	3,800
3.	Spare Parts Department	3,600
4.	Expansion of the Scaffolding Production Shop	4,175
5.	Stores for paint equipment, fire resistant material, fuel, salts, chemicals, scrap	4,000
6.	Garage & fire station	2,000
7.	Sales pavillion	3,000
8.	Head office	5,000
9.	Kindergarten & medical center	2,700
10.	Central kitchen	1,000

Since these facilities are not mandatory for reaching the planned capacity, IMT has not finally decided on the exact period of Phase II project execution. The implementation schedule will primarily depend on the availability of funds. Phase II expansion is estimated to cost about Din 200 million, of which about 10% would be in foreign exchange. IMT's projected financial situation (Annex 7-2) should allow the Company to undertake Phase II in 1978-79. For the purpose of this report the project refers solely to the Phase I expansion. The proposed Bank loan will be used for Phase I, whereas IMT's cash generation after full expansion to 35,000 tractor/year in 1976 should be sufficient to finance the Phase II expansion.

B. Tractor Parts Machine Plant

6. The layout of the new tractor parts machine plant is given in Annex 4-2, page 1. The bay includes the machine shop with 40 lines, repair, heat treatment and surface protection facilities. Certain tractor parts (hydraulic pump and front axles, welded, pressed and rough machined parts) will not be manufactured in the new plant, but in the implement shop and its Annex. The improved features of the proposed tractor parts machine plant are a) its short production cycle, b) its completion of each part on one machine line only, c) good production process planning and rational grouping of machines. The plant will work on a two-shift basis, although its capacity could be expanded by going over to three shift operation.

7. The machine shop manufactures gears, differentials, gear assemblies and miscellaneous tractor parts on 40 machine lines. The five major machine groupings are castings, steel parts, gears, high volume small parts, and grinding. Internally, medium weight parts are transported by roller conveyor, whereas light parts rely on overhead monorails. Heavy parts which do not require heat treatment are conveyed directly to the assembly shop. To facilitate the production flow, parts requiring heat treatment are produced near the heat treatment shop, and conveyed directly to the heat treatment, plating or grinding operations.

8. Machine Tool Requirements. IMT estimates that out of 333 existing machine tools, 265 could be effectively used in the expansion program. The present manufacture of 12,000 tractors is effected on 333 machine tools of which 65 are of high productivity (18.3%). After expansion (35,000 tractors/year), a total of 690 machine tools will be used out of which 245 will be highly productive (34.0%). The project includes 275 standard machine tools and the following additions of high productivity machine tools: 4 multi spindle bar automatics, 25 automatic and semi-automatic machine tools, 42 front operated lathes, 10 drilling machines with rotary tables, 23 multi spindle drilling machines, 3 deep hole drilling and boring machines, 3 automatic grinding machines with charger, 5 profile grinding machines, 2 heavy duty surface grinding machines, 2 centerless profile grinding machines, 1 external broaching machine, 24 single spindle bar-automatices, 2 internal gear hobbing machines.

9. Machine Tool Utilization. From the production point of view, this selection of machine tools will facilitate a significant reduction of machine time. The machine time on an IMT 533 tractor with differential lock and cab will be reduced from 121.0 hours to 85.5 hours, thus saving 35.5 hours (29%). However, a transfer machine 1/ is used only for rear axle trumpet housing. No other components are machined on transfers. The trumpet housing transfer

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1/ A transfer machine is a complex, automated machine capable of doing different operations including setting up of the machine and inspection.

machine reduces the present 10 machines, 7 workers and 8 minutes stroke and 52 minutes full cycle time to one transfer machine with two workers/shift and 2.6 minutes stroke and 5.2 minutes full cycle time.

10. The machine tool utilization for both shifts is satisfactory (92%). In order to prevent transfer of a component from one line to another, a number of auxiliary and cheap machines are installed in the line, although the percentage utilization of such a machine may be low. Similarly, on lines requiring close tolerance gear cutting, the grinding machines are added on the same line. For spiral gears requiring high tolerance which cannot be obtained by copy lathe, an additional grinding machine is added on the line.

11. Heat Treatment in the tractor parts machine plant a second heat treatment unit will be installed. A transfer of the existing facilities would be too costly and, moreover, they can be used economically in the old building for implement parts treatment. The operation involves, consecutively, gas carburation, hardening heating, quenching in pools with water, oil thermal solutions, and under pressure machines, inductive hardening, ignition hardening, soft nitriding, annealing, normalizing, degreasing, washing and sand blasting. The proposed production program requires the following capacities:

	tons/year
Gas carburation	4,100
quenching	7,150
soft nitriding	150
ignition and inductive hardening	1,850
pressure hardening machines	1,250
sand blasting	5,730

The installation of the new equipment will fundamentally change the technological level of IMT's heat treatment operation: a) the heating of the gas carburation furnace will be by propane-butane gas which results in higher productivity; b) hardening by ignition or intermediate frequency currents achieves a higher productivity than classical heating; and c) the installations can be arranged near the machine line, thus improving material flow and production time.

12. Surface Protection of tractor parts and implements will be carried out partly in the existing bay and partly in the new tractor parts machine plant. The process consists of four basic operations (galvanizing, plating-copper, nickel or chrome, phosphate treatment and burnishing), and the corresponding final operations (degreasing, pickling, rinsing, drying, oil coating, anodizing, mounting, demounting, partial isolation of surfaces, copper deplating, and uncoating of foiled galvanic films).

The project requires an annual capacity for surface protection of:

galvanizing	6,813,000 pcs	or	2,900 dm^2
copperplating	5,700 pcs	or	12,740 dm^2
decorative chromeplating	304,000 pcs	or	129,000 dm^2
phosphate treatment	3,806,000 pcs	or	3,646 kg

The surface protection equipment in the new plant will include galvanizing and phosphate treatment facilities only. The galvanizing process is similar to the existing one. Automatic equipment has not been selected since the size of the treated parts varies widely which would impede continuous operation.

A special disposal installation will neutralize the waste liquid resulting from the surface protection and hardening operations.

C. Tractor Assembly Plant

13. The layout of the tractor assembly plant is given in Annex 4-2, page 2. The new 16200 m^2 bay will provide areas for the main assembly and sub-assembly lines, two paint and drying shops, tractor accessories assembly, final tractor inspection and adjustment, engine storage, transit storage and storage of parts from outside suppliers. The layout of the assembly shop is spacious with 2 horizontal and 3 longitudinal passages each of which is 5 meters wide, and a number of service passages along the work area. The layout of the plant is sound. It provides good working conditions and sufficient floor space for later modification.

14. The new assembly shop consists of eight major assembly group lines (center housing, gear box assembly, engine preparation, front axle preparation, main assembly, parts painting, sheet metal painting, final assembly) and a number of sub-assembly work areas. The assembly operations are designed to be carried out as selected group activities, i.e., based on time and motion study, norms for each operation in assembly have been established, and the work so designed that each worker is engaged equally with no idle manpower capacity. Required hardware is stored in boxes or special carriages on wheels along the assembly line which increases the productivity of the assembly operation considerably. Internal transportation is by conveyors, synchronized through a central control system.

15. The improved material flow and machine grouping of the new tractor assembly shop will permit assembly of the model IMT 533/540 at 2.6 min/stroke 1/ and the model IMT 558/560 at 3.7 min/stroke as compared to 7.0 min/stroke and 8.9 min/stroke for the present operation.

1/ Output frequency, i.e., 2.6 min/stroke means that every 2.6 minutes a tractor rolls out of the assembly shop.

Quality Control

16. The proposed project will overcome the deficiencies of the present quality control system. The improved material flow and machine organization of assembly and sub-assembly lines will allow for the introduction of a line inspection system on all assembly operations.

17. Painting Shops the tractor assembly plant includes two painting and drying shops for sheet metal and parts. The new paintshops will be heated by oil instead of the electric powered infra-red rays of the present facilities. This technologically more advanced solution is cheaper, safer and results in a higher drying productivity. About 82 items will be processed through the sheet metal paintshop, where the following operations are carried out: (a) washing, (b) painting, (c) vaporizing, (d) drying and cooling. The parts are painted red, grey and blue-green.

D. Implements Production Shop.

18. The project envisages the transfer of the existing implements production shop to the existing main production bay. The implements heat treatments and assembly operation will occupy about 1/3 of the building which will also accommodate offices, the repair shop, the tool room, and the raw material and parts storage.

19. The implement production shop producing about 27,000 units/year in two shifts, will require 127 new machines and reorganization of the four major assembly lines in a) a trailer line with a floor conveyor, mechanized painting booth and oven (80°C); b) a plow line with an overhead conveyor, painting booth and oven (140-180°C); c) a cultivator line with a floor conveyor, painting booth and oven (140-180°C); and d) a common line for small machines.

In addition, a fifth ground painting booth will be installed.

E. Storage and Material Handling Facilities

20. Internal Transport has been primarily by forklifts. The expansion project aims to reorganize the production flow and will introduce conveyors as far as possible. In particular, conveyors will be used for transport of a) sheet metal through the paint shop and assembly line, b) parts within the machine shop, c) prepared engines to the assembly line. Transport of heavy parts will be carried out in pallets by forklifts. However, the Company has not yet determined the internal transport system in sufficient detail. Assurance should be sought during negotiation that adequate steps have been taken.

21. Storage. The proposed covered and open store areas are adequate and take into account the supply of raw material and parts from outside sources, IMT's production of semi-finished and finished components as well as the

internal and external material movement system. The project includes the following storage facilities a) 7,695 m^2 raw material storage and preparation bay, b) a storage area in the existing production hall primarily for forgings, castings and components, c) an engine and finished components store, in the tractor assembly bay, d) 3 sheltered stores of 3,800 m^2 each for tires and engines, e) an underground flame-proofed fuel and lubricants store, f) an open storage area for tractors and implements, and g) an oxygen bottle shed.

F. Utilities

22. Electricity. The existing transformer sub-station (35/10 KV), which is also used by FOB, will not have sufficient capacity to meet both companies increased needs after project completion. Therefore, an agreement was reached with BEOGRADSKE ELEKTRANE, the local power company, for the supply of additional electricity as well as installation of a main transformer station along with transmission lines. A new 110/10 KV transformer to be built in the IMT complex will be connected through a 3 km double circuit 110 KV overhead transmission lines will be shared by IMT and FOB according to their projected power needs; 50% of the transformer investment cost will be provided by BEOGRADSKA ELEKTRANE and 25% each by IMT and FOB.

Total annual consumption of electric energy is expected to increase from 12 MW to 31.5 MW after project completion. On a per unit basis, this implies an average electricity consumption increase per tractor from 600 kwh to 700 kwh due to improved ventilation, heating and lighting in the plants, a higher degree of mechanization of machining and internal transport as well as additional in-house tractor parts production.

23. Water. IMT is connected with the Belgrade water supply system and uses at present an average of 550,000 m^3 water/year. The existing wells on the property have not been exploited during the past ten years. The project envisages the construction of a) a water recirculation system, primarily for cooling water used in the compressor station and the hardening process, and b) extension of the existing water neutralizing facilities. The recirculation of water is expected to result in a decrease of annual water consumption to about 390,000 m3. Water supply does not pose **any** problem.

24. Compressed air is supplied by FOB which has sufficient capacity to supply IMT's present average consumption of 6.2 m^3/minute. After expansion a capacity of 49.8 m^3/min. will be necessary. As part of the project IMT plans to install its own compressor station (capacity: 3,000 m^3) in one of the existing buildings.

25. Gas. The heat treatment ovens as well as the paint booth in the existing production hall use liquid propane gas, whereas the drying process after painting relies on electric power. The installation of additional surface protection, heat treatment facilities and paint shops will more than

triple IMT's annual gas consumption. After expansion, IMT intends to purchase natural gas for heating of the automatic heat treatment ovens (142.5 Nm^3/h) and the drying installations (199.5 Nm^3/h). NAFTAGAS has been informed of the Company's natural gas requirements of 351 Nm^3/h.

26. Heating. The existing production facilities on IMT's property are heated partly by FOB's steam boiler and partly by 130°C water from the Central Heating Station in Belgrade. The covered area of 30,670 m^2 with a capacity of 152,520 m^3 requires about 5,000 x 16 KCal heating energy per year.

The Central Heating Station Belgrade agreed to supply IMT's total projected heating requirements of about 25.10^6 KCal/h. after 1975. This hot water supply will be sufficient for heating of the 123,205 m^2 covered area (823,040 m^3) and servicing of the ventilation system in the tractor parts machine plant and tractor assembly plant.

27. Transportation. The IMT Belgrade factory is located in an industrial area with direct access to the main highway and the urban road system. The Company has no direct rail-link. The project envisages an annual transport requirement of 130,000 tons for raw materials, parts and supplies: (a) fuels, greases and liquified gas will be delivered by NAFTAGAS using special vehicles, (b) IMT will transport engines from IMR (13,420 tons), castings from FOB (24,000 tons), tires from REKORD (4,000 tons), paints and lacquers (300 tons) with its own trucks and forklifts. Transport of the remaining quantities will be arranged through rail and outside transport enterprises.

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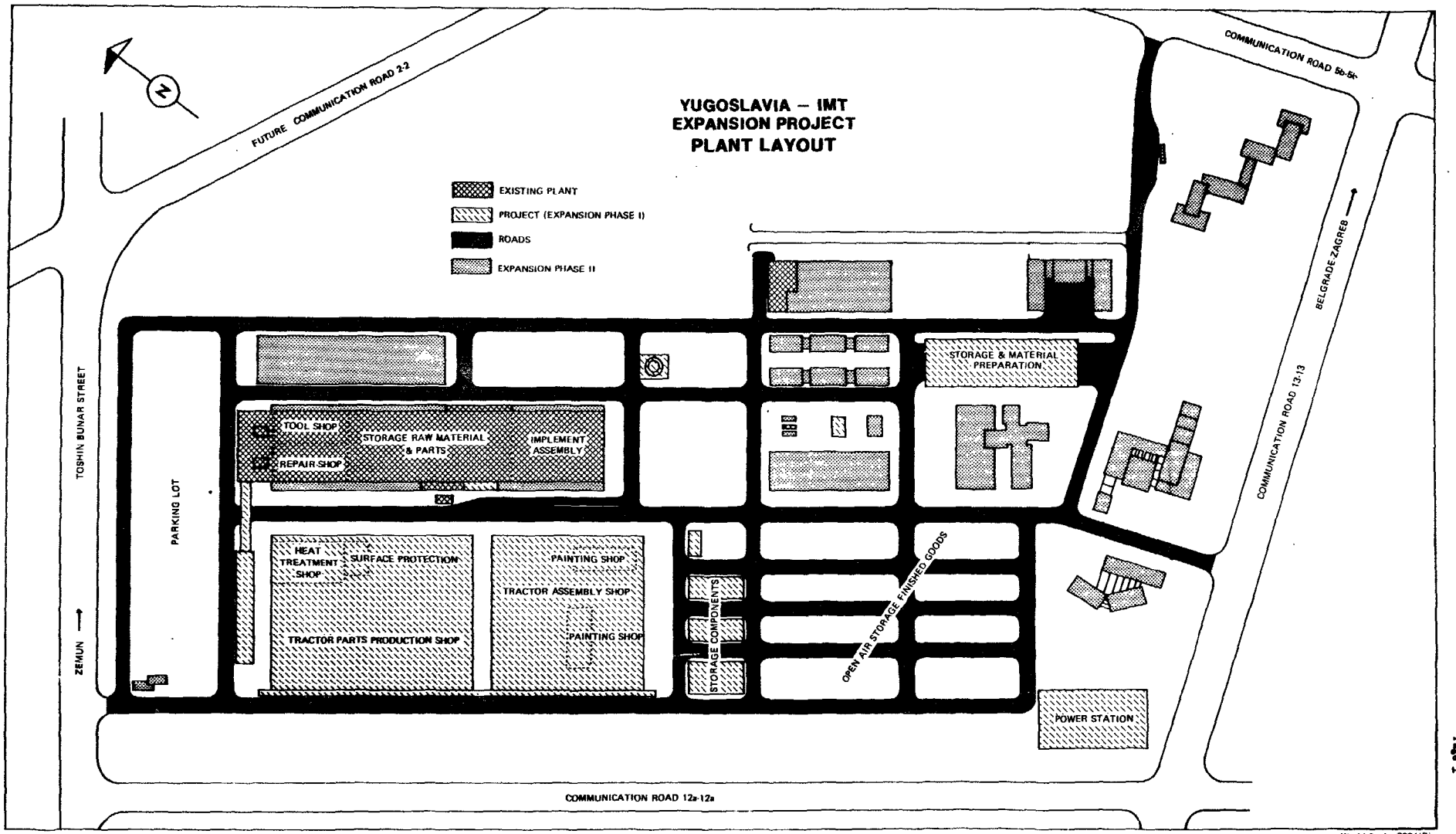
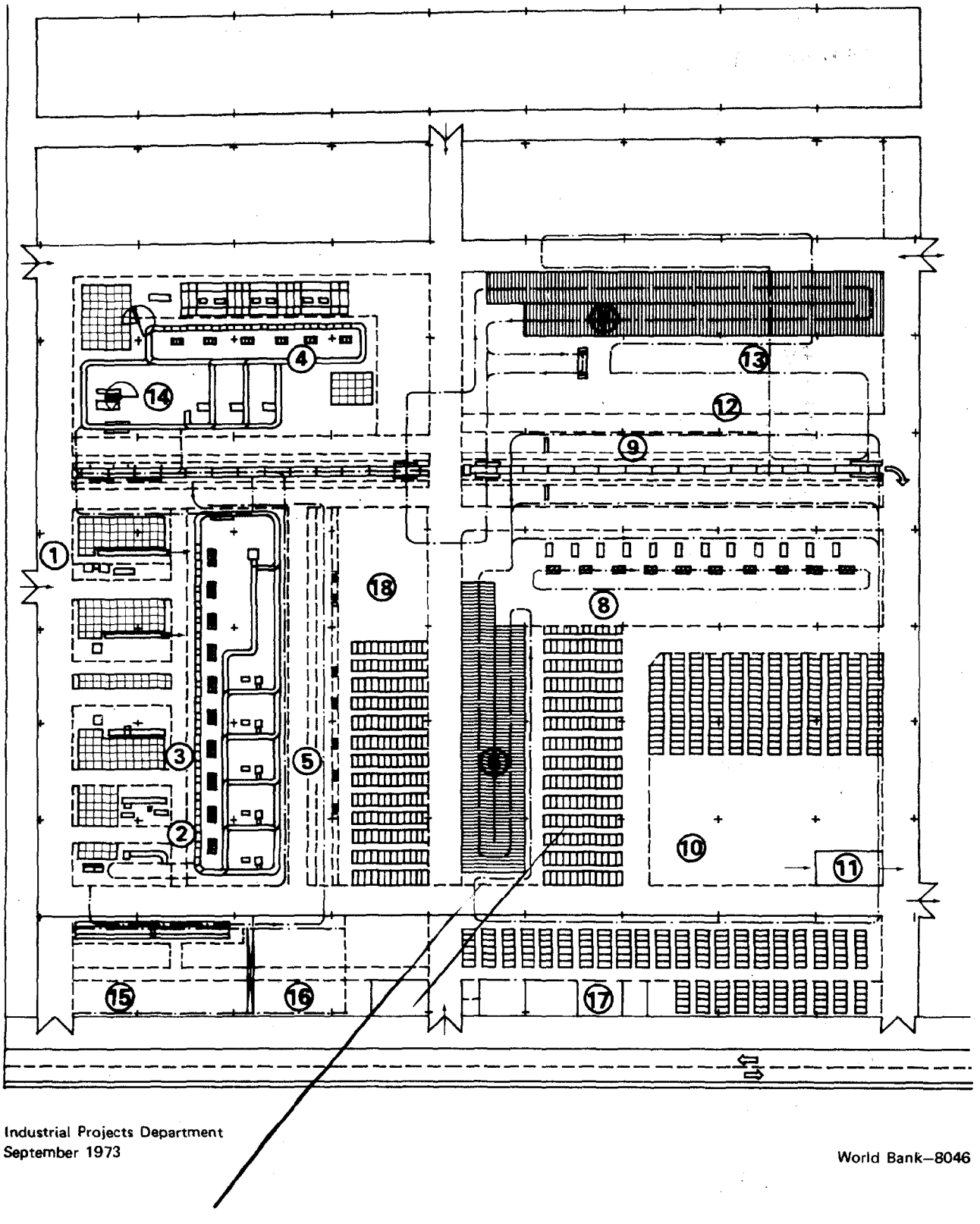


World Bank–8004(R)

ANNEX II-2
Page 1

YUGOSLAVIA - IMT TRACTOR EXPANSION PROJECT
LAYOUT OF TRACTOR ASSEMBLY PLANT



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YUGOSLAVIA - IMT TRACTOR EXPANSION PROJECT

LAYOUT OF TRACTOR ASSEMBLY PLANT

1. Central Housing
2. Rear Axle Assembly
3. Brake Assembly
4. Gear Box Assembly
5. Engine Preparation
6. Sheet Metal Parts Painting and Drying Plant
7. Tractor Painting and Drying Plant
8. Cabin Assembly Line
9. Main Assembly Line
10. Readjustment of Tractors
11. Paint Touch-up
12. Tractor accessories Sub-assembly
13. Tractor Production Control
14. Repair Shop
15. Engine Store
16. Transit Store
17. Components and Parts Store

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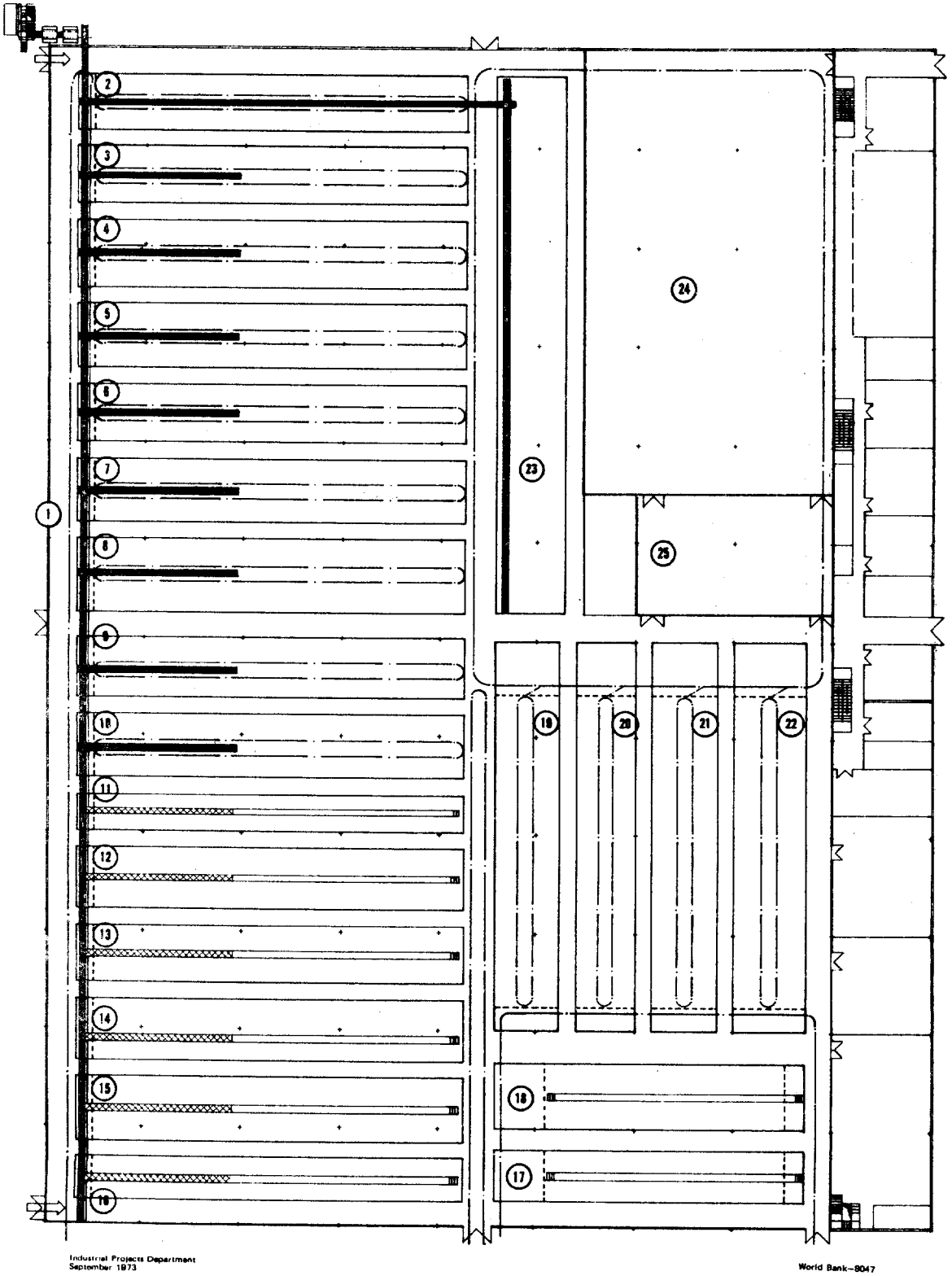
YUGOSLAVIA – IMT TRACTOR EXPANSION PROJECT

LAYOUT OF TRACTOR PARTS PRODUCTION PLANT



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YUGOSLAVIA - IMT TRACTOR EXPANSION PROJECT

LAYOUT OF TRACTOR PARTS MACHINE PLANT

1. Unloading ramp
2. Axles, shafts, general line I
3. Straight tooted bevel gear; general line II, levers
4. Spur driving and bevel gear
5. Broaching, copying and inner grooves for parts
6. Grooving of shafts and axles
7. Broaching of cylindrical gears
8. Spur gears, carden joints, rings, ball joints
9. Crown wheels, bars, balls, front wheels
10. Rear axles
11. Sleeves and carriers
12. Brake drum, hydraulic cover, support front axle
13. Hub, flange, cylinder, piston planetary ring carrier
14. Axle and differential housing
15. Transmission case
16. Central housing
17. Repairs
18. Steering mechanism housing
19. Gear grinding
20. Small components grinding
21. Shaft grinding
22. Grinding of the steering mechanism, differential and pulley components
23. Machine automates for small components
24. Heat treatment
25. Surface protection

Industrial Projects Department
September 1973

YUGOSLAVIA - IMT TRACTOR EXPANSION PROJECT

MANPOWER PROJECTIONS AND TRAINING

1. As of May 1973, IMT employed 3,524 workers and employees, of whom 2,905 were in Belgrade. The labor force is distributed according to qualifications and plant locations as follows:-

IMT Manpower (1973)

	IMT Belgrade	FMK Knjazevac	Service Center Dobanovci	Total
I. Professional Training				
VSS - University (2 degrees)	136	10	3	149
VSS/1 - University (1 degree)	116	24	3	143
SSS-intermediate training	321	39	15	375
NSS-basic training	144	22	13	179
Sub-total	717	95	34	846
II. Skill Level				
VK-highly skilled	372	33	23	428
KV-skilled	969	239	87	1,295
PK-semi-skilled	479	16	5	500
NK-unskilled	368	65	22	455
Sub-total	2,188	353	137	2,678
Total	2,905	448	171	3,524

Manpower Projections

2. The proposed expansion project will increase IMT's manpower by 1,440 men by 1976. Both in relative and absolute figures highest employment generation will occur among highly skilled workers:-

IMT Belgrade-Labor Force Projections for the Tractor Expansion Project

Qualifications	1973 Number	1973 %	1974-83 Number	1974-83 %
I. Professional Training (staff)				
VSS-University	136	5	180	4
VSS/1-University	116	4	142	3
SSS-intermediate	321	11	435	10
NSS-basic	144	2	145	3
Sub-total	717	25	902	20
II. Skill Level (workers)				
VK-highly skilled	372	13	457	10
KV-skilled	969	33	1,615	37
PK-semi-skilled	479	16	922	21
NK-unskilled	369	13	499	10
Sub-total	2,189	75	3,493	79
Total	2,906	100	4,395	100

Out of 3,443 workers, 2,151 will be associated with tractor production and 584 with implements manufacturing.

3. About 523 new staff will be needed for the General and Services Departments, according to the following projections:-

IMT Belgrade - Staff Projections

Department	1973 Number	1976 Number
Development	130	220
Production and Inventory Control	422	473
Maintenance	197	300
Machine Tools	118	200
Sales & Services	141	180
Management and Auxiliary Staff	296	463
Total	1,304	1,836

Despite this considerable increase of services and auxiliary staff, the important contribution of the expansion project is the employment generation for skilled and unskilled workers. IMT projects that by 1976 57% of the personnel in the tractor and implements production will be direct labor as compared to 47% in 1973.

4. A comparison between IMT's projected total labor force and the percentage of indirect labor indicates that the number of workers required is about 10-15% above US standards for plants of similar size. However, the IMT labor force projections are acceptable in view of the selection of machine tools, the lack of emphasis on fully automated transfer lines and economic considerations. IMT's plant layout is relatively labor-intensive and therefore has a positive effect on the Yugoslav employment problem.

Training and Recruitment

5. IMT does not anticipate any difficulties in recruiting the additional number of workers and employees required for each skill level. The Company is well known in Yugoslavia for its technical excellence as well as social and economic benefits, and has continuously attracted applicants.

6. The manpower program for the expansion project foresees direct recruitment of workers and staff as well as training of the present labor force. The project includes Din 7.0 million for training purposes. IMT plans to hire 324 of the required 646 highly skilled (KV) workers according to the following skill types and time plan:

	1973	1974	1975	Total
Grinding machine operators	-	2	12	14
Milling machine operators	6	11	15	32
Automechanics	10	25	25	60
Auto-tinsmiths	4	2	4	10
Auto-locksmiths	-	1	2	3
Tool makers	6	20	20	46
Metal abraders	14	20	30	64
Machine locksmiths	12	38	30	80
Temperers	-	3	12	15
	52	122	150	324

In addition, 70 - 90 semi-skilled (PK) workers presently employed by IMT, will annually complete the prescribed course at the Workers University in Belgrade and receive the KV qualification. For the training of unskilled workers (NK) for skilled (PK) qualifications, IMT uses its own school and on the job training.

8. To attract professional staff IMT has been giving scholarships to students who join the Company upon completion of their studies. The projected need for VSS level staff in 1976 will be covered by this type of recruitment.

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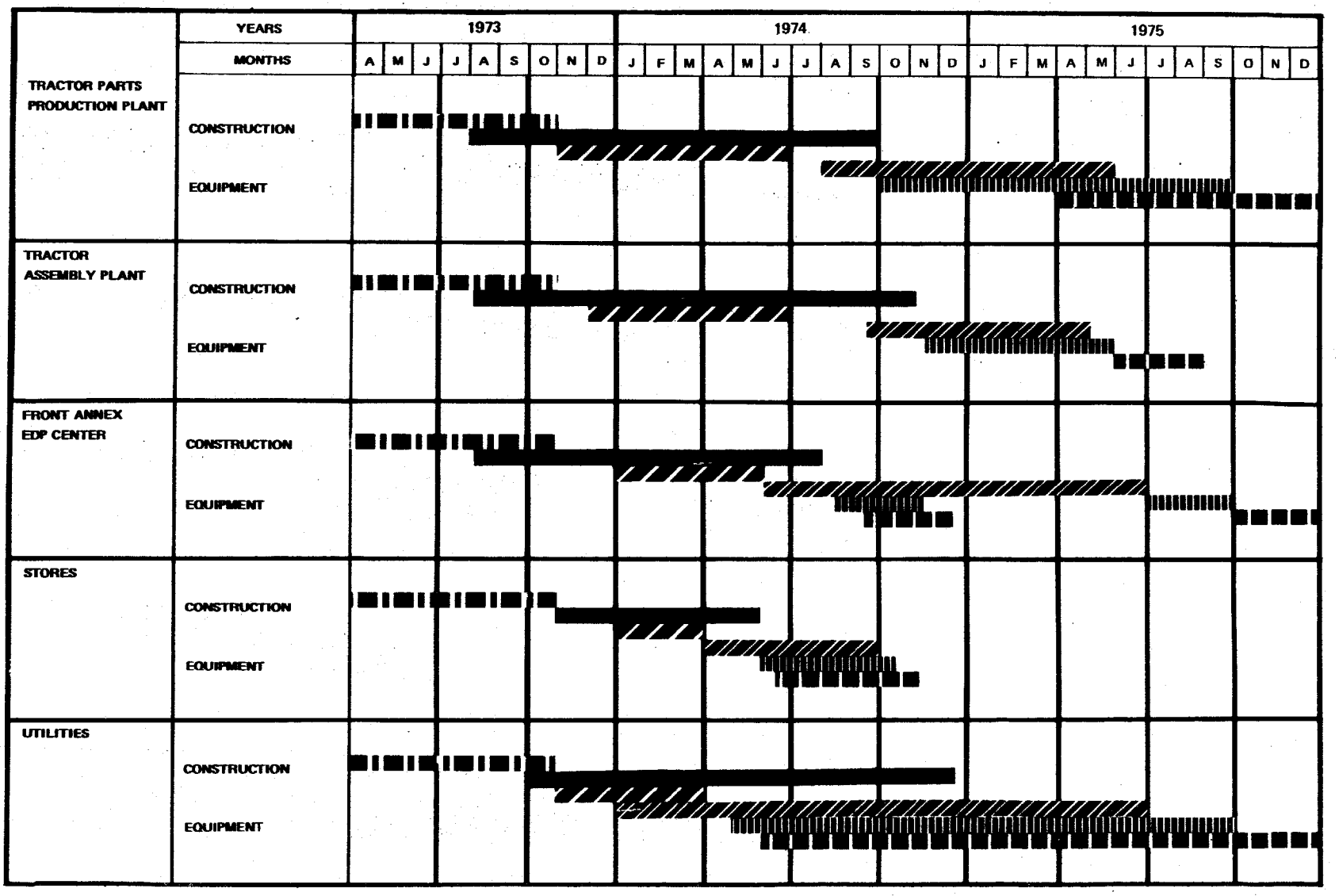
YUGOSLAVIA - IMT TRACTOR EXPANSION PROJECT
PROJECT IMPLEMENTATION SCHEDULE



Engineering | Civil Works | Tendering & Contracting of Equipment | Equipment Delivery | Equipment Erection | Test Runs

Industrial Project Department
September 1973

ANNEX 4-1

YUGOSLAVIA

IMT TRACTOR EXPANSION PROJECT

Detailed Project Cost Estimate
(Din Million)

	Local	Foreign	Total
1. Building and Civil Works			
Design	4.8	-	4.8
Buildings	87.9	-	87.9
Installation	40.7	-	40.7
Infrastructure	39.6	-	39.6
Subtotal	173.0		173.0
2. Equipment and Spare Parts			
Standard Machine Tools	35.1	132.1	167.2
Special Machines	5.6	85.0	90.6
Heat Treatment & Surface Protection Equipment	5.3	23.9	29.2
Assembly Equipment	23.6	11.2	34.8
Internal Transport Equipment	10.0	9.6	19.6
Control and Laboratory Equipment	0.4	2.6	3.0
Shop Inventory	5.9	0.3	6.2
EDP Center	-	10.3	10.3
Spare Parts	-	12.8	12.8
Subtotal	85.9	287.8	373.7
3. Transport and Insurance	27.6	-	27.6
4. Duty and Taxes	103.8	-	103.8
5. Erection and Installation	16.4	-	16.4
6. Engineering, Pre-operating and Start Up Expenses			
Engineering and Design	2.2	-	2.2
Training	2.0	-	2.0
Project Management	2.5	-	2.5
Fees and Sundries	0.3	-	0.3
Subtotal	7.0		7.0
7. Physical Contingencies	34.5	27.2	61.7
8. Price Escalation	49.8	40.2	90.0
TOTAL FIXED ASSETS	498.0	355.2	853.2
9. Incremental Working Capital	380.7	-	380.7
TOTAL PROJECT COST	878.7	355.2	1,233.9

NOTE: For description of cost items, see Chapter 4 of this Annex.

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I. EXPLANATION OF COST ITEMS

A. Building and Civil Works Cost (Item 1)

1. Total cost of building and civil construction amounts to Din 173.0 million. IMT signed the construction contract in May 1973 with Gredjevinsko Preduzece "RATKO MITROVIC," a well-known contractor in Belgrade. "RATKO MITROVIC" was selected from five Yugoslav construction companies which had submitted their bids following local competitive bidding procedures. Specifications, and terms and conditions of the contract have been reviewed and are satisfactory. The contractor "RATKO MITROVIC" is responsible for all major building and civil construction related to IMT's expansion program, including a) ground levelling and final engineering, erection or installation of b) main buildings and annexes, c) water, electric and heating systems, d) power, gas and compressor stations, e) open and covered storage spaces and f) roads and landscaping. 1/

B. Equipment Cost (Item 2)

2. Equipment cost estimates are based on a) actual prices prevailing in 1973 or b) on late 1972 or 1973 quotations from potential suppliers in the USA, and Western and Eastern European countries. IMT has divided all equipment items according to the financing and procurement sources: a) Din 111.5 million or about 25% of total estimated equipment cost will be procured from Yugoslav manufacturers, b) some standard machine tools, heat treatment and inventory equipment totalling Din 22.0 million are earmarked for purchases in clearing countries, c) an estimated Din 47.6 million of equipment will be imported from IMT sources of convertible currency. These items originally earmarked for Bank financing are now being directly procured and paid for by IMT, in order to meet the project schedule. Bids for the paint shops and the equipment for internal sheet metal transport have already been received and are presently being evaluated. d) Bank-financed equipment is estimated at approximately 60% of total equipment cost. It is expected that most of this equipment will be imported, since items for which competitive Yugoslav suppliers exist have generally been included in the exclusively locally procured category.

3. Detailed cost estimates for foreign and local equipment are given below. It includes a provision for spare parts for equipment from convertible currency countries only. IMT maintains that the remaining equipment consists of standard machines and that the ordering and supply of spare parts from Eastern European and Yugoslav equipment manufacturers is adequate so that an increase of spare parts inventory for these equipment items will not be necessary.

1/ During the mission's visit construction work, i.e., filling of the terrain, was underway.

Equipment Cost Estimates
(Din million)

Equipment Item	IMPORTED EQUIPMENT /1 Bank Financed	Convertible /5 Currency	Clearing	Total	LOCAL /2	TOTAL
1. Standard Machine Tools	115.5	-	16.6	132.1	35.1	167.2
2. Special Machines	65.5	19.5	-	85.0	5.6	90.6
3. Heat Treatment & Surface Protection Equipment	22.2	.8	.9	23.9	5.3	29.2
4. Assembly Equipment	-	11.2	-	11.2	23.6	34.8
5. Internal Transport Mechanization	3.6	6.0	-	9.6	10.0	19.6
6. Control & Laboratory Equipment	1.2	-	1.4	2.6	.4	3.0
7. Shop Inventory	0.3	-	-	0.3	5.9	6.2
8. EDP Center	10.3	-	-	10.3	-	10.3
9. Spare Parts	10.9	1.9	-	12.8	-	12.8
Sub-total --	229.5	39.4	18.9	287.8	85.9	373.7
10. Contingencies /3	22.9	3.9	.4	27.2	8.6	35.8
11. Price Escalation /4	33.2	4.3	2.7	40.2	17.0	57.2
Total Equipment Cost Estimate	285.6	47.6	22.0	355.2	111.5	466.7

/1 cif Yugoslav border
/2 cif cost at plant
/3 10% for equipment from countries with convertible currencies, 2% for clearing countries, 3% for local equipment
/4 3% semi-annual price escalation for imported equipment, for local equipment 5% semi-annual increase in 1973, 4% - 1974 and 3% thereafter
/5 financed by IMT

C. Transport and Insurance (Item 3)

4. Transport and insurance cost relates only to foreign equipment since, for all locally procured items, the cif cost at plant are given. It covers transport and insurance expenses between IMT and the Yugoslav border, i.e., it includes no foreign exchange component. The estimate of Din 27.6 million based on recently quoted railway, handling and insurance charges.

D. Duty and Taxes (Item 4)

5. Duty and taxes, totalling Din 103.8 million, are calculated according to the prevailing tariff rates for machine tools and equipment which came into effect on February 26, 1973. The present customs duty for machine tools and special equipment varies from 19-21% of the cif value (Yugoslav border). For the capital cost estimate 21% duty has been uniformly assumed. In addition to the customs duty, taxes of 9% on the cif value (Yugoslav border) - 3% import tax and 6% special tax — have to be paid for all imported items.

E. Erection and Installation Cost (Item 5)

6. In line with IMT's past experience erection and installation cost have been estimated as 4.5% of foreign and local equipment cost value.

F. Contingency (Item 6)

7. To the total cost estimates, based on a detailed breakdown into buildings, civil works, equipment as well as financing and procurement sources, the following contingencies have been added to account for minor changes and omissions: a) 10% for buildings and civil works as well as equipment from convertible currency countries; b) 2% for equipment from clearing countries and c) 3% for locally procured equipment. The lower contingencies for Yugoslav and Eastern European equipment seems justified, since these items are predominantly standard machine tools whose design changes infrequently and with which IMT is familiar. Considering the advanced stage of project preparation, the contingency provision should be adequate.

G. Price Escalation (Item 7)

8. Civil construction and local as well as Western European equipment cost have been increasing at the rate of 6-10% p.a. during the past two years. In order to account for future price and construction cost increases, price escalations have been included in the investment costs. In view of the steps being taken by the Federal Government of Yugoslavia, the domestic inflation rate is expected to drop, so that the following escalation rates have been assumed for civil works, domestic equipment, erection, transport and insurance costs: 1974-8% and 1975-6%. With regard to foreign equipment, a 6% inflation rate per year has been adopted uniformly for clearing and convertible currency countries. Based on these assumptions, total price escalation is estimated at Din 90.0 million (49.8 on domestic cost and 40.2 on foreign exchange costs), i.e., about 11% of total fixed assets.

H. Engineering, Pre-operating and Start-up Expenses (Item 8)

9. According to Yugoslav law, these expenses are allowed to be capitalized only if they are costs incurred outside the company, i.e., consulting services, fees, outside training. However, all costs related to on-the-job

training and project services performed by IMT staff are charged directly to the income statement. IMT envisages special training costs of about Din 2 million and consulting fees of about Din 4.7 million.

I. Incremental Working Capital

10. Details of calculations and underlying assumptions are given in Annex 5-2.

J. Interest During Construction

11. Interest during construction is calculated on the basis of expected disbursements for local and foreign loans. All foreign interest charges relate to the Bank loan, since interest on bilateral credits from clearing countries is payable in Dinar. According to Yugoslav regulations interest during construction may not be capitalized. However, the enterprises have the right a) to borrow from their house bank an amount up to the interest during construction, to be paid back in several installments after construction completion and b) to charge the total interest during construction to the income statement during this later period. For the current projections, interest during construction is charged to the income statements for the period 1976 to 1980.

Industrial Projects Department
September 1973

YUGOSLAVIA

IMT TRACTOR EXPANSION PROJECT

Estimated Working Capital Requirement - With Expansion
(Million Current Din)

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
A. Current Assets											
Cash	25.0	27.0	38.0	60.0	61.8	63.5	65.6	67.8	70.0	72.0	74.0
Accounts Receivables	71.4	77.1	125.5	256.0	270.9	287.0	298.5	310.4	322.8	335.8	349.1
Inventory											
(a) Raw Material	179.8	181.2	310.2	436.6	462.8	490.6	520.1	551.3	584.3	619.3	656.5
(b) Work-Process	41.0	44.5	75.6	108.3	115.8	124.8	132.7	141.1	150.1	159.1	168.6
(c) Finished Goods	54.7	59.4	63.5	67.8	72.3	76.8	81.5	86.6	92.0	97.5	103.4
Subtotal	275.5	285.1	449.3	612.7	650.8	692.2	734.3	779.0	826.4	865.9	928.5
Total Current Assets	371.9	389.2	612.8	928.7	983.5	1,042.7	1,098.4	1,157.2	1,219.2	1,283.7	1,351.6
Less: Accounts Payable	83.9	90.6	208.2	242.5	257.1	272.6	288.9	306.3	324.6	344.1	364.7
B. Working Capital	288.0	298.2	404.6	686.2	726.4	770.1	809.5	850.9	894.6	939.6	986.9
C. Incremental Working Capital	-17.5	+10.2	+106.4	+281.6	+40.2	+43.7	+39.4	+41.4	+43.7	+45.0	+47.3

Assumptions for Working Capital Estimates:

1. Cash: 1 week labor cost and Din 2.0 million petty cash (1973-75), Din 5.0 million thereafter.
2. Accounts Receivables: 1973-1975 23 days; 1976 and thereafter 30 days; accounts receivable do not include IMT's credit to customers with 3 years maturity.
3. Inventory: 1973-75: raw materials - 60 days; work-process - 12 days; finished goods - 16 days; 1976 and thereafter: raw materials - 72 days, work process - 15 days; finished goods - 9.5 days.
4. Accounts Payable: 30 days for raw materials, supplies and utilities.
5. No incremental working capital requirements in foreign exchange is needed since foreign estimated accounts receivables exceed foreign accounts payable.

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YUGOSLAVIA - IMT TRACTOR EXPANSION PROJECT

BANK FINANCED ITEMS

Category		Amount of Loan Allocated Expressed in Dollar Equivalent (000 US$)
I.	Standard Machine Tools including turning machines, toothing slot and spline machines	7,450
II.	Special Machines including drilling, milling and grinding machines, presses, honing and sharpening machines	4,230
III.	Heat Treatment and Surface Protection Equipment	1,430
IV.	Equipment for Internal Transport Mechanization	230
V.	Control and Laboratory Equipment	70
VI.	Shop Inventory Equipment	20
VII.	Equipment for Electronic Data Processing Center	670
VIII.	Spare Parts	710
IX.	Contingencies and Price Escalation	3,690
	TOTAL	18,500

Industrial Projects Department
September 1973

YUGOSLAVIA

IMT TRACTOR EXPANSION PROJECT

ESTIMATED SCHEDULE OF DISBURSEMENTS (IBRD LOAN OF US$18.5 MILLION)
(in 000 US$ equivalent)

Year		Disbursement	Amount Outstanding	Undisbursed Amount at End of Quarter
1974				
	I Quarter	-	-	18,500
	II Quarter	2,700	2,700	15,800
	III Quarter	3,500	6,200	12,300
	IV Quarter	2,700	8,300	10,200
1975				
	I Quarter	4,000	12,300	6,200
	II Quarter	5,000	17,300	1,200
	III Quarter	1,200	18,500	-
	IV Quarter	-	-	-

Industrial Projects Department
January 1974

YUGOSLAVIA - IMT TRACTOR EXPANSION PROJECT

PRODUCTION, PRICE AND REVENUE BUILD UP (1973 - 1976)

ITEM	Quantity 1973	Quantity 1976	Net Unit Prices 1/ 1973 2/	Net Unit Prices 1/ 1976 3/	Net Revenue (million din) 1973	Net Revenue (million din) 1976
A. TRACTORS 4/						
IMT Tractor 20-25 HP	-	1,000	-	34,841	-	34.8
IMT Tractor 533/540	13,600	22,500	48,360	54,589	657.7	1,228.3
IMT Tractor 558/560	1,600	2,900	57,052	64,402	91.3	251.2
IMT Tractor 575	650	1,600	104,280	110,898	67.8	177.4
IMT Tractor 585	-	1,200	-	110,898	-	133.1
Tractor Sets CKD	1,000	-	5,365	-	5.4	-
Tractor over 100 HP	-	300	-	237,639	-	71.3
Sub-total	16,850	29,500	n.a.	n.a.	822.1	1,967.4
B. TRACTOR ACCESSORIES						
Pulley	2,150	2,800	1,906	2,151	4.1	6.0
Automatic Drawbar	5,950	7,700	898	1,014	5.3	7.8
Cabin	2,500	700	1,779	2,009	4.4	1.4
Stabilizer	3,000	1,400	262	296	.8	.4
Weight	2,500	2,100	745	841	1.9	1.8
Seat	1,500	25,700	6,279	7,088	9.4	182.2
Other Accessories	n.a.	n.a.	n.a.	n.a.	32.0	39.7
Sub-total	17,600	40,400	n.a.	n.a.	57.9	239.3
C. AGRICULTURAL IMPLEMENTS						
Trailer 3/3T	5,500	6,500	15,807	17,843	86.9	116.0
Trailer 5/3T	500	1,300	24,691	27,871	12.3	36.2
Potovator	450	200	10,203	11,517	4.6	2.3
Plow	1,500	8,000	6,884	7,700	10.3	61.6
Seed Drill	100	1,000	10,642	12,975	10.3	12.9
Cultivator	200	1,000	3,730	4,211	.7	4.2
Disc Harrow	400	4,000	6,300	7,112	2.5	28.4
Other Implements	n.a.	n.a.	n.a.	n.a.	71.7	105.3
Sub-total	8,650	22,250	n.a.	n.a.	190.3	366.9
D. SPARE PARTS AND COMPONENTS	n.a.	n.a.	n.a.	n.a.	55.3	149.0
E. SCAFFOLDING	n.a.	n.a.	n.a.	n.a.	47.9	54.1
F. KNJAŽEVAC -						
Motorcultivators and Implements	n.a.	n.a.	n.a.	n.a.	117.7	268.9
TOTAL	n.a.	n.a.	n.a.	n.a.	1,285.3	3,045.6

1/ ex factory selling prices assuming a 14% increase over 1973 prices by 1976 (see also Annex 6-1, page 2)
2/ 3.25% discount rate
3/ 3.8% discount rate
4/ For detailed production build up 1973-1977, see Annex 2-3, para 8.

n.a. - not applicable

Industrial Projects Department
October 1973

YUGOSLAVIA

IMT TRACTOR EXPANSION PROJECT

Revenue Projections 1973 - 1983
(Din Million)

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Gross Revenues (Current Prices) 1/	1,328.5	1,434.8	1,838.8	3,161.3	3,554.2	3,767.5	3,918.2	4,074.8	4,237.8	4,407.4	4,583.7
Discount 2/	43.2	46.6	57.8	115.7	135.0	143.1	148.9	154.8	161.0	167.5	174.2
Net Revenues (Current Prices)	1,285.3	1,388.2	1,781.0	3,045.6	3,419.2	3,624.3	3,769.2	3,920.0	4,076.8	4,239.9	4,409.5
Net Revenues (Constant Prices)	1,285.3	1,285.3	1,531.6	2,436.4	2,773.0	2,773.0	2,773.0	2,773.0	773.0	2,773.0	2,773.0

1/ Prices are fixed annually by a Federal Price Commission. At present and in the future, IMT does not intend to differentiate export and domestic prices. The projections assume a selling price increase of 8% in 1974 and 6% in 1975. For 1976 prices have not been increased, since it is the first year of full production and IMT expects to undertake a special marketing effort. However, price increases of 6% p.a. have been assumed in 1977-1978 and 4% thereafter.

2/ Assuming 3.8% discount in 1976 and 3.25% in all other years.

Industrial Projects Department
September 1973

YUGOSLAVIA - IMT TRACTOR EXPANSION PROJECT

Raw Materials, Parts & Supplies

A. Suppliers' Classification and Problems

1. Timely and economical supply of raw material, parts and supplies is crucial for IMT's production, which is primarily an assembly type operation. The project more than doubles IMT's demand for raw material and parts thus requiring careful inventory planning and control. The Company is aware of the importance of adequate supply arrangements for successful project implementation. The measures to be taken are described below and should minimize bottlenecks after expansion.

2. Purchasing and inventory control of raw material, parts and supplies are handled directly by the Production Planning and Control Department. After project completion this function will be computerized. To establish a reliable supply system, domestic and local suppliers are classified in four groups A, B, C and D according to the:

a) range of the suppliers' production program and compatibility with IMT's needs;

b) extent of similar business interests between IMT and the supplier;

c) extent of suppliers' specialization;

d) membership in the UMI group;

e) capability to expand supply according to IMT's expansion program; and

f) distance between the suppliers' plant and Belgrade, and transport facilities.

Category A suppliers are those who fulfill or score high on all the above criteria. Suppliers classified in Category B presently do not meet all criteria, but have been reliable suppliers in the past or are currently undertaking currently expansion programs in line with IMT's development and production program. Category C and D suppliers do not meet more than two of the above criteria.

3. Long-term contracts have been established or are presently negotiated with Category A and B suppliers. IMT expects to eliminate all regular purchases from C & D suppliers for major items until project completion by seeking out and engaging additional companies which qualify for the B category. The present distribution of suppliers by category is as follows:

Suppliers	Category	Number of Suppliers
1. spare parts & assembly components	A	18
	B	28
2. raw material	A	6
	B	4
3. semi-products & forgings	A	2
	B	3
4. castings	A	2
	B	1
5. other supplies	A	3
	B	1
	C&D	11
6. tools	A	4
	B	4
	C&D	5

4. Total requirements for raw materials and parts during any period are supplied by at least two different companies to avoid total dependence on one supplier. The majority of domestic supply arrangements are one-year contracts: a) IMT informs its suppliers by June 15 of the projected yearly demand; b) contracts for the following year are signed by the end of October; and c) definite orders for the first quarter are given in October and, for the remainder of the year, in January. Despite the relatively long lead time given, prompt delivery is not guaranteed. Therefore, all components necessary for tractor or implements assembly are classified according to importance and availability in four groups: Group I parts -- delivery 10 days before assembling; Group II parts -- 3 months prior to assembling; Group III parts 6 months prior to assembling; Group IV parts -- annual production requirements. About 90% of IMT's annual requirements of parts have been Group I and II supplies.

5. Although the supply situation regarding the main raw materials and parts for the production of tractors, implements and machine tools is not expected to be a major bottleneck for IMT's expansion, the Company's dependence on timely delivery of components and parts is relatively high. Supply problems will warrant the management's continuous attention.

B. IMT Requirements and Suppliers

6. The proposed expansion project will increase IMT's requirements for raw materials, components and supplies up to the following quantities:

IMT SUPPLY REQUIREMENTS - 1977

	Quantity Piece	Weight (Tons)
Engines	35,000	13,500
Forgings	-	11,000
Grey iron castings	-	24,700
Non-ferrous castings	-	300
Steel sheets	-	23,500
Screws, nuts	-	2,500
Metallurgic material	-	24,500
Steel tubes	-	4,000
Bearings	-	500
Accumulators	70,000	2,500
Tires	192,000	6,000
Dyes, lacquers	-	600
Fuels, lubricants	-	2,500
Salts, chemicals	-	400
Propane-butane gas	-	500
Others	-	9,000
		126,000

7. Steel Products. IMT requires various steel products including steel bars, steel wires, flat and rolled steel and steel pipes primarily for the machine tool production. At the present, there are eight steel plants in Yugoslavia with a total capacity of about 2.6 million tons per year of crude steel equivalent. Their capacity is expected to increase to about 5 million tons by 1975, and 7 million tons by 1980. IMT will continue to cover its demand for steel products from local suppliers, i.e., ZELJEZARA NIKSIC, RAVNE, STORE, SKOPJE, SISAK, JESENICE, ZENICA, SMEDEREVO and K.O.M. PROKUPLJE. Domestic steel works do not produce certain steel products, such as bar and flat carbon steel or the special steel tubes required by IMT. The projected annual requirement of about 2,000 tons of such products, after expansion, will be covered by imports.

8. Castings. There are some 250 foundries in Yugoslavia producing nearly 400,000 tons of steel iron and non-ferrous castings. IMT purchases its total requirements for gray castings (e.g., flywheels or engine blocks) and nodular castings (e.g., axle housing or transmission blocks) from FOB. FOB and IMT had been one enterprise until 1971 and occupy production facilities adjacent to each other.

9. In October 1972, IMT signed a long-term (8 years) contract with FOB. To meet IMT's demand for steel castings after project completion, IMT is supporting FOB's expansion program with a Din 30 million loan at concessionary terms. However, even after expansion FOB will not be able to supply a sufficient number of castings for engine blocks and heads. The foundries ATMOS - Maribor and PETAR DRAPSIN - Mladenovac have agreed to supply the necessary quantities on a year-by-year negotiable basis. In addition, ATMOS - Maribor will continue to meet IMT's silium casting requirements.

10. Forgings. IMT's main suppliers of forgings CRVENA ZASTAVA, KOVACKA INDUSTRIJA, ZMAJ, MASINSKA INDUSTRIJA AND TOVARNA VERIG will continue to cover IMT's total requirements for expansion. At present, the Company imports rear axle forgings, but a local firm BRATSTVO - Novi Travnik is negotiating a long-term contract with IMT.

11. Pressings. The main supplier of pressings is IKARUS, another UMI member. The expansion plans of both companies have been coordinated.

12. Rubber and Plastics. IMT will be able to meet the requirements of plastic products from three domestic suppliers; i.e., JOZE KERENCIC, GIP and DES. Rubber goods will continue to be supplied by REKORD, MILOJE, ZAKIV, VITOJEVAC, and GIP. 15 X 30 tires are currently imported from England, but Rekord is testing local prototypes and should be able to supply IMT's need by 1976.

13. Engines. IMT purchases engines primarily from IMR, a UMI member. The 3-year contract between the two companies stipulates the supply of a) IMR manufactured diesel engines of type S-4 and b) IMR-assembled Perkins engines. IMT makes available the necessary foreign exchange to purchase the foreign engine components. The present capacity of IMR is 17,000 engines per year. The company is expanding to produce 40,000 engines annually, which would be sufficient to meet IMT's requirements from a quantative point of view. IMT has asked IMR to broaden its product range and produce 3-5 types of engines. Such a change in IMR's production program would require an investment of Din 40 million. IMT proposed to make available the amount required.

14. Brakes. The local suppliers RUEN, KOCANI and FAK, will continue to meet IMT's demand after expansion.

15. Clutches are supplied by FRAD, New Belgrade and RUEN, Kocani. FRAD is a member of the UMI group; the Company will expand its capacity in accordance with IMT's increased production.

16. Steering Wheel and Steering Assmbly. The available capacities of IMT's local suppliers, JOZE KERENCIC, Ormoz and SOKO, Master, will be sufficient to meet IMT's future requirement.

17. Batteries and Electrical Equipment. All batteries are supplied by TELSA, Brcka on the basis of a 4-year contract. The Company SATURNUS, Ljubljana has agreed to provide head lamps and direction lights according to a 3-year contract between the two companies. In exchange IMT has agreed to meet Saturnus' foreign exchange obligations for imports of raw materials and components. The main suppliers of other electrical equipment (battery cables, cable terminates, etc.) are 26 SEPTEMBAR, Krupanj, STANDARD, Bosanska Gradiska, AGROVOJVODINA, Novi Sad and AGROPREMA, Belgrade. These companies will continue to meet IMT's requirements after project completion.

18. Wheels. The major Yugoslav producer of wheels is LUBRAVA, Sremska Mitrovica. This company is presently completing an expansion program which would result in production capacity sufficient to supply IMT's increased demand. IMT is negotiating with ZMAJ, Zemum as back-up supplier.

19. Tools. IMT will require the following quantities of machine tools after project completion:

Fastening tools	3,200 positions
Lamps	1,500 positions
Other fastening tools	1,700 positions
Cutting tools	5,900 positions
Measuring tools	4,950 positions
Forgings & pressing tools	1,090 positions
Accessories	5,700 positions
Total	24,040 positions

Approximately 88% of the required quantities will be manufactured by IMT, but the company expects to purchase in the future more machine tools from domestic or foreign specialized suppliers. In particular, IMT will import Harbetok knives for conic straight toothing, Klingelnberg knives for toothing, Oerlikon knives for toothing plate holders from hard metals, plates from hard metals and micro drillers.

20. Other Parts and Supplies. IMT has discussed with the present suppliers of other parts and supplies its requirements after project completion. The capacities of these companies should be sufficient and no bottlenecks are expected. The potential and present main suppliers are: a) for fuel and oil - JUGOPETROL, Belgrade; b) for paints and lacquers - KOLOR, Medvode; c) for instruments and flexible shafts - TELEOPTIK, Zemun and RUDI CAJAVEC, Banja Luka; d) for springs - SLAVKO RODIC, Bugojna and FENOR, Nova Raca; e) for screw parts - TVIK, Krin, VIS, Svilajinac, ELIND, Valjevo, IGMAN, Konjic; and f) 10 small companies for the supply of seals, washers, tubings, pins and chains.

C. Imports

20. Imports of raw materials and parts are allowed under three main systems: (a) the GDK system; (b) the RK system; and (c) the LB system. Under the GDK system, companies which export are allowed to import about 25% of their raw material requirements for export production. Under the RK system, imports of specific items are determined as commodity contingents by the concerned Yugoslav industrial associations. Under the LB system, no limits are imposed on the import of specific items. In addition, companies can use their retention quota (20% of exports) after foreign debt service payments to import raw material and parts without restriction.

21. The following table shows the custom duties on the import of IMT main supply items and the import system under which they fall:

	Taxes & Custom Duties %	Import System
Electrical Equipment	19%	GDK
Steel products	22%	GDK
Forgings	28%	RK
Castings	28%	RK
Engines	28%	GDK
Tires	26%	GDK
Bearings	26%	RK
Machine Tools	19%	RK

22. Neither the present Yugoslav import system nor the availability of foreign exchange for raw material and supplies is expected to pose any problems for IMT's expanded production program. Imports of materials amount at present to 7-10% of total material costs and are projected to decrease to 5-8% by 1976. Selected components, tools and special steels will be imported from the following countries: (a) England--bearings, liners, pumps, valves, small tractor parts, steel; (b) FRG--needle bearings, cutting tools, micro drills, extruders, steel; (c) Italy--semi-shafts, front axle, steel; (d) Austria--bearings, compressors; (e) Belgium--diamond tools; (f) Switzerland--knives and steel; (g) Sweden--tools; (h) Spain--tires.

23. At present, the import content of the standard tractors IMT 533/558 is 3-5% compared to 45% for the 575/585 models. IMT plans to decrease imported components for the 575 and 585 models to 8-10% until 1975 by procuring the engines locally (IMR - Perkins). The new ones 100 hp model will rely on imported gearlinks. Since the envisaged production volume for this product size does not allow economical in-house development and production.

24. Many of IMT's suppliers do not dispose of adequate import contingents and foreign exchange rights to guarantee supply of import-dependent parts and components. In these cases IMT will continue to finance directly the import content of its supplies by making available to the suppliers its own accumulated surplus foreign exchange rights.

Industrial Projects Department
September 1973

YUGOSLAVIA

IMT TRACTOR EXPANSION PROJECT

OPERATING COST PROJECTIONS

A. Production Cost

Material Cost

1. Based on the production program given in Annex 6-2, and the corresponding raw material, parts and supplies requirement detailed in Annex 6-2, the following direct and indirect material costs have been projected:

Material Cost and Production Build-Up

	1972 (actual)	1973	1975	1976	1977
I. Production (units)					
Tractors	14,402	15,850	19,450	29,600	35,000
Implements	6,117	8,650	8,650	22,250	27,000
II. Material Cost (current Dinar million)					
Direct Material Cost					
Tractors & Accessories	482.0	727.9	1,020.6	1,719.6	1,878.1
Implements	102.8	148.2	165.9	324.6	367.4
Others	177.4/1	76.8	92.3	97.8	103.7
Indirect Material Cost	12.9	14.6	26.8	38.0	42.8
Total	775.1	967.5	1,305.6	2,180.0	2,392.0

/1 Including Dinar 135.1 million for implements purchased from subcontractor.

2. IMT depends on outside suppliers for all major components. After project completion there will be no essential change from the assembly type operation. IMT will expand the machining operation for tractor parts disproportionately, thereby increasing the Company's value added to material cost from about 5% in 1972 to not more than 8% after expansion.

Labor Cost

3. The proposed expansion project will increase IMT's labor force by 1,440 men. Detailed manpower projections are given in Annex 4-3. Labor cost projections have been based on an average of 184 hours/month, one shift in the tractor assembly plant and non-productive departments and two shifts in all other production facilities as well as the following number of employees and salary scales:

Manpower and Salary Scale Projections

Qualification Salary Category		1973 (actual) Salary Din/h	1973 (actual) Number of Employees	1976 (projected) Salary Din/h	1976 (projected) Number of Employees
Direct Labor					
VK - highly skilled	I	12.0		16.4	
	II	10.5	372	14.4	457
	III	9.0		12.4	
IV - skilled		8.4	969	11.4	1,615
PK - semi-skilled		6.6	479	9.0	922
NK - unskilled		5.7	369	7.8	449
Indirect Labor					
VSS - University		15.5	136	21.2	180
VSS/1 - University		12.5	116	17.1	142
SSS/intermediate training		10.5	321	14.4	435
NSS/basic training		6.6	144	9.0	145

In accordance with labor agreements between the city of Belgrade and IMT an annual salary increase of 12.3% has been assumed until 1978 and 8% thereafter.

Operating and Tractor Unit Costs

4. Taking into account direct and indirect costs as well as depreciation (see Annex 2-7, para. 15), the operating costs can be summarized as follows:

Operating Cost Projections

	1972		1975	1976	1977	
Production (units						
Tractors	14,402		19,450	30,500	35,000	
Implements	6,117		8,650	22,000	27,000	
Operating Cost (current Din million)		%				%
1. Production						
Material	775.1	81.5	1,305.6	2,180.0	2,392.0	78.3
Labor	72.1	7.6	140.0	230.0	269.0	8.8
Sub-Total	847.2	89.1	1,445.6	2,410.0	2,661.0	87.1
2. Maintenance and Repair	30.4	3.2	55.0	86.9	93.9	3.1
3. Administration and Selling	44.5	4.7	82.0	140.5	156.1	5.1
4. Depreciation	25.5	2.6	76.0	110.1	110.1	3.6
5. Others	2.9	0.3	7.6	30.0	32.3	1.1
Total	950.5	100.0	1,666.2	2,777.5	3,053.4	100.0

Due to the assembly type operation, and the relatively low level of wages in Yugoslavia, IMT's cost structure is dominated by costs for raw materials, parts and components. Total direct and indirect material cost decreases from 81.5% of operating cost in 1972 to 78.4% in 1977, since the expansion of IMT's production facilities allows an increase of machining of tractor parts and components.

5. Although tractor unit costs are expected to increase because of the inflationary cost increases during project implementation, the project should realize some economies of scale and cost decreases in constant prices as illustrated by the following table:

Tractor Unit Cost Comparison
(Index 1972 = 100
constant prices)

	1972		1977	
Model	Production (units)	Unit Cost (Index)	Production (units)	Unit Cost (Index)
533	11,926	100	25,000	97
558	1,812	100	3,300	99
575	142	100	1,800	74
585	275	100	1,500	79

Unit cost for the standard IMT 533/558 models are estimated to decrease by 1-3% only, since they have already been produced on a large scale in 1972. In addition, the project is not expected to decrease unit costs of maintenance, administration and selling expenses for at least 3-5 years after project completion, since the Company has to strengthen its marketing activities, and past maintenance and repair cost had been particularly low in anticipation of the expansion and the related new investment. In the case of the IMT-575 and IMT-585 models, the Company should realize economies of scale of 20-25% per unit by (i) increasing the present pilot production to economical production lots of about 1,500 tractors/year, and (ii) decreasing the import content of these models from a present 45% to an average of 8-10% by 1975 (Annex 6-2, para. 23).

6. IMT has not yet prepared unit cost calculations for the new 20-25 hp tractor and the above 100 hp model which IMT intends to introduce after project completion. The Company expects to realize for these tractors profit margins which are substantially lower than those for its standard models (2-5% as compared with 10%). As for the 100 hp tractor, the projected annual production of 400 units does neither allow economies of scale nor does it justify special development effort on the part of IMT's research and development department. Consequently, to break-even, the tractor model will rely to a large extent on parts used for the IMT-575/585 models and imported component. As to the small 20-25 hp tractors the model choice and production strategy (licensing vs. own development) has not been finalized. However, in view of the considerable competition in this products range and IMT's initial cost of tooling up, the Company does not expect to realize notable profits for the 20-25 hp tractor during the first few years of production. Nevertheless, IMT desires to enter the market segments for the 20-25 hp tractors and above 100 hp units in order to (i) offer the full range of tractor types on the domestic market and (ii) thereby strengthen its market position vis-a-vis present and potential competitors.

Industrial Projects Department
November 1973

YUGOSLAVIA

IMT TRACTOR EXPANSION PROJECT

Projected Income Statement - With Expansion
(million current Din)

Year Ending December 31	1972 (Actual)	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
I. Net Sales												
Domestic	977.1 1/	1,224.4	1,315.9	1,704.8	2,764.3	3,112.2	3,286.9	3,385.0	3,477.8	3,621.6	3,773.2	3,929.9
Exports:												
Convertible	23.3	26.3	31.3	32.9	121.6	132.7	145.9	166.1	191.1	202.6	214.7	227.6
Clearing	30.5	34.6	41.0	43.3	159.7	174.3	191.6	218.1	251.1	252.0	252.0	252.0
	1,030.9	1,285.3	1,388.2	1,781.0	3,045.6	3,419.2	3,624.4	3,769.2	3,920.0	4,076.2	4,239.9	4,409.5
II. Cost of Goods Sold												
Materials, Supplies, Utilities	775.1 2/	967.5	1,044.8	1,305.6	2,180.0	2,392.0	2,567.0	2,688.3	2,828.0	2,964.4	3,142.0	3,284.0
Labor	72.1	85.5	96.0	140.0	230.0	269.0	305.4	329.8	356.2	384.7	415.5	448.7
III. Gross Profit	183.7	232.4	247.4	335.4	635.6	758.2	752.0	751.1	735.8	727.1	682.4	676.8
IV. Operating Expenses												
Maintenance and Repair	30.4	37.6	41.0	55.0	86.9	93.9	103.2	110.1	117.5	125.4	133.8	142.8
Administration and Selling	44.5	54.5	60.6	82.0	140.5	156.1	173.5	186.7	200.9	216.1	232.1	249.7
Depreciation	25.5	42.1	42.1	76.0	110.1	110.1	110.1	110.1	120.0	120.0	120.0	120.0
Other Expenses	2.9	4.9	6.3	7.5	30.0	32.3	34.8	37.3	40.1	43.1	45.7	48.4
V. Operating Profit	80.5	93.3	97.2	114.9	268.1	365.8	330.4	306.9	257.3	222.5	150.8	115.9
Other Income	12.7	-	-	-	-	-	-	-	-	-	-	-
Financial Charges	19.2	13.8	19.5	18.0	137.0	132.1	122.6	112.7	102.2	70.0	60.7	51.7
VI. Income before Taxes and Contributions	74.0	79.5	77.7	96.9	131.1	233.7	207.8	194.2	155.1	152.5	90.1	64.2
Taxes and Contributions	0.7	0.9	1.7	1.5	1.8	2.4	2.3	2.2	1.9	1.9	1.5	0.4
VII. Net Income	73.3	78.6	76.0	95.4	129.3	231.3	205.5	192.0	153.2	150.6	88.6	63.8
VIII. Appropriations												
Reserve Fund	4.0	4.7	5.2	5.4	5.6	8.5	7.4	6.9	6.0	5.9	5.4	3.2
Collective Consumption Fund	27.6	15.0	15.0	15.0	20.0	30.0	30.0	30.0	30.0	30.0	30.0	20.0
Compulsory Loans	6.1	9.0	15.4	16.4	18.2	20.2	19.5	19.2	18.4	18.2	16.0	5.4
Business Fund	35.6	49.9	40.4	60.1	85.3	172.6	148.6	135.9	98.8	96.5	37.2	35.2

1/ Including income from trade of implements and parts produced by others (Din 183.2 million). No such income has been assumed for projections.
2/ After inventory charges.

NOTE: For explanation of terms used, refer to Annex 2-7.

Industrial Projects Department
January 1974

YUGOSLAVIA

IMT TRACTOR EXPANSION PROJECT

Projected Income Statement - Without Expansion
(Current Din Million)

Year Ending December 31	1972 (Actual)	1973	1974	1975	1976	1977	1978	1979	1980
I. Net Sales									
Domestic	977.1 1/	1,224.4	1,315.9	1,386.9	1,470.1	1,558.4	1,651.8	1,717.1	1,783.9
Exports:									
Convertible	23.3	26.3	31.3	32.9	34.9	37.0	39.2	41.6	44.1
Clearing	30.5	34.6	41.0	43.3	45.9	48.6	51.2	54.6	57.9
	1,030.9	1,285.3	1,388.2	1,463.1	1,550.9	1,644.0	1,742.6	1,813.3	1,885.9
II. Cost of Goods Sold									
Materials, Supplies, Utilities	775.1 2/	967.5	1,044.8	1,107.5	1,174.0	1,244.4	1,319.1	1,398.3	1,482.1
Labor	72.1	85.5	96.0	107.8	121.1	135.9	152.7	164.9	178.1
III. Gross Profit	183.7	232.4	247.4	247.8	255.9	263.6	270.9	250.1	225.7
IV. Operating Expenses									
Maintenance and Repairs	30.4	37.6	41.0	44.2	47.7	51.5	55.6	59.3	63.2
Administration and Selling	44.5	54.5	60.6	67.3	74.7	82.9	92.2	99.2	106.8
Depreciation	25.5	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
Other Expenses	2.9	4.9	6.3	7.5	8.7	10.0	11.4	12.9	14.4
V. Operating Profit	80.5	93.3	97.2	86.7	82.7	77.0	69.6	36.6	(0.8)
Other Income	12.7	-	-	-	-	-	-	-	-
Financial Charges	19.2	12.5	11.8	11.2	10.9	10.6	10.2	10.1	10.0
VI. Income (Loss) before Taxes and Contributions	74.0	80.8	85.4	75.4	71.8	66.4	59.3	26.5	(10.8)
Taxes & Contributions	0.6	1.0	1.1	1.2	1.4	1.5	1.7	1.9	-
VII. Net Income (Loss)	73.3	79.8	84.4	74.2	70.4	64.9	57.6	24.6	(10.8)
VIII. Appropriations									
Reserve Fund	4.0	4.7	5.2	5.3	5.7	6.8	8.6	7.0	-
Collective Consumption Fund	27.6	15.0	15.0	15.0	15.0	15.0	15.0	10.0	-
Compulsory Loans	6.1	9.8	15.8	16.5	9.4	10.2	10.7	7.6	-
Business Fund	35.5	50.2	48.3	37.3	40.0	32.9	23.2	-	-
-for Fixed Asset	14.3	23.7	34.6	16.0	12.4	9.3	-	-	-
-for Current Assets	21.3	26.6	13.7	21.3	27.6	23.6	23.2	-	-

1/ Including income from trade of implements and parts produced by others (Din 183.2 million).
2/ After inventory charges.

NOTE: For explanation of terms used, refer to Annex 2-7.

Industrial Projects Department
September 1973

YUGOSLAVIA

IMT TRACTOR EXPANSION PROJECT

Projected Source and Application of Funds
(Million Current Dinar)

Year Ending December 31	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
I. SOURCES											
1. Net Appropriation to Business Fund	49.9	40.4	60.1	85.3	172.6	148.6	135.9	98.8	96.5	37.2	35.2
2. Depreciation	42.1	42.1	76.0	110.1	110.1	110.1	110.1	120.0	120.0	120.0	120.0
Subtotal	92.0	82.5	136.1	195.4	282.7	258.7	246.0	218.8	216.5	157.2	155.2
3. Decrease in Working Capital	17.5	-	-	-	-	-	-	-	-	-	-
4. Increase in Short-Term Debt	-	-	26.4	-	-	-	38.5	-	-	-	-
5. Increase in Long-Term Debt for Fixed Assets:											
- IBRD	-	128.6	158.1	-	-	-	-	-	-	-	-
- Clearing	-	5.2	10.0	-	-	-	-	-	-	-	-
- Beogradska Banka	48.1	170.2	116.0	-	-	-	-	-	-	-	-
- Local Suppliers' Credit	-	7.0	10.2	-	-	-	-	-	-	-	-
Subtotal	48.1	311.0	294.3	-	-	-	-	-	-	-	-
6. Increase in Long-Term Debt to Current Assets	60.0	20.0	150.0	150.0	-	-	-	-	-	-	-
TOTAL SOURCES	217.6	413.5	606.8	345.4	282.7	258.7	284.5	218.8	216.5	157.2	155.2
II. APPLICATIONS											
1. Increase in Fixed Assets:											
- Expansion Program	82.2	349.5	421.5	-	-	80.0	120.0	-	-	-	-
- Replacement & New Investment	-	-	-	5.0	10.0	12.0	14.0	17.0	22.0	24.0	27.0
Subtotal	82.2	349.5	421.5	5.0	10.0	92.0	134.0	17.0	22.0	24.0	27.0
2. Increase in Working Capital	-	10.2	106.4	281.6	40.2	43.7	39.4	41.4	43.7	45.0	47.3
3. Decrease in Short-Term Debt	37.0	2.9		19.5	20.1	-	-	38.5	-	-	-
4. Repayment of Long-Term Debt											
for Current Assets	3.4	14.6	17.2	17.3	44.3	43.5	43.6	29.6	29.6	29.6	29.6
for Fixed Assets:											
- IBRD	-	-	-	-	8.8	18.4	19.8	21.3	22.9	24.5	26.4
- Others	14.7	19.2	18.7	33.5	53.0	39.0	38.1	38.1	37.5	33.7	33.7
Subtotal	18.1	33.8	35.9	50.8	106.1	100.9	101.5	89.0	90.0	87.8	89.7
5. IBRD Interest during Construction	-	6.0	19.5	(5.1)	(5.1)	(5.1)	(5.1)	(5.1)	-	-	-
6. Net increase in Financial Assets 1/	20.3	11.1	44.0	(6.4)	112.4	34.4	37.7	30.4	55.4	15.2	1.8
7. Net increase of Inventory Coverage 2/	60.0	-	(20.5)	-	(39.5)	-	-	-	-	-	-
TOTAL APPLICATION	217.6	413.5	606.8	345.4	244.2	265.9	307.5	211.2	211.1	172.0	165.8
(Deficit) Surplus Cash	-	-	-	-	38.5	(-7.2)	(-23.0)	7.6	5.4	(-14.8)	10.6
Accumulated Surplus Cash	-	-	-	-	38.5	31.3	8.3	15.9	21.3	6.5	-4.1

NOTE: For explanation of terms used, refer to Annex 2-6.

1/ Deposits and long-term loans to customers and suppliers, not including compulsory loans.
2/ According to Yugoslav regulations, 80% inventory has to be covered by the business fund for current assets or long-term debt by 1973 and 100% by 1975.

Industrial Projects Department
January 1974

YUGOSLAVIA

IMT TRACTOR EXPANSION PROJECT

Balance Sheet Projects - Without Expansion
(million current dinar)

Year Ending December 31	1972 (Actual)	1973	1974	1975	1976	1977	1978	1979	1980
ASSETS									
I. Current Assets									
Cash and Banks	25.4	25.0	25.0	25.0	15.7	16.6	30.0	30.0	15.0
Receivables	102.5	71.4	77.1	81.3	86.2	91.3	119.0	119.3	122.5
Inventory	273.8	275.5	285.1	303.2	322.4	342.9	330.2	325.0	298.0
Subtotal	401.7	371.9	387.2	409.5	424.3	450.8	479.2	474.3	435.5
II. Fixed Assets									
Gross Fixed Assets	355.9	435.9	478.0	520.1	562.2	604.3	645.5	697.6	738.3
Less: Accumulated Depreciation	209.0	251.1	293.2	335.3	377.4	419.5	461.6	513.7	555.9
Net Fixed Assets	146.9	184.8	184.8	184.8	184.8	184.8	183.9	183.9	182.4
III. Financial Assets	31.0	49.7	81.0	94.8	106.3	116.2	121.1	128.6	136.0
IV. Other Assets	94,9	114.6	134.8	155.1	175.9	197.7	221.3	243.3	265.7
TOTAL ASSETS	674.4	721.0	787.8	844.1	891.2	949.4	1,005.5	1,030.1	1,019.6
LIABILITIES									
I. Current Liabilities									
Accounts Payable	96.2	83.9	90.6	96.1	101.8	107.9	114.4	121.3	128.6
Short-Term Debt	53.1	12.5	11.5	10.2	-	-	-	-	-
Current Portion of Long-Term Debt	18.2	23.3	22.0	18.9	12.8	8.9	7.0	7.0	6.5
Subtotal	167.5	119.7	124.1	125.2	114.6	116.8	121.4	128.3	135.1
II. Long-Term Debt	81.3	95.8	73.8	54.9	42.1	34.2	27.2	20.2	13.7
III. Equity									
Reserve Fund	18.6	23.3	28.5	33.9	39.6	46.5	55.1	62.1	62.1
Collective Consumption Fund	76.3	91.3	106.3	121.3	136.3	151.3	166.3	176.3	176.3
Compulsory Loans	12.5	22.3	38.2	54.7	64.4	73.5	85.3	93.0	93.0
Business Fund	318.3	368.5	416.8	454.1	494.1	527.0	550.2	550.2	539.4
Subtotal	425.7	505.4	589.8	664.0	734.4	798.4	856.9	881.6	870.8
TOTAL LIABILITIES	674.4	721.0	787.8	844.1	891.2	949.4	1,005.5	1,030.1	1,019.6

NOTE: For explanation of terms used see Annex 2-7.

Industrial Projects Department
January 1974

YUGOSLAVIA

IMT TRACTOR EXPANSION

Projected Balance Sheet - With Expansion
(million current Dinar)

Year Ending December 31	1972 (Actual)	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
ASSETS												
I. Current Assets												
Surplus Cash 1/	-	60.0	60.0	39.5	39.5	38.5	31.3	8.3	15.9	21.3	6.5	-
Cash	25.4	25.0	27.0	38.0	60.0	61.8	63.5	65.6	67.8	70.0	72.0	69.9
Receivables	102.5	71.4	77.1	125.5	256.0	270.9	287.0	248.5	310.4	322.8	335.8	349.1
Inventory	273.8	275.5	285.1	449.3	612.7	650.8	692.2	734.3	779.0	826.4	865.9	928.5
Subtotal	401.7	431.9	449.2	652.3	968.2	1,022.0	1,074.0	1,056.7	1,173.1	1,240.5	1,280.2	1,347.5
II. Fixed Assets												
Gross Fixed Assets	355.9	438.1	787.6	1,209.1	1,214.1	1,224.1	1,316.1	1,450.1	1,467.1	1,489.1	1,513.1	1,559.7
Less: Accumulated Depreciation	209.0	251.1	293.2	369.2	479.3	589.4	699.5	809.6	929.6	1,049.6	1,169.6	1,289.6
Net Fixed Assets	146.9	187.0	494.4	839.9	734.8	635.8	617.7	641.6	538.6	440.6	344.6	251.6
III. Financial Assets												
Compulsory Loans	12.5	21.5	36.9	53.3	71.5	91.7	111.2	130.4	148.8	167.0	183.0	188.4
Others	18.5	38.7	71.1	137.1	122.4	228.6	257.9	349.5	315.9	371.3	396.5	388.3
Subtotal	31.0	60.2	108.0	190.4	193.9	320.3	369.1	479.9	464.7	538.3	579.5	576.7
IV. Other Assets	94.9	114.6	134.8	155.2	180.8	219.3	256.7	293.6	329.6	365.5	400.9	424.1
TOTAL ASSETS	674.5	793.7	1,186.4	1,837.8	2,077.7	2,197.4	2,317.5	2,462.8	2,506.0	2,584.9	2,605.2	2,599.9
LIABILITIES												
I. Current Liabilities												
Accounts Payables	96.2	83.9	90.6	208.2	242.5	257.1	272.6	288.9	306.3	324.6	344.1	364.7
Short-term Debt	53.1	16.1	13.2	39.6	20.1	-	-	38.5	-	-	-	-
Short-term portion of Long-term Debt	18.2	18.1	33.8	35.9	106.1	100.9	101.5	88.9	90.0	87.8	89.7	91.6
Subtotal	167.5	118.1	138.0	283.7	368.7	358.0	374.1	416.3	396.3	412.4	433.8	456.3
II. Long-term Debt												
For Fixed Assets												
-IBRD	-	-	128.6	286.7	277.9	259.5	239.7	218.5	195.6	171.1	144.7	116.4
-Others	55.0	88.4	251.6	369.1	315.3	276.3	238.2	200.1	162.9	128.9	95.2	61.5
For Current Assets	26.3	82.9	88.3	221.1	309.5	266.0	222.4	192.8	163.2	133.6	104.0	74.4
Subtotal	81.3	171.3	468.5	876.9	902.7	801.8	700.3	611.4	521.4	433.6	343.9	252.3
III. Equity												
Reserve Fund	18.6	23.3	28.5	33.9	39.5	48.0	55.4	62.3	68.3	74.2	79.6	82.8
Collective Consumption Fund	76.3	91.3	106.3	121.3	141.3	171.3	201.3	231.3	261.3	291.3	321.3	341.3
Compulsory Loans	12.5	21.5	36.9	53.3	71.5	91.7	111.2	130.4	148.8	167.0	183.0	188.4
Business Fund	318.3	368.2	408.6	468.7	554.0	726.6	875.2	1,011.1	1,109.9	1,206.4	1,243.6	1,278.8
Subtotal	425.7	504.3	580.3	677.2	806.3	1,037.6	1,243.1	1,435.1	1,588.3	1,738.9	1,827.5	1,891.3
TOTAL LIABILITIES	674.5	79 .7	1,186.4	1,837.8	2,077.7	2,197.4	2,317.5	2,462.8	2,506.0	2,584.9	2,605.2	2,599.9
Current Ratio	2.4:1	3.7:1	3.3:1	2.3:1	2.6:1	2.9:1	2.9:1	2.5:1	3.0:1	3.0:1	3.0:1	3.0:1
Debt/Equity Ratio	16:84	25:75	44:56	56:44	53:47	44:56	31:69	30:70	25:75	20:80	16:84	12:88

NOTE: For explanation of terms used, refer to Annex 2-7

1/ including inventory coverage required by Yugoslav law.

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YUGOSLAVIA - IMT TRACTOR EXPANSION PROJECT

I. FINANCIAL PROFITABILITY

Input for the Financial Rate of Return Calculations

1. The financial rate of return calculations are based on financial cost and benefit streams expressed in real value terms i.e. The financial projections in case of expansion and without expansion (Annex 7-1) as well as the project cost have been adjusted to reflect real prices. A comparison of IMT's financial cost and benefit streams with and without expansion results in the following incremental position:

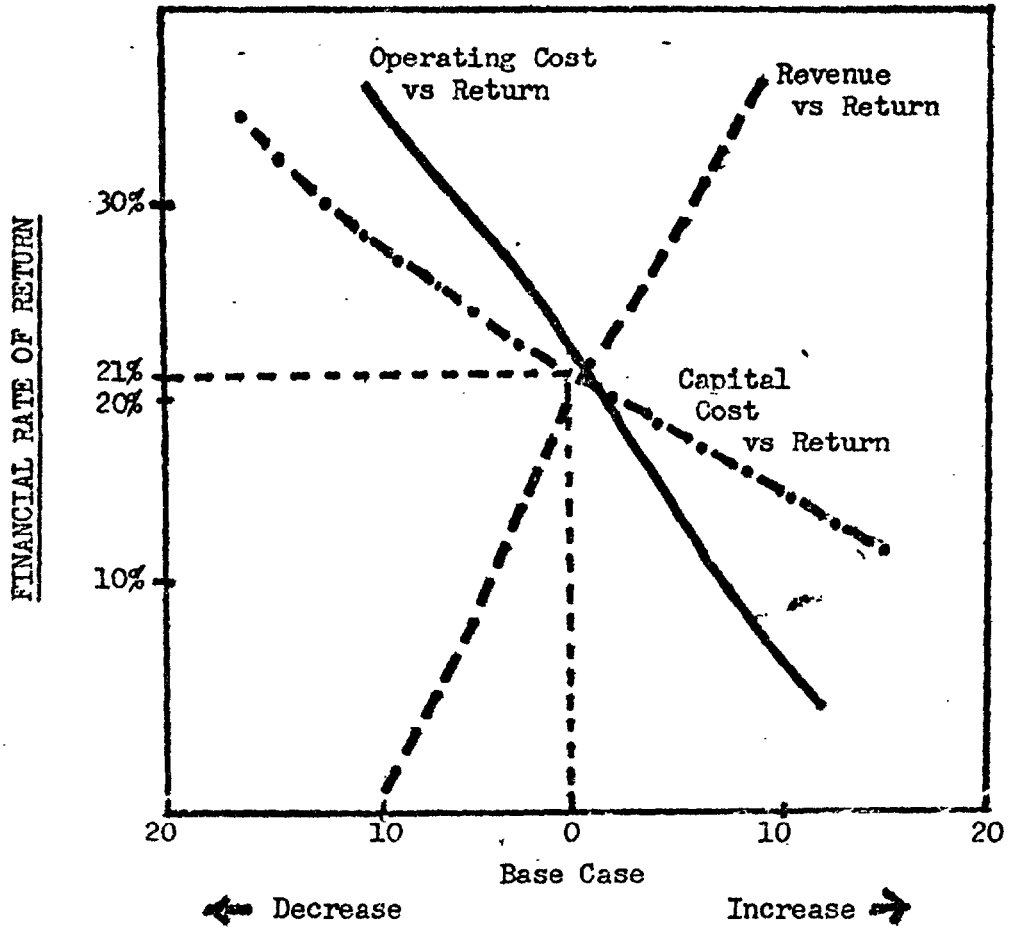
Incremental Financial Cost and Benefit
Stream of the IMT Tractor Expansion Project
(real prices)

	Incremental Investment Cost				
	Project			Operating	Incremental
	Fixed Assets	Working Capital	Other Investments/1	Cost	Revenue
1973	82.2	-17.5	-10.2	-0-	-0-
1974	349.5	10.2	-11.0	-0-	-0-
1975	422.6	106.4	-11.7	258	318
1976	-	281.6	- 7.4	1,241	1,494
1977	-	-	- 3.2	1,418	1,775
1978	-	-	78.0	1,551	1,881
1979	-	-	119.3	1,6.8	1,956
1980	-	-	1.4	1,748	2,034
1981	-	-	5.4	1,831	2,076
1982	-	-	6.4	1,954	2,319
1983	-	-	8.4	2,036	2,163
1984	-	-	8.9	2,158	2,293
1985	-	-	9.4	2,286	2,430
1986	-	-	10.0	2,425	2,576

/1 including replacement and Phase II expansion in 1978/79.

2. The financial rate of return calculation and its sensitivity tests assume a 14-year production period including 3 years construction and zero scrap value.

II. SENSITIVITY TEST ON FINANCIAL RATE OF RETURN



CASE	CAPITAL COST	OPERATING COST	REVENUE	RATE OF RETURN
1. Base Case	100	100	100	21.0
2. 6 month Delay of Project Completion				17.3
3.	110	100	100	18.3
4.	100	110	100	3.1
5.	100	100	110	36.8
6.	120	100	100	14.4
7.	110	110	100	1.2
8.	100	100	90	- 1.6

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YUGOSLAVIA - IMT TRACTOR EXPANSION PROJECT

Sources and Uses of Foreign Exchange
(million current Din)

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Net Export to Convertible Currency Countries	26.3	31.3	32.9	121.6	132.7	145.9	166.1	191.1	202.6	214.7	227.6
I. Sources of Foreign Exchange Rights											
1. Retention Quota	3.6	3.6	3.6	9.3	9.3	9.3	9.3	9.3	9.3	5.2	5.2
2. Depreciation Quota	5.3	6.3	6.6	24.3	26.5	29.2	33.2	38.2	40.5	42.9	45.5
3. Hard Currency Sales	3.0	12.1	16.3	-	-	-	-	-	-	-	-
Total	11.9	22.0	26.5	33.6	35.8	38.5	42.5	47.5	49.8	48.1	50.7
4. Accumulated Foreign Exchange	-	1.5	10.8	11.4	21.8	24.3	20.3	24.6	35.5	46.3	59.0
	11.9	23.5	37.3	45.0	57.6	62.8	64.8	72.1	83.3	94.4	109.7
II. Uses of Foreign Exchange											
1. Repayment of Foreign Loans											
IBRD	-	-	-	-	8.8	18.4	19.8	21.3	22.9	24.5	26.4
Others	9.1	5.8	5.6	3.9	2.0	.5	-	-	-	-	-
Sub-total	9.1	5.8	5.6	3.9	10.8	18.9	19.8	21.3	22.9	24.5	26.4
2. Interest Payments											
IBRD (at 7 1/4%)	-	6.0	19.5	20.8	20.8	19.8	18.5	17.0	15.4	13.8	11.9
Others	1.3	.9	.8	.5	.5	.2	-	-	-	-	-
Sub-total	1.3	6.9	20.3	21.3	21.3	20.0	18.5	17.0	15.4	13.8	11.9
TOTAL	10.4	12.7	25.9	25.2	32.1	38.9	38.3	34.0	38.3	38.3	38.3
Surplus (deficit) - (I)-(II)	1.5	10.8	11.4	19.8	25.5	23.9	26.5	38.1	45.0	56.1	71.4

Note: for explanation of terms used, refer to Annex 2-6.

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ANNEX 7-5

YUGOSLAVIA - IMT TRACTOR EXPANSION PROJECT

BREAK-EVEN-POINT ANALYSIS

IMT's expansion project will be completed by late 1975 and is expected to produce at full capacity 35,000 tractors per year in 1976. 1/ The year 1978 was chosen as the basis for the break-even-point analysis since it is the first full year of IBRD loan repayment.

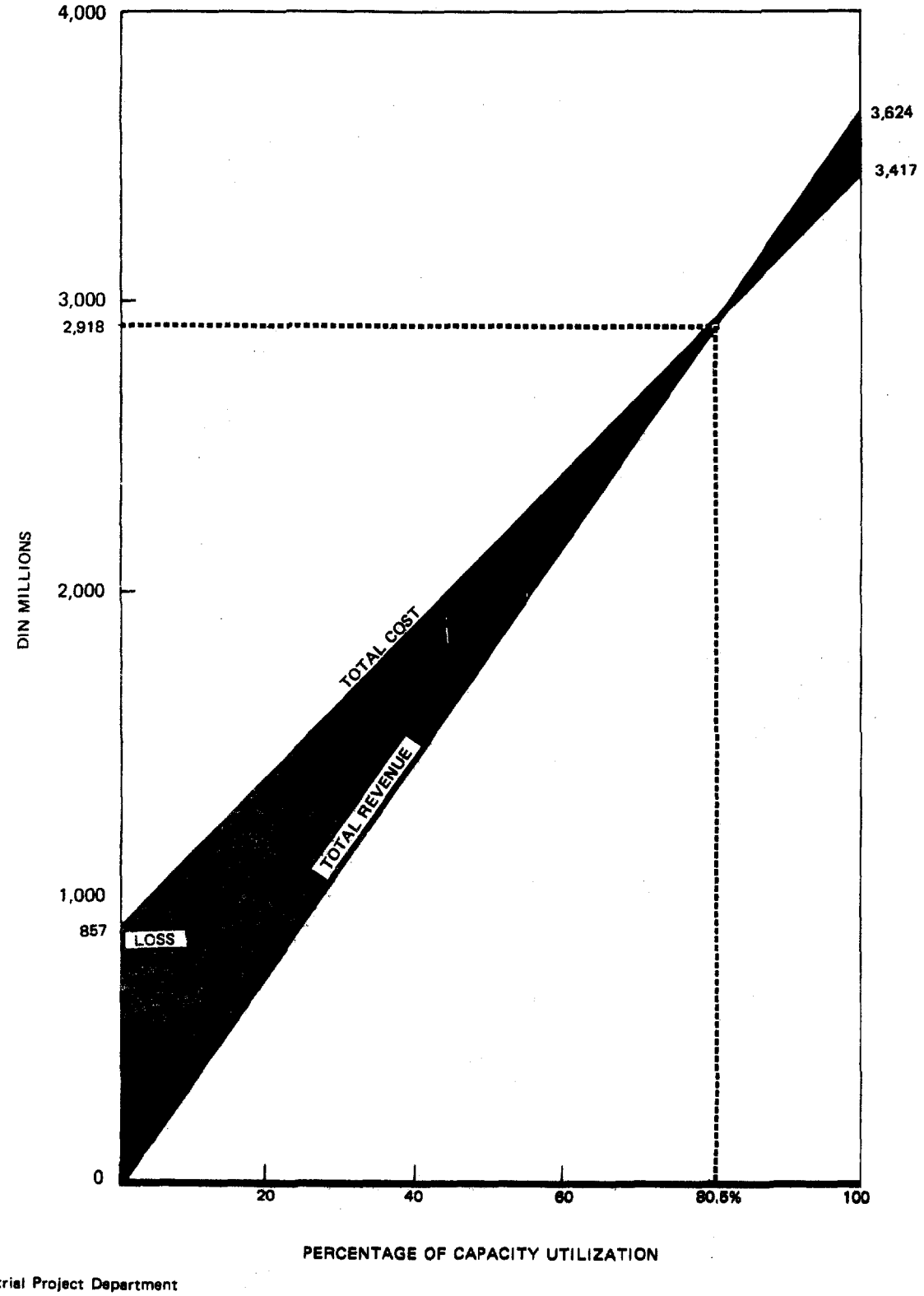
Cost Items	(Din Million) Variable Cost	Fixed Cost
Materials, Supplies, Utilities	2,310.3	256.7
Labor (Production)	219.9	85.5
Maintenance & Repair	20.6	82.6
Selling & Administration	8.7	164.8
Other Operation Expenses	-	34.8
Financial Charges	-	122.6
Depreciation	-	110.1
Total	2,559.5	857.1

Revenue	Din. 3,624.4 million
Profit Break-even-point (capacity %)	80.5% or about 28,175 tractors and a proportional number of implements and tractor accessories
Debt Repayment	Din. 100.9 million
Cash Break-even-point (capacity %)	79.6% or about 27,860 tractors and a proportional number of implements and tractor accessories

1/ For detailed production program at full capacity see Annex 2-4, paras. 8, 13, 15, page 1.

YUGOSLAVIA - IMT TRACTOR EXPANSION PROJECT

Break-even Point
Year 1978



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YUGOSLAVIA - IMT TRACTOR EXPANSION PROJECT

ECONOMIC RATE OF RETURN AND SENSITIVITY ANALYSIS

I. Assumptions for the Economic Rate of Return Calculations

1. The economic cost/benefit stream has been derived from the financial projections (Annex 7-1) and the financial cost/benefit streams (Annex 7-5). The latter have been modified (a) to replace the commercial benefit stream with one based on the opportunity costs of tractor and agricultural implements import to Yugoslavia, and (b) to eliminate taxes and duties from the cost streams. In view of the present and projected economic situation in Yugoslavia, no shadow pricing of labor of foreign exchange rate has been employed.

2. Revenues. The revenue stream in the economic cost/benefit projections comprises the expenditures Yugoslavia would have to incur to import comparable tractors and agricultural implements, if IMT would not choose to produce this agricultural machinery domestically. Accordingly, the economic benefit stream has been based on the lowest international prices (cif Yugoslav border) of comparable products expressed in real value terms. The price comparison (Annex 3, paras. 21-24) indicates that Yugoslavia could import tractors ex duties and taxes from clearing countries about 15% below the domestic price level.

3. Project Cost. The unescalated financial project cost has been reduced by duties and taxes totalling Din 103.8 million (Annex 5-1).

4. Personnel Cost: No shadow pricing of labor has been employed. However, total labor cost as well as the labor cost of maintenance and repair, and administration and selling expenses have been adjusted by excluding 9% taxes and contributions to the Government.

5. Raw Materials and Components Prices. Material inputs for the economic operating cost stream have been valued at comparable international prices (cif Yugoslav border and excluding Yugoslav duties and taxes) as detailed below:

Prices of Selected Raw Material and Components

	Financial Cost 1/	Economic Cost 2/
	1973 Din/kg	
1. Steel		
Drawn steel bars St 37K Ø 6-1	6.80	4.2
Drawn steel wire C-60K Ø 4-6	8.50	8.50
Rolled steel St 42 Ø 30-60	2.70	2.65
Flat steel bank St 60/50-80/	3.4	3.4
HVT band St 37 165x/0.10-0.55/	5.4	5.3
2. Forgings	12.3	10.4
3. Castings	6.5	5.3
	1973 Din/Unit	
4. Engines		
IM-0 33/T	1,448.5	952.5
4A - 248	1,880.0	993.2
5. Pressings	15.6	15.4
6. Tires		
15 x 30	2,037	1,559
14 x 30	1,658	1,400
7. Bearings		
530.01.220	59.15	43.8
532.01.510	37.45	27.7
532.01.840	63.85	47.2

1/ domestic prices or import prices including taxes and duties.
2/ comparable international prices (cif Yugoslav border).

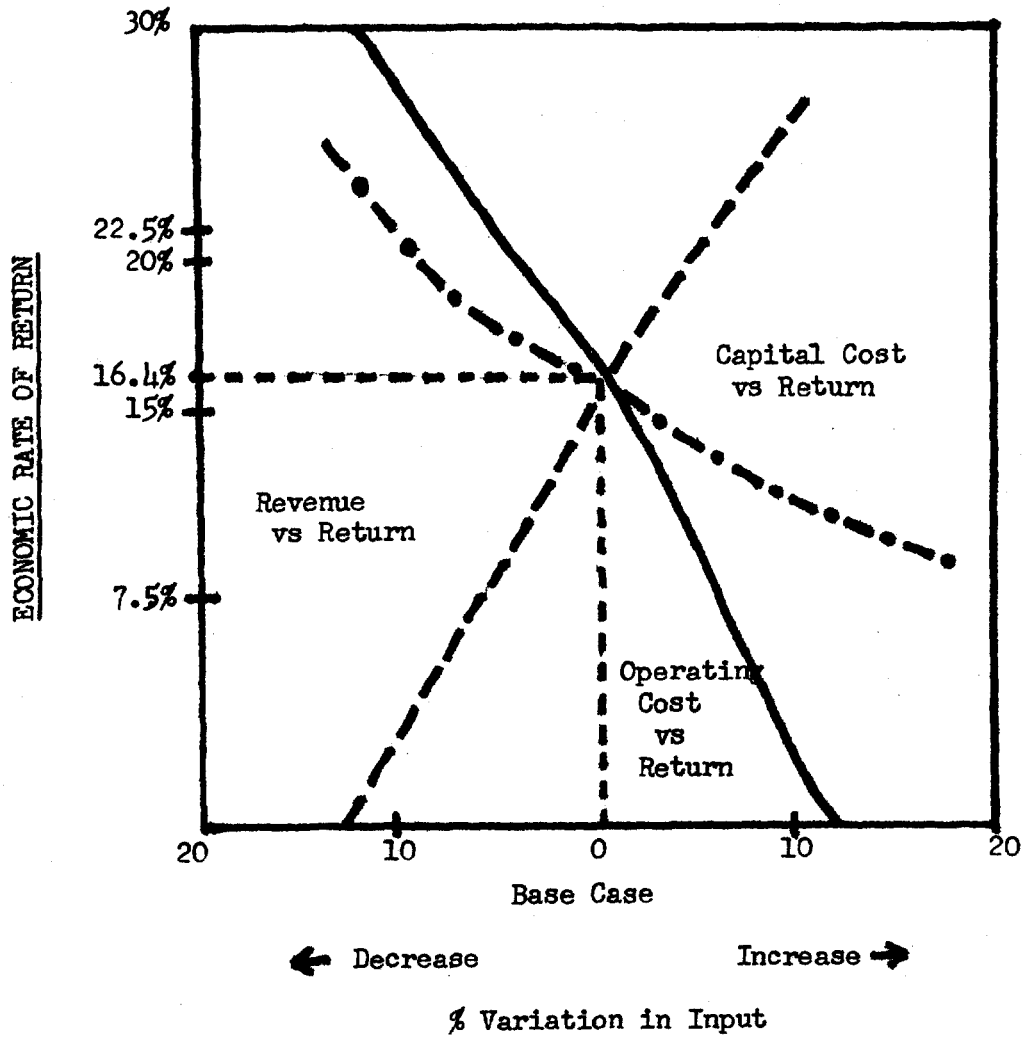
SOURCE: IMT and UMI Cost Data.

6. All costs and revenues are expressed in real prices. The above noted adjustments to the financial cost and benefit stream results in the following input for the economic rate of return calculations.

Incremental Economic Cost/Benefit Stream of the IMT Tractor Project
(million Din real value terms)

	Incremental Investment Cost	Incremental Operating Cost	Incremental Revenues
1973	55.3	-0-	-0-
1974	302.1	-0-	-0-
1975	438.4	232	270
1976	244.3	1,116	1,269
1977	-3.1	1,276	1,509
1978	13.4	1,395	1,599
1979	101.1	1,456	1,663
1980	1.3	1,573	1,729
1981	5.3	1,648	1,765
1982	6.3	1,759	1,871
1983	8.0	1,832	1,938
1984	8.4	1,942	1,994
1985	9.2	2,057	2,091
1986	9.8	2,182	2,187

II. SENSITIVITY TESTS ON ECONOMIC RATE OF RETURN



	CASE	CAPITAL COST	OPERATING COST	REVENUE	RATE OF RETURN
1.	Base Case	100	100	100	16.4
2.	6 month Delay of Project Completion				13.4
3.		110	100	100	12.8
4.		100	110	100	2.7
5.		100	100	110	29.0
6.		120	100	100	9.8
7.		100	90	100	28.4
8.		110	110	100	0.8
9.		100	100	90	- 2.9

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YUGOSLAVIA - IMT TRACTOR EXPANSION PROJECT

Foreign Exchange Savings
(Million Current Din)

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
I. Foreign Exchange Earnings Without Expansion											
Net Export Sales	60.9	72.3	76.2	80.8	85.6	90.4	96.2	102.0	108.1	114.6	121.5
Less: Raw Materials and components 1/	43.2	38.0	17.6	18.8	20.0	21.2	22.4	23.8	25.2	26.7	28.3
Spare Parts 1/	4.9	5.3	5.9	6.1	6.3	6.5	6.8	7.2	7.5	7.9	8.3
Interest	1.3	.9	.8	.6	.5	.2	-	-	-	-	-
Amortization	9.1	5.8	5.6	3.9	2.0	.5	-	-	-	-	-
Sub-total	58.5	50.0	29.9	29.4	28.8	28.4	29.2	31.0	32.7	34.6	36.6
Net Earnings (I)	2.4	22.3	30.9	51.4	56.8	62.0	67.0	71.0	75.4	80.0	84.9
II. Foreign Exchange Earnings With Expansion											
Net Export Sales	60.9	72.3	76.2	281.2	307.0	337.5	344.2	442.2	454.6	466.7	479.6
Less: Raw Materials and Components 1/	43.2	38.0	42.0	41.7	44.2	46.8	49.6	52.3	55.7	59.0	62.6
Spare Parts 1/	.8	1.0	4.3	6.5	8.5	10.0	12.1	14.3	17.0	20.0	24.2
Interest 2/	1.3	6.9	20.3	21.3	21.3	20.0	18.5	17.0	15.4	13.8	11.9
Amortization	9.1	5.8	5.6	3.9	10.8	18.9	19.8	21.3	22.9	24.5	26.4
Sub-total	54.4	51.7	72.2	73.4	84.8	95.7	100.0	104.9	111.0	117.3	125.1
Net Earnings (II)	6.5	20.6	4.0	207.8	222.2	241.8	244.2	337.3	343.6	349.4	354.5
I. Incremental Net Foreign Exchange Earnings (II)-(I)	4.1	(1.7)	(26.9)	156.4	165.4	179.8	177.2	266.3	268.2	269.4	269.6

1/ excluding duties & taxes
2/ existing loans and 7-1/4% interest for IBRD loan

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IBRD 10716
OCTOBER 1973