



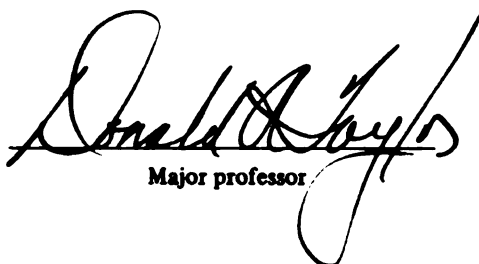


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thesis entitled
AN ANALYSIS OF THE EXPECTATIONS AND
RESULTS OF TECHNOLOGY TRANSFERS
BY SELECTED U.S.A. MULTINATIONALS
TO THE EAST EUROPEAN BLOC

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MARILYN LOUISE LIEBRENZ

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Major professor

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AN ANALYSIS OF THE EXPECTATIONS AND
RESULTS OF TECHNOLOGY TRANSFERS
BY SELECTED U.S.A. MULTINATIONALS
TO THE EAST EUROPEAN BLOC

by

Marilyn Louise Liebreinz

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

School of Business Administration

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Abstract

AN ANALYSIS OF THE EXPECTATIONS AND RESULTS OF TECHNOLOGY TRANSFERS BY SELECTED U.S.A. MULTINATIONALS TO THE EAST EUROPEAN BLOC

by

Marilyn Louise Liebrez

The following study considers multinational corporations (MNC's) in technology transfer relationships with Eastern Europe. It is a pilot study involving an analysis of MNC expectations, as they entered into agreements with countries in Eastern Europe, compared to the outcomes which are resulting from those agreements.

The agreements have several characteristics in common. Perhaps the most distinctive aspect is that these agreements might be termed somewhat 'non-traditional'. The corporations are imparting a relatively high level of technology which in the past has usually been provided only when the MNC possessed an equity involvement.

Non-equity agreements with Eastern Europe vary in several respects from joint ventures, with one distinction being that most of these arrangements are for a specific time period. At the end of this period

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the corporation and the host firm or country mutually expect to conclude their relationship. Agreements may be extended or additional ones may be negotiated. However, in most cases, the specific arrangements are still viewed as short run ventures, even if involvement of one form or another is projected for the future.

This study considers the advantages and disadvantages of the non-equity approach to technology transfer. It concentrates on Eastern Europe and considers non-equity agreements with developing nations only as related to firms currently operating on a non-equity basis in Eastern Europe. The study involves six selected corporations, each with at least one agreement of a non-equity nature. The results of this pilot study are descriptive and analytical, concentrating on variations between MNC expectations and outcomes. The information was gathered through personal interviews with corporate officers, and reflects their opinions and evaluations. This information, as collected and analyzed, provides an initial framework for both current and future agreements of this non-equity format.

The descriptive results are grouped within the following categories: direct transfer of technology, indirect transfer of technology, environmental considerations, political arena, financial flows, leverage and

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control issues, contract format, expectations which did not materialize, unexpected occurrences, and benefits to the corporation.

The analytical results have been drawn from an analysis of the descriptive ones. Factors which appear to have had an impact upon these technology transfers include certain aspects of the technology, training issues, potential problems with the provision made for such occurrences, leverage, contract preparation, facilitating aids, and the rationale behind the transfer.

The conclusion of this pilot study of select firms provides a limited yet hopefully insightful view into transfer of technology. The growth and acceptance of such transfers involves both benefits and risks. It is hoped that this study will aid in the analysis of those factors and favorably affect future technology transfers.

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1. The first step is to identify the problem or goal. This involves understanding the current situation and what needs to be achieved.

confidence and patience throughout the years of research. Therefore, to them, their wives and families, for their help, far-reaching endurance and unending support, a great note of thanks.

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CHAPTER I

PERSPECTIVE ON NON-EQUITY TECHNOLOGY

TRANSFER TO EASTERN EUROPE

Introduction

Multinational corporations (MNCs) have utilized different international linkages in their global approach. Some linkages involved a form of direct investment. Direct investment has been said to be one means by which the MNC gained continuity and, ideally, a high degree of control.

Another linkage has been evolving however, which has been viewed as less traditional. This is the sale of technology which does not include an equity investment on the part of the MNC in the project. Furthermore, unlike several other linkages, it is never expected to evolve, in most cases, into a direct investment or a joint venture.

This type of linkage involves the transfer of the corporation's technology and/or managerial skills in return for payment from the foreign party. This knowledge sale differs from a typical product sale in several respects. First, the foreign party may be a private company, but may also be a foreign government. Second, the transaction is viewed as a one-time sale and purchase although

the time involved in the transaction may encompass a number of years. Third, the control which the MNC has over the arrangement exists, but usually differs from that held in an equity investment. A high degree of control over the operation may not be viewed as desirable or even necessary.

This transfer of technology also differs from more customary licensing arrangements as well. The technology transferred here usually involves a license arrangement but the qualitative and often the quantitative, aspects of the technology are generally far more extensive than prior licensing concessions. The magnitude of the projects, which often involve some construction and equipping, tends to be more typical of arrangements usually accompanying direct investments.

Justification for the more non-traditional transfer approach appears to be more from necessity than choice. Fears concerning market saturation are growing in regard to the developed countries in numerous industries. Trading opportunities in countries which permitted direct investment by the MNCs have been diminishing in recent years. In many cases market opportunities which open up are in the socialist world sphere or with developing third world nations. Many of these opportunities, however, include restrictions on MNCs entering these markets.

In 1974, researchers noted that MNCs were finding it increasingly practical to stress their technical and marketing skills without trying to obtain ownership or control of foreign property.¹ This tactic was described to be used particularly in dealings between U.S. companies and the U.S.S.R. The Soviets desired U.S. technology and marketing expertise, but would not allow ownership or control. Developing nations, too, especially those with reserves of key raw materials, were demanding more of a say, and often a controlling interest in multinationals operating within their boundaries.

Raymond Vernon noted these tendencies in developing nations. The concluding chapter from his book, Storm over the Multinationals, states:²

One clear line of policy in many developing countries has been to provide support to local public and private enterprises in their efforts to find untied sources of foreign capital and technology, and to develop their own channels of local and foreign markets. With that objective in mind, governments have imposed special taxes on the income of foreign-owned subsidiaries, ceilings on license fees paid by local licensees to foreign licensors, limitations on foreigners' use of local credits, requirements for the sale of equity to local interests, and so on.

John K. Ryans, Jr. wrote, in an analysis of another potential marketplace now opening to the west, the People's Republic of China, that:³

the PRC . . . has been attempting to achieve a major increase in agriculture and develop its industrial capability through its own resources and initiative . . .

The result is that, for one or several reasons, corporations are applying the alternative of non-equity transfer of technology and/or management instead of using the linkage of direct investment in arrangements beyond the usual licensing operations.

This dissertation studies the perceived outcomes of MNCs who have entered into non-equity transfers of technology and/or management, in comparison with their expectations. Incentives behind the usage of the non-equity transfer will be examined. Successful technology transfers may take many forms. The attainment of every expectation in a non-equity transfer may not be a requirement in terming the venture a success from the viewpoint of the MNC. However, if future non-equity projects are to be a viable possibility, MNCs will have to achieve certain goals or a minimum level of satisfaction from the expectations which were present when the agreement was arranged. The dissertation aids in the identification of problems which may arise, and offers possibilities for avoiding or circumventing those problems, thus enabling more MNC's to avail themselves of the opportunities present via technology transfers.

Organization

The organization of this dissertation involves five chapters. Separate corporate descriptions regarding

expectations and outcomes comprise chapters three and four.

Chapter I--presentation of a statement of the situation, including background on non-equity agreements, technology transfers, and overview of Eastern Europe through a review of the literature.

Chapter II--statement of the methodology and areas of concentration as derived from the literature and preliminary corporate interviewers. Description of question areas used in conducting the study.

Chapter III--description and analysis of corporate expectations in non-entity technology transfers to Eastern Europe.

Chapter IV--description and analysis of corporate outcomes of non-equity technology transfers to Eastern Europe.

Chapter V--summation of results with conclusions, limitations and recommendations for further study.

Appendix A--listing of corporations, countries and products involved with the eight agreements considered in this study.

Appendix B--questionnaire outline used as basis for personal interviews.

Background

Development and acceptance of technology transfer

Technology appears to be one of the most important American exports. Royalties from the transfer of technology amounted to \$2.95 billion in 1977.⁴ However, much

of the research which has been done in the areas of the transfer of technology has focused on the appropriateness of such transfers as to local product adaption or the creation of a code of conduct covering these transfers. Instead of examining the transfer arrangements, studies have more often dealt on the desirability of technology transfers, concentrating on the feasibility of such linkages for the most part.

Essentially, technology transfer may be broadly interpreted to include all items reflecting a firm's knowledge of a certain product or process which are passed from that firm to others. An accepted meaning for technology transfer has come to indicate the transfer of the ability to reproduce an item, or a part of it. One source stresses the fact that transferring such ability requires a long-term knowhow commitment on the part of the seller, via selected personnel familiar with the product being produced who are able to adapt to foreign conditions. It is also noted that the long-term commitment often involves updating obligations during the time of the agreement, and sometimes a buyback.⁵

In the early 1970's the basic structures used in technology transfers were listed as licensing agreements, turnkey arrangements, co-production agreements and operation or management contracts.⁶

A list of possible technologies includes the following services:⁷

1. Aid in the production of a product;
2. Providing services to other firms;
3. Aiding product design;
4. Enhancing product value;
5. Branching out to non-profit areas;
6. Strictly selling knowhow.

Such technology sales are sometimes overlooked by some corporations as noted by this study. Possible reasons given for ignorance of technology sales includes the aspect of increased difficulty in a relatively intangible product and that of not recognizing such sales opportunities.⁸

A broadened view of technology, extending beyond the realm of a particular tangible product, was emphasized by Eugene Lang, who noted that technology transfer may "consist of patents or trademarks, an ability to do something uniquely well, a good product design, special application techniques, or anything that is sufficiently distinctive to permit the individual manufacturer to be a strong competitor in a particular market."⁹

An international survey of chief executives regarding technology transfer was made by James R. Basche, Jr. and Michael G. Duerr for The Convergence Board in 1975. This survey, while considering all possible avenues for such transfers, including investment ventures, highlighted the opportunities available to corporations and reasons for seeking such technology sales.¹⁰

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Another comprehensive study of technology emerging in 1975 was that submitted by Harvey W. Wallender, to the United Nations Economic and Social Council at the Seminar on the Management of the Transfer of Technology within Industrial Co-operation.¹¹ One of the more important points of this presentation is the detailed breakdown of technological transfer options provided by Wallender. This breakdown highlights the level to which the analysis to technology transfer had risen by the mid-1970's over the prior two decades.

Arguments against technology transfers

These are numerous, if not conclusive. Basic criticisms appear to fall into four categories: exportation of jobs, creation of competition, national security issues, and maintenance of control.

Exportation of jobs. For Americans job exportation has been an argument against several forms of international linkages, including technology transfer. Hawkins and Finn noted that while the U.S. has traditionally adopted a liberal policy toward MNCs, the movement to increase regulation of the MNC toward restricting foreign investment and technology transfer has been supported by labor.¹² Winpisinger seconded this view by pointing out that the technological innovations which

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are produced in the U.S. but then transferred to other nations cause many American workers to be unemployed.¹³

It has been validated, however, that technology transfers, at least in the short run, at times help to increase jobs, and may even be vital to the continued growth of industry.¹⁴ Harvey and Kerin espoused this view stating that MNCs have had a definite positive effect on domestic employment rather than decreasing domestic export-related jobs through the MNC worldwide distribution of technology.¹⁵

Creation of competition. Creation of potential competition appears to be another chief argument against technology transfer. One rebuttal against the competition argument has been that, in many industries, the rapid pace of development is such that the transferred technology is often outdated in a short period of time. As such, computers would seem to be one field where innovation would usually be ahead of the technology being transferred. However, as reported in Computerworld, the U.S. computer industry has begun to experience diminishing markets in Europe and Japan.¹⁶ The uncontrolled transfer of U.S. technology to other countries has been blamed for the stimulation of competition which has been seen as threatening the industry. Furthermore, U.S. export controls were not seen as faulty as much as the fact that countries receiving U.S. technology were shortly passing it on to additional countries.¹⁷

One common complaint involves the export of American technology, and indirectly, American jobs. A point made in favor of curbing the sale of American technological innovations abroad was stated by Herbert Meyer, who wrote that the export of technology will only hurt some other American firm because many nations are using this very knowledge to undersell American firms in world markets. Prohibiting the sale of U.S. technology, comments Meyer, would encourage export purchases, providing more royalties for American firms while maintaining that competitive edge.¹⁸

Passing on the products of technology formerly gained via a transfer appears to be a logical development. One author noted that technology, in this instance purchased by Eastern Europe from France, was suspected of being used to manufacture products which would be shipped back to compete with other products in Western markets. This appears possible, as Eastern European countries desire exports to improve their hard currency shortage.¹⁹ It is also not illegal, unless specifically forbidden by the technology transfer agreement.

Lang dismisses the argument against competition by stating that the question is not really valid. He presents the following four points favoring technology transfer.²⁰

First, knowhow can be dealt with as property value, protected by ground rules in most countries. Second, contractual techniques can limit its transfer to others. Third, those concerned about revealing their knowhow are often kidding themselves. A competitor, given enough time, money and talent, can acquire a similar body of knowledge. Fourth, knowhow is a wasting asset--it becomes obsolete as technology advances and markets change.

One aspect to technology transfer supporting its international sale and distribution is the position which stems from the idea that being able to sell technology abroad has encouraged firms to invest more capital in research and development, capital which is generated by current international technology sales. Studies are finding that U.S. corporations tend to export foreign production of new products much earlier than in the past--within five years now. It is also pointed out that greater secrecy is maintained regarding processes than products these days.

Overseas operations are not just on the receptive end of such transfers. These operations also provide some of the revenues as well as the inspiration for development. One source states that approximately 30 percent of the financing for R & D stems from overseas and that the global approach to innovations has some of the development being conducted abroad as well.²¹

Competition as a whole is not an issue for all companies. One American company, for example, appears

more concerned about patent protection and cash flow issues. The position of Texas Instruments, as stated by its General Patent Counsel, Harold Levine, is that "no transfer of high technology should take place unless it (is) in a manner which provide(s) a sufficient flow of funds into the U.S." The company notes that it feels only government intervention can secure patent protection.²²

Clarification of technology issues in regard to competition appears to require breaking away from generalities and concentrating on more specific issues. For example, a recent article by John Kiser noted that discussions on the 'technology gap' refer to averages, placing the U.S. in a superior position. However, in reality, Kiser points out that technology from the U.S.S.R. is being used routinely by American companies. He urges a deeper analysis be made to uncover those areas where each country is technologically superior.²³

National security issues. This is the third major contention against technology transfers, although the global activities of MNCs as a whole have also been a focal point for such considerations.²⁴ Root notes that the Export Administration Act is directly linked to restricting exports to politically sensitive areas.²⁵ Technology transfer issues involving defense controls have been particularly applied on technology sales to the Soviet Bloc.

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The position of the Department of Defense is that the transfer of some types of technology is tantamount to providing a country with the means to conduct more sophisticated warfare against the U.S.²⁶ The rationale underlying export restrictions comes from the belief that high technology is vital to the strategic security of the U.S.²⁷

The U.S. has been described as having the most stringent controls over the export of high-technology products of any Western country.²⁸ Those in contention with current export controls, take the position that the lack of a standard criteria and conflicting interpretations, combined with the lack of distinctions between military and non-military technology, make it extremely difficult for U.S. industry to assume a responsible position in such technology transfers.²⁹ Those concerned with the unfavorable balance of trade currently held by the U.S. note that restrictions on the export of products with potential strategic applications of either the product or the knowhow to communist countries are seriously curtailing the U.S. sales abroad. They are also restricting companies competitively through bureaucratic delays and licensing procedures.³⁰

Maintenance of control. Direct investment traditionally has been viewed as providing both partners with an element of control; with the majority partner in the lead. However, at least some corporations are observing

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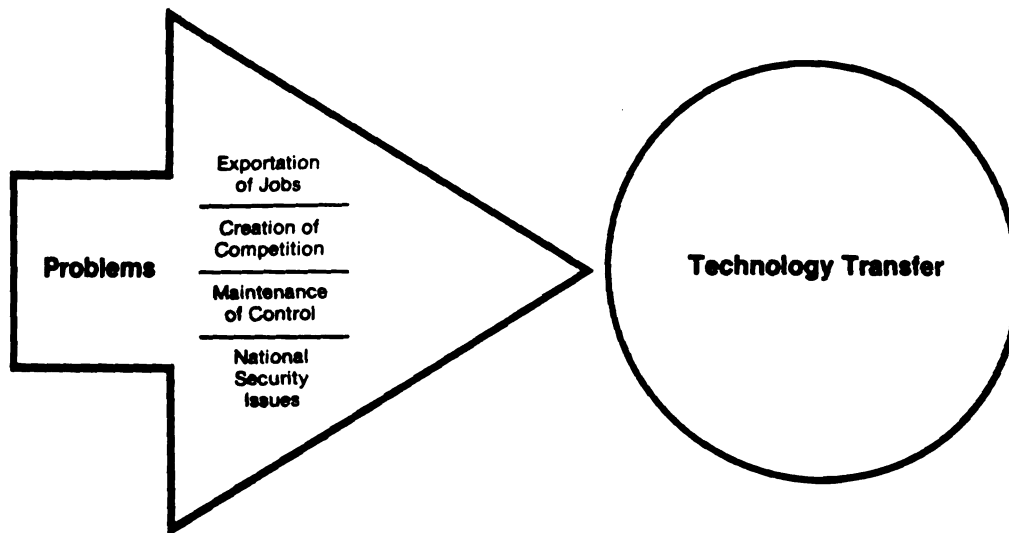
that in some countries, even if the MNC possesses a majority interest in the company, the local government would actually control the company anyway.³¹ Technology transfer offers many of the benefits ascribed to international business: establishment of new markets; increase in corporate reputation and product demand; political and economic stability assessments, without the risks of financial investment.

Technology transfer sales appear highly viable in the area of natural resource development. While the foreign company may hold a high degree of control at the start of a direct investment project of this type, readjustment of the initial contract becomes highly probable once the project is in operation. Sale of management services, without the accompanying equity investment, however, provides an income which is unlikely to be cancelled.³² These arrangements, known in some areas such as the Middle East, as service agreements, appear to be on the rise and seen as up-and-coming opportunities.³³ See Figure I-1 for a diagram of the four problems here.

Selection of technology transfer linkage

Viable alternative. Would an MNC select technology transfer as the most advantageous linkage over other options such as 100 percent investment or

Figure I-1
The Technology Transfer



**Problems Accompanying
the Technology Transfer**

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joint ventures? Such a transfer is often a viable alternative for the financially strapped corporation, since "governments all over the world are attempting to get a bigger share of the profits, jobs, markets, and technical and managerial skills that multinational companies create or control."³⁴ As these MNC controlled 'benefits' are desired without accompanying ownership strings or import fees technology transfers are often one of the few feasible access routes to some markets. The transfer provides financial remuneration to the MNC, and, in some instances, also makes alternative product production sources available for use by the MNC, without an equity commitment. Technology transfers do provide a 'middle of the road' approach which seems to provide more benefits with fewer detriments than many other linkages in regard to current global options. David Horner of the Office of International Investment in the Bureau of International Commerce states that, "licensing and management contracts offer a 'low profile' as contrasted to direct foreign equity investment . . . a 'middle way' of retaining foreign markets--a step beyond simple exporting, a step short of overseas production."³⁵

Minimization of political risk. The business climate for direct investment ebbs and flows. In Latin America, for instance, foreign investment has been encouraged, at least in some countries, since the

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mid-1970's. It appears that sales of technology, including knowhow, circumvent much of the risk associated with direct investment. One example of the sale of managerial expertise is the agreement which Exxon has with Venezuela to market, for a fee, Venezuela's crude oil and other products. This arrangement with Venezuela, which nationalized its oil industry in 1976, exemplified a type of technology transfer which is growing in popularity around the world.³⁶ See Figure I-2 for an overview of these issues.

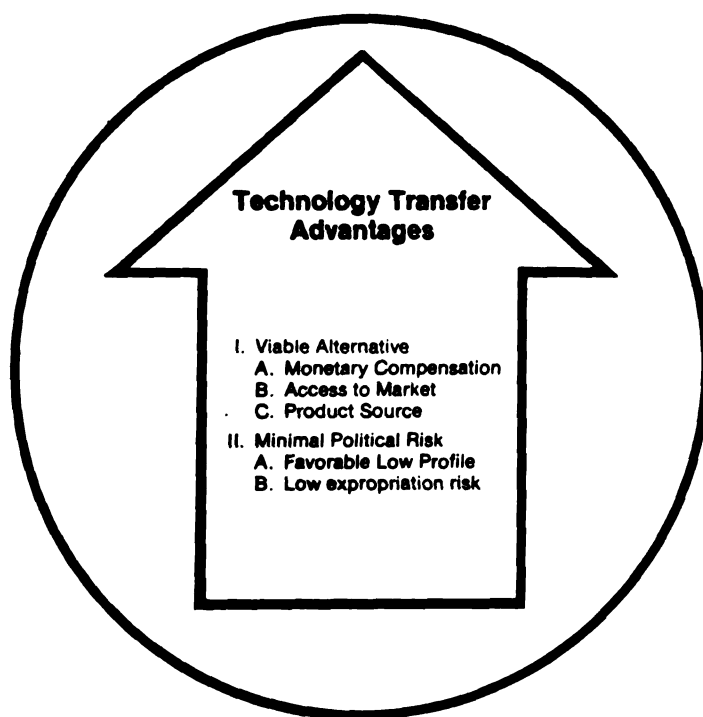
Assessment and improvement of technology transfer

One of the first studies which analyzed technology transfers including both technical and managerial knowledge was that published by J. S. Fforde in 1957. His inquiry was summarized as follows:³⁷

An inquiry into such British experience as might be found relevant to the solution of the following general problem: if the underdeveloped countries should consider they require an element of foreign managerial and technical services for use in the operation of industrial, etc., enterprises locally promoted or supported, how may they best acquire and use such services on terms that are adequate to attract them in the correct quality and quantity but are also consistent with local social and political requirements.

Fforde used the terms managerial and technical services to include possession of a technical, commercial, financial, legal, administrative or entrepreneurial bias. He distinguished four different routes in which this transfer

Figure I-2
The Technology Transfer



Technology Transfer Advantages

occurred: (1) the individual route; (2) the joint venture (not necessarily implying equity); (3) the product-specialized foreign investment (only an outside firm involved, no local partner); and (4) the trader-industrialist (more a byproduct of the bygone British era than a viable future route).

Of the four routes, the second and the fourth forms of transfer are ones which best reflect the type of non-equity transfer considered in this thesis.

It must be pointed out that while Fforde described technology transfers, the desirability of such transfers or even the use of such transfers as an acceptable approach, was another issue. Fforde noted that the situation of "local financial control (versus) foreign technical control" was more easily said than performed.³⁸ He reported that he had found this type of transfer utilized by MNCs where the local situation appeared too politically risky or where the market appeared initially lucrative but where little hope was held for future growth. He did describe some MNCs who had switched from desiring an equity involvement to seeking short-run involvements. In these instances, they sold their skill and expertise instead of their product in the more traditional sense.³⁹

Peter Gabriel, in the late 1960's, concentrated on the aspect of the management contract. This analysis

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differed from Fforde, who had included both managerial and technological skills with his study. The management contract, as defined by Gabriel, was an arrangement under which operational control of an enterprise (or of one phase of an enterprise) which would otherwise be exercised by the board of directors or managers elected or appointed by its owners is vested by contract in a separate enterprise which performs the necessary managerial functions in return for a fee.⁴⁰

Gabriel drew several distinguishing traits between such a contract and several other types of contractual arrangements; technical services agreements, license agreements, engineering and construction agreements, and contracts for exploitation of mineral resources.

His research involved a detailed study of four different situations which utilized management contracts, describing the means by which the contract was established, general terms, and the final evaluation based on the operation of the contract. His conclusion was that management contracts could make significant contributions to increasing the efficiency of public enterprises in less developed countries.⁴¹

The use of management contracts was also studied by British researcher Richard Ellison, who did an in-depth investigation of the management contract activities

of 16 large MNCs. He noted that, "for many companies, the management contract, together with licensing and technology agreements, appears to be the only way to maintain or build their interests in many parts of the world."⁴²

Furthermore, he found that while approximately half of the companies he studied used management contracts for 'defensive' reasons, particularly protection of an investment which had been expropriated by a local government, the other half used them 'aggressively' in actively looking for situations where they were able to sell their services. Ellison was able to draw out seven suggestions toward a more successful operation utilizing this approach. These were as follows:⁴³

1. A company must work hard at changing its traditional attitudes;
2. Rapid training of local nationals is essential;
3. Control must be shared;
4. Equity participation should usually be avoided;
5. Fees dependent on profits can be dangerous (better on sales volume);
6. Some internal organizational changes are needed;
7. If possible use a short and simple contract document.

Management contracts apply to a number of industries. One of the areas benefiting from the receipt of managerial expertise is that of mass merchandising. Clarence Mann, Assistant General Counsel for Sears, Roebuck and Company, provided an assessment of such

expertise at the Seminar on International Issues in Transfer of Technology held in Paris in 1977. Mann's assessment of such service technology transfers is that the benefits far exceeded just the immediate industry receiving the information, helping the entire country or region covered by the transfer.⁴⁴

Identification of technology transfer as a feasible possibility for companies elicited some studies toward improvement of such transfers. One of the few analyses to emerge, thus far, is that by H. J. Rath, who examined technology transfers between the U.S., Canada and the NATO nations. His recommendations for technology transfer included the following four points:⁴⁵

1. For optimum success of technology transfers, monetary payments are preferable to a production (counter-purchase) contract;
2. If counterpurchase is a prerequisite, the technology received should be listed in the agreement as the product sales vendor;
3. The technology receiver should be involved in the transfer from the beginning, in the planning stages;
4. The technology seller's personnel should act in an advisory capacity.

The heightened attention being directed to technology transfers should not be taken as a discovery of a new phenomenon. Technology, to some extent, has always been an underlying factor of license agreements. A relatively new aspect to appear within the past decade or two has been the extension of the amount of

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information provided as licensed technology when corporate involvement on other fronts, such as direct investment or joint ventures, was inversely decreasing.

It may be more accurate, actually, to discuss the expanded growth of the information transferred via licensing than to concentrate solely upon technology transfers. The greatest bulk of technology transfers occurs through licensing. The impact of these international transfers has transformed the Licensing Executives Society in NY, formed in 1964, into an international organization with chapters around the world.⁴⁶ The increasing use and importance of licensing was pointed out by a Business International publication, International Licensing: Opportunities and Challenges in Worldwide Technology Management which appeared in 1977.⁴⁷ In addition to material applying to typical licensing conditions in selected markets, this publication lists alternative licensing strategies in global business strategies.

Licensing expertise offered by Eugene Lang includes the following cautionary notes:⁴⁸

1. Don't give licensee unqualified access to new developments;
2. Don't assume that use of the trademark can be properly licensed without restrictions against production of inferior products;
3. Don't warrant the validity of patents which you license or blindly agree to attack alleged infringers;

4. Don't get involved with a licensee until you are absolutely certain he knows your particular line of business;
5. Don't set up license conditions that involve you in the management prerogatives of a licensee. Your job is to help, but not to make decisions for the licensee;
6. Don't give up all control over the manufacture and marketing of your product abroad;
7. Don't assume that the specifications used in your organization can be followed abroad;
8. Don't think that mere agreement between you and the other party completes the deal--government approval is often required;
9. Don't assume that a large royalty or a minimum royalty guarantee the licensee isn't economically sound;
10. Don't assume that your knowhow cannot be copied;
11. Don't think that, just because an agreement has been reached and blueprints transmitted, profits will roll in--follow through is essential;
12. Don't take anything for granted--ever.

Trade with Centrally Planned Economies

Identification of separate trading blocs

The centrally planned economies constitute a major potential market, with a combined population of more than 1.4 billion people.⁴⁹ The Department of Commerce (DOC) reports that by 1977, "U.S. trade (imports and exports) with the centrally planned economies (including Eastern Europe, the U.S.S.R., and the People's Republic of China) totaled \$3.8 billion, a dramatic

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increase from the pre-Detente 1971 level of only \$650 million."⁵⁰ The Department of Commerce also notes, however, that "while other industrialized nations of the Western world captured 25 percent of communist trade in 1977, the U.S. share was only 1.7 percent." Pointing out that the U.S. is responsible overall for 12 percent of world trade, the DOC notes that "there is apparently room for further U.S. penetration into the communist markets."⁵¹

This penetration did increase during the first nine months of 1979 as aggregate U.S. exports to the communist economies totalled 39.7 percent above 1978 totals for the same nine month period. As the U.S. imports from these countries rose 25 percent, a surplus balance of trade was achieved through U.S. exports to Eastern Europe, excluding the P.R.C. and the U.S.S.R. which rose 20.4 percent.⁵²

Trading relationships between the United States and the Soviet Bloc have shifted since the mid 1940's. Gradually broadening and deepening from the end of World War II until the mid 1970's, the height of detente appeared to culminate with the 1972 Trade Agreement between the U.S. and the U.S.S.R. This was the "first attempt by the U.S. to establish a general bilateral trade agreement with a communist country," as noted by Irene Lange and James Elliott.⁵³ They point out, however, that the Soviets never put the legislation into effect because the U.S. included aspects in its Trade Act of

1974 which were unacceptable to the Soviets, particularly Section 402 (Jackson-Vanik Amendment) linking Most Favored Nation trading status to the right of free emigration, and Section 613, which placed a limit on the aggregate amount of Exim-credits available to the Soviet Union.⁵⁴

One policy consideration which was becoming clearer during the mid-1970's was that the Socialist Bloc was no longer being viewed as just one unit. The U.S.S.R., Eastern Europe and the People's Republic of China were emerging as separate entities, and were being treated as such. The U.S.S.R. has not received the Most Favored Nation trade status from the United States, but Poland and Romania received this trading concession in 1974 and 1975, respectively, through GATT. One of the indications of the intention of the U.S. to encourage closer East-West economic connections was exemplified by the creation of the Bureau of East-West Trade within the U.S. Department of Commerce. This Bureau, established in 1972, was given dual functions: to "promote the orderly development of U.S. economic relationships with the centrally-planned economies of Eastern Europe and Asia and to continue the Department's responsibility for implementing and enforcing the nation's export control system."⁵⁵

Countries included under the heading Eastern Europe vary from source to source. The broadest

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interpretation appears to be a listing encompassing all members of the Council of Mutual Economic Assistance (CMEA, formerly known as Comecon); including Yugoslavia which has observer status. Another common selection included the U.S.S.R. but not Yugoslavia, and one of the narrowest listings refers just to Bulgaria, Czechoslovakia, German Democratic Republic, Hungary, Poland and Romania.

As of 1977, Eastern Europe, excluding the U.S.S.R. and Yugoslavia, was listed as having a population of 108.1 million. Poland had the largest population at 34.9 million, followed by Romania with 21.8, G.D.R. with 16.8, Czechoslovakia with 15.1, Hungary with 10.7, and Bulgaria with 8.8 million people.⁵⁶

Assessment of Western involvement in Eastern Europe

The broadening of political acceptance of the Socialist bloc in the early seventies brought on a spate of agreements which, in turn, helped to generate additional studies of such business. Some of the analyses were directed toward increasing such trade.⁵⁷ The Columbia Journal of World Business in December 1973, devoted the majority of its entire volume toward East-West Trade issues, including financing and marketing as well as political and economic assessments.⁵⁸

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However, within even a couple of years, the tone had shifted. One theme starting to be predominant involved disappointments when earlier expectations had apparently not materialized.⁵⁹ Another growing trend was the desire of the East to make inroads on trade with the West, as indicated by Nikolai Patolichev, Soviet Minister of Foreign Trade in 1976, and others.⁶⁰

A third theme continued a topic which had never completely died down from Cold War times--that of security measures. The question, "Is Selling Technology to the Soviet Dangerous?" was never fully answered.⁶¹ The danger alluded to stemmed primarily from the prospect of creating competition, but other dangers, to individual businessmen if not to the entire country, involved possible default and overborrowing.⁶²

Studies which concentrated on the market opportunity aspects of Eastern Europe apart from the Soviet Union came into prominence in the 1970's. In most instances, Eastern Europe was taken to include all countries who were members of the Council of Mutual Economic Assistance, usually excluding Yugoslavia which possessed only observer status in CMEA. Observations have not only been made by representatives of the West. Comparative observations of East Europeans regarding their impressions of MNC corporate officials on projects in Eastern Europe were also reported.⁶³

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Eastern Europe began to be identified as an area to be studied by itself or in connection with multinational corporations. One study, by G. Peter Lauter and Paul M. Dickie, laid the groundwork by pointing out the value of such analyses.⁶⁴

One of the earliest guides to business involvement with Eastern Europe was that published by Business International S.A. in 1972. Excluding both Yugoslavia and the U.S.S.R., this lengthy publication provided both summary overviews of each country within its definition of Eastern Europe and chapter-length discussions of types of involvement including 'organizing for East European operations,' 'developing a marketing strategy,' negotiating the contract,' and other topics, ending with 'Western controls on trade with the East.'⁶⁵

Manuals and monographs appeared by the late 1970's which offered guides and suggestions to aid executives in their negotiations and contracts with Eastern Europe. The Licensing Executives Society (U.S.A.) Inc. published a licensing guide to Eastern Europe (excluding the U.S.S.R.) in 1977. Edited by Edward P. White, the volume addressed itself to a country-by-country breakdown of issues affecting licensing in those countries.⁶⁶ In the same year, the Atlantic Council Committee on East-West Trade published a paperback designed to aid corporations in East-West trade.⁶⁷

An analysis, entitled "East-West Trade Organizational Structures and Problems," by G. Peter Lauter, was presented at the Third U.S.-Romanian Seminar on Trade and Economic Cooperation in Bucharest, 1978.⁶⁸ The major thrust of the paper analyzed organizational structures which have been utilized by MNCs in their dealings with Eastern Europe--in part to overcome the criticisms of inflexibility and to enable the units to adapt to conditions within Eastern Europe. Lauter's basic premise was that "the large American multinational corporations, with a few notable exceptions (such as Control Data), have no comprehensive long-term East-West strategies and that, consequently, they have not developed the organizational arrangements necessary to fully exploit the various market opportunities in socialist economies. The limited integration of overall corporate activities and the difficulties of coordinating sub-divisional level operations result in cumbersome information processing and slowed-down decision-making."⁶⁹

One case study was presented in Peter Lauter's paper on East-West Trade Organization although in a disguised manner. While designed to point out organizational difficulties, the case study did illustrate some other problems facing corporations operating in Eastern Europe. However, the study did not actually address

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the changes or adaptations which might occur over the course of such an agreement.⁷⁰

Observations on one company's experience were also published by one of the U.S. businessmen involved in an East European project. Thomas Fahey provided one of the few observations from the angle of the businessman in regard to non-equity transfers into Eastern Europe. His description concentrated on General Tire's involvement with Romania.⁷¹ His observations regarding General Tire's desire for such an involvement tended to emphasize the corporation's relatively smaller size, although accompanying factors were also apparent.

The Department of Commerce was also involved with documenting working conditions prevalent in Eastern Europe. It presented the results of a 51 company survey conducted in 1977 under the title, "Working Onsite in Eastern Europe and the Soviet Union."⁷² Other Department of Commerce materials published in the latter half of the 1970's included such booklets as "Joint Venture Agreements in Romania: Background for Implementation,"⁷³ and "East-West Trade Financing: An Introductory Guide."⁷⁴ Produced through the Domestic and International Business Administration out of the Bureau of East-West Trade, these materials reflected the growing body of knowledge which had been amassed by this time as aids intended to promote trade with the Soviet Bloc.

Certain aspects of MNC trade with Eastern Europe received more attention as circumstances warranted. For example, the countertrade issue has been explored in several monographs and articles originating with the Department of Commerce.⁷⁵ Diagrams of countertrade steps have illustrated the steps involved in such transactions.⁷⁶

It should not be interpreted that all materials have been produced solely by organizations outside the East European Bloc. One monograph produced in West Berlin, "Guide to Trade and Cooperation with Eastern Europe," provided both an overview of information and suggestions for offices in Berlin from which more information was able to be obtained.⁷⁷

Technology Flows Between the West and the East

Analysis of problems and opportunities

An assessment made of the role of Western technology upon the socialist bloc was done in 1976 by John P. Hardt and George D. Holliday. The impact was summed up in seven major points:⁷⁸

1. Western technology began to play a major role in the Soviet economy, starting with the eighth Five-Year plan (1966-1970), carrying on into the 9th and 10th respectively.

2. The selective policy of technology transfer and absorption appeared to have had a significant aggregative effect on Soviet industrial production, far in excess of the modest value of imported machinery.
3. The effective transfer of technology was mainly in broader systems transfer, involving not only machinery and plants but also training, management and foreign expertise or knowhow.
4. The effective Western technology transfer, demanding domestic investment and adoption of Western systems threatened to change the traditional role of the military and the party.
5. The rate of technology importation appeared limited by the Soviet ability to finance trade in hard currency.
6. Western technology was more critical to the economic modernization and consumer improvement plans of Eastern Europe. These countries are more flexible in their acceptance of Western commercial norms, but even more constrained by balance of payment difficulties.
7. The People's Republic of China could engage in extended East-West commercial relations.

Another survey published in 1976 presented opinions of businessmen actively engaged in technology transfers to the Soviet Union, it was highly optimistic of technology exchanges between the U.S. and the U.S.S.R. The six selected conclusions of the study are as follows:⁷⁹

1. U.S. executives with cooperation agreements with the U.S.S.R. generally evaluated most aspects of the Soviet civilian system for generating new technology more favorably than those without such agreements;
2. The level of a company's technology did not appear to be an important factor contributing to the perception of Soviet technology;

1. The first step is to identify the problem or goal. This involves understanding the current situation and what needs to be achieved.

3. Many of the businessmen involved with the USSR appeared to be well read and knowledgeable about the Soviet Union in general, and highly literate about the areas of Soviet industry which directly related to their own business area;
4. The most well-read and best-informed businessmen seemed to have a reasonably high opinion of Soviet technology, with optimistic projections for valuable technology exchanges;
5. Many of the American businessmen interviewed anticipated a minimum of risk regarding future Soviet future competition;
6. Most of the businessmen interviewed saw arguments against U.S.-U.S.S.R. trade as reflective of positions against international trade in general, not particularly against trade with communist nations in particular.

Not all studies involving technology looked at the flow from the U.S. to the socialist bloc. One study, in 1977, considered the potential for technology transfer from the Soviet Union to the United States.⁸⁰ Surprisingly, the number of Soviet licenses as listed in the report was 26, twice as many as licenses purchased from the United States (13), and a contradiction to those who were unaware of this reverse. However, Kizer points out several factors which reduce the discrepancy to approximately 22 to 13. Furthermore, since the price paid for U.S. licenses is established to be ten times greater than the price paid for U.S.S.R. licenses, the total number of licenses is misleading as to the size and magnitude of the trade. Kizer's personal reaction was that the "Soviet performance of selling technology

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abroad parallels their performance internally. That is, the reasons for a poor showing on the international market are related less to the availability of useful technology to sell and more to their (inadequate) system of incentives (poor), organizational structure, and scarcity of qualified (inclined toward a 'selling' orientation) personnel for carrying out the job.⁸¹ This does not reflect unfavorably on the U.S.S.R.'s technology per se but does present some of the barriers which might reduce a reverse technology flow.

One approach supporting trade with the Soviet Union is that taken by Robert Schmidt which presents the position that through trade with the U.S., the U.S.S.R. will alter the nature of their society, enhancing the chance for more freedom and compatibility with U.S. society. Schmidt sees economic survival for the U.S. based on its ability to trade, and points out that the U.S. has products and technology as its trading resources, but without exchange, these resources will stagnate.⁸²

Interestingly, another analysis made on the impact of imported technology upon the Soviet Union in regard to motor vehicle sector derived the following conclusion: "it is apparent that Soviet leaders are strenuously urging domestic industry to benefit from imported foreign technology. While significant diffusion undoubtedly has occurred, there are signs of Soviet

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dissatisfaction over the rate and extent of diffusion. Soviet industry in general has not been "transformed" through infusion of Western technology and there is little sign that industry will be revolutionized in the near future."⁸³

One problem impacting on U.S. trade to the Socialist Bloc concerns export restrictions. Bureaucratic delays result from a case-by-case analysis of each product, and at least one author feels that the U.S. needs a coherent national policy of technology transfer based on three objectives:⁸⁴

1. Improved control over militarily significant technologies;
2. Minimized impact of the controls on commercial trade;
3. Encouraged development of new technologies.

An accompanying problem related to export controls, writes another researcher, William Norris, is that there is a lack of positive initiative. Export control guidelines are based largely on U.S. assessment of communist technology.⁸⁵

The opinion, at least in some areas, is that the U.S. will, in the future, continue to be the world's technological leader and that the real threat lies in the quantity, not the quality of the Soviet weapons and in Soviet willingness to use them rationally.⁸⁶ A study back in 1978 by the Brookings Institute concluded that

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no military, political or economic reasons existed for denying exports of sophisticated data processing equipment and technology to countries in the Eastern Bloc.⁸⁷ The rationale behind this position was that the computer technological levels of the U.S. and the communist countries were perceived as being relatively equal. Furthermore, such technological exports were not viewed as substantially crucial to labor intensive economies.

Many military technologies also serve important peaceful purposes, with uncertainty existing as to the end uses of certain technologies.⁸⁸ The other side of the coin, however, is that products with civilian uses also have military significance. Despite projections that the U.S. and the U.S.S.R. hold fairly equal computer technology, at least once source supported the curtailment of the Control Data computer sale to the U.S.S.R. This was because the computer was seen as possessing at least 40 times more computer capability than held at that point by the U.S.S.R., with accompanying question as to the ultimate use which would be made by the U.S.S.R.⁸⁹

The value of export controls might be basically questioned. The spread of critical technology may be only retarded, not stopped, by such restrictions as this technology is able to reach the communist countries

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through nations friendly with both the Western and Eastern spheres.⁹⁰

Assessment of the security issue from a chronological perspective was provided by Samuel P. Huntington in the article "Trade, Technology, and Leverage: Economic Diplomacy," which appeared in 1978.⁹¹ According to Huntington, economic relations between the U.S. and the Soviet bloc were at their lowest during the Cold War of the 1950's, as exemplified by the creation of the Coordinating Committee on Export Controls (COCOM). The pendulum swung the other way, however, with an opposite position appearing in the early 1970's. This was presented with the argument that "American economic dealings with the Soviet Union should, so far as possible, resemble those with any other society."⁹² Regardless of political consequences, Huntington noted that the results of this detente have benefited the Soviet Union more than the United States or the West in general, but he points out that the Soviets are also now facing other problems resulting from this advanced economic development.⁹³

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Studies of technology transfer to Eastern Europe

Many of the analyses and studies which have looked at U.S. business involvement in Eastern Europe have included technology transfers in one form or another. Only three studies, however, have specifically addressed the issue of technology transfer to Eastern Europe. One was the approach taken by Eric W. Hayden.

Hayden's study in the mid-1970's chronicled a number of non-equity transfers between U.S.-based MNCs and countries in Eastern Europe. Because of the restrictions against equity involvement for most countries in this region, few of the connections involved equity. He included the aspect of the management contract as a part of the whole area of technology transfer. Technology was "the quantum of knowledge by which such inputs as patent rights, scientific principles and R & D are translated into production of marketable materials, components, and end products. This quantum comprised two parts: the engineering documentation and the manufacturing techniques, with the latter being the human implementation of the written instructions contained in the former."⁹⁴

Hayden's objective was to describe the types of technology transfers being supplied to Eastern Europe by U.S.-based multinationals. His concern was essentially

to provide a framework of categories of such transfers; and to sort out, as far as possible, characteristics including advantages and disadvantages with the transfer vehicles. The intention was to capture as full a description as possible up to one point in time. His particular analysis detailed the type of arrangements made by these firms noting that there were three stages of involvement in the non-traditional area: (1) technical assistance; (2) technical assistance plus trademark rights; (3) technical assistance, trademark rights, and repurchase commitments.⁹⁵

The second major study was a massive one conducted prior to 1976 under contract from the Department of Commerce through the Bureau of East-West Trade. Much of the data was collected by Paul Marer and Joseph C. Miller, through the International Business Research Institute of the School of Business, Indiana University, with many of the corporate interviews conducted by John B. Holt. Unfortunately, this comprehensive report, East-West Industrial Cooperation: The U.S. Perspective, remains as yet unpublished by the Department of Commerce, but Marer and Miller provided a summary of some of the findings in their articles in the Journal of International Business Studies in 1977.⁹⁶ Their study involved all CMEA countries (excluding Yugoslavia) and encompassed industrial cooperation agreements (IDCs) including those

of an equity nature as permitted by Romania and Hungary. Their initial mail questionnaire was sent to 1068 corporations with some type of involvement, with followup interviews conducted either in person or by telephone. Marer and Miller used an eight category descriptive listing to distinguish types of IDCs: scientific-technical agreements; knowhow; licensing; turnkey; subcontracting; co-production; joint ventures; and reverse licensing (where the U.S. firm is importing a license). The scientific-technical agreements were not actual contractual projects, but areas of exploration which were hopefully to lead to a project.⁹⁷

The third study, published by Business International S.A. in November 1977, was titled "Corporate Strategy, Planning, Organization and Personnel Practices for Eastern Europe."⁹⁸ The report included the U.S.S.R. as well as Yugoslavia and considered corporations from Western Europe, North America and Japan. The study was unique in that it "represented the first attempt to systematically investigate the experience of a large number of Western companies in a variety of industries which had been active in Eastern Europe for many years." The group researchers in charge of the project expressed surprise in regard to their study of corporate policies. The objectives of Business International (BI) were to describe what had been assumed were the well-defined sets of strategies

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and tactics held by the corporations involved in Eastern European regions. It became apparent to the researchers, however, that such strategies had not been formulated by these corporations but adopted ad hoc. BI therefore provided descriptions of the involvement without a statement as to corporate policy. One concern cutting into the value of the study was that "in view of the need to maintain good relations with their Eastern European business partners, many companies were reluctant to discuss in depth the many problems they continually face and how they overcome them."⁹⁹

Framework for Assessment of Technology Transfer to Eastern Europe

Identification of crucial issues

Technology transfer has been found to be a workable global linkage for multinational corporations. The major criticisms against such transfers appear to fall into four categories: exportation of jobs, creation of competition, threats to national security, and maintenance of control. Criteria weighed in the selection of a technology transfer over other linkages include monetary compensation to be gained, access to an otherwise relatively inaccessible market(s), the possibility of establishing a non-equity product production source and the

minimization of political risk especially regarding expropriation.

The exportation of jobs is an issue which is dependent upon the situation. Eastern Europe, with the exception of a few instances in Romania, Hungary, and Yugoslavia, does not permit joint ventures of an equity nature with firms based in capitalistic-centered economies. Those joint ventures which are permitted in those countries are thoroughly scrutinized. The shortage of hard currency throughout Eastern Europe makes exporting to that area a virtual impossibility without alternative financing measures. Thus, technology transfer, particularly with buy-back or countertrade measures, is often one of the only means available for entering the East European market. In such instances, job exportation is a mute issue, for alternative sales are not feasible.

National security issues, particularly the use of American technology to gain military superiority is a chief consideration in regard to dealings with communistically controlled economies. However, the decision as to what technology may or may not be transferred is not as much an issue for the individual corporation as for the government agencies responsible for ruling on such exports.

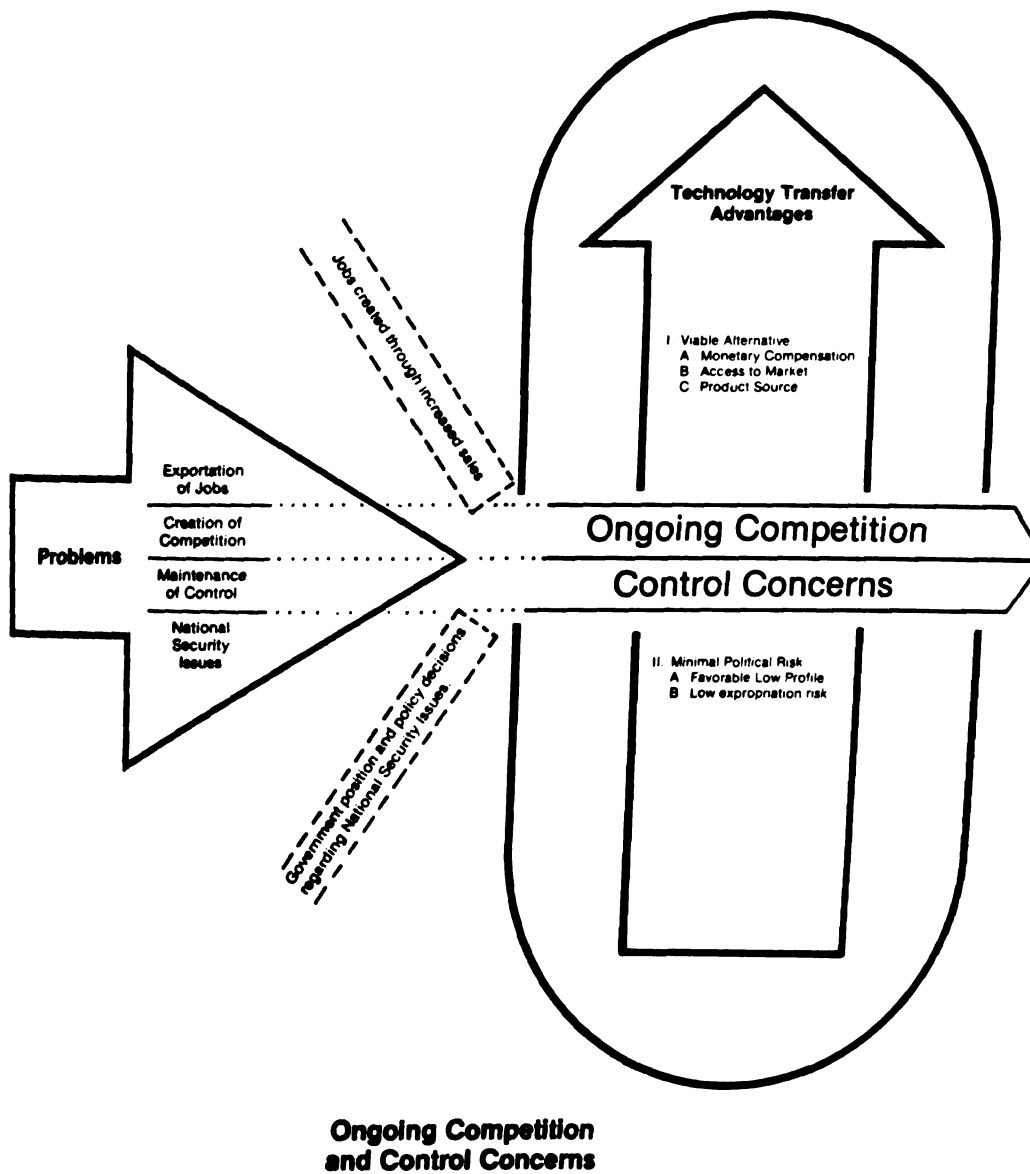
Thus, the decision facing the multinational corporation centers around the two remaining issues:

that of the creation of competition and that of the maintenance of control. Competition is more or less a consideration on the future. Firms setting out to transfer a certain body of techniques, information, knowhow and processes face the possibility that, in direct proportion to the success with which they are able to complete such a transfer, they create a competitor with powers potentially equal to their own, at least as of a certain point in time.

The control issue is also vital. Without equity, either on a majority or even minority basis, the corporation must find its leverage in other areas. Since the corporation's strongest position is at the start, or even in the negotiating stage prior to the agreement, the maintenance of control throughout the transfer is an issue, if not a requirement, during the entire operation of the agreement. See Figure I-3.

One advantage of technology transfer is the option of increased trade when other forms of access are impossible or undesirable. Technology transfer offers the MNC a viable additional source of components or completed products as well as access to additional knowledge through contact with other firms and individuals. Furthermore, it does so with a minimum of political risk, in comparison to direct investment alternatives.

Figure I-3
The Technology Transfer



Expectations versus outcomes of technology
transfer to Eastern Europe

The research which has been done on non-equity transfers has dealt on descriptions of the transfer, often as related to a certain aspect. Suggestions for successful non-equity transfers have been included in some of the studies, drawn from the researcher's observations but have not been the primary focus of the research. The only case which examined the expectations versus the actual outcomes was that done by Gabriel, but this dealt specifically with the management contract approach, not with the spectrum of possible transfers.

Researchers have provided descriptive studies of particular aspects which have been analyzed. These descriptions, in many cases, included areas where difficulties were encountered; but few studies have looked at expectations versus outcomes for non-equity transfers, examining certain actual transfers, over a period of time. The possible use of such non-equity technology transfers warrants such a study: improving such technology sales reinforces this need. The scarcity of research in the area of non-equity transfers, combined with the lack of experience on the part of most MNCs in this area, provides a need for the collection of as much experience and predictive analyses as possible.

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The following study concentrates on an assessment of eight separate technology transfer arrangements to selected countries in Eastern Europe, with the intention of examining the techniques used by the MNCs involved in those transfers. The intention is to identify factors which will help to insure the success of technology transfers. The creation of competition by the conclusion of the venture and the maintenance of negotiating leverage or control over the transfer throughout the time period of the agreement are elements which will be included in the analysis. The expectations which existed at the start of the transfer may be subject to variation, but will be compared to the outcomes at the agreement's conclusion. Observations and results which provide recommendations for future technology transfers will be of benefit to MNCs desiring to utilize this global linkage.

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FOOTNOTES--CHAPTER I

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CHAPTER II

METHODOLOGY

Objectives of the Research

An increasing number of corporations are seeking access to global markets. There is an increased need for skill in alternative forms of marketing. Knowledge which helps to develop these skills is in demand. One objective of this research is to explore the technology transfer approach when the agreement is not accompanied by any equity involvement on the part of the transferring agent; when the intention is to present the viability of this type of technology transfer.

A second objective is to identify procedures or processes which may enable firms to accomplish such technology transfers more efficiently. Aspects which may be identified as potential problem areas so that these may be avoided or revised are to be noted. Thus, analysis of selected cases should reveal those considerations that may improve the process of non-equity technology transfer in the future.

Significance of Study

A commitment to the non-equity technology transfer approach involves a shift for most companies from that of producing a product to that of training and supervising others to produce that product. This shift carries benefits, but also some disadvantages. It utilizes MNC technology in many cases, but it also deprives the MNC of certain employees, at least for the period of time during which the transfer training is taking place. In many cases, additional staff are needed so that the MNC's other production is not curtailed while the transfer is being carried out. Thus a future commitment to additional transfers is often made so as to utilize this additional staff.

To choose not to become involved with technology transfer is not a simple decision either. Potential markets may be avoided or overlooked by an MNC. This could be a deprivation and may not only affect the MNC but also potential host countries.

Definitions of success of such transfers vary with the project. If some expectations are met, then at least an initial confidence in the operation, and acceptability of the technique, is usually established. Exceeding expectations should only provide support for the non-equity form of transfer, and more confidence in entering into similar future linkages. If the outcomes

fall far short of the expectations, the cost could be high, depending upon the commitments which have been made. The risks which some MNCs face in the non-equity transfers of technology and/or management, are in the realm of corporate reputation, growth, and policy, as well as in the time and man hours involved. This may not be as visible as financial loss in an equity investment but may easily be equivalent or even a greater detriment.

Definitions

A non-equity transfer arrangement is one which, for the purposes of this study, does not require an equity involvement initially, or in the future. The time period is established contractually, and is of a specific duration. The technology involved, in most cases, goes beyond the information or services usually provided in customary licensing agreements.

Technology transfer is an area subject to some confusion. For the purposes of this study, technology transfer will be defined as the transfer of hardware, such as factories, machines, products and infrastructures (roads, laboratories, water distribution systems, storage facilities, etc.). It includes the transfer of software, including such non-material ingredients as knowledge, knowhow, experience, education and organizational forms. Key knowhow, such as the capacity to manage and apply techniques, is also included.¹

It should be emphasized, however, that knowhow may be even one step further removed, as pointed out by the American Economic Association which has noted that technology "includes both specific knowledge about physical production embodied for example in machines, designs, formulas, etc. and also more general knowhows such as organizational procedures concerning coordination in production, procurement, marketing and research and development."² These definitions allow for many variations of non-traditional transfers. To avoid confusion, the types of involvements to be considered in this study are listed below. It is expected that most of the situations studied would encompass several of these involvements in the course of the project, as none of these are to be viewed as mutually exclusive.

1. Turnkey--just the construction and equipping of a factory, plant, or place of operation, although sometimes this term refers to the staffing and operation of a project. The accompanying services required to operate the plant once the initial switch is turned on or the plant put into operation will be considered separately.
2. Product technology--the product information which is necessary to create the product. However, it does not include the information which is necessary to construct or assemble the product.
3. Process technology--the information which details the assembly or construction of the product, often referred to as knowhow. Another element which may be applicable here would be adapting the manufacturing methods to a revised version of the product.

4. Management (running plant)--this category comprises the initial startup (including planning and proposal development) as well as operational aspects once the plant is functioning. It would include staffing, but not the training of locals or in-country nationals. It would also include analysis of the operation, such as consideration of environmental support or other related issues.
5. Management (training)--all training aspects, particularly in operations which are expected to become totally localized within a certain time period. The training may be entirely within the host country, or may include training at other locations, including the MNC's headquarters.
6. Patent rights--patent rights are often included as part of the product technology, but it is possible to supply one without the other. In some instances, the patent rights are filed long before the transfers occur.
7. Trademark rights--the right to the firm's logo as well as its technology, at least for a certain period of time. It would be particularly important where payment for the services provided was to be supplied via the repurchase or buyback arrangement. However, it would also be especially desirable in cases where the trademark would increase the demand for the product in that area. An accompanying factor with the trademark rights would be inspection tours to insure and maintain product quality.

Methodology

Description of study

This study will look only at accepted agreements, but will consider the negotiation process used to arrive at those agreements. Certain elements change after a

contract is signed and accepted and these will be detailed.

Outcomes of projects vary from the initial expectations in different ways. This study will help to identify those factors which vary between the anticipated results and the final outcome with the intention of overcoming those variations in future transactions. Identification of the accompanying reasons for these discrepancies should help future transfers.

This study will concentrate on a comparison of the expectations and outcomes of selected technology transfers. This will be accomplished by a description of the actual outcomes of non-equity transfers of technology and/or management skills in the final form as the project concluded, or at a certain stage if the project is still in process. These outcomes will be compared to the anticipated results projected at the start of the agreements. Examination will be made of transfers of technology and/or management skills in the East European bloc with its socialistic political systems. This region was selected for two reasons. First, the political systems in most of these countries prohibit joint ventures involving an infusion of equity from the company based in the capitalist sphere. Hence, non-equity agreements are more common in this region. Second, prior studies, particularly the research conducted

by Eric Hayden, have laid a groundwork by describing some of the expectations which did exist at one point in time. Building upon this base offers more opportunity for an indepth study than would be the case if other transfer examples were selected.

This research examines the non-equity transfers by looking at the aspects prevalent in the selected agreements. Information will be collected from MNCs with current or prior experience with the non-equity transfer mode. Much of the information will be obtained through personal interviews. The firms cooperating on this research, having non-equity transactions in one or more East European countries, will be listed in Appendix A in detail; they include the following:

Clark Equipment Company--Bumar Foreign Trade Enterprise (Poland) and Universal Tractor Foreign Trade Company (Romania); International Harvester Company--Bumar Foreign Trade Enterprise (Poland) and Hungarian Railway Carriage and Machine Works (Hungary); Honeywell, Inc.--Metronex/Mera (Poland); Westinghouse Electric Corporation (semiconductor division)--Unitra Electronic Industry Union (Poland); General Tire International Company--Romania State Enterprise of Foreign Trade (Romania; The Bendix Corporation--Varazeinski Tekstini Komdinat (Yugoslavia).

Initial interviews with several corporations indicated that in some cases several corporate officers would need to be contacted in regard to a project. These decision-makers were usually at the vice-presidency level, but day-to-day handling of most of the transfer projects was done on the managerial or program coordinator level. The supporting information obtainable from these employees, particularly managers involved with the projects, would contribute to the examples described in this report.

The information obtained through personal interviews will be structured along the format of the actual outcomes (or the situation in progress) compared to the expectations which were said to exist prior to the start of the transfer situation. The questionnaire followed during the personal interviews including the 'actual versus anticipated' results format will be included in Appendix B.

Expectations and outcomes--major approach

The objectives are to investigate technology transfers and to describe such non-equity technology transfer agreements with the intention of pinpointing potential problem areas. To accomplish these objectives, the approach of this research will be to examine certain

such agreements over a period of time, documenting the expectations and outcomes of the corporations engaging in these technology transfers. A comparison of corporate expectations with the eventual outcomes should define those areas where variations occurred. An analysis of the factors causing these variations should provide some guidelines for such future technology transfers.

Selection of cases

The selection of East European countries considered in this study, and the further choice of corporate projects within those countries, was made with several reasons in mind. As stated earlier, the study has been designed to complement the earlier research of Hayden as far as possible. This was done primarily to take advantage of the data on the agreements which had been already collected and analyzed. Furthermore, much of the data represented opinions and expectations at a point in time near the start of many of those agreements, thus providing a secondary indication of corporate anticipations in many areas at the start of the projects. The companies selected for this study are those drawn from among those considered by Hayden who agreed to participate in this research and were willing to share their observations regarding the outcomes of

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those projects. This referred to outcomes either at the conclusion of the project, or, for those still in operation, at a certain point in time substantially after the startup point.

Yugoslavia, and the arrangement between Yugoslavia and The Bendix Company, represents a significant point of departure from the above rationale. This agreement was sought out for two reasons. First, Yugoslavia was included in this study because, like Romania, the country does permit some equity ventures to be established. Thus, this agreement provides a similar background in the direct investment sense to the study of Romania. Second, since Bendix had been in the process of establishing a major non-equity venture with the Soviet Union, the company's actions indicated an acceptance of the non-equity format and a desire to establish contacts within the Soviet Bloc. Since the contract with the Soviet Union had been 'postponed indefinitely' just prior to this study of their Yugoslavian operation, the company's assessment of the non-equity approach promised to be interesting.

Research areas

The study is comprised of two basic research areas:

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A. Descriptive Factors

B. Analytical Factors

The descriptive factors relate to highlighting aspects of the respective transfer projects and, as the term implies, are descriptive in nature. As such, they are essential to understanding the total scope of such non-equity agreements. The analytical factors are designated as those elements which emerge in the analysis of the selected transfers and are seen to have a major impact upon the project in the attainment of corporate expectations.

The following factors have evolved as descriptive of such agreements.

A. Descriptive factors

1. Direct transfer
2. Indirect transfer
3. Environmental factors
4. Political factors
5. Financial factors
6. Leverage
7. Contract format
8. Expected events which did not occur
9. Unexpected occurrences
10. Anticipated benefits to the corporation

A discussion of each of these descriptive factors follows, based on information obtained through the literature review and some preliminary interviews with the corporations.

Direct transfer of technology. This aspect may be the most obvious as it relates to the actual transfer

itself. Drawing from definition of technology transfer, this category encompasses all information involved in the transfer--be such information as that found on blueprints or as intangible as human experience and knowhow.

Hayden noted some of the adverse factors which the MNC's involved in the transfers expected prior to the undertaking. These included awkward extant designs, poor production techniques, low quality control standards, and very low worker morale and initiative.³ However, he pointed out that expectation of such conditions does not always include an accurate preconception as to the extent of the condition.

Several of the above points allude to worker skills and training tasks, another part of the direct technology transfer. Language proficiency especially on the part of the workers to receive certain training is also a factor. Without adequate communication of training skills, the mastery of processes and techniques would be affected.

Harvey Wallender, in his paper, "Managing and Evaluating Technology transfer in Manufacturing Industries," brought out a prime aspect which differs between expectations and outcomes--technology was often transferred as a bulk process when it should be done in stages, over a period of time, with different approaches being used at each stage.⁴

Some problem areas detailed by Fforde were in the marketing/administration area and production area, respectively. Fforde found expectations in the marketing/administrative area often in error as to the market demand or potential, or as to the competency of the local staff (often hired by the host party). This latter aspect tended to heighten the divergence in the third area, production, when it was below or behind expectations. This was often determined to be due to training difficulties, socio-cultural shifts, or technological aspects on the job.

Fforde did not hold the lack of staffing competency solely to be the fault of the host party, however, as he noted that often many capable employees did not want certain overseas assignments. As these individuals often possessed enough clout to turn down overseas assignments, less-competent individuals were permitted to assume the posts.⁵

A brief telephone interview with Honeywell, International, seconded an aspect of expectations first noted by Fforde--that of the lack of skill or appropriate background of local workers. A precautionary dimension was added as Honeywell stated that it attempted to select a level of technology appropriate to the ability of the host party. Inappropriate selection, however, would cause problems as to the transfer.

Thus, a comprehensive description of the immediate aspects of a technology transfer would include detailing the products and processes of the technology, the skills and training tasks required of both the trainers and trainees, an assessment of a common language area, consideration of delays which are directly related to the production areas, and other technologically-related factors.

Indirect transfer of technology. This category is connected to the above description, but remains one step removed from the specific technology by considering the supporting needs which are required in the transfer. Certain transfers described by Hayden, Fforde and others alluded to the equipment purchased from the transferring company, or the plant construction and layout designed by the company selling the technology but implemented by the purchasing party.

Another aspect here involved the acquisition of raw materials, as part of the justification for the on-site manufacturing of the acquired products would imply the use of local raw materials. In such instances, any services rendered by the transferring company along the lines of raw material procurement, or quality testing would impact upon the technology transfer.

Therefore, the indirect transfer of technology issues include the construction, equipping and layout of

any and all plants or factories to be used in connection with the purchased technology, raw materials acquisition and approvals, and other supportive capabilities.

Environmental considerations. This category considers the surroundings in which the transfer will occur. For the most part, this relates to the host country or territory but might also include the home base of the transferring agent.

In the strictest connotation of the term, the environment refers to the geographic area, with its accompanying climatic or other factors. In a broader sense, however, the environment relates to the socio-cultural milieu within which the technology transfer would occur. Hayden's description of low morale or worker apathy might easily fall into this realm.

Since the transfers to be considered involve Eastern Europe, security issues are also a factor to be looked at in the description of the transfer. Restrictions placed upon the seller of technology in regard to application of the technology, or even in the implementation of the technology could affect the efficiency as well as the overall outcome of such a transfer.

The larger technology transfers, especially those where construction or lengthy stays within the country were required, would also have an interface with the transportation systems of the country. Those

companies who agreed to have relatively lengthy in-country stays for their executives and representatives would also be concerned about the accommodations available for their employees. In the preliminary interview, Clark had noted that plans for MNC staff accommodations abroad should include appropriate housing conditions for family members, and that differences of 'appropriate' might occur.

The category of environmental considerations, therefore, includes the geographic factors, but also the socio-cultural interfaces, security issues, logistics, and accommodation factors which comprise the surroundings within which the transfer is to occur.

Political arena. The security issue was included with the environmental considerations, but this separate category considers more of the major political interfaces which might occur particularly when the technology transfer is taking place between entities based or representing differing political ideologies.

Certain technologies are controlled by the U.S. government and are not permitted to be sold to all countries, particularly those connected to the socialist bloc. Thus, one issue here would be the home governmental approval and permissions required to effect such technology transfers to Eastern Europe.

On the other side, governments in Eastern Europe may have equal if not similar objections to trade with companies based in a capitalist political sphere. The restriction against equity-involved joint ventures in many of the East European countries is one indication of such restrictive policies.

Labor union objections, in general, to the idea of job export might also be viewed as a particular type of political issue as some of those union concerns might be exemplified by legislation. Therefore, this aspect of technology transfer should be examined, if only for its impact on the transfer or future transfers.

The political arena category covers both home and host parties, and respective governmental issues, as well as home labor unions and possible objections to the export of jobs or other aspects of trade with socialist bloc nations.

Financial flows. Regardless of the rationales taken by the corporations in their individual justifications for accepting the technology transfer arrangements, certain financial flows were assumed to be integral to the success of the projects. Therefore, this category is designed to examine the approaches taken to payment in each transfer.

The most applicable aspect here would be the payment arrangements laid out by the corporations, with

the accompanying payment schedules. Supplementing these payments would be the additional purchases made by the host company or country, either of total units (potential substitutes for the technology purchased until local production was in operation) or sub-assemblies (to aid production and help with training) or otherwise, such as raw materials.

Incidental expenses encountered by both parties would be another issue. This could refer to additional expenses encountered in regard to equipment purchases or construction aspects, especially if these areas were part of the transferring agent's responsibility, to expenses connected to housing or transportation, or other areas.

Since the multinational corporations, in each instance, are selling their technology for a certain price, payment for this technology is a crucial aspect of each of these transfer arrangements. The category of financial flows looks at these flows as to the payment schedule commitments, supplemental purchases, especially in the area of products prior to the on-stream local production, and incidental expenses.

Leverage and control. This category grows out of the consideration that a sale of technology without an accompanying equity involvement might place the seller in an uncomfortable position if the information

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had been provided, but the payment had not been made. Whether an equity basis, particularly that of the minority partner does indeed provide adequate leverage might be debated, but the lack of any such involvement requires the seller of the technology to gain control of integral portions of the operation in other ways. Negotiating leverage should be relatively high for the seller at first, especially if the technology has been sought out by the host company or country, but perpetuating this leverage-type of position would appear to require additional effort. Examination of this category leads directly into the next one--that of contract format, designed to enhance or at least preserve a firm's leverage.

Ellison appeared to feel that acceptance of the non-equity transfer arrangement carried over into the control issue, where the MNCs who supported the non-traditional approach by choice (as contrasted to those involved in expropriations) also cooperated in the area of shared control more easily.⁶

Several MNCs had an equity participation in Ellison's study. He had found this aspect to be detrimental to decision-making, an opinion contrary to most traditional thought in this regard. Ellison noted that fees were often unsatisfactory as to expected profits and that there appeared to be a lack of guidelines for the establishment of fees in general.⁷

The aspect of control varied from company to company. Some firms felt that leverage or control, in the shape of a 'missing technological link' for the product, was vital. This referred to holding back a portion of the information until other commitments had been completed. Others noted that a firm's marketing expertise for the completed products was enough to act as a control mechanism. Still others noted that just the desire for a continued association, including updated technology and additional contracts of the non-traditional transfer form, provided enough leverage to make the relationship successful.

Contract format. Another area which appeared to cause difficulty was the type of contract drawn up for the agreement. The preference of Ellison was a shorter, simpler document since he felt the lengthier one inevitably excluded some item.

Ellison urged the training of nationals to be as rapid as possible. He pointed out that countries often saw this training as the most important benefit of the transfer, while MNCs viewed production of the product as their chief aim.⁸

Cordell Hull, vice president of Bechtel, International, offered suggestions in regard to agreements centering on the Middle East, but his suggestions would appear to apply to most areas. The aspects where

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he found difficulties arising as to expectations included:⁹

- (1) the time estimated to accomplish transactions (3-4 times longer);
- (2) little to no recourse to laws outside the limits of the contract itself;
- (3) multiple language usage necessity in creation of agreements (checked for accurate translation);
- (4) cost-plus-fee contracts difficult compared to fixed price contracts;
- (5) establishment of multiple currency components, with an established rate of exchange, so monetary fluxuations would be partially reduced;
- (6) insurance which took longer to obtain and cost more than expected;
- (7) unexpectancies which suggested placing a Force Majeure clause in the contract;
- (8) a thorough review of the arbitration, suspension and termination clauses in the contract;
- (9) realization that guarantees may not be secure or forthcoming;
- (10) inclusion of a detailed description of all performances expected by both parties, since this is an area which could be easily misinterpreted.

Hull's listing covers many areas where expectations did not keep pace with outcomes, but he provided suggestions to sharpen an awareness of those discrepancies. However, it does appear difficult to satisfactorily include all the details recommended by Hull in the short, simple contract form suggested by Ellison in his research.

Gabriel, who had found general expectations matching the outcomes in all four of his situations (actually exceeding in certain aspects in two examples), noted certain aspects which ought to be recognized before entering into such agreements. These included:¹⁰

- (1) risks involved in starting such technology transfers includes the number of employees since the additional staffing requirements provide at least a partial obligation toward similar commitments in the future;
- (2) agreements with governmental concerns carry problems which private firm contracts do not usually have, and thus, such agreements should be carefully scrutinized on this basis;
- (3) the most powerful position of the MNC is at the start of the undertaking, or during the negotiations, hence, any desired changes are best enacted at these times, not afterwards.

Corporate experiences amplified the above observations. Clark reported instances in bargaining where signed contracts were not accepted as an accomplished fact. They stressed the point that some nations might be reluctant to follow the contract exactly.

Bendix cited an initial hesitancy in regard to concluding negotiations since the 'assumed-concluded' agreement to establish a spark plug plant in the U.S.S.R. had just been postponed indefinitely. The firm also noted that countries often try to establish contracts in such a way that the MNC is responsible for all unexpected occurrences. Officials noted that one

should avoid contracts worded in such a way which stated that if the MNC's end of the agreement had not been fully completed within the specified time period, the financial payments owed by the host country would never be completely forthcoming.

International Harvester noted the distinction between the honor placed on a contract in the socialist countries in comparison to some other countries. "You may negotiate long and hard to obtain a contract in the socialist state, but once it is signed, it is honored. In other countries, this is not always so."

Expectations which did not materialize. In these technology transfers, most of the essential points of the transfers would appear to be fairly clear-cut: the technology involved, the amount and timing of the payments, the time frame of the agreement. However, it would seem that certain expectations might exist which would not be fulfilled. Hayden lists certain problems which he describes as exceeding the specific expectations of the parties involved, although these were not seen as insurmountable. His listing included:¹¹

- (1) U.S. governmental approval delays
- (2) equipment delivery problems
- (3) worker apathy
- (4) lack of worker technical skill
- (5) consumption of more corporate time and energy than expected.

Among the factors identified by earlier studies of technology transfers were those pointed out by Fforde. He had found three general areas where expectations often fell below actual outcomes. The first area might be termed expectations based on the initial contact where misconceptions had been established. Such misconceptions distinguished by Fforde included the idea that the host party knew more about the operation, particularly in regard to manufacturing expertise, than was actually the case; that the association between the MNC and the host to be stronger because a highly knowledgeable MNC and a well-known local party were involved than was actually the case; and that the MNC would be fully able to overcome cross-cultural difficulties because the MNC had accepted the assignment, when in reality, these difficulties were often beyond the power or awareness of the MNC.¹² Obviously, certain expectations, large or small, would presumably never be totally fulfilled on every project. However, this category's purpose is to examine the expectations to determine, if possible, the reasons behind their unfulfillment.

Unexpected occurrences. Obviously this category is one which would need to be completed through the collection of information. However, its existence aids in documenting aspects which were not anticipated, but which may have had a major impact upon the project. One

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allusion to unexpected events was made by Ellison, in the form of a recommendation rather than an itemization of unexpected possibilities. He recommended some restructuring within the MNC to allow for more flexibility in dealing with unexpected occurrences, such as manpower or staffing problems.¹³ Several corporate observations from preliminary interviews with Clark Equipment, lent some insight into this area.

Executives at Clark Equipment stated that in their experiences, unexpected situations have arisen in regard to the number of staff members required, or the period of time for which their services are needed. On the other hand, it was pointed out, mandatory adherence to a schedule might jeopardize the project, while extended staffing might be a means for successful completion of the project. Thus, certain requirements should remain flexible.

Clark also pointed out another aspect which arose in regard to a problem planned for but not expected to arise. A host country improved upon the basic technology of the MNC. When the MNC requested royalties, however, the MNC's right was questioned as the patent involved was not the exact one which had been supplied by the MNC. Interpretation of the arbitration clauses, as well as other portions in the contract were expected to be required before this issue was successfully settled.

One positive discovery which had exceeded all expectations of Clark Equipment was that reciprocal development of new products had been gained through non-equity technology transfers.

Unexpected aspects, thus, might involve a variety of areas including rapport between the parties involved, internal and external changes, product sourcing, quality controls, or technological boundaries and developments, among others.

Benefit to the corporation. The category of financial flows is designed to examine the monetary exchanges as laid out by the agreements but does not fully consider the reasons behind the corporation's decision to enter into the technology transfer. Profit may be the chief reason, but several other aspects would appear to also be underlying the decision, and may, in some instances, be the primary rationale.

Bendix stated that specific transfers were hoped to be profitable based on the fees as stated in the contract, but their expectations would be fulfilled if the endeavor proved profitable only as to the sale of products or parts.

International Harvester representatives also stressed the point regarding payments and profits. When the IH agreements permit full disclosure of the needed technology, a major source of income in the arrangements

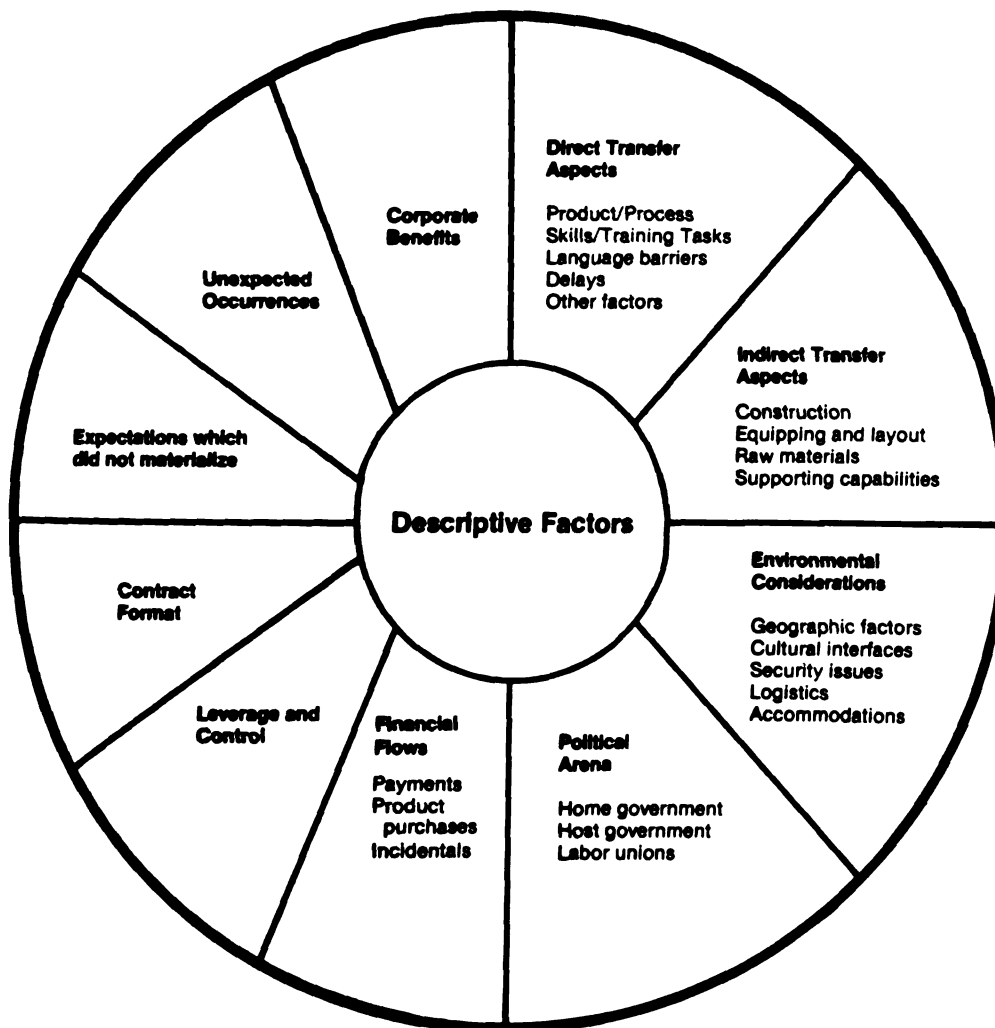
is often the inclusion of purchases of parts from IH for the project on an ongoing basis, during but also after the technology transfer aspect has been completed.

In regard to management contracts in particular, Ellison noted that expectations varied with the initial reason underlying a firm's entrance into a non-traditional transfer agreement. He pointed out that 'agressive' firms fared more successfully and profitably than those 'after-the-fact' firms which undertook such a transfer as a means of recouping some of their losses due to expropriation.¹⁴

The category of corporation benefits, therefore, will look at the major reasons behind the corporation's decision to enter into the specific technology transfer under consideration, ranking those reasons if feasible. The intention is to compare the rationale behind corporate expectations with the benefits actually gained by the corporation from the transfer.

These descriptive categories comprise the basis for the comparison between expectations and outcomes. The descriptive factors are summarized in Figure II-1. An analysis of the resulting variations is to provide a listing of analytical factors which should provide some guidance for future technology transfers.

Figure II-1
The Technology Transfer



Descriptive Factors
of the Technology Transfer

Interview Guide Development

From these descriptive categories involving the elements in non-traditional transfers, the question areas have been selected. Their arrangement on the questionnaire was designed to elicit comparative responses. The questionnaire was essentially an interview guide as the information would be obtained through personal interviews with corporate officials.

Background and overview of company,
country, and product

A general section in the questionnaire was provided to obtain background information from the corporations. This was positioned at the beginning of the questionnaire (and hence, the interview) for two reasons. First, it provided a perspective from which to compare information which followed relative to the specific agreement which would be discussed. Second, such a question area is often non-threatening, and carries little to no risk in terms of confidential information. Thus, it provides an opportunity to become acquainted on a low risk yet informative basis. The desire for the information was based on the assumption that perspectives on various projects might vary, depending on past incidents or the lack of such experiences.

Title, date, descriptions of specific agreement(s) under consideration

This category began the narrowing down process in concentrating on the particular agreement(s) involved in the study. The listing of aspects such as turnkey, product-process transfer, management, patent, trademark rights, and buyback provisions was designed as a checklist to speed the information gathering yet not overlook aspects of the contract. Each company's arrangement with a single country was considered separately, unless comparisons were offered by those involved, but in some instances, one general agreement was often broken down into separate contracts. Hayden had distinguished such areas as technical assistance; trademarks, and buyback stipulations. In situations where these areas were covered by separate contracts, the discussions still considered these aspects to be part of the overall arrangement between the two parties involved. Requesting a listing of corporate responsibilities as well as the responsibilities of the other party helped to clarify the extent of the technology being transferred--especially in situations where the actual corporate contract was not permitted to be studied. Since Eastern European industrial arrangements need to be concluded between state trading enterprises, yet are negotiated often on the level of the ministries, the identification of each party

or level involved in the transfer helped to overcome confusion on the identification of the parties.

Negotiations

The impetus behind the desire for the agreement was seen to be a highly relevant factor, as pointed out both by prior studies as well as the preliminary corporate interviews. As well, the actual negotiations were expected to be important--both as to the length of time involved, the initiator, and the type of format adopted as the official contract. Thus, the negotiations area was left fairly unstructured so that many individual points would be provided.

Time frame

Delays were pointed out as being a major factor in the eventual success or failure of the agreement; hence, the time frame as originally projected compared to the eventual timing was needed. It was also important to distinguish the timing between different phases of the projects.

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Aspects of involvement

This was used as an umbrella category, covering financial flows, staffing and personnel arrangements, and the protection accorded to the project participants. The financial flows were considered vital to each arrangement since the profit-centered MNCs had undertaken the technology transfer under a sale basis. However, several aspects existed within the financial area. First was that of the payments themselves, as contractually arranged. Second, these payments would not reflect the profitability of the venture without an accompanying statement on the expected or unexpected expenses which occurred during the course of the project. Third, profits based on products or items expected to be sold during the course of the agreement would be another factor. Fourth, additional sales or financial flows not actually expected in connection with the project would also impact upon the overall evaluation of the financial picture of the technology transfer.

The personnel aspect was considered from two bases--the domestic company involved in the transfer and the trainees (those employees selected to receive any particular training necessitated by the transfer) from the host company or nation whose education, in most instances, was expected to be an integral part of the

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transfer. Personnel issues expected to most affect the domestic company included the availability of key personnel and factors which caused difficulty or hardship in connection with the transfer. Issues considered particularly crucial to the host involved training difficulties and quality controls. The underlying belief was that the staffing area impacted upon the financial flows in that delays or an unsuccessful transfer would negatively affect the profitability of the venture.

Protection was an issue which was based in the control-leverage attitudes of direct investment agreements. A study of the leverage available to the MNC once the agreement had been signed (which, at least according to one author, was then a period of greater risk and less control) was considered desirable in the construction of future recommendations as well as current analyses. Protection also involved issues affecting patents and trademarks in a security realm, as well as legal protection which might have been found to be available in court systems or arbitration proceedings.

Problems

The problems section on the questionnaire was included as more of an insurance that items relevant to the transfer which may have been overlooked in prior

categories would be noted. It was not intended to emphasize problems over opportunities or other aspects of the transfer. It did appear to be true, however, that areas which varied to an appreciable extent from expectations, were often described as problems.

Assessment

The assessment area, looking at aspects which affected the project ease, difficulty or as opportunities provided an overview which was also seen as broad enough to touch upon other aspects of the agreement which may not have been covered previously. The checklist approach to the opportunities involved in the technology sale was designed to emphasize points which may had been unspoken, especially in the light of one or two major reasons behind the desire for the transfer.

Variations

The technique was to obtain an accurate description of each agreement, with its phases, and then to explore areas where variations had occurred between initial expectations and the final outcome (or the stage at which the transfer was currently involved). Distinguishing between straight description and the variations which had occurred (or were perceived to have occurred)

over initial expectations was seen as one way of isolating two separate points of analysis. Thus, the questionnaire requested changes or variations as appropriate in each category.

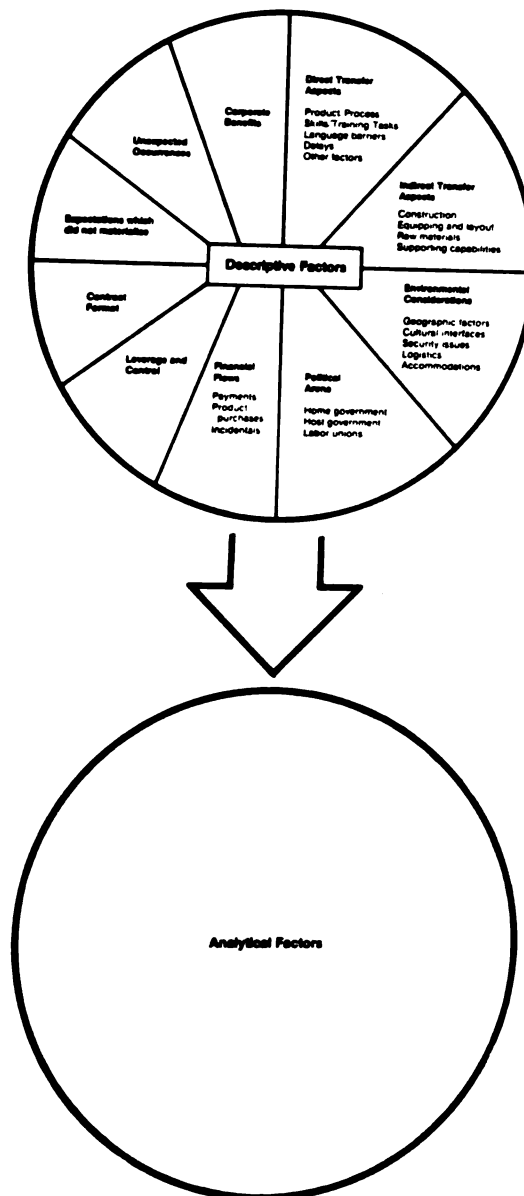
Limitations of Methodology

The approach being utilized in this study should provide some pragmatic and useful information which will be of benefit to corporations considering technology transfers, particularly to countries within the socialist bloc. However, this methodology carries some limitations. The extremely small number of corporations used as the basis for this information does not permit generalizations to be made from the experiences of more corporations. Personal interviews provide more information, on the whole, than short, specific questionnaires, but the opinions of the individuals involved represent only that person's viewpoint. A discussion of expectations, in hindsight in some instances, is often colored by events which have occurred since that time. Furthermore, corporate personages notwithstanding, the expectations lie with different individuals who may have radically different expectations even though they both are involved with the same corporation. Thus, the information is limited by the number, and bias inherent in the individuals providing the material, over and above all

statistical information regarding each project. On the other hand, however, analyses of these technology transfers will also be made by the same individuals. These decision-makers will determine, in part, future corporate transfers. Information which will improve corporate performance in this regard will benefit these individuals, the corporations, and the receiving host companies and countries.

Thus, an overview of the technology transfer as it will be seen in this study involves consideration of the initial criticisms of such transfers, but also the justification. It examines technology transfers on a descriptive basis, but seeks analytical factors which underlie those arrangements. Figure II-2 illustrates the relationship between these elements.

Figure II-2
The Technology Transfer



Descriptive Factors
lead to Analytical Factors

FOOTNOTES--CHAPTER II

¹International Transfer of Technology Sources of Conflict, U.S. Chamber of Commerce, p. 5.

²E. Hewett, "The Economics of East European Technology Imports from the West," American Economic Association, May 1975, p. 377.

³Eric W. Hayden, Technology Transfer to Eastern Europe, U.S. Corporate Experience (New York: Praeger Publishers, 1976), pp. 54-56.

⁴Harvey Wallender, "Managing and Evaluating Technology Transfer in Manufacturing Industries," UN Economic and Social Council, Sc. Tech./Sem. 3/R.16. (June 13, 1975).

⁵J. S. Fforde, An International Trade in Managerial Skills (Oxford: Basil Blackwell, 1957), Chapter IV.

⁶Richard Ellison, "An Alternative to Direct Investment Abroad," International Management, June 1976, pp. 25-27.

⁷Ibid.

⁸Ibid.

⁹Cordell W. Hull, "Practical Considerations of Middle East Service Agreements," Intertrade Journal (June/July 1976), p. 25+.

¹⁰Peter P. Gabriel, The International Transfer of Corporate Skills: Management Contracts in Less Developed Countries (Boston: Harvard University Press, 1967).

¹¹Hayden, p. 55.

¹²Fforde, Chapter IV.

¹³Ellison, pp. 25-27.

¹⁴Ibid.

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CHAPTER III

DESCRIPTION AND ANALYSIS OF CORPORATE EXPECTATIONS IN NON-EQUITY TECHNOLOGY TRANSFERS TO EASTERN EUROPE

Introduction

Expectations might well be the subtitle of this section, as the intention of Chapter Three is to delineate the expectations of six corporations which embarked upon non-equity arrangements with certain countries in East Europe. Two of the companies established similar agreements with two different countries, so eight different agreements are described in this chapter. Each agreement has been treated separately, but all have been formulated along the same structure.

Outline

The outline followed in constructing the descriptions of corporate expectations is as follows:

Country

Company's Name

Description

Background of domestic company and host
Transfer of technology
Responsibilities

- Corporate Perception of Benefits to be Gained from Agreement
- Negotiations
 - Parties involved
 - Initiating contact
 - Length of negotiations
 - Issues and obstacles
- Time Frame
 - Overview
 - Special considerations
- Financial flows
 - Payments
 - Purchases from the domestic company
 - Purchases by the domestic company
- Personnel
 - Training tasks
 - Other personnel involvement
- Protection
 - Leverage
 - Inspection privileges
 - Patent/trademark defense
 - Legal provisions
- Project Assessment
 - Factors expected to make the project easier than usual
 - Factors expected to make the project more difficult than usual
- Expectations for the Future

Country-company arrangement

Four countries are represented in these descriptions. Two of the countries were involved with several of these projects simultaneously, while the other two countries had only one project of those considered in this entire study. Poland had by far the greatest concentration of corporate involvement as represented in this analysis. The companies and respective products whose technology was being transferred to Poland included: Clark Equipment Company-axles; International Harvester

Company-complete construction vehicles; Honeywell, Inc.-electronic pressure transmitters; and Westinghouse-semiconductors. Romania had purchased technology for radial tire manufacture from General Tire and transmission technology from Clark Equipment. Hungary had a series of arrangements with International Harvester for the transfer of agricultural equipment technology, and Bendix was transferring the information required to manufacture the material for disc brake pads to Yugoslavia.

This chapter is involved with expressing the expectations of each company as these expectations existed at the start of each agreement. Effort is made to include all relevant descriptive details of each arrangement so that a more accurate comparison will be possible in the analysis with the subsequent outcomes.

Poland

Clark Equipment Company

Description

The Clark Equipment Company, based in Buchanan, Michigan, signed an agreement in 1972 with the Bumar Foreign Trade Enterprise (FTE) in Poland to transfer Clark's technology relating to the manufacture of cast housings and axles to Poland. Through the Bumar FTE Clark was associated with the Bumar Union of Construction Machinery Industry, which includes all Polish enterprises involved in earth moving, construction, or road building undertakings in Poland.

The arrangement between Clark and Bumar was divided into three sections. Under the technical assistance portion, Clark agreed to transfer all information relating to the manufacture of heavy-duty, cast-housing planetary reduction axles (drive axles, drive steer axles and tandem axles) to Bumar.¹ The second portion consisted of the trademark rights which Clark agreed to transfer to Bumar for each of those axles. The third portion involved a marketing agreement in which Clark agreed to repurchase some of the axles from Bumar.

Background

Domestic company. Clark's product line includes construction equipment, cranes, fork lift trucks, axles, and transmissions or drive trains.

More than 90 percent of Clark's present business is in axles, transmissions and related components, material handling equipment, and construction machinery. Axles and transmissions accounted for \$299.9 million, material handling equipment for \$766.8 million and construction machinery for \$665 million, for a total of \$1731.7 billion in worldwide sales in 1979.

Clark Equipment stated that it adapts its agreement to fit both the country and tasks at hand. Thus, the corporation might have several rather unconventional types of arrangements functioning concurrently. This approach differs from many firms which tend to hold fast to one type of agreement, often that of 100 percent ownership or nothing. Clark has had numerous majority interest ventures but is also open to minority ones. For example, Clark has one minority venture with Mexico where Mexico controls 74 percent and Clark 26 percent, with loans backing this joint venture to an amount of nearly \$14 million as of 1979. Clark has also been exploring a type of agreement known as 'product in hand,' which is to be a combination of a turnkey venture

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combined with a management contract, in addition to the usual technology product and process transfer. Clark officials summarize such a project as a situation where the company staffs and runs the plant as well as building it. The contract requires the corporation to guarantee a certain level of output, and, in some cases, the corporation's payment, at least in part, is taken in the form of that plant's production. Perhaps the most obvious difficulty in such an undertaking is the enormous size and responsibility of such an endeavor--and in the number of things which could go wrong prior to the time the production is on-stream and meeting projected quotas. Clark noted that some countries seem to be making this 'product in hand' type of arrangement a national policy, but also noted that a country must appear to offer great opportunities, financial or otherwise, often market entry or raw material acquisition, to have the necessary leverage to induce a corporation to accept such a large responsibility.

The history of Clark Equipment's overseas involvements began after World War II when Clark, a domestic company with not overly large sales, found that parts, repair and maintenance were needed for the fork lift trucks sold during the War which were left all over the world. So Clark started by franchising dealers (1946) and soon had \$5 to \$6 million in exports.

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In the 1950's, Clark formed their international division and began licensing in Australia, Belgium, Germany, France, and England, forming joint ventures everywhere except in Belgium where the company was usually the minority partner on a basis ranging from 30 to 45% ownership.

In the 1960's Clark began licensing in the larger lesser developed countries, such as Argentina and Brazil. The corporation went on buying sprees in England, France, Germany, and Australia, buying control of operations. New joint ventures were formed with substantial equity in Mexico, Belgium, Japan, and in South Africa on a minority basis of 20 percent.

In the 1970's the purchases of the 1960's were rationalized and refined. Some operations were closed down, such as the one in England, and the corporation went back to the development philosophy, licenses and joint ventures of the Clark 1950's position. But note that in the 1960's, Clark could take control because the company had prepared the way in the 1950's, and in the 1970's, it could do the same thing in the developing markets. This was the idea behind licenses in such countries as Korea, Taiwan, Algeria, and India. Potential agreements are still pending with Indonesia, Egypt and Venezuela. Algeria was a possibility at one time but has never been finalized. Licenses without

investment were also established in New Zealand. Selection of countries was based on environmental risk ratings with preference toward the lower risk areas.

Clark feels one should not stop improving what is already possessed. The company earned \$870 million outside the U.S., with direct sales of \$599 million and licenses of \$271 million as of 1979.

In 1945, the 'international' aspect of Clark was limited to a network of domestic distributors which were exporting replacement parts. However, increasing worldwide competition eventually encouraged Clark to branch out to a system of licenses where foreign companies assembled or manufactured Clark products, paying Clark for its services. To coordinate its international activities, Clark has an export marketing subsidiary, Clark International Marketing S.A. (CIMS), and a licensing subsidiary, Clark Equipment A.G. (CEAG), which handles all licensing concerns outside the United States. Clark is rather unique in that it adopted a minority position or even a non-equity basis for many of its agreements internationally far earlier than most companies.

Clark Equipment stated it has a high commitment to the international aspects of its business with a corporate goal at one point in time to have at least 50 percent of its business conducted overseas by 1980.

However, because the corporation is aware of its limitations, financial and otherwise, it is probably even more cautious than other larger companies such as Caterpillar Tractor or General Motors.

Clark's approach in the transfer of technology is to use knowhow packages to form a wedge into the market with their partner. Clark sees the local production of their products as a necessity in the distant future in terms of remaining cost-competitive with other firms.

International contracts of a licensing nature are handled by a separate division with the Clark Equipment Company. This international licensing division, which operates as a separate profit center, is the arm which transfers technology for Clark. The corporation feels that the culminative international experiences of this unit provide continuity in their overseas arrangements.

Clark's approach to the majority of its international license arrangements is that it provides all knowhow as well as documentation to insure that regardless of where in the world the product is produced, it will be manufactured with the same techniques and to the same standards that Clark demands of its domestic manufacturing operations. Supporting this tenet, Clark always supplies its trademark with such technical assistance agreements.²

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Managerial skills and the transfer of technology as separate areas are blurred. One official at Clark pointed out that, at Clark, we are knowhow people, (but to apply and implement) that knowhow, managerial skills are also necessary.

Clark provides managerial assistance for the licensee, because the company does as much as feasible to make the licensing situation a success.

Clark feels that licenses are flexible, 'living' documents, tailored to the needs of the particular situation. Clark has noticed that arrangements with Europe and Japan utilize one type of license, but the lesser developed countries need a different form. They feel that many countries in Latin America require a different approach from the others.

Most of the managerial aid which Clark provides is non-compensated, and usually is provided to the licensee to help promote the success of the enterprise. For instance, in Mexico, Clark has a 26% joint venture where the company is involved in a non-compensated managerial contract to the company which provides substantial technical service on car transmissions. Clark's profit from the investment depends on its success, thus, the company feels that such managerial responsibilities are justified, but the loss of such managerial expertise

to international operations is still a detriment to Clark's internal group.

Thus, Clark feels there could be a time when Clark would charge for the managerial services which accompany a knowhow or technical disclosure fee. However, it appears that one must plan for these services, and be able to provide them for a certain period of time. As it is now, Clark has provided managers, generally in the non-compensated way, one or a few at a time--some from retirement, even. So such provision has not been a great loss to the corporation internally.

Clark feels there is a blurring or responsibility in a license contract where management is not mentioned. It is a far cleaner cut in such situations where the managerial aspect is noted. One 'blurred' example is Clark's arrangement in Spain where Clark builds lift trucks through a joint venture with a Spanish firm. Clark was the minority partner, providing their knowhow and trademark, and had an export marketing agreement to market the output outside host country's territory. During the recent depression in Spain, however, the firm ran into severe financial problems. Clark ended up having to send their financial people there. Thus, Clark provided a service not in the license agreement, but one which was deemed necessary to keep the project operating.

Generally, Clark stated that it appears that in one out of three situations, it supplies a service which Clark did not think would be necessary, and which had not been included in the agreement. Clark received no compensation for helping in these instances, but the losses which might have been incurred otherwise would have been even greater.

Clark does not (usually) sell one-shot licenses or technology items. The company views licenses usually as a continuing document between two parties, because Clark licenses 'living products.' It licenses by model, but updates changes (usually in the contract) or provides amendments via new contracts. However, one official noted that an innovation might be to separate the team--new licenses (transfer of technology) from management--protect the license, (knowhow) via a paid contract on management.

Host. Bumar Union of Construction Machine Industry had a history of contacts with Western-based companies prior to its involvement with Clark Equipment. The first Western partner of the Huta Stalowa Wola combine was the Jones Cranes Company, manufacturer of mobile cranes in the United Kingdom. This agreement, signed in 1966, is still in progress. Another agreement with a crane manufacturer, the Coles Cranes Company,

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also of the U.K., was begun in 1971. Bumar also has contracts with Stetter of the Federal Republic of Germany for the manufacture of truck mixers, with the Swedish firm of Kockums for heavy duty transport trucks, and with the British firm of Hamworthy for hydraulic equipment. However, none of these agreements is as extensive as either of the agreements signed in 1972 with the two firms from the United States, International Harvester and Clark Equipment.

Axle production was not unfamiliar to Bumar prior to the agreement with Clark, but their axle design was considered obsolete, with the metal composition not adequate for extremely heavy vehicles. Thus, Bumar desired both an improved design from Clark as well as metallurgy techniques to improve the processing of the metal. Such improvements in their axles would enable Poland to produce stronger construction vehicles, and such equipment was vital to the country's plans for improvement and upgrading. As well, such an axle would provide Poland with a viable export, either by itself or incorporated into a vehicle. The operation involving the axles was to comprise 400,000 square feet within the Bumar complex.

Transfer of technology

The agreement between the Clark Equipment Company and the Bumar Foreign Trade Enterprises is actually composed of three agreements, each between Bumar and a separate entity of Clark. The Technical Assistance and Cooperation Agreement was signed by Clark's European subsidiary based in Switzerland, Clark Equipment A.G., (CEAG), while the Trademark Agreement was with Clark Equipment of Buchanan, Michigan. The third agreement, The Marketing Agreement, was between Bumar and Clark's marketing arm, Clark International Marketing S.A. (CIMSA). CEAG is Clark's representative for all licensing arrangements outside the United States while CIMSA represents Clark in all international marketing responsibilities.

Turnkey. Clark (CEAG) did provide Bumar with a list of equipment drawn from Clark's own plants where axles were produced and assembled, and assisted Bumar in their plant layout, but Clark did not build or equip the operation at Huta Stalowa Wola directly.

Information and knowhow. The knowhow supplied by Clark included all technical information and production knowhow necessary for the manufacture of the designated axles plus any relevant background knowledge related to the preparation of the materials including

metallurgy techniques. This knowledge regarding axles was up-to-date information, but also was to be kept current as Clark was to supply Bumar with any improvements or modifications which were made by Clark on their own production lines, although Clark was not obligated to inform Bumar of any research being undertaken which had not already been implemented or actually put into production. This knowledge was transferred via documents and blueprints, but also through the training provided to Polish employees by Clark technicians both on the site in Poland and at Clark facilities in Buchanan and Jackson, Michigan.

The technical information provided by Clark included: engineering drawings of details and assemblies; engineering bills of material; material specifications; assembly and production test information; inspection procedures; process sheets and route sheets; production, inspection and assembly tool drawings and fixture drawings; metallurgical information; suggested machinery requirements and plant layout; SAE standards and AISI standards and any available cross reference information and patents. All information was to be in the language of the originating country (English, in this instance), and all conversion to the metric system was the responsibility of Bumar. The information was

to be provided within sixty (60) days after the receipt by Clark of the disclosure fee, or the required portions of it. Clark was to suggest which axles, or portions of the axles, should be initially manufactured; also noting which portions should be initially purchased, using its best efforts to help in both the manufacturing and purchasing aspects.

Clark stated that the corporation felt that their partner was entitled to all the information possessed by Clark which was necessary for that partner to build the product as well as Clark itself was able to build it. On the one hand, this does not mean that the partner needs to know how to design that product, but on the other hand, that partner needs to know how to cut a gear tooth, how to heat tune it, and how to do all the manufacturing processes essential to that product's creation.

Both product and process technology were transferred as Clark keeps emphasizing that the purchase price or disclosure fee is not just for blueprints or similar information, but also for expertise which is the aspect of technology transfer which is often the most crucial part.

Clark agreed to "use its best efforts to assist in purchasing or otherwise acquiring" parts which were not available in Poland or which were not to be immediately manufactured by Bumar.³ This included parts

manufactured by Clark subsidiaries, but also extended to third party suppliers. Furthermore, Clark was also to guide Bumar in the selection of manufacturing priorities as to axle parts.

Clark maintained the authority to approve the use of the components being produced in Poland, as well as making certain that the parts were not used erroneously, where the construction or strength of the unit would not be certified.

Management. No management as such was involved, as far as was formally stated in the agreement, but Clark noted that whenever an extensive amount of technology is shifted, especially when processing information is included, management techniques are also passed along.

There are three types of packages which Clark provided; each carry an implicit association with managerial expertise:

- (1) the technical license--including the knowhow;
- (2) the trademark agreement, which implies quality control measures;
- (3) the export marketing agreement, where all exports from this source are under Clark's control OUTSIDE their home market area. (NOTE: for instance, Poland controls sales throughout the entire COMECON area, excluding the U.S.S.R., so Poland's home market is far larger than the country's boundaries alone).

Clark did not have any managerial commitments in Poland, in regard to the operation of the axle manufacturing plant. Such managerial control, Clark pointed out, is against the philosophy of Eastern Europe and legally not permitted, as no foreigner is allowed to give orders to one of the local residents. However, Clark was involved in training the Poles, and such training included advice on plant operation, particularly related to efficient operation of the plant.

Clark's permission for the use of the corporate trademark was contingent upon three aspects: quality control, product design, and use of approved materials. The managerial area in such a situation might be best explained by noting the distinction between orders and suggestions. Clark did not order anyone at Bumar, but only made requests.

Patents. All necessary patents were included with Clark's technology.

The agreement included all essential patents which were properly registered in Poland, but Bumar, from that point on, had the responsibility of keeping the patent registration up-to-date by paying the additional maintenance fees.

Nonexclusive patent licenses were included in the agreement for both Clark and Bumar, with the additional obligation stated for Bumar to disclose any

improvements in the stated products back to Clark. Thus, even if Bumar did not want to take out a patent on an axle improvement, for example, they would be required to do so to protect Clark's rights.

Clark has provided Bumar with the approximately 25 patents (out of the 250 parts in each Clark axle) with the stipulation that Bumar was not to reveal this information to any third party for up to five years following the culmination of the Clark-Bumar accord.⁴

Trademarks. The Trademark Agreement, between Bumar and Clark Equipment refers to all information provided by Clark Equipment A.G. through the Technical Assistance and Cooperation Agreement. Clark authorized the use of its trademark to Bumar, not only within Poland, but throughout Eastern Europe, including Yugoslavia, Mongolia, and the U.S.S.R., as well as India, for all approved axles produced through this agreement, which had passed all designated inspections.

Bumar agreed to reimburse CEAG for the actual costs incurred in making all trademark tests and all Clark products produced during the course of the agreement are to be trademark approved and are to carry the Clark U.S.A. designation. After the conclusion of the agreements, all use of the Clark trademark is to cease except on items which had been produced prior to the completion of the agreement.

Clark provided Bumar with its trademark for all axles produced under the Clark technology, with the stipulation that periodic inspections be run, ascertaining that all axles met Clark standards and requirements to carry that trademark. Since Clark will be repurchasing some of these axles for its own use, the company is directly concerned that the axles be representative of corporate high quality. This buyback provides another reason to have all modifications transferred as soon as feasible to Poland from Clark's other production facilities to insure the interchangeability of all parts.

Clark is to receive a royalty on all axles sold by Bumar for a ten year period, commencing upon the first sale of the product. This royalty does not apply to all axles purchased back from Bumar by Clark directly.

Under terms of the warranties involved in this transfer, Clark has noted that the parts produced in Poland have to meet certain specifications. Should that item fail to meet those specifications, Bumar must then replace the item with one manufactured under Clark Equipment Company auspices in the United States, paying all shipping costs for the obtainment of the part as well.

Clark, through CEAG, maintained the right, but not the obligation to be able to inspect the products being produced. Clark did agree to inspect and test at least one product from each different axle being produced to certify the use of its trademark.

Clark (CEAG) did agree not to enter into an agreement of a similar nature with any other East European country for the duration of this agreement.

Bumar was permitted to subcontract portions of the axle manufacture within Poland, but only after security precautions had been taken and Clark duly advised of the procedure.

Buyback. The third part of the agreement between Clark and Bumar is to the marketing commitment which notes that Clark has agreed to repurchase some of the axles produced by Bumar from Clark's technology for its own use at a price equal to Clark's own sale price from its factory in Buchanan, Michigan.

Thus, Clark obtains axles already on the European continent for the same price as in the United States, but avoids all transportation charges.

The Marketing Agreement was between Bumar and Clark International Marketing S.A., the marketing subsidiary of Clark Equipment which was based in Venezuela and is now based in the Caymen Islands. This agreement

stated all price sources for parts, components and full assemblies pertinent to the axle agreement, guaranteeing Bumar the availability, as far as possible, of all necessary parts, components, and spare parts. The Marketing Agreement also delineated portions of the world where CIMSA would use its best efforts to sell the axles produced by Bumar under the Clark trademark, for the joint interest of both parties. The agreement included the projected sales and production targets laid out on a year-by-year basis, starting from a year after the effective date of the contracts, and even stated the warranty which Bumar was to provide on the products resold to Clark. CIMSA was not held to any official number of axles which would be repurchased from Bumar or sold under its marketing network. CIMSA was to provide its "best efforts" in working for such sales as would be possible.⁵ On all axles resold to CIMSA (at the ex-factory price, Buchanan, MI) Clark was not to receive any royalty. As with the other two agreements, all were to run concurrently, and jointly expire, based on the 10 year sales periods for each axle model.

The buyback arrangement is one which ideally should benefit both parties if the agent transferring the technology requires or desires an additional source of its product. In this way, the source is obtained

without additional equity and the new producer is guaranteed a purchaser.

No official buyback level or limit, or starting date, was included in the contract, but Clark anticipated being able to buy products as soon as production was on schedule. The corporation did hope to be able to buy axles to help supply their French subsidiary, with the objective of covering major economic spheres throughout the world, but particularly those within the European area.

The contract included an exclusive sales agreement, but did not list exclusive territories. Bumar is permitted to market the Clark axles outside of its 11 nation territory if the axle is incorporated into a Polish-made vehicle.⁶

Responsibilities

Domestic company. Clark's responsibilities in this project were to provide Bumar with all information and knowhow relevant and necessary to completely manufacture the cast-housing planetary axles, and to keep Bumar updated as to improvements on those axles for the duration of the 10 year production agreement. In addition, Clark was to provide suggestions as to equipment purchases and plant layout prior to the actual manufacturing process, and to provide adequate training and

consultative services so that Bumar employees would be able to manufacture the axles eventually without assistance from any Clark personnel, helping to financially subsidize such training. Clark, in addition to the technical assistance services, also agreed to provide its trademark for the duration of the agreement (subject to adequate quality control measures) and to help in marketing the axles on a form of buyback basis, as one of Clark's bases for undertaking this project was to obtain an additional source of these axles for their own marketing needs.

Host. Bumar's responsibilities were initially to provide suitable facilities in which to set up and operate the axle manufacturing equipment, and to provide capable employees to be trained in such production. Bumar was to uphold all of its financial obligations to Clark throughout the course of the agreement, both as to the disclosure fees and the on-going engineering services and royalties payments which were owed to Clark. It was to uphold product quality so as to maintain the Clark trademark. Bumar was also responsible for informing Clark of any improvements made in the axle by Bumar engineers, and was to financially keep all patents (Clark's and Bumar's) up-to-date, so as to protect the interests of both partners.

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Corporate Perception of Benefits to
be Gained from Agreement

Clark Equipment appears to have entered into the agreement with Poland for multiple reasons. Primary reasons included obtaining a source of supply without a financial commitment, the fees paid for the technology to help offset prior development costs, obtaining as much benefit from the technology as possible before it became obsolete, and capitalizing on the opportunity to sell as many components or related parts as possible on an export basis. This last reason was generally aimed at temporary sales until the Bumar facility was on-stream and self-sufficient, but other sales were projected even after this point. Rather than prioritize these justifications for the agreement within this category, Clark officials stated that it was felt that each reason was valuable and should attempt to be maximized. Bumar needed the axles, and Clark did not possess the supply capability either in the East or the West to supply Bumar without investing a significant dollar amount into production facilities. Thus, facing a supply problem where sufficient high quality castings were not available, Bumar's invitation to establish a non-equity venture in Poland, was a welcome and needed offer.

Secondary reasons for the agreement with BUMAR in Poland include obtaining a toehold in the market which would lead to greater involvement and the sale of components which would be purchased to go into the product being assembled by Bumar. The possibility of the sale of additional products, not directly related to their manufacturing venture with Bumar (except for service or replacement parts which would be a direct spinoff) but which were desired by Poland or even other countries within the Eastern Bloc as a result of the association between Clark and Bumar was also an underlying rationale and a hopeful one.

Clark did not view the arrangement with BUMAR as one which would help supply Clark with raw materials although this possibility did exist.

Poland's first priority was to obtain an axle which would be a viable export commodity. Their desire for updated technology which would leapfrog the country's axle knowhow into the modern era only seconded their prime concern with exports. Another reason was the saving of hard currency which would be gained because axles were being manufactured within the country and no longer needed to be imported. This justification falls last because Poland had been importing very few axles, since axles were manufactured within the country already.

Negotiations

The negotiations between Bumar and Clark were completed extremely rapidly, especially for such a first-time agreement. The usual reason behind such a rapid acquiescence is a strong desire for the agreement to be concluded, usually indicating a great demand for the product, which was the case in the Clark-Bumar agreement.

Parties involved

The negotiations were conducted between Clark Equipment Company, U.S.A., but involved representatives of Clark Equipment A.G. and Clark International Marketing S.A. The agreement signed in 1972 was under the Bumar directorship of R. Mikoda.

Initiating contact

Poland initiated the contact but Clark had been actively preparing to enlarge their European operation.

Length of negotiations

The negotiating time between Clark and Bumar was unusually short. It was the first political agreement between Poland and a USA company, and was completely negotiated in three months in Poland, start to finish,

with ratification following within several months. Negotiations are usually assumed to require two years, with a two to three year time span considered standard.

Another factor affecting the speed with which the negotiations between Clark and Bumar were conducted was the fact that the arrangement was not only suitable to Poland, it also appeared to be ideally suited to Clark's immediate needs and desires. Clark had been "on the verge of pouring several million dollars into the expansion of its Belgian transmission plant when a fortuitous visit by the Polish government's commercial representative altered Clark's plans."⁷ Poland was already building a new addition to its existing axle facility. Thus, Clark would be able to supply its own technology, suggesting equipment which it favored, to purchase the axles it desired at a cost far lower than would be the case if imported from the United States. All these advantages would be obtained without any financial drain on the company--indeed, at a profit for the sale of the technology. Finally, unlike many West European arrangements, Clark would be able to maintain its access to its traditional markets in Western Europe and elsewhere while Poland concentrated on Eastern Europe, an area generally closed to Clark in any case. Furthermore, Clark was to receive a royalty payment for those axles sold by Bumar in Eastern Europe for the duration of the contract.

In addition, Clark faced a complete lack of competition in this situation, for, while axle producers form a limited oligopoly, it was found that the only other bid far outdistanced Clark's bid by being ten times as high. It is no wonder that the negotiations which usually take several years were completed within several months between Clark and Bumar.

Issues and obstacles

The U.S. government did not disapprove of the Clark axle technology sale to Bumar in Poland, but Hayden notes that Clark pre-empted this possibility through a statement in their contract with the Poles which "absolved the company (Clark) of any obligation 'to disclose any technical data or information which . . . is primarily designed for or used in connection with military, naval, or other application relating to national defense or security'." "Hayden also noted that in its export license application, Bumar committed the axles for use only on non-military vehicles, and that, consequently, the license was immediately granted by the U.S. Office of Export Administration.⁸

English was the official legal language of the contract, as it is with all of Clark's legal agreements of this type.

Time Frame

Overview

The axle agreement was ratified on August 30, 1972, and is slated to run for ten years during which time, specified payments for the disclosure of the technology are to be paid on a regular basis. In addition, royalty payments are required, based on plant production levels, and are in effect for 10 years from the time the product is first sold by Poland.

Special considerations

The time frame of the agreement was for ten years, from 1972 through 1982, for installation of the equipment and startup of the production, with production runs for ten years for each model, dating from its initial production in Poland.

The agreement was to run for 10 years for each model included in the contract. If an additional model were to be added, this would run for 10 years from that date.

The contract between Poland and Clark held no time table or schedule, although certain estimates were included. The transfer and disclosure of information from Clark to Bumar began in December 1972. Two years

were required before production was underway. It was anticipated that Bumar would be annually producing 15000 axles and 3000 cast iron housings a year after 1976.

Financial Flows

Payments

The financial payments by Bumar to Clark were to be in two forms; an initial payment or series of payments for the technology itself termed the disclosure fee, and a set of ongoing payments on an annual basis for the duration of the ten-year contract which were termed the engineering fee and approximated royalty payments.

The majority of the disclosure fee was to be paid immediately following the ratification of the contract, with two smaller payments following in the two coming years, on the anniversary of the effective contract date. The percentage of the service fee due each year decreased at regular increments but a bottom limit was set. This minimum fee was stated for each year and increased, at regular increments, reflecting the expectations for increased production and sales. All payments were to be in U.S. dollars, with no stipulation for

inflationary increases apart from the current net price basis. No variable factor was tied to the minimum annual payments.

Payment was arranged as such: Bumar would pay Clark the initial disclosure fee within thirty (30) days of the signing of the contract, and Clark would provide the information to Bumar within one year from that effective date. For the duration of the contract, Bumar agreed to pay Clark a service fee, and 'royalty' payments determined by a quarterly report of Bumar to Clark. As mentioned before, Bumar was responsible for paying a certain minimum fee back to Clark each year, regardless of production rates. Clark's methods for determining the fees for a non-equity agreement vary from situation to situation. For example, the on-going fee requested for the Bumar project was computed on a percentage of the U.S. sale price, with the decreasing percentage dropping from 4 to 3 to 2 percent over the ten-year period. In addition to providing the royalty payments back to Clark, Bumar agreed to pay Clark a 20 percent sales commission, and was also required to pay a customs tariff of 11.4 percent on axles exported from Poland.

Purchases from the domestic company

Clark anticipated some gain to be forthcoming through the sale of axle component parts to Poland in three ways: provide components until the manufacturing plants at Radomski and Stala Wola were on-stream; sell components which would go into the axles being manufactured (more of a long-range prospect than the first area); and sell exports to Poland which might be indirectly related to the axle production but which were more as a result of the Clark-Bumar relationship than the manufacturing venture.

Purchases by the domestic company

Clark expected to make few if any purchases of its own in regard to the agreement, apart from some equipment purchases which would be resold to Bumar, functioning as a middleman more than a selling agent. No Clark personnel were slated to be living in Poland for any length of time, as the training schedule was to have visits up to three weeks in duration at any one time for Clark employees. Thus, no purchases related to housing or accommodations were anticipated.

Personnel

Training tasks

Domestic company. Clark agreed to provide the necessary technicians and specialists for training in Poland for a certain number of days free of charge (with airfare and local expenses to be borne by Bumar, including a daily allowance). Any days over and above this stated number, however, were to be totally at the expense of Bumar.

Clark was to supply the technical personnel for the Bumar project as needed out of the wide resource of manpower available in the company. When metallurgists were needed, or heat treatment personnel, Clark was to bring them over to Poland. Clark put its domestic employees selected to work with Bumar under a special contract to go over to Poland.

Hayden noted that Clark did anticipate some training needs, although the specific problems, be they worker indifference, careless craftsmanship or poor equipment, had apparently not been determined prior to the project.⁹

Host. The expenses of the Polish technicians brought to the United States were paid by Clark but the anticipated costs of those visits were included in the initial disclosure fee.

Clark agreed to provide a certain number of man-days worth of training to Bumar employees at Clark plants in the United States. For these visits, Clark agreed to pay hotel expenses and a daily stipend to each Polish trainee. (The expenses for this training were assumed to have been included in the price given for the initial disclosure fee.)

Protection

Leverage

The trademark was presumed to be a major point of leverage for Clark in dealing with the Poles. The Clark logo on the axles was considered virtually essential for Poland's axle exports. Indirectly, it was felt that the trademark provided the assurance that Bumar would be kept abreast of all developments or axle changes since Clark would want all axles carrying its logo to be similar.¹⁰

However, the trademark was not considered Clark's only form of leverage. One reason why Clark appeared to have selected the non-equity form of technology transfer

with few qualms was that the corporation felt it had a technology which was able to be transferred step by step. It was pointed out that companies which must place all of their information up front are in a somewhat more precarious position in regard to collecting later fees or royalties. However, Clark feels that an equity position does not necessarily provide an adequate measure of control--even if that position is a majority one, as it was pointed out that "even if you own a subsidiary, you often do not control it." Hence, Clark has sought other forms of control through different leverage measures.

Inspection privileges

Clark has actually found that the standards which the corporation requires for their operations abroad are sometimes actually stricter than the standards which are imposed domestically. However, the company notes that its ultimate desire is to have total interchangeability of parts with no quality differential.

Patent/trademark defense

Clark offered assistance should any patent claims or liability claims result during the course of the agreement, but did not offer to directly defend any claims which arose.

A clause was also included which noted that Bumar was not to incorporate any of the information provided by Clark for use in other new or improved products without first obtaining Clark approval or permission.

The updating between Clark and Bumar in regard to improvements in the axle is a two-way venture. Clark has agreed to keep Bumar aware of all improvements in the axle, but Bumar has also guaranteed to do the same for Clark, and has granted Clark "nonexclusive rights to all (Polish) inventions, improvements and patents acquired or applied for" which involve the Clark axles during the course of the agreement. This area of protection or defense lasts only for the duration of the agreement.

Each different axle model manufactured by Bumar is to be covered by the terms of the overall agreement for a total of ten years from the time the first axle is sold, and is subject to the payment of the royalties. However, after the ten year period has expired for each model, Bumar is entitled to manufacture and sell the axles without the payment of further fees. However, use of the Clark trademark will not be permitted once the agreements have been concluded.

Legal provisions

The arbitration clause is included in all Clark agreements. In the case of Bumar's agreement, the arbitration court in Switzerland is the designated one. A Force Majeure clause has also been included in all three agreements between Clark and Bumar.

In addition to the arbitration and force majeure clauses, Clark included a notation regarding the interference of "supervening powers" and also included a disclaimer regarding no disclosure of military information.

Project Assessment

Because the arrangements between Clark and Bumar were a first in several respects, Clark had no particular expectations beyond the aims of the agreement.

Expectations for the Future

One interesting aspect of the contract is that while the ultimate purposes are stated as axle manufacture, the possibility for joint production or development of metric axles or other projects of mutual benefit to both parties was stated on the first page of Clark's written agreement with Bumar.

Poland

International Harvester Company

Description

On June 7, 1972, International Harvester Company entered into an agreement with Bumar in Poland to manufacture crawler tractors or bulldozers at an existant facility in Poland. The enormity of this undertaking becomes more apparent when it is realized that this agreement included all aspects of the manufacturing and assembly process necessary to create this product. The agreement, of a ten year duration, included rights to the International Harvester trademark, and the obligation on the part of IH not only to furnish their most modern version of the crawler tractor but also to keep the facility updated as to improvements for the duration of the contract. The disclosure fee covering the initial transfer was not dependent on any buyback, but research, engineering and manufacturing fees (REM's) were limited to one-half the value of IH purchases from Bumar, either through the repurchase of components produced by the facility or the buyback of the assembled final product.

Background

Domestic company. Unlike some of the other companies involved in this study, IH had no prior involvements of the non-equity form which it developed with Bumar in Poland or Raba in Hungary. In each of its thirty overseas facilities, it held at least a minority equity position. The Bumar project with no equity contributed by IH was a first for the company in over 140 years.¹

The undertaking in Poland was a completely new venture for IH in several regards. In addition to being the corporation's first non-equity venture, the plant in Poland was designed to manufacture crawler tractors. This was something IH had never built on the European continent prior to this agreement. Their plant in England, however, dating back to 1903, has manufactured the BT-20 model of the crawler tractor.

The international emphasis in the IH name is appropriate, as a high percentage of IH earnings stem from its international activities. In 1977, one-third of total sales of approximately \$6 billion came from outside the U.S.

A major internal corporate reorganization occurred in 1977, resulting in several relatively independent product groups.² In terms of the company's four product

areas, \$2.7 billion alone came from its truck sales, \$2.3 billion from agricultural equipment, \$731 million from Pay Line construction and industrial equipment, and \$208 million from Solar turbo machinery.

Since the reorganization at IH, the Pay Line group is now the division involved with the Bumar undertaking, even though all negotiations were initially conducted through the Overseas Division of IH.

Host. The agreement between Bumar and IH involved the Huta Stalowa Wola facilities, an industrial park complex. This plant already produced construction equipment, but the goal was to produce a more updated version which was both durable and modern. Bumar representative Systus Olesik has stated that "the availability of the IH line of crawlers will complement our existing line of construction equipment for growing Eastern Europe markets and (Bumar) looks forward to being a source for International Harvester products in Europe and other markets best served by Poland".³

The Bumar Union of Construction Machinery Industry is the largest and most specialized manufacturer of construction machinery in Poland. It is the second largest manufacturer of construction machinery within the Council for Mutual Economic Assistance nations, and ranks seventh largest world wide in this type of manufacturing.⁴

Bumar has been described as the manufacturer of nearly 90 percent of the construction equipment produced in Poland with five major operations and 20 plants throughout which employ approximately 45,000 individuals.⁵

The Managing Director of Bumar, Jerzy Zaskurski, has attributed the rank and position achieved by Bumar to product specialization into the heavy earth moving machines, and to a determination to produce the basic hydraulic and drive assemblies thus making it possible to "manufacture not only the finished machines but also all indispensable components."⁶

Bumar currently has its own steel-making plant, steel and iron foundry, forge, and wire drawing plant with numerous machinery and assembly plants within the Huta Stalowa Wola complex. Since 1967, Bumar has specialized in the manufacture and assembly of construction equipment. This agreement involved the manufacture of entire vehicles with many of the pieces to be created at this facility, dependent upon the forging and casting skills of the Polish workers there.⁷

The Industrial Combine, Huta Stalowa Wola, is Bumar's largest manufacturing facility and is located in the southeastern part of Poland. It originated in 1938, was severely damaged during World War II, but has been equipped and updated and today employs more than 25,000 workers in its 150 kilometer radius.⁸

Bumar has held cooperative agreements of various sorts with several companies around the world, including one with the Soviet Union for gearboxes and axles, the International Harvester Co. and Clark Equipment Co. of the U.S.A., Hamworthy, Jones Cranes, and Coles Cranes of Great Britain, Kockums of Sweden, and Stetter of the Federal Republic of Germany. However, the most extensive agreement of any of these is that with IH for the manufacture of crawler tractors, heavy loaders and combustion engines, both as to designs currently in production and for joint research and development on new products.⁹

It should be observed that despite the autonomy of each of the separate countries within the Eastern Bloc, the Bumar Foreign Trade Enterprise has noted that it has a "good tradition of working closely with construction equipment producers in the USSR, Yugoslavia, Romania, and Czechoslovakia."¹⁰

Transfer of technology

The initial cooperation agreement between the International Harvester Company and the Polish Industrial Combine Huta Stalowa Wola was signed on September 18, 1972, and included the production, sales, and technical service for a series of medium-sized crawler tractors, involving 140, 200, and 285 horsepower, crawler loaders, and pipe layers.¹¹

Turnkey. This project was not a turnkey venture in the usual sense, in that IH did not construct the facility or even design the layout for the equipment. Bumar did the layout, but was able to seek the advice of IH for any difficulties which might come along.

International Harvester did have "advisory obligations to Bumar in the matter of manufacturing process and technology, but no obligations or responsibility or the right to interfere in the selection of manufacturing equipment or organization of manufacturing" as this was entirely at the discretion of Bumar.¹²

Knowhow. IH transferred all product technology for crawler tractors, vehicles which fall into the earth moving equipment category. The transfer included all assembly line techniques and other process knowhow.

It has been stated that under the 1972 agreement between Bumar and IH, "Bumar obtained the engineering and manufacturing knowhow and the rights to manufacture and sell three basic sizes (five models) of crawler dozers and loaders: TD15C tractor-dozer, 175C loader, TD20E tractor-dozer, TD25C tractor-dozer, and the TD25CS side-boom."¹³

Production knowhow included the specifications required for the metals and other materials going into the manufacture of the equipment. Information essential to this manufacturing process involves the tooling and

machine techniques required to correctly operate the equipment, and the inspections and the specifications which must be met in regard to the quality control measures. Process knowhow generally involved the assembly line skills, but also overlapped into the area of machine operation.

The initial technology was also to be updated by IH for the duration of the agreement until three years before its conclusion, which would be in 1979 of the ten year period or thereafter, if the agreement had been extended. At this time, the information would become property of Bumar if all other responsibilities had been fulfilled.

International Harvester agreed to provide all updates on the technology transferred under the agreement, but this pertained only to the immediate equipment included in the contracts. Thus, if IH were to develop a new machine which was substantially different from the existing ones, even if it qualified as a crawler tractor, this technology would not automatically be transferred to Poland. Or, if substantial changes were made in the existing equipment, such as a new axle assembly or another major part, this would not automatically be transferred, either.

The technology transferred by IH only pertained to those areas where IH possessed ownership. For example, the electric starter motors in the vehicles were purchased from third-party vendors by IH, and thus, certainly could not be transferred to Poland.

Management. No managerial aspects, per se, were contained in the contract in a separate area, but the training knowhow overlapped with managerial areas in the process techniques.

Patents. The crawler tractor agreement involved one major patent which IH supplied.

Trademarks. Yes, IH had to supply its trademark as one stipulation of the contract but Bumar's responsibility in this regard was that the product produced meet the strict standards imposed by IH.

Buyback. While International Harvester "assumed no specific obligations to buy anything from Bumar" during the course of the project as stated under their 1972 agreement¹⁴, it was anticipated that IH would purchase both components and entire vehicles back from Bumar, as reflected by the interconnection with the REM fee calculations.

The desirability of the buyback stemmed from the lower cost advantage, but the fact that the vehicles would have been manufactured in a new plant which is totally up-to-date, utilizing the latest in equipment as well as in technology, would also be an enticement.

Three French machine centers were purchased, at a price of \$1.5 million each. These were for manufacturing the crawler tractors. One of the four models being produced was to be of a completely new design while the other three reflected models similar to those in current production.

Other aspects. The contract between IH and Bumar provided Bumar exclusive marketing rights to some countries, including all territory in Eastern Europe, and non-exclusive rights to other countries which were identified individually or by certain regions.

The exclusive and non-exclusive rights provided to Bumar by IH in the sale of the completed products related, in part, to the type of engine carried by the machine. Bumar is permitted to sell products carrying either the IH or its own Polish diesel engines throughout Poland and Eastern Europe. Outside of this region, the equipment must have an IH engine only if it is marketed through an International Harvester distributor in the non-exclusive countries.

International Harvester supplied all the requisite technology for the complete manufacture of the construction equipment, but insisted that its own engines be installed in the machines, at least the ones distributed through its own international network of dealers. Furthermore, it also had negotiated a contract such that

the Poles had committed themselves to purchasing at least a certain amount of both completed products and components until their own facility was self-sufficient, thus guaranteeing IH of product sales which it would otherwise not have obtained.

Guarantees were in effect from the viewpoint of both parties in this agreement, in that Bumar was also assured by IH that both the completed products and the components would be available to Bumar. This alleviated the possibility that Bumar would be caught short at some point before its own manufacturing facilities were functioning or be unable to complete its assemblies because certain components were unavailable.

Responsibilities

Domestic company. The responsibilities of International Harvester in the agreements with Bumar were; to be available for consultation if desired on the renovation or installation of equipment for the manufacturing process, to provide complete product and process information and knowhow, to make all necessary patents and IH trademarks available, and to buyback components and completed machines as required for resale through the international marketing network of International Harvester.

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Host. The responsibilities of Bumar, in Poland, were to build and equip the facility, including casting and forging abilities, as well as all manpower and raw materials which met IH specifications, and to properly reimburse IH for its technology. Furthermore, Bumar had to make certain that the product produced, whether in component form or in its completely assembled state, conformed to rigid IH specifications before the IH trademark was permitted to be applied.

Corporate Perception of Benefits
to be Gained from Agreement

The major reason for entering into the agreement by International Harvester involved the sale of whole vehicles until the Polish facility produced its own, accompanied by continuous sales of components and replacement pieces.

Since Poland already either manufactured or acquired from within CMEA tractors, wheel loaders and pipe layers, in the conventional sense, the country did not present a viable market, as such, for International Harvester.¹⁵ The opportunity, therefore, to sell completed products until the Polish undertaking was on stream and component and replacement parts even after that time was considered to be the major benefit of the agreement. This increased market for whole units, component parts and even service parts pertained not only

just to Poland itself, but to the entire East European region. These sales involved the components which were purchases for assembly into the machines produced by Bumar, and also for servicing the needs which arose throughout Poland which were not filled through conventional Polish channels.

The second reason for desiring the arrangement with Bumar, was the direct profit to be gained through the technology sale itself. Since IH viewed the Eastern Bloc as a closed territory for sales in its conventional manner, this technology sale provided a source of income which would otherwise not have been possible.

Making use of this technology before it became obsolete was only a secondary consideration in this instance since only the most modern technology was transferred to Poland. A more viable concern would have been that of the creation of a competitor should the supply of the products exceed the demand. However, at the point in time that the agreement was negotiated the unfilled backlog was predicted to increase, and IH's concern was directed toward filling those orders, not worrying about competition.

The incentive to provide Bumar with the latest equipment designs did not appear limited to obtaining the contract. International Harvester stated that it wanted to uphold its own reputation as a leader in the area of

construction equipment. This reputation would be enhanced through the additional attention paid to the Polish undertaking and the subsequent spread of its products throughout Poland and Eastern Europe.

The third reason for the desire of the agreement, in the viewpoint of IH at the start of the operation, was the potential source of products both completely assembled and component parts, which IH would be able to obtain. The buyback aspect of the agreement was in part essential to obtaining the contract, but it also involved products which IH, through granting its trademark and applying the rigid qualifying measures which all products carrying its trademark had to meet, would be able to use within its own marketing plans.

International Harvester expected to benefit from the sale of products during its agreement with Bumar, regardless of the purchaser of the product. A royalty had been guaranteed back to IH from all products sold carrying its trademark, so all sales by Bumar would contribute to the sales of IH as well. Furthermore, all purchases of the products, either completely assembled or components, by IH, are annually negotiated at a competitive price. Thus, IH will not be required to purchase products back at unfavorable prices.

The advantages to Poland and Bumar should also be examined. Bumar, through its agreement with IH, had

obtained the latest technology in regard to certain construction equipment. It had not only obtained this equipment for its own internal use, but also had a highly viable product for sale and export, thus providing a excellent source for obtaining hard currency.

Surprisingly, IH did not view their Polish operation as a toehold toward increasing involvement of an equity nature, despite the fact that IH had no prior non-equity arrangements anywhere else in the world. Granted that most East European nations do not permit equity ventures; however, several countries in Eastern Europe had stressed their desire for equity joint ventures, even with Western-based companies.

Instead, IH viewed the Polish venture as one where IH technology teamed with the capital and manpower resources to produce the product, and one where IH ideally gained an additional supply source through the capital and efforts of others.

Negotiations

Parties involved

Negotiations between Bumar and IH were handled through the Overseas Division of International Harvester, the section of the corporation which had been responsible

for all international activities from the wholly owned subsidiaries to export licensing.

International Harvester representatives included its President and Chief Executive Officer, Brooks McCormick, Executive Vice President, Omer G. Voss, and the President of the Construction Equipment Division, Jules C. Laegeler. Two representatives from the Overseas Division of the IH Special Operations Group were also valuable contributors, Robert J. McMenamin and William B. McIlvaine, Jr.¹⁶ Negotiations on the Polish side were conducted through the Ministry of Machine Industry. Bumar's own Foreign Trade Enterprise takes care of all imports and exports involving Bumar, and is under the control of the General Director of Bumar. Negotiators from Poland included the Directors of the BUMAR Union, Huta Stalowa Wola, and the BUMAR Foreign Trade Enterprise.

Initiating contact

The initial invitation was made by Poland to International Harvester because of the company's reputation in the construction equipment area.

Length of negotiations

The contract between Bumar and International Harvester, signed in 1972, was not a hasty venture. Initial contact was made between IH and Poland in Chicago in 1968, and the first visits on the part of the corporate officials were made to Poland in 1969, three years prior to the signing.

Part of the reason for the extended period of time passing between the initial contact and the final contract approval was the delay while the Polish construction equipment industry organized its own foreign trade enterprise, BUMAR F.T.E., in 1971.¹⁷ This foreign trade enterprise has the responsibility for organizing the foreign relationships of the industry, both in export sales and licensing, with the ability to purchase foreign construction equipment for production in Poland as well as for domestic use.

The initial negotiations between IH and Bumar were the most difficult, in part because both parties were venturing into new and unknown territory. Each time the tentative contract contents were revised or amendments added, a new fee schedule had to be drawn up. However, accord was reached, and the success of the initial project, that of crawler tractors, is reflected in the later agreements involving the wheel loaders.

Issues and obstacles

An initial issue facing the negotiations involved the non-equity nature of the Polish proposal. Since International Harvester had never ventured into such an undertaking before, this factor had to be worked out.

The large scale of the project was another factor adding to the length of the negotiations, because so many issues had to be considered. The fact that this was one of the few operations, especially in the industrial goods area, where total products were to be manufactured, not just components, expanded the extent of the undertaking, hence the negotiations, even more. Such issues as the qualifications necessary for the IH trademark, the delineation of marketing territories, and the feasibility of the buyback were involved. The buyback issue was one of Bumar's requirements which IH was willing to consider in return for gaining access to the Eastern Bloc.

The Poles were not willing to accept anything less than the most modern and updated technology since their intentions were to manufacture quality equipment that would benefit construction and other developments within their country as well as to provide them with a viable and desirable product for sale and export. However, it would also be accurate to point out that

International Harvester's concern with keeping its Polish partner up-to-date in regard to its latest technology involving their products was doubly beneficial because of its plans to repurchase so many of the completed products as well as components itself.

Time Frame

The agreement between Bumar and IH was signed in 1972, and was to be effective for ten years for the manufacture and assembly of crawler tractors. The contract concentrated on the duties or responsibilities to be performed rather than specific deadlines.

Financial Flows

Payments

Payment for this technology was to be made by Bumar in the form of an initial disclosure fee and subsequent research, engineering and manufacturing fees (REM's) "expressed as a percentage of the value of units produced by Bumar during the term of the agreement."¹⁸

Financial flows were anticipated to be high, as one statement from IH Executive Vice President, Omer G. Voss noted in a news release at the time of the signing in 1972, "though it is difficult to accurately assess the

full impact of this agreement on IH, we expect that it will improve sales by many millions of dollars annually. This venture will enable International crawlers and loaders for the first time to be manufactured and sold in substantial quantities in the rapidly expanding markets of the Comecon countries and will enable IH to increase its sales in Western Europe as well."¹⁹

International Harvester's fees from this non-equity technology sale of the crawler tractor transfers were to come from several sources. The initial fee resulted from the disclosure payments. Furthermore, although the content of the completed machines were to be 50 to 60 percent Polish or national content, IH was to supply the remaining components, either from the United States or through their British subsidiary, which was another source of profit. In some cases, the sale was not just components but the complete machine. In other instances, it was the replacement or service parts. In such latter instances, royalties were not paid if sold to Bumar. Other sources of profit were also to be generated in that IH would also be able to purchase components back from the Polish facility for use in their own manufacturing operations in England or elsewhere. The Polish facility also was to supply IH with complete machines which would be provided to IH at a negotiated price.

Purchases from the domestic company

International Harvester expected, by 1978, to see an annual production of 1500 completed units by Bumar with an invoice value of \$100 million.

Purchases by the domestic company

No major purchases were anticipated on the part of IH over and above the component or completed assemblies under the contract. No major housing or accommodation purchases were anticipated as the training was to be done in the United States with only periodical visits on the part of the IH representatives to Poland.

Personnel

Training tasks

Domestic company. International Harvester did not specifically indicate in the contract the number of individuals to be involved. Their intention was to train the Polish supervisors in all aspects of production and assembly regarding the production of crawler tractors. The contract did provide for a specific number of man months of training which IH would provide for Bumar employees in the United States. The contract also noted

the number of man months for IH personnel which IH would make available to Bumar in Poland. Bumar was to cover their expenses. Their approach was to have the Poles come to the United States, at Bumar's expense, for the training, so that the expenses on the part of the Americans would be minimized. International Harvester did expect some difficulty in getting corporate employees to accept positions involving frequent trips to Poland.

Host. It was recognized that extensive training would be required but the past experiences possessed by Bumar employees were taken as an indication that the basic skills were already there, and needed only to be applied to the IH particular manufacturing and assembly processes. Poland was to pay for all expenses for its employees, although IH was to provide Bumar trainees with a daily stipend while they were in the United States. The contract stated a certain number of man hours to be contributed by IH representatives.

The technology was transferred via drawings, but was also demonstrated in shop practices where utilization was to be stressed.

Protection

Leverage

International Harvester did not appear to be particularly concerned about the possibility that Bumar would not provide the appropriate royalty payments due IH, based upon the sales by Bumar of the machinery and components. This lack of concern appeared to be based upon the excellent working relationship between the two parties and upon the IH trademark. Should Bumar not honor its agreement with IH, the use of the trademark would no longer be permitted. Hayden points out that "the Poles know that without the quality guarantee assured by a U.S. company's trademark, their own products would have little chance of competing in Western markets; without access to the U.S. company's product improvements and its West European servicing agents, their own output would not long endure in the competitive West."²⁰

Domestic company. Thus the trademark was considered to constitute a high form of control. The threat of the loss of the IH trademark was expected to provide IH with a form of control since the trademark's loss was seen as having a detrimental impact upon Bumar's operation.

However, another form of leverage was contained in the arrangement in that Bumar still had to purchase engines from IH to qualify for the IH trademark. It was felt that the Polish designed engines in the American-designed machines would not provide a specific level of performance. Thus, should IH refuse to sell engines to Bumar, the entire production capability would be limited to only selling components and complete vehicles utilizing the HSW Trademark. Therefore, the components supplied by IH, in addition to the trademark, also constituted a high form of control over the status of the project, even though the technology itself had been transferred.

International Harvester also stipulated that the technology which it provided to Bumar was not to be transferred to anyone else. At the conclusion of the agreement, either after ten years or whenever the agreement was to end if extensions had been applied, Bumar was to have ownership of the technology if all responsibilities and guarantees had been met. This technology would include all updated aspects which had been developed throughout the course of the agreement, up to three years prior to the conclusion of the agreement.

A technology guarantee was provided by IH to the effect that Bumar would be able to create vehicles

meeting IH standards if all instructions were correctly followed and the proper raw materials were used.

Host. Bumar also had a high degree of control in this operation, in part because IH had requested that the products being produced at the Polish facility be available to supply IH's own subsidiary in England. Thus, IH's assembly plant in England needed the products being produced in Poland, while Poland also required some of the components from IH.

The only financial guarantee posted throughout the operation appeared to be the letter of credit posted by Bumar to cover the first payment of the disclosure fee. This was a one-time event, however, and was not expected to be repeated.

Inspection privileges

Inspection provisions were included for IH because of the strict standard requirements accompanying the IH trademark. IH was guaranteed access to inspect and test the workmanship of all products being produced under its trademark.

Patent/trademark defense

The patents involved with the technology were required to be registered in Poland.

The use of the IH trademark was open to Bumar, as long as the stipulated rules and regulations were followed.

Legal provisions

An arbitration clause was included in the contract, as well as a Force Majeure notation.

Project Assessment

Factors expected to make the project easier than usual

The past experience of the Bumar employees was felt to be a great advantage, because so many of the procedures would already be familiar to them. International Harvester also felt that the training sessions conducted in the United States where similar production was actually taking place would be an ideal way to provide a working example for the Poles. The past experiences of International Harvester throughout the world were also expected to be of great help, because, although none of the arrangements had been of a non-equity nature, the

international background had provided IH with a broad scope of potential problems and their plausible solutions. International Harvester felt that it entered into the agreements with Poland with general expectations, but no fixed, firm ones.

Factors expected to make the project more difficult than usual

Several aspects of this technology transfer appeared most formidable. First, it must be noted that the extent of this technology sale included total vehicles. Unlike other transfers which involved only a portion of the vehicle, such as the axle or braking components, IH had agreed to transfer the entire knowledge behind one of its more desirable units. Furthermore, it guaranteed that through the correct application of its blueprints and training, these vehicles would be able to be manufactured to meet certain specifications which would permit the use of the IH trademark.

The buyback aspect of the agreement provided further pressure upon IH to succeed in this endeavor since the corporation's hopes for an additional product source were dependent, in part, upon the successful production of the intended machines.

Another difficulty involved the fact that this arrangement was a first in regard to a transfer of this type with Eastern Europe, a region somewhat unknown to IH. This factor, combined with the totally unfamiliar non-equity type of contract, required IH to feel its way as it went along. Due to the nature of contracts and agreements with Eastern Europe, the transfer had to be totally laid out prior to the start of the agreement, thus forcing IH to project its expectations without much past experience to go by.

However, IH felt totally confident that the project would succeed and also felt that it would be able to work through any problems or difficulties which might arise.

Expectations for the Future

International Harvester hoped that the agreement with Poland would result in (relatively) immediate product purchases by Bumar from IH, until the facility in Poland was producing on its own. In the long run, IH hoped that this initial contact with Poland would lead to further agreements both in Poland and throughout East Europe. However, these expectations, while important, were secondary to the hopes that the immediate project would be fruitful and profitable, particularly in terms of the technology fees and equipment sales.

Poland

Honeywell, Inc.

Description

The 1974 agreement between Honeywell, Inc. in the U.S.A. and Metronex/Mera in Poland involved the Class 41 Transmitter, an electronic pressure transmitter based on a piezo electric silicon sensor. It concerned technology which had been developed in the United States to be transferred into Polish production with the help of only the U.S.A.-based division. The agreement was scheduled to last five years but did have provisions for extensions.

Background

Domestic company. The Polish government insisted that the agreement include the sensor technology specifying that all information be at the latest and most updated level. Surprisingly, considering Honeywell's usual reluctance to provide such current technological information, the company agreed to such a demand. This was unusual on two counts. First, in this instance, Honeywell controlled the only source of this sensor technology. Second, the stated interests of the corporation have been to sell products, not their technology behind the products. Still, an accord was reached and

the agreement was concluded, but was subject to the approval of the United States government on the transmittal of sensitive technology.

Hayden reported that Honeywell was more inclined to sell its technology to a developing nation than a developed one, to avoid setting up a competitor to itself, because it felt that the underdeveloped country would be less likely to develop into a competitor.¹ Eastern Europe appears to fall somewhere between the developed and underdeveloped country. Honeywell was concerned that their technology, especially that relating to their valuable sensor assembly and construction, not fall into the wrong hands, including the Soviet Union. But the company also felt that Poland was particularly desirous of working with their company, at least for the immediate future, and would not be willing to risk that relationship at this time by transmitting this sensitive technology to others.

Honeywell, Inc. provides an example of a technology exchange utilizing a product available only through the Honeywell auspices. The corporation categorizes its operations into four areas; environmental systems and controls, industrial systems and controls, aerospace and defense, and information systems. Its total annual revenues are close to three billion dollars, with the Information Systems area providing more than one billion alone. Honeywell, Inc. has transferred technology in a

manner similar to this arrangement with Metronex to other parties in Holland, Italy and Japan from the 1940's through the 1970's. Various Honeywell products have been involved, such as residential heating, industrial products, and aircraft control devices and systems.

The corporation is currently involved with a technology transfer agreement with Poland through a license involving the Class 41 Transmitter developed by the Process Control Division located at Fort Washington, Pennsylvania. This technology transfer to Poland is under the industrial systems and controls area which provides control devices, analog and microprocessor based instruments and computer based systems for data acquisition, monitoring and control of industrial and electric utility processes.

Host. The agreement was signed by the Polish Foreign Trade Enterprise, Metronex, which is part of the Polish Trade Union Mera. Metronex is an import-export agency in Poland for a particular category of goods under the umbrella-like auspices of Mera.

The Technical Assistance Agreement between Honeywell, Inc. and the Polish Foreign Trade Enterprise, Metronex, representing the interest of the Industrial Union Mera effective December 19, 1974, was not the initial contact between the corporation and Poland, although it was the first to have totally American-based involvement. Three license agreements had been established

in 1973 between Poland's purchasing enterprise, Metronex, and three European-based subsidiaries of Honeywell. All three agreements involved some aspect of technology exchange. The Honeywell Europe S.A.-Mera/Metronex Agreement of May 10, 1973 (also called the Milan Agreement) involved a license for Poland to manufacture two devices, the Differential Pressure Transmitter No. 411, and the Pressure Transmitter No. 412 for five years. The Honeywell GmbH Agreement, signed in June 1973, involved the manufacture of the Vutronik line of valves to control the fluids in large pipes. Honeywell's Scottish subsidiary, Honeywell, Limited, licensed production of the Vutronik line of recorders and controllers in November 1973.

Transmitters are important to Poland because of their versatility, especially in the area of petroleum extracting and refining. Since Poland's plans for the future include a heavy emphasis in this area, this technology is of prime importance to the country's chemical industries. Hayden noted Poland's indication that it hopes to double its current oil consumption by 1980 and one-third of the country's 1976-1980's expenditures have been assigned for the construction of new refineries and petro-chemical plants.² These transmitters are used as monitors on pipes carrying liquids. Solid state construction makes the item both durable and unlikely to break

down. It also provides an extremely accurate gauge of the pressure of the liquid within the pipe. Thus, the Honeywell product is in demand both because of its design and also because of the increased need for such a product.

Transfer of technology

Honeywell indicated that it would do the following in order to efficiently transfer this new technology to Metronex:

- (1) Transfer to Metronex in Poland all testing equipment required to test various types of Class 41 Transmitters;
- (2) Provide Metronex in Poland with Class 41 Transmitter acceptance kits;
- (3) Utilizing Honeywell Employee services, would;
 - (a) train Metronex specialists at Honeywell facilities in the U.S.A. (Fort Washington facility),
 - (b) send Honeywell supervisors to the facilities of Metronex in Poland in order to have the Metronex staff assemble the Class 41 Transmitter acceptance kits into Class 41 Transmitters by the proper utilization of the special testing equipment in the execution of tests;

- (4) Support Metronex specialists in the U.S.A. and Poland regarding the manufacture and utilization of sensor assembly.

Turnkey. Involvement by Honeywell in the operation was most comprehensive but since Honeywell did not construct the building, this project would not fall under the usual definition of a total turnkey operation. In this instance, an existing facility was remodeled. However, Honeywell did supervise the entire equipping of the plant, right down to the screwdrivers. This included providing equipment either constructed at Honeywell's operations in the United States or purchased from third party suppliers through the Honeywell auspices in the U.S.A. In addition to the purchasing and installation of the equipment, Honeywell supervised the tooling of equipment where necessary. This equipment came under the categories of device acceptance kits, special testing equipment, and certain production tools, including tooling facilities. Upon expiration of the contract, these items were to remain the property of Metronex.

Information and knowhow. All product and process technology were initially provided in regard to the Class 41 Transmitter, including all information related to its construction and testing, with the exception of the sensor technology which was to be held in abeyance until the fifth year of the Agreement. Honeywell agreed to sell the

special testing equipment required to test the manufactured assemblies, and acceptance kits to Metronex in Poland. This was considered to be part of the total Honeywell knowhow package encompassing the manufacture, testing, servicing, and repairing of the Class 41 Transmitter assemblies or sub-assemblies. This included the:

- (a) testing (but not the manufacture, servicing or repair of these items) of electronic components and sub-assemblies of these transmitters which are also used in other Honeywell products;
- (b) testing (but not the manufacture) of the portions of these transmitters which are purchased from third party sources but which are used in the transmitters; and
- (c) testing and servicing (but not the manufacture) of machines and other apparatus purchased by Honeywell from third party sources but which are used to manufacture the transmitters.

The Class 41 Transmitter Technology transferred included the Class 41 pressure, differential pressure, flange mounted level, extended diaphragm flange mounted level, absolute pressure and compound transmitter models. In addition, Honeywell agreed to transfer all knowhow relating to developments and improvements of these Class 41 Transmitters during the contract period.

This agreement was to include all information owned by Honeywell at any time during the term excluding items involved with the sensor assemblies from third party sources. Honeywell sensor assembly knowhow was considered a special aspect of the technology transfer and was the subject of some special provisions.

The English language version of the agreement is the official version. All knowhow documentation was to be in the English language.

Management. Management of the plant was not the responsibility of Honeywell, although training which included managerial and production techniques was provided both on-site in Poland and in the United States at the Fort Washington plant.

Patents. Honeywell agreed to furnish patent information to Poland should the Polish patent rights be challenged by a third party. Honeywell agreed to provide Poland with a list of all patents owned by Honeywell related to the Class 41 Transmitter within three (3) months of the start of the agreement, with an updated listing one year before the agreement's conclusion.

Trademarks. The agreement provided patent rights and trademark rights of a sort. The label of the Polish product is to read "Made in Poland-MeraPnefal under license from Honeywell, Inc." This notation must cease when the agreement expires.

Buyback. The agreement did contain an allusion to a buyback clause, but only on the condition that the items selected be of comparable price and quality in meeting recognized needs. It contained no "hold-back" clauses referring to withholding of payment, products or services should responsibilities of either party not be met.

During the five year period of the agreement Poland is allowed to sell the completed assemblies within the Eastern European area including Poland, Hungary, Czechoslovakia, Romania, the Soviet Union, Bulgaria, East Germany, Yugoslavia, Albania, and Mongolia. They will also be able to sell the assemblies outside of the East European region after the five year agreement is concluded.

The implication that Honeywell would buy back an equivalent product if desired quality and need existed implies the pressure that was placed on the company to include the buyback aspect in the agreement. The fact that Honeywell had the leverage aspect of proprietary claim to the product being the only firm to possess this particular sensor technology, however, appeared to be instrumental in being able to avoid a total buyback commitment.

Other aspects. Total assemblies and sub-assemblies were also to be provided by Honeywell to help meet production quotas until the plant was operating under its own

production and also for training the Polish workers in the assembly process.

Responsibilities

Domestic company. Honeywell's responsibilities, in general, were to equip the factory, train the workers, transfer knowhow regarding the Class 41 Transmitter, and provide certain testing apparatus. Their duties were not to end until 75 units, which met all specifications, came off of the assembly line. However, this responsibility did not include overall management of the project, but only specific approval of machines and tooling levels. Honeywell was responsible up to the point that the host could manufacture the instruments within certain specifications.

Honeywell, Inc. agreed to provide the services of Honeywell specialists and supervisors to perform specified training tasks as well as to provide special testing equipment and device acceptance kits. Specified documents of Honeywell knowhow were to be provided by certain dates; particularly, but not limited to, the first six months of 1975, or within certain time periods following the release of manufactured items. Documentation refers both to the current documents for the Class 41 Transmitter and to all future class 41 Transmitter changes or revisions made by Honeywell.

Honeywell also was to provide samples of the transmitter or portions of the units involved in the creation of the transmitter at specified times and agreed to test five transmitters each year for the duration of the agreement. Honeywell would also supply additional employee services should Metronex request such services.

Honeywell agreed to supply the sensor assembly knowhow, including employee services, available during the calendar year 1979. Only the list of machines, including manufacturers utilized in the sensor assembly, was previously provided in early 1977.

Access to the sensor technology appears to be more of a start than a conclusion in that the manufacturing capabilities required to produce this intricate item are considered rigorous. Thus, should Poland decide to go ahead with the manufacture of the sensor, expensive tooling of the equipment and additional training of employees will be required and would be subject to further agreements and an extended time limit.

Host. A summarized listing of the responsibilities of Metronex under this agreement would be that they were to follow all instructions specifically as laid out by Honeywell. As well, they were not to sell or provide services connected with the Class 41 Transmitter outside the Eastern European territory until the specified time

limit had been concluded. In terms of their own aims, Metronex hoped to eventually manufacture a product which had 15 percent U.S.A. input, or less, which met specifications.

Another responsibility of Poland was to inform Honeywell of any improvements made by Poland in the Class 41 Transmitter or related process control instruments, including all technical information of the developments. This could potentially lead into a joint development venture, should they improve on the product for either local or international production.

Corporate Perception of Benefits to
be Gained from Agreement

Honeywell entered into this agreement with Poland with the view that this opportunity offered Honeywell the chance to increase the corporation's penetration into Eastern Europe in general as well as the opportunity to sell more products. The hope was that the Honeywell name would become better known throughout Poland and Eastern Europe so that items not even indirectly associated with the Class 41 Transmitter would also be purchased from Honeywell. Honeywell did not view the manufacturing situation as a source from which to obtain additional transmitters. Thus, the sale of technology was the main initial motivation for Honeywell in desiring this agreement

with Poland. Accompanying benefits included the sale of assemblies or sub-assemblies, particularly until the Polish production capabilities were functioning, and the access gained into a new market.

Negotiations

Parties involved

Domestic company. A three-man team was involved in the contract negotiations; one person a representative of the Minneapolis-based headquarters, one from the Fort Washington, Pennsylvania, manufacturing plant where the Class 41 Transmitter, the item involved in the agreement, is produced in the United States, and one experienced negotiator and person highly familiar with the Polish culture, language, and previous Honeywell European agreements.

Host. The agreement was made between Honeywell, Inc. and Metronex, a part of the Mera Union within Poland. The individual factory employees in Poland were only generally consulted during the negotiations, although the Fort Washington plant's representative was an integral part of the team representing Honeywell on the part of the United States. Implementation of the agreement would be the responsibility of the two respective plants, however, both as to equipping and training.

Initiating contact

The Polish government was interested in obtaining access to the Honeywell technology and had made the initial overtures, but most of the contact grew as an extension of the discussions carried over from the European agreements signed in 1973.

Length of negotiations

Total time involved in the negotiations, including discussions on the sensor technology, took approximately 1½ years. Much of this time involved first obtaining the permission and then discussing the methodology for the transfer of the silicon sensor technology, the particularly desirable aspect of the Class 41 Transmitter.

Issues and obstacles

Security and approval. Governmental approval had not been secured by the date of the signing in 1974. A compromise was reached in that Honeywell, Inc. would provide all other information initially, and offered unlimited purchases of the sensor for the course of the Agreement. During the final year of the agreement in 1979, Honeywell would then transfer the sensor technology if all permission had been granted. Permission was eventually granted by

the U.S. Department of Commerce to provide the sensor data as of January 1979.

The negotiations were held both in Poland and in the United States. However, the location selected as the depository for the sensor data until the 1979 deadline had been reached was in neither country, but in a third area, considered neutral by both parties. The Swiss Depository Bank was selected in Geneva, and the appropriate documents were to be placed on reserve there during the first six months of the Agreement.

To insure that the technology would be supplied to the East European recipient at the appropriate time, regardless of political or other intervening forces, the data placed in the bank on microfilm, was provided with instructions that it was to be turned over to the appropriate Polish authorities as of January 1979 should unforeseen circumstances prevent the final transfer to Mera. The only condition which would nullify these instructions would be default by the Poles on the terms of the agreement, when despite notification of the default, the situation had not been corrected. Barring war or other circumstances beyond the control of either party involved, the turnover of the documentation would include the updated technique, based on the improvements made over the course of the five years of the agreement.

Honeywell's stated corporate philosophy is to sell products, not necessarily technology. Foxboro, an American competitor of Honeywell in the process control division, was also being considered for this Polish contract, although the Foxboro products are different in composition from Honeywell. However, part of the reason for the acceptance of the Honeywell contract, Hayden states, was that Honeywell was willing to sell their technology for the Class 41 Transmitters and willing to provide the training necessary for the manufacture of these transmitters. The Honeywell willingness to transfer this technology and the novelty of that principle was the selling point which provided the basis for the acceptance of their offer over all the others.³

Detailed contract format. The format of the contract was extremely detailed, designed that way in part because of some experiences of Honeywell's European subsidiaries. It required strict adherence on the part of the Polish engineers to each aspect of the transfer. Screws were not even to be changed without permission. This was viewed as essential by Honeywell. Past experiences, particularly with their Scottish subsidiary, had indicated that comprehensive contracts produced better actual operation. Thus, despite the desire on the part of the corporation to conclude the negotiations as quickly as possible to free the employees involved with the

negotiations for other matters, each element of the transfer was painstakingly explored and delineated.

Time Frame

Overview

The Technical Assistance Agreement between Honeywell, Inc. and Metronex, effective as of December 19, 1974, was to run for a period of five years, until December 31, 1979, but was able to be extended, subject to terms mutually acceptable to both parties, if such a request were received 12 months prior to December, 1979.

The estimated time frame for the entire project of five years included one year to 1½ years for the startup of the assembly, or from the opening on October 19, 1974 to December 1975--June 1976. Four months for equipment installation was included in this time frame with an additional two months of training provided for learning how to operate that equipment. The entire agreement was to conclude December 31, 1979, unless the extension was requested.

Special considerations

Knowhow. Honeywell listed the documents which contained all the knowhow regarding the Class 41 Transmitters and provided Metronex with one copy of each document during the six month time period extending from January 1, 1975, through July 31, 1975. The time schedule for any Class 41 Transmitters which might be developed during the period of the agreement stated that the necessary documentation was to be sent to Metronex within 30 days after Honeywell had approved the item for manufacture.

At the conclusion of the agreement, Honeywell was to provide a transparency and a microfilm copy of all drawings involved with the knowhow package (in metric dimensions) as well as a copy of all Engineering Change Orders relating to the transmitters and subsequent revisions.

The timing for the transfer of the sensor assemblies, subsequent to approval by the U.S. Government, was that the documentation was to be provided starting January 1, 1979, with all information transferred by February 1, 1979. The information being used for security purposes was to be in the Swiss Depositor's Bank within the first six months of the start of the agreement, or by June 1975. Prior to the ultimate transfer of sensor assemblies, Honeywell was to provide Metronex with a

complete listing of all machines and other apparatus used to manufacture the sensor within 30 days after January 1, 1977.

Payments from Metronex to Honeywell. The payments were divided among the total five years, although the greatest bulk of the money was to be paid within the first two years, in the first three payments. With the exception of the first payment which was due shortly after the signing of the agreement, late in December 1974. All other payments were to be preceded by a letter of credit which was to be lodged with the Philadelphia National Bank by a certain date.

Products purchased from Honeywell by Metronex. Honeywell agreed to sell Metronex both full units (of the Class 41 Transmitters) as well as parts and sub-assemblies, both to provide for the need for the product until the Polish manufacturing facility could get underway and also to provide a training ground for the assembly of the units.

The price lists for the respective units or sub-units were listed in the agreement with a full price given for full units (including a 10 percent discount off the current retail price) and a stated price listed through the end of 1975 for sub-units, and a pricing formula to be effective after that period of time.

A fixed price was applied to all sensor assemblies purchased through 1977, (with a maximum of 2000 units per calendar year) and a pricing formula which would apply through 1984. Metronex was also supplied with a procedure to follow in terms of timing in regard to projected need forecasts for the products.

Patent listing. An initial listing of all patents owned by Honeywell which related to the Class 41 Transmitters involved in this technology transfer were to be passed on to Metronex within the first quarter of 1975. An update of this listing was also to be supplied by the end of 1978.

Training. The agreement listed a training schedule that provided for the man-days to be supplied by Honeywell and Metronex as well as a complete listing of the types of training to be offered and the description of the skills areas or backgrounds of the persons to receive such training.

Production deadlines. The project was intended to go into production within the first quarter of 1976 when the following conditions had been met:

- (a) Polish operators selected for production
- (b) All special testing equipment installed
- (c) Production methods decided
- (d) All Class 41 Transmitter acceptance kits ready
- (e) 75 transmitters to be assembled, which met specifications.

Extensions. The agreement was to be open to extension, if application had been made 12 months prior to its conclusion in December 1979, or, by December 1978. The extension would not affect the transfer of the sensor technology, and while any extension would allow Metronex access to updated technology in the Class 41 Transmitter area generally, an update on the sensor technology would not automatically be a condition of the extension.

Honeywell's inclination to extend the agreement would appear to be quite positive, because an extension meant more product purchases should be involved than would normally be the case. Poland's desire to continue the agreement would provide the country with more technology updates.

Financial Flows

Payments

Payments to Honeywell have been in the currency utilized by the subsidiary involved. The Scottish subsidiary's agreement, for example, specified English pounds, while the American corporation's agreement of 1974 requested dollars. All payments were to be in U.S.A. dollars, net of any taxes or other charges by the government of Poland.

Honeywell was to assume all responsibility for arranging and paying for any required export licenses required for this agreement.

Metronex was to arrange and pay for all required import licenses and/or duties involved in this agreement.

The payments were divided into two general categories, the first constituting a disclosure fee for the technology, and the subsequent payments reflective of the products being produced although there was no percentage listed or specific royalty type payment schedule established.

All payments were monetary in nature, with no products taken in exchange. Setting the appropriate price proved difficult, since there were no comparable Polish products as to either price or quality. Since the entire financial basis was specified in the contract at the beginning, the wrong price could well have jeopardized the profitability of the entire venture.

Honeywell's compensation for the transfer included an eight percent annual escalation fee applied to the subsequent payments after the initial disclosure fees. These subsequent payments were termed the update fees since improvements in the product were to be provided to Poland for the duration of the contract.

The payments schedule listed in the agreement included the amount of the payment, the date it was to be received, and the date of the letter of credit which was to precede the payment. The first payment, due in late December 1974 at the start of the agreement, was the only one which did not require a letter of credit.

For all services and knowhow which Honeywell was providing, Metronex agreed to pay Honeywell through the Philadelphia National Bank according to the pre-determined payment schedule. Additional Honeywell employee services which might be requested by Metronex over and above the amount scheduled in the contract were to be reimbursed within 30 days after Metronex had received the monthly invoice from Honeywell for such services.

Purchases from the domestic company

Honeywell agreed to sell complete units to Metronex until the Polish manufacturing facility was in operation. The price for such units included a discount from the then current Honeywell list price. These items were guaranteed for 18 months from the date of delivery by Honeywell. Delivery was to be within 20 weeks of the receipt by Honeywell of the order.

Honeywell further agreed to sell parts and sub-assemblies of the transmitters to Poland through the course

of the agreement (and, in the case of the sensor assemblies, until December 31, 1984). The ex-factory price for these units was initially listed in the agreement as effective up to December 31, 1975, and thereafter would be computed according to a certain formula which provided an escalation factor to take rising costs into account.

The sensor assembly prices were set through December 31, 1977 (for a total of 2000 units for each calendar year), and were also computed on the basis of another formula from 1978 through 1984. Both formulas took various cost of living index factors into account in determining an equitable price for the items. These items were guaranteed for 12 months from the date of delivery by Honeywell. Delivery was to be within 18 weeks of Honeywell's receipt of the order for sub-assemblies and 14 weeks for parts.

Eastern Europe generally does not manufacture many spare or replacement parts. In this agreement, Honeywell insisted that Metronex be willing to use up to five percent of its extra component parts to rework any items which did not meet intermediate or final inspection. Honeywell would supply any additional components needed beyond this amount, free, unless the shortage were due to carelessness on the part of Metronex.

Payment for both the complete units and the parts or sub-assemblies was to be via a letter of credit through the Philadelphia National Bank which was to be submitted 30 days prior to the shipment of any items. All payments were to be completed before any products or equipment were shipped. Should delays occur on the part of Honeywell, a change, based on a percentage of the price, would be assessed.

Purchases by the domestic company

No purchases were anticipated to be made by Honeywell apart from equipment to be supplied to Metronex under the agreement.

Personnel

Training tasks

Domestic company. The agreement laid out the daily charges for Honeywell production specialists in Poland, computing the actual travel and living costs plus a daily charge which increased slightly for each year of the agreement. The agreement also listed the daily charge for each Metronex employee at the Fort Washington facility which also increased slightly each year of the agreement.

Honeywell personnel to be sent to Poland included one production engineer for six weeks (30 man-days) and one quality/test engineer for three weeks (15 man-days), which constituted 45 days of the 60 days projected for 1976.

There was a separate cost structure for the 1979 transfer of sensor technology for both the Honeywell specialists in Poland and the Metronex employees in the United States (in this case, in the factory in Minneapolis, Minnesota) which was higher than the prior cost structures to reflect the more complicated technology involved in the sensor production.

Costs involved in the training and travel were absorbed by the respective entities involved. When the Poles came to the United States for the training sessions, they paid for travel and their living expenses. Similarly, when Honeywell employees traveled to Poland, the corporation paid for those expenses since the negotiated fees paid to Honeywell under the agreement had included a portion for the travel and training expenses involved in the transfer. Should the training sessions in Poland, requiring the presence of Honeywell employees, exceed the limit in the contract, Poland would be financially responsible for those extra trips or additional days.

Host. Training in the case of this manufacturing item is considered to be of particular importance because of the accuracy involved in the product integrity.

The list of training tasks to be supplied by Honeywell employee services to Polish personnel in the United States included the objectives for each area of training, the specific topics to be covered, the time required, and the Polish personnel positions or qualifications selected to receive the particular training. These experience or position areas on the part of the Polish delegates included the positions of quality engineer, materials engineer, design engineer, production engineer, and foreman.

Skills or task areas to be taught to the Polish personnel in the United States included the following areas as identified in the agreement; receiving inspection, sub-assembly production, test operations, printed circuit board assembly, troubleshoot operations, theory of operation, quality assurance, materials control, documentation, and final assembly operations.

The timing was arranged that the Polish engineers would be first brought to the United States for training, then would continue that training back in Poland, as others were trained at the same time. Updating would also be provided over the course of the agreement, either in Poland or in the United States.

Protection

Leverage

Domestic company. Honeywell, in this case, has a high degree of control over the operation in several respects. First, because of the upcoming transfer of the sensor technology, Poland would have an additional incentive to maintain good relations with the firm. This is not to say, however, that amiable relations would not be present otherwise.

Second, Poland intended to purchase sensor assemblies from Honeywell prior to the sensor transfer. These assemblies form an integral part of the Class 41 Transmitter, and thus, the purchases are essential to the operation of the item. Third, there was a high possibility that Poland would continue to purchase these sensor assemblies even after the transfer of this technology, due to the extremely high cost of tooling which would be involved in equipping the plant for the sensor manufacture. Fourth, Honeywell was essentially the sole source of this item or product so that, should the relationship break down, the Poles would have no other means of obtaining the items. Since these items were necessary, or at least greatly desired by Polish industry, there was a high incentive to make the entire agreement successful. Fifth, since the contract was one involving updating, the

Poles would have more to gain through amiable relations for the duration of the contract.

A secondary form of control, on the part of Honeywell, is that if it should appear that the Poles were not capable of mastering this manufacturing operation, Honeywell had the option of noting this and subsequently stopping the transfer.

Honeywell guaranteed in writing that their responsibilities of successfully transferring the technology in terms of product knowhow and process expertise in terms of satisfactorily producing the Class 41 Transmitter would be met. Honeywell agreed to keep their representatives at the factory in Poland as well as to provide training in the United States for the Polish workers until the quality tests were acceptable. Additional training or representations over and above the specified limit to achieve good acceptance units would be at Honeywell's expense.

Honeywell guaranteed that the Class 41 Transmitter could be manufactured through the use of their knowhow. Proof of the transfer would be the successful production of 75 transmitters. If required to meet this guarantee Honeywell employee Services would be available to remain in Poland beyond the scheduled 60 calendar days in 1976, at Honeywell's expense. If Honeywell came to feel that it would not be reasonably possible to manufacture these items in the course of the agreement, the company did have the option of providing Metronex with this conclusion

through a written notice. Upon receipt of such a notice, Metronex was to either, (1) accept the Honeywell transfer as satisfactory, or (2) accept the cancellation and send both the special testing equipment and the transmitter acceptance kits back to Honeywell after Honeywell had reimbursed Metronex for all payments to that date.

Host. The control element on the part of Metronex, on the other hand, involved the terms of the agreement itself. Honeywell, Inc. had agreed to transfer certain technology to Poland and to work with the Poles until that technology had been satisfactorily transferred. This required that the information being transferred be correct and suitable, and the training sessions be conducted in such a way that the skills involved in this manufacturing process be passed along. Since Poland would be purchasing detail parts as well as the sensor units for the duration of the contract, the profit aspect provided another form of control by Poland over Honeywell.

It is interesting to note here, however, that the leverage which Honeywell possessed through its proprietary claim to the sensor and Class 41 technology was not sufficient to prevent Poland from demanding, and receiving, the updated version of this technology at the end of the contract. Honeywell would probably much rather have transferred an earlier version of the technology. However, the prospective sales to Eastern Europe appeared to have been enough of an enticement to induce Honeywell

to proceed with the agreement despite its reluctance to part with its latest technology in this area.

Metronex guaranteed not to utilize the knowhow involved in the Class 41 Transmitter, including the sensor assemblies, for any other purpose than the manufacture of these transmitters in Poland. It also agreed not to sell or otherwise dispose of the transmitters outside the specified countries within the Eastern Bloc during the period of the agreement or to service such transmitters outside that area without written approval from Honeywell.

Metronex also agreed to inform Honeywell of any improvements made regarding these transmitters.

Certain responsibilities had to be met by Poland before progress could be initiated in other areas. One example would be the installation of the equipment which Honeywell insisted be completed before the next level of training commenced.

Inspection privileges

Domestic company. Inspections were to be utilized by both parties. Poland was to provide Honeywell with two or three samples per year and monthly quality reports on the factory. At least one representative from Honeywell was to visit the installation in Poland annually. The inspections pertained to the product being manufactured or

assembled in Poland, and Honeywell was to inspect five samples annually for the course of the agreement.

Host. Inspections were also to be done on the items shipped to Poland by Honeywell. If any flaws or defects were found in these items, Honeywell was either to replace them or refund the purchase price and Poland was to return the items, with no penalties involved on either side.

Patent/trademark defense

Protection in regard to the patents and trademarks involving the Class 41 Transmitter had several dimensions. First, Honeywell restricted the use of the sensor and all other items involved with the Class 41 Transmitter to only this product. Metronex was permitted to manufacture, utilize, and sell only this transmitter and was not to use this technology in other forms. Second, should the issue arise, Honeywell agreed to provide defense information to Metronex to defend the patent, if a third party contested it.

The only trademark provided to Poland by Honeywell under this agreement was the following statement:

Made in Poland
MERA-Pnefal under license from
Honeywell, Inc., U.S.A.

Poland could not use any other indication of Honeywell's name or involvement.

Legal provisions

Arbitration was to be held in the London Court of Arbitration, using the English language.

External protection for both parties included stipulations in the agreement for arbitration proceedings to be based in London, Great Britain, if this should become necessary.

The agreement also included a Force Majeure clause, but had no provision for court involvement beyond that of patent defense or arbitration.

Project Assessment

Factors expected to make the project easier than usual

The proprietary nature of the technology involved in this transfer required Honeywell and Poland to work together, since Poland would be unable to obtain this technology from any other source. Furthermore, since the high technology fields are often out-dated so rapidly, this opportunity provided Honeywell with the means to utilize their technology. The transfer, while involving intricate items, did concentrate on small, rather easily-managed equipment packages; unlike some transfers which involve massive amounts or sizes of equipment. The high

skill level required to perform the manufacture of the transmitters resulted in employees from both sides who were highly trained and skillful.

Furthermore, the relationship with Poland had been paved by the numerous agreements between the Poles and the European subsidiaries of Honeywell, so by the time the U.S.A. company was involved, both groups were relatively familiar with each other.

Factors expected to make the project more difficult than usual

The major concern in this area would probably be the high skill and precise techniques which were required to manufacture the Class 41 Transmitters to certain specifications.

Expectations for the Future

Honeywell felt that this project could provide access to the East European market and thus saw the project as a stepping stone to other agreements as well as an important agreement in its own right.

Poland

Westinghouse Electric Corporation

Description

Westinghouse Electric Corporation agreed to design, equip and put into operation a plant for power semiconductors in Eastern Europe through an agreement with the Polish People's Republic. The \$9.7 million contract, signed on March 12, 1973, and effective as of April 1, 1974, was arranged through Westinghouse's Semiconductor Division in Youngwood, Pennsylvania. This was the largest sale of technology ever made by Westinghouse to that date, and was the first agreement of its kind between a U.S. power semiconductor manufacturer and Eastern Europe. The agreement called for Westinghouse to put into operation a manufacturing plant which was guaranteed by Westinghouse to be capable of producing a minimum of 200,000 rectifiers and thyristors annually on a two shift basis. The production facility in Poland is located in the Lamina complex, an industrial area ten to twenty miles south of Warsaw in the town of Piaseczno. The agreement between Westinghouse and Poland was for five years, with production at the facility expected to be under way by 1976, or 32 months after the signing of the contract.

Background

Domestic company. The greatest proportion of corporate earnings in Westinghouse comes from the sale of products, not technology per se. Thus, the approach of the corporation is to seek to sell products. However, when this avenue is not particularly feasible, such as when a lack of hard currency negates product sales to any appreciable extent, or when a country is more concerned with using its capital to develop such products itself, Westinghouse agrees to sell its technology.¹

The corporate structure itself reflects this willingness to sell production knowhow through the existence of their international licensing division; a separate profit center whose sale of 'licensing' includes production technology as well as patent rights and documentation. Under this arrangement, the licensing division, together with the manufacturing division, negotiates all international contracts of this sort, but the individual divisions (the semiconductor division in this case) are then responsible for carrying out the details of the contract. Consistency is achieved through having personnel from that respective division on the negotiating team when the contract is being drawn up.

Westinghouse does realize the risks incurred by a firm which establishes potentially viable competitors

through such technology transfers. However, corporate officials at Westinghouse in the semiconductor division have pointed out that the power semiconductor industry requires a high capital outlay in equipment and research and development but the market for the final product is relatively low, and competition is stiff in marketing that product. Thus, profits in such an industry depend either upon pricing the final product high enough to recoup the development costs or on selling the technology itself. If the product cannot be sold, Westinghouse therefore agrees to sell the technology. The licensing center within Westinghouse is intended to arrange suitable and mutually advantageous technology transfer sales.

Westinghouse feels that their approach to technology transfers of the type involved in Poland do not necessarily create competitors. Former semiconductor division general manager Maurice G. Sardi has noted that:²

The benefits of selling technology are sufficient to offset the disadvantage of setting up competitors." The way Sardi explains it, "when negotiating the contract, it was necessary to freeze the technology at a particular point four years ago. But since then, Westinghouse has been continuing its own R & D; we are now four years smarter. I can sell technology through, let's say, phase one. But it would take the same resources to get to phase two as it took to get from zero to one, and there are no option clauses in the contract under which we would provide the next phase. Moreover, the purchasers want to advance themselves. They now have the core, but how they perpetuate it is their problem.

The division's operations manager, Mickey Turner, adds, "It takes a long time to learn the semiconductor business, and it will take many years to get good yields. We just showed them how."

Westinghouse further protects its technology by limiting its transfer contracts to five years in duration. This way, the technology is provided at that stage one, but the updating period is relatively short.

Another point which is also part of its accepted approach to technological transfers is the fact that although Westinghouse will not always extend trademark rights to its partner, it virtually guarantees that the transfer will be successful. Westinghouse expresses confidence that its partner will be able to produce the desired product meeting certain specifications with, at least, the minimum capacity described in the agreement. Any situation where Westinghouse is not able to adequately transfer the technology as predicted would reflect adversely upon the corporation's ability as a seller of technology and might jeopardize future profits from this type of transfer.

The standardized corporate approach to such transfers may include a buyback arrangement. This is logical where the trademark has been provided, but is still an option where the trademark has not been part of the transfer package. In general, the reason for the lack of desire for a buyback arrangement usually stems

from the impetus which prompted the sale of technology instead of products in the first place. If the product is able to be re-purchased by Westinghouse at a desirable price at a point when Westinghouse needs an additional product source, the buyback arrangement is usually present. Even when such a need is uncertain, Westinghouse often includes an optional buyback possibility.

The customary policy of Westinghouse in regard to patents is to include all necessary patents with the technology transfer for the period of the agreement, which is usually five years. However, it is possible under mutual agreement to extend the patent license for periods of time as convenient. At the conclusion of this time period, however, all rights revert back to Westinghouse, although the purchaser maintains full rights to the production of the product.

Despite the magnitude of Westinghouse's international contacts, the technology transfers account for only a small percentage of the corporation's overall earnings. It has been stated that Westinghouse has had more than 200 licensing arrangements in more than 40 countries, where the licensing involvement included the technology transfer, patent rights and production knowhow. Of the corporation's \$6 billion worth of sales \$35 million or less than 1 percent comes from licensing.³ However, in terms of profits, Hayden has noted that the

transfer of technology is virtually pure profit. The overhead involved in most transfers is relatively low since the technology has already been developed, thus, more than one-fifth of the corporation's net income comes from licensing fees and royalties.⁴ This is not just a desirable luxury, however, but a means of existence.

Since the technology within some areas such as the semiconductor sphere changes so often, sellers of this type of technology must be able to profit quickly from their latest innovations. Because such changes tend to negate patent rights, innovations spread quickly throughout the entire industry. Thus, unless the technology is sold quickly, it is likely to become obsolete and generally worthless to its creating company.

Westinghouse, through its experience in technology transfers, expresses a confidence in its ability to satisfactorily effect that transfer throughout the world. However, the project in Poland was the largest transfer of semiconductor information at that time ever undertaken by Westinghouse, and the magnitude alone carried a high degree of responsibility. Prior to the signing of the Polish Agreement regarding power semiconductors, the Westinghouse Semiconductor Division was involved in two similar transfers in Puerto Rico and Le Mans, France. In fact, it was hoped that the assembly plant in France would be a source of materials or

subassemblies for the Polish plant until production there was totally complete. The Polish contract marked the first time that Westinghouse would transfer the processing or highly technical aspects of this technology, so this would be a new challenge for Westinghouse in this regard.

Westinghouse transferred the information necessary for Poland to produce thyristors and rectifiers. The trade name for thyristors is silicon controlled rectifiers or SCR's. These solid state semiconductors are used to convert alternating current to direct current in industrial applications ranging from welders, motor controls, power supplies, and electroplating equipment to the large equipment used in mills and mining. The thyristors to be produced at the new facility were to operate from 40A to 1500A, a fairly extensive range. The distinction between a rectifier (power variety) and a silicon-controlled rectifier is that a basic rectifier converts power, while a silicon-controlled rectifier not only converts power but controls it.

Westinghouse was not the only company with such a product. There were about twelve manufacturers of semiconductors around the world, but Westinghouse and General Electric have the major market share of power semiconductors. Thus, Westinghouse was not the only source of this product, but had derived more efficient systems for delivering the product.

These systems were currently in use in both the stateside Youngwood location and in the Le Mans, France, installation. The system guaranteed delivery of high power semiconductor devices in as little as from 45 to 54 hours, contrasted with the four to six weeks delivery times quoted by other firms. This new system also made it possible to "bank" partially complete semiconductors and to fill orders from this bank. Thus, semiconductors from the Youngwood facility would be able to be used to help start up the Polish facility. The partially complete semiconductor devices would help the mastery of each new manufacturing step.

Unlike some technological areas where innovation is relatively slow, the semiconductor field appears to be in a state of constant revision and improvement, and technology which is only six months old may already be obsolete. It has been noted that the success of a semiconductor manufacturer depends almost entirely on its technological innovation ability⁵, a firm using the latest production technology may be able to cut costs by as much as 40 percent. Thus, the new production techniques of Westinghouse provided an added value to its semiconductors over others.

The manufacture of the silicon rectifiers and thyristors provided a number of areas where improved production techniques would add to the efficiency of the

process. Silicon, used because of its ability to withstand high temperatures, has been described as a poor conductor of electricity and must be batched or blended with other ingredients, for example, boron or phosphorous. The outcome of this process is the final silicon wafer, although this must then be incorporated into the final packaged product. All these steps in production, however, provide a number of areas where efficient manufacturing methods greatly help to reduce costs of production.⁶

Host. Westinghouse knew that the manufacture of semiconductors was not new to Poland. But the facility which had been there was 20 to 25 years old and had been used to manufacture low-power semiconductors. Westinghouse felt that Unitra, the Polish manufacturing facility, was turning out a product which was not suitable for many uses. Furthermore, Westinghouse felt the production methods of the Poles were highly inefficient in relation to modern procedures.

The agreement with Poland fell under the Polish Ministry of the Machine Industry, which also oversees the electronics segment of the Polish industry, the Unitra Electronic Industry Union. This is the largest single electronics producer in Poland with a 1975 volume of \$1.1 billion, and an annual rate of growth which averages between 15 to 20 percent. The Poles had sought a number of foreign licenses, of which the Westinghouse contract

was only one example. In semiconductor products, 65 percent of Unitra's total production was based on foreign licenses, although overall production involves only 28 percent of foreign input. The five-year plan covering the years 1971-1975 included an objective to double the output of the electronics sector of the Polish industry.⁷

Transfer of technology

Turnkey. The building was already standing but Westinghouse was responsible for suggesting the modifications which were to be done to the actual building shell. It was to have a 30,000 square foot manufacturing area when completed. These modifications included air conditioning, lighting, etc., even to suggesting the proper finish for the floors. Westinghouse was to specify, supply, and oversee the installation of all production equipment. Much of this equipment would be purchased by Westinghouse but would come from other suppliers. Some of the equipment included diffusion furnaces, silicon slicers, lapping machines, photochemical equipment, presses and welders as well as the semiconductor testing equipment. Initially, the plant in Poland was to meet its silicon requirements from Western sources, eventually manufacturing its own. No arrangement was made to purchase complete semiconductors from either the Youngwood

or the Le Mans facilities prior to the startup of production in Poland, and it was assumed that the Poles would use Western European semiconductor producers to meet their immediate requirements. Westinghouse did note, however, that the corporation would be able to help meet any shortages which might arise upon request.

Information and knowhow. Westinghouse provided Unitra with its 1973 state of the art technology in regard to power semiconductor manufacture; the latest technology that it had in that area at that time. It also agreed to provide Unitra with access to any commercial modifications either as to technical data or production methods made by Westinghouse during that five-year period, within 60 days from the time that Westinghouse put such modifications into current production. This provision included all technology which Westinghouse might acquire and was reciprocal in that Westinghouse was to be informed of any revisions which Poland made in the product.

A list of the support services which accompanied the manufacturing information is as follows: quality control, incoming inspection, ratings and reliability, calibration, stores, production control, inventory control, base brazing, air/water cooled assemblies, mask duplicating, and lead and wire feeder operation.

The approach which the Westinghouse semiconductor division used in regard to its technology transfer was

extremely detailed, with each step scrutinized carefully, and the process figuratively frozen at each point. The semiconductor manufacturing process had been fully categorized by function and by material and equipment needed. This characterization was in the form of a computer program which transferred each manufacturing operation on a step-by-step basis from the Youngwood facility in Pennsylvania to the Lamina factory in Poland. The person in charge of this massive operation was Donald A. Walczak, Manager of Project Engineering for Westinghouse Semiconductor. The time frame devised by Westinghouse was 32 months from the start of the project until the production was operating on its own. To accomplish all tasks within that time frame, the work was divided into three phases: one, preparation, modification of the building to appropriate standards; two, implementation, purchase and shipping of equipment and starting of training; three, finalization, complete equipment installation and the running of acceptance tests. The approach was extremely methodological. All equipment was consolidated at the Youngwood facility, with acceptance tests even run on the equipment there in the materials development laboratory. After these tests, economical containerized sea shipments were sent from Pittsburgh to Poland on a certain timetable, so that the equipment would arrive only when the facility in Poland would be ready for

it. This approach was practically the ultimate in inventory control. It provided for the complete equipping of each work station, including all necessary tools, spare parts, and even service requirements.

The installation at the factory was done sequentially so that each step in the process was completed in virtually chronological order, following the manufacturing steps required to produce the finished devices. Each item was listed, alphabetically by function, right down to the number of waste baskets to be supplied.

The training was to commence along the detailed time table, starting 15 months after the start of the agreement, and was to be considered complete only when all acceptance tests had been concluded. Additional training was possible, however, especially when any updating was required. Even the conclusion of the project was detailed as to the departure schedule and the 'weaning' of the managers so that the facility was left on its own in a systematic fashion. The contract included details as to the qualifications required of all Polish specialists to be trained.

Management. No specific general managerial responsibilities were listed in the agreement, although some of these aspects were indirectly included under the descriptions of the training as laid out in the contract.

Patents. The Westinghouse Agreement actually contained two contracts. The first was the Technical Assistance Agreement which laid out all the procedures and training schedules as well as the product documentation to be transferred. The second contract was the Patent License Agreement, which included all stipulations accompanying the use of the patents involved in the manufacture of the power semiconductors.

Westinghouse granted Poland a non-exclusive license to manufacture the stated thyristors and rectifiers in Poland and to sell those products in Poland and surrounding Eastern European nations during the course of the five year agreement. In fact, Westinghouse granted Unitra all patents for worldwide sales except those for the United States and Canada. In a general sense, Unitra would be able to market the products in those two areas, but through the action of not providing the rights to the patents for these areas, Westinghouse technically reserved the right to apply a patent infringement suit against Unitra, if Poland attempted to sell the products in those areas. The patents revert to Westinghouse at the conclusion of the agreement, although the five year deadline is able to be extended for another three years. After the termination of the agreement, Poland has the right to continue to utilize the information for its own use without charge.

Trademarks. Westinghouse did not provide Poland with its trademark in this agreement, although Poland does have the right to use the term "Licensed by Westinghouse" for the duration of the agreement, but not after that point. Any indication of Westinghouse involvement on particular products must be approved by the corporation in writing. At the conclusion of the agreement, Poland must cease to note any involvement by Westinghouse, although the extension of the Patent Agreement would allow Poland to advertise the alliance for an additional three years beyond the conclusion of the offer portion of the agreement.

Buyback. Westinghouse does not have any buyback arrangements included in this agreement, as such. However, after the agreement had been signed, an arrangement was made whereby Westinghouse indicated a willingness to purchase some items if the product quality, timeliness and price was satisfactory to all parties concerned. Westinghouse also potentially saw the option of buying back some parts as well as complete products.

Responsibilities

Domestic company. The detailed contracts provide an extensive listing of the responsibilities of Westinghouse in regard to this project. The

responsibilities of the company were contractually summarized as "Westinghouse will specify, supply, and oversee installation of all production equipment, train plant supervisors and assist in the startup of the plant." Interestingly, the contract also included a brief description of what Westinghouse was not responsible for as well as the corporation's stated responsibilities.

Host. The Technical Assistance Agreement clearly lists all of the responsibilities of the purchaser, in this case, Unitra. These are as follows:

Generally, to provide all labor, materials, supplies, information and services for construction and operation of the Plant and all activities related to it which Westinghouse is not obligated to provide by this Agreement, including, without limits:

1. specification of electrical power, gas, water, sewers, or other existing or readily available services or utilities;
2. electrical characters, general statement regarding the reliability of supply and frequency of outages, if any;
3. electrical characteristics for power and lighting within the Plant;
4. architectural-engineering design and construction of the plant, sources of service, points of entry of service, using metric measures, in the English language, drawings and specifications to be forwarded to Westinghouse for comment;
5. compliance with regulations of local or other government agencies as to safety, employment, hours of work or other matters;
6. facilities for medical attention;
7. security or fire protection;
8. office furniture, etc.;

9. tables, benches, etc.;
10. communications systems;
11. lighting;
12. external transportation facilities;
13. installation of manufacturing or other required equipment;
14. modifications of plant necessary to make plant compatible with specifications;
15. labor necessary to operate plant
16. administrative personnel
17. technical and engineering staff to install equipment, tooling and operate plant;

in a proper and timely manner.

Corporate Perception of Benefits to be Gained from Agreement

The desire by Westinghouse for the Polish contract appears to be a indication of the firm's overall market strategy. Hayden noted that when possible, or feasible, to sell its products, the corporation would do so. However, if the sale of those products was most unlikely, then Westinghouse would opt to sell its technology.⁸

In this situation, Westinghouse appeared to favor the transfer of its technology for several specific factors. First, the hard currency shortage in Eastern Europe had been a barrier to the sale of Westinghouse products there, so it appeared that the sale of technology was the only sale which could take place to any great extent. Accompanying this motivation, was the tendency on the part of the Eastern European bloc to purchase technology from the United States. Products imported from the Western European facilities were more accessible

to Eastern Europe but were more expensive than those which might be produced locally. Thus, while the doors to product sales were generally closed to Westinghouse, the doors to technology purchases were invitingly open.

Hence, the foremost desire on the part of Westinghouse for this agreement with Poland was the income obtained from the fees involved in this technology transfer, and the licensing center of Westinghouse negotiated a contract with Poland which reflected the corporation's approach to these transfers. The corporation stated that these fees are viewed as profit, but the basis for them stems from the reasons of taking advantage of the product before obsolescence sets in as well as to compensate for the high development costs accompanying such products. The fees, in this case, were also partly equivalent to royalties since no product auditing was to be done in this instance.

The second major reason for Westinghouse's desire to obtain the Polish Agreement was that the corporation felt the contact would open additional doors for them both in Poland and throughout Eastern Europe. The obvious approach would be additional semiconductor facilities, perhaps different but related to the products produced at Lamina. However, Westinghouse also saw an opportunity to diversify its technological range throughout Eastern Europe, perhaps as to marine equipment and air conditioning.

A third reason for the Unitra Agreement involved the establishment of a possible source for Westinghouse for either the completed product or raw materials from the Polish facility, and also an opportunity to sell some semiconductors to the facility, especially prior to the onset of Lamina's own production. However, Westinghouse itself felt that the possibility of such purchases was unlikely beyond the purchase of some partially completed semiconductors from the "bank" in LeMans. These would serve more as training aids rather than actually fulfilling the need for the product.

Negotiations

Parties involved

The Westinghouse executives involved in the negotiations with Poland were headed by Paul E. Lego, at that time general manager of the Semiconductor Division. This negotiating team included Westinghouse Overseas Licensing group, Donald A. Walczak, project manager of the transfer operation, Douglas D. Danforth, executive vice-president of components and materials and C.E.K. Fox, manager of the manufacturing development laboratory.

The negotiations between Westinghouse and Poland were held with Unitra, the foreign trade arm of the

Polish Electronic Industry Association. Polish principals included Jerzy Milobedzki, director of Unitra, Aleksander Lobodziec, general director of Lamina, Dariusz Piwowarczyk, technical director, Lamina, Jerzy Szyjko, manager, semiconductor operations for Lamina, and Jerzy Michalowicz, manager of research and development for Lamina.

Initiating contact

The first inquiry was made to Westinghouse by Unitra by letter in the late 1960s. Poland was interested in Westinghouse because of the corporation's strong position in power semiconductor technology. Jerzy Bilip, Unitra's technical director, stated that (Westinghouse) was selected as a partner because of its "very strong knowhow".⁹ It appears that the main competition for the contract was from the Siemens Corporation of West Germany, but that Westinghouse was preferred because of its lead in manufacturing development and product quality.

Vice President Doug Danforth noted that Westinghouse held, at that time, 500 to the total 2,000 patents generally considered to form the basis of all semiconductor manufacturing technology.¹⁰ Poland was also interested in Westinghouse because of the corporation's experience in international technology transfer, feeling that the

corporation would be able to successfully accomplish the task. However, at that time, a permit was needed from the Department of Commerce and this permission was difficult to obtain. However, the proposal was reinstated in November, 1972, and by this time Poland had been awarded a Most Favored Nation status as well as having received Export-Import Bank credits. Business International¹¹ noted that "the fall-out from the current U.S.-Soviet detente has made it easier for U.S. companies with critical technology to obtain validated export licenses from the Commerce Department". It also appeared that the Polish commercial counselor's office in New York was instrumental in helping Westinghouse obtain the necessary export permission from the Office of Export Administration arm of the Commerce Department.

Length of negotiations

Almost two years passed from the time when negotiations were reinstated until the contracts were signed on March 12, 1973. Since U.S. government approval was not a concern at that time, these two years provided opportunities for ironing out some of the contractual differences between the Polish representatives and the Westinghouse team as well as a chance for both sides to become acquainted with each other. Both the Technical

Assistance Agreement and a Patent Agreement were officially written in English. Following is the time schedule of events transpiring prior to the agreement's effective date.

Issues and obstacles

Equipment costs. Westinghouse wanted to separate equipment costs from other contractual payments, thus preserving the corporation's anticipated fees from any fluxuations in equipment purchase or availability. However, Unitra insisted that the agreement include equipment purchases at set prices. The Polish feeling was that such purchases were then the responsibility of the American corporation. If the firm spent more than the prescribed amount, it was their concern. However, if the purchases amounted to less than that amount, any remaining funds were to be returned to Poland.

This issue was part of the reason underlying the final format of the agreement involving addendums A and B which included equipment costs. These were added during the final stages of the negotiations.

Prices quoted in the agreement were general estimates, based on actual prices, as far as possible, plus an inflation factor. Pricing out the project took from January to October, 1972. Westinghouse cautions any firms involved in such negotiations to know equipment

TIME SCHEDULE

POLAND PROJECTEVENTS

Initial Contact to Effective Date

JANUARY, 1972	SCD DECISION TO GO.
APRIL, 1972	MEETING WITH U.S. DEPT. OF COMMERCE
MAY, 1972	FIRST VALIDATED LICENSE APPROVED.
MAY, 1972	OFFICIAL INQUIRY RECEIVED FROM POLAND.
JUNE, 1972	LETTER OF INTENT SIGNED.
AUGUST, 1972	PROPOSAL SUBMITTED TO POLAND
OCTOBER, 1972	INVITATION RECEIVED FROM POLAND.
NOVEMBER, 1972	SCD TRIP TO WARSAW.
DECEMBER, 1972	UNITRA TECHNICAL PERSONNEL VISIT SCD.
JANUARY, 1973	UNITRA AGREEMENT FINALIZED
FEBRUARY, 1973	FINAL NEGOTIATIONS STARTED.
MARCH 12, 1973	UNITRA AGREEMENT SIGNED IN WARSAW.
JUNE, 1973	U.S. APPROVAL OF EQUIPMENT LICENSE.
SEPTEMBER 15, 1973	SEMICONDUCTOR SAMPLES SHIPPED TO UNITRA
SEPTEMBER 21, 1973	COCOM APPROVAL OF EQUIPMENT LICENSE.
SEPTEMBER 27, 1973	NOTIFICATION OF GOVERNMENT APPROVALS DELIVERED TO UNITRA.
JANUARY 30, 1974	LOAN AGREEMENT SIGNED BETWEEN EXIM CHEMICAL BANK AND BANK HANDLOWY.
APRIL 1, 1974	EFFECTIVE DATE OF AGREEMENT.

prices, or be able to accurately estimate those expenses.

Price negotiations were detailed and difficult. One negotiating tactic involved in the pricing question used by Unitra was to ask the price of an item, then to consider the agreement without that item (and the accompanying price). Then the item (and price) were put back, but sometimes different amounts resulted in the confusion, with Unitra representatives watchful for the best advantage.

Buyback arrangements. Westinghouse was not desirous of including a buyback arrangement within this project, and appeared to have enough leverage during the negotiations to avoid the required inclusion of a buyback clause as one of the contract terms. Presumably, this was due to the favorable reputation possessed by the corporation in the area of silicon-controlled rectifiers. However, a flexible option was drawn up as an advantageous option to both parties, but was not included as part of the official agreement. This stated that product purchases could be made by Westinghouse should the product quality, timing, and price be agreeable to all parties involved.

Special development. Westinghouse agreed to revise one of their basic products to the extent that it was most suitable for Poland's uses, even if the

corporation could not use the product personally elsewhere. This was made more feasible because of the lack of a required buyback clause which was helpful in this regard since Westinghouse could hardly have been expected to have agreed to such adaption if the corporation had been repurchasing the semiconductors. At the same time, this did not totally rule out the use of the Unitra facility as a future source of semiconductors for Westinghouse since the revisions pertained only to a portion of the total anticipated production.

Time Frame

Overview

Westinghouse and Unitra signed their agreement on March 12, 1973, but the agreement did not go into effect until April 1, 1974. The period between these two dates was the time necessary to acquire the appropriate or necessary licenses. Westinghouse required an export license from the U.S. government, while Poland had to obtain import licenses and also enter into a credit agreement with the Export-Import Bank of the United States. The effective date of the contract began 15 days after the final approval had been obtained by both parties, and written notice to that effect had been

received on both sides. Hayden notes that the major delay was caused by an incident only indirectly connected with the semiconductor industry:¹²

While Westinghouse was given almost immediate permission by the U.S. government to sell its SCR technology to Poland, the entire project was delayed a full year by CoCom. The difficulty centered on the United Kingdom's objection to the sale of the furnaces. Apparently the United Kingdom was reciprocating an earlier U.S. objection to the United Kingdom's export of a similar item to East Europe, an objection that came in the days before the United States liberalized its export controls.

The Technical Assistance Agreement expired on the fifth anniversary of its effective date, or April 1, 1979. This means that no more updating will be provided after this date. The Patent Agreement, however, is able to be extended for an additional three years, and would then expire on April 1, 1982. Under such an extension, Unitra could continue to mark the semiconductors produced in the Lamina facility as "made under license from Westinghouse" until that date. All indication of involvement would cease after that time.

Special considerations

Phases. The initial portion of the agreement is divided into three phases, commencing with the effective date of the agreement and concluding with the acceptance tests. These will indicate that all aspects of the

manufacturing process have been successfully transferred to the Polish facility. The three phases are as follows:

Phase I: Planning--April 1974 to October 1974

Phase II: Implementation--October 1974 to
October 1975

Phase III: Finalization--October 1975 through
November 1976

The detailed approach is illustrated on the enclosed Guideline for Contract Events.

Knowhow transfer. Westinghouse, through its intricate computerized program, divided the transfer of the technology into small sections. In general, however, the knowhow was to be transferred to Poland under the following schedule: documentation to Poland (April 1, 1974 through December 1974); equipment shipped, installed and debugged (January 1975 to April 1976); training at Youngwood (May 1975 through November 1975); technical assistance at Lamina (January 1976 through November 1976); and acceptance tests (March 1976 through November 1976).

Payments to Westinghouse. Unitra was to provide four equal payments to Westinghouse during the course of the first two years of the agreement. The first payment was to commence April 1, 1974 as the agreement went into effect. The second was to follow in October 1974, the third in October 1975, and the fourth payment was to be made in November 1976. In addition to these payments,

NOTE: THE ABOVE SCHEDULE DOES NOT ANTICIPATE DELAYS DUE TO CAUSES BEYOND WESTINGHOUSE REASONABLE CONTROL; I.E. WORK STOPPAGES, NATURAL DISASTERS OR POLITICAL ACTIONS.
0 = EXTENSION DUE TO RECTIFIER TECHNOLOGY.

letters of credit for the purchase of equipment and supplies were to be filed in January 1974, October 1974, and July 1975. The dates for the payments generally parallel to stages in the transfer process, since the first payment commenced at the start of the operation, the second represented the manufacturing information acquisition, the third reflected the equipment delivery point, and the fourth followed the acceptance tests.

Training. The formal training sessions were to commence at Westinghouse's facility in Youngwood, Pennsylvania, no later than 15 months after the onset of the agreement. These training sessions were generally scheduled to begin in May 1975 and to extend through November 1975, although Westinghouse reserved the right to determine when training was deemed complete and mastered. The total period for this training was not to exceed 50 man months and was not to be less than 25 man months.

The on-site training presumably was to accompany the technical assistance provided by Westinghouse and formally was to commence on January 1976, although Westinghouse personnel would have been there in Poland long before that date. This technical assistance training was to conclude with the successful completion of all acceptance tests, and was scheduled to be over by November 1976.

Deadlines. The deadlines mentioned in the agreement were as follows: construction to be completed by October 1975, when the equipment was to be installed; production, from January 1976 on; acceptance tests, started by March 1976 and completed 32 months after the start of the agreement, or by November 1976.

Extensions. The only extension noted formally was that of the three-year optional extension. The Technical Assistance Agreement listed a time period for most interactions. These major time lines are listed below.

Modifications: Westinghouse is to notify Unitra of all modifications to the product within 60 days of such an introduction into production at the Youngwood plant.

Technical Manufacturing Assistance: A maximum of 24 man months of resident Westinghouse management was to be supplied.

A maximum of 24 man months of technical experts in various fields were to be supplied by Westinghouse.

List of equipment: Unitra was to provide Westinghouse with an alternative list of equipment if the list provided by Westinghouse was not considered desirable within 60 days after the effective date of the agreement.

Supply of equipment: Unitra was to establish a letter of credit within 30 days after the start of the agreement for the amount of \$2.5 million with a specified bank.

Default: Notification of default must be made within 30 days of such an occurrence, and remedy must be made within 60 days or termination results.

Performance warranties: Westinghouse warrants no later than 32 months from the effective date that the plant will produce a mix of useable stud mounted and Pow-R-Disc products at a rate of 400 pieces per day for five days.

Tests: No later than 32 months from the effective date, a test of the fusion and assembly belt lines will be conducted at the Polish site. The test will demonstrate certain results with specified limits, at this time.

Trademarks: Any request to utilize any aspect of the Westinghouse trademark must be made by Unitra to Westinghouse in writing, and the corporation must respond within 90 days to this request.

Termination: In the event of default, termination will result not less than 30 days after the final notice is given.

Financial Flows

Payments

The payment arrangement between Westinghouse and Unitra divided the total amount into four payments of equal size which were to be transferred to Westinghouse at specified periods, generally coinciding with different stages of the project. The individual payment amounts were not divulged, but if the total package amounted to approximately \$9.7 million with equipment purchases described as being close to \$4 million¹³ approximately \$6 million would remain to be divided into four payments for Westinghouse. These payments would include both the

initial disclosure fee for the technology and the estimated royalties.

Westinghouse usually charges a royalty on licensed items produced from their technology for the duration of their agreements. In this case, Westinghouse chose not to abide strictly by their corporate policy of charging three to five percent royalties of the unit price, but arrived at a predetermined lump sum fee based on the projected production capacity of 200,000 devices manufactured annually. This approach removed any need for monthly or annual auditing of the Lamina factory's production by Westinghouse.

Financing for the total project was arranged through several banking operations. The Export-Import Bank financed 45 percent, undisclosed commercial banks in the United States financed 45 percent, and Poland provided the remaining 10 percent in a cash downpayment. Business International reported a U.S. government guarantee on the eight-year Export-Import Bank loan. The Polish bank involved in the transaction as the obligor is the Handlowy Bank.¹⁴

Purchases from the domestic company

The equipment purchases were listed as from Westinghouse, but the largest portion was only arranged through Westinghouse with the corporation acting as the prime-contractor. These purchases, especially those made during the first six months of the agreement, included diffusion furnaces, silicon slicers, lapping machines, photochemical equipment, presses and welders as well as semiconductor testing equipment. The partially assembled semiconductors to be used as training aids as well as the service or replacement parts as requested in the agreement were also included. The total cost of these purchases, nearly \$4 million during the course of the project, was instigated with an initial letter of credit in the amount of \$2.5 million.

Purchases by the domestic company

No major purchases were anticipated by Westinghouse apart from the equipment procurement, although some of the expenses of the personnel involved in the project in Poland were the responsibility of the corporation.

Other financial flows

A number of contingency arrangements were listed in the Technical Assistance Agreement. These included:

Purchase of replacement equipment: any damage incurred to the equipment once the responsibility had passed to Unitra although Westinghouse would assist in the repurchase of the equipment. If the purchase amounted to more than \$2.5 million, however, another letter of credit was to be established first. Westinghouse would also be reimbursed for any expenses incurred in performing this task.

Spare parts: Westinghouse was to recommend a one year's supply of spare parts for each piece of equipment and Unitra was to have a letter of credit for \$300,000 and replacements were to be obtained as needed.

Test completion: The contract contained an arrangement whereby Westinghouse was to perform any acceptance tests if Poland was not capable of completing the tests. In such a case, Westinghouse was to be paid \$200,000 for these services. Any delays in the conducting of the tests in general beyond the control of Westinghouse were to be the total expense of Poland.

Personnel expenses: Westinghouse was to bear all expenses for travel, moving, and housing for its own personnel, and was also to pay for the salaries, living allowances and other remunerations and expenses of the personnel. However, Poland was to provide available suitable housing and living accommodations and to reimburse Westinghouse personnel for any taxes imposed upon them by the Polish government. HOWEVER, Poland was to absorb ALL expenses including travel, housing and moving expenses and living allowances for a maximum of 48 man-months of resident Westinghouse management during the technical assistance portion of the contract. The only expenses incurred by Westinghouse itself during this period with these personnel would be the salaries and other similar remunerations of these employees. Poland was to cover all expenses incurred by its citizens while on training visits to the United States in connection with this agreement.

Personnel

Training tasks

Domestic company. The Technical Assistance Contract provided for the following personnel to be involved with the Unitra project:

1. Works engineering manager: works with Unitra to review the basic plant construction and design, and remains on-site throughout the entire period involving installation of the equipment, and as needed thereafter until acceptance tests have been completed.
2. Assistant works engineering manager: is available as needed at the discretion of Westinghouse to assist the engineering manager.
3. Other personnel: a number of technically qualified personnel to be supplied on a short-term basis by Westinghouse at critical points when workload and activity are high. They may be there during equipment installation. (This does not include equipment technicians who would be paid by the equipment supplier as part of the total cost of the equipment purchase including installation and startup as a condition of sale.)
4. Management services regarding technical manufacturing and manufacturing controls: 24 man-months of resident management from the period when the equipment is installed until the acceptance tests are completed. An additional 24 man-months of technical experts from various fields to assist in initial adjustment and process specifications.

Westinghouse was to bear all costs regarding the first three above categories related to travel, salaries and other similar remunerations or expenses. Poland was responsible for providing available suitable housing, and

all necessary working permits as well as paying any Polish tax reimbursements. However, Poland was to pay for all expenses for the fourth category, the management services, provided during the technical assistance period in Poland following the equipment installation. Westinghouse was to provide the salary and related remuneration to individuals involved with the management services for the specified time period. However, should these individuals be required to stay in Poland after the acceptance deadline, or more than 32 months after the effective date of the contract, all expenses would be the responsibility of Westinghouse (unless the reason for the delays had been the fault of Unitra and had been beyond the control of Westinghouse).

Westinghouse did not really know what to expect in regard to the staffing, and was taking a policy of waiting to see what would occur. The company did have such a wealth of experience from prior international arrangements that there was a general confidence that no situation would be too difficult. Corporate concern over potential language difficulties was reflected by the Polish language lessons which were provided to all Westinghouse personnel directly involved with the project. These individuals studied Polish for an entire year before going to the country.

Host. The technical backgrounds of the Polish personnel to be trained by Westinghouse as enumerated in the Technical Assistance Agreement included graduate engineers or technical supervisors, with at least one mechanical and one electrical engineer. The total number of trainees was not stated, but it was pointed out that no more than six specialists were to be trained at any one time in the Youngwood facility. The total period of training in the United States was to be no less than 25 man-months and no more than 50 man-months. The contract also stated that all specialists were to have a command of the English language such that no translation services or interpreters would be required.

The training to be received in the United States was to commence no later than 15 months after the effective date of the agreement. The purpose of the Youngwood training was to acquaint the Polish specialists with the materials, processes and equipment required for the manufacture of the designated thyristors and rectifiers. No mention was made of the training to be provided to the Polish specialists on-site in Poland apart from the duties specified for the American personnel involving training.

Poland was to pay all expenses incurred by its specialists while being trained in the United States, including salaries, living allowances, traveling expenses, and other remunerations, including any claims or the like

of which may arise against these individuals. However, the specialists were not to be responsible for any damages caused while acting under instructions from Westinghouse.

The wording of the contract appeared designed to legally cover a variety of situations which might arise but more as a precautionary measure than a predictive one. The stipulation regarding the fluency of the English language also appeared preventative more than predictive.

Protection

Leverage

Domestic company. Westinghouse was in an excellent bargaining position throughout the negotiation of the contract for several reasons. First, and foremost, the corporation had been selected by Unitra in Poland because the semiconductor technology of Westinghouse was desired by the Poles. This situation usually exists when the technology is proprietary to one company, however, despite similar technology available elsewhere, Westinghouse appeared to be the first choice of Unitra. Part of this appeared due to the reputation held by United States companies in general and by Westinghouse in particular that their technology and quality was best. However,

part was also due to the higher expertise which Westinghouse possessed in manufacturing efficiency of silicon-controlled rectifiers. Such process knowhow becomes part and parcel of the product itself. Thus Westinghouse actually did have an element of proprietary control.

Another plus in favor of Westinghouse was the corporation's experience in transferring technology. The corporation was virtually able to assure the buyer of its ability to transfer manufacturing knowhow.

The contract used by Westinghouse provided specific guidelines detailing the responsibilities of the Polish side. This itemization provided the American company with leverage to resist pressure from the Poles to proceed until Unitra's responsibilities had been completed for that stage. For instance, Westinghouse could refuse to ship certain equipment if the building was not complete.

The entire contract was virtually a statement of the guarantees and responsibilities of Westinghouse, particularly the assurance that the technology would be successfully transferred within a certain time period, as illustrated by the acceptance tests.

Host. More general leverage was possessed by Poland. This hinged on the fact that this technology transfer was really the only feasible entry into that

country, since product purchases were unlikely for the reasons described earlier. Thus, Westinghouse was under an obligation to successfully complete this project if further contracts were desired.

The immediate leverage of Unitra over Westinghouse was due to the fact that the American company had virtually guaranteed that they were able to transfer the technology to manufacture a certain number of thyristors and rectifiers annually which met certain specifications which could be successfully transferred to Poland within 32 months from the start of the agreement. If this did not occur within that time period, Westinghouse was obliged to stay on in Poland, at the corporation's expense, until such acceptance tests were successfully completed. The payment schedule assisted this control, since the fee payments coincided with certain stages in the transfer process. Had these stages not been completed on time the payments may have been withheld by Poland.

The list of responsibilities of Poland in the contract provided a framework for Unitra's obligations in the agreement. These were associated with completion of the building, and the provision of suitable materials, technical people, and some equipment. Westinghouse was not required to proceed with further stages of the project until Poland had completed its responsibilities for that portion.

Inspection privileges

The agreement made a provision for Westinghouse's right of access to the Lamina facility as long as any equipment or materials were still under warranty. This right of access provided Westinghouse with the ability to review Unitra's data regarding the facility as well as to observe the treatment and maintenance of the equipment.

The acceptance tests may also be inferred as being a form of inspection. However, the conclusion of these 'inspections' were to cease with the successful completion of the plant. At which point it was to be assumed that the manufacturing capability had been adequately transferred and needed no further attention.

Patent/trademark defense

The separate Patent Agreement detailed all rights and privileges accorded to Unitra by Westinghouse regarding all relevant patents. Patents not possessed by Westinghouse had to be purchased separately by Unitra. The non-exclusive license provided to Poland was valid through the five years plus the additional three years if the extension is granted. However, after this point in time, Poland would have the right to use the information for its own use without charge. However, Poland was not to have the right to pass the information on to a third

party, even after the agreement terminated. If this situation were to occur, Poland was to reimburse Westinghouse accordingly.

Poland was required to protect Westinghouse in regard to infringement actions. Westinghouse was to use its best efforts to assist Poland in an infringement situation, but Poland was to pay any costs. However, Westinghouse was not required to take action in a case where Poland may have sold a patent to a third party but then become involved in an infringement suit.

The words "licensed by Westinghouse" may be used on the product as long as the agreement is in effect, but not after its completion. Poland was permitted the use of statements regarding its involvement with Westinghouse, as long as these requests were to be made in writing three months in advance with permission granted. Since no additional privileges were extended regarding the Westinghouse trademark, no other protection was considered necessary.

Legal provisions

The Technical Assistance Agreement stated the arbitration procedures for both elements of the contract. Any disputes unable to be settled otherwise were to be submitted to the International Chamber of Commerce in

Paris, before three arbitrators. The case was to be conducted in English. The verdict was to be handed down within three months of the hearing.

The contract carried a four-part Force Majeure, negating liabilities causing delays or disruptions between the parties unless otherwise noted, covering the following aspects: one, acts of God, civil disturbances, accidents, third party delays such as in transportation, labor difficulties; two, governmental actions; three, other delays not the fault of the other party; four, delays due to the other party and measures for dealing with such situations.

Westinghouse appeared to have taken the position that overlapping coverage was better than any aspect which might not be fully considered in one contract article or another. Thus, several articles tended to emphasize certain points, such as those involving limitation of liability, warranties, and governmental requirements which were, at least in part, covered in other articles.

Project Assessment

Factors expected to make the project easier than usual

Westinghouse was relying upon its past experience in such transfers to provide a basis for the confidence expressed by the corporation. It guaranteed that the power semiconductor technology included a number of preventative measures, such as the listing of guarantees or responsibilities for both parties, and the customary provisions for arbitration, Force Majeure, infringements or third party indemnity, and the procedures involved in possible termination proceedings.

Factors expected to make the project more difficult than usual

Such a transfer to a socialistic country usually carries several inherent difficulties and this was no exception. Westinghouse was concerned about the security restrictions which might be placed on both parties. A language barrier would exist, despite translators. The large scale of the transfer combined with the intricate technology involved could affect the success of the project.

Expectations for the Future

The contract with Poland was prompting Westinghouse to consider a number of additional possible transfers with the Eastern Bloc. Corporate officials expressed hopes for similar facilities to be built in the People's Republic of China, and were intent on sounding out the governments of Romania, Bulgaria, and Czechoslovakia. Westinghouse realized that the approaches to these countries had to be in line with the country's overall goals as Walczak noted "it takes so long to determine what they want; everything is tied in to five-year plans".¹⁵ Both Romania and Bulgaria already had some semiconductor manufacturing facilities, directly or indirectly with American companies, but did not possess the type of technology sold to Poland.

Romania

General Tire International Company

Description

The agreement between General Tire International Company and the Romanian State Enterprise of Foreign Trade (ROMCHIM), specified that General Tire was to design, supervise construction, and put into production a \$75 million modern, all-radial steel tire manufacturing plant in Floresti, Romania.

The venture was the first and largest project to be undertaken by an American-based company in Eastern Europe. The completed tire factory was expected to be the "most modern, efficient tire factory in existence".¹ The agreement, signed on March 1, 1973, stated that the intended production capacity of the plant would be one million steel-belted radial truck and passenger tires per year. The agreement preceded the one signed between Romania and Control Data by just a few weeks, but unlike Control Data's joint venture, General Tire's involvement was that of a long-term technology transfer contract without any equity involvement. General Tire was to handle the turnkey responsibility and provide the industrial knowhow for the initial start-up, continuing to update this tire technology for the ten year duration of the agreement.

Background

Domestic company. General Tire's stated approach has been that of "total flexibility" in regard to its international operations. Thus, corporate associations have included purely technical assistance contracts, management responsibilities without ownership, minority ownership, or, in a few rare cases, majority ownership situations. In the past, General Tire has had affiliations of one type or another in 35 different countries with direct ties in 26 nations. Currently, the company has withdrawn from such a variety of contacts, preferring to put more attention into fewer operations so that the involvement in these situations could be more inclusive and all-encompassing. Thus, GT now has subsidiaries in nine countries outside the U.S., and technical affiliations in an additional ten countries. Selection of the involvement is dependent upon the particular situation at hand, GT being flexible to the point where the most appropriate linkage is the one usually adopted. The Romanian tire plant is one example of the extensive involvement included under the technical affiliation category.

General Tire uses the 'case by case' sale of technology, that is, licensing of only selected products

or processes*, only when the situation or parties request it. Their approach to the transfer of technology is able to be an across-the-board total package involving all tire products. This includes the technology for all tires manufactured by the firm: passenger, truck, off-the-road, tube or tubeless, bias or radial. For instance, General Tire has been involved in negotiations with Czechoslovakia, a country which wants just the off-the-road tire technology portion of General Tire's technology.

General Tire prefers its technical assistance agreements to be of a relatively long-term duration (from 10 to 20 years although this usually does not exceed 10) because the transfer of total tire technology is a continuous project of great magnitude which requires a long period of time, especially with the installation of improvements. Within such a time frame, however, technology is advancing so rapidly that the technology transferred at the start of such an agreement is often revised and updated if not changed completely by the end of the agreement. On the other hand, Romania, as in most of the East European centrally planned economies, operates on the basis of the state's five year plans, where little allowance is made for changing technology (a point which

*This varies somewhat from the description provided by Hayden who stated that GT's approach is an all-or-nothing philosophy (Hayden, Technology Transfer to East Europe, p. 92).

became apparent during negotiations, but a situation which was adjusted to meet the needs of the parties involved).

General Tire's corporate policy will permit its General Tire trademark to be used when General Tire technology is involved without an equity basis. An example of this policy is found in the Romanian agreement.* The company does not plan to repurchase any of these tires on the basis of its trademark. As corporate officials pointed out the repurchase or buyback issue is a consideration based upon other factors. However, when the tires being manufactured have passed all required acceptance tests, the buyback potential is a viable option. Philosophically, GT officials have pointed out that technology transfers are viewed as a sale, similar to product sales, not an investment. As such, the quality of the resulting product is as important as the quality of any respected GT product.

General Tire was established in 1915, long after the other major tire companies. Its market niche was not that of a direct competitor to the others, but as a specialty producer of premium, extra high quality tires. To create such a product, General Tire required extensive research and development facilities. However, the cost

*Hayden stated that GT did not provide its trademark to the Romanians in this agreement (Hayden, Technology Transfer, p. 95) but GT corporate officers stated that Romania did indeed have the use of the GT trademark, as long as the quality control tests were acceptable.

of such research needed to be offset by measures beyond the price of the product, and General Tire chose to sell its resulting technology to continue its research and development. Lacking the desire or the capital to establish 100 percent equity in its overseas ventures, General Tire was the only tire company for 40 years to operate on less than a total equity position, a unique position among tire manufacturers. In fact, it had less than 50 percent equity involvement in many of its operations.

Its first international contract was the establishment of a small company in Mexico in 1932.

Now General Tire is involved in such diverse areas of the world as India, Tanzania, and Argentina, as well as Romania. This non-equity experience on the part of General Tire in its international involvement has now placed General Tire in a role where it functions as a consultant to other companies eager to operate on such a basis. The incentive to establish overseas manufacturing facilities has become one of the chief means whereby the U.S. tire manufacturers have been able to remain competitive on the international front. Some of the other tire companies, although much larger had never considered technology transfers, having only operated on a subsidiary or joint venture basis. These companies are now coming into the arena of technology selling, but are finding it more difficult to adjust to the non-equity approach without prior experience in this area.

The technology which General Tire has transferred to at least 40 different tire or rubber-plastics related overseas manufacturing facilities has included "such documentation as tire dimensions, stock preparation formulas (amount and types of resins, rubber, carbon black, and other additives), and temperatures and duration of vulcanization; plus production techniques and process information relating to compounding, milling, and mixing, calendaring, extruding, beading, actual tire building, curing, final finishing, and quality control".²

Host. The prior tire technology possessed by Romania was a combination of tire technology from several countries over a period of four decades. In fact, the first tire company to operate in Romania was the American-based Goodrich Tire Company, whose plant was built there in 1933, and operated by Goodrich until World War II in 1939, when it became fully-owned property of the Romanians. The Romanian tire technology remained at this level until 1954, when a contract was made with the Dunlop Tire Company to modernize the former Goodrich plant. About ten years later, in 1962, the Italian tire company, Pirelli, built a new plant in Bucharest. The approach of Pirelli, however, was strictly that of a turnkey operation with no technology transferred after the initial construction and equipping was completed. Thus, the general output in Romania of two million tires a year had been the

combined result of these two tire manufacturing facilities prior to the construction of the I.A. (initials which stand for Tire Manufacturing in the Romanian language) Victoria II Factory built at Floresti through General Tire's technology.

General Tire's involvement in Romania represents the flexibility of the company in adapting to the terms which another company (or, in this case, a country) demanded. The construction of the facility in Romania was necessary because their existing level of tire technology was judged to be "at least twenty years old" according to the firm. General Tire would have probably preferred to export tires to Romania, but this desire was not feasible, being deterred by the lack of ready capital in Romania among other reasons. Building such an extensive tire manufacturing facility appeared justified because the country's projected need for tires included 40,000 heavy vehicles to be produced annually by 1975 as well as 50,000 passenger cars. Furthermore, General Tire was informed that Romania intended to use only 60 percent of the tires for domestic use, with the remainder being used for export to East and West European markets. Indeed, General Tire even saw the possibility that some Middle Eastern markets would be lost through the Romanian exports.

As noted by Eric W. Hayden in his book Technology Transfer, the sale of technology by General Tire including

equipment purchases has provided the company with 15 to 20 percent of its total earnings in recent years. Hayden writes:³

In the Romanian project, for coordinating the purchase and shipment of approximately \$30 million worth of U.S. equipment, General Tire earned 5 percent, or \$1.5 million. (The equipment portion of the project was financed by the U.S. Ex-Im Bank (45 percent, or \$13 million), U.S. commercial banks (45 percent), and Romania's trade organization Romchim (10 percent down payment) with which General Tire conducted the commercial negotiations). In addition, it received an initial disclosure fee of \$1 million for its technology, as well as a commitment by the Romanians to pay \$500,000 per year for General Tire's 'on-going technical service assistance and manufacturing assistance.'

General Tire, as a corporate policy, feels that its past involvement with non-equity agreements internationally has helped the company to interact with its partners in such a way that the company has developed "a precious and valuable 'knowhow', the art of listening and getting along with a host of varied attitudes and ideals.." ⁴ Thus, General Tire's proposal to Romania stated: ⁵

Because of numerous minority and purely technical association ventures which General Tire has been engaged in during the past forty years, it has had to learn the meaning of harmonious cooperation and become an expert at it. In contrast to companies used to 100 percent ownership with dictatorial attitudes, General offers technical knowhow coupled with human knowhow, which is the most winning combination.

General Tire International Coordinator for the Romanian factory project, Gustav Prekopa, has also noted

that, "Romania has been for decades, and still is, a European leader in oil production and has vastly developed petrochemical industries for the conversion of this commodity into various end products. Tires are one of these."⁶ Romania does have an annual production of crude oil of approximately 14 million tons and 20 million cubic meters of natural gas, being Europe's second largest producer next to the U.S.S.R. Its population of 20 million offers both sizable employment potential for such a tire factory and a large domestic market for the output from the tire plant.

Romania's vehicle registration has more than doubled in the past five years. The capacity of the new tire factory is intended to bring all existing tire manufacturing facilities currently in the country up to an annual production figure of three million tires.

Romania, prior to the construction of the manufacturing facility involving General Tire, had two other large tire factories, one dating back to the 1930's. These plants were largely responsible for both satisfying internal demand and exports. The tire factory involving General Tire was the first Romanian tire factory to be fully equipped with U.S. machinery since the end of World War II.

Transfer of technology

Turnkey. To accomplish this end, General Tire, under this contract, was responsible for supplying all turnkey services involved in constructing the plant as far as the blueprints and supervision were concerned. Romania would do the actual construction and building. The company was responsible for equipping the plant-- purchasing the bulk of the equipment from the United States, but using locally produced parts if possible. Once in production, Romania was to be responsible for supplying raw materials which met prescribed specifications.

As an example of the magnitude of the project, the size of the factory was 1700 feet long. The General Tire supervisor, Oz Perrine, who was responsible for overseeing the construction of the factory in Romania, noted that this factory size superceded many others. For instance, the plant constructed in Tanzania had only been 800 feet long. The goal of the Romanians was to be able to produce millions of tires annually, and the factory had been designed with this intent in mind.

Perrine's task was to interpret the blueprints and construction data for the project, and to ascertain that the building and equipment were proceeding as required. It was the responsibility of the Romanians to install the

equipment under the specifications laid down by General Tire.

Information and knowhow. The technical service contract involved two aspects. The first encompassed the initial transfer of the product technology including the knowhow involved in the actual manufacture of the tires. The second was the on-going portion including the updated technology and marketing techniques which would commence when the first part was judged completed. These functions are listed in this summary analysis:⁷

- (1) Delivery of the specialized equipment
- (2) Design of the factory
- (3) Assistance in the supervision of installation
- (4) Adjust and fine tune the equipment
- (5) Assist in start up of equipment and lines
- (6) Start up of production
- (7) Training of supervisory personnel
- (8) Transfer of manufacturing technology
- (9) Continuous update of this technology for an initial period of 10 years after start up.

The contract listed these functions, and included a bar chart of the anticipated completion times.

The Technical Service Contract phase two of this transfer provided for annual services to the tire facility in Romania which extended beyond strictly receiving the updated blueprints or new processes in Radial tire manufacture. This contract guaranteed Romania would receive General Tire expertise in troubleshooting any problems which may occur any time with the GT technology. It also provided for the training of

employees for any new techniques. Since the acceptance tests were to provide an indication that the plant was capable of achieving its predicted objectives as to tire quality and quantity, any problems in this regard after that point were to be the responsibility of Romania. The annual fee to be paid by Romania provided for the services of a certain number of skilled General Tire consultants for a specific number of man-days or hours at specific rates. These services were considered particularly important in the updating of the technology since changes often are reflected in the processing of tires during the manufacturing stages.

Management. No managerial responsibilities were included in this agreement beyond the training and construction supervision. However, as in most production setups, some management training was combined with basic production techniques.

Patents. All necessary information was included under this agreement, including all needed patents. However, unlike highly specialized areas, the production capacity in tire manufacture is as important as the blueprint type of information, perhaps more so.

Trademarks. General Tire International made its trademark available in the Romanian project. It included the stipulation, however, that all tires carrying its logo were not permitted to be applied to any tires

manufactured in Romania until all acceptance tests had been completed at the factory. Romania had the right to choose whether the tires carry this trademark or not. The right to the use of the General Tire brand name was permitted only for tires designated to be sold in Romania, and in limited overseas markets (including all of the Eastern Bloc countries, and several middle-eastern countries). It was not to be used on tires to be exported to any other locations. Should Romania not want to use the General Tire brand name, it was still permitted to use the phrase "made in collaboration with General Tire" on tires prepared for export as well as tires sold within the country or the Eastern Bloc. All rights to the use of the General Tire name were to cease at the conclusion of the agreement, after the ten years of the Technical Service Contract had expired.

Buyback. A 'buyback' aspect to the contract was one of the items which the Romanians would have preferred. This meant the outflow of hard currency would have been substantially reduced as the company involved would have taken some of the manufactured product back as payment for services rendered. General Tire has found that buyback clauses often require the company to employ additional effort in such a case to market those tires. In this instance, GT sidestepped this issue in the formation of the contract, primarily because the chief competitors

bidding for the Romanian tire plant were also not interested in having to accept a buyback arrangement.

Responsibilities

Domestic company. General Tire's two areas of responsibility included supervising the plant's construction, and providing certain services as stated in the Technical Service Agreement.

Host. The only responsibilities of Romania as listed in the agreement were to provide the requested payments within the specified time frame.

Corporate Perception of Benefits to be Gained from Agreement

The initial motivation behind General Tire's involvement in this Romanian project was the profit to be made through such a technology transfer. It was a venture which complemented General's prior experiences in the non-equity mode, and offered an opportunity to apply previous experience on a large scale. Thus, because General was organized for such endeavors, this project promised a good return on assets as currently possessed by the company.

Another prime consideration was that this venture would provide an additional supply of their product without the outflow of equity which would be required if

General were to construct a facility on its own. However, because of the lengthy time involved before production would be on-stream, this supply source was viewed as a long run possibility, not an immediate likelihood.

The radial tire technology sold to Romania was GT's latest and most advanced information. With such recent information, it was possible that Romania could actually become a competitor with General Tire. However, the GT's view was that the long run opportunities in this venture more than compensated for the possible competition which might arise.

General Tire's interest in obtaining the Romanian contract was two-fold. The first aspect involved its penetration into Eastern Europe in general, especially through such an enormous undertaking as the Romanian tire factory. General Tire felt that Romania was also in an excellent location to export tires to other areas with its seaport on the Black Sea and its well-developed network of roads. Its interest also focused particularly on Romania, however, because the corporation felt that the country itself "holds the potential for the future as a sizable and rapidly growing marketplace."⁸

Negotiations

Parties involved

Domestic company. Numerous corporate officials from General Tire were involved in the negotiations with Romania. One of the General Tire negotiating team was a Romanian national, who had been born there and had lived there until 1965. His knowledge of the language and the culture of Eastern Europe provided a common ground between the two parties.

Host. The negotiating hierarchy in Romania consisted of four levels in this case. At the top was the ministry to which the specific industry belonged. In this instance, the tire industry belonged to the Ministry of the Chemical Industry of Romania. The second level encompassed the State Enterprises for Foreign Trade. These are the buyers who act on behalf of those who will administer the plant. The contacting enterprise interfacing with General Tire was ROMCHIM. The third level was the industrial 'centrale' which possessed full technical competence. The 'centrale' involved here was the Tire Rubber Goods and Plastics Administration. These centrales are often aided by design institutes, and in this case, the design institute was called IPROCHIM. The fourth and final level was the state organization which

would be administering the plant under construction.

In this agreement, this was the Victoria, Floresti, tire complex.⁹

Initiating contact

There are a number of ways in which a U.S. businessman or company can initiate negotiations for a manufacturing venture in Eastern Europe. The range has been described as extending from those where a preliminary inquiry did not exist and the company was seeking entry or introduction to its potential partner through such channels as exhibitions, trade fairs, or mail inquiries, to those where the State Enterprise for Foreign Trade already possesses an interest in the product category or even in the particular company. In the case of General Tire, Romania had already examined a variety of tire manufacturing companies around the world in its opening quest for a tire plant manufacturer, but Romania's approach was to issue a brief, one page inquiry to all rubber companies, not to extend an invitation to just the country's first choice.

The past involvement of General Tire in non-equity situations, combined with the experience and adaptations which the company had gained through the variety of locations and working conditions, led the

company to start negotiations with Romania in July 1971. GT was firmly convinced that the company could handle the project.

This lead to a deeper interest on the part of both parties and General Tire conducted several official corporate visits to Romania in late 1971 and early 1972. Its proposal was extended in March 1972. This proposal of General Tire was one of several bids which were analyzed by Romanian officials, but General Tire's bid was selected by Romania over those from other competitors.

Length of negotiations

The contract between General Tire and Romania took up to 18 months to completely negotiate and was over 300 pages long. It was written in English, although the contractual discussions were held in Romanian on their side, with translation into English for the benefit of the General Tire negotiators. Considering the detail which had to be laid out, the length of the contract was not regarded by General Tire as overly long. In retrospect, GT felt that an even larger document would not have been inappropriate. Furthermore, 18 months may be viewed as a relatively short negotiating period.

General Tire possessed a number of aspects which appeared to be particularly desired by Romania. This had

apparently been determined by Romanian officials prior to the start of the official negotiations. Time-wise, this was beneficial because many of the preliminary investigations had been completed from July 1971 through January 1972, and therefore, the period of time required to conclude the negotiations between General Tire and Romania was between 12 and 18 months, or the time from when the proposal was extended in March 1972 until March 1973 when it was signed. Considering the enormity of the project, this was a surprisingly brief period.

Issues and obstacles

Contract format. One of the members of General Tire's negotiating team pointed out that the approach of American companies toward contracts in Eastern Europe often differs from the approach taken by East European countries. This was evident in part by noting the emphasis which is placed on all specific details in the contract by the East European nation. An East European country such as Romania uses the contract as a specific indication of the responsibilities and duties to be carried out. Projects will precisely follow such a document to the letter. Thus, in negotiating, GT officials noted it was important that the American company pay close attention to contract details since

those details would be considered mandatory throughout the functioning of the agreement. Furthermore, while the negotiations usually take place between a company and (in Romania) the State Enterprise for the Foreign Trade, implementation involves the buyer or individual factory and the industrial centrale. Hence, the contract details must be clear enough to allow all parties to understand the obligations, whether or not they were involved in the initial negotiations. In GT's case, since the negotiations were really held in three levels: one, the chemical ministry; two, the state enterprise; and three, ROMCHIM; all elements of the contract had to be very clearly stated, since implementation would take place on the fourth level, the factory of Floresti.

Competition. The political ramifications of the contract between General Tire and Romania extended beyond the transfer of tire technology. Romania wanted the technology to build steel-belted radials, and General Tire, based in the United States, was experienced in regard to the non-equity transfer of tire technology. Thus, among the possible competitors from the United States, General Tire was able to demonstrate past experience in similar agreements, as well as a proven ability to be flexible and adapt to a particular situation. However, several other firms, based in other countries, were also strongly favored for diverse reasons. Several

European suppliers had the advantage of knowledge of the country through prior contacts. Pirelli, for example, was a more logical vendor since the company was already operating in Romania and was a familiar name.

Other factors were also involved in Romania's corporate selection. For instance, Romania was desirous of obtaining the Most Favored Nation (MFN) status from the United States. Courting a U.S. company might have been part of the nation's approach toward being awarded this trading honor. It may not have been a coincidence that the MFN discussions were being held about the same time as the General Tire negotiations. Romanian president, Nicolae Ceausescu, did invite President Nixon to the country for a state visit, where the 'magnitude of the General Tire contract' was pointed out.

Another possible reason for the selection of General Tire over other tire companies might have been that General Tire was willing to sell its technology relating to radial tires. Michelin, based in France, was considered to be the most experienced radial tire company, but this company would not sell its technological process. However, General Tire was in competition with several other firms possessing technology generally equivalent to that of General Tire's. If General Tire had not been willing to supply Romania with their total and latest radial tire technology, another firm would probably have been willing to do so.

Romania was very concerned that the country receive the latest technology in regard to radial tire manufacturing, as well as a continuing update on that technology. Part of this concern was based on past experiences by East European countries where purchases of obsolete equipment or processes had been made and where more recent improvements had rendered those purchases less in value as a result. Thus, General Tire provided Romania with the information and knowhow to manufacture two types of radial tires: the fabric carcass steel-belted radials used on passenger cars which are tubeless and the fabric carcass steel-belted and steel carcass belted tire for trucks and other heavier equipment requiring tubes. This transfer package did not include the technology possessed by General Tire for the construction of 'off-the-road' tires used by the larger vehicles which are often required in mining or earth-moving operations.

Long term commitment. One of the major negotiation hurdles introduced by General Tire was adapting GT's need for a relatively long period of time to the Romanian five-year plan. The solution was to separate the contract into two parts: the first involving the construction and equipping of the factory up to the point of tire production inspection and approval. The second aspect was that of an on-going technical service agreement which

would run for ten years, but which would commence only at the point of acceptance of the plant's production capability as being on-stream.

Bias, price and equity obstacles. Hayden, in his book, noted three obstacles which General Tire had to overcome in negotiations with Romania.¹⁰ The first was that of a psychological hangover within the U.S. tire industry dating back to 1964 when the Firestone Tire and Rubber Company was awarded a contract with Romania. However, because a contract had been signed with a communistically oriented country, public outrages including picketing outside the firm's headquarters in Akron, Ohio, caused this contract to be cancelled. To avoid a similar reaction, General Tire sought and received a formal letter from the U.S. government through the Office of International Commercial Relations in the Department of Commerce which stated that as of the Export Expansion Act of 1971, it was government policy to encourage trade between the United States and all nations of the world with which we have diplomatic and trading relations, including most of the communist countries.

The second obstacle as enumerated by Hayden was General Tire's insistence that the company be paid a technical services fee of \$500,000 annually for ten years. "According to General Tire, its turnkey price, exclusive of the annual charge, was ten percent lower than that of

its nearest competitor, a consortium of the United Kingdom's Dunlop and Italy's Pirelli. This brought the total package price to approximately \$2 million more than that of its European rivals."¹¹ Hayden noted that General Tire had compromised on two aspects which had remained objections to its European rivals. First, the company agreed to consider revising their non-equity technical assistance agreement into a joint venture involving equity by both partners. Second, General Tire agreed to arrange for a Viennese broker to help Romania dispose of \$17 million worth of raw materials as an aid to help Romania raise some hard currency with which to pay off the dollar cost of the plant.

The third obstacle was really an offshoot of the second one, in that the Romanians were quite insistent that General Tire be involved on an equity basis with this manufacturing facility. However, General Tire saw this venture strictly as a non-equity type of technological transfer where General Tire would receive fees for their technological and managerial expertise in creating and operating a tire manufacturing facility. Thus, General Tire adopted the policy that such a joint venture might be feasible once the equipment was installed and the technology had initially been transferred. When General Tire learned that their European competitors were also adverse to entering into an equity agreement, however,

the company urged that the contract be signed without that issue being resolved, but included a joint venture option which would be renegotiable within the first five years of the agreement.

GT also had a concern during the negotiations that it might be providing free design and equipment advice without being in the final running for the contract. Thus, GT was reluctant to take a stand that would cause negotiations to be terminated on issues which were feasible if not totally desirable.

General Tire's corporate policy on overseas joint ventures had been to own between 25 and 40 percent of the equity since it had been felt that while a higher percentage was too costly, any less denied the company necessary operating leverage. However, corporate policy had substantially shifted from this earlier view to a position where equity was considered from an investment standpoint but not a leverage aspect. In this case, the company did not want to be involved in an equity joint venture because of investment considerations. Hayden pointed out that the Romanian tire plan value is \$75 million, thus 25 percent would equal almost \$19 million. General Tire's anticipated revenues from the project at the time of the negotiations were in the area of \$8 million with \$1.5 million coming from its equipment commission, \$500,000 from supervisory fees, \$1 million from the initial

technology disclosure fee, and \$500,000 annually for ten years (or \$5 million) from the servicing and technology update fees.¹² General Tire's approach to equity involvement usually evolved on a smaller scale such as the \$10 million projects which were being negotiated with Somalia and Sudan at that time.

Time Frame

The project commenced on March 1, 1973, and was divided into two portions, with the second part to commence when the approvals had been given on the first part. The initial task facing General Tire and Romania was the construction of the factory at Floresti, and the equipping of that plant. This was estimated to take approximately two years. When this plant was completed, then the quality acceptance tests would be run, and when the tires being produced met those acceptance standards, the first stage would be complete. At this point, the second stage, the Technical Services Contract, would go into effect and run for ten years. Thus, the contract's actual length was ten years plus whatever amount of time was necessary to construct, equip, and complete the acceptance tests at the plant.

Financial Flows

Payments

The total cost of the project for the Romanians was to be financed through loan agreements with the Export-Import Bank and commercial banks in the United States. Payments to General Tire were to be paid in U.S. dollars and were non-taxable by Romania.

Hayden detailed the initial payments to General Tire, excluding the equipment purchase and including the commission on those purchases, to total \$2.5 million, or \$1.5 million for the equipment commission and an additional \$1 million for the initial disclosure and service fee. The annual payments of \$0.5 million for the ten year Technical Service Agreement would bring the total payments to General Tire by Romania up to approximately eight million dollars, by the ultimate conclusion of the contract.¹³

The technical service annual fee of \$500,000 was the payment which the Romanians are to provide for the updated technological improvements which General Tire had made in its radial tire production over the 10 year period. There was an element of risk here in that should Romania decide that its current level of technology in radial tire production was sufficient, it could

decline to pay this annual fee. Since the agreement had been signed, however, this would be in violation of the contract.

General Tire's approach, when the company had an equity involvement, often appeared to be to request only an equipment commission or a similar fee for such projects, assuming the technology fees would be transferred via the project's technical service contracts.

This technical service fee might be viewed as a form of license fee, as it could represent a percent of sales value of the tires being produced over a ten year period. The use of a constant figure as on the GT-Romania project removes the necessity for General Tire to audit the tires produced and sold, and then compute the percentage accordingly.

Such a predetermined sum usually appears preferred by East European countries, where all contract details need to be identified. However, such a fee might represent a fairly high payment if production were to be delayed or slow. On the other hand, it is conceivable that this fee could be less than an actual sales percentage if the production of the plant were higher than anticipated.

The contract between General Tire and Romania has been described by General Tire as somewhat standard for the Eastern Bloc, including the Soviet Union. It was very

precise, and was to be followed to the letter. However, there were some variations. In most contracts of this type, a percentage of payments, including those initial, up-front ones, are often held back until all responsibilities have been completed for that particular stage of the product. But in this agreement, if anything was not completed by the specified date, there were stipulations for penalties to be paid back to Romania, but no portion of the payments were held back in anticipation of this occurrence. On the other hand, the initial technical disclosure fee of \$1 million, with the remaining four-fifths to be paid over the course of the ten year period was to remain constant. No escalation clause was mentioned in the contract, although inflation or other factors could substantially reduce the actual dollar amount of the payments by the conclusion of the ten year period.

Even within the Eastern Bloc, certain countries have more difficulty in raising the hard currency than others for such projects as the one between General Tire and Romania. Romania has its petroleum resources to use as a base for its capital outlay since it is the second largest producer of crude oil and natural gas in Europe, next to the U.S.S.R.

Other countries are not so fortunate. In some other countries, the methods used to overcome the shortage of hard currency are often one of the most crucial bargaining points, and in some cases, a compensation arrangement is necessary to finance the project. In this instance, GT agreed to help Romania market some products to help with the financing but did not agree to any mandatory product repurchases.

The time frame generally anticipated that plant construction would require approximately two years, and that the acceptance test would be completed shortly thereafter. Thus, by 1979, General Tire expected to have received complete payment including its commission on all equipment payments.

Purchases from the domestic company

In this instance, the equipment purchases were part of the overall agreement and were not considered separately. General Tire did not anticipate any additional equipment purchases from Romania, because the equipment supplied was intended to be sufficient for the intended production with all immediate repairs or replacements covered by manufacturers' warranties. No tire purchases were anticipated since Romania did have some tire manufacturing facilities within the country already, although it did not possess radial tire technology.

Purchases by the domestic company

The agreement stated that Romania would have the responsibility of providing the expatriates from General Tire with suitable housing and transportation; thus, the company had no major concern regarding projected expenses in this area.

Personnel

Training tasks

Domestic company. The agreement called for a total of 300 man-months to be provided by General Tire. The company's initial expectations were that 12 to 14 people would be used on a permanent basis ('permanent' being defined as residing in the country longer than six months, but not an indication of intention to stay beyond the completion of the project), or a period of time approximately two years for the General Tire employees to be on-site in Romania.

The two initial fee payments for the equipment and initial technology transfer included provisions for a certain number of man-hours, both in terms of visits particularly relevant to equipment deliveries and adjustments, and in terms of longer stays for those who were posted to Romania to live there for a period of time such

as during the plant construction. General Tire was to assume all additional expenses for any man-months exceeding the amount enumerated in the contract. Romania was to be responsible for providing adequate housing and transportation for all General Tire employees sent to Romania on the project.

No major problems were anticipated by General Tire since the corporation's experience in adapting to international situations had been extensive and it was assumed that all obstacles could be overcome or worked out.

Host. A wide range of skills were to be needed on the part of the Romanian workers since the project ranged from first the construction of the facility, to the operation of the factory. Production training was to be accomplished both in Romania and at General Tire facilities in the United States. General Tire was to supply some of the training in the United States, but all expenses were the responsibility of Romania.

General Tire anticipated some problems in regard to training involving a lack of appropriate skills on the part of some of the Romanian workers. There was also an expectation of fluxuating quality levels. However, General Tire knew that many of the employees had prior experience in tire production and expected that any problems could be overcome with proper training.

Protection

Leverage

Domestic company. General Tire's periods of greatest leverage were considered to be at the negotiating stage and during the Technical Service Contract stage. The latter stage would be particularly important if it became known that certain extremely important improvements had been made in radial tire technology. But the period between these stages was one where the company was in the position of transferring the greatest body of technology outright. Some industries, particularly those involving intricate electronics, are able to hold back certain portions of technology as insurance that the other party will accomplish all promised responsibilities. However, in the manufacture of radials, most of the information must be passed along immediately. Thus, one of the few controls available to General Tire during this construction stage was the receipt of the payments from Romania made on a quarterly basis. Should the payments stop, General Tire's help on the project would also stop.

The guarantee which General Tire International offered to Romania was the ability to manufacture radial tires equal to those produced in the United States, assuming the workers at the plant in Romania followed the

directions provided by General Tire and the raw materials used in the production met certain specifications.

General Tire's guarantee of tire production only extended through the point of the acceptance tests, when it had been indicated that the Romanians had mastered the initial production skills, and that the equipment was capable of producing the expected tire quality. On the other hand, the annual technical service fee provided both for the implementing of any improvement which might be developed as well as servicing and quality maintenance of equipment.

Host. The payment schedule was also a control, however, which was able to be used by Romania to keep General Tire to its commitments. Since the bulk of the payments to General Tire were to be paid via the Technical Service Contract, or after the completion of the plant when production was in process, the pressure would be on General to have the acceptance tests completed as soon as possible, an indication that the first stage of the entire agreement had been accomplished and that the Technical Service Contract was in effect.

Romania's guarantees, on the other hand, were to construct the factory within a certain period of time and to provide employees who would be involved in both the construction and equipping of the plant, but also to

supply additional employees with certain abilities or skills who would be capable of performing the operational functions to put the tire production into operation.

Inspection privileges

Inspection provisions were established on two levels for the tires being produced. Tires prepared for export had to meet more rigid qualifications but all tires had to meet certain specifications.

Patent/trademark defense

All tires would be permitted to carry the notation that they had been produced in Romania with the help of General Tire when the acceptance tests were completed. Certain tires could not carry the company's official logo if they were to be exported to an area where General Tire had any stated contact, as listed in the agreement, since that would make Romania a direct competitor of General Tire in those areas. Those tires manufactured in Romania after the Technical Service Contract was in effect (indicating that all acceptance tests had been passed) were to carry the General Tire logo in Romania if their quality met certain standards. Any tires produced prior to this acceptance were not to carry this logo.

Legal provisions

The agreement provided for several external protection measures of benefit to both parties, such as the inclusion of the Force Majeure clause and the provision for arbitration should disagreements arise. The arbitration court identified in this agreement would be located in Paris, with the negotiating language to be French.

Project Assessment

Factors expected to make the project easier than usual

General Tire's prior experience in technology transfers of the form being used for Romania appeared to provide a body of background experience for the company to draw upon in this endeavor. The desire by Romania to have General Tire handle the project appeared strongly in favor of the technology. The political environment surrounding this transfer appeared supportive.

Factors expected to make the project more difficult than usual

The greatest deterrant on this project appeared to be its overall size as it was one of the largest

transfers of this type undertaken by General Tire. An accompanying factor here would also be the restrictive, closely-controlled nature of the Romanian political sphere which prevented much direct contact between General Tire and the tire factory.

Expectations for the Future

General Tire was certain that it would be able to transfer this tire technology and felt that the factory in Romania would provide a potential future source of supply, if needed, as well as a central hub from which General Tire's reputation would spread throughout Eastern Europe.

Romania

Clark Equipment Company

Clark Equipment Company, headquartered in Buchanan, Michigan, and The Foreign Trade Company Universal Tractor located in Bucharest, Romania, entered into a series of agreements signed on April 10, 1975 and effective as of October 29, 1975.

Description

The purpose of the technology transfer from Clark Equipment A.G. was to provide manufacturing technical assistance, documentation, and patent trademark licenses, for power shift transmissions and torque converters to Universal Tractor in Romania. This was the technology purchased from Clark, through a Technical Assistance and Cooperation Agreement, a Trademark Agreement, and a Marketing Agreement.

The Technical Assistance License and Cooperation Agreement was between the European subsidiary of Clark U.S.A., Clark Equipment A.G. (CEAG) and Universal Tractor (UT), and was the transfer mechanism for the information and knowhow provided by Clark to Romania.

The Trademark Agreement with Universal Tractor was also handled by Clark's European subsidiary, CEAG.

All Clark trademarks and trade names owned by Clark U.S.A. on and in connection with the power shift transmissions and torque converters were to be supplied to Universal Tractor, subject to specified quality controls.

The Marketing Agreement, the third part of the total package between Clark Equipment and Universal Tractor in Romania, contained the same effective date as the other two portions, October 29, 1975, and was to run concurrently with the other agreements. However, this agreement was with the Clark International Marketing S.A. corporation of the Clark Equipment Company (CIMSA). It is the promotional arm of Clark involved in the sale and promotion of the products produced by Clark in most of the world markets. Universal Tractor was to receive the services and cooperation of CIMSA in selling and promoting the sale of the transmissions and torque converters produced by UT from Clark technology. CIMSA would also benefit from this arrangement as Clark would have an additional supply source of these products in Romania and all promotional endeavors would help to increase the Clark Equipment's volume internationally and broaden the awareness of Clark's products. CIMSA's role was also important. The sale of the Clark-related products produced in Romania affected the payments which Clark was to receive from the transfer, as well as the sale of components from Clark to

UT for use in the creation of these products. This would be a factor only initially, however, until full production was on-stream. Unlike Poland, Clark was to receive no license fee for those transmissions kept in Romania but was to receive a fee for all those sold outside that country.

Background

Domestic company. Clark Equipment describes its world-wide corporate commitment as very high--with hopes for having at least 50 percent of its business conducted overseas by 1980. However, it should be noted that the corporation is limited by the amount of equity which it has available, and as well, notes a lack of sophistication which makes it difficult to be innovative. Thus, Clark uses license agreements as a wedge which it drives into a market with the help of its local partner. This type of license agreement includes a knowhow package far beyond the type of information just found on blueprints. Clark provides the knowhow and manufacturing expertise behind the production of its products because it feels that the local production of the Clark products will be a MUST in the future. Eastern Europe, to Clark, represented a large market which was closed via other normal marketing channels. Thus, because of the inability of Clark to enter such a

market in other means, it considered such approaches as technology transfers. Likewise, were Clark able to enter a market in other ways, such a technology transfer might not be selected, because such an action does carry disadvantages such as the creation of competitors, or a lack of cost controls. Clark's interest in the Soviet Bloc was not limited to the 1960's or 1970's. Clark wanted to enter the Soviet Bloc years prior to its current agreement with Eastern Europe. Immediately after World War II, the Soviet Union wanted to build heavy axles, and Clark was to provide the turnkey operation to setup such a plant. However, the U.S. government embargoed the shipments of equipment and sold it at an auction, for less than the letter of credit. After that point, Clark adopted a policy of exporting, with a German joint venture base. This remained fairly constant until the 1970's when the non-equity agreements were negotiated.

No distinctive features relating to Romania appeared to be found in the background of the Clark Equipment Company which were not already provided in the writing regarding the Clark arrangements in Poland. The Romanian agreement was signed three years after Clark's effective date had commenced with Bumar in Poland, and was a sign of marked progress on the part of Clark in penetrating some aspects of the Eastern Bloc. Clark's emphasis on axles in Poland and transmissions in Romania was for two reasons.

First, Clark was prevented, by the agreement with Poland, from establishing another axle facility within Eastern Europe. Second, however, the transmissions were a second step toward a more complete Clark manufacturing operation involving total vehicles. Clark envisioned reciprocal trade between Poland and Romania; axles for transmissions and vice versa.

Host. Universal Tractor has been described as Romania's foremost manufacturer of tractor equipment. It had the facilities for the manufacture of power shift transmissions and torque converters, but needed the information and technical knowhow to be able to produce such items.

Transfer of technology

Turnkey. Clark was not involved in this project in the true turnkey sense, but was expected to provide some of the services often found in connection with turnkey operations. CEAG was to furnish a list of required equipment as used by Clark for the production and assembly of the designated products and to furnish a recommended plant layout and aid in the plant layout and processing necessary for the successful production of the transmissions and torque converters. Clark also agreed to furnish any special tools at cost to Universal Tractor, at CEAG expense.

The facilities were scheduled to be completed by 1977, and were to include more than 250,000 square feet for the manufacturing and assembly of transmissions.

Information and knowhow. The technical information supplied by Clark was to include all of the following:

- Engineering drawings of details and assemblies
- Engineering bills of material
- Material specifications
- Assembly and production test information
- Inspection procedures
- Process sheets and route sheets
- Production, inspection and assembly tool drawings and fixture drawings
- Metallurgical information
- Suggested machinery requirements and plant layout
- SAE standards and AISI standards and any available cross reference information
- Patents
- Test programs to establish trademark approval of transmissions and torque converters

It was to be sufficient to enable UT to manufacture the designated products to Clark trademark quality. It should be noted that Clark provided information on how to manufacture the parts, but not how to design them.

The transmissions supplied to Universal Tractor by Clark included model numbers 2000, 3000, 4000, 5000, 8000, and 16000. Mating torque converters included model numbers C170, C5000, C8000, and C16000. The technology supplied by Clark was to include all subsequent improvements and included subassemblies, components parts and accessories for use on or in connection with the specified transmissions and torque converters, together with all spare and renewal parts.

The cost of reproducing the information (two sets) was to be borne by CEAG with one (reproducible) set of drawings. Clark was to furnish all existing engineering changes to UT without further requests by UT or further charges to UT which covered all modifications, or improvements including all technical information on the involved product models as listed in the agreement. Clark also agreed to answer any UT inquiries and furnish advice relative to the agreement.

CEAG was to supply UT within 120 days of the effective date of the agreement with a list of suggested parts which initially Clark felt should be manufactured there in Romania for the first 100 assemblies, and those which should be purchased by UT, and would use its best efforts to help UT purchase those components.

Management. As with other arrangements in Eastern Europe, Clark did not plan to take part in the management of the operation apart from skills training in the processes and plant operation.

Patents. The patents included under the agreement involved not only the patents directly related to the listed products, but also all patents which CEAG might acquire during the life of the Agreement relating to the particular products being transferred to Romania.

Universal Tractor also provided CEAG with assurances that Clark Equipment was to receive, royalty-free, non-exclusive licenses to any transmissions or torque converters held by UT during the course of the agreement, including access to all inventions, improvements or patents originating during the time period of the agreement.

Trademarks. Clark U.S.A. authorized Universal Tractor to use its trademarks throughout Eastern Europe, including Poland, Albania, Bulgaria, Czechoslovakia, Romania, German Democratic Republic, Hungary, Yugoslavia, Mongolia, and the Union of Soviet Socialist Republics. Before the trademarks were able to be used by Universal Tractor, however, all products manufactured in Romania were to qualify under the specified test procedures. In addition to the designated tests, Clark was also permitted entrance to Universal Tractor premises at all reasonable times given prior notification for the purpose of inspecting the products or the methods of product manufacture, in addition to quality controls. Clark also maintained control over the usage of the products to ascertain that certain parts are not used for the wrong purposes.

In addition to the Clark insignia, all products manufactured in Romania were to carry a designation or indication that the item had been manufactured by Universal Tractor under license from Clark Equipment. This requirement

also applied to the use of all Clark trademarks or logos used in sales or other promotions. Universal Tractor was not to use another notation which included or was confusingly similar to the Clark trademarks. In addition, Universal Tractor was not to conduct its business in a manner that was harmful to Clark's trademarks or the good will which they represented.

The trademarks provided to Romania were provided on a non-exclusive basis, permitting Clark to use or permit others to use its trademarks concurrently.

The fees and financial arrangement concluded between Clark and Universal Tractor did not involve any additional payment for the use of the Clark trademarks.

The right to the Clark trademarks was for the duration of the Agreement, after which time, all trademark permission was to cease.

Buyback. Clark had a buyback clause with Romania, but it was more optional than a necessity, and was included to help Romania with fee payment as a measure to help the country develop its construction industry. As such the Romanian project was designed to provide mutual advantages for both partners.

To help the marketing effort on all sides, mutual cooperation was encouraged as UT and CIMSA agreed to exchange available market forecasts for the maximum sale of agreement products.

CEAG provided UT with non-exclusive paid-up licenses to make, use, sell, or otherwise dispose of the designated transmissions and torque converters within the prescribed Eastern European area. CIMSA's intent in regard to the UT agreement, meanwhile, was to supply all current and future Clark customers located in Europe, Africa, and Asia with the transmissions and torque converters manufactured in Romania. It was expected that the purchase of these products by Clark from UT would exceed the payments due from UT to Clark. In fact, it was anticipated, at the signing of the agreements, that CIMSA's purchases of the Model 2420 transmission alone would be equal to two to three times the total fees to be paid by UT as stated in the Technical Assistance and Cooperation Agreement.

CEAG agreed not to enter into a similar production agreement with any other country within the defined area for the duration of the agreement. Furthermore, should Clark during the period covered by this agreement, desire to manufacture any powershift transmission or torque converter within the East European area which was not covered by this present agreement with UT in Romania, the matter was to be discussed with UT before any manufacturing rights were to be granted to another manufacturer within this region.

UT was permitted the right of sub-contracting the manufacture of sub-assemblies, parts, or entire models, within Romania, but only after taking proper precautions regarding product quality maintenance and technology secrecy.

CEAG also granted UT the right to use or sell or otherwise dispose of complete vehicles incorporating the transmissions or torque converters (including replacement parts for the products manufactured under this agreement) throughout the world and provided UT with rights to all current and future patents possessed by CEAG which applied to the agreement products, for the duration of the agreement.

Other aspects. The possibility of a joint development program was emphasized right from the start as even indicated by the opening statement of the Technical Assistance License and Cooperation Agreement which noted that "both UT and CEAG are interested in expanding this Agreement over a period of time and will jointly study the feasibility of a joint venture involving the manufacture and sale of the products covered by this Agreement and possible other products of the Clark Group of mutual interest." Thus, the possibility of joint product development and/or marketing efforts was at least anticipated from the beginning of the project, although no specific suggestions or plans were made at the start. One final

point, interestingly, was that all three agreements listed the official addresses of both parties where all correspondence involving the agreement is to be sent, for giving or requesting all notices. Thus, should some notice not be received, the excuse for erroneous address could not be used.

Responsibilities

Domestic company. The obligations of Clark, in reference to the CEAG responsibilities included the following:

- CEAG will provide technology information to UT;
- CEAG will furnish engineering change information to UT;
- CEAG will furnish tools to UT at cost;
- CEAG will answer UT inquiries on design and technological information;
- CEAG will indicate initial parts to be manufactured or purchased and will support purchase;
- Visits of CEAG specialists in Romania;
- Training of UT technical personnel by CEAG;
- CEAG will furnish list of required equipment;
- CEAG will inspect and test agreement products;
- CEAG will not enter into similar agreements with others for similar products;
- CEAG obligation limited to existing information;
- UT has right to sub-contract;
- Clark transmissions not included in agreement.

CIMSA obligations involved no technical information transfers, but did pertain to the marketing responsibilities in selling the transmissions and torque converters or buying the Romanian products for Clark's international marketing use.

One of the first obligations of CEAG was to provide UT with the initial installment of technical information within 120 days of the effective date of the Agreement's acceptance. CEAG was also to aid UT in obtaining information or purchasing equivalent components from third-party suppliers for all components and parts required in the manufacture of the designated products which were purchased by the Clark Group from other companies.

Interestingly, the technical information supplied to Romania was to be in French, English or German.

All conversions, including from Clark measurements to the metric system, were to be at the expense of Romania. Clark was to assist UT, however, in specifying equivalent materials to compensate for different materials, and in both instances, Clark had the responsibility for approving all changes or conversions.

Host. The obligations of UT included:

- Initial disclosure fee;
- UT fees to CEAG (not including sales to the Clark group);
- UT was to pay no fee on parts purchased from the Clark group;
- Dates for calculation and payment of fees;
- UT accountability for sales outside Romania;
- UT skills.

UT's obligation in helping with CIMSA's responsibility was to demonstrate its willingness to meet all quality, delivery and price prerequisites necessary during the term of the agreement as it was initially approved.

UT was to inform CIMSA of the characteristics of the vehicles for which the transmissions and torque converters were intended, and CIMSA was to advise UT, within 30 days, of the proper transmissions for those vehicles. CIMSA was not to deny advice in this area, but was not to be held responsible if UT did not request such advice or if transmission failure was due to improper selection or usage.

Universal Tractor was to honor the secrecy of the technical information provided for its manufacturing improvements by CEAG not only for the duration of the agreement but for an additional five years. UT was also to apply its best efforts in manufacturing the maximum number of products, commensurate with the markets available to UT for such products.

UT was to follow the CEAG engineering manual as to the testing, performance, specification and recommendations for manufacturing the transmissions and torque converters covered by the agreement.

Corporate Perception of the Benefits to be Gained from Agreement

Clark's desire for the agreement with Romania had three parts. First was a desire to obtain a manufacturing source for marketing elsewhere, particularly in Eastern Europe. Second, the agreement acted as an entry vehicle

for Clark into Eastern Europe. Third, Clark hoped to obtain additional income from UT's payment of the disclosure fee and royalties.

Romania, it was felt, wanted this agreement with Clark, in order, to save hard currency, to improve their transmission development, and, to obtain more hard currency through exports.

Negotiations

Parties involved

Clark Equipment's representation, especially those individuals selected by the headquarter's staff to be the company's chief negotiators, met with both representatives of the Romanian government and Universal Tractor.

Initiating contact

Romania made the initial overture to Clark Equipment, but the contact had been made through Clark's growing relationships throughout Eastern Europe because of Poland's Bumar project.

Length of negotiations

Romanian agreement took two and a half years to conclude.

Issues and obstacles

Both parties were responsible for all permissions and approvals from their respective governments. CEAG had the general approval of the U.S. government prior to the effective date of the contract, but had yet to settle formal permission for the license from the U.S. and Swiss authorities, while UT sought approvals from the Romanian government. The effective date of the contract was to be the date upon which the final approval was obtained.

CEAG and UT were to meet and negotiate agreements on 180 and 140 horsepower transmissions for crawler tractors, and the general agreement was not to become effective before these negotiations had been completed. This amendment was attached to the Trademark Agreement between Clark and UT, effective as of April 10, 1975, the same date as the agreement itself. It noted that in addition to the transmission model series and mating torque converter model series designated in the agreement, two crawler tractor transmission models, numbers LT7758 and LT7759 were to be added. The amendment also indicated that other countries, upon mutual agreement, could be

added in addition to the designated East European countries listed in the agreement. This would involve only those interested in utilizing the Clark Trademark as applied to the products produced in Romania. As with the original statement, UT agreed to furnish representative production samples for trademark tests and qualification.

Time Frame

Overview

The contract was to extend for a period of 10 years from the effective date, and was able to be extended for an additional period if conditions had been agreed upon at least prior to one year before the end of the stipulated 10-year period. However, the ten-year period individually applied to each model being produced under the terms of this contract, dated from the start of that model's manufacture in Romania. UT was therefore permitted all rights regarding each model as long as the required fees were paid for the indicated 10 year period.

Special considerations

The Technical Agreement included a listing of several project phases, with recommended time frames. These phases were as follows:

- Phase One: CEAG provides layout
UT sends three engineers to the USA
within the first five months
- Phase Two: Transmission details provided within
seven months to UT either within
the USA or an agreed location
(where UT is to act under CEAG's
advice).
- Phase Three: Components which are not available
from the normal products in the
Clark group will be built.
Two prototype transmissions will be
assembled as a UT activity.
CEAG will provide one engineer within
12 months.
- Phase Four: Lab tests will be conducted, using one
CEAG prototype.
UT will provide one engineer for
training within 18 months.
- Phase Five: Vehicle test performed using one
prototype transmission from UT.
CEAG will provide one engineer within
29 months.
Tests to be performed now on up to
2000 hours of work.
- Phase Six: O-Series pre-products (UT activity)
produced within 30 months.
- Phase Seven: Final approval certificate provided
from CEAG with UT agreement within
the 30th month.

Financial Flows

Payments

All payments and fund transfers were to be in USA dollars, to a bank agreed upon in writing, with the exception of the sale of the products by UT to CIMSA.

CIMSA agreed to sell UT spare, replacement or renewal parts according to the Clark Central Parts Mulheim Net Original Equipment Manufacturer's Prices, again, with any discounts given to other licensees. CIMSA also agreed to sell UT complete torque converters and transmissions, as desired.

All payments were to be made in full in U.S. dollars via bank transfers through a mutually agreed upon U.S. bank, unless payment was to be in products, which would then be priced with delivery made Free Romanian Border.

Clark's payments from Romania were hopefully to be totally in products, however, not dollars--even though the fees were calculated in dollar amounts. It was anticipated that Clark Equipment would be purchasing at least an equivalent amount (dollar-wise) of transmissions and torque converters during the course of the agreement. However, it was noted that should Clark not have offered to purchase at least the equivalent of the amount of the disclosure fee, the license/service fees were to be waived until purchases totalling the amount of the initial disclosure fee had been made. UT was not to pay any fees to Clark for component parts purchased from Clark which were incorporated into the transmissions or torque converters. In such instances, the cost of these components was to be deducted from the established price of the final product.

UT was to provide CEAG with a semiannual reporting of the product sales outside Romania, and in this instance, was to pay Clark the stated fee in U.S. dollars within 90 days of the end of each reporting period if the Clark orders had not been equivalent to or above that amount.

The obligations of Universal Tractor regarding these fees included the payment of the initial disclosure fees to CEAG by the following time periods:

First payment--within 120 days after the effective date of the Agreement (after the technical information has been transferred to UT as described under schedule I, phase I)

Second payment within 270 days after the effective date of the Agreement (after the technical information has been transferred to UT as described under schedule I, phase II)

Four additional payments to be made within 60 days of each anniversary of the effective date until the total fee has been transferred from UT to CEAG.

The license fees owed to CEAG by UT were to be calculated as 5 percent of the net price of all agreement manufactured products sold outside Romania (except spare and replacement parts and products sold to Clark Equipment). These fees were to be for the rights and licenses granted and for the continuing obligations carried out by CEAG (such as product improvements or technology updates). This payment was to be in the form of products, calculated on the basis of the net price as mutually negotiated between CEAG and UT. Should the products not be able to

be delivered, UT was then responsible for paying these fees in U.S. dollars.

Purchases from the domestic company

CIMSA agreed to sell all required components necessary for product manufacture to UT according to the standard CIMSA price list including discounts, used for other licensees.

Purchases by the domestic company

The "net CIMSA price" stated in the agreement referred to the price Free Romania Border, at which UT was to sell the Agreement-related products back to Clark. To achieve its promotional and sales quotas, CIMSA estimated that this price could be no more than 65 percent of the price for the same product as listed in the CIMSA price book at the time of delivery (or, for an equivalent spare replacement or renewal part, 65 percent of the Clark Central Parts Mulheim Net Original Manufacturer's Price).

All prices were to be based on the CIMSA Price Book, issued by Clark International Marketing S.A. Automotive Division which includes the prices in effect for Clark transmission and converter assemblies F.O.B. United States factory (or ex-factory), as published on January 1, of each year.

Personnel

Training tasks

Domestic company. The agreement provided for Clark expertise both on Romanian soil and for training Romanians in the USA. CEAG personnel specialists were to be at the disposal of UT for a total of 400 man-days, with each individual visit to be for no longer than 21 days. Any additional man-days of CEAG specialists in Romania were to be the expense of UT, including salaries, air passage, local transportation and hotel accommodations.

Host. An additional 400 man-days of training were provided for UT trainees at Clark manufacturing sites. Under the terms of the agreement, UT was to pay for the air passage nearest to and from the place of training, but CEAG would then be responsible for all local transportation and hotel accommodations. UT was to insure that at least one member of each team would have a necessary working knowledge of English but CEAG was also to use its best efforts to provide local interpreters.

Protection

Leverage

Domestic company. To maintain its leverage through such a technology sale, Clark tries to build in some controls which provide it with some advantages throughout the course of the project. In this project with Romania, Clark's marketing agreement appeared to provide a high amount of leverage as both partners were hopeful that CIMSA sales of the transmissions would be high. In such an arrangement, sales would benefit both parties.

One other point of leverage appeared to be the fact that, while license fees were to be accorded to Clark throughout the course of the agreement, the largest bulk of the payments were to be made within the first few years of the agreement, reflecting the transfer of the major portion of the technology. As well, Clark's repurchase intentions, with the award of its trademark and those accompanying controls, helped to insure on going product quality.

Host. Romania's leverage was similar to most other agreements of this type, in that Clark had to live up to its obligations to be awarded its fees. Furthermore, since Clark was hoping to be able to purchase transmissions for its own marketing use, Romania had some control over those

purchases. Again, since sales benefited both partners, teamwork was encouraged.

Inspection privileges

CEAG had the right, but not an obligation, to send one of its representatives to Romania to inspect the products being produced, but was required to provide UT with prior notification.

Patent/trademark defenses

Clark Equipment A.G. (CEAG) was to be responsible for all trademark registration, renewals, and defense including any expenses involved, while Universal Tractor was to be responsible for maintenance of its status as a registered user.

Universal Tractor was responsible for notifying CEAG of any trademark infringements which came to its attention, but proceedings upon such notification were to be at the discretion of CEAG.

Legal provisions

The arbitration court designated in all three agreements was to be the International Chamber of Commerce in Paris, France, through the common courts of the Arbitration Commission, overseen by three selected arbitrators.

The Force Majeure clause in all three agreements included any and all unforeseeable, inevitable or unavoidable event which could occur after the effective date of the agreement, relieving the affected party from liability under the agreement. All notification involving the invoking of the Force Majeure was to be made within fifteen days of the occurrence of the event or as soon as possible, and required official confirmation. Any Force Majeure clause lasting longer than eight months permitted the cancellation of the agreement.

All three agreements included a provision listing the proper addresses for both Clark and Universal Tractor, for all official notices and correspondence. CEAG was responsible for supplying adequate information and training so that UT would be able to produce equivalent products. Should CEAG's technical information be due to failure on the part of CEAG in this regard, CEAG was to correct the defect within 60 days from the official claim. Further, UT was able to be reimbursed for damages in such an instance through the measure of arbitration.

UT was to warranty all products sold back to CIMSA for 1000 hours of service or six months from sale to the ultimate user up to eighteen months after shipment by UT, whichever occurred first, but CIMSA did agree to provide recommendations as to service parts or repair manuals.

CEAG would not be held at fault for any liability or damages resulting from the designated products (with the exception of faulty technical information furnished by CEAG) but CEAG agreed to assist UT in the defense and settlement of any claims and to help UT in changing the products or method of manufacture to avoid future liability.

Disclaimers were included on both sides where neither party assumed responsibility and was not to be held liable for death or any injury or accident which might befall any such representative of the other party.

Project Assessment

Factors expected to make the project easier than usual

Clark tended to feel that the company's growing familiarity with the Eastern Bloc would smooth the way for the project in Romania, at least in part. The fact that Clark was not responsible for building the new manufacturing facility, but was only to suggest equipment and layout, helping to acquire items whenever possible, relieved Clark from a heavy load of responsibility while yet maintaining high corporate involvement.

Rapport was expected to be high in that Clark had provided its latest transmission technology and had included its trademark and had designated intentions of purchasing the final product for its own marketing needs.

Factors expected to make the project more difficult than usual

Clark did not appear to believe any major difficulties would appear, apart from the fact that the arrangement with Universal Tractor was the first of this type between Clark and Romania, and Clark realized that each country or new endeavor would include some unexpected problems or occurrences.

Expectations for the Future

The increased entry into the Soviet Bloc marked another step in Clark's penetration of this market. Clark hoped to increase the trade of its products between various Eastern European nations as well as to create various sources of its products throughout those countries. It also hoped that each agreement with the individual countries would be followed by additional contacts and extended involvements.

Hungary

International Harvester

Description

The success and growing involvement of IH in Poland paved the way for a similar non-equity agreement between IH and the Hungarian Railway Carriage and Machine Works (RABA) in Hungary. The initial agreement was signed in 1976 for tandem axles but was subsequently expanded through additional product lines which were added in 1977 and 1978. Unlike the Bumar arrangements concerning construction equipment, the product lines in Hungary involved IH axles and agricultural implements.

Background

Domestic company.--The IH philosophy regarding non-equity transfers appeared to have changed since its initial agreement with Poland, as the desire to enter into such a non-equity agreement on the part of IH was far more positive than in its initial Polish venture. This appeared to be due to two factors. First, IH was now somewhat familiar with the non-equity format, realizing the advantages of such an arrangement in providing

a potential manufacturing source without an equity investment on the part of IH. Second, IH had found that an agreement with an East European country was not only feasible but desirable in terms of product and component sales.

Corporate background in the agricultural equipment area has been fairly extensive. The agricultural equipment product line of IH constitutes the second largest of its four general lines. The corporation had a record \$2.334 billion in sales in 1977, compared to \$2.701 billion from the truck division, \$731 million from construction equipment, and \$208 from solar turbo machinery. Furthermore, this amount from agricultural equipment sales represented a 3.2 percent increase in sales over IH's prior year as listed in the IH Annual Report of 1977--at a time when conditions were adversely affecting farming in most areas of the world.

The interest on the part of Hungary in IH's agricultural products stemmed in part from the fact that the country had an expressed interest in obtaining this type of agrarian product from IH. As well, however, IH could not set up a competing enterprise for construction machinery in Eastern Europe since this would violate the IH arrangements with Bumar.

While IH does not have a monopoly in the agricultural equipment area, it does carry a line of farm

tractors which are not available everywhere. For example, IH has a line of large tractors having 150 horsepower or more, which are used in only three places in the world: the state farms of Eastern Europe, North America (including Canada), and, to a limited extent, Australia. Farms in other areas, such as Western Europe, are too small to justify the use of such large vehicles.

Transfer of technology

Each agreement between IH and RABA involved a separate item within the truck or agricultural equipment line. However, several of these agreements contain the manufacturing technology for a component, such as an axle, but not for the entire vehicle.

Turnkey.--None of the agreements between IH and RABA included a turnkey approach as all construction and equipping was done by the Hungarians. IH did not even become involved with the equipment selection, but did provide suggestions on the tooling of the machines when needed to adjust to the IH technology. Technology relating to product and process was transferred.

Knowhow.--The agreement signed in 1976 between IH and RABA dealt with the IH tandem axle, and was to conclude in 1986. The 1977 agreement between IH and RABA involved plows and disc harrows. As with the 1976

agreement, this one was also of a 10 year duration, to conclude in 1987. The 1978 agreement involved the IH cyclo planter. This last agreement runs until 1988, at the end of which time, RABA is not to disclose the knowhow for 20 years. Should RABA desire updates of this knowhow after 1988, the agreement must be extended.

The agreements between IH and Hungary were arranged as a series of contracts, including a counter purchase agreement by IH, open in that IH had agreed to purchase something, but with no boundaries apart from the stipulation that it be something other than farm implements, listing the dollar amount of the counter purchase.

Each agreement was comprised of several contracts. For example, the agricultural implements agreement between IH and RABA signed on March 9, 1977, included three types of contracts: a license agreement; a purchase agreement; and an agreement for the use of the IH trademarks on the agricultural equipment. This agreement runs for 10 years, or until January 31, 1987, unless extensions are granted. Four items of agricultural equipment are involved; two models of the plows (720, and 800 moldboard plow series) and two of the harrows (490 tandem disc harrow series and the 770 offset disc harrow series).

The trademark agreement, effective as of March 11, 1977, included the following categories which covered the plows and disc harrows:

1. Official permission
2. Proper use
3. Quality control measures
4. Warranty limitations
5. Ownership
6. Term length
7. Effectiveness
8. Notice
9. Relation to entire agreement
10. Arbitration and governing laws and language

Appropriate exhibits accompanied the body of the agreements including such aspects as detailed descriptions of the products involved; a statement of the licensed trademarks with appropriate IH logo designs; countries excluded from the sale of axles; countries excluded from the sale of agricultural equipment; a list of standard parts; and a statement of in-plant inspection and audit procedures.

The sale of axle technology to Hungary included the usual IH promise of updated and improved technology. However, it is relevant to point out that this update technically refers to refinements on the basic product, such as the axle. Should IH come out with a drastically new form of axle, this technology would not be passed along without additional remuneration. It is highly

possible that, in such an event, negotiations might commence regarding the axle, particularly if the product comprised an integral part of the IH equipment.

General management.--There was no management included in the transfers, but IH did anticipate bringing over their technical people to show how to manufacture the items and to explain why things were done in certain ways.

Patents.--The transfer included all necessary patents.

Trademarks.--The use of IH trademarks on products which met specifications was included for certain products or components.

Buyback.--This stipulation was essential although it took the form of a counter purchase arrangement. The price was specified through a certain date, and then subject to increases or decreases depending upon the current wholesale price of motor trucks.

International Harvester views a buyback as a situation where a product directly related to the cooperative agreement is repurchased, while a counter purchase exists where a product unrelated to the cooperative agreement is purchased with the hope that the firm will be able to use the product. For example, IH is considering purchasing axles from RABA since Hungary does manufacture

30 ton axles with a high quality reputation. These axles would not contain IH technology, but would be able to be used by IH. If these axles were bought, IH would purchase them in the same way that axles would be purchased from any unrelated company or source.

A barter type of exchange is another option which may exist where the product which is bought is not intended for use by that company, but is intended to be resold or traded for an item which the company will be able to use. So far, IH has not used the barter arrangement in Hungary.

Should the manufacturing process for the IH farm implements being produced in Hungary fall behind schedule, such implements may be purchased from IH to satisfy the immediate demand, but IH had noted that it did not have a supply of extra axles on hand and would be unable to supplement the production in this area.

Other aspects.--Marketing territories were identified on the agreements, listing areas where IH alone would be able to market some of the products. These designated areas varied with the different products in the agreement. Such a designation provided RABA with the opportunity to market the axles to all other areas of the world without concern of infringement into regions where IH already was involved through the corporation's own distributors.

Responsibilities

Domestic company. A brief summary of all the agreements categorizes the responsibilities of IH as providing its Hungarian partner with the appropriate technology with accompanying training or instruction, and, when authorized, the IH trademark after all qualifications had been met.

Host. RABA, on the other hand, was responsible for all construction, equipping (when necessary), raw materials, component parts, and for providing employees capable of mastering the skills and techniques required to produce the products involved in the transfer. RABA was also to reimburse IH at the stated times, for the technology. This was to be done through the payment of the initial disclosure fee with subsequent payments as necessary for any royalties or research, engineering and manufacturing (REM) fees when incurred.

Corporate Perception of Benefits to be Gained from Agreement

Overall, International Harvester felt that an arrangement in Hungary, which was similar to its non-equity agreement in Poland, would complement its activities there as well as increasing the reputation of IH throughout East Europe. Furthermore, since Hungary was

interested in axles and farm implements, the product base of IH throughout the Soviet Bloc would be substantially broadened. There was even the potential for an exchange arrangement between the construction equipment being produced in Poland and the axles and farm implements being assembled in Hungary.

In a more immediate sense, IH desired these agreements with Hungary because the corporation would be receiving payments for some of its technology, as well as cultivating another source of axles, either of its own design or of the current Hungarian design to supplement its other supplies.

However, the additional product source facilities which IH gained through their Polish agreement would not be duplicated in the same way on the Hungarian project in the area of axles, because IH was not in the business of selling axles, but only of using this product as a component in their vehicles.

In Poland, IH felt that some overseas production facilities had to be established to retain their market share in Europe, due to impending competition from five or six other firms. The Hungarian project, however did not include such a justification for the technology sale as it did not perceive such competition. As with Poland, however, IH foresaw an increased market potential as IH previously had no market share in this region.

Negotiations

Parties involved

The agreements were all signed between International Harvester Company as the domestic company and the Hungarian Railway Carriage and Machine Works (RABA).

Initiating contact

Unlike the arrangement between IH and BUMAR, where Poland had first sought out the American company, IH was the instigator in regard to the Hungarian projects.

Length of negotiations

The first contract between IH and Hungary in regard to these projects occurred in 1970, but the serious discussions did not take place until the fall of 1975, with the first agreement signed in 1976.

Issues and obstacles

The most intriguing aspect of the Hungarian arrangement was in relation to the counter purchase issue--where IH agreed to a certain monetary amount of purchases. This remuneration then provided Hungary with the potential funds necessary to buy essential components

from IH to make their manufacturing and assembly ventures possible in the farm implements line.

Time Frame

Overview

The tandem axle agreement signed in 1976, runs until 1986, while the plow and harrow agreement signed in 1977, will conclude in 1987, and the cyclo planter agreement of 1978 concludes ten years later, in 1988.

Financial Flows

Payments

In this reciprocal type of arrangement, IH did have its payments tied to the Hungarian production runs of axles indirectly, although not directly to the IH products being produced. As in the Polish project, two types of payments were to be involved.

Purchases from the domestic company

IH had agreed to a counter purchase of a certain amount of axles, assuming those axles were available.

Prices for these axles were firm through a certain date and subject to a percentage change based on the wholesale price of truck parts after that date through the remainder of the agreement.

Purchases by the domestic company

No purchases of any consequential size were anticipated on the part of IH.

Personnel

Training tasks

As in its other technology transfers, IH agreed to provide training both in the United States and in Hungary for RABA employees involved with the transfer. No problems were anticipated, particularly because IH now had prior experience in such technology transfers on a non-equity basis and because, in the case of Hungary, RABA employees were already manufacturing axles although not of the IH design.

Other personnel involvement

No other involvement was anticipated.

Protection

Leverage

Domestic company. Throughout the arrangements with Hungary, IH maintained a relatively strong position. The Hungarian dependency upon IH purchases provided both partners with a strong incentive to work together.

To insure that proper methods were used, and also that the final product was according to specifications, IH agreed to test the completed components. If the product did not meet the IH standards, it was to be sent back. This arrangement provided IH with additional leverage, since the Hungarian operation had supplied the funds for this transfer and would not be reimbursed until IH repurchased the axles. Thus, RABA could be out \$20 to \$30 million at some point, which would delay other programs which depended upon the availability of funds.

Host. Hungary maintained the usual leverage, in that the country offered an extended market to IH as well as immediate payment for aspects of IH technology. In the case of Hungary, the contracts reflected all guarantees in the form of responsibilities on the part of both partners, supported by the financial payments which would be made on the part of RABA or product purchases on the part of IH.

Inspection privileges

Inspection provisions included in the Hungarian contract included the rights of IH to test all products to determine their qualifications as to meeting the predetermined specifications. IH was given the right of inspection throughout the duration of the contract.

Patent/trademark defense

If a patent acquired from IH is challenged, IH has agreed to defend RABA's position, at IH cost. Under U.S. law, IH has the right to grant patents to others. In regard to the IH trademarks, permission is included providing all tests and standards have proven acceptable.

Legal provisions

All IH contracts with Hungary carry the same arbitration clauses, and refer to the Swiss arbitration court in Zurich should difficulties or disputes arise. A Force Majeure clause is also a permanent clause in IH contracts of this sort.

Project Assessment

Factors expected to make the project easier than usual

International Harvester expected the arrangements with Hungary to be easier than with Poland for three general reasons. First, the magnitude of the project was much smaller than the entire manufacturing venture with Bumar for construction equipment, hence it should generally be less complicated. Second, IH felt Hungarian workers with RABA would require less training because the technology to be transferred was not as extensive and because their prior experience was more appropriate to the project. Third, IH now had a body of experience with such non-equity technological transfers upon which to draw in effecting such arrangements.

Factors expected to make the project more difficult than usual

The interdependence between different aspects of the IH-RABA agreements was a recognized concern, as the payments for farm implement components were tied to the IH purchases of RABA products which made RABA dependent upon its own production schedule. This placed IH in the middle. Apart from this, there were the usual concerns accompanying most technological transfers on an international scale, but no overt problems were anticipated.

Expectations for the Future

International Harvester hoped to continue to expand its production sources as well as product marketing through East Europe, and the Hungarian ventures were steps in these directions. In its immediate plan, IH hoped to expand the types of operations and technology transfers within Hungary as well as potentially keeping negotiating channels open with the East European countries.

Yugoslavia

The Bendix Corporation

Description

At the present time, The Bendix Corporation, headquartered in Southfield, Michigan, is currently involved with several agreements of a non-equity nature in the Soviet bloc.

The agreement which will be examined in this study is a License and Technical Assistance Agreement between The Bendix Corporation and Varazeinski Tekstini Komdinat (Vartek), in Varazdin, Yugoslavia, for the manufacture of organic friction materials for disc brake pads for a specific model of automobile produced in Yugoslavia. The agreement was validated by the Yugoslav government on January 24, 1975, and extends through January 24, 1985.

Background

Domestic company. The involvement on the part of The Bendix Corporation with countries in the socialist sphere such as in Eastern Europe and the USSR demonstrates the corporation's lack of problems with past and present agreements. It also indicates an on-going corporate

assessment of need for the types of products which Bendix is capable of supplying and a demand by those countries for such products.

The agreement between the Bendix Corporation and Vartek in Yugoslavia came about through the involvement of the French subsidiary of Bendix, Ducellier Bendix Airequipment, Societe Anonyme (DBA, S.A.) owned 92 percent by Bendix, U.S.A.

This is not the only contact between Bendix (Southfield) and Eastern Europe or the U.S.S.R., however. A License and Technical Data Agreement between The Bendix Corporation and Licensingtorg of the U.S.S.R. was also signed in March 1977. The licensed product covered under the terms of the agreement was a power booster for the vacuum power brakes for a certain model of automobile. An earlier agreement, signed in 1968, involved another model with another variation of the brakes. The 1968 agreement provided the technical assistance required to produce the brakes, therefore, such assistance was not a requirement of the 1977 agreement.

These agreements also include the licenses for the applicable patents for the products. Both the 1968 and the 1977 agreements were of a one-time fee nature for product technology with no training or process information provided and with no subsequent revenues from sales of the products required to be paid back to Bendix.

Various subsidiaries of The Bendix Corporation, especially those headquartered in Western Europe, also have several contracts of a non-equity nature with either Eastern Europe or the U.S.S.R., but the above agreements are the only ones held by the U.S.A.-based corporation as of this date.

Perhaps the most advertised arrangement between Bendix and the U.S.S.R. was that of a tentative plan for the construction and operation of a spark plug plant within the U.S.S.R. Despite premature descriptions of the agreement released in January 1977, the contract talks are now, as described by one corporate official, "placed on ice indefinitely." However, there are several other agreements in the final stages of approval, including one for industrial gauges between Bendix and Licensingtorg of the U.S.S.R. which includes both a License and a Technical Assistance Agreement. Another venture, in the planning stage, is between Bendix and Hungary. Both situations are in the non-equity format and involve the transfer of technical data.

Host. The agreement signed between The Bendix Corporation and the Vartek company or Varazeinski Tekstini Komdinat, involved the manufacture of the friction material for disc brakes. The factory is located in the town of Varazdin, population 40,000, of whom over 10,000 are directly employed by the Vartek Company. The

agreement was concluded with Bendix, although only one of the divisions, the friction material division, was to be directly involved with the supply of technology. Yugoslavia manufactures its own cars through a license agreement with Fiat.

Transfer of technology

The agreement examined here will concentrate on the technology transfer of the American-based corporation to Yugoslavia. Bendix was to furnish technical assistance and initial consultation for the layout of the plant and the production equipment, production equipment specifications including all raw materials specifications, and assistance in implementing and maintaining production of the licensed products.

Turnkey. The extent of responsibility included in this transfer did not extend to the construction or equipping of the factory to produce the friction material, but did include a suggested list of equipment to be purchased, including alternative purchase items when possible.

Information and knowhow. All technical information related to the preparation of the friction material was included in the transfer of the product technology, while the actual process transfer was to be accomplished

through training sessions held both on site in Yugoslavia and in the United States at the Bendix plant in Troy, New York. The information was transferred in written English, as well as through oral instructions. The information as to improvements is to be updated until January, 1983. This formula refers strictly to one vehicle model, such as a Fiat 125 or 126, for example. Should Yugoslavia desire to use this product on a different car model, a formal letter of request must be made and approved.

Management. No specific managerial techniques were included, apart from the production knowhow.

Patents. A patent agreement was included in the contract, although its importance appeared to be in its application to third party infringements since Bendix did not carry a patent on the friction formula in Yugoslavia. When the patent expires it is also to expire in regard to the agreement. At this point, the patent will fall into the public domain.

Patents related to improvements or updating of the friction material must be submitted to Yugoslavia within eight months after the filing date. If Yugoslavia elects to keep the patent, Yugoslavia must pay the submission fees to file it in that country. If the country does not accept the patent within sixty days, then Bendix is free to offer the patent to other

potential licensees. This freedom exists whether or not the country accepts the patent since normally all licenses are granted on a non-exclusive basis.

According to the terms of the agreement, the purchaser, in this case Vartek, is responsible for paying for the filing and prosecution expenses for application of relevant patents in the specific territory. It also appears that the purchaser is to reimburse the seller for any expenses incurred in such patent applications. Should Vartek desist in paying the maintenance of the necessary patents or not accept the initial patent application within sixty days of its filing, it would renounce all rights to these patents. Bendix also disclaimed all responsibility to the product manufactured in Yugoslavia in regard to the sale or utilization of that product.

Trademarks. No trademark rights as such were included in the transfer agreement, although the Vartek is permitted to state, "manufactured under license by Bendix". It has been general corporate policy not to permit unaffiliated companies to use the Bendix trademark except for exceptional circumstances and this example is no exception.

Normally, after an agreement has expired, all rights and privileges bestowed by that agreement dissolve, including the use of all trademarks or corporate associations. Such is the case in this instance, unless the

agreement is extended. It is highly probable that the agreement may be extended beyond 1985, including all technological updates relating to the friction materials. In such a case, the extended use of the Bendix manufacturing license logo would be most likely.

Buyback. The fact that this friction material is not used at this time on automobiles manufactured in the United States provides a logical reason for the lack of inclusion of the buyback clause which is often part of non-equity agreements with countries in Eastern Europe. No buyback clause was included in this agreement, and all purchase fees with the exception of the initial disclosure fee, are based on a percentage of sales with a minimum royalty fee applied annually. Yugoslavia is not to export the friction material although the product certainly may be exported as original equipment on a complete automobile.

Other aspects. Bendix did have the option of transforming this non-equity agreement into that of a joint venture. This was feasible since Yugoslavia is one of the few countries in Eastern Europe which permits this type of alliance with a capitalist country. However, this option was viable for only the first five years that the agreement was in effect, or until January 24, 1980, and was not part of the official agreement.

Responsibilities

Domestic company. The responsibilities of The Bendix Corporation under this agreement with Vartek are generally designated. Bendix is to provide the technical documentation relating to the plant and production and to the formulation and processes necessary to produce the organic friction materials. As such, Bendix was to provide a suggested listing of necessary equipment required for such manufacture, and to offer requisite training toward the production of the friction compound. The equipment suggestions listing was to include raw materials sources in addition to the equipment itself. In some cases, materials were to be initially imported, obtained through Bendix or alternative sources, with a gradual switch to Yugoslavian materials if available. The training was to be a two-part endeavor; with skilled technicians from Bendix traveling to Yugoslavia on a visitation basis, and technicians from Vartek attending training sessions in the United States as well. Since no construction or long-term training on the part of Bendix was necessary, no provisions were included for lengthy housing or transportation of families to Yugoslavia from the Bendix offices. Bendix was also expected to perform quality control checks on the product, because, even though the item will not carry the Bendix trademark,

certain specifications are required to meet the standards of the original equipment manufacturers (OEM's). The OEM in this instance is Zestava, a Yugoslavian company marketing automobiles under license from FIAT. The OEM also performs its own tests on the product since some of their standards may vary from those of Bendix. Thus, while Bendix approval is not the only control, it is an important one. Producing quality materials within Yugoslavia is important in terms of the overall product as well, since it is hoped that cars manufactured there will be of approximately 95 percent local content including the brake mechanisms in the near future.

Host. The responsibilities on the part of the Vartek company in Yugoslavia in this agreement are, in summary, to pay the assigned royalties. The quarterly payments of the royalties were to be accompanied by royalty reports which included a list of the products sold, the turnover obtained by Vartek through such sales, and the amount to be paid to Bendix according to the agreement. Payment of at least a minimum fee schedule is mandatory, regardless of manufacturing delays; so it is to the benefit of the company that the factory be equipped, staffed, and functioning in the shortest possible time so that sales of the product may be used to provide the funds for these fees. As well, Vartek is responsible for all travel expenses involved in operation of the agreement.

Corporate Perception of Benefits
to be Gained from Agreement

There were two major reasons underlying the desire of The Bendix Corporation to undertake the project in Yugoslavia. The foremost reason initially was to take advantage of technology which had been developed but which was not being utilized at the present time in Eastern Europe. The accompanying factor was that of obtaining an entry to a market area, specifically that of Yugoslavia, but generally that of Eastern Europe.

Negotiations

Parties involved

Negotiations were carried out through the International Division of Bendix, through the Vice President of Licensing. This position handles licensing around the world for Bendix in all four areas: Aero-space/Electronics, Automotive, Industrial, and Forest Products.

The negotiations were carried on with the company officials of the Yugoslavian factory directly, with no interference from governmental officials.

Initiating contact

Initially, the braking components were supplied through a Fiat-operated company, but Yugoslavia desired local production of the braking components and approached the Bendix subsidiary, DBA, in France, for the technology to produce the disc brake. The request for the formula for the friction compound was combined with the request for the disc brakes, but DBA did not possess the friction material information. However, the parent company, The Bendix Corporation in Southfield, did have this technology. It is interesting to note that while The Bendix Corporation in Southfield had this information, the corporation was not using it currently because the braking components of automobiles in the United States require the use of a different process. Thus, this sale provided a use for such technology. Furthermore, such a sale of technology would not create a competitor of Bendix, at least in the domestic sense.

Separate agreements were drawn up between Yugoslavia and DBA in France for manufacturing technology on the disc brakes and between Yugoslavia and Bendix in the United States for the friction materials.

Length of negotiations

The first contract had been drawn up by December 1973, but over a year passed before the agreement was officially ratified in Yugoslavia on January 24, 1975.

Issues and obstacles

No particular obstacles emerged during the negotiations. Yugoslavia was desirous of being able to produce the desired product within specific quality guidelines. Bendix was concerned that the product be produced in good quality. When assured that Yugoslavia would honor this desire, no stumbling blocks remained.

Joint venture. Yugoslavia is one of the few Eastern European countries which permits equity ventures by foreign corporations with ownership up to 40 percent, but, in this case, Bendix was not desirous of such an arrangement. However, as mentioned earlier, the possibility of expanding the agreement to that of a joint venture at a later time remains open if such an arrangement is desired.

The option to transform this non-equity arrangement into a joint venture appeared suitable to both parties within the five-year time frame, although the desire to invest in the project appeared to have been originally suggested by Bendix.

Time Frame

Overview

No time frame was included in the agreement detailing activity between the opening and closure dates, although certain time limits were established such as for the patent acceptance period. The joint venture option might also be viewed as a time constraint, although this was not part of the license agreement. Following the initial ten year period, the License and Technical Assistance Agreement is to continue on from year to year unless a written notice of intention to cancel is provided by one of the parties.

Special considerations

An opening issue mentioned in the agreement notes that should the country involved (Yugoslavia in this case) not ratify the agreement within three months after the parties have indicated their approval, the parties are to sit down together to work out areas of dissention or decide how to proceed. This issue regarding validation of the contract did not arise in this case because Yugoslavia did ratify the agreement.

Production was anticipated to begin within three years of the effective date of the agreement, or by mid 1978, although this issue was not specifically mentioned. Several other time limits were not detailed in the agreement. For example, there was no time limit placed on training periods. Instead, the emphasis was put on the mastery of certain techniques, as determined by the trainers.

In the case of default by one party of any of the essential obligations of the agreement, the other party was to have the right to terminate the agreement after 60 days of notice to this effect. However, should the default be remedied within the specified period, termination would not ensue.

Financial Flows

Payments

Financially, the amounts of the contract were not permitted to be given out in detail. However, a general approximation of the size of the agreement places the size of the initial disclosure fee in the range of \$100,000 to \$500,000. Assuming minimum royalty payments over the course of the remaining nine years of the life of the current agreement, it is expected that the total amount

paid to Bendix by Yugoslavia will be approximately \$500,000 to \$1 million. Of course, this amount would be increased should the production rise, and the minimum royalty payment proportionately increased.

The arrangement was that an initial disclosure fee was to be paid at the start of the agreement, with subsequent payments provided on an annual basis thereafter, for the duration of the nine remaining years of the contract. Until production was in force, these payments would be of a minimum level. Following the startup, the royalty payments will be increased, if necessary, because this payment would be based on a percentage of gross sales. All payments are to be in U.S.A. dollars guaranteed by an acceptable bank, with no inflation factor, but also with no discounts included. The use of the gross sale price, however, would take price fluctuations at least partially into account. The payments would be guaranteed by a Yugoslav bank and placed in a locked box bearing the address of Bendix.

Because the royalty payments are based on a percentage of gross sales, Bendix maintains the right to obtain all information on Vartek's sales of brake compound friction materials leading to a correct audit. Because the material is to be used in the construction of the cars, the number of automobiles produced in Yugoslavia also provided a backup check on the approximate sales of the item.

All royalties not paid within 30 days after each quarter of the calendar year were to be assessed a ten percent interest charge. Bendix is permitted examination of all records related to production and sale of the product at reasonable intervals for up to three years following the conclusion of the agreement.

Interestingly, Vartek is obligated to pay any income taxes assessed against Bendix by Yugoslavia (up to but no greater than the amount of tax assessed against Bendix relating to this product in the United States). These payments are then deducted from the amount owed to Bendix under the determined disclosure fee and subsequent royalties stated in the agreement.

Purchases from the domestic company

To aid in the training, Vartek purchased some completely premixed compounds of the friction materials from Bendix; priced less than the manufactured items. These were purchased several months prior to the anticipated startup date of January 1979, and were intended to provide functional training more than to aid the factory's inventory level. Bendix did not expect Vartek to purchase finished items of the friction materials as a carryover until their own production was underway, although Vartek does have a contract to provide the product to the Yugoslavian manufacturers of the cars.

Vartek was to sponsor all travel expenses incurred on the project, either by Bendix or Vartek employees. Furthermore, Vartek was to reimburse Bendix for any and all expenses incurred in the transfer of technology to Yugoslavia, over and beyond all travel expenses. This reimbursement was to be made within 30 days following receipt of the invoice for such expenses.

Personnel

Training tasks

Approximately 200 Yugoslavians were expected to be involved in the brake friction materials production; but this estimate included both the French subsidiary's project as well as the American-based one. As stated before, Vartek was to be responsible for all travel expenses.

Low morale on the part of the employees involved with the Vartek project was not viewed as a potential problem. Some of this optimism appears to stem from the company's reputation which is very prestigious, at least in the area of textiles, and some from the active community involvement role which the company has taken in the town itself. Problems in production are expected to be slight, and will probably be due to inexperience since

the production of these friction materials varies greatly from the production of textiles there.

The agreement listed no skill areas required of selected workers, on the part of Vartek. Furthermore, no training schedule was included and the numbers of workers to be instructed in the United States or the quantity of man-hours or man-days were not documented. All training to be provided by Bendix in the United States was to be conducted in the Bendix facility located in Troy, New York. However, some additional training was also to be given at the Bendix subsidiary located in Spain, an affiliate skilled in this form of friction materials manufacture.

Protection

Leverage

Domestic company. The leverage possessed by Bendix throughout the agreement would depend to a great extent upon the value placed on the friction material by Vartek and on the personal relationship developed between Bendix and Vartek. Any improvements developed by Bendix in the material after 1983 when the technology is no longer being transmitted to Vartek should only increase the desirability of the extension of the project.

Host. This leverage would also be held by Vartek since Bendix has indicated its desire for future transactions. Thus, both partners should be in good positions to mutually satisfy each other's wishes for additional involvement.

Inspection privileges

Inspections or quality control checks are permitted by both sides. Bendix is to use the inspections to track the quality of the product as a method to insure the transfer of the technology. The host, and in this case, the OEM, use the quality control checks to approve the product before its use on the automobile.

Patent/trademark defense

In the event of a threatened infringement suit against Vartek, or Vartek's customers, Bendix has agreed to freely provide Vartek with any information in its possession which would assist Vartek in dealing with the suit.

A reciprocal patent opportunity is included in the event that Vartek improves upon the original technology provided by Bendix. In this event Bendix would then be granted a nonexclusive and nontransferrable license to manufacture and sell the improved products throughout the entire world.

Legal provisions

Bendix approved exports of the brake friction material to other countries only within the Eastern European bloc. Furthermore, Vartek was allowed to export licensed products as part of the original equipment on a complete vehicle, in this case, the automobile. Vartek is also permitted to provide replacement parts for all vehicles carrying this particular friction material as part of the vehicle's original equipment. This permission covers not only those vehicles in Yugoslavia but also wherever these vehicles may be exported.

The technology transmitted to Vartek was the state of the formula as of 1975, although all updated improvements will be provided to the company by Bendix until two years before the completion of the agreement, or up to January 1983.

Over and above the wording of the contract, Bendix describes the relationship as one of assistance and helpfulness, where, if Bendix would be able to help their Yugoslavian partner, they would want to do so. The project is viewed by Bendix more as a long-term relationship which may go beyond the ten year contract date, in either an extended, or expanded measure, than as a terminal project for only immediate gain.

Protection aspects written into the Bendix contract with Yugoslavia include an arbitration clause which refers settlement to an outside court, in this instance, to be located in France, and subject to the Rules of the International Chamber of Commerce.

Interestingly, there does not appear to be a Force Majeure clause. However, Bendix is permitted to terminate the agreement in the event of certain circumstances or actions on the part of Vartek, such as an unjustified delay of payment, unauthorized use of the Bendix trademark, failure to respect specified product standards relating to quality, insolvency, bankruptcy, or a total cessation of activity.

Project Assessment

Factors expected to make the project easier than usual

The attitudes of both Bendix and Vartek toward this project as only the starting point for a much longer and more fruitful relationship were considered to be a positive factor in smoothing out any problems which might arise on this particular agreement.

Factors expected to make the project more difficult than usual

Nothing was seen which might make the agreement more difficult than usual.

Expectations for the Future

The future was the major consideration in this case, since Bendix desired to continue its association with Vartek in particular as well as with Yugoslavia in general, and even to expand its contacts throughout Eastern Europe. The immediate option of establishing a joint venture with Vartek aided this desire, as does the possibility for extension of the agreement beyond 1985.

FOOTNOTES--CHAPTER III

Poland

Clark Equipment Company

¹Eric W. Hayden, Technology Transfer to East Europe: U.S. Corporate Experience (New York: Praeger Publishers, 1976), p. 45.

²Ibid, pp. 49-50.

³Ibid, p. 46.

⁴Ibid, p. 46.

⁵Ibid, p. 46.

⁶Ibid, p. 48.

⁷Ibid, p. 50.

⁸Ibid, pp. 46-47.

⁹Ibid, pp. 48-49.

¹⁰Ibid, pp. 49-50.

International Harvester Company

¹Eric W. Hayden, Technology Transfer to East Europe: U.S. Corporate Experience (New York: Praeger Publishers, 1976), p. 54.

²International Harvester Company, Annual Report, Chicago 1977, p. 2.

³Jerzy Szumski and Janusz Piotrowski, Bumar (Poland) - International Harvester (U.S.A.) Cooperation Is Now Over Five Years Old and Keeps Going, unpublished monograph, Office of Polish Commercial Consul, Chicago, May 1978.

⁴Polish Machine Industry Offers 5(73) (1979):4.

⁵Szumski, p. 7.

⁶Polish, p. 5.

⁷Szumski, p. 8.

⁸Szumski, p. 8.

⁹Polish, p. 8.

¹⁰Szumski, p. 9.

¹¹Polish, p. 4.

¹²Szumski, p. 10.

¹³Szumski, p. 10.

¹⁴Szumski, p. 10.

¹⁵Hayden, p. 54.

¹⁶Szumski, p. 3.

¹⁷Szumski, p. 3.

¹⁸Szumski, p. 10.

¹⁹Szumski, p. 4.

²⁰Hayden, p. 95.

Honeywell, Inc.

¹Eric W. Hayden, Technology Transfer to East Europe: U.S. Corporate Experience (New York: Praeger Publishers, 1976), p. 25.

²Hayden, p. 59.

³Hayden, p. 62.

Westinghouse Electric Corporation

¹Eric W. Hayden, Technology Transfer to East Europe: U.S. Corporate Experience (New York: Praeger Publishers, 1976), p. 66.

²Howard Wolff, "Polish Plant Ready to Roll," Electronics, October 14, 1976, p. 75.

³Hayden, p. 65.

⁴Hayden, p. 65.

⁵Hayden, p. 65.

⁶Hayden, p. 68.

⁷Hayden, p. 57.

⁸Hayden, p. 66.

⁹Howard Wolff, p. 74.

¹⁰"Westinghouse Gets Pact to Build Plant in Poland," The Latrobe (Penn) Bulletin, 11, December 1973, p. 1.

¹¹"Westinghouse Turnkey Contract Typifies Poland's Need for Top Flight Technology," Business International XX(50) (New York: Business International) (December 14, 1973):393-394.

¹²Hayden, p. 68.

¹³The main contract for equipment purchases was for \$2.5 million, but add-ons brought this amount up to a total of \$3.7 million.

¹⁴Business International, p. 394.

¹⁵Howard Wolff, p. 74.

Romania

General Tire

¹Gus Prekopa, "Negotiating Technology in Romania," Les Nouvelles, Journal of the Licensing Executives Society X(2) (June 1975):86.

²Eric W. Hayden, Technology Transfer to East Europe: U.S. Corporate Experience (New York: Praeger Publishers, 1976), p. 92.

³Hayden, p. 92.

⁴Prekopa, p. 86.

⁵Hayden, p. 93.

⁶Prekopa, p. 86.

⁷Prekopa, panel presentation at the 75th Annual Meeting of the National Machine Tool Builder's Association, October 29, 1976, p. 4.

⁸Prekopa, Les Nouvelles, p. 86.

⁹Prekopa, Les Nouvelles, pp. 86-87.

¹⁰Hayden, pp. 93-94.

¹¹Hayden, p. 94.

¹²Hayden, p. 92.

¹³Hayden, p. 92.









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CHAPTER IV

DESCRIPTION AND ANALYSIS OF CORPORATE OUTCOMES

Introduction

This chapter follows the same general format as the preceding one, but concentrates on the outcomes of those non-equity arrangements between selected corporations and countries within East Europe. As before, each case is handled separately, but the same outline has been used for all eight projects.

Outline

The outline used for detailing the outcomes of these non-equity arrangements follows the same structure as the one used for describing expectations.

Country

Company's Name

Description Variations
Current Corporate Perception of Agreement Benefits
Negotiations
 Contract format revisions
 Pending negotiations
Time Frame
 On schedule
 Behind schedule

Financial Flows

Payments

Purchases from the domestic company

Purchases by the domestic company

Personnel

Training assessment

Other personnel involvement

Protection

Leverage assessment

Utilized inspections

Patent/trademark defenses

Legal provisions invoked

Hindsight

Factors which made the project easier than anticipated

Factors which made the project more difficult than anticipated

Progress of Future Expectations

Time qualifications

It should be pointed out that most of these agreements were still in progress at the time this information was obtained. Therefore, this summary of corporation outcomes is based upon perceptions up to a certain point in time. In some instances, it is highly possible that these outcomes will vary or even change drastically before the agreements are actually completed. In fact, the only agreement which had officially concluded was between Westinghouse and Poland. Honeywell's arrangement with Poland was due to finish within the year but an extension was known to be in the offing.

Poland

Clark Equipment Company

Description Variations

The 1972 agreement between the Clark Equipment Company with its foreign subsidiaries and the Bumar Foreign Trade Enterprise involved the manufacture of Clark-designed axles in the Bumar plants located in Stalowa Wola and Radomsko. The output was intended to supply the needs of both Clark and Bumar customers. Five years after the instigation of this arrangement, one of Clark's European subsidiaries reported using the Polish built axles "with excellent results,"¹ a tribute to the functioning of the project.

Production-wise, however, the axles being manufactured at the plants at Radomsko and Stalowa Wola were at a low production level. No new Clark axle models had been introduced in 1977. This was attributed to a relatively flat market, and to a lesser extent, a lack of hard currency. However, one additional Clark model was slated for release by Bumar in 1978.

Clark officials reported that the Bumar project was being used as a source, with 257 axles purchased from Bumar through CIMSA to meet a Clark demand in France in

1977. Bumar had been reliable as to delivery time, product reliability, and axle quality, Clark reported.

Clark officials noted that, at times, dealing with the East Europeans was far more satisfactory than similar contracts or arrangements with other groups or regions. Their experience has been that the East European partners hold to their end of the bargain, that they live up to the letter of the contract. Clark observed that their East European partners had liked their American partners, trusted them, and heeded their instructions. With this chemistry at work, Clark feels that such arrangements have a better than average chance of working. Clark also feels that such contractual arrangements should be relatively on-going, with updates and the need for improvements worked out during the initial time period. The technology transfer over the stated time period, Clark feels, provides the high level of support which makes the transfer more of an extended operation.

Joint project

Perhaps one of the most unexpected aspects of the agreement between Clark and Bumar occurred when the partners joined talents to produce an excavator axle which Bumar had been previously purchasing from the U.S.S.R. Clark felt this joint venture promised a "new

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way for us to go" in their international dealings, and, at least for this venture, should be successful since the demand already existed for the product.

Bumar possessed a license from Clark Equipment Co. for the manufacture of axles. However, what might have been described as a 'rather classical license agreement' has now been extended to cover several new variations of axles, designed entirely by Polish specialists, with technical solutions fully approved by Clark, which are now being produced and sold as a jointly-developed Clark-Bumar products.²

Clark was very pleased with the metric axles which should benefit both Clark and Bumar. The dead steering axle amendment was signed on October 25, 1975.

The amendment to design an axle with metric dimensions which would satisfy the Russian demand was signed in April 1975. It called for the joint development of an hydraulic excavator model which would replace the present Bumar axle used in the U.S.S.R. Bumar had been exporting axles to the U.S.S.R. for the past six or seven years, but the design was obsolete. Bumar embarked on the joint development project with Clark to create an updated axle of metric dimensions to upgrade this design.

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Another benefit resulting from the knowhow exchange between Bumar and Clark has been extraneous information gained by Clark of the approach which the U.S.S.R. takes in many of its construction projects. During the joint axle development project, Clark found a distinct difference between the method of operation of the U.S.S.R. and the U.S. in pipeline construction. The United States will build a road alongside the pipeline being constructed and bring equipment down as the work progresses. The Soviet Union will fly in an excavator in parts, assemble it for a specific area, but then will just leave it and fly in another vehicle in parts further down the way.

Transfer of technology

Clark felt it never seemed to have a serious problem with Bumar regarding quality control. Clark maintained the right to inspect all products carrying its trademark, and held to the standard that no product would be approved which was not up to specifications. Part of the incentive behind the high quality of Bumar's workmanship was explained by one Clark official who stated that Bumar simply wanted to work with Clark. Because of this desire Bumar would follow Clark's instructions accordingly.

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Other skills required

Accompanying the actual product knowhow were other skills such as cost control. Clark officials remarked that Bumar had become increasingly cost conscious. "Seven years ago," one Clark official noted, "Bumar would not have counted the number of nuts being used--now they are counted carefully."

Inventory control

Since Clark was involved in a form of buyback arrangement with Bumar, the corporation wanted certain models which could then be used to meet their needs elsewhere. However, they found it was more difficult than anticipated to arrange to have Bumar manufacture those particular models. Furthermore, the whole area of inventory control was more difficult than expected.

Current Corporate Perception of Benefits from Agreement

The three reasons given for Clark's desire for the agreement with Bumar included a manufacturing source for Clark's international market, especially in Europe; an entry vehicle into Eastern Europe; and the profit to be gained from the disclosure fee and component sales. The results from the arrangement varied somewhat from the expectations.

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The primary justification for the arrangement with Bumar by Clark officials at first had been to establish a source of supply of heavy duty axles on the European continent since the costs of importing products from Clark, U.S.A., priced such units beyond current local market prices. However, during 1978 interviews with Clark officials this rationale for effecting the technology transfer was described as 'limited' at best. This view may have been influenced by the delays which were encountered which had slowed the production rate, and hampered the supply of axles.

Clark found that the business cycles which affect the United States are often reflected in Europe six to nine months later. For instance, the general recession which appeared to peak in the United States in 1975 reached a saturation point in Europe during the latter months of 1975 and 1976. This brought about a slowdown in the buying of replacement parts and units which has only recently resumed its anticipated volume. Thus, sales appeared to be less than had been anticipated.

Clark's ardor for this transaction as the corporation's entry point into Eastern Europe which had been highly optimistic in late 1974, appeared to have cooled off--perhaps because many of the possible agreements which were being considered at that time had not materialized. Clark, by 1978, appeared to have adopted a

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"wait and see" approach. On the other hand, more contacts had been made within Poland and throughout Eastern Europe than apparently had been initially expected back in 1972.

Clark had gained more mileage from its technology in terms of the disclosure fees paid during the agreement. This payment could be used for additional product development as well as for offsetting past development expenses. Clark had received only the minimum payments in the engineering fee and royalty area because of delays in the production schedule, and from the drop in sales. These lower payments had been, in part, offset by additional component sales which had exceeded expectations, when the axles had not been manufactured in Poland as rapidly as anticipated. These increased sales refer to only the components sold to Bumar until their own facility was on-stream. Those components sold to be incorporated into the final product were not included in this tabulation. In the latter regard, sales were understandably down because this component category was directly tied to production.

An unexpected sales opportunity was that of products not directly connected to the axles in the agreement. Sales did increase on an export basis from Clark during the course of Clark's involvement with Bumar.

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Negotiations

The agreement between Clark and Bumar appears to have been adequately comprehensive as it has covered all contingencies which have arisen thus far.

Contract format revisions

A side agreement was drawn up, permitting Bumar to use some of the components being produced for other applications.

Four amendments have been added to the original agreement. The first pertained to the permission to produce what was termed a dead steer axle. The second and third amendments were never signed or put into practice, and the fourth amendment was designed to expand the agreement into the joint development project creating a metrically-scaled hydraulic excavator axle for exports to the U.S.S.R.

The license for the manufacture of axles between Bumar and Clark has been expanded since the original agreement to "cover new types of products, designed entirely by Polish specialists, whose technical solutions have been fully approved by the firm of Clark Equipment Co., and are now being sold as a jointly developed Clark-Bumar product."³

Pending negotiations

A problem not really understood by the Americans was that Clark expected to conclude arrangements on the basis of the company's name being known--not realizing that the people involved in the negotiations must become acquainted with their foreign counterparts on a personal basis for the arrangements to really be taken seriously and concluded.

Clark found that the speedy time involved in settling the contract was not totally advantageous. The negotiating period can be a time of becoming acquainted as well as of ironing out contract issues. Clark's agreement with Bumar had been concluded so rapidly that this familiarization time occurred afterwards, when the project was underway. It would appear to be an advantage to have this rapport already established prior to setting a project into motion.

There is a tendency for people to come into prominence as situations create a need or demand for their particular group of skills and background experiences. Clark found this to be true in that one of their best and chief negotiators was a person who had familiarity with the East European culture as well as with the industrialized products being discussed. It must be pointed out that

much of the smoothness of the negotiations and of the project itself was due to this individual and the rapport which he was able to establish.

Time Frame

On schedule

The axle production in Poland appears to be on course now, although the variety of axles is not as great as some had hoped. However, demand does not seem to be as high as initially projected. This may also be due to a large demand for a variety of axle types, rather than a high demand for relatively few models.

Behind schedule

The time frame as projected for the Clark-Bumar project ran into several delays. The first major delay was caused by difficulties in obtaining the necessary equipment, and then, when production was getting on-stream, the recession which was affecting Europe about 1975, reduced demand for the product. The initial delays were frustrating to both Clark and Bumar, and since the axle was a vital component in a number of vehicles, it affected production in Poland. Many of the axles were

needed for the cranes being produced in Poland and thus, the shortage of axles hindered the supply of cranes as well as affecting the revenues returned to Clark as royalty payments. Some years only 100 to 200 axles were produced, and at some times, only 50 axles.

In retrospect, Clark felt that part of the problem with the production quotas was that the tentative schedule as listed in the contract reflected the ambitions of Bumar more than the reality of such a technology transfer. Forecasts which were so optimistic could only be disappointing when the goals were not achieved.

One of the most negative results of the production delay was that the entire Bumar crew was fired. This was upsetting, as one Clark individual noted, because these individuals were fired for causes over which they had no control. Clark's impression of their Polish colleagues was that they were working with some very good engineers.

Financial Flows

Payments

Financial flows from Bumar to Clark have been generally as anticipated. The first disclosure fee was a bit late, due to a misunderstanding, and some royalty payments have been behind schedule, which is almost considered

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to be the case worldwide. The lower production levels, and the drop in the demand for axles, at least in Europe, has resulted in lower payments to Clark because the company is paid only the minimum royalty level each year. However, this is expected to improve as construction and other areas of business which utilize vehicles incorporating these axles pick up.

Purchases from the domestic company

Purchases from the domestic company have been higher than anticipated in a direct product sense, since some axle components were purchased from Clark because the need was there prior to the production capacity in Poland. Other component sales, those assembled into the axles during production are down, because they reflect a direct relationship to production.

Purchases throughout the Eastern Bloc from Clark for products unrelated to axles are up : more originally anticipated.

Purchases by the domestic company

Generally, Clark has not needed to purchase any unexpected items for work on this project. This is in part due to the fact that all visits to Poland by Clark personnel are made only on a visiting basis so no long term accommodations have been necessary.

Personnel

Training assessment

Domestic company. Hayden noted in 1976 that Clark encountered personnel problems including a lack of worker training, low quality control, worker indifference, contributing to a longer time required before the startup of production.⁴ However, by 1978, Clark's assessment had become more positive. Clark noted that it had found the technical capability of the Polish engineers outstanding and the manufacturing efforts in the plants of high quality.⁵

Actually Clark found the capability skills within Bumar to be very good--in fact, the supply of academically-trained engineers was stated to be even better than expected. Manufacturing capabilities appeared to be approximately what Clark had anticipated.

The company felt that Poland's "abundance of well-trained and capable engineers and manufacturing plant workers," combined with the "American companies manufacturing and plant operation knowhow, plus an ability to market products in the Western markets . . . seem to be far more important than the low Polish labor costs and highly sophisticated American products which are commonly considered to be the major incentives for mutual action."⁶

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When the equipment was installed in Poland, Clark sent technicians over there at the request of the Poles to teach them the operations on their own equipment. No Clark representatives were in Poland for more than three weeks at one time.

One training point which Clark uses in training their own technicians is to insist that a new person always take an experienced person along. This procedure was successfully used on the Bumar project.

Host. For training, Clark brought the Polish trainees over to the Jackson manufacturing plant where they could get first-hand experience working with the heat treatment operation and gear cutting. The Poles came in groups of 10 or less and stayed for three to four weeks. Although a translator was needed, the training was generally on a one-to-one basis. The skill areas represented by the Poles included heat treatment, furnace operation, quality control, and gear cutting.

The number of individuals involved and the length or number of visits were approximately as estimated, Clark reported. Clark did feel that more time was needed for planning and documenting than originally anticipated. In addition, some of the Polish workers wanted training in techniques which were outside the realm of the Clark technology, even to the manufacture

of certain bolts which Clark purchases from others. Thus Clark could not supply the technology for the bolt manufacture.

Clark found that Bumar lacked skills in application engineering and manufacturing techniques, not in theoretical engineering, and attempted to correct the problem through the installation of better equipment and upgrading the workmanship. The three step approach on improving the workmanship involved improving individual worker machining and tooling skills, maintaining tight control over product quality, and attempting to instill worker pride in accomplishment through illustrating how each person's job helped to improve both the product itself and the image of Poland throughout the world.⁷ These techniques were successful since the product being currently produced does meet the specifications set out by Clark.

One problem noted by Clark in regard to the project with Bumar was that of over-capitalization in the equipment sense. Bumar had suddenly been inundated with equipment and required time to learn to use it efficiently. A major step in the right direction had already been taken, however, as the problem had been identified by the Polish workers and, with this realization, measures could be taken to overcome their 'growing pains'.

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Other personnel involvement

Clark felt that no major problems arose as to staffing in Poland. Their technicians were to be there for a total of three weeks at a time, maximum, although individuals would return for additional visits. What Clark did find was that to adequately staff the project, the corporation had to develop a human resources contingent. However, once the project was completed, or, particularly, once the major portion of the training was completed, this group of experienced training technicians had to be absorbed back into Clark's domestic operations if no other international projects were available. This resource base, Clark felt, virtually committed the corporation to seek out additional arrangements which could take advantage of this staff, much as their technology transfers took advantage of corporate research. Clark had found that selection of those individuals possessing both the technical skills and the adaptive skills needed for international operations required skill in itself but that once selected and experienced, opportunity should be taken to use their services as much as possible.

Protection

Leverage assessment

It was noted earlier that Clark usually does not undertake such an agreement without granting its trademark. This gesture was intended to provide Clark with a potential supply source for the product being manufactured as well as a viable form of leverage in negotiating with their East European partner. This leverage was perceived to be gained because the Western trademark was believed to make the product a more desirable export and was even felt to make the product more in demand within the country.

Whether this assumption of leverage was accurate is somewhat in question, but perhaps a more accurate assessment would be to question the amount of leverage gained by Clark through the granting of its trademark. Clark technology is certainly respected throughout East Europe and its reputation in regard to its axles is excellent, so, in a general sense, its trademark was a desirable item. It might even be questioned whether Clark would have obtained the agreement in the first place if they had not been willing to transfer the trademark along with the technology.

However, unlike complete or final products, the trademark on an axle is far less visible than the logo of a company which appears, for instance, on the front of a dozer or truck.

Both Clark and International Harvester transferred their trademarks to Poland for the use on their respective products. However, due to the nature of their products and the fact that Clark was involved only with axle manufacture while IH was producing total vehicles, the Clark trademark was relatively hidden while the IH logo was patently visible. This aspect tended to result in more awareness of the IH name than the Clark name throughout Poland, with no relation to the product performance or quality. Thus, the trademark may have impact for the immediate buyers but the general reputation of Clark would not be spread as wide or as rapidly through familiarity with its trademark as would be the case with another type of product or the manufacture of an end product.

This factor was not oblivious to Clark, however, and additional measures were also taken to aid the corporation's position. One official described another means which Clark employs by noting that although the company provides its partner with carefully delineated plans, there is always an undone segment. Even though the plans are delivered piece by piece, a final segment is often missing. In cases of vehicle manufacture the 'missing

piece' is often the transmission or drive train technology which is never transferred. This provides Clark with an assurance of a continuing relationship because usually the creation of an adequate transmission would require years of study on the part of the other party, and the purchase of the transmission from Clark is a far less expensive solution.

In fact, Clark notes that their agreement with Japan was the only one, to that point in time, where all Clark technology had been transferred. The basis for this concession involved the fact that Clark possessed something else which Japan desired; in this case--a superb marketing organizational skill. Thus, Clark knew that Japan desired this 'knowledge' and access to the international marketing entries possessed by Clark as well as the technology. An accompanying factor, as well, in the Japanese instance was that research in those product lines was rapidly developing new products or so greatly improving the current ones that their product remained desirable and sought out.

Utilized inspections

An unexpected situation regarding the quality control inspections arose in Poland. The Poles were anxious to sell cast iron housings to the Soviet Union. Clark,

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being strict right from the start as to methods and procedures, insisted on inspections even though the Poles were not yet manufacturing their own components but were purchasing them from the United States.

However, when they started inspecting the items prior to the sale, they found differences in the quality standards in the components purchased from the U.S.

Patent/trademark defenses

Poland cannot sue others for illegal use of the Clark patent or trademark but, instead, must notify Clark who decides the legal disposition. No problem has arisen here, so far.

Legal provisions invoked

An unexpected situation arose with the joint development project in Poland. Poland had a contract to supply the U.S.S.R. with certain axles. The contract with Clark noted that the transfer of innovations or improvements on the technology supplied by Clark to Poland has a two-way street. Both Clark and Bumar are obligated to supply their partner with improvements relating to the axle. However, Bumar presented an instance where it felt that the improvements made on the axles being designed for the U.S.S.R. were done totally by the Poles,

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without the assistance of Clark. Bumar's offer to Clark was strictly limited to the purchase price of the parts of the axle purchased from Clark. This was at only 0.5 percent which Clark felt was only one-sixth of the correct amount. Clark felt that the improvements made in the axle were possible because of the technology transferred to Poland, and that Clark should be paid at least 3 percent of the price being obtained. This matter was reviewed and renegotiated, and Clark reduced its demand to 1.5 percent but was holding firm at that level. If Bumar rejected this position, Clark intended to withdraw the offer and take the matter to arbitration. The eventual outcome was to resolve the issue at approximately 1.5 percent of the value, close to Clark's final position.

Hindsight

Factors which made the project
easier than anticipated

Clark feels that a firm should not encounter any major impasses regarding technology transfers if the planning is thorough and concentration is applied to those areas where the license is weak. However, the corporation notes that this planning must be followed by implementation which is just as thorough, and control must be

maintained throughout the transfer to provide for the interchangeability and quality of the finished products.

The entire operation between Clark and Bumar was described as easier than anticipated through the good personal relationships which developed between Clark officials and all levels of Polish officials, including the high-ranking ones. Clark also found that the Polish employees depended upon the Clark trainers for the product technology including instruction, not going off on their own. This may have been interpreted in part as a reluctance to make decisions, but it provided for a smoother and less troublesome transfer of technology.

Clark found that quality control was easier in Poland than in Romania (but also noted that their project in Romania had not been underway for very long, which would make a difference). However, since this was a pleasant surprise, it made the project in Poland much easier for the Clark technicians.

Factors which made the project more difficult than anticipated

The two greatest problems faced by Clark were "the late delivery of manufacturing equipment to the Polish plants and the slump in axle requirements occurring in Western Europe. This slump in demand, caused by the recession in West Europe, was passing by 1977, but in its

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wake left a variety of small orders for various sizes of axles. This type of situation is more difficult for Bumar to fill as the plant is geared toward the manufacture of a higher volume of axles of one type at a time."⁸

One of the factors which appears to have made the technology transfer to Eastern Europe most difficult was the nationalistic tendencies of each nation within Eastern Europe. This prevents the CMEA countries from operating as one monolithic block. Each country, given a suitable export commodity, tends to first use the product for its own internal use, if it is essential. Then it is exported to the West or to the U.S.S.R. in exchange for either raw materials or gold. Finally any surplus is shipped to other countries within CMEA. Clark felt that the corporation would benefit from their axle production in Poland as this would complement the Clark transmission technology being transferred to Romania. However, it was found that interchange between the two countries was not encouraged, and the possibility of exchanges between these countries would be relatively minor.

Difficulties did arise from the lack of authority on the part of the Eastern Europeans who were most involved in decision-making, especially at the local level. However, such a need prompted changes, and over a period of time, the authority to make decisions, especially those not involving any additional expenditure of funds, was provided.

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Progress of Future Expectations

It was reported that the reputation of Clark Equipment in Poland did not appear to be dependent upon the visibility of its trademark for, already by 1975, Clark was involved in negotiations in at least six other areas which represented possible projects of a relatively large magnitude.⁹ However, by 1978, few of these projects had been finalized or awarded to Clark. In fact, one of Clark's major disappointments occurred in late 1975. Additional agreements were concluded between International Harvester and Bumar, but not between Clark and Bumar. On the part of Poland, the alliances with both companies tended to spread any risk which might have been present through the use of only one company. Such a variety of associations provided Poland with more resources and contacts than would have otherwise have been the case. Bumar's selection of IH instead of Clark for the additional trade appeared to be based on a variety of reasons including several rather intangible factors. One Polish official noted that IH tended to have a more humanistic yet advanced image among the Poles, compared to the image which Clark projected, although no one incident or occurrence could be pointed out as a possible cause for this perception.

The Clark arrangement with Bumar in Poland has an ironic twist as it turns out that Clark's technology

in axles is being used in some instances to assemble their competitor's product.

Clark seems to feel that joint projects appear to be a most viable possibility just beginning to be explored. Adjustment to metric scaling is one area where Polish and American workers could benefit from each other's skills; a conclusion Clark has come to as a result of the Bumar project. Joint modification of Polish products for U.S. and Western markets is another resource area as well as development of new products for both areas.¹⁰ Other cooperative areas might be to have the Polish partner handle the testing and manufacturing of prototypes while the U.S. partner works on the tooling and scheduling aspects. Another cooperative venture might be to combine talents in a joint sales effort using both Polish and American marketing and sales experience, for the sale of each other's products.¹¹

Poland

International Harvester

Description Variations

Extensions and Enlargements On
The Original Contract

Five years after the initial signing in September 1972, it was noted by Jerzy Szumski, Economic Affairs Officer for the Commercial Consulate of Poland, that "the feeling on both sides is that mutual expectations have been fulfilled and that perhaps even more importantly in the course of daily implementation of mutual covenants, new perspectives and potentials continually emerge and are not unattended."¹

Rapport and subsequent developments that had materialized through the Bumar/IH project by 1978, ten years after the initial negotiations were begun, contained several aspects whose very existence speak highly for this non-equity project.

The various agreements which IH has now with several agencies in Poland are far more complex than the usual license agreement where some products are brought in, and a royalty is paid back to the parent company

based either on the products brought in or on the sale of those products. These aspects are incorporated into this non-equity agreement but are only part of the entire operation.

The cooperative agreement has been extended four times to date. The latest extension was to provide for the manufacture of transmission gears for IH bulldozers which were assembled not only in Poland but also at IH facilities in Great Britain and the USA. This manufacturing is being carried out, not at Huta Stalowa Wola directly, but by the Pzlrzeszow Works.²

Within three years, the crawler tractor portion of the agreement had been expanded to wheel loaders, including pipe layers. As before, this sale of technology was contingent upon Bumar receiving the most modern vehicle information including the trademark.

Additional Products

The progression of products produced in Poland began with the 140 h.p. crawler bulldozers, manufactured in 1973, followed by crawler loaders. By 1975, crawler tractors of increased horsepower, 200 and 285 respectively, were being produced.³ All in all, seven crawler models were provided to Bumar by IH.

Also in 1975 a wheel loader and pipe layer agreement was signed between Bumar and IH, adding other vehicles to the production process. The Poles expressed a relatively high demand for pipe layers, a form of crawler tractor which is used for laying oil or gas pipe lines. This brought the number of wheel loader models under this transfer to nine. All were covered by the IH trademark.

This 1975 addition to the basic Bumar-IH agreement was designed to help the manufacturing facilities of both partners. International Harvester wanted to manufacture two units in their British subsidiary; the TD15C tractor-dryer and 175C loader. Bumar agreed to provide "skidded tractor units (tractors without engines, controls, attachments and crawlers) on a multi-year delivery schedule to the IH Doncaster facility for completion and subsequent sale by IHGB throughout the United Kingdom, Europe and Africa."⁴

Joint Development

Product development ranged beyond just a transfer of knowledge. Mutual design efforts were instigated in May of 1975. This was done through the establishment of a joint Polish American design office, for the development of a 'new-generation bulldozer and engine.' This

development contract permits full access to the research and development work of both parties.⁵

Another development project came about because Bumar had desired a different gear drive on the vehicles. The equipment, as utilized by IH, had a gear drive which could only pull, and did not reverse. The Poles, working with IH, were instrumental in helping to create a power shift version of the machines, and Bumar signed a joint development agreement with IH to create a torque converter which would be adapted for use in Poland and other areas with similar terrain.

These torque converter components manufactured by Bumar are to be after joint development and testing. This project, while a separate entity, is an offshoot of the IH/Bumar agreement, beginning on March 17, 1978, and is scheduled to run for nearly 20 years, concluding in 1995.

The respective responsibilities in the joint agreements between IH and Bumar, for the joint development of new crawler tractors, diesel engines, and critical machine components, have been listed as follows: "IH is basically responsible for the engineering design while Bumar is responsible for the construction of engineering prototypes. Bumar engineers will also participate in the designing process as consultants and in order to ensure

that the engineering documentation is readily usable in Polish plants and truly metric."⁶

Trademark Permission

In 1977, IH trademark approval was reached on some models of the crawler tractors. The cooperative agreement signed by IH stated that every part and component incorporated in the production cycle, both in regard to component deliveries and final products which were to be the property of IH, had to be tested and receive an official conformity certificate. Extremely thorough quality control tests were performed both in Poland and at the IH facilities in Chicago, on the first items to be manufactured within each product area.

One of the initial responsibilities of IH and Bumar was to develop the Polish equivalents for the American steels and other materials used in the manufacture of the construction equipment. The Polish facility had a total of 158 steels and metals, of which 147 were found to be suitable for substitution, while another 7 steels and 4 modular irons had to be especially produced to American specifications.⁷ Thereafter, additional checks were performed to make certain that the products were continuing to meet those standards. "It is gratifying to note that the components manufactured through the

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auspices of Huta Stalowa Wola passed all quality checks and were permitted to carry the IH trademark."⁸ The first totally assembled machines permitted to carry the IH trademark produced under Huta Stalowa Wola auspices included the TD 15 C crawler bulldozers and crawler loaders.⁹

Preparations

New buildings were constructed for the IH project, despite the fact that the Huta Stalowa Wola already was a massive industrial complex. The new fabrication and assembly shop involved 40,000 square meters, with an additional 20,000 square meters for the gear shop addition, and more construction underway for the crawler undercarriage shop and a modern automatic forging plant which was being imported from Japan.¹⁰

In preparation for the IH manufacturing project, Bumar also had created many of its own tools. It was reported that 6900 items, including fixtures, jogs, tools, gauges, dies, templets, and patterns had been created by the end of 1973, at an expense of approximately 900,000 toolroom hours.¹¹

The transfer of the technology from IH to Bumar was essentially engineering design documentation, factory standards and voluntary manufacturers' standards, plus

manufacturing engineering documentation for items manufactured by IH and informal knowhow. The engineering design documentation alone consisted of over 20,000 drawings, all of which required conversion to the metric system, and translation into Polish. It was reported, however, the Bumar engineers completed this task in several months, building upon former experiences with the British-based crane companies--the 'soft metric conversion' approach being used to "ensure full interchangeability of parts."¹²

Technology Updates

The technology which IH supplied to Bumar has been updated since the original transfer, with revised information going over to Poland from IH virtually every year. This IH policy of implementing its product improvements internationally on a concurrent basis provides for product consistency as well as interchangeable parts, but does create some down time since all facilities are then retooling or making other necessary changes all at the same time.

To insure interchangeability, IH and BUMAR developed a coding system to indicate which Polish parts had been approved for substitution with U.S.-made parts. It is commendable to note that 90.5 percent of all

possible parts qualified for substitution. This substitution requirement referred to components which were to be used in the manufacturing process, not to items carrying the IH trademark.¹³

The manufacturing policies of Bumar in regard to the IH technology transfer have been summarized as follows:¹⁴

1. Descend from as assemblies to part numbers levels with imported components when justified by economic and manufacturing considerations.
2. Move from bay assembly to line assembly as fast as possible (a shift from bay assembly approach was introduced by IH to Bumar at the Huta Stalowa Wola facility by 1975 for all five crawler tractor-dozers and loader models).
3. Substitute locally-made components for imported ones as fast as technically viable (but only after IH approval).
4. Concentrate on production of substitutes for the most expensive imported items (but ones which are feasible), and gradually build capabilities for the remaining items.
5. Continue to import items which IH also purchases from outside suppliers, or until IH has totally approved substitution.
6. Work toward developing own availability of items not commercially available in Poland which are necessary for product--such as those with peculiar shapes or unique fasteners.

Along this line, it is important to realize that, by 1979, some of the vehicles manufactured by Bumar under the IH trademark, contained up to 85 percent Polish-made content.

Corporate Structure Revisions

One change which has impacted upon the projects in Eastern Europe is the corporate restructuring which has taken place throughout IH. The new IH structure has a product orientation instead of its prior 34 year old geographic orientation which was based on domestic divisions with an accompanying international division. Currently, IH now has five groups which are each free-standing, self-sufficient worldwide business groups. The group directly involved with Bumar in Poland is the Pay Line division, responsible for construction and industrial equipment. Each group contains marketing and technical expertise as well as its own R & D and related service organizations.¹⁵

Since the time that IH signed the initial agreement, it has "reordered its corporate priorities in the past five years to emphasize overall asset management rather than sales volume." Assets were considered to be virtually anything of value to the firm. This approach has involved, (1) installation of a new strategic planning program providing strong top-down guidance, (2) implementation of new compensation practices rewarding individual performance, and (3) worldwide reorganization which consolidating related assets into product groups.¹⁶ It is this last aspects which directly related to the

Polish cooperative agreement since the Pay Line group includes construction equipment

Commercial Offices

Another result of the IH-Bumar agreement was that, as of the mid-1970's, both IH and Poland established commercial offices; IH with their Office of Technical Information in Warsaw, and Poland with the Office of the Polish Commercial Consul in Chicago. The thrust of the IH office was to promote sales of IH products to Poland, and coordinate service capabilities in regard to those products. Poland's office provided liaison functions for a number of Polish industries as well as assistance to its representatives. Despite the existence of this office, however, Bumar is considering the establishment of its own company in the US to help in the coordination of its activities.

The combine, Huta Stalowa Wola, was reorganized in 1973 to provide a separate office in Warsaw which would oversee such technology transfers as evidenced by the IH agreement. This office was created to coordinate such activities as the transfer and absorption of technology, personnel training (for HSW and others from Poland), procurement of financing by Bank Handlowy, and acquisition of manufacturing equipment from Polish and foreign sources

in cooperation with specialized foreign trade enterprises, and the development of Polish suppliers as sources for various components.¹⁷

One of the mutually advantageous points of the agreement between Bumar and IH is that the transfer does not stop with the manufacturing process but also encompasses the area of "worldwide marketing cooperation" of their agreement products in a manner utilizing to the fullest extent possible their respective advantages in a marketplace while fully observing the rights of franchised dealers of both Bumar and IH."¹⁸

The involvement between IH and Poland has certainly increased since the venture began in 1972. Currently, IH is selling machines made in Poland, using the international marketing capabilities of IH to export a Polish-made product. This is part of the marketing agreement to support and implement sales activity of the IH products connected with Poland; however, officials note this involvement has gone far beyond the activities initially envisioned in this area. The company has been investigating markets for their products throughout the COMECON countries and elsewhere. In return, for example, the company is marketing Polish products in Africa.

Currently, the construction machines produced through this cooperative agreement have been purchased by

users from Yugoslavia, Libya, and more recently by Angola, Algeria, and the People's Republic of China, in addition to the sales to the Soviet Union. These sales are in addition to those construction machines marketed through the IH distribution network internationally.¹⁹

Conclusion

The joint development projects which grew from the IH/Bumar project are an indication of how much broader the project has become beyond what was originally anticipated. Officials at IH reported by 1977 that the bugs had been worked out and that things were going quite well on the Polish project. This was a change from earlier, more pessimistic reports. As projected, subassemblies from Poland were being shipped to Great Britain for use in the IH facility there. Thus, despite the receipt of the technology fee itself as a source of profit, IH felt that the corporation had benefited more than expected. It was selling goods that it otherwise would not have sold. It had developed European sources for IH products which IH could not have afforded to do on its own because of the great amount of capital which would have been needed for such a venture. Furthermore, the joint development projects had expanded the scope of the initial one-way technologies transfer into a two-way international information flow and research partnership.

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Current Corporate Perception of
Benefits from Agreement

The initial motivation for IH in entering into the Bumar agreement was the financial gain to be made. Hayden had reported that IH had three aims in this regard: to sell entire vehicles until the Bumar project was on stream; to supplement that production once it was going through the sale of components which were not locally manufactured but still necessary for the vehicles; and to continue to sell replacement parts until an adequate supply of service parts was in stock. Hayden stated that Bumar was obliged to purchase \$1.5 million worth of components in the first three years, followed by another \$6 million for additional components as agreed upon in 1974.²⁰ These anticipated financial aims ranked first, followed by the profit gained through the technical disclosure fee and by the potential which Bumar possessed to become an additional source of products to supplement other IH manufacturing facilities.

Now, seven years later, IH still appears to rank the sale of products as its number one priority, although this significance is also explained by the fact that, until the initial Bumar cooperation agreement in 1972, IH had no market entry or access to the socialist bloc. Furthermore, even the sale of products is losing its

number one position to the aspect of product source availability. After an initial period during the setup and training time which involved some problems and confrontations, IH has become increasingly complimentary of the skill and workmanship of the Poles. The ability of Bumar to adequately manufacture the vehicles according to IH specifications has provided IH with a dependable product source. One IH official, in 1976, termed Bumar an "absolutely first-class source which is going to be one of the main manufacturers of crawler components, replacement parts, and final products for all our markets, especially Western Europe."²¹

International Harvester admitted that the corporation, in general, did not glimpse all the long-run possibilities of its agreement with Bumar. The agreement was merely taken to be a type of license arrangement, although the extent of the technology being transferred was far more extensive than in usual license agreements. Only a few executives appeared to grasp some of the greater benefits which might be gained through the association.

The market for replacement parts and service in the construction equipment appeared to be an area which could be developed more fully. The socialist bloc appeared to have a dearth of replacement components since most parts are manufactured for new products, and IH

felt that the service side ought to be expanded. Sale of secondary parts had not been a major consideration in the earlier phase of the agreement but IH felt that this aspect would become increasingly important as more machines were being used throughout the Eastern Bloc.

Negotiations

Contract Format Revisions

The negotiation party for Huta Stalowa Wola was the Polish Foreign Trade Enterprise Bumar, and the contract with IH was one of the first such industrial cooperation agreements ever to be signed by the Polish industry with a foreign partner.²² During the negotiations, it was noted that "the initial talks were accompanied by prejudices resulting from ignorance of one another's possibilities. However, it was found that reserve and tension disappeared within a few years when it became clear that both partners had proved themselves worthy of each other and "mutually indispensable."²³

The term 'indispensable' may not be as accurate as 'mutually advantageous' since both parties benefited through their union. IH had established a bridgehead on the vast market of the socialist countries without having to develop its own manufacturing facilities there while

its Polish partners technically improved their construction machines and were able to manufacture products sought by buyers from hard-currency markets.²⁴

The initial contract drawn up between IH and Bumar was the result of long and difficult negotiating sessions. IH reported that terms kept changing, amendments were added, and fees had to be recalculated accordingly. However, since that opening experience, IH found subsequent contracts or revisions as new extensions or additions were made, to be far easier. The contract format has been changed and is considered to be much easier to follow and understand now. Before, the wording and intentions were expressed in general terms, now the agreements are extremely specific in all regards, including any marketing obligations. However, IH noted that while these more recent versions might be more suitable, their past experiences were necessary for this evolution to take place.

In negotiations, IH officials point out that a viable contract must contain advantages for both parties, otherwise, one partner will become dissatisfied or disgruntled with the agreement.

IH found that quality standards are difficult to enforce: daily inspections had become commonplace. IH felt that all of their future agreements would delineate inspection and quality standards, as it had learned that all details had to be provided to guarantee quality.

International Harvester emphasized the fact that in such a non-equity transfer of this magnitude, it was important to understand the people as well as the products being transferred. The corporation noted that in arrangements with most countries, but particularly such areas as East Europe, the benefits of such arrangement to both parties must be emphasized. Resources should also be listed, including people available. Leaders of the country must be involved, informally as well as formally, during negotiations. IH stressed the fact that Poland's politicians were involved whenever possible.

One of the first indications to IH that this project with Bumar might be more time consuming than initially anticipated emerged in the negotiating session which took more time than expected and involved more people. The original negotiations seemed to involve a small number of individuals but as the negotiations intensified, an expanding, inverted pyramid of individuals were contacted as various operations were considered. These individuals included engineers and financiers, as well as the manufacturing-technical staff.

Current world events were on Poland's side in the early 1970's in regard to this agreement with IH. A worldwide depression of sorts had affected the truck and heavy equipment business when the Polish came to IH. International Harvester was at a decision point because by the

early 1970s, the company "severely needed capital and could find virtually no sources."²⁵ In such an environment where market activity was down, it appeared that IH was persuaded to take the risk of providing a potential competitor with not only current, but actually future technology relating to the IH construction equipment line in return for the advantages which Poland offered.

Technology including the latest improvements was a firm requirement of the Poles. Bumar Managing Director Zaskurski remarked that through all Bumar negotiations and agreements, "one basic principle has been always adhered to; namely that any product to be manufactured within the Bumar Union either as a final product or an assembly had to be a product to be yet manufactured by the given firm in the future and not a product the production of which was soon to be abandoned." He also noted that "all cooperation agreements have been concluded only at the stage when the given product was either still on the designers' drawing boards or just implemented into production."²⁶

Corporate pressure was evident throughout the negotiations with Bumar as Poland insisted upon current, virtually future technology. The fee for such technology was high; IH officials said \$100 million for the company's technology, Poland offered \$10 million. The figures finally agreed upon were a compromise between those components.

There were also business pressures on IH. The changing business scene, even in regard to pollution controls was a factor as IH had assumed they would have 10 to 12 years to incorporate certain controls, and found they had three to four years instead. Thus, certain technology would have an even shorter life span.

International Harvester pointed out that while the wording of the contracts and extension clauses has become more specific as to duties and details, the overall extent and intent of their agreements with Poland have broadened considerably from their initial strict, finite agreement to produce crawler tractors. Now IH states that the corporation sees their agreement with Bumar via their joint development projects, as cooperation on an entirely new plateau.

Pending negotiations

No new negotiations were pending, according to IH officials.

Time Frame

On schedule

It is also important to note that all payments due from Poland, with fixed dates were fully completed on

time. The various projects undertaken by IH in Poland, however, met with several delays. Since a specific time frame was not incorporated into the agreement, these delays were distinguished only in contrast to what was generally expected, not to certain deadlines. The emphasis was placed upon the goals to be achieved. Because of this 'end result orientation' both Bumar and IH reported that they did whatever was required to achieve those results. In some instances, these goals required more time than initially estimated, but it was felt that it would be inaccurate to view this as a negative factor.

Behind schedule

The agreements did not contain many time deadlines, according to IH officials, but estimations were held as to the likely period of time required for the operations. According to this estimate, the setup time required for at least the crawler tractor production ran about two years behind schedule, using finalization of manufacturing capability as the end point of the setup. Part of the reason for the extended time appeared to be a lack of an infrastructure for implementing decisions. This resulted in a hesitancy on the part of many workers and supervisors against making the wrong decision, which tended to detract from general efficiency.



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The anticipated time frame for the wheel loaders was less accurate than for the crawler tractors. This apparently was due to the fact that the entire line of loaders was redesigned, a process which benefited the ultimate product line, but which greatly hampered the schedule as projected for Poland. The design holdups were caused by IH, not Poland, and IH took full responsibility for any delays connected with this aspect of the transfer.

Time schedule expectations also varied between IH and Bumar. At one point, Bumar was 30 percent behind in terms of its crawler tractor production, and felt that overall production was 2½ years behind schedule. However, IH hastens to point out that Bumar's projected schedule was not necessarily the schedule anticipated by IH, as the corporation suspected production would take longer to get on-stream.

One problem which is likely to arise in any instance where production is dependent upon certain component imports presented itself in the Polish project. Poland's cutbacks of Western goods, including components essential for the manufacture of the IH wheel loaders, slowed production of the vehicles. Indirectly this slowdown also affected the expansion of other facilities at Bumar and thus, had an impact upon all of the production and assembly connected with those components or projected expansion plans. However, this type of balance of payments

and trade problem, while outside the total control of those involved with the project, is often of a fairly temporary nature. Thus, its impact would be equivalent to the effects of an economic slowdown.²⁷

Variations in the time frame

Variations have occurred in the time laid out for the agreements. The crawler tractor was signed in 1972 and was to run for a period of ten years. However, the additional units, including wheel loaders, which were added in September 1975, via an amendment to the crawler tractor agreement, provided a concurrent term which was not to be less than 15 years, or 1990.

Thus, the initial 1972 agreement was lengthened, with its termination date extended from 1982 to 1990, along with the wheel loader amendment. The joint development projects were scheduled to extend until 1995, five years beyond the completion date of the other two projects.

Financial Flows

Payments

Payments from Poland to IH have been exactly on time as designated. The only payments which have been variable are those related to production schedules such

as royalty payments which would involve the purchase of components to be used in the assembly of the final vehicles, or the rebuy by IH of certain components manufactured in Poland for use in IH production.

Payments have been in U.S. currency, although the English subsidiary of IH initially used Swiss francs. No payment problems have occurred as yet, but it was pointed out that in agreements of this nature, there are three general sources of revenue. The first is that of the disclosure fee or initial payments. The second is that gained from the sale of products or component parts, usually most plentiful before the facility is on-stream itself. The third source comes from royalties, gained from the sale of the completed product or components. This last area is seen as the one of greatest risk because it carries the least control for the receiver of those fees, and also involves the longest time period. The longer the time period between the contract and the receipt of the fees, the more risk is incurred.

The earliest years of the Bumar project were the most severe for IH in terms of revisions to the corporation's original expectations. The disclosure fee was not all profit, free and clear. It was noted by the mid-1970's that "the expense of travel back and forth, the need to hold the Poles' hand every step of the way, the executive negotiating time, and the mammoth training effort required,

had all but erased any expected profit from the technology fee."²⁸ However, since that time, the corporation has re-evaluated the expenses involved in training and negotiating and considered them to be more of an investment, fruitful because a product source had been created. Furthermore, a portion of the technology fee did remain after all training had been accomplished on the Bumar project.

IH also encountered greater expenses involved in equipment testing, particularly in regard to some axles which were sent to the United States for additional strength tests. This was in addition to the higher costs involved with the additional travel to Poland.

IH stated that the corporation was, in general, very pleased with the Polish project. But, the anticipated volume, both in terms of production and in terms of sales, was not as high as hoped. This was true of IH expectations but also particularly true in terms of the Polish expectations. It was noted that while the Poles had talked of thousands, they were producing hundreds instead. The demand, however, had not been heavy either. This demand aspect was expected to pick up, however, since worldwide construction was steadily increasing.

Sales of the equipment produced by Bumar throughout Eastern Europe were made through Polish sales offices. IH was to receive a royalty from these sales. IH also

received some publicity from these sales. The IH image expanded as familiarity with the company grew throughout the region. In fact, IH found the importance of their East European dealings had been reflected in the corporate structure which had taken increasing note of the agreement with Poland, placing additional importance to the sales to socialist nations.

Purchases from the domestic company

While it was true that the anticipated profits from the agreement had been offset by the extra man hours required on the project, the products being developed in Poland were expected to result in additional profits back to IH. The equipment from the Bumar agreement at first contained between 20 and 30 percent Polish content, thus, IH was contributing 80 percent of the components in some of those vehicles. However, some models by late 1978 were of 85 percent Bumar-made components.

However, IH sales directly to Eastern Europe as a result of the Polish agreement were limited to a few replacement parts, although some small crawler tractors were purchased by Poland from the English subsidiary during the negotiation period from 1968 through 1972. This was more as an example of the good faith being generated by the talks, however, than an indication of future sales through this channel. Even when all

manufacturing was to be on-stream, Poland was still slated to buy some components from IH, since the anticipated Polish national content of all machines was to be 60 to 70 percent, with some of the remaining components continually purchased from IH.

The financial flows appear to be below expectations more on the part of Poland than IH, since Bumar's sales were related to the production schedule. With the anticipated production running a year to 18 months behind, Polish revenues to be gained from the buyback purchases of IH, were consequently behind. However, this is an area which would change as production picked up. It appeared that the Polish approach regarding the delivery of some products seemed to be 'if not today--tomorrow,' whereas, in keeping with certain schedules, the promised orders had to be received on time.

Purchases by the domestic company

International Harvester did purchase a number of items to help its employees sent to Poland. These purchases included houses (several villas) and International's line of consumer vehicles, International Scouts. In addition, IH also financed extensive rest and recreation holidays for its employees involved with the project in Poland. Certain foods and other consumer products not

available in Poland were shipped in by the company as well.

Personnal

Training assessment

Domestic company. The staffing outcomes of IH varied from their initial expectations as the Bumar project progressed. International Harvester found that greater involvement was required; utilizing more people from IH, and a greater number of trips to Poland. The length of the visits remained fairly constant, however, in regard to expectations, as did the job areas of the personnel being utilized.

The current arrangement at IH in the U.S. has been the involvement of three to four individuals to handle the Polish project, drawing upon others there at IH as needed. This is in addition to the representatives which IH placed in Poland for a period of time. IH found these overseas placements detracted from the technology transfer profits, but it had the overriding priority of making the project successful. To be ultimately profitable as a product source, it was realized that it might be necessary to forego some immediate gain to achieve the long term goals.

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Throughout the technology transfer from IH to Bumar, only two IH personnel resident managers for the project were assigned to Poland on a lengthy basis. This was viewed by Poland as "something generally unheard of in cases of a technical venture of such complexity. It was a good testimony to the high levels of technical proficiency of Bumar's plant and its people."²⁹ By 1979, the IH representatives in Poland consisted of a territory manager and a service manager.

International Harvester did encounter some resistance on the part of some of its employees toward being sent to Poland, as anticipated. However, the corporation worked to provide a decent environment for its employees sent there. No additional salary or fringe benefits were financially supplied to these employees, but IH provided the additional living comforts as described above. These benefits helped those employees to save a greater portion of their salaries than would have been generally possible in the United States.

Selection of corporate employees to be involved on overseas projects is a careful consideration at IH. No specific training courses are used, as IH apparently feels that 'adjustment' seminars are "almost useless," according to some IH officials. Instead the corporation pre-screens possible employees for overseas positions,

and uses personal counseling for those to be sent, involving the entire family. The increasing expenses including difficult taxation payments involved in sending employees overseas for any length of time have increased to the point, however, where IH has severely cut back on such assignments to where the corporation has virtually discontinued sending Americans overseas. However, monetary expense is not the only justification as it has been found that the comfortable environment in the United States makes it especially difficult for many Americans to adapt to conditions abroad. Other nationalities, such as the British, Germans, Australians or New Zealanders seem to fare better.

Previously, the presence of a host country national as the overall manager of an IH operation abroad was an exception, whereas today it is closer to the norm, as IH actively seeks out nationals for such training or helps persons from another country apart from the United States adapt to the position. Americans are often sent abroad for just relatively brief, fixed time periods instead.

Host. Purchasing the license from the American company required a number of changes and adaptations on the part of the Poles. This included conformation to U.S. documentation, specifications, and adherence to tests to verify high product quality. It also required the



modernization of production machinery and the purchase of special-purpose machines including numerically-controlled machine tools designed to ensure high precision of individual components.³⁰ Heat treatment and welding techniques were modernized, and personnel were up-dated as to the use of the equipment. On-the-spot training and inspections were provided by visiting specialists from International Harvester.

International Harvester had stated that "never again will it enter into a technology transfer agreement based on expectation of penetrating a new market, . . . (but rather that it would only consider such agreements where it had advance assurance that its partner would become a first-rate source of the product)."³¹ However, since 1975, the point in time when this thinking reflected the outlook of IH, the corporation appeared to have gained new confidence in its ability to transfer techniques and skills and expressed additional interest in other similar ventures throughout the Eastern Bloc. Poland, through the actions of the Bumar employees, had been partially responsible for this increase in confidence on the part of IH, because the later outcomes of the Bumar project were proving so successful.

International Harvester found it was not prepared for the extent to which training needs of Bumar would have to be met. These needs did not stop with the top managers,

but extended down through all supervisory levels. Programs were needed to build enthusiasm as well as skills and quality control measures.

IH found three types of training difficulties present in the Polish project, despite Bumar's prior experience with Western companies. Poor quality control procedures were the major difficulty, but this was in part aggravated by a lower level of skills on the part of workers, and also by inappropriate worker incentives. IH found itself instructing workers not only in the manufacturing process itself, but in managerial or supervisory skills, especially as these related to quality control procedures.

The initial documentation fee was increased so that IH could provide the Poles receiving training in the USA with a per diem allowance which provided them with living expenses. The Poles were starting from a far lower level of expertise than originally anticipated, but it was found that the anticipated number of manhours were more than ample for transferring the technology. For example, it was found that the Poles had no actual concept of the type of building required for this type of operation, as to the requirements for the floor strength, or sanitation, including shower rooms. International Harvester had expected this knowledge to be part of their basic knowledge.

International Harvester found that the Poles were not used to working up to the standards required by IH, therefore, training measures went beyond assembly line techniques to such points as teaching the Poles to cover equipment at the end of the shift or similar precautionary measures. Part of the problem was that the Poles were not used to having to adhere to such strict tolerance levels, and previously had not needed to follow procedures so exactly.

Quality control standards did not relate only to materials tolerances and the workmanship of the final product. In many manufacturing operations, cleanliness affects the output and such factors as the dust in the air may be a crucial factor.

One aspect of training which frustrated IH officials was that the Poles, especially at first, did not follow instructions or ask for advice. One official noted that even though the Poles had bought the technology of IH, they did not act as though they actually wanted that information. Instead, they kept 'reinventing the wheel'.

On the other extreme, the questions asked by the Poles in the training sessions went far beyond the actual need-to-know areas. For example, they wanted to know all details of a bolt, including the chemistry of the

steel. This type of questioning is excellent if the project is to be manufactured, and such questions also apply if the product is to be custom ordered, as certain specifications may be required. However, when such items are basic purchases from third-party suppliers, questions may be more distracting and confusing than beneficial.

One area of training which required more attention than originally anticipated was that of tooling procedures. The Polish workers had a high familiarity with the operation of some of the equipment, but tooling up for the new products was an area which required additional training.

Troubleshooting was another area which required more attention than originally anticipated. Trainers from IH spent a greater proportion of the time checking to see where problems were originating in regard to the manufacturing process, and determining the cause behind malfunctions or parts which were not coming out properly. However, these problems were often temporary ones, and solved when correct operating procedures were explained and then followed. Part of the training involved the untraining aspects where prior procedures were different from IH methods had to be sorted out and disregarded before the new methods were applied. The possibility of this revised training had not been an expectation of IH

prior to the agreement, but one which became necessary as the project advanced.

In general, International Harvester found the training sessions far more involved than originally anticipated. The Poles had their own management style and techniques. IH trainers had to incorporate the prior approaches of the trainees into the new material. The training ranged far beyond the usual product/process information transfer. The documentation of IH had to be interpreted, substitutionary materials had to be selected, as well as relaying all know-how related to processing the necessary parts.

Some of the training difficulties appeared to originate with the observation that "few planners were evident among many plodders," as one person described the situation. Supervision appeared limited to giving orders and such orders would usually be followed, often regardless of the circumstances or in the face of apparent problems.

Other personnel involvement

International Harvester was responsible for helping the Poles to merchandise the product as well as helping them to produce. However, merchandising in a socialist sphere is unlike operations in a more free-enterprise

economy. Many sales were from government to government or agency to agency, and were often not based on a profit motive. However, cash flow was very important, based on the Eastern European need for hard currency. One effort of this was that the Poles needed additional training in adequate equipment comparison because they lacked the advantages of product knowledge gained by competitive selling. Thus, IH also became involved in training on the comparison and buying of products.

International Harvester hoped to hire some of the Poles as salesmen for the construction equipment, to work with potential customers in Poland, and elsewhere in Eastern Europe. The strategy was to familiarize possible users so that IH equipment would be requested by the customers, not forced upon a user, who might want a competitor's product instead. This 'pull' strategy obviously built upon the IH worldwide reputation for excellence and helped to further this image, but by training the Poles in sales techniques, IH was also providing a transfer of information which was secondary to the product technology itself, but was knowledge impacted upon technology transfer, encouraging the sale of the products.

Protection

Leverage assessment

Domestic company. International Harvester maintained a high degree of leverage throughout the entire project with Poland. This was due to several reasons. First was the fact that all training was, in general, to take place in the United States, with only temporary visits to Poland by IH specialists. Therefore, delays in training and production affected Poland far more than IH, in terms of personnel, production revenues and other financial flows. This is not to say that IH was not affected, since IH certainly noted a far greater involvement in regard to its training responsibilities and personnel than originally anticipated. However, Poland had more to lose through major delays or holdups.

Great teamwork resulted from both parties doing their best to instigate production as rapidly as possible. This teamwork, brought a greater rapport which in turn, grew through the multiple joint development project which evolved during the first few years of the agreement. Such rapport may seem the opposite of control or leverage, but in reality, the desire of both parties to work together itself might be viewed as leverage directed toward getting the job done yet maintaining a high self image.

The IH trademark apparently provided a high element of control in this instance since the Poles greatly desired the use of the trademark on the vehicles completed at the plant. This trademark was seen as beneficial to the Poles in terms of their increased export market. It was virtually necessary for IH since the facility's production was viewed as a one major source for both some assembled vehicles and component parts. Should the products not be manufactured according to specifications, or should other problems develop on the project, the potential loss of the trademark would be a severe detriment.

Required component purchases from IH also helped to maintain an aspect of leverage in that Bumar required certain components to completely assemble the vehicles. Inability to obtain these components from IH would jeopardize the entire project's production capability for total vehicle assembly.

The total vehicle buyback was a form of leverage in that IH had the option of refusing any products which did not conform to specifications. Thus, IH had a control over the quality of the products in addition to lending its trademark, and since the desire to sell the products by Poland was high, the buyback option was also important to the financial status of the Polish operation.

Variations in guarantees on the part of IH on this project were due to the increasing amount of technology being transferred as more vehicle and component information was involved with subsequent amendments. IH had offered some of the research capabilities of the corporation in regard to the joint development project in which all information was to be shared between the two partners. IH had, for all general purposes, completed its initial guarantees to transfer the technology necessary to manufacture crawler tractors and wheel loaders, when the vehicles were permitted to carry the IH trademark.

Host. Several aspects of the project as it developed over the first seven years helped to identify the control factors which were possessed by Poland, particularly Bumar, as well as IH. One factor was the teamwork issues, whether involved on the joint development project, or on the assembled vehicles which were then to be purchased back by IH for use in meeting the corporation's international marketing demands, IH and Poland would both benefit from their mutual efforts.

Poland does have the potential to be a true competitor of IH but the issue is, at least for the immediate future, postponed. The IH trademark, and the dependency which Poland as yet has upon IH for engines and other components reduces the competitive angle.

Actually, Poland's greatest control measure appeared to have resulted from the increasing emphasis which IH placed upon the facility as a growing source of products to meet IH marketing demands. The more dependent IH became upon the Bumar facility's output, the more leverage Poland would gain.

Guarantees on the part of Poland, through Bumar, were met in regard to facilities, equipment and trainees necessary to manufacture the desired construction equipment and vehicles. Again, as above, the expanded guarantees, on the part of Poland, related to research capabilities involved in the joint development project.

Utilized inspections

Because the construction equipment had to be manufactured to withstand great amounts of stress and since the IH trademark was involved, inspections and tests were a major concern throughout the project. Initial tests on the components and final equipment, as well as on the raw materials used in the construction of the equipment, were extensive, both in Poland and in the United States. Since some of the vehicles have now been certified as meeting all specifications and standards required to carry the IH trademark, tests and inspections will be limited to maintenance of those standards, and to certification of additional vehicles or models as available.

The approval for the trademark was to be permitted only after the Polish made vehicles had passed extensive tests conducted at the IH testing grounds outside of Phoenix, Arizona. As of 1978, three vehicles (TD15C, 175C, and TD25C) had been approved for the IH trademark.³² The permission to use this trademark was noted by IH Board Chairman, Brooks McCormick at the celebration of the fifth anniversary of the IH-Bumar project with these words: "We never would approve its use by anyone if we felt it would not continue to be respected. Bumar and the employees at Stalowa Wola have earned the right to use this trademark through their outstanding performance over the past five years It represents the highest recognition we can bestow upon one of our trading partners."³³

Patent/trademark defenses

Bumar used its own trademark when selling its construction machinery in 'joint markets' (presumably those markets in which it held a non-exclusive license to sell such machines) but these tractors did not carry the IH trademark. The two trademarks could not be used together on the same machine.

One IH official noted that the Poles covert the American trademark far more highly than most Americans realized, and far more than expected even by IH.

Legal provisions invoked

No situations requiring arbitration or other legal resource had arisen.

Hindsight

Factors which made the project easier than anticipated

International Harvester found that the flexibility and dedication of the Polish people certainly made the project not only easier, but probably feasible. The corporation feels that this overwhelming desire on both sides, from the highest level on down, to have this transfer work successfully was the ultimate reason for its success.

The corporation found that this dedication transcended the difficulties which were encountered, whether in the training area, the equipment operation, or even in the wording of the contract. Where certain portions of the contract were found to be vague, or misleading, the determination of the individuals involved was to identify the results to be achieved, and work proceeded from that position.

Factors which made the project
more difficult than
anticipated

Perhaps the most difficult aspect of the project, from the view of IH individuals closely involved with the entire operation, was getting the Polish side to accept the quality standards required by IH and to apply proper control policies and procedures. It has been pointed out that IH was in a beneficial position with Poland in that a British firm, Jones Cranes, Ltd., had previously entered into a technical assistance agreement with Bumar, and had provided an earlier introduction to Western-type demands. Jones had agreed to accept the completed product as partial payment so the Poles had been held to strict reinforcement of the British firm's quality standards, virtually Bumar's first contact with Western quality control.³⁴ The rejection rate had been relatively high, but the lessons learned and the skills developed carried over into the agreement with IH.

Actually, the prior training provided to some of the Bumar employees was a deficit at the time because the employees automatically did things one way when IH required a different procedure. Thus, much of the training involved unlearning, helping the employees to ask questions or to seek instructions instead of operating on their own.

The non-equity aspect of the arrangement made it additionally difficult for IH in a training sense. Since IH had to achieve its specified quality standards through the efforts of the Bumar workers, it could not just send in its own team of specialists to correct any deficits which might occur. However, despite the frustrations in this regard, this aspect in the long run has proved to be a great advantage. The Poles have mastered those techniques, and are able to produce products meeting all specifications. Thus, IH now does have a supply source which operates on its own, without any equity commitment from IH.

Review of the IH-BUMAR association

Benefits to IH from the IH-BUMAR project as listed by one source include:³⁵

- (1) a significant increase of sales of construction equipment to countries of Eastern Europe, including the USSR (1000 heavy crawler tractors in the past five years) Poland, Hungary, and Yugoslavia;
- (2) excellent image among countries in the Eastern Bloc, where a similar cooperative agreement has already been established with Hungary, and more under negotiation.
- (3) additional revenues from license fees, and commissions on some BUMAR sales;
- (4) expanded market penetration through creation of new sources for its products in Poland and the UK;

- (5) stable and growing business of selling components to Bumar (although Bumar's shopping list is becoming shorter, the annual values grow with the increasing production of the Polish plant);
- (6) creation of an economically attractive source of components and assemblies of guaranteed quality;
- (7) ability to introduce some new products and own-design components at one-half or less of normal product development cost.

Advantages to Poland and Bumar from the IH agreement have been described as:³⁶

- (1) important gains in manufacturing and engineering technology;
- (2) influx of valuable knowledge in the areas of product marketing and after-sales service;
- (3) improvement of professional skills of engineers, workers, sales, and management people;
- (4) availability of first-class products with vast potential of sales in Poland, Eastern Europe and other countries;
- (5) valuable and growing opportunities of supplying components and subassemblies to IH plants in the USA and elsewhere;
- (6) opportunities of deploying own engineering and product development resources for creating jointly with IH (highly) competitive and advanced new products with worldwide acceptance, at a substantially lower cost and risk than in the case of its own development.

Progress of Future Expectations

Since the venture with Poland has turned out to be beneficial far beyond initial expectations, IH has

revised its expectations for the future. For a start, IH has begun to see the advantages of the non-equity type of technology transfer, particularly when the craftsmanship and determination of the host party are as dedicated as the Poles. Because of their skill, equipment is now being produced in Poland which is being purchased by IH as an integral part of the corporation's international marketing mix.³⁷ It has also been reported that, based on the success of manufacturing components for the IH facility in England, IH is now exploring the possibility of manufacturing components in Poland for use in its manufacturing facilities in the United States.³⁸ Hayden noted, in 1976, that IH would "enter another technology transfer agreement if assured that their partner would eventually be a first rate source of supply of the product."³⁹ This opinion has expanded since that time to the point where IH feels confidence in its ability to transfer the necessary training and skills to the point where non-equity agreement situations are indirectly being sought out. Yugoslavia and Romania are examples of two countries where interest has been expressed in possible technology transfers. International Harvester has expressed a growing interest in both Yugoslavia and Romania, and has increased its product line offerings in an effort to fulfill projected needs in those countries.

It would be accurate to point out that IH is considering now additional technology transfers through the socialist bloc, and considers the non-equity type of transfer a viable means toward accomplishing this end.

Poland

Honeywell, Inc.

Description Variations

The experiences which Honeywell has had thus far with Poland appear to be excellent. The agreement between Poland and Honeywell, Limited, the Scotland based subsidiary, has been extended for another year, and overtures have been made to Honeywell headquarters in the United States for the extension of the 1974 Agreement. Regardless of the length of the requested extension of this technical assistance agreement, the total transfer of the technology, including the valuable sensor information, will be completed as of December, 1979.

Since no intervening events have occurred to disrupt the relations between Poland and the United States, the security measure of the sensor information in the bank vault in Switzerland will not be a necessary aspect of this final portion of the transfer. Instead, the information in Switzerland will be sent back to the United States, since that information dates back to 1974, and updated information, as of December 1978,* will be

*Note: An earlier analysis of this Honeywell/Metronex Agreement by Hayden (Technology Transfer, p. 60) noted that the sensor technology transferred would date back to the 1974 state-of-the-art regarding the sensors. This is not so, as Honeywell is providing Poland with the current technology.

assembled and sent to the Polish representatives in early 1979.¹

The initial operation in Poland went extremely smoothly, according to the perceptions of the Honeywell individuals involved with the project. Part of the credit for this smooth operation is attributed to the strict adherence to the agreement, including all specifications and procedures. One of the few variations which Honeywell permitted was that of allowing Poland to purchase some of the equipment required for the project in Poland (or elsewhere in Eastern Europe, if it could be located there), instead of ordering all equipment from Honeywell in the United States. This variation aided the hard currency flow from Poland. There appears to have been no detrimental effect in terms of the quality of the equipment obtained, and the timing aspect was not affected. It may even have been helped by the relatively local purchase origins. Honeywell did have to approve all the purchases.

Not only did Honeywell require strict adherence to the terms of the agreement but required that all changes related to the updating of the product be made as soon as changes were able to be documented in the United States. This was required even if application of any changes required additional training in Poland or even in the United States. To avoid mistakes, the Polish engineers were required to use Honeywell drawings.

There appeared to be no changes in any of the major elements in the agreement. The agreement has gone so smoothly, and has been more profitable than anticipated, indicating that the company will probably tend to encourage an extension of this agreement.

Current Corporate Perception of Benefits

The profitability of this venture has surprised Honeywell beyond the company's expectations. The sale of products has been particularly beneficial. During the negotiations it became evident that while Honeywell preferred the use of a pricing formula throughout the agreement to adjust the price of the units to the current world-wide economic situation, the Poles desired a firm price for each item to be listed in the contract which would remain constant during the agreement. Honeywell acceded to this request of Metronex and supplied a constant price list. As it happened, the price of the unit fell below this price (an unusual occurrence in these times of inflation) but both parties had to stand by the stated price. Furthermore, the price quoted for the sub-assembly pieces was the same as for the completed assemblies, but the Poles preferred these sub-units for use in their training sessions. It was reported that "25 percent of Honeywell's price is based on assembly

costs," so this turned out to be a 'windfall'² although this was not confirmed by the company. Thus, the fees gained from the sale of its products, combined with the fees paid for the technology, have made this transfer particularly successful.

The success of this venture has encouraged the company to extend consideration of the current agreement as well as to look for additional ventures in Eastern Europe.

Negotiations

Contract format revisions

The success of the agreement at least in part, has been attributed to the efforts of the negotiating team. The one general criticism which Honeywell, Inc. grew to have of the Metronex Agreement was that the conclusion of the contract was not worded as crisply or precisely as the initial portions. However, since this portion dealt with or referred to procedures involved in the potential extension currently being requested, it was hoped that any ambiguities would be cleared up through these means.

It is felt by Honeywell that the formality which existed and was followed at the start of the negotiations was beneficial, in that the stipulation to follow

all contract obligations precisely was thereafter adhered to rigidly by the Poles. The protocols for the agreement were completed on the spot, and only minor revisions have been required throughout the working of the project. An example of such a minor variation would be the changing of the name of the Polish representative in the United States for this project, for instance.

Pending negotiations

The current agreement has a high probability of being extended, and other agreements with several other countries will be underway shortly.

Time Frame

On schedule

The time frame for the 1974 agreement was carefully adhered to in most respects.

Behind schedule

There were only minor timing variations within two to three weeks either way in regard to the setup time framework. One instance occurred when a minor problem in regard to the construction and equipping of the factory in Poland did threaten to delay the entire project.

However, the Poles were determined to keep the project on schedule and put in extra hours. To do so, Metronex actually ran three shifts for weeks to get up to schedule. Because of this additional effort, the plant's construction was completed in record time which kept the project functioning according to the projected schedule as the Honeywell training representatives would not come over until all was ready to go. This devotion to the project on the part of the Poles provides an insight into the success of this project. All involved with the agreement wanted it to succeed. Thus, extra effort such as working overtime to keep within the time frame was done on both sides to help insure its success.

A problem did occur in regard to production schedule which had its origin in the product's design. It is important to note here that it is most uncommon for a company to agree to transfer its most recent or current technology. Part of the reason for this is, obviously, to take advantage of their own research and development before permitting others to use it. However, another reason is that the transfer of technology is, itself, a challenge, and it is preferable to have all aspects of the product perfected before such a transfer is made.

In this instance, the problem occurred when the development of one of the variations in Class 41 Transmitter incurred some problems, causing the timing of this

product's schedule to slip. This eventually resulted in delays while the product was being revised at the Honeywell auspices in the United States. Thus it might be said that birth pangs were still coming when the product had already been sold. However, Honeywell worked to overcome the problem putting in extra effort and hours, as the Poles had done, and these delays were surmounted.

The demand, on the part of the Poles, for the very latest technology has proved to be to their benefit. Now that the agreement has reached its initial conclusion, Metronex has a piece of technology which is relatively unique and as up-to-date as possible. The willingness of Honeywell to provide this technology and work with the Poles through any difficulties which might arise also provides an indication of the concern which the corporation applied to the project.

Other aspects--extensions

The requested extension of the 1974 agreement is for another five years, and includes a request for updated information on the Class 41 Transmitter during that period. However, the updating through this additional period will not extend to the sensor technology. The sensor is still a unique product and highly viable. The Poles, through their insistence for the most advanced and latest technology, have obtained a valuable product.

Despite obtaining the sensor technology, the decision to actually manufacture it has yet to be resolved by Metronex. The cost of tooling and training would make the manufacture of the sensor itself an extremely unprofitable undertaking, at least in the immediate future. Thus, despite the transfer of the sensor technology, another request accompanying that of the agreement extension has been proposed for a ten (10) year purchase agreement (to 1989) of the sensor assembly. Currently there is a ceiling on the number of sensor assemblies which are permitted to be purchased each year, set at 2000 sensor assemblies per calendar year.

Financial Flows

Payments

Financially, Honeywell has found the monetary flows specified in the agreement to have been completely met by Poland. Purchases of supplies and assemblies as well as the payments involved in the agreement itself have been made through letters of credit. The monetary transfers have been made suitable from the start. Honeywell anticipates no future problems here, as in most cases, such arrangements tend to become simplified over a period of time as such transfer of payments become more routine, and most problems occur at the start, if at all.

Purchases from the domestic company

Purchases of total units, especially prior to the startup of the production in Poland, were generally as expected. The contract specified the price of the complete units, the sub-assembled units and the other parts available for purchase.

Financially, the desire by the Poles to purchase detail parts was also of great advantage to Honeywell since the price of these items was the same as the completed unit price. So each sub-assembly purchased by Poland was a source of immediate gain in its own right. Honeywell's estimation that approximately \$5 million worth of products would be sold to Metronex during the course of the agreement has been achieved.

Purchases in a controlled economy such as Poland's require long range predictions as to future needs. When these predictions also must take an unknown manufacturing schedule into consideration such as in the Class 41 Transmitter instance, accurate assessment of potential need becomes even more difficult. It appears common to over-estimate the number of items which will be manufactured in the early days of production startup. The early days of the agreement bore this out as it was found that that more unassembled and sub-assemblies were needed than originally envisioned. On the other hand, despite

actual needs, parts in such countries as Poland are not able to be purchased until the money for the purchases is allocated.

Poland did find that their initial estimate of need for transmitters was somewhat higher than was actually the case. However, this turned out not to be a problem as not as many items were manufactured as soon as anticipated either. Part of the difficulty in production involved manufacture of transmitters which met exacting specifications. For example, early transmitters off the assembly line could withstand 250 pounds of pressure, but were supposed to be able to withstand the specified 1000 pounds.

Personnel

Training assessment

Any questions or concerns on the part of Honeywell in regard to the ability of the Poles in manufacturing the intricate transmitter vanished in the course of the operation of this agreement. In retrospect, this anxiety was well-founded in that Honeywell personnel in the United States had found the maintenance of consistently high quality in the manufacture of the Class 41 Transmitter difficult themselves in the beginning. However, their anxiety made the establishment of the correct manufacturing

procedures even more important, so that the transfer would not be impeded. Thus, erasing manufacturing difficulties in the U.S. was an impetus to easing difficulties in Poland.

Domestic company. The trips to Poland by Honeywell employees were just that--trips. The longest visit by any one employee lasted six weeks, and no families were sent over, so any family members accompanying U.S. employees would be at their own personal expense. In total, approximately 24 individuals from Honeywell were involved in this technology transfer, from job-related areas of design, manufacturing, quality control, and management. Generally, instruction was given to the Polish production operators, who then, in turn, trained other Poles at the plant in Poland.

There appeared to be no serious personnel problems on the part of the Honeywell employees who provided the on-site training in Poland. The stays were of a visiting nature and commenced for the most part when the equipment had been set up in Poland and the plant's construction was completed. At that point, the Honeywell representatives went to Poland with the goal of remaining until the operation was progressing correctly, which was accomplished on schedule.

Host. The underlying premise that the Poles would have to learn all steps and phases of manufacturing

and assembly of the Class 41 Transmitter was held by both the Honeywell personnel involved in the transfer and the Poles. This stands out in contrast to the earlier venture between Honeywell's Scottish subsidiary where both sides had assumed less training was needed than actually the case. As a result, in that case, additional training and even some retraining had been necessary.

In the case of this 1974 Agreement, the Polish engineers and other workers were in the United States for six to eight weeks and were trained thoroughly by going over the documentation for the transmitter step by step. Honeywell found the Polish workers to be good intelligent people whose aggressive and determined approach to the training provided a thorough preparation for the project.

No problems developed with security issues during the duration of the project. Various Polish workers involved with the factory management came to the United States for a total of six times, while the technical personnel had a total of four visits. Some of the same individuals returned, but there were some changes noted by Honeywell, especially as to the foremen. All individuals were described as highly professional and very expert in their respective fields. If party members were included in the groups, no mention was made of the fact by the Poles or the Americans. Some of the changes in

individuals coming to the U.S.A. for training may have been due to visa regulations since it was found to take two to three months to get a visa to come over for the training sessions. Visits to the United States were not seen as jeopardizing the futures of any of the individuals involved. In fact, Honeywell noted that many of those selected to attend those training sessions were promoted or given additional responsibilities over the years.

One of the aspects of the agreement which Honeywell felt was instrumental in advancing the training methods was that those who were trained were required to train others. This helped to establish the methods in the trainer's mind as well as passing the information along to others. This requirement was specified in the agreement.

Protection

Leverage assessment

Domestic company. The leverage aspects which were present when Honeywell entered into the agreement remained viable, unlike other instances when the firm supplying the technology appeared to lose its bargaining position as the technology was transferred to the host country. There appeared to be two reasons for the maintenance of this leverage. First, Honeywell still

had a proprietary claim to the technology which had not been duplicated by any other company as well, so Poland was still unable to play one company off against another, and had to deal with Honeywell if their products were desired. Second, since the tooling costs for manufacture of the sensor assembly were so expensive, Poland may very well continue to purchase the assemblies from Honeywell, and would want amiable relations on that account.

Host. On the other hand, Poland also holds the same leverage as it had at the start of this agreement in that the country offers a highly desirable market for Honeywell products. Honeywell wants to continue to sell its products to Metronex as well as to expand its sales within Poland and other regions within the Eastern Bloc, and this desire forms an element of leverage for Poland.

Guarantees appear to have been met by both sides as to completion of their responsibilities. The only apparent issue remaining to be resolved are the terms and length of the requested extension of the agreement itself.

Utilized inspections

No inspection difficulties have arisen and since the products being manufactured in Poland now measure up to the specification requirements, both parties appear to feel that the transfer has been successful.

Patent/trademark defenses

No situation has arisen in regard to patent contesting, and the Poles are using the Honeywell trademark as designated. Another reason for their desire to extend the agreement may be the desire to extend the use of the "under Honeywell license" trademark, and this may well be a desire by Honeywell to extend the agreement as well.

Legal provisions invoked

There has been no need to apply any of the external protective aspects involved in the agreement, thus far, such as application of the Force Majeure clause or resorting to arbitration.

Hindsight

Factors which made the project easier than anticipated

Several aspects made this agreement easier to complete than expected. First, Honeywell found that the skill level and the determination of the Polish workers involved with this project was much higher than they had hoped, and the technology was able to be transferred without any major difficulties. Second, the demand for the product was such that the company was able to sell

even more units than anticipated which was beneficial to all concerned.

Factors which made the project more difficult than anticipated

Two minor problems developed in the course of the agreement in terms of timing. The first was caused by a delay in the construction and equipping of the factory in Poland and was overcome by the determination of the Poles to work overtime to keep the project on schedule. Honeywell also had the leverage here to be able to say that the company employees who were to come over and assist the implementation of the manufacturing processes there were not going to arrive until all conditions were set for operation, which presumably helped the determination to get everything ready.

The second problem occurred back in the United States on the part of Honeywell in regard to the development of the Class 41 Transmitter itself. Some aspects of its development were incomplete and thus, had to be ironed out before the technology could be transferred to Poland in any respect. However, this was an instance where Honeywell resolved to work as rapidly as possible to iron out the difficulties and ready the project for completion, in part as an indication of the company's dedication to the project. As it turned out, Honeywell felt that the

transfer may have actually gone smoother because of this development slowdown since extra care was taken to overcome these problems in the transfer itself.

Progress of Future Expectations

Honeywell views the opportunities afforded through this agreement as two-fold. First, there has been an increased level of sales to Poland through the workings of the agreement. Honeywell expected an increase, but the result far surpassed their expectations. This has included total units, subassemblies, and even replacement parts. The increase has concentrated on the area of process control equipment, with most exports coming from the Fort Washington facility of Honeywell.

Second, Honeywell is exploring the proposed extension of the 1974 Agreement now and feels the future holds great promise for other potential agreements. The desire for the Eastern European countries for hard currency provides an incentive toward manufacturing or processing agreements over the approach of exports so the firms which will be most acceptable to Eastern Europe will be those whose offers take those desires into account. One surprising outcome of the 1973 Agreement between the German Honeywell subsidiary and Poland in manufacturing the Vutronik line of valves is that the German subsidiary began to buy back this product from Poland, the same

product they previously licensed to that country. The fact that the 1973 agreement between Honeywell, Limited and Poland was extended is an indication that the project was so successful that the parties felt it would be mutually beneficial to extend it to take advantage of updated technology and continuing material sales.

The agreements have prompted greater interest on the part of Honeywell in Eastern Europe as a foothold for that region. An agreement is being discussed with Yugoslavia for a joint venture in computer assembly licensing. This has no direct connection with Poland, but the success and excellent relationship which Honeywell has established with Poland has provided an incentive to pursue other potential contracts. All the agreements between the European subsidiaries of Honeywell as well as with Honeywell, U.S.A. have proved most successful in Poland.

Poland

Westinghouse Electric Corporation

Description Variations

The project was termed a 'significant success,' with anticipated profits resulting from the technology transfer.

Project Manager for the semiconductor project in Poland, Don Walczak, reported that the Unitra's plant is now in full operation under the Polish company. Walczak attributed much of the success of the project to the data processing program developed by the Semiconductor Division for control and transfer of that technology and manufacturing capability. Without such a program, he felt that the transfer of manufacturing capability could possibly have been a nightmare of delays in deliveries, documentation or performance. These delays could result in drastic financial penalties through slipped time schedules, overruns, and inefficient use of personnel.¹

Those involved with the transfer with the Semiconductor Division indicated that this computerized program for the technology transfer of thyristors and rectifiers to Poland was born of necessity since a system was needed to effect the transfer that would enable the

company to keep track of the various activities involved in this transfer. Walczak described the objectives of this computer program as follows:²

To outline the details of the program, define the scope, record information, effect changes, capture the technical idiosyncrasies of the process, systematize the information for transfer, distinguish between technical needs and technical wants, define customer responsibility, control the monies allotted for purchasing, outline service requirements and minimize paper shuffling.

There was also a need to key some identification system for each discrete piece of information and to be able to rapidly communicate any changes in information that would affect performance of the project to the customer or purchasing within the time scope allotted for the project. It was with these objectives that the program was formulated.

To accomplish these objectives, Walczak set up the three-part program. At the heart of the system was the numbering approach used where each item, for instance, was given an eight-digit number, two digits reflecting its location to a work station, two for its operation, two for its function, and two as its own special identification. Three types of printouts were used; bills of material, financial information and services information

Through the efforts of Mr. Walczak and the strict adherence to the devised program, the project in Poland functioned on schedule and was accomplished in perhaps the most systematic way possible.

It was found that the original contract did not cover all possible issues which arose, but addendums were added to apply to such issues as the assembly line yield, processing yield, and voltage design. To solve the voltage problem, Westinghouse adapted their product to the Polish environment by designing a unit which would operate with 2800 volts. Since the Semiconductor Division has no other market for this product, this is just one indication of Westinghouse's concern toward the project. Much of the ultimate success of the venture has been attributed to the efforts of both parties.

Systematic control over each step helped to provide confusion and prevent waste. For instance, when equipment was received in Poland after having been tested and examined in the United States, the items were signed off as taken from the crate, and any missing items were immediately noted or requested at that time. The equipment was placed in locked bins until needed, but this precaution appeared unnecessary since no theft was ever reported. All major items were immediately placed in the proper location so there was a minimum of confusion in the unloading or unpacking of crates.

Walczak noted that the purchase of all new equipment for this project was an advantage for Westinghouse. Not only did the corporation first have the opportunity to systematize the shipments and pretest the equipment,

but, in many cases, startup services for the machines was one of the conditions of sale. In the purchase of machinery, Westinghouse in its function more as an intermediary or agent, was able to stipulate these conditions when buying the equipment and machinery.

An approach which Westinghouse found helpful during this transfer was the creation of charts and signs which were designed to be visible in the facility. A system of buzzers, lights, clocks and recorders accompanied these charts. The objective was to have each step so visible that details which may have been overlooked on log charts or in paperwork were not able to be overlooked. Thus, a manager had only to glance up to see the progress that was being made. This system was used during the installation phase of the operation and in teaching the manufacturing steps. The product flow was designed to move in the form of a three-leaf clover, or from storeroom to storeroom. When the three loops had been completed, the product was finished. This approach provided an accurate means to control product quality since steps which were being inadequately completed were able to be pinpointed and corrected.

Although the contract did not specify the transfer of any general plant management information unless it pertained directly to the manufacturing process, Westinghouse found that such training was needed.

Initially, the general management training was limited to product or inventory control, but it evolved into more than that. Westinghouse found the Poles needed assistance in general procedures, such as how to move in the equipment most efficiently. If rollers or dollies were not available, they were constructed. Cleanliness is crucial in the production of semiconductors since the quality control is so critical, and soon Westinghouse was covering the cleaning, vacuuming, and painting standards necessary to reduce the dust in the facility. A group of university students were even hired to scrape the windows so the glass was clean.

No changes occurred in the area of patents or the trademarks type of association provided to Unitra. However, one final rather unique task done by Unitra was to create a film of the project, including views of the site, the plant, and the various operations. This task may not be unusual for some projects, however, because the security within Eastern Europe is more restrictive than in some areas of the world, this was unique for this type of operation. It was also highly beneficial to both parties. It provided Unitra with a tangible record of their semiconductor operation and sparkingly clean factory. It provided Westinghouse with a film version of their successful conclusion to the project.

As expected, the patent portion of the agreement was extended for three years, permitting Unitra use of their Westinghouse association on their license indication. As before, no direct trademark usage has been permitted. Then, too, once the patent agreement has expired, Unitra will not be able to use the Westinghouse connection in their sales promotion or on their products.

The teamwork approach appeared to be the work of both parties. As noted above, Westinghouse did help Unitra in providing some training functions which had not been specifically listed. Westinghouse also pitched in at various times to help Unitra achieve or complete some prime responsibilities if it became apparent that some assistance could be helpful.

Current Corporate Perception of Agreement Benefits

The actual outcome of the Polish Agreement appeared to have followed the expectations held by Westinghouse in regard to the corporation's reason for desiring the contract. The project's completion without the incurring of any additional expense justified the major reason; a transfer of technology for the fees obtained from that sale. Essentially, the fees paid for the technology functioned as royalties which may be viewed as comparable to the profits which would have been obtained

had the product itself been sold there. While the technology surrounding power semiconductors of the sort provided to Poland may be updated rapidly, the technology sold to the Poles will not be obsolete for some time, especially as applications are plentiful for silicon-controlled rectifiers in Poland.

Westinghouse's second reason, a toehold in Poland and throughout East Europe, had not materialized by late 1979 to the extent desired by the corporation. One possible venture, an agreement for the production of color television tubes was awarded to the RCA Corporation and Corning Glass Works in late 1976. However, although no agreements had been concluded, a far higher awareness of Westinghouse and the corporation's products existed as a result of this project.

Furthermore, this awareness developed far before the project was completed. Westinghouse had anticipated that any further contacts throughout Poland or Eastern Europe would be as a result of the sale of the semiconductors produced at the Lamina facility. However, it became apparent that the corporate reputation spread as a result of the project itself, long before the products reached the market. In fact, Westinghouse was invited to give a technical presentation in Romania just because word of the corporation's involvement had spread to that country.

It is often pointed out that personal friendships are very important in Eastern Europe. This was a prime example. Project manager Donald Walczak virtually commuted between Pennsylvania and Poland from 1974 until production was underway in 1976. Romanian officials had not heard much of Westinghouse but they had heard of Don Walczak. On the basis of his reputation, they requested a presentation to find out what Westinghouse was all about.

Westinghouse officials indicated that they felt a joint venture would probably be needed in Poland to actually provide a proper foundation for future contacts. The corporation's facility in LeMans, France, is apparently concerned about the Unitra project as it tends to view the operation in Poland as a potential competitor. Since LeMans possesses both the Westinghouse trademark and a highly active sales force, the competition at this point in time is hardly severe. Westinghouse still reiterated the hope that the success of the Polish venture should assist in obtaining future contracts throughout the Eastern Bloc.

The third body of advantages sought by Westinghouse through the contract remained potentially viable, although, so far none have transpired. These included the possibility of another source of semiconductors for Westinghouse on a buyback basis and access to raw materials in Poland. No more additional sales of

semiconductors were purchased from Westinghouse prior to the startup of production at Lamina, over and above those used as training aids but such sales were not anticipated.

From Unitra's perspective, sales of the semiconductors remain a potential source of hard currency for Poland, but one which had not been greatly tapped as yet.

A benefit transpired from this agreement which had not been recognized prior to the transfer. This was the broadened perspective which the Semiconductor Division in the United States gained as a result of breaking down the entire transfer process into a detailed computer program. The transfer became a high, controlled experiment which provided new insights into Division design, processing and other methods of production. The documentation of the Division's knowhow provided information which brought more order and method control to the Division and heightened the future use of its resources.

Negotiations

Contract format revisions

The contracts comprising the agreement between Westinghouse and Unitra appeared to be most suitable. Fifteen additional addendums were constructed as need arose. Most related to specific issues requiring relatively minor revisions, such as manufacturing or equipment

and tooling information. A protocol was also written regarding the final acceptance tests (November, 1976) detailing what and what not had been accomplished, even listing spare parts that were still missing. Westinghouse noted that all funds set aside to purchase equipment had been spent.

Westinghouse pronounced their earlier negotiations sessions with the Poles demanding but fair. "The Polish people are hard negotiators, and they held the line hard at getting what they paid for, but there was no attempt to go beyond that," was Maurice C. Sardi's opinion, former Semiconductor Division general manager.³

Westinghouse was never able to learn whether the company had been in direct competition with other American semiconductors for the Unitra contract. Westinghouse had no information from their own sources and Unitra was not willing to divulge this information.

At the conclusion of all negotiations, the final agreement had been hand-written in Poland then typed there in English. Both parties had ample opportunity to carefully analyze all portions, and both sides felt fully cognizant of all clauses of the contract. Apart from the letter which kept possible buyback arrangements open for Westinghouse and the addendums, no major changes have been added to the contract. The patent provision had

been accepted for the three year extension, so the patents will be valid through 1981. This feature actually applied to only one patent, but this provision also enables Unitra to use the term "Made under license from Westinghouse" until the end of that time period. No additional fee was involved for the patent extension.

The updating feature of the five year agreement involving the continuing transfer of all relevant improvements for the particular thyristors and rectifiers purchased by Poland which might be developed by the Westinghouse Semiconductor Division during that time period was not extended. This service concluded in 1978.

Pending negotiations

At this point in time, no additional agreements have been concluded between Westinghouse's Semiconductor Division and Poland, or in Eastern Europe, for that matter. However, Westinghouse does not rule out future agreements, feeling that the successful conclusion of this agreement will enhance all further contracts. The company is looking into the establishment of a similar plant in the People's Republic of China as a result of this successful project. Westinghouse is confident that their systematic approach to technology transfer makes such interchanges even more desirable from both buyer and seller standpoints.

Time Frame

On schedule

The agreement officially concluded on April 1, 1979, but this was almost an anti-climax in terms of the project's development. The crucial deadline in the contract was the November 1976 deadline for the acceptance tests, and this deadline was met on schedule. All necessary tests were passed. In Unitra's view, this indicated that production was on-stream for the power semiconductors which were needed throughout the Polish economy. In the view of Westinghouse, the lack of delays meant that the corporation's profit from the fixed price contract was secure and free of expensive delays. As anticipated, the patent portion of the agreement was extended for three years, or until 1982.

Behind schedule

Even though the final deadline was met, several incidents occurred in the course of the 32-month set-up period which might easily have disturbed the efficiency of the project. On the preparation stage, all equipment was assembled at the Youngwood division's plant for shipment to Poland. This was found to be a major factor in maintaining the schedule. However, in Poland, the

situation was less efficient. Any materials to be procured had to be ordered through a procurement type company, accompanied by three quotes. This lengthy and time consuming procedure resulted in many delays. The building shell was complete, but the supplementary materials needed for the renovation were difficult to obtain. Setting and maintaining certain standards as to cleanliness within the plant required additional work on the construction and some installation. Once these problems were surmounted the schedule appeared to progress as anticipated.

Financial Flows

Payments

All payments were received from Unitra as scheduled, with the final payment arriving by December, 1976. The extension of the patent agreement for three additional years did not require any additional payments on the part of Unitra. By arranging the payments to the different work segments, Westinghouse found a basis for accomplishment had been provided as the payments then visually marked the progress of the agreement.

Most contracts within Westinghouse's Semiconductor Division are not as large as this project in Poland.

Hence, most do not require such complicated financing arrangements involving the Export-Import Bank as well as other U.S. commercial banks. Time and effort were required on the part of Westinghouse to explain the financing arrangements to both the treasury representatives within Westinghouse and to the outside banking officials involved on the project.

The acceptance tests were completed as scheduled. This is particularly important to a corporation's overall profit projections in the fixed-fee type of contract such as this one. Additional testing would have been at the expense of Westinghouse, unless the problem had been with Unitra alone.

Purchases from the domestic company

The equipment purchases went as arranged. No additional assemblies or subassemblies were requested beyond those used for training.

Westinghouse had a surprise regarding service or replacement parts. The contract stipulated that the spare or replacement parts were either to be kept in reserve or be available. However because the demand for spare parts was so high more spare parts were purchased than ever anticipated. When possible, the spare parts were purchased from the Westinghouse LeMans operation in France.

However, an indirect consequence surfaced involving the equipment suppliers utilized by Westinghouse. Since Westinghouse had acted as the prime contractor for much of the equipment installed in the Lamina factor, the vendors used by Westinghouse were introduced to Eastern Europe. The reputations of these suppliers increased as a result and they were able to sell to the other Eastern Bloc countries. Many were invited to exhibit at some of the trade fairs, such as Munich.

Purchases by the domestic company

Westinghouse had not exercised its buyback option from Unitra because it had not encountered a need to purchase any of the items manufactured by Unitra to that point in time. The company had rented cars while in Poland. This was to reduce the time spend waiting for buses.

A number of small but important improvements were required during the construction and equipping phase at the Lamina facility. The water system had to be improved, if only to maintain a constant pressure; otherwise, even the toilet tanks would not operate. Additional lights needed to be installed. Instructions at the work stations were printed in dual language, both Polish and English to speed comprehension and avoid mistakes.

Unexpected tasks were accomplished through hiring part time workers. For example, students were hired to scrape and clean the windows.

The expenses incurred by these improvements were covered by Unitra in this instance, but it is important to realize some unanticipated expenses will usually arise on any project and provision should be made in advance regarding such costs.

Personnel

Training assessment

Domestic company. The Youngwood representatives on the Unitra project included Paul E. Lego, general manager; Thomas P. Nowalk, advisory engineer; Donald Walczak, project manager; engineers Larry D. Hall, Richard Harm, John P. Lindenberger, Ronald P. Nandor, and Edward D. Pomper, with draftsman Richard M. Beabes. Engineering support services were provided by the Westinghouse Manufacturing Development Laboratory in Pittsburgh. There were approximately 16 people from Westinghouse involved in the project, with 11 individuals on-site. This number generally coincided with the anticipated size. However, more than 80 round trips were made to Poland (72 such trips during Phase III alone), which definitely exceeded

expectations. However, it was felt the trips were definitely needed, and Westinghouse absorbed the cost of this additional travel. As well, the length of the stay of the individuals was not indicated in the original contract, but Walczak made it a policy that no Westinghouse employee was to remain longer than six weeks in Poland without a two-week break back in the United States. No Westinghouse employees remained in Lamina for the duration of the project. No families were move to Poland. True to predictions, the acceptance tests were completed by November 1976, and all members of the Westinghouse team were home by Thanksgiving, except Walczak, who left November 31, 1976.

The skills possessed and used by the Westinghouse employees fit the tasks at hand, because the employees were not sent to Poland unless the work there was ready from them. The approach was to adapt the work to the individual, and this was done with both the American and Polish personnel. In addition to the technical and engineering expertise of the Westinghouse employees, managerial skills as well were required to be passed along. Westinghouse personnel were also involved in the building renovation, something not anticipated beforehand.

Basically Westinghouse kept to the budget laid out for the project. The two major expense areas which were

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not specifically anticipated included car rentals and the additional trips.

The Poles were responsible for providing "available suitable" housing for the Westinghouse team, but the apartments initially selected were not deemed to be fully satisfactory. Instead, the Westinghouse employees moved into a small hotel near the Wisla River. These accommodations, paid for by the Poles, turned out to be ideal. The hotel provided a charming gathering place as well as home-like atmosphere and the personal service was excellent.

There were very few actual problems. Some harassment by the local police was noted the first two to three months, but this quickly died down with no repetitions.

Some of the Polish working habits surprised the American employees. It appeared that the Poles did not take lunch breaks. The Polish workers would have early breakfast before starting work and take a second breakfast about 9 in the morning. This was followed by frequent coffee breaks until the workers went home at 3 in the afternoon. Following the philosophy of being open-minded about the local customs and adapting to that style whenever possible, the Americans soon brought out their Mr. Coffee machines and stocked their offices with peanut butter and other foods. This way, in the

spirit of 'when in Poland, do as the Poles,' they were able to take short breaks instead of a lunch hour.

Westinghouse approached the conclusion of the project with as much care and planning as had been done throughout the entire period. Project manager Walczak stressed the end points. By sending the other Westinghouse engineers home the Poles were encouraged to operate the factory on their own. Walczak noted that it was hard to let go, after two to three years of close association, but realized that the Polish technical people had to be put on their own. The Americans were physically removed from the site, gradually over a period of time. Finally, Walczak was the only American remaining on the project. His final duty, after completion of the protocol was the successful conclusion of the acceptance tests, involved listing any exceptions such as things not done or spare parts not delivered.

Host. Westinghouse felt that the success of the project was due, in part, to the high caliber of Polish people involved with the project. General Manager Lego observed "(The Polish Government) assigned talented people to us, and the work proceeded in an atmosphere of mutual confidence and trust. There was never any feeling that anyone was trying to put something over on anyone else."⁴

Westinghouse found the Poles to have excellent training in chemistry or physics, with specific skills concentrations almost to the point of having tunnel vision. It was up to Westinghouse to provide a broader overview, relating these individual disciplines to the production of semiconductors. The company found this far preferable to situations where 'unlearning' must be done before 'learning' is possible.

Some 50 hourly workers and 25 professionals were employed in operating the new semiconductor facility, but over 200 Poles were involved in the total project including the construction and installation phases.

The training sessions in the United States varied from three to ten weeks depending on the area of training in length for the six Poles who were sent in each group. All 50 man-months allotted for training were completely used, but no additional training time was required. In general, different individuals were sent over with each group, but the same individual would return for additional training on rare occasions. The Polish technical manager was the acknowledged leader for the group.

Westinghouse set up an individual training program for each person, and kept notes on each session. The company also arranged all training so that not only were the most appropriate instructors there, but also the right

set of tools, in equipment but also in management. The training sessions generated high rapport, especially with the project engineers.

Westinghouse used the management team concept in the training to implement the concept of the processing center, with areas for slicing, lapping, and diffusion. Thus, the teams were exposed to all aspects of the manufacturing process.

No unexpected expenses were generated or created throughout the training sessions in the United States. Poland paid all financial commitments for training as designated.

All problems with the training of the Poles were relatively minor, and certainly overshadowed by the opportunity which Westinghouse gained through being able to work with such able, dedicated workers. Therefore, the following observations are more accurately termed information, not problems.

All Polish trainees sent to the United States for training did not appear to have the same level of involvement with Unitra. Some individuals were key technical personnel, others came in a supporting capacity.

Only minor language problems existed. All trainees took classes in English, pertaining to the technical areas involved in semiconductor manufacture.

As well, all American engineers involved on the project studied Polish for a year before going to the country with lessons two and three days a week. It was noted that there will usually be language problems when dealing with technical areas.

Other personnel involvement

Some management rules in Poland differ from their American equivalents. For example, any employee who became ill automatically received three days off. As a result, there was relatively high absenteeism, and times when the Americans never knew if an employee was going to be absent or not.

The contract stated that safety rules were to be followed. But it was difficult to enforce those rules, when the regulations appeared meaningless, which must apply universally. Westinghouse attempted to provide the reasons behind regulations. One instance involved some acid which was spilled, which would have resulted in burns and perhaps blindness. Fortunately the employees were wearing safety glasses and safety shoes. The company found it best to concentrate on realistic regulations which were not overly protective.

The morale of the Polish workers was quite high. They exhibited a great pride in their country, and in

their technological improvements. They appeared to like the United States, but seemed somewhat apprehensive of the competitive nature of the capitalistic system, preferring their secure system instead.

Interestingly enough, Westinghouse found itself also providing marketing expertise as well as management training during the course of its contract with Unitra, although this was also beyond the specific scope of the project. This advice benefited all parties. If Unitra sold more semiconductors, both Westinghouse and Unitra benefited from the actual funds and the increased reputation.

Protection

Leverage assessment

Domestic company. Westinghouse maintained its initial advantages throughout the course of the agreement. This continuing leverage appeared due to several aspects. First, the agreement was contractually fulfilled by Westinghouse meeting all corporate obligations. In connection with this successful completion, Westinghouse established personal contacts and friendships, providing an excellent basis to further relationships in the Eastern Bloc.

Second, despite the five-year updating period, new advances would prompt desires for extended technological assistance agreements. This, combined with the growing reputation of Westinghouse throughout Eastern Europe, made both the company and its products more desirable. The firm was not seen as the sole source of most technology but was viewed as one of a small number of firms possessing excellent technological resources.

Westinghouse illustrated the company's leverage on the Unitra project by not shipping equipment because the plant was not ready. Trips made to determine the status of the project were done before approvals were granted. However, no crucial delays occurred longer than two months in duration. This created no major problem, in part because the contract schedule had been estimated to include some delay time.

Host. The leverage of the Poles was also maintained throughout the contract, although, as with Westinghouse, the greatest proportion of responsibilities of both parties occurred within the first 32 months of the agreement. However, because Westinghouse views future similar alliances with Poland as desirable. Poland still holds the power of awarding future contracts.

Poland's leverage in regard to Westinghouse also stemmed from the contract itself, just as Westinghouse had similar controls with Unitra. One example would be

Poland's request for a final protocol which formally listed all complete and incomplete aspects of this transfer at the time of the official turnover to Unitra.

Westinghouse met all guarantees as laid out in the agreement by successfully transferring the manufacturing capability to produce power semiconductors in Poland through the efforts of Unitra. Likewise, Poland met all of its guarantees which were vital to the success of the operation in both the construction-equipping area and in the training area.

In both instances, it was felt that the guarantees were not really necessary in working the project, but were desirable legally. As it turned out, these guarantees were not utilized in a legal sense in this case.

Utilized inspections

Westinghouse was permitted to examine the facility, although the American personnel were always escorted when moving from one building to another at the Lamina complex. Technically, the company's right of access ceased upon completion of the facility, but the rapport was so high by this time that Westinghouse was under no obligation to leave. The firm's actions in departure were designed to get the facility totally under Polish operation in a training sense, not for any other reason.

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Patent/trademark defenses

No patent or trademark disputes or infringements have arisen.

Legal provisions involved

No instances activating the Force Majeure clauses have arisen and no disputes have been taken to arbitration.

Hindsight

Factors which made the project easier than anticipated

Westinghouse analyzes each transfer project as a matter of corporate policy to study methods for improving their transfer system. Such an analysis of the Unitra transfer concluded that the reasons for the success of the project might be listed as: One, the product, as it was 'frozen' in its 1973 state of development, was more than adequate, and therefore remained substantially unrevised, with a few exceptions. Likewise, two, the process which was also detailed in its 1973 state of the art, was excellent. Warnings were given, however, that all processes had to be followed to the letter. The third point was that of personnel, both on the part of the Polish workers, and from Westinghouse achieved high

levels of rapport. The Polish manager of the project was singled out as an extremely excellent person. If assistance was needed, he knew where to get it. Westinghouse also found that their project manager, Don Walczak and the rest of the project team did a superb job. The fourth element attributing to the project's success was that the planning, particularly the systematized computerized approach, supported as it was by organized filing, record-keeping, and even the telex system, provided a comprehensive approach.

There are some other points which, while maybe not responsible for the total success of the endeavor, certainly played supporting roles in making the project easier. One of these was the creation of the film, which provided a stimulus for concluding the endeavor, and a reminder that the Poles were able to manage the plant. Another was that of being able to pinpoint areas of difficulty--actually part of the systematized point made earlier, but one which helped Westinghouse improve not only the transfer to Poland but also enabled the company to examine their own process to make it more efficient and provide a better assessment of their own operation.

Westinghouse also pointed that the advantages of using new equipment of high quality. The operation can be standardized, and any initial problems corrected within

the warranty period, another boom to keeping profit margins close to the anticipated level. The inclusion of the installation and startup as part of the purchase price was also beneficial.

The system used by Westinghouse in accumulating all equipment, including all necessary tools and instructions, at the plant in Pittsburgh, and then sending these items via container to Poland when the time schedule indicated that installation would be relatively soon, provided a control over the equipment which minimized loss, breakage, and mistakes as to operation.

The emphasis on visibility was important in controlling the entire training process. The charts on the walls, with sound apparatus warning of problems, were able to be read more easily and rapidly than reams of written reports--particularly in a situation where dual languages were involved.

Finally, the other element which helped the entire project was that sufficient time had been included in the contract in the projection of progress so that all operations were able to be completed within the time frame. Delays did occur but provision had been made for possible delays so the operation was not jeopardized.

Factors which made the project more difficult than anticipated

Several aspects provided varying degrees of difficulty. First and possibly the most crucial points were the outages which occurred in Poland in regard to some raw materials, particularly metals. The time and effort required to locate suitable substitutes created a lengthy delay. Testing the raw materials for specifications was time consuming, as was provision of the management training for the supervisors.

Restrictions in Poland also attributed to delays, although these could have been far worse. One example of these delays was the four to five month period required to obtain permanent (until the completion of the project) work visas.

Progress of Future Expectations

None of the possible contracts between Westinghouse and other countries in the Eastern Bloc had materialized by 1979 although contacts had been made. Westinghouse did exhibit its wares at the Trade Fair in Romania, and other countries were still expressing interest. An arrangement with Romania was being pursued but had been postponed for further consideration. A possible arrangement between Westinghouse and the People's Republic of

China is viable, as contracts have been made with visits and technical discussions in the offering.

The rapport between Westinghouse and Poland is expected to lead to other important contacts in that region as the two parties are looking for areas where mutual needs may be satisfied. Presently Unitra requires a stronger financial basis before being able to pursue additional contracts with Westinghouse.

Westinghouse's sale of technology continues to be a viable approach. The corporation's technology sales have increased proportionately since 1973, substantiating this opinion. Such rewarding ventures as the Unitra/Westinghouse Agreement served to strengthen this position.

Romania

General Tire International Company

Description Variations

The agreement between General Tire International and Romania has been in operation for six years now and while much has been accomplished, it appears safe to say that a number of unexpected situations have arisen--far more than General Tire, with its wide background in overseas ventures, ever anticipated. This is not to say, however, that all of the occurrences had been negative in scope; but it must be pointed out that several unusual events have transpired in the past six years.

Perhaps the best overall statement of General Tire's problems in Romania is best summarized by a statement from Gustav Prekopa, General Tire International's Coordinator for the Romanian Factory Project:¹

General Tire International has performed this routine of technology transfer in many various countries time and again successfully, but never have we earned our fruits of labor as thoroughly as in this project. What is then this basic difference that we encountered for the first time in Romania that made our task so much more complex? I don't think it can be really quantified other than with a vague generalization. One difference which is apparent is that individual enterprise, so prevalent in the West, does not exist in Eastern Europe in the same manner. Instead, individuals

conform to the State-administered system. Individuals do not make decisions--the group decides. We have found that the individual tire technicians in Romania are extremely knowledgeable, highly qualified experts, who have adopted and assimilated the training rapidly and thoroughly. (But,) everything has to be committed to writing which, in turn, can be then analyzed by a collective group for it to formulate an opinion, an acceptance, or a refusal. This arrangement in practice makes technology transfer considerably more difficult and frustrating.

One of the strongest frustrations which General Tire encountered appeared to be the lack of inclination or inability, for one reason or another, to assume responsibility. This was also a problem which General Tire apparently had not encountered prior to this project, as they stated that "outside the Eastern Bloc, in East Africa or in the Middle East (the corporation had found) a willingness to share the blame."

However, it appeared that once this problem was recognized, it was possible, at least at times, to allow for such behavior, and take appropriate action. It was noticed that as long as a decision did not have to be made by a Romanian, all was fine. Actually, GT found that the problem did not appear to be an inability to assume responsibility, but rather that the workers involved with the project were just not permitted to make mistakes. The requirement to make a decision included the possibility of making a mistake, or possibly having to admit to having made a mistake. Thus, one method used during construction

circumventing decision-making was to have a daily log sheet on what was to be done. The American supervisory staff went so far as to make chalk marks on the floor where the machines were to be installed, eliminating even this level of decision-making for the Romanian workers.

There was another aspect to this area of responsibility that became evident in the approach of the Romanians to their machinery or even total plant purchases. It was noted that the Romanians wanted the best in machinery and the latest in technological developments, the 'gold-plated factory' concept. The initial price for such items might be higher, but the technology would not become outdated as rapidly, and the machinery would tend to run better and longer, even if the maintenance on that equipment was not as thorough as desired. One observation by a General Tire International Romanian Project Supervisor in regard to the equipment in the plant was that the machines were operating better than ever anticipated--especially in the light of the lack of proper oiling and maintenance schedules. One GT official noted that such 'gold-plated factories' would provide an output that would be more constant and often higher, thus providing a more constant measure within keeping of the dictates of the five-year plan.

Current Corporate Perceptions of
Agreement Benefits

The initial reason for General Tire's interest in the project in Romania was the financial gain to be realized through the sale of technology to that particular country. It is more difficult to assess whether General Tire's desire to expand throughout Eastern Europe was more the cause or the effect of the interest in the Romanian project. It may easily have been more convenient and coincidental than premediated, in this case. However, because the company is so internationally oriented, the prospect of a toehold in the market was certainly one factor, if not the major one.

General Tire's expectations of Romania as a potential source of scarce raw materials had not materialized, but the corporation's continuing involvement in the country maintained a potential hope in gaining some of these raw materials in the future.

On the other hand, with the demand for radial tires growing throughout Europe and the Middle East, General Tire saw the production in Romania as a source of supply of the completed product which the Corporation might be able to use through repurchases to help their own sales, internationally. It was noted that this possibility is often present in agreements in which General Tire provides its trademark or logo, but the

increasing demand for the tires, combined with the high quality of the tires being produced by Romania (or anticipated to be produced by Romania once the acceptance tests have been completed) has magnified this expectation in this particular instance.

Negotiations

Contract format revisions

The agreement between General Tire International and Romania was awarded and became effective on March 1, 1973, but General Tire found that the conclusion of the contract discussions were really only the start of a bigger round of negotiations. Since that date, 25 protocols have been signed between GT and Romania, amendments which either altered or clarified aspects of the contract. The intent behind structuring a protocol is to introduce certainty into uncertain situations and is a mid-course negotiating device. In this instance, it appears that the one party started reacting to aspects of the contract which were particularly beneficial for the other party but not for both. General Tire found that, based on their experience, the negotiations had only really just begun when their contract was signed. The entire project appears to have become one drawn-out negotiation.

General Tire's recommendations regarding post-contract discussions are the same as those developed during the initial negotiations: everything should be documented. One official stressed the concept that although both parties might appear to be in agreement, nothing is certain until that agreement is down in writing. The corporation found that the best negotiating position for their company was to be constantly in the position, if possible, to terminate performance at any time with a minimum of financial loss, or, as verbalized by one official, "don't get yourself in so deep that you can't walk away."

General Tire appeared to find the entire negotiating process far more difficult than anticipated. It was expected that the negotiations for any contract would require at least a year but GT expectations regarding the red tape involved in dealing with a country in Eastern Europe was far underestimated. However, it was stressed that the "unbelievable" red tape was not the fault of the Romanians as much as it was the entire problem of dealing with a socialistic form of government where everything had to be exactly laid out ahead of time.

At times, the negotiators from General Tire felt that the Romanian position at the negotiating session was unreasonable, but GT was being forced to try to find a common ground somewhere between the Romanian position and

the GT realistic one. These situations occurred, it was stressed, regardless of the topic; whether the session involved the collection of funds, performance of work, or a discussion of difficulties.

General Tire felt that the language structure used by the Romanians, which may have been intensified through the translation appeared designed to put the supplier, General Tire, on the defensive. On top of this, each word was taken at its literal meaning and the contract was viewed as 'the law'.

Additional care was required to thoroughly peruse each section of the contract, as in revisions, as the contract language was often rephrased. During the negotiations, portions would be lost or varied, such as from the "delivery penalty will be three percent of the undelivered portion of the value of the subsection," to the "delivery penalty will be three percent of the value of the subsection," which would have resulted in a sizable increase in the penalty.

Other variations caught during the rephrasing process included such instances as "the work required to be performed" which may have been reduced during the negotiations, along with the price, but the number of man-days required of the supplier on the site would not have been proportionately reduced, thus, remaining the

responsibility of the supplier in the agreement, requiring additional effort and expense.

General Tire found that one way balance was able to be restored during negotiations was to contribute additional items to the contract settlement, such as by making sizable spare parts or supplies contributions, whereupon the Romanians would permit contract language interpretation to be modified.

General Tire observed that part of the difficulty in dealing with Romania lay with the underlying cultural tendencies. These appeared to more closely resemble the Latins or Italians than other northern East Europeans. This was reflected culturally but also politically. GT found this exhibited in the Romanian's almost feudal dedication to the President of that country. In their form of government, which tended to resemble Stalinistic Communism, the word of the government appeared to be absolutely final. General Tire had expected more flexibility, despite a prior knowledge of their system of government.

The technology being transferred caused problems, for several reasons. One issue which arose was that the Romanians wanted the technology for items outside of the realm of General Tire's. These items were connected with the authorization of GT in providing such technology from outside suppliers.

The Romanians also criticized the technology which General Tire was able to transfer. For example, one person involved with the project pointed out, "they still want a better blend rate than our own technology calls for." The technology being transferred by General Tire was their latest information in regard to radial tires. General Tire did not want to promise more than it was able to deliver, and it wanted to accurately portray the finished product so that the Romanians would not come back and say "you have given us a product inferior to the one you promised." On the other hand, General Tire certainly did not want to downgrade its technology or provide descriptions which fell short of their capabilities.

Part of General Tire's problem was that the contract wording was such that if something had not been excluded, it was therefore by default, considered to be included. For example, General Tire became involved in training the Romanians in the usage of the equipment, something which had not been anticipated but because it had not been specifically negated by the contract language, it became one of GT's responsibilities.

"Normally in a contract," one official stated, "you don't have a thousand little details. Eastern Europe, however, want a huge Pert Chart, measurably

pinned down." But, after they have such a chart, another General Tire official noted "they don't need you any longer--they'll do it themselves."

Communication, over and above language differences or the translation between the two languages, was difficult. The underlying problem appeared to be that the communication style of the Romanians was always, to the Americans, threatening. The Romanians appeared to take a firm position for every encounter and expressed that position with force, regardless of the necessity for such an approach. For example, GT found that a statement such as "you are in violation of Article 5.x of the contract" might mean "we haven't received your invoice to permit the time-based payment due under the contract." Or, another example, the statement "you have not fulfilled your obligations to provide complete documentation" might mean "we can't find the anchor bolt description required for the item of equipment."

In addition to the defensive nature of the communicating style, the contract language was rigidly enforced, regardless of the logic behind the statement or the situation. Thus, problems with the respective languages on this project appeared not to be from translation difficulties, but more from the interpretation of the content.

Looking back at the situation, General Tire noted that it might have been better to have had an equipment supplier as a buffer company. GT could then have furnished a list of equipment and a description of the necessary types of technicians required to install it. The equipment supplier might even function as the prime contractor, even if the specific technology being transferred originated with General Tire.

In retrospect, GT noted that the contract format may also have inadvertently fostered frustration by having too many areas which required interpretation. Furthermore, General Tire realized that while the contract appeared to specify the tasks which their company was to perform, Romania's responsibilities started and stopped with paying for the project. In the current agreement, Romania was not specifically responsible for accomplishing certain duties, but only for paying for them. If GT were to draw up a new contract, this one would contain the responsibilities of both partners, in addition to payment schedules.

Pending negotiations

Romania had indicated a desire to acquire General Tire's technology for off-the-road vehicles. This technology would ideally complement Romania's

current technological package from General Tire. However, the corporation had adopted a policy of waiting until the current project had passed the acceptance test stage before considering further involvement.

Time Frame

On schedule

The project appeared to be behind schedule for several reasons.

Behind schedule

General Tire found that their expectations in regard to the timing of the project in Romania had been too ambitious for several reasons--some within the control of the company and some totally outside its jurisdiction. After five years, their observation was "unless you have the patience to take three weeks to accomplish three days work, don't go."

In retrospect, General Tire felt that their time frame expectations had been overly optimistic but part of the reason for setting the 1975 construction completion deadline (with the accompanying startup in production) was the Romanian desire to accomplish this by the end of the five-year plan which concluded in 1975. The

Romanians wanted the production to be underway by the end of that calendar year. Even at the beginning General Tire had felt that the construction deadline for such a large plant should more accurately be outlined within a time frame of three years. In this case, this would have been March of 1976.

The design and equipment delivery took the anticipated 18 to 20 months and was being delivered while the plant was under construction by the Romanians.² General Tire did face equipment delivery problems due to the petroleum shortage which was caused by the OPEC oil embargo in the United States in the early 1970's. This indirectly if not directly slowed down construction in a number of areas for the years 1974-75. General Tire had advance ordered the major machines for equipping the Romanian tire factory since such items need to be custom built to plant specifications, from General Tire prototypes. However, due to the recession and the resulting slowdown, it took almost five years to totally equip the Romanian tire factory, and virtually another year before manufacturing lines were installed and equipment finely tuned.

General Tire felt the plant construction went very well--considering that the Romanians were adapting tire production to GT's instructions--just as General Tire was in a similar position in regard to Romanian life styles.

Training, both on-site in Romania and at several General Tire locations throughout the United States, was in progress throughout the construction and installation phases, so this aspect was not completely affected by the construction or equipment delays.

The first tire came off the line in June 1975, thirty months after the signing of the contract, which was in record time. However, this was only part of the pilot run, since the equipment was still in the process of being installed. By the end of 1976, production was up to 60 percent of the projected total capacity, with total production achieved by March 1977. Unfortunately, during that month, a major earthquake caused extensive damage to the plant and it was another twelve months (or March 1978) before production resumed in quantity.

The earthquake was totally disruptive and exerted a devastating impact. However, it was not the only event to delay the acceptance tests, which had to be performed on the tires before the final approval was able to be given. Another problem arose involving the test vehicle which was being used to compare the tires produced in Romania through this project with tires manufactured by General Tire in the United States. In April 1978 during one of the extensive road tests, the vehicle went off the road, incurring extensive damage and suspending the test. Another road test was begun in

June 1978 but since these tests must run for months, it would be at least June 1979 before this test could be culminated. This road test needed to be satisfactorily completed before the protocol could be signed, signaling that the tire quality was deemed acceptable in accordance with the standards laid out in the contract.

Protocols in this instance were the official documents which did not change the intent of the contract but verified its progress. Several types of protocols were used on this project. Descriptions accompanying major protocols were termed sight protocols, and were used to clarify or annotate certain portions. For example, one sight protocol laid out the route for the final road test.

Another timing problem which presented itself occurred back in the final stages of plant construction. General Tire had run into difficulty in getting some of the earlier protocols accepted with regard to the completion of certain aspects of the plant. Those on the scene, both the Americans and the Romanians, were having no success. The deadlock was finally broken only when some higher Romanian officials were brought in as these individuals were in a capacity to make decisions regarding the completed stages. These officials were appointed to keep the contract going in Romania, since they



possessed both the authority and ability to work with the local managers at the site.

General Tire would restructure a number of aspects of this project if it were possible to restructure such things, but unexpected calamities such as the 1977 earthquake would still go beyond normal revision projections. On the other hand, the fact that such a disaster did occur only strengthens the statement that unexpected occurrences need to be built into such a project's time frame and cost structure.

The extended time required to complete the acceptance tests was a financial detriment to General Tire in several respects. First, the additional revenues to be gained from the installation of the Technical Service contract would not commence until the acceptance tests had been completed. Furthermore, since no escalation percentage or fee had been attached to the contract, inflation steadily reduced the amount of real dollars which General Tire would gain from this service contract. Second, the delays resulted in greater expenses for General Tire in the form of additional personnel and attention paid to the project. Third, since the contract did not forbid production of tires in the plant prior to the acceptance tests but only forbade use of the General Tire official logo, the machinery was being operated and tires were being produced and worn down before the tests

had been completed. This, in turn, was forcing General Tire to prove contract acceptance on machines which had been worn down, potentially jeopardizing the tests and extending the time period when the tests will be completed.

General Tire's comments regarding the culmination of the acceptance tests for tires from the plant, were based on its experiences over the past six years. One of their observations was the 'acceptance tests on individual machines will succeed or fail depending on whether operation of the equipment involved makes it easier or more difficult, respectively, to attain quotas. That is to say, thin materials make less kilos than thick materials, so a machine to make foil will not pass acceptance tests readily.' In general, this meant that quantity reigned over quality--another throwback to the Romanian devotion of their five-year plan concept. Another point was that "if performance penalties are imposed, delays by Romanians will be attributed to the 'fault of the supplier'." A third item was that although the completion deadline and performance criteria had been stipulated by both the buyer and the seller, the buyer was the one who actually stipulated whether the completion and performance met the requirements. But the 'requirements' were also interpreted by the buyer, and the seller would be paid when the buyer was ready.

During the preparation of the contract, General Tire found itself in the position of weighing the quality of its tires against the fees being offered by Romania. This meant the company was in the difficult position of having to determine the maximum durability and life expectancy of its product at a time far in advance of the actual manufacture of the product. To underestimate the durability of its product would short-change GT in terms of payment, but to overestimate the durability of the tires could prohibit GT from passing the acceptance tests or being compensated.

This situation arose when Romania laid out the standards which the tires were to meet and described the tests to meet those standards. General Tire felt that it should have been the one to lay out the standards since the tests reflected their tire technology. Radial tire technology was part of the most current line, so extensive analysis over the years had not yet been possible. Thus, the company was dealing with technology which was not as familiar as their older tire lines. Furthermore, the negotiators on the project were representatives of the company but not all were from the engineering staff with direct knowledge of the capabilities of the tires.

The quality of the tires produced also depended upon the quality of the raw materials used in the

production of those tires. General Tire provided specifications for raw materials, demanding that all tires carrying its trademark be manufactured from materials meeting certain standards. However, General Tire had no control over tire production if the Romanians chose to manufacture tires from materials which had not been continuously quality-checked, if the Romanians did not use the General Tire trademark, or indicate involvement. Checking raw materials from local sources in Eastern Europe is an expensive procedure since not only must the quality be initially studied, but must be continuously policed to insure consistently high standards.

General Tire International was thus caught in a dilemma in regard to its operation in Romania. Its immediate goal was to complete the construction and equipping of the tire factory and have the acceptance tests run on the tires being produced so that they would be able to proceed to stage two of their agreement, the Technical Service Contract. Production had to be started before the acceptance tests could be run so that the workers could be instructed in the operation of the equipment and processes. Since local materials were not as expensive as the standardized materials imported from abroad, local raw materials were used in early production runs, and the tires which were produced, although unable to carry an indication of General Tire's collaboration,

were still serviceable. General Tire had no control over this production, since the plant was the property of the Romanians and the tires were their total property. However, because the equipment was being operated, normal wear was also making the upcoming acceptance tests more difficult. In the midst of this dilemma, the earthquake occurred which further delayed the tests. Shortly after the damage to the plant had been repaired, the road test vehicle was destroyed, delaying the acceptance tests for another year.

Financial Flows

As a result of these occurrences, the additional time and effort involved also brought additional expenses to General Tire without any supplementary payments. The best approach was to attempt to have the acceptance tests completed as soon as possible so that the additional payments would be forthcoming. The equipment which had been repurchased after the earthquake was more expensive due to the passage of time and inflation. Since General Tire purchased much of the equipment from other suppliers, it had no control over the initial purchase price. Thus, General Tire's anticipated price list was, by that time, obsolete. In some instances any commission was substantially reduced or negated. Equipment had been purchased under warranty but the extended time meant expired warranties. Any expenses incurred on that equipment

after that period were then the responsibility of General Tire. One official pointed out that all additional expenses had to come out of the \$1.5 million reimbursement which was the total fee for the initial technology and machine installation.

Another factor which provided additional expenses for General Tire, beyond the incidents already mentioned, was the double taxation treaty which went into effect between the U.S. and Romania in 1975. This meant that General Tire was taxed by both countries, not just one or the other.

On the other hand, it was to Romania's advantage to extend the tire production time prior to the acceptance tests. The longer Romania could operate the plant before the acceptance tests, the more tires could be produced and subsequently sold without any additional financial outflow on the part of Romania. Furthermore, since the Technical Service Contract would supply improvements in radial tire production for ten years, a longer period prior to its instigation provided for more possible developments and improvements which could then be applied to the Romanian operation.

General Tire noted that their contract contained one of the harsher penalty clauses, although as yet, no penalties had been assessed and they did not anticipate

that any would be applied, especially since the acceptance tests were so near completion. Their contract applied a penalty based on a percentage of all equipment costs if certain pieces of equipment had not been installed by a certain time. Penalty clauses are often based on a percentage cost of just the undelivered equipment items--not on all machines. General Tire's feeling is that the company should not agree to any more contracts containing such a penalty clause. If such a clause were mandatory, General Tire would then expect the prime contractor take that responsibility. In such instances, General Tire, as a procuring agent, would then take responsibility for any costs resulting directly from a loss of production from events under their control or would agree to pay a certain amount for every day involved in delays of their making.

A counter-balancing aspect to the penalty clauses included in the contract between General Tire and Romania, however, is the fact that there is no hold-back clause. As noted earlier many contracts with the socialist sphere require that a certain percentage of the initial fees not be paid until all work or purchases have been completed. If anything does not meet with total approval, that portion of the fee which has been held back is in part or totally assessed as a penalty against the party which had not met its obligation in

full. The usual hold-back percentage is 10 percent. It has been noted in connection with the Soviet Union that this 10 percent is usually never forthcoming as some minor aspects usually are judged incomplete and the fee is withheld.

The sale of the tires which were being produced in Romania was providing more income to pay the upcoming General Tire technology update fees. Production capacities in Romania are a state secret. General Tire officials did not even know the current tire production of the plant which they had provided. They are aware that improvements had been made in the machines in the plant and that additional equipment had been purchased for the other tire plants in the country, and felt the production of tires in the country may be exceeding even their expectations. However, regardless of the output, General Tire's annual fee would still be \$500,000. The only way this amount would vary would be if another process of different type of product were also purchased from General Tire, and this would be implemented only after a separate contract had been negotiated.

There is always the possibility that Romania will refuse to go into the Technical Service Contract portion of the agreement with General Tire, but it has been hoped that this problem will not arise. General Tire

felt that it had several points in its favor. First was the fact that the technology transferred to Romania was the state of radial tire development back in 1973-74. A number of improvements had been made on the part of General Tire since that point in time, but had not been transferred to Romania because the updating aspect had not been initiated. Romania would actually gain four to six years of additional technological developments prior to its ten year contract yet would only have to pay for the ten year period.

The aspect of inflation was a second point, since the true dollar amount of the fee had dwindled substantially since this amount was first specified back in 1973. Thus, the cost to Romania would not be as great as initially laid out.

Legal aspects provided a third rationale. Because the entire agreement was a legal document, Romania's standing world-wide would be jeopardized should the technical service portion of the agreement not be honored. The Eastern Bloc, as a whole, has the reputation for honoring all contracts, and this type of action would certainly be contrary to that tradition. On the other hand, Hayden reported that one middle-level State Department official noted that Romania was in default at the end of 1974 to "half a dozen" U.S. firms.³

The question arises as to whether General Tire would negotiate a similar type of agreement in regard to the divided fees portion with an update involvement of relatively long duration. In retrospect, it certainly would have been less complicated to just have built a tire plant and then left, much as Pirelli had done in Romania in the past. However, General Tire still feels that the transfer of their technology was not something that was able to be successfully accomplished in a 'one-shot' operation. This was due to the relatively long period of time which was required to set up such an operation. Improvements were constantly being made and if these improvements were not implemented, the tire plant was outdated from the moment its first total production was set into operation. General Tire saw itself in the business of long-term transfers, and felt that the initial period was the most difficult. Relations between the partners usually became successively better throughout the entire period of the agreement. Furthermore, General Tire saw the 'one-shot' approach as a type of operation which literally created competition for a company, because little rapport or teamwork accompanied such a transfer. General Tire, through its extended operation, felt that it created additional supply sources and broadened its own base of operations.



The cost of the project in Romania to the Romanians listed at \$30 million in loans for the equipment, including the \$1.5 million paid to General Tire for the equipment installation and initial technology purchased from General Tire plus the additional expenses which Romania incurred in the construction of the plant. All payments for these initial purchases had been received. The Technical Service Contract fees were to be paid on a semi-annual basis with the first payment to be received six months after the completion of the acceptance tests.

Should the acceptance tests not be successful, General Tire and Romania would have to reach another understanding, since General Tire felt that Romania would not have arrived at a 'peaceful possession of the factory' and thus, would have no right to General Tire's technology.

During the negotiation process, General Tire did reduce its original statement of its technical fees, but felt that this reduction was proportionate with what would have been offered to other potential buyers. The fees would not have been out of line under the anticipated time schedule, but the lack of an escalator clause combined with the other unexpected delays had made the financial situation much tighter than should have been the case.



There was another element to the financial flows involved with the Romanian project for General Tire. Romania, as an oil-rich nation, is also a source of petroleum-based materials. General Tire had hoped to be able to acquire some of these materials but Romania would not sell them to General Tire at the price offered during the oil shortage which occurred in the mid-1970's. It should not be interpreted that Romania did not want to sell the materials to General Tire, but rather, as Hayden pointed out, Romania used its natural mineral wealth as leverage much as the more developed countries use their technology--by selling it to the highest bidder.⁴

It ought to be noted here, that General Tire International was the company involved with the tire plant in Romania, but this is only one of the companies within the General Tire Corporation. As such, General Tire International is only indirectly connected to the other areas within the corporation which are involved in materials purchases. One General Tire official observed that the subsidiaries of General Tire do their own purchasing, and General Tire International only approves certain purchases. Thus, other affiliates of General Tire International needed to become involved if certain purchases had been desired from Romania. It also needs to be stressed that while Romania did possess some

valuable raw materials, obtaining a particular quantity of a certain quality by a specific deadline requires guarantees that such a supply would be available. Many suppliers often choose to buy from a source which, although more expensive, had been able to provide specified amounts on a certain timetable in the past.

Personnel

Training assessment

General Tire's anticipated staffing requirements for the Romanian project were underestimated if only because of the unexpected occurrences and the extended time period required to complete the acceptance tests. The company's estimate was for 12 to 14 people involved full time for two to three years, or, in terms of man-months, involvement, which ranged from 288 man-months to 504 months. Actually, while the number of individuals from General Tire substantially increased over their expectations, the period of time which these individuals spent on the project was less than anticipated, so the final result was thus far within the anticipated man-months projection. Approximately 40 of General Tire's top technical experts had spent about 20 man-hours each on site in Romania, for a total of 240 man-months. Only

one person, General Tire's chief site representative, was still living in Romania in a supervisory position. Several others would be involved, however, until the acceptance tests were completed.

At one point, there were 67 individuals on-site in Romania, including technicians from the various equipment manufacturers. General Tire did have two families residing there in Romania for three years each, including the family of Oz Perine, the project engineer who had the on-site responsibility for supervising the construction and equipping of the plant.

General Tire found that there was a bit of reluctance on the part of its employees toward living in Romania, although conditions there were relatively palatable compared to some other areas, like Saudi Arabia. Some of the problems encountered on a day to day basis were typical of those found in many developing countries, such as difficulty with transportation, especially private cars, a lower quality level of housing and the additional expense of imported goods. High quality food was not expected to be a problem in Romania but the expatriates found that, to aid the hard currency supply, Romanians exported their best foodstuffs. The approach in Romania was that the people had to work together, to suffer a bit longer, so that factories could be built

and the country could become prosperous. Ironically, America, at that point was purchasing 100 percent of its pork requirements from Romania. However, the expatriates living in Romania temporarily had to survive on the local fare.

The agreement between General Tire and Romania called for adequate transportation and adequate housing for the expatriates, but the soon found out that each side had different definitions of 'adequate.' For example, adequate transportation to and from the plant site was, to the Romanians, the local bus network. However, the expatriates soon found that this bus ran intermittantly, at best, and not at all on weekends. The transportation problem was alleviated for the most part when General Tire bought an automobile to transport the personnel to and from the plant. Housing, General Tire officials found out, should have been specified by the type of apartment or hotel rooms desired, right down to room size and toilet facilities.

The time spent on personal incidents was underestimated. For example, when a sub-contractor had a heart attack, half the people at the construction site took the day off. Little things such as getting or renewing one's driver's license took much longer than would normally be the case in the United States. Romanian

holidays and national events also intruded upon the project. The factory was located 50 miles north of Bucharest, along the airport road. If there was a demonstration at the airport, or if an important person was arriving or departing from the airport, people would be lined up along the road with banners or flags and all other traffic was stopped. There were times when the expatriates could not even reach the plant.

In addition to local disruptions or complications, however, the expatriates also encountered reminders that they were living in a controlled, socialist state. Their movements were constantly checked, with their credentials examined even when they traveled from town to town. The expatriates would walk into their Romanian accommodations to discover that the contents had been examined in their absence, with pictures rearranged on the walls and other changes made. Harassment continued on the roads, where the expatriates received more than 30 traffic violations for such offenses as having dirty license plates. Once the expatriates were run off the road by Romanian Party members in their black Mercedes. The Romanian government took the golf course away, stating that it seemed to be used only by foreigners, and made it into part of the adjoining Peoples Park.

On the other hand, the expatriates who had accepted the Romanian assignment had done so at least

partially aware of the problems and difficulties they would be facing. All reported that their assignment was certainly financially beneficial. It did appear that no difficulties were encountered which could not be overcome.

The social isolation of the expatriates in Romania appeared to concern the Americans more than the physical accommodations. The foreigners were really left to be an island unto themselves. The families that lived there for several years noted that they were never once invited to a Romanian home for dinner, and they never ate out except at company dinners. They were also reluctant to invite any Romanians to their homes for fear of placing the individuals in a risky security position. The expatriates commented that there were two classes of Romanians, those who could associate with the General Tire employees and those who could not. It was understood that those who were able to have more extensive contact with the expatriates were those party members whose integrity was not questioned, or those who did not present a risk in escaping to the United States. As such, the expatriates found that it was a society where all was equal, but some were more equal than others.

Despite the social and political restrictions, those who did have contact with the Romanians felt they were warm, friendly people. Three of the men sent there

by GT married Romanian women, and all brides have since been permitted to enter the United States.

The security problems did not end on Romanian soil, as General Tire officials noted that security appeared to be an important issue among those selected to come to the United States for training. Again, it was felt that several of those who came were sent in their capacity as Party Members, either to oversee the group, or as a reward for services already performed. However, nothing was ever said in this regard. Those who appeared to enjoy life in the United States too much apparently jeopardized their future in Romania, as they were treated as 'contaminated' once back home.

The element of distrust on the part of the Romanians for the American capitalists was apparent at the factory as well. In fact, the Pirelli tire employees, or those employed at that operation, were used to check out the General Tire plant.

The expatriates involved with the project felt traits exhibited by the Romanian workers were not the result of the undercurrent of distrust however as much just indicative of the apathy which seemed prevalent in the country. Some of the expatriates involved in training the Romanian workers to operate the plant noted frustrations which involved the bureaucratic type of

behavior, a lack of tooling and machining skills, improper maintenance, quality control and supervisory procedures at the management level, and, most of all, by the lack of motivation in the workers.

However, these observations did not present an impossible barrier to those involved in Romania. General Tire International Project Manager Perrine described the Romanians as "good people." He noted that the Romanians had been cautious of him, but added the "cooperation was there." He realized that the Romanians had taken on an enormous project. In a training sense, he had found the Romanians to have a higher skill level than many of their U.S.A. equivalents.

Perrine pointed out that a large amount of unlearning had been necessary because those involved in the General Tire factory had been formerly trained in the Pirelli and Dunlop facilities. On the other hand, he observed that his advice was not always followed, because he "was a capitalist." Perrine felt that it was sometimes easier to introduce a new industry into a country rather than to update an existing one. When he had supervised the construction of a General Tire plant in Tanzania, the Africans had no knowledge of what had to be done, so instructions were always followed.

Perrine found that one had to operate with the Romanian system. For example, because bartering was a

way of life, one bartered for the items which were needed, rather than just demanding them. He also found that he had no authority in the construction area. Once he had watched a foundation formed in the wrong location, but had no authority to stop the progress. Because Perrine, and other expatriates, were not allowed on the construction site during regular working hours, Perrine had to inspect the operation over the lunch hour.

General Tire felt that worker incentive was indeed lacking. This appeared due in part to the fact that if mistakes were made, punishment was forthcoming. Workers did not seem to care, as long as they did not have to make any decisions which could lead to mistakes. Their communication approach was to demand, not request.

The Americans also had a problem with petty theft. One GT official summed it up this way. "The people were relatively honest. If they had a chance to get something honestly, they would buy it--they wouldn't steal it. But anything Western that they could not buy--they stole. We were told 'there is no stealing in this country', but after the equipment boxes were opened up, things disappeared. One example was the little colored plastic discs on some of the machines. These discs disappeared, but reappeared as bicycle reflectors. Another example might be windshield wipers. We had to

take ours off each night to preserve them. They do not manufacture spare parts there, so there were no extra wipers to buy."

There was another aspect to the staffing of the plant by the Romanians. More workers tended to be used than would be the case in the United States, including many more women. This tended to cause some problems, because many of the machines were scaled to the size of an average male. The women were far smaller, so many of the controls were out of reach for them. Thus, equipment was both overstaffed and underutilized at the same time.

Protection

Leverage assessment

Domestic company. Perhaps the most viable form of leverage available to General Tire at the present time is Romania's desire for GT's off-the-road tire technology. To have any credibility with General Tire, or with other tire firms for that matter, Romania will have to honor its present agreement.

It is interesting to note that a common item of leverage, the trademark, has not affected the operation in Romania, nor has the promise of the use of their logo provided General Tire with any apparent advantages.

General Tire will not permit its logo to be used until the acceptance tests have been completed at the plant, but the Romanians are legally allowed to use the statement 'made in collaboration with General Tire' on all tires produced at the plant intended for use in Romania at any time. However, the Romanians apparently felt that the production of tires as rapidly as possible was preferable to the use of any trademark or notation, and had not indicated any General Tire involvement on any tires so far.

Thus, in Romania, it would appear that the demand for radial tires was such that a particular trademark was of less consequence than actually obtaining such tires. It may also be true that General Tire's involvement with tire manufacturing in Romania was common knowledge, so that an indication of the tire technology's source was not necessary.

Regardless, the trademark, an element of leverage used by other firms dealings with Eastern Europe, was not sufficient in this case to overcome the other reasons prolonging the completion of the acceptance tests.

Host. General Tire's immediate aim was to progress beyond the acceptance test stage into phase two of the agreement. However, Hayden noted that there were at least three arguments against Romania's continued

involvement with General Tire following the acceptance of the plant.⁵ The first was that Romania was experiencing a hard currency shortage, in part due to such technology purchases from Western nations. Thus, paying GT their annual Technical Services contract fee would be undesirable. The second was that tire technology is 'fairly stable' with infrequent drastic changes. The basic process often does not change and in such cases updating may not be particularly crucial. The third aspect was that Romania did have a reputation of not honoring all of its contractual obligations. General Tire had already experienced one example of this type of behavior.

General Tire's offer to help Romania dispose of some of its raw materials to help its hard currency shortage had included General Tire as the first choice purchaser. However, during the oil shortage, when General Tire tried to obtain first bargaining rights to some of those raw materials, such as polyvinyl chloride, carbon black, and synthetic rubber, Romania sold the items on the West European spot market where prices were 30 percent higher than those offered by General Tire.⁶ The fact that the Romanians have chosen not to indicate General Tire's involvement on the tires being currently produced may be an indication of their desire for no future involvement as well.

It was noted that General Tire had the option of revising the agreement from a non-equity basis to one involving equity. Part of the justification for such a shift, would have been to increase GT's leverage in regard to Romania on the part of GT. However, leverage in the form of an equity basis appeared to have some major disadvantages in the opinion of General Tire, as well as advantages. These deterrants did not center upon nationalization, although that is a possibility in a situation where a company has an equity position in another country. Instead, they were based upon the differing objectives between the partners in this case. For example, Romania's objectives for a joint venture included access to hard currency and entry into Western markets. The U.S. company's objectives included access to Romania in particular and Eastern Europe in general. Thus two different territories were involved. There was also a problem in the exchange rates between the U.S. dollar and the Romanian lei, since the current rate of exchange increased the cost of production in Romania and reduced the competitive aspects of such a joint venture in the world market. Thus, an equity arrangement did not appear to provide adequate leverage to offset the disadvantages.

Utilized inspections

The upcoming acceptance tests will provide an opportunity for a major inspection which will be the official one in terms of analyzing the tire content and manufacture. Prior inspections had been utilized by various General Tire representatives to determine the proper construction and functioning of the equipment.

Patent/trademark defenses

Since no use had yet been made of the trademark or General Tire involvement, there had been no need to apply any trademark defense measures. No patent problems had arisen.

Legal provisions involved

The earthquake of March 4, 1977, was the only event for which the Force Majeure clause of the contract had been invoked. Application of this clause indicated that the unanticipated delays in the project were not the fault of either General Tire or Romania, and thus, that no penalty clauses or other actions were to be taken against the contractual parties as a result of the delays. The earthquake expenses were semi-reimbursed to General Tire by Romania (approximately 50 percent)

since Romania paid all local expenses and a proportion of the remaining ones.

Hindsight

Factors which made the project easier than anticipated

General Tire's extensive experience in technology transfers of this type prompted the company to feel that it was not going to encounter any difficulties that it would not be able to overcome. Expectations were that problems would come up, but that nothing would be unsolvable. That still appears to be the consensus at GT although the project has been more involved than anticipated.

General Tire did find several aspects of the transfer of technology to Romania which made the project easier than anticipated. The major discovery was that the Romanian's knowledge of the tire industry was much higher than expected. Furthermore, the individual skill levels among the workers were also much higher with the result that the training sessions were easier and the Romanians were able to grasp the essentials of radial tire manufacture. Because of the high skill level it is also possible that some improvements may be made by the Romanians which would result in a reverse technology flow for General Tire back in the United States.

In a sense, some of the greatest problems faced by General Tire, such as the damage incurred by the earthquake and the accidental destruction of the vehicle road-testing the tires, might also be seen as beneficial. The disaster which certainly affected both the Romanians and the Americans had the effect of pulling both parties together in the attempt to repair the damages. Any time frame complaints which may have been instituted by either party were negated at the point of the quake, thus no penalties were assessed. The road test vehicle's accident certainly extended the time before the acceptance tests, but also provided more opportunity to perfect the tires being tested which may have helped the acceptance tests. Thus, even some of the greatest problems faced by General Tire in Romania may also be viewed as opportunities.

Factors which made the project more difficult than anticipated

Difficulties did occur. Some of those difficulties were expected, at least in part, but the full extent was not anticipated. Some other problems such as the earthquake or the road-test vehicle destruction, for example, were not expected.

These underestimated problems included the lack of cooperation found throughout the Romanian system, combined with the amount of red tape involved in accomplishing all tasks--large or small. The need for close administration with the accompanying decision-making obligation needed to maintain production was also included in this area. Low worker incentives and morale were expected, but the lack of pride or care in the quality of the work produced, and the lack of cleanliness were still surprising.

Progress of Future Expectations

General Tire was interested in a continuing involvement in Romania for several reasons. First, since the company had made a policy of selling technology as much a part of their business as selling tires, and has equipped their operations with this intent in mind, they were generally interested in locating future sales of technology. This would specifically include the area of off-the-road tires. Second, since the Romanian project required such close involvement between the Romanians and GT, this familiarity would make future projects with that country much easier.

General Tire felt it would certainly revise its current contract format before entering into another agreement of the type now operating in Romania. The

company was following its own advice in negotiating a three-way contract between East Germany, a French equipment supplier and themselves. General Tire would only be the equipment supplier, not the prime contractor in this arrangement. The French company, in addition to purchasing the equipment listed by General Tire, would also be responsible for the construction and installation. An additional advantage for this project would be that the French company had done business in East Germany prior to this project and was familiar with the people and culture. Financing arrangements would also be more easily arranged since the project could be financed through France as well.

The equity option on the Romanian project had not been acted upon during the first five years of the agreement, and was considered an unlikely occurrence at this stage of the project. General Tire had concluded that the advantages obtained in switching from their non-equity basis would not be substantial enough in terms of additional operating leverage or profits.

General Tire was finding that their involvement in Romania had opened several other doors within the Eastern Bloc and also with neighboring countries outside of that specific region. The upcoming negotiations with East Germany have already been mentioned. The General Tire corporate staff entertained a delegation from the

People's Republic of China in January 1978. One of the greatest surprises to the General Tire corporate officers was the fact that China was extremely impressed with General Tire quality because of the project in Romania. This familiarity with GT tires was in spite of the fact that the acceptance tests had not been completed or that none of the Romanian-produced tires carried the General Tire logo or trademark.

Several other countries, in addition to the PRC, had expressed an interest in General Tire technology. Yugoslavia had approached General Tire with the possibility of establishing a tire facility in that country, and other inquiries had come from Poland, Hungary, and Czechoslovakia. Talks with the Soviet Union had already passed through several stages. Thus, it was felt that General Tire would be involved with the Eastern Bloc countries in the future. In several respects, the project in Romania had provided a wealth of experiences which would be of great help on these upcoming potential projects.

Romania

Clark Equipment Company

Description Variations

The Romanian project has appeared to have flowed more smoothly, on the whole, than the Polish agreement. Clark officials feel this might be due to several reasons. One is that Clark had two to three years experience in transferring technology to an Eastern Bloc country prior to the start of the Romanian project.

As well, the Romanian project took longer to negotiate, which gave all parties an opportunity to become personally acquainted prior to the startup of the operation. Clark found that the American approach was the expectation to conclude arrangements on the basis of the company's name being known--whereas the Eastern European way concentrates on the people involved with the negotiations. They must become acquainted with their counterparts before the negotiations are accepted and concluded.

Clark felt that their representatives had an extremely good relationship with Romania--right from the very first day. Part of this may be due to the continuity which Clark found in dealing with Romania. The same individuals tended to stay in their positions, and Clark

was able to find a form of stability which had been lacking in Poland where personnel and positions tended to be shifted more often.

The initial contract between Clark and Romania, represented by all three agreements, involved transmissions, but not those for crawler tractors. The amendment which provided for those transmissions might be considered a separate contract. These transmissions were created through a joint development process where Romania made all the components, paid all the costs incurred by Clark in testing out these transmissions, and will also pay Clark a fee for all transmissions of this type which Clark is able to sell outside Romania. This rather went beyond the area of licensing. Romania needed a transmission for a crawler, and wanted it in metric scaling. Thus, in jointly working on this, they have the crawler, and we have started in the metric changeover. They made the drawings in the USA, and parts there in Romania. Now both sides independently tested the product and then compared results.

The amendment which was added to the agreements included several changes made in several of the agreements. In the Technical Assistance License and Cooperation Agreement (TACA), the changes dealt with the additional products covered under the agreements, the engineering information to be furnished by CEAG to UT, CEAG's

nonavailability to enter into other similar agreements for products covered by this agreement, CEAG's aid to UT involving the extent of the information to be transferred, and changes made in the scheduling of the payment of the disclosure fees.

The amendment, signed April 10, 1975, also noted several changes in the Marketing Agreement between CIMSA and UT. The first change added two crawler tractor transmission models to the information contained in the technology transfer. These were models LT7758 and LT7759, an 180 horsepower transmission and mating torque converter, and a 120/140 horsepower transmission and mating torque converter, respectively. The models, including those added through the Amendment included Model Series numbers: 2000, 3000, 4000, 5000, 8000, and 16,000.

Unlike the problems which arose on the joint development project between Clark and Bumar, the joint development project which came about between Clark and Universal Tractor appeared to flow smoothly. Romania wanted twenty months for their responsibilities. Their final outcome required thirty months as CEAG and Romania built a prototype of a transmission for a crawler tractor. Previously, the transmission for this bulldozer had been imported from West Germany, but Romania wanted to become more self-sufficient in this regard as the import was particularly undesirable in the light of their hard

currency shortage. The transmission had to be fully metric in scaling. As stated in the agreement, all products developed by Romania or by both partners related to the agreement were to become the property of both partners, and Clark now had the rights to this metric transmission for its own use should it desire this item.

However, Clark's arrangement with Romania, for instance, is completely different. Clark has no equity in the Romanian project. Clark's personnel worked with Romania's in creating this product, but the product was designed by Romanians and was paid for by Romania.

One unit of the 180 horsepower crawler transmission which had been prototyped at Hidromecanica late in 1977 had been sent to the Clark Equipment plant in Jackson, Michigan, for inspection and tests in 1978 with three additional prototypes being machine tested at the same time in Romania. The Romanian production schedules for this transmission model were slated for the second half of 1978. Additional models scheduled for the 1978 production in Romania were the 4000 series power shift transmission, the C5000 series torque converter and the 140 horsepower crawler transmission.

Current Corporate Perception
of Agreement Benefits

Clark's expectations appear to be materializing in Romania, although at a slower rate than originally scheduled. The facility as a source of transmissions or profit center for license fees and royalties has been slower in developing production levels than time schedules had indicated at first. However, offsetting this deficit has been the increase in component sales and exports to Romania to facilitate their production.

An additional benefit which had been anticipated as a possibility but not to the scale which has materialized is the joint development project involving the metric crawler transmissions. Clark had not originally foreseen the additional fees which could result from such an endeavor, and will also have rights to the use and production of the units when fully developed.

Negotiations

The involvement with the government in Romania, from Clark's experience on this project, has been extremely cordial. Romania had received the Most Favored Nation status prior to the agreement which was a great help in terms of financing and arranging the project, but Clark felt that the cooperative nature of the officials appeared to run far beyond normal political relations.

Contract format revisions

Clark appeared to feel that their contract with Romania was most beneficial. Based on the success of the project thus far, their analysis of some of the negotiation arrangements, negotiators and contract format might be helpful for others thinking of becoming involved in a similar venture.

Levels of negotiations. Clark found that there was no need to organize meetings with government officials or Ministers as it was necessary to wait for an invitation from such an individual. Such an invitation was usually forthcoming only after the initial arrangements for the technology transfer had been made with the appropriate foreign trade organization. Such a unit tended to bring all individuals together, including Ministers and any partners from the companies to be directly involved with the transfer. The Ministers will have the ultimate approval power.

For corporations based in the United States, the starting point is not directly in Eastern Europe but usually with the Bureau of East West Trade in Washington D.C. This Bureau will usually contact the representatives in Eastern Europe after a preliminary analysis has approved the technology for the transfer.

Negotiators. The representative or representatives from the American-based company (or any other company, for that matter) need not be lawyers or technicians, Clark points out, but has found that an individual having familiarity in both of these areas can be invaluable. Such an individual would be able to negotiate from both angles in such a case, and often facilitates the negotiations. Selection of such an individual as the official corporate representative appears to be one of the best ways to successfully negotiate such contracts, but Clark further admonishes that, in addition to the above-mentioned skills, this negotiator (or negotiators) must still expect lengthy and drawn-out discussions, and have the patience to endure them.

Clark has found throughout its negotiations with Eastern European countries that negotiations require far more personal acquaintanceship than is usually the case in the United States. The time spent in achieving mutual rapport over the negotiation table appears to be actually a means for facilitating the project once the agreements have been concluded.

Clark also admonishes the negotiator to be prepared for lengthy sessions, and to expect the negotiations to persist over a long period of time. Regardless of the time required or needed, however, Clark also points out

that no contract should be signed unless it is totally satisfactory, as mistakes or items overlooked can be very expensive or detrimental.

Contract issues. Clark points out that all contracts with Eastern Europe should be exceedingly detailed, because this contract will be followed to the letter-- regardless of the actual stipulations which have been accepted. Great care should be used in scrutinizing each aspect contained in the contract prior to the final signing. Clark also notes that, unlike the United States where contract wording is sometimes taken to court for the final interpretation, the contract is often taken to be the final arbitrator itself in the Eastern Bloc. Thus, such details as the financial considerations should be clearly laid out and Clark also recommends a final ceiling placed on all financial commitments.

Clark notes that contracts should contain "two-way street even though the traffic in one direction may be considerably greater than that in the other." Examples of such clauses might include governmental approvals (both sides) or nondisclosure of technology of military importance or two-way flows of developments or inventions which are created from this immediate technology.¹

Clark tries to include clauses holding the possibility of joint development within the corporation's contract as this type of activity tends to bring the partners

closer together and often results in new variations if not totally new products. One common possibility for such an activity, Clark points out, is the conversion of American products to the metric system.

Despite the haggling which characterizes the negotiation sessions, Clark has found the atmosphere changes greatly once the contract is signed. The process of getting the final approval might be frustrating, but once this has been obtained, the partners, at least in Clark's experience, appear to have upheld the agreement to the letter.

Time Frame

The transmission plant in Brasov with the attendant tooling and machinery procurement continued to progress favorably as scheduled, as of 1977, but was not completed by this date.

Clark supervising the building of an entirely new plant in Romania, from scratch, had anticipated production to begin in 1977, or approximately two and a half years after the start of the building. But production of the transmission was underway, officially, three and a half years, or by mid-1978, a year behind schedule. However, given the enormity of the project, Clark felt this delay was not too bad.

Financial Flows

Despite the smaller size of the operation in Romania, Clark found, to its surprise, that from the start of the Romanian project in 1975 through 1978, the net cash flow to Clark from the operation was twice the size of the net cash flow to Clark from Poland, despite the fact that the Polish operation had been under way since 1972. This included both fees and sales for the entire extent of each respective project from its official starting date.

Approximately \$2,400,000 in axles, transmissions and torque converters were shipped in 1977, for orders entered by Universal Tractor in 1976. Greater levels of shipments were expected in 1978, but some of the bureaucratic problems inherent in the Romanian foreign trade system had to be overcome before this could materialize. In addition to the initial disclosure fee, Clark received an additional payment for their cooperative help on the joint project.

In retrospect, the sale of component parts to Romania provided Clark with an even greater benefit than had been originally anticipated. Romania wanted to create a construction-making industry, of which the production of transmissions capable of driving construction vehicles was only one step. Bumar, in Poland, on the other hand, represented a more mature industry interested in supplying their own needs. These component sales to Romania have

totalled over \$1 million annually. This represents a total net gain as well, as Clark pointed out, because the company was not in the market at all prior to the Romanian Agreement. The initial products produced contained ten percent locally-produced components, hence, the other ninety percent was composed of imported components, the majority from Clark. However, Clark realized that these component sales would drop off sharply as the local content of the axles and transmissions expanded.

As with negotiations, Clark has realized that products often will not sell on the basis of the company name alone, but after the individuals themselves, representing the company are known. The slump in sales which appeared to hit Eastern Europe in the latter part of 1974, and persisted through at least the start of 1977 did not have as much impact upon Clark's Romanian operation as it did upon their venture in Poland. This was for reasons other than Clark's reputation, however. The lessened impact in Romania appeared to be due to the fact that the Romanian project had begun later, and hence, was in the building and equipping stage, not a manufacturing one. The slump in sales did not hit Romania because the product was not there to sell in the first place. Since the Romanian agreement was signed in 1975, the project was barely under way, for most of this time. There was a slight drop in sales from 1975 to 1976, largely in terms of a percentage

of total sales in Romania, but quite slight when compared to the sales throughout Poland, or the entire Eastern Bloc. This was presumably due to the fact that some transmissions had been imported, but that with the potential to manufacture their own materials, these potential sales were postponed. This postponement would also have been encouraged by the recession causing less availability of hard currency. In fact, from 1976 on, Romania's sales in transmissions rose dramatically, whereas the sales in both of those product categories were falling in Poland and other areas. In fact, Clark reported that the license agreement with Romania had led to substantial orders for component parts.

The Romanian project had a far higher percentage of American-made components being imported and used in the final assembly of transmissions than Clark's manufacturing contact in Poland. The percentage in Romania has 80 percent American input into the final product as of 1977, but it must be pointed out that this was barely two years after the project had been started. Furthermore, this was partially due to the fact that the Romanians were not as prepared in terms of support industry as, for example, Poland, where the percentage of imported components into the final product was approximately 30 percent. In retrospect, the export market appears to have been more anticipated than what has actually occurred up to 1977, which

Clark hoped to find in Eastern Europe. However, Clark did feel that more mileage had been gained from their transmission which might be interpreted as aiding the overall product development costs.

Other financial factors tended to counterbalance each other. Whereas the fees initially requested for in the negotiations with Poland had been accepted without much discussion, and hence, were higher than Clark had originally anticipated, the fees requested in the settlement with Romania had been compromised to the satisfaction of both parties. However, the joint development project with Romania appeared to have more promise than originally anticipated.

The lower license fees received from the Romanian operation, due to the slow startup were disappointing, but since the license fees were to run for 10 years from the time the product was first manufactured and sold, these fees were expected to pick up over the time of the agreement.

Personnel

Training assessment

More than 1000 individuals have been involved to date in the Clark project with Universal Tractor in Romania, including all workers in the Romanian factory.

Domestic company. Over 80 Clark employees from around the world have participated in the technology transfer or training sessions connected with Romania.

Clark reported no unusual difficulties or problems with its employees and found the climate within Romania to be accepting and responsive.

Host. Clark found the officials or top workers in Romania to be more motivated than the general factory workers, because cash bonuses were available. Common motivational problems, prevalent throughout Eastern Europe, such as quality controls or worker indifference, were to be found, but Clark did not find this a deterrent to the project, and noted that the Romanians were, on the whole, skillfully trained and anxious to have the project succeed.

Protection

Leverage assessment

Domestic company. The initial control on the part of Clark comes from the inspection and quality control standards which must be met before the Clark trademark is permitted to be applied to the product. However, the marketing agreement is also a form of control because Clark will be taking and selling items for UT, actually helping UT to export the product.

Host. The increased rapport between Clark and UT appears to have reduced the necessity for the emphasis on controls. Romania has met its financial commitments and yet also holds the promise of increased involvement with Clark as an enticement for the future.

Utilized inspections

Quality control has been a concern of Clark throughout the duration of the agreement since their trademark is involved, but no inspection problems have come up.

Legal provisions invoked

One distinction which Clark has found between Poland and Romania is that Romania will use intermediaries to help negotiate or settle disputes before an issue is sent to the arbitration board. Poland, it appears, does not do this, and, as a result, Clark has found it easier to work with Romania.

Hindsight

Factors which made project easier than anticipated

Clark found that the Romanians were less familiar with the manufacturing and assembly of the transmissions, and, as a result, tended to follow Clark's advice more closely. The Poles, who had an extensive amount of experience in similar although not updated products, had tended to do things their way until convinced to follow Clark's advice. Thus, Clark actually found it easier to work with the Romanians.

Factors which made project more difficult than anticipated

The basic problem was the longer time required before the startup of production. Clark felt that the problems encountered in Romania were really minor in scope

and were the type of things which arise around the world during the construction of a new plant. Questions on the type of processes to use, for example, or adapting to local conditions in the most efficient way are illustrative.

Problems always arise when transferring working methods from one culture to another. One incident noted by Clark was that the cement floor in the plant in Romania was not sealed, a procedure which had not been pointed out because it was so taken for granted in USA building construction and finishing. On the other hand, once such items are noticed, they can usually be remedied easily.

Clark found its involvement with Romania was not out of character with their knowledge of the constraints found throughout East Europe. However, despite this general expectation, the controls for letting individuals out of the country in Romania were extremely tight so that it was difficult for individuals to obtain exit visas to come to the Clark training sessions in the United States. In this regard, Poland was relatively free in terms of its dealings with the West. Romania also had a lower standard of living than Poland, and an accompanying lower stage of development, with the accompanying problems which such a stage would present.

Progress of Future Expectations

No further arrangements had materialized between Clark and Romania, but several other areas of interest had been developing with other representatives in the Soviet Bloc. Clark had sent a proposed technical cooperation protocol to the State Committee for Science and Technology in late 1976, but the proposal was viewed as too broad, and Clark had been requested to detail specific areas of cooperation. This matter was also being considered by the U.S.-U.S.S.R. Trade and Economic Council.

Clark had begun discussions with the U.S.S.R. in 1976 regarding a lift truck license. These discussions had continued throughout 1977, and a product and production study was prepared to be presented to both Clark and U.S.S.R. officials in 1978. Clark noted that the U.S.S.R. had been evidencing interest in lease agreements intended to cover various types of products manufactured in the West and required by the Soviet Union. The lease arrangement was being suggested as an alternative method of financing purchases without increasing hard currency debt. Clark had prepared a lease agreement draft for presentation to Soviet officials in March of 1978, paralleling a program supported by the U.S.-U.S.S.R. Trade and Economic Council which was attempting to open up additional trade between the two countries.

Hungary

International Harvester

Description Variations

The technology transfer to Hungary has been enthusiastically received and the products are being manufactured there. As the oldest of these agreements was barely two years old at the time of this assessment, this was a most positive sign, predicting that IH would seek more ventures of a similar form in the future.

The 1976 tandem axle technology transfer, supplemented by a plows and harrows agreement in 1977, and a cyclo planters agreement in 1978, was joined by a grain drills agreement in 1979.

The results reported here concentrate on the variations which occurred between the initial expectations and the final outcomes. However, these details reflect changes but may not accurately portray the overall success of the transfers, since these results and conclusions are based on a minimum of time. Undoubtedly, additional changes will occur before the conclusion of these agreements in the late 1980's.

Updating had been involved because IH was also selling components to Hungary in the various manufacturing and assembly ventures, so it had to ensure that all components were interchangeable. Generally speaking, all technology had been updated and was current on all projects in all locations, throughout Hungary.

The axles being manufactured in Hungary were up-to-date and according to IH, certainly comparable to axles made by competitors in the USA. However, since the axles were of the IH design, all service or replacement business came to IH. Furthermore, since these axles went into the trucks, this provided the trucks with a higher percentage of IH parts. Hungary and IH were working on a joint development project in connection with these axles, but the end result was not to develop a new axle, but only to refine and improve the existing one.

Several compromises had been made to provide for a more smoothly running operation. For instance, the original plans called for 27 inspection points, but this was cut back to 15. IH did some marketing of the farm implements manufactured by RABA, to help the Hungarians in selling their product. These implements were not to be designated to be sold in the U.S. but in other areas of Europe or surrounding areas.

Current Corporate Perception of
Benefits from Agreement

The view of opportunities afforded to IH and RABA in the axle agreement had not appeared to change to any great extent during the first three years of the project. IH saw the opportunities being afforded by the RABA agreement, at least in regard to the axle technology transfer, as relatively similar to its project in Poland. Prime reasons for the arrangement by IH were to obtain a source of supply of axles for IH use elsewhere, and to sell component parts to RABA which went into the construction of the axle and farm machinery. Actually, since few component parts were purchased involving the axle production and assembly, most IH component sales were in the farm machinery line. The axle arrangement was a form of subsidy by IH for the farm implements arrangement, because IH had contracted to repurchase the axles, which provided RABA with the requisite funds to purchase the components for the manufacture and assembly of the farm implements.

All arrangements with Hungary presented IH with more of a toehold upon the East European market. This gave IH direct access to the potential Hungarian market, but also reinforced its position as a product supplier throughout Eastern Europe.

The fees paid to IH for the technology, and the subsequent royalty payments, based on sales of the IH sponsored products were another reason for IH's desire for such arrangements, although this reason ranked third or fourth in priority. The fees were desired, certainly, but as IH found, additional expenses in training often tended to offset if not negate these fees. However, the longrun potential of these projects provided IH with enough justification to the point that IH was seeking further involvement along similar lines in the future. RABA wanted to increase its export market both within Hungary and outside. Its goal was to become an integrated farm machinery supplier and it needed access to a source of technology to obtain the full range of farm machinery, such as IH was able to supply. Here RABA had obtained much of these goals through this transfer.

Negotiations

No major changes had been reported in the contract format since the agreements had been signed. The rapport and progress thus far, in fact, had encouraged IH and RABA to seek out even more additional technology transfer areas.

Time Frame

On schedule

Delays had occurred, preventing the time schedule from correlating with earlier estimates.

Behind schedule

The time frame with the Hungarian project appeared to have suffered from delays. Two time problems occurred during the initial set up period, caused by equipment delays and tooling problems. The equipment which had been ordered and purchased for the project was late, hence it was not able to be installed according to the original estimate.

The second problem was that the product, when it did come off of the production line, did not meet specifications. These time problems were not anticipated, as IH had accepted the time frame as laid out by RABA.

Financial Flows

Payments

The financial flows to IH from Hungary were behind schedule. These were the fees related to the

production schedule, however, not the disclosure fee payments.

Purchases from the domestic company

More components or pieces of farm equipment had been purchased by RABA than initially estimated, although fewer total units of farm implements had been sold to Hungary.

Interestingly, two different organizations had been involved in the respective purchases of the items and overall, sales of the equipment had been lowered throughout Hungary. This trend seemed reflected throughout Eastern Europe. Entire units or whole pieces of farm machinery were purchased through the foreign trade organization, operating out of Budapest. Components or other pieces which were purchased by RABA for use in its manufacturing and assembly operations. The RABA purchases had been higher in volume.

Personnel

Training assessment

IH found that Hungary needed more technical assistance than anticipated, and felt that a far greater training effort was required than originally realized.

IH had encountered training difficulties requiring subsequently additional time in Poland and should have been prepared for similar experiences in Hungary but somehow felt that the Hungarian workers would not need such assistance. These training tasks combined with the expense of travel back and forth, negated a major portion of the profit from the technology fee.

On the other hand, unlike Poland, the Hungarians were quite self-sufficient in several other aspects. For example, in Poland it had been felt that there was 'a need to hold the Poles' hand,' whereas the Hungarians were more capable of working on their own. Also in Poland, additional time had been required by executives for negotiations, but negotiations with Hungary tended to be less complicated or involved.

IH found that the transfer of the process portion of the technology to Hungary was considerably more difficult than anticipated and a number of IH technicians were sent to Hungary to review the process as it was operating in the plant there. The reason was determined to be that RABA had been manufacturing axles for years, and the workers felt they knew how to make them, so many IH instructions were ignored. This situation was even more acute than had been the case in Poland where the employees, although they had been involved with the manufacture of construction equipment in general, had

never manufactured crawler tractors prior to the IH involvement. The problem appeared to lie with the improper sequences being used, and with the lack of correct testing procedures, not in the use of the equipment as such.

One of the major training tasks in Hungary was the improvement of these poor quality control procedures. Other problems such as a lack of workers skills or inadequate worker incentives were not as evident in Hungary as in Poland.

Protection

No changes appeared to have occurred since the initial agreements had been formulated. If anything, the continuing rapport between IH and RABA would probably be of greater benefit in negotiating future agreements or working out problems on the present transfer than even another form of leverage. On the other hand, part of this rapport may exist because the leverage was there already, on both sides.

One area with the potential for misunderstanding occurred in part because some leverage did exist. Fortunately, this situation was recognized and corrected rapidly. Permission to use the IH trademark is granted only after the products have passed all inspections and cleared all quality control checks, In the case of one

product in Hungary, however, IH became aware of the fact that RABA felt that IH was deliberately slowing down the program. This was presumably because IH had agreed to buy back some of the products, but RABA interpreted this to mean that IH did not want to buy back the products, and was using the trademark quality checks as an excuse. (If the IH trademark was not present, IH was not obligated to repurchase the goods.) However, IH soon assured RABA that this was completely wrong, as IH was only concerned that product quality be maintained at the corporation's worldwide high standards. In this regard, Poland had been exposed to Western quality control standards more than Hungary. This was an aspect of the Hungarian accord, not immediately apparent in the timing sense, which involved greater difficulty in Hungary than in Poland.

Hindsight

Factors which made the project easier than anticipated

Unfortunately, it appeared that none of the elements initially anticipated to make the Hungarian projects easier; less complexity, prior experience by RABA employees with axle production, and former IH experience in the non-equity form of technology transfer,

was particularly beneficial on this product. On the other hand, the rapport between RABA and IH was comfortable and delays in training and productions were relatively brief. The fact that production had commenced within two years of the start of the agreements emphasizes the positive working of the project.

Factors which made the project more difficult than anticipated

In fact, the expectations of IH that this Hungarian transfer would be easier may have inadvertently made it slightly more difficult because IH was not anticipating some of the difficulties. For example, IH tended to accept RABA's time schedule estimate when it might have been more accurate had IH plotted its own, based on its own experiences. Had the extent of untraining been realized, more emphasis might have been applied in urging Hungarian workers to follow IH instructions. It does appear that, in general, prior experience certainly is more of an asset than deficit. It also appears that the contract format of the agreement has an impact on the success of the project, and IH has certainly benefited from its prior experiences in this regard. However, operating on past occurrences may also sometimes distort the perception of new situations.

Progress of Future Expectations

Additional projects are in the works, based on the growing success of the IH-RABA agreements. The current agreements between IH and RABA deal with truck axles and agricultural equipment, but the possibility of an exchange type of program between RABA in Hungary and Bumar in Poland was being explored with the Hungarian products to be bartered for the Polish-made construction equipment of IH design.

Yugoslavia

The Bendix Corporation

Description Variations

A comparison of the expectations versus the outcomes of the Bendix Agreement with Vartek at a point in time four years after the onset of the agreement and just after the startup of the actual production of the organic friction material found relatively few items of disagreement. The price Bendix had placed on its technology had been accepted as fair and equitable. Production had been delayed for almost a year and the friction materials, when produced, had not been up to specified quality, but these problems had been overcome. The working relationships between Bendix and Vartek were excellent, to the point where Bendix was seriously considering exercising its option of joining Vartek in an equity position or joint venture.

One situation had arisen in connection with the workings of this agreement which illustrates both the advantageous and disadvantageous aspects of multinational corporations when involved in such undertakings as this agreement. The broader range services able to be provided by a multinational corporation are usually an

advantage, as in this instance where the disc brakes and the friction materials were able to be provided. Bendix, in Michigan, through this agreement had been able to provide benefits to Yugoslavia which the French subsidiary of Bendix, DBA, was unable to fulfill. Thus, Bendix, through its multinational operations, was able to provide a service through its wider range of technology and products than would have been possible through just one company. However, this multinational factor may also generate disadvantages, problems, or misunderstandings. One such incident occurred after this agreement with Vartek was underway. Bendix acquired another company after January 1975, which held a formula for another type of organic friction material. Vartek contended that this formula should be provided to the Yugoslavian company since it was an advanced form of the technology which according to the contract was to be provided by Bendix to Vartek until 1983.

Vartek's position was that all technology related to the brake friction materials which was available to Bendix both directly and through its subsidiaries should be covered by this agreement. Bendix, on the other hand, felt that only the technology held by the corporation based in Southfield should be subject to this agreement. Its subsidiaries operate independently and information held by them should not be involved.

In this instance, a compromise was reached. The new formula was provided to Vartek, but the training sessions on this new formula provided by Bendix were conducted at a Bendix subsidiary in Spain, not at Troy, New York, where the other training had taken place. No additional payments were requested.

Current Corporate Perceptions
of Agreement Benefits

The reasons for the creation of the agreement have remained constant, but the emphasis has shifted. Initially, the foremost rationale was to be the monetary gain from the fees paid for the technology and the use being made of the technology. However, the compatibility which Bendix and Vartek in Yugoslavia achieved helped to change the emphasis from immediate monetary gain to that of establishing a toehold in Eastern Europe which could lead to greater involvement for Bendix, both within Yugoslavia and throughout other countries in East Europe as well as in the Soviet Union. At the same time, the Agreement with Yugoslavia was increasingly seen as distinctive, primarily because of the characteristics of the country which distinguish it from other countries in Eastern Europe. This is particularly true in regard to its related freedom from controls and accompanying lower emphasis on security.

Negotiations

The feeling of Bendix was that the agreement had been concluded without unpredictable difficulties. Cognizant of the independent nature of companies in Yugoslavia compared to most of the other East European countries, the corporation still felt that the Vartek company would have to await approval from the government. However, it appeared that there was no lengthy or heavy government scrutinization. Neither was the agreement requested to be scaled down, either in regard to its duration or the amount of the requested payments. Bendix derived the price placed on its technology after consideration of several factors: its importance to the buyer, its estimated remaining product life before replacements take over, the likelihood of suite or patent infringements, and an analysis of potential competition as well as the estimated production demand.

Time Frame

Behind schedule

The startup of the actual production was behind the projected schedule by six months to one year, and finally began in full in early 1979, four years after the agreement was ratified. The delay was attributed to

the inexperience of the company and its employees in production of this type. An accompanying problem involved the inadequately low quality of the friction materials which were being produced. However, additional specific training helped to overcome these problems so that production currently met both quantity and quality specifications. This training specifically concerned the selection of raw materials and the qualification or acceptance procedures needed to approve those raw materials. The delay did affect Bendix since additional visits on the part of corporate personnel were required, and the payment schedule annually collected was limited to the minimum royalties. The incentive to meet anticipated production quotas was high, however, because the sooner the production was up to expectations, the sooner Vartek would be able to satisfy some of its contractual obligations.

Future schedule

The projected time frame was for the designated ten year limit, but expectations now are that an extension will be requested in regard to the updating of the technology. No official request has been made to exercise the equity option and, at this point, only six months remain in which to do so, or by January 24, 1980. Since

production has been in progress only six months using the original formula, no updating in the technology has been added, although it is highly possible this will be done before the agreement is concluded.

Financial Flows

Payments

Bendix noted that lump sum payments of specific amounts are requested in contracts of this type within Eastern Europe more often than payments based strictly on sales or royalties. The agreement stipulated that Bendix was permitted access to Vartek records for verification of sales, however no problems were anticipated regarding the accuracy of these royalty payments. It was also pointed out that since the friction material was used in the automobile production, a fairly accurate count would be possible based on the number of automobiles manufactured each year.

So far, only the minimum royalty fees have been paid to Bendix. Vartek has submitted a quarterly report of sales, documenting the amount of friction materials sold. Three annual payments have been received, in addition to the initial disclosure fee. The annual fee payment schedule has been approved by both parties through reports on production and sales done on a quarterly basis.

Eventually an additional benefit should be that the minimum royalty payments to Bendix will increase proportionately as more friction material is produced. So far, Bendix has not had any problems with the payments in U.S. dollars, although the set fee reflects the rate of inflation only through increases in the selling price of the product. No problem occurred in connection with the payments--either as to the form, timing, or collection.

Purchases from the domestic company

There have been no major purchases by Vartek of completed organic friction materials. This was not expected but is always a possibility when a firm has a contract to fulfill and production is delayed. The anticipated two months supply of non-assembled friction materials were purchased, but more as a training aid than in filling a certain quota. Vartek also imported resins from Bendix, U.S.A., as of September 1978 but this need was not expected to exist beyond a year.

Bendix has found that Eastern European countries will not make large quality purchases in most cases, attributing this behavior to the shortage of hard currency in those countries, making such purchases relatively difficult.

Purchases by the domestic company

Bendix has made no purchases in Yugoslavia of any consequence in connection with this project.

Personnel

Training assessment

The high morale of the employees in Vartek appears to be somewhat unusual in comparison to Eastern Europe as a whole, but the reasons for this appear to lie partially within the structure of Vartek itself, and partially with the governmental structure of the country. The company has had a very high reputation, at least in its production of textiles, so an accompanying factor of employee pride in craftsmanship already existed. As well, the company has a high level of community involvement. Thus, the delayed production schedule and accompanying low quality problem were not a result of low employee morale and, in part, represented a challenge to the workers.

There appears to have been a minimum of language difficulties up to this point, although several problems appear to have arisen through the necessity for language translation. If confusion or misunderstandings occurred,

a closer assessment of what was being said appeared to resolve the difficulty.

Part of the Bendix policy in communication is to have a written record of all interchanges. It is felt that this custom has prevented many communication problems from occurring or increasing.

At least five visits to the site in Yugoslavia had been made by three different Americans from Bendix--with each visit approximately a week in length. Reciprocal visits had been made by two Yugoslavians to the United States, again for a week each time.

The intensive training was started in 1977 and concluded, for the most part, that same year. At this point in time, training will most likely involve variations resulting from the revised formula and in the future, will most likely be limited to updating or improvements.

Vartek paid for all travel expenses, as stipulated in the agreement. The expenses were directly paid for all Yugoslavian travel and invoices were sent to Vartek for all expenses incurred by Bendix technical and training representatives.

The delay in the production startup was attributed to the inexperience of the workers with such a manufacturing process, but this was said to be solved by additional training directed toward specific trouble spots.

Other personnel involvement

There have been no security problems in the agreement either on the part of the United States or Yugoslavia. This technology was not viewed as a security issue, so no U.S. governmental approvals were necessary. The contact between the Yugoslavs and the Americans appears to have been open and unrestricted. However, it should be pointed out that no American assistance was involved with the construction or equipping of the factory beyond the suggested list of equipment items. Furthermore, the training visits involved a very small number of Americans to Yugoslavia, or Yugoslavs to the United States for the relatively short period of a week in each instance, so contact between the two groups has not been highly extensive.

Protection

Leverage assessment

Domestic company. The incentive behind encouragement to start the production as soon as possible was the fact that Vartek had to pay Bendix a minimum royalty for each year, whether the product was being manufactured or not. Thus Bendix maintained a high degree of leverage in that the company's expertise was seen as a source of

knowledge from which to work through training problems and overcome any difficulties. Furthermore, most delays would not cost Bendix any additional expense as Vartek would be the party most concerned about getting the production moving.

Host. Bendix had made its hopes of extended and increased involvement known and Vartek, as well as Yugoslavia in general, would be the contact. Therefore, there was high concern that this immediate project be successful so that more would be forthcoming.

Utilized inspections

Inspections have been used to determine that the quality of the materials is up to specifications.

Patent/trademark defenses

No patent suits or infringements have been brought up and Vartek has not requested any export permission for the materials, apart from the use as original equipment on the cars. Use of the phrase "made under license by Bendix" beyond the termination of the contract will cease if no extensions are applied to the agreement.

Legal provisions invoked

Thus far, arbitration has not been invoked, nor has there been any provocation for considering arbitration. Neither has there been any situation calling for a termination of the agreement due to default. Furthermore, no instance has arisen which would point out the lack of a true Force Majeure clause in the contract, or force an interpretation on the contract on such a point.

Hindsight

Factors which made the project easier than anticipated

The rapport between Bendix and Vartek has undoubtedly been the greatest asset to this venture and the mutual anticipation for the extension of this agreement as well as for additional projects has provided an impetus to make this agreement as successful as possible. The lack of unexpected or difficult problems has provided a relatively smooth period of operation throughout this agreement. The control which Vartek is able to exert over its responsibilities on the project have also provided an adaptability which is sometimes lacking in some of the other East European nations.

The relatively small size of the project also aided the ease in which it has been executed. Bendix did not have any construction or even equipment supplier responsibilities but only functioned in an advisory capacity in this regard. Furthermore, unlike agreements which require the seller to cover all expenses within the established fee statement, this agreement permitted Bendix to be reimbursed for all actual expenses over and above the stated disclosure fee and subsequent royalty payments. This was a possibility because this project had a minimum of travel or training expenses compared to most other projects involving a high degree of technology transfer. Bendix also benefited in a general way from the presence of its subsidiary's agreement with Vartek which was much greater in scope than the specific friction-materials production project which has been analyzed. The subsidiary, DBA, helped to smooth the way in many cases, setting a general form of operation which Bendix (U.S.A.) was able to follow as well.

Factors which made the project more difficult than anticipated

The only difficulty of any magnitude encountered to this point in time appeared to be the delay in production startup time, with an accompanying low quality problem in the materials which were produced. This was

attributed to the inexperience of the workers, who had come out of a textile production background and to the lack of suitable raw materials, with the lengthy acceptance procedure which had to be instituted to assure specified quality.

Progress of Future Expectations

Bendix had not actually taken any steps toward changing the non-equity aspects of its Vartek agreement into a joint venture, but was still considering this alternative.

Other than this option, which had to be exercised before January 24, 1980, no immediate projects were in the offering either in Yugoslavia or other countries of Eastern Europe. It was anticipated, at this stage, that the agreement would be extended, on a year-by-year basis, after the initial ten year time period has been reached in 1986. It was also hoped, on the part of Bendix, that the agreement would materialize into a larger project but nothing concrete had been concluded.

FOOTNOTES--CHAPTER IV

Poland

Clark Equipment Company

¹Lewis J. Lamm, article for Polish Foreign Trade Journal, author's monograph, 1977, p. 1.

²Polish Machine Industry Offers 5(73) (1977):8.

³Polish, p. 8.

⁴Eric W. Hayden, Technology Transfer to East Europe: U.S. Corporate Experience (New York: Praeger Publishers, 1976), pp. 48-49.

⁵Lamm, p. 1.

⁶Lamm, p. 2.

⁷Hayden, p. 48.

⁸Lamm, p. 1.

⁹Hayden, p. 52.

¹⁰Lamm, p. 3.

¹¹Lamm, pp. 9-10.

International Harvester Company

¹Jerzy Szumski and Janusz Piotrowski, Bumar (Poland) - International Harvester (U.S.A.) Cooperation Is Now Over Five Years Old and Keeps Growing (unpublished monograph), Chicago, Office of Polish Commercial Consul, May 1978, p. 5.

²Polish Machine Industry Offers 5(73) (1979):5.

³Polish, p. 5.

- ⁴Szumski, p. 11.
- ⁵Polish, p. 6.
- ⁶Szumski, p. 12.
- ⁷Szumski, p. 18.
- ⁸Polish, p. 5.
- ⁹Polish, p. 5.
- ¹⁰Szumski, p. 19.
- ¹¹Szumski, p. 20.
- ¹²Szumski, p. 15.
- ¹³Szumski, p. 22.
- ¹⁴Szumski, p. 17.
- ¹⁵Business International S.A., "IH Reorders Priorities to Emphasize Asset Management Over Sales," April 15, 1977, p. 119.
- ¹⁶Business, p. 115.
- ¹⁷Szumski, p. 13.
- ¹⁸Szumski, p. 10.
- ¹⁹Polish, p. 5.
- ²⁰Eric W. Hayden, Technology Transfer to East Europe: U.S. Corporate Experience (New York: Praeger Publishers, 1976), p. 54.
- ²¹Hayden, p. 54.
- ²²Polish, p. 4.
- ²³Polish, p. 4.
- ²⁴Polish, p. 4.
- ²⁵Business, p. 115.
- ²⁶Polish, p. 7.

- ²⁷Szumski, p. 25.
- ²⁸Hayden, pp. 56-57.
- ²⁹Szumski, p. 16.
- ³⁰Polish, p. 4.
- ³¹Hayden, p. 57.
- ³²Szumski, p. 22.
- ³³Szumski, p. 22.
- ³⁴Polish, p. 8.
- ³⁵Hayden, p. 56.
- ³⁶Szumski, pp. 23-24.
- ³⁷Szumski, pp. 24-25.
- ³⁸Szumski, p. 12.
- ³⁹Hayden, p. 57.

Honeywell, Inc.

¹Eric W. Hayden, Technology Transfer to East Europe: U.S. Corporate Experience (New York: Praeger Publishers, 1976), p. 60.

²Hayden, p. 63.

Westinghouse Electric Company

¹Donald A. Walczak, "A System for Transfer of Manufacturing Capability," unpublished manuscript, 1978, p. 1.

²Donald A. Walczak, pp. 1-2.

³Howard Wolff, "Polish Plant Ready to Roll," Electronics, October 14, 1967, p. 75.

⁴Howard Wolff, p. 75.

Romania

General Tire

¹G. Prekopa, "Technology Transfer to Eastern Europe: General Tire's Experience in Romania," panel presentation at the 75th Annual Meeting of the National Machine Tool Builders Association, October 29, 1976, p. 6.

²Prekopa, p. 4.

³Eric W. Hayden, Technology Transfer to East Europe: U.S. Corporate Experience (New York: Praeger Publishers, 1976), p. 96.

⁴Hayden, p. 96.

⁵Hayden, p. 96.

⁶Hayden, p. 96.

Clark Equipment Company

¹Lewis L. Lamm, address to the Foreign Trade Convention, November 18, 1975, unpublished paper, p. 7.

CHAPTER V

SUMMATION OF RESULTS, WITH CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS FOR FURTHER STUDY

Assessment

The expectations and resultant outcomes of the selected corporate technology transfers to Eastern Europe have been presented in case-by-case instances. However, an analysis needs to be made of these transfers in a collective sense, with the purpose of compiling suggestions for further non-equity approaches, especially into the East European area. An analysis of the results considers these transfers under two categories: descriptive factors and analytical factors. Descriptive factors, as laid out in Chapter II, include:

Direct transfer of technology: product/process, skills/training tasks, language barriers, delays (specifically relating to the product or knowhow), and other technology-related factors;

Indirect transfer of technology: construction, equipping and layout of plant or factory, raw materials acquisition and approval, and other supportive capabilities;

Environmental considerations: geographic factors, cultural interfaces, security issues, logistics, and accommodations;

Political arena: home governmental concerns,
host governmental concerns, and home labor
union objections;

Financial flows: payments, supplemental
product purchases, incidental expenses;

Leverage and control;

Contract format;

Expectations which did not materialize;

Unexpected occurrences: rapport, change,
product source, quality control,
technological boundaries;

Benefit to the corporation.

Analytical factors, as identified through an
analysis of the eight cases of technology transfers just
described, include:

Technology: type, planning, staging;

Training: needs, approaches, prior experience;

Potential problems: disasters, delays, misinter-
pretations, change, development limits,
competition, restructuring;

Leverage: initial position, ongoing leverage;

Contract preparation: negotiations, format;

Facilitating aids: political involvement, labor
unions, personal contact and support,
realistic timing;

Transfer rationale: financial compensation,
other benefits.

This study will conclude with an assessment of
the limitations of these results, and some recommendations
for further study.

Descriptive Factors

It should be pointed out that all the technology transfers considered here have been successful to both parties, in the short-run, at least. The technology has been imparted to the receiving country and the products or processes are, in every case, currently being produced at least to some extent. Each country has provided the specified payments to the MNC as required by the stages of the transfer laid out in the contract. In terms of the bottom line of the MNC, each transfer has lived up to its promises, guarantees, and responsibilities. This refers both to the transfers which have already been officially terminated, and to those which have yet to reach the concluding date as set by the respective agreements. Remaining responsibilities appear limited to updating provisions including concluded projects if extensions were granted on patents or other aspects, supplying additional models, obtaining a higher percentage of locally-produced components, passing final tests, and/or providing additional approvals as required to meet certain specifications or trademark criteria.

Direct transfer of technology

Product/process. The transfer of technology as exemplified by technical information such as carried by

blueprints appears to be perhaps the least difficult aspect of the entire transfer process. Two aspects were emphasized by a majority of the transfers: one, the more familiar the technology the more successfully it transferred; two, the more carefully planned the transfer, the more easily it was accomplished, with the least disruption.

International Harvester, for example, found that the transfer of the more familiar crawler tractor technology was easier to transfer to Poland than its more recent wheel loader information. Honeywell found that certain product problems, especially in regard to production, became apparent. These difficulties were not limited to the transfer to Poland, but rather, were first noticed on Honeywell's own production capacities within the United States. Honeywell actually turned this particular problem area into an opportunity, however, when the additional attention paid to the production in the United States resulted in the development of a systematic approach to teaching the method in Poland.

General Tire's radial tire transfer to Romania provided an example emphasizing the disadvantages of transferring the less familiar technology. GT's line of radials represented one of the company's newer technological areas. Consequently, GT had little knowledge of the performance of its tires over a long period of years,

although the company certainly had adequate assurance of their radial tire's performance capabilities. However, some of the described problems might be traced to unfamiliar technology.

Those firms encountering 'latest-technology' problems all attributed the source to the fact that the East European countries insisted on the very latest version of the technology available. This was certainly not a criticism of this requirement. Despite any hardship or extra difficulty which might result, each firm had, for one reason or another, acceded to this request. In many instances, this concession was made by the MNC in order to obtain the contract.

Furthermore, it should be pointed out that once the agreement had been ratified, all firms were conscientious in keeping the East European countries informed of the most updated versions of the products. This benefited all parties concerned, particularly as some of the American firms, such as Clark, International Harvester, and Westinghouse anticipated using the East European manufacturing facility as an additional source for their own international marketing needs. Honeywell noted that such strong emphasis on updating might cause some immediate delays or slowdown in the immediate production process, but in the long run, both sides benefited

from the latest advances or improvements in the product line.

Careful planning was stressed by a number of firms. The most detailed transfer appeared to be that organized by Westinghouse, with its computerized lists which included even the number and placement of the wastebaskets. The advantages of figuratively 'freezing the process' did not appear to be confined to the transfer itself, as project manager Walczak pointed out that Westinghouse was able to streamline its own production through such an intricate breakdown of tasks, equipment and production steps. Clark Equipment noted that careful planning was 'vital' to attempting such a technology transfer, while Honeywell went one step further. It pointed out that not only must the transfer and training steps be carefully charted out, but prime insistence must be placed on absolute adherence to each and every instruction. Honeywell's insight had been gained second-hand through some experiences which had occurred to its Scottish subsidiary. Its resulting demands appeared successful as its transfer went smoothly, despite the high complexity of its product. Westinghouse seconded this advice: careful planning was essential but had to be carried out to be effective.

The attitudes surrounding these technology transfers transcended the monetary benefit to be gained.

The possibility of repurchasing the products was one incentive behind the concern of the MNC's for high product quality, but not the only one. At least two firms supplied technology which was not able to be used in the United States, such as Bendix in Yugoslavia. Others helped to adapt the products to local conditions, as in the case of Westinghouse and International Harvester in Poland. These firms also emphasized their desire to help Poland as much as possible in utilizing the technology; the adaptations were not useable back in the United States.

Technology flowed both ways as many of the firms became involved in joint venture projects which were expected to help the U.S. to varying extents. Clark Equipment was one of the few firms to actually anticipate such a possibility in its contract. Several others, however, such as International Harvester, emphasized opportunities which might exist such as making use of metric conversions as applied back to product scaling in the United States.

In most cases, contracts contained clauses affirming the rights of the MNC's to any developments, including patents, which might result from the technology transfer and innovations created from their basic technology by their East European partner. The purpose of such clauses might be interpreted foremost as an

optimistic insurance policy. This would be to protect the possibility that should something of worth be derived, the MNC would then have ownership rights. However, these clauses may also be viewed as positive outlooks, expecting that the knowledge generated by the partnerships would be likely to lead to additional benefits.

Of all the joint ventures materializing from these technology transfers, International Harvester appears to have become involved in projects carrying the greatest magnitude. One part included the metric scaling of certain aspects of their vehicles, particularly the crawler tractors, which would, hopefully, be useful to IH in their American manufacturing plants someday. As well, however, IH was working with the factory at Huta Stalowa Wola and Bumar in jointly developing a torque converter and a power shift gear mechanism which would be valuable for both IH and the Poles.

Clark Equipment was involved in joint development projects in both Poland and Romania. Unfortunately, the Polish endeavor involving a metrically scaled axle had become embroiled in a technical suit when Clark maintained that it should be paid a high percentage of royalties because the product developed by the Poles had been influenced by the Clark technology. The Poles, on

the other hand, taking the position that their product was substantially different from Clark's, therefore felt that only a very small royalty payment should be paid to Clark. Clark's joint development in Romania had progressed with less controversy, and Clark, at least, felt that their Romanian venture exemplified teamwork. The Romanians designed the product, Clark had agreed to help produce the prototype, and both partners would be involved in the testing.

Neither Westinghouse nor Honeywell had become involved in a major joint development project, but this may have been due to the relative brevity of their contracts with Poland. General Tire, in Romania, was considering the development of a metric version of some equipment. This might be seen as a reverse technology flow, since the information originating in Romania would be sent back to the United States to help with the changeover to the metric standard--should such a change become necessary.

Product quality was crucial to each transfer. General Tire was the only firm among the transfers considered here whose entire product, the radial tires, had yet to pass all acceptance tests at the time of this assessment, although some models or certain components were still to be approved on other projects. It should be pointed out, however, that the acceptance tests for

the tires as laid out by Romania and GT, did not just involve a series of tests at one point in time, but actually required durability runs covering more than a year. Furthermore, the tests in Romania had been severely delayed due to environmental factors.

The overall quality of the final product was a concern in all companies, but inclusion of the corporate trademark intensified this factor. IH distinguished the components which were permitted to be obtained from local or third-party manufacturers and those which had to be from IH or another approved source. This referred to the Polish project involving the construction of the Bumar-built crawler tractors or wheel loaders. To carry the IH logo, the vehicles manufactured in Poland had to incorporate the IH diesel engine, in addition to conforming to the above requirements.

Skills/training tasks. The virtually unanimous verdict from the firms involved with the transfers was that the East European trainees were far more skillful and had better technical expertise than had been anticipated. This was stated both by firms who had initial reservations regarding the available technological abilities of the trainees and by firms who assumed that the Eastern European workers possessed the necessary skills and background. Bendix appeared to be one of the least concerned about training needs (despite the

fact that the workers to be employed in the manufacture of friction materials for disc brakes had previously been employed as textile manufacturers--a highly divergent process). Ironically, Bendix found that a great deal of training was needed. However, Bendix was also highly complimentary about the ambition and determination of the Vartek employees in Yugoslavia, in mastering the new techniques.

In several instances, retraining or unlearning appeared to be a necessity. For example, IH found retraining necessary in Poland, but even more essential in their Hungarian operation. This was in spite of the fact that their manufacturing operation in Poland was far more extensive. IH appeared to feel the additional need for retraining in Hungary might be due, surprisingly, to the relative simplicity of the product. The complexity of the construction machinery being transferred to Poland required Bumar workers to adhere strictly to IH instructions. In Hungary, the workers may have felt they already were familiar with manufacturing techniques required for producing agricultural machinery, and hence, did not follow IH recommendations as closely. It was also felt that IH did not adequately anticipate the extent of training which would be necessary in Hungary. This was a bit surprising since IH had encountered a high need

for certain training on the Polish project, and there was little reason to think the Hungarian project would be much different. In any case, IH's prior experience was not beneficial in this regard in that it did not provide additional guidance for other projects.

The GT project in Romania provided another instance where retraining appeared to be one necessity of the operation. In retrospect, General Tire representatives realized that the Romanians felt they already knew how to produce tires because they had been manufacturing tires for a long period of time. The production of radial tires was a variation which did not seem to provide enough difference for changing procedures.

Honeywell, as mentioned before, felt that part of the successful training experience was due to the corporate insistence that all instructions be followed to the letter. The corporation also found, however, that their training approach where a small body of workers were instructed who then, in turn, trained additional workers, was highly successful. The 'each one-teach one' approach tended to instill the skills as well as expanding the knowledge to others.

Prior contact with Western-based firms appeared to be important in the quality control line. IH found, for example, that Bumar in Poland accepted the standards

level set by IH with more understanding than the Hungarians. This was taken to be because Poland had become aware of Western quality control levels while Hungary had not had much exposure prior to the IH project. To aid the process in Hungary, IH reduced the number of inspection points from 27 to 15, to make the procedure as simplified as possible. Fifteen checkpoints appeared to be the lowest number of inspections that could be made without any resultant quality loss.

However, even prior contact with Western quality standards was not always sufficient. Overall, it took IH five years from the start of its endeavor in Poland until the first model was pronounced acceptable for the IH trademark. Clark found itself in a situation where many of the initial workers on its projects in Poland were discharged because the production quality was not up to specifications. Unfortunately, it was felt that the problem did not lie with those individual workers, but with the general adaption of the Western quality standards. By the time new employees were trained, the entire group had, in reality, become more adjusted to Western quality demands. In general, Clark was eventually well pleased with Bumar reliability, product quality and delivery commitments. Furthermore, it appeared that the experience in regard to training which Clark gained in Poland enabled Clark to avoid some of the same problems in Romania.

Lower morale and a lack of worker incentives were reputed to be commonplace throughout Eastern Europe, and many of the firms taking on these technology transfers had a precognition of some of the conditions which would affect their training programs. However, except for some instances of low morale reported by Clark and IH, these factors did not seem to have a great impact upon the training or skills transfer.

Some specific training problems were evident. Several firms observed that the high skills exhibited by the workers could be misleading because it did not indicate a general competency in all instances. For example, Westinghouse found it had to assess skills in each area and could not assume that particular expertise was always present. For example, General Tire pointed out that the lack of positive incentives, combined with the punishment accorded to workers making wrong decisions, produced employees who refused to take on responsibility in Romania. Once all responsibility for decisions was removed, however, GT described the Romanians as hard-working individuals.

Training in certain processes was not the only type of technology or knowhow to be transferred. Training in supervision and basic managerial principles was also found to be necessary. Westinghouse and IH both provided such training in an informal manner on

their projects in Poland. Westinghouse found it needed to instruct employees in cleanliness and safety standards. Pragmatically, it found that such standards were followed and enforced best when the reason for the regulations was plainly obvious. Clark, too, noted that environmental procedures, such as sealing concrete floors, were lacking in Romania and needed to be upgraded. IH even went beyond the level of supervisory training to provide marketing training as well to the Poles and helped RABA, in Hungary, in selling some of the Hungarian products which were not even part of the IH project. Clark also noted that attention paid to cost controls was finally being applied and that inventory control, extremely difficult at first, had improved as well.

Conclusion of a project was seen as an important phase of the entire operation. Westinghouse and their Polish partners created a film depicting the project's successful completion. As well, the project manager timed the departure of the Westinghouse employees so that the Polish workers were gradually required to operate the project on their own, staging it so that the transition was done smoothly and without great stress.

Language barriers. Somewhat surprisingly, considering that all eight technology transfers involved at least two languages, no company reported any language difficulties over and above problems generally expected.

Bendix felt that part of their success in avoiding misunderstandings in the language area resulted from the corporate practice of having a written record of all verbal interchanges or instructions. Westinghouse, with its computerized system, found that instructions at all processing stations printed in both English and Polish were a great help. Westinghouse feels that problems often occur, not from the confusion resulting from language misunderstandings, but from not being able to obtain information easily--regardless of the language. To provide such information and to facilitate the production flow from area to area, Westinghouse developed a system of visible charts, with production flows, expenses and other information readily legible. This information was audio as well as visual, with a system of buzzers and lights worked out to provide warnings and signals more or less transcending any one language. In fact, Westinghouse seemed to feel that such a system of broadcasting basic information helped to reduce costs and streamline production as well as overcoming language problems.

Delays. Delays appeared on every project in one respect or another. General Tire probably had the most severe delays, caused by the earthquake and accident to the road test vehicle. However, an earlier delay caused

by the petroleum shortage which hit the United States just prior to the mid 1970's, was actually the primary delaying factor. This petroleum shortage slowed the manufacture of the equipment ordered by GT for the Romanian tire plant. As the equipment warranties were only for a specific period of time, GT found itself with the responsibility for repairing equipment which had passed the warranty period. The subsequent disasters compounded the initial one, and time became a critical problem. International Harvester, in Hungary, and Clark, in Poland, also reported delays in obtaining machinery ordered for equipping the factories. Clark, in particular, encountered another instance of 'cumulative' delays where the initial delays in axle production, caused by equipment shortages and training problems, were then affected by the impact of the recession. Thus, when production capability was finally on-stream, demands had diminished. IH also had tooling delays affecting the project in Hungary.

The testing, or even obtaining, of raw materials which met requisite specifications, was time-consuming for a number of companies. Bendix, to get its product on-stream, supplied some needed resins during the early years of the contract but felt this would be a temporary situation and that such resins should be locally available shortly. General Tire in Romania, Bendix in

Yugoslavia, IH and Westinghouse in Poland; all reported production delays resulting from the extended time required to test out the local raw materials. Westinghouse found that the raw materials outages as well as the time needed to test the raw materials which were obtained doubled the delay factor.

Another factor creating some delays appeared to stem from the hard currency shortage in Eastern Europe. Honeywell, Westinghouse, and IH in Poland all reported that delays in production were caused in part because some components were unable to be purchased in quantity due to a hard currency shortage. Other delays were caused by special situations. For example, Westinghouse found that additional time was needed to achieve the level of cleanliness required for their intricate production.

Time projections were under-rated in some instances. Clark, in Poland, found their initial time frame too ambitious, under-estimating the time which would be required to accomplish certain steps. General Tire, in Romania, found the same thing to be true. In both cases, however, the time frame had been set with five year plans or other national objectives in mind--not just the project itself. IH, in Poland, was operating under the time schedule as set by Bumar. The company

suspected the time allotment was overly optimistic. IH was right. Clark's project in Romania was running a year behind schedule, but Clark did not feel that this was occasion for concern. They felt the original estimates may have been too brief, because no production or other major problems appeared to exist in Romania. Westinghouse, too, stressed the importance of realistic time frames with enough time to accomplish designated tasks.

Not all delays were caused by factors within Eastern Europe. The refinement of the technology back in the United States caused a delay both for IH and Honeywell in their respective transfers to Poland, as mentioned earlier.

On the other hand, Westinghouse felt that numerous delays were avoided because all equipment to be shipped to the project in Poland was collected, inventoried, tested and packaged into containers in Pittsburgh. Furthermore, the equipment was held until the stage of the project in Poland was ready for such equipment; then it was permitted to be shipped overseas. In the long run, this system carried a higher guarantee that the equipment arriving in Poland would be suitable and in working condition. Tighter control over the equipment inventory in this situation, it was felt, also helped to avoid losses, deter any major theft, and reduce breakage.

Indirect transfer of technology

Construction. Numerous firms encountered delays in the actual construction or renovation of the facilities. This was most crucial for the American firms who were to supervise the construction, as in the case of GT, but it also affected the overall timing of the project in every instance. The firms who fared the best in these situations were those whose contracts had listed specific responsibilities for each party, and had included stages to those responsibilities. Thus, Honeywell and Westinghouse, for instance, were able to encourage the Poles to complete their responsibility in construction because the MNC's would not provide the next level of their technology until the specified construction had been completed. In such a case, the delay would provide additional expense to Poland, but have little impact upon Honeywell's or Westinghouse's operations.

Equipping and layout. The impact of delays upon equipment warranties has been already mentioned, as has the advantage of pretesting and packaging equipment prior to shipment abroad. Several companies mentioned the advantages of purchasing new equipment, because manufacturer warranties usually accompanied such purchases. It was also noted that an accompanying advantage in such

instances was that many equipment purchases could be negotiated to have the machine set up and initial tooling included in the purchase price. But GT also noted that problems accompany new equipment if the MNC undertakes the responsibility of providing this equipment, especially when the MNC functions as the middleman utilizing outside suppliers. Since East European agreements often have finite prices, any delays or increases in equipment prices beyond MNC control must be absorbed by the MNC. GT stresses the desirability, instead, of being the contracting agent, not the prime contractor.

One problem encountered by GT was a conflict between maintenance and repair duties. Equipment maintenance was the responsibility of the Romanians, but repair of the machines fell to GT. As Romanian maintenance varied from the level usually desired by GT, repairs were more frequent. On the other hand, GT appeared gratified to note that the equipment seemed to be standing up better than anticipated under such circumstances. GT also encountered some instances of petty theft in regard to equipment. The items removed were, in most cases, not taken for the monetary value but for their unique qualities. Often these were objects which were not available for purchase on the local economy.

To avoid some possible delays in equipping the facility in Yugoslavia, Bendix not only provided a list of recommended equipment, but also a list of substitutions, including items which might be available locally. As hard currency shortages appeared to be a universal problem throughout Eastern Europe, such a practice appeared to be helpful. In some instances, local sources might also help to avoid delays in obtaining certain equipment as well.

International Harvester encountered technology questions by the Poles relating to some of the equipment or materials bought from third-party suppliers. As such, IH did not have the authority or information regarding such technology to transfer to the Poles. The Poles put what information was available to good use, however, as IH reported that Bumar itself constructed many of the tools to be used on the project. This created some delays at first, but paid dividends in the long run as expenses were curbed and repairs were far facilitated.

Raw materials acquisition. The delays resulting from the additional time required to either obtain or test the local raw materials have been described. The lesson appears to be that additional time should be allotted toward such purchases. Furthermore, initial testing does not appear to be sufficient, as the quality level in Eastern Europe was described as fluxuating.

Most interfaces with raw materials pertain directly to the production involved in the technology transfer. However, GT encountered an instance where GT was to have first rights toward the purchase of certain Romanian raw materials in the petroleum area. This was initially laid out as part of the negotiating leverage directed toward helping the Romanians finance their radial tire technology purchase. However, when GT attempted to purchase these materials, Romania refused and sold them to another bidder, at a higher price than GT's offer.

Other supportive capabilities. Accommodations and logistics will be considered under environmental factors, but direct project support falls into the indirect transfer area. Westinghouse found that secretarial help was difficult to obtain, yet was crucially needed on the project. Dual language ability appeared most vital in this capacity.

Environmental considerations

Geographic factors. The geographic factor which most heavily affected the projects in Eastern Europe during this time span was the earthquake which hit Romania in March 1977. As this type of disaster is relatively uncommon in this region, the probability of such

an occurrence was unlikely. As such, it was one of those times and incidents for which Force Majeure clauses are intended, and, in GT's case, used.

Apart from this natural disaster, no other geographic factors affected any of the projects to any appreciable extent. The location of most of the plants or factories within larger industrial complexes actually acts as a type of protection or insurance against many types of slowdowns or devastations, as heavy snows or other elements often would not affect production there as much as upon a smaller or more remote facility.

Accidents are liable to occur anywhere, but the one incident which impacted heavily upon a project was in the case of GT's road test vehicle which ran off the road in Romania and was destroyed. Since this vehicle was road-testing the tires produced in Romania, another vehicle had to be prepared and the tests had to be started over--a factor which added to the delays which had already affected the radial tire transfer.

Cultural interfaces. In general, all companies appeared to appreciate the cultural heritages as evidenced through their interfaces with the East European countries. The people were described as friendly and some of the individuals who had occasion to remain on-site in the region for any appreciable length of time, reported fond memories of their stay, as a whole.

Some elements were not totally desirable. Working procedures were not as efficient as would have been desired by the Americans. Incidents cut into the normal working hours, including extended sick leave, absences to attend funerals or other celebrations, or even demands for flag waving for officials enroute to or from the airport. On the other hand, Westinghouse found the Poles did not take lunch breaks and, in this instance, the Americans had to adapt to the approach of having many snacks but no meal, as such, at noon.

General Tire appeared to find life in Romania more difficult than most of the other firms involved with this study. However, it should be pointed out that GT's project required more Americans to live in Romania for longer periods of time. Many of the other projects often just had visits by corporate trainers which lasted no longer than three weeks at one time. GT did distinguish between the official policy of the Romanians and the local citizens. On the local level, GT representatives found the Romanians to be admirable people. Four GT employees married Romanian women and brought their brides back to the U.S. The approach of the Romanians was a problem, especially on the official level. GT's feeling was that the official tone used by the Romanians was often threatening or accusatory. This imparted a

lack of hospitality, as well as a reluctance by the Romanians to follow GT instructions.

Security issues. Part of the inhospitable feeling in Romania was due to the high level of security in the country. GT representatives reported instances of harrassment, both on the roads and in their homes. The movements of the GT expatriates were carefully watched by the Romanians, and they even noted that they were afraid to make many friendly overtures to the Romanians for fear of being misunderstood or of getting their countrymen into difficulty.

Surprisingly, however, GT's experiences in Romania were not reflective of impressions by other project representatives. Clark Equipment, also involved in Romania, had many supportive comments to make regarding the Romanians, and their high skill levels. Clark did say that security appeared to be a difficulty in obtaining exit visas for the employees selected to come to the U.S. for training, but apparently this did not present an overly-difficult problem. Poland and Hungary did not appear to present any difficulty, and Yugoslavia appeared to be fairly open. Thus, it may be that the reason for the variation in impressions might stem from the different projects in Romania. The rationale that an extended length of stay in one country would produce an accompanying negative attitude would not appear to be

always true, as other project representatives appeared to appreciate a country more with a longer stay. It should be pointed out that GT's project was faced with some setbacks of a severity not affecting other projects. These problems may well have influenced attitudes on both sides.

In some instances, it did seem to come down to a matter of rapport. Clark and IH both were initially favorably interacting with Polish representatives, but over the course of their respective involvement, Clark's involvement with Poland tended to decrease while IH's increased. At the same time, however, Clark enjoyed a heightened rapport with Romania, while GT did not seem to have the same relationship.

Logistics. Various aspects of logistics appeared to be frustrations, but not actual project deterrants. Westinghouse noted that their own experiences might have been due, in part, to the particular contract arrangements which required all transportation between the U.S. and Poland to be on the Polish airlines. As this schedule was rather infrequent, frustrations mounted. Furthermore, Westinghouse was required by stipulations accompanying Export/Import Bank regulations to utilize Polish carriers for a full half of all shipping on the project. This created some additional delays as some of

the Polish carrier schedules did not coincide with the Westinghouse shipping timetable.

Westinghouse, International Harvester, and General Tire all noted differences between the MNC and Eastern European definition of "adequate." 'Adequate' transportation, under Eastern European standards, included available public transportation, such as bus lines. However, the MNC's reported that such transportation was often not sufficient. Buses did not always run on schedule, often did not operate on weekends, and tended to not run often enough. General Tire resolved the difficulty by purchasing cars for its personnel in Romania; IH shipped over some International Scouts for its employees. Westinghouse rented automobiles there in Poland.

Westinghouse also reported a problem with slow mail delivery, especially between the U.S. and Poland. To overcome this problem, a shuttle arrangement was organized. Employees traveling between the U.S. and Poland also carried official correspondence.

Accommodations. The same problem regarding varying definitions of 'adequate' appeared to carry over into the realm of housing and living conditions. In retrospect, the MNC's felt that more specific descriptions of desired living arrangements within the original contracts would have avoided some of the disappointments.

As it was, most firms tended to make some variations. Westinghouse had been assigned some apartments but these were not felt to be as suitable as some other arrangements. Therefore, its employees shifted to a smaller, charming hotel which provided services such as restaurants as well. Westinghouse employees found this arrangement ideal, as it was homelike, most serviceable and permitted adaption to travel schedules. IH purchased some villas for its employees posted to Poland for the longer tours of duty, and shipped in some of the food items which were unavailable on the local economy. It should also be noted that, for the most part, MNC employees were compensated handsomely for their work on the respective projects. Discontentment with certain other aspects was seen at least partially offset by their financial reimbursement.

Political arena

Home government concerns. U.S. government approval actually exists on two levels in transfers of this type. The first level considers such technology transfers in regard to the political relationship between the U.S. and another country. The second level involves technology which might be considered a security risk, often regardless of the country or region involved.

General Tire included statements of U.S. government approval, a precaution with its roots in history as Firestone had attempted such a transfer several decades earlier but had encountered both public and political antagonism to such an exchange.

On the second level, Honeywell was the only company among the transfers involved in this study to have information which was seen as potentially sensitive enough to require additional U.S. government scrutiny. Indeed, the initial contract was concluded subject to U.S. government approvals in regard to the transfer of the sensor information. As it turned out, the U.S. government permission was granted. Even with U.S. transferral permission, however, the sensor technology was not to be provided until the conclusion of the five-year agreement. Honeywell worked out a system of controls whereby the technology was stored with a neutral third country as a precaution during the five-year period. This was a security measure against the intervention of political influences which might prevent the eventual transfer, despite initial U.S. government approval. The five-year time limit was completed without any intervening factors, so Honeywell was able to transfer the up-to-date sensor technology directly from its U.S. headquarters. However, such a storage arrangement

appears to be a highly feasible and a viable method for future technology transfers of a similar nature.

The spread of potentially sensitive technology from East European countries to the Soviet Union is an issue open to interpretation. Most of the technology transfer agreements contained stipulations that the technology was not to be transferred to additional parties, for reasons which ranged from political aspects to those of patent and trademark protection. However, reinforcement of these stipulations, at best, was only for the time period indicated on the contracts. Furthermore, control over the use of this information appeared limited as enforcement would be limited to international legal measures, of uncertain strength. Several companies did admit to concern over wrongful use of their technology, both in political and economic senses, but appeared to have taken the gamble that their East European trading partners would abide by contract regulations.

Only one company, Westinghouse, reported an undue amount of U.S. government red tape involved in obtaining their export license. This aspect appeared due to the fact that this transfer was somewhat unique in the type of information being transferred more than strictly politically sensitive.

Host government concerns. The cooperation received from the host governments in arranging and implementing these contracts appeared to be far more supportive than originally anticipated by the majority of the MNC's.

This support was initially most evident in situations where the East European country had sought out the American company. In such instances, even the negotiating time was often substantially reduced, such as in the case of Clark Equipment to Poland or General Tire to Romania. Bendix was reportedly amazed that the approvals in Yugoslavia did not appear to even require the permission at high government level, and that the contract was able to be concluded at the factory level. In this instance, once assured that Vartek would honor the contract with all its accompanying regulations, Bendix was ready to proceed with the transfer. Westinghouse and IH both described the Polish officials as extremely cooperative throughout the operation of the transfers.

General Tire found that government participation at higher levels helped to keep their radial tire technology transfer more efficient as officials with necessary authority were willing to step in if occasions required such support.

Westinghouse encountered a unique situation in that the Westinghouse subsidiary in England registered a protest against the technology transfer to Poland--not on the basis of the technology itself to be provided, but against some of the equipment being sold to Poland for the manufacturing operation. This protest stemmed from the type of blast furnaces suggested in the equipment listing, because the English subsidiary felt that their product line should have been suggested.

Home labor union objections. The major union objection to the technology transfers was expected to be regarding the loss of potential jobs for Americans. As such, several of the firms involved in these non-equity transfers pointedly noted two aspects of the transfers which actually benefited American workers. The first item was that in such transfers, the question of creating a facility in the United States or outside of its boundaries was not an issue. In each instance studied, the firm did not have (or had not apportioned) the capital needed to construct such an entity. Thus, the likelihood of building such a plant in the U.S. was not even one of the possibilities. Second, the sale of American-made components, and, in some cases, whole or sub-assemblies, was substantially increased, thus increasing American exports and benefiting American workers.

Several firms, such as Westinghouse, had expressed these advantages to the unions, with the view of preventing an dissention, and no firm reported overt union problems over these technology transfers.

One problem did occur, caused by some of the American workers although it was not promoted officially by any labor union which potentially jeopardized a project. International Harvester found that some of its individual employees had strong objections to dealing with communistic countries, and were attempting to sabotage the operation by putting anti-communist literature into boxes of components being shipped to the project in Poland. The Poles, unpacking these components, were upset and angered by these messages, thinking that IH did not really want to engage in the technology transfer. It was not until IH discovered what was happening, and put a stop to the propaganda campaign that relationships became better.

Financial flows

Summarizing the results of the financial flows from the projects results in several observations. Many of these appear reflective of common sense. For example, accurate timing appears crucial in achieving projected profit margins. An exception to this statement, however,

would be the delays in production which actually aided the financial flows for several companies, because additional products and components were purchased to compensate for the losses in production.

Payments. All arrangements between the MNC's and East European countries had payment schedules which were divided into at least two major areas: initial disclosure fee payments and on-going technical assistance or royalty payments. In most cases, the initial fees constituted the major bulk of the entire financial payment providing a less risky situation for those firms receiving these payments. In all instances to date, these payments had been made as stipulated. Westinghouse had noted a problem in that the banks through which the transactions would be handled within the United States had not been specifically indicated, with the result that Westinghouse, at first, literally had to chase down its payments from Poland. This may have been partially the fault of the contract terminology, but more likely the result of a new project where operations were not yet standardized, and where approvals both in Warsaw and in the U.S. were late in arriving. Next time, Westinghouse notes, it will stipulate the banks to be involved.

General Tire's operation in Romania was somewhat unique from other projects in two respects. First, a larger proportion of its payments would be due during phase two of its operation than in most other projects. Second, GT had been beset by the expenses caused by the earthquake and other events which had delayed the completion of the acceptance tests. Subsequently, the shift into the second part of the project had not yet occurred. Due to the unexpected disasters, GT was disappointed in the financial flows from the first phase of the project, but was hopeful of the second part as soon as the acceptance tests were completed.

Several firms emphasized emphasized the desirability for an escalator clause in the contracts in regard to purchase payments for both equipment and materials, as well as to payments themselves. This escalation might be tied to current price levels, or be a annual increase percentage but its mere existence provided the MNC's with an opportunity to guard against changing conditions. The difficulty with the inclusion of such a variable clause is that many contracts with representatives of the socialist bloc need to have finite financial limits laid out for the entire length of the contract. Under such a situation, however, this often places the MNC at the disadvantage, as prices usually rise. However, in one instance, the price actually dropped from the one in

the contract, but both parties were required to follow the prices as stated in the agreement.

Another clause which is sometimes included in East European contracts is that of the holdback. This provides the host with the option of not paying a final part of the fee until all responsibilities have been met on the part of the partner. Since something is usually subject for criticism in projects of any great magnitude, the holdback clause often becomes an obligatory extra fine or payment. Companies noted that if a holdback clause were required, it is best to have a very specific listing of responsibilities and duties of both partners. It is particularly important that one party not be jeopardized because of the actions of the party. GT felt that their arrangements with Romania tended to balance out as, on the one hand, their contract did contain a penalty clause, but, on the other, avoided a hold-back stipulation.

The financial flows appeared to reflect the balance of controls or leverage of the projects in general. Westinghouse and Honeywell each had contracts which clearly laid out all responsibilities for the Poles as well as for the domestic companies. Furthermore, in their contracts, all expenses were the responsibility of the host country, as was also the case of Bendix in

Yugoslavia. At least a minimum royalty type payment was required for each year of the project, whether production was in process or not. Thus, these companies were able to control their part of the operation, and keep it in balance with the progress of their partner with a minimum of expense on their part. International Harvester was to also receive a royalty type payment from both Poland and Hungary, but not until production was underway in each case. As delays were encountered, requiring additional IH employee time and travel, these expenses cut into the IH financial estimates for the projects.

Very few cost cutting hints were provided by any project managers, except for the suggestions by Westinghouse to make the expenses as visible as possible. Westinghouse also felt that tight inventory control, combined with pretesting of all equipment, helped to keep costs much lower than would otherwise have been the case. Even with its careful control, however, Westinghouse found that it was difficult to isolate travel expenses from living expenses, and adopted a per diem costing approach instead. Clark Equipment, in Poland, found other inventory problems to be affecting its financial basis. Clark had the responsibility for selecting the axle models to be produced. However, Clark found that relatively few numbers of numerous models were actually

demanded, although their assembly line techniques encouraged the larger production of fewer models.

Clark's financial flows in Poland were affected by more than just the number and types of axles being produced, however. The timing of its Polish operation, with production slated for the mid-1970's, coincided with the recession which hit Europe about that time. This slowed both construction and the demand for construction vehicles. Since the Clark axle was a major component in these vehicles, the diminished demand had a direct impact upon the profitability of its entire project. This was not always true as its project in Romania was just far enough behind the Polish one to escape the heaviest impact from the recession. Furthermore, the demand was such within Romania that Clark products were purchased even prior to the startup of production. Ironically, the Romanian project was bringing greater financial flows to Clark, even though the Polish project was of a much greater magnitude: a reminder that results, even in well-planned projects, are not always predictable.

No company expressed a major concern over the receipt of the royalty or technical updating fees which were to be provided during the latter portion of the agreement. General Tire was perhaps in the most risky position as its technology would have to be completely

transferred before production could commence. Thus, the technical service contract payments could be seen as updating fees, but GT's leverage at this point would not be very high. Many firms had opted for specific payments instead of actual royalty fees which are usually computed from product sales or production quotas. Bendix, one of the few firms to receive actual royalty payments, expressed no concerns regarding the auditing or book-keeping involved. Since the brake materials were to be installed as original equipment on the cars being produced in Yugoslavia, however, Bendix did have an indirect source to supplement its other production records. In comparison, GT admitted that it had no knowledge of the actual number of tires being produced in Romania.

Supplemental product purchases. Product purchases from the domestic company varied from project to project. Honeywell described the purchases of its sub-assemblies as far greater than ever anticipated, while Poland was glad to be able to purchase the units which acted as a training aid while also supplementing production. Furthermore, Poland had requested the ceiling raised on the number of sensor units which it would be able to purchase, despite the fact that the country would be provided with the sensor technology. Tooling machines to manufacture the sensor units was anticipated

to be very costly and continuing to purchase the items from Honeywell was seen as a less expensive alternative.

Honeywell had not anticipated being able to sell as many units as actually occurred, and was pleased at its overall sales. Other firms, such as International Harvester in Hungary, reported that certain items, such as component sales, were higher than anticipated, compensating for other sales, particularly those of complete units or total vehicles, which were lower than originally projected.

Westinghouse reported that its project with Poland benefited some of its third party suppliers as bringing these vendors into Poland to setup the equipment introduced those particular product lines in Eastern Europe. Some of these vendors were subsequently invited over again for trade shows and other business, totally apart from Westinghouse.

Incidental expenses. Generally, purchases of transportation vehicles and accommodation supplements exceeded corporate expectations in this category. However, this applied, on the whole, only to firms involved with on-site responsibilities over a long period, not to those whose involvement was concentrated into shorter time periods. Westinghouse and IH found more trips between the U.S. and Poland were necessary on their respective projects, requiring extensions on both time and expense estimates.

Leverage and control

Equity arrangements were not considered, at least by the firms involved in this study, to provide an essential element of control in the operation of a project over and above that found in non-equity arrangements. In fact, the two firms with options to shift into joint ventures, General Tire in Romania and Bendix in Yugoslavia, had opted not to take that route.

Selection of the non-equity arrangement may have been more from necessity than preference in some instances. Several firms noted that they had been disinclined to finance a project of the magnitude of the ones in Eastern Europe, but some firms, such as Clark Equipment, stressed the desirability of such non-equity arrangements. Clark's opinion was that equity involvements, referring to joint ventures, do not really provide the non-host partner with an adequate control basis if located on foreign soil. This was felt to be true even if the arrangement was one including majority interest. Instead, Clark felt that leverage ought to be built into projects on other bases, regardless of the financial arrangement. Clark, for instance, considers the gradual transfer of technology to be one method for gaining control--holding the crucial formula did not provide the sensor technology until the very end is an example of this type of leverage.

Both Clark and General Tire had assumed that the inclusion of their corporate logo and trademark in the technology package would provide additional leverage but found this to be exaggerated in importance. Clark's trademark is revered throughout Poland and Romania, but since their product is actually only a component of an entire vehicle, the visibility of the trademark is, for the most part, lost to the general public. In the case of Romania, General Tire had set up the agreement so that the acceptance tests had to be successfully completed before permission to use the GT logo would be granted, thinking that this would be an additional incentive to complete the acceptance tests. Instead, Romania was apparently more inclined to manufacture radials without a trademark--and without any royalty payments--than inclined to be permitted to use the GT logo.

Another form of leverage is evidenced by an arrangement where the MNC has agreed to undertake marketing or other selling responsibilities. Clark had noted, that, in an agreement apart from those studied on this project, continuing access to the Clark Equipment Company's distribution system constituted a highly desirable entry which gave the company leverage throughout the course of that particular agreement. The same type

of control was found here, particularly between Clark and its Romanian contacts. The marketing and sales aid which Clark was able to provide to Romania gave the corporation leverage, and also encouraged greater teamwork since increased sales financially benefited both parties.

This area of leverage is not limited to marketing expertise but applies to any benefit which the MNC might be able to offer the interested party. GT holds the technology for tires for off-the-road vehicles in which Romania has expressed a high interest. GT would be desirous of selling this technology to Romania, but has taken the position that such a transfer is not to be considered until the current project has shifted into phase two with all acceptance tests completed.

One of the more successful incentives toward keeping projects within designated time frames appeared to be the structure where the American firm was able to go into a waiting pattern until the host partner had completed certain responsibilities, such as construction or equipping. This arrangement, however, had to be construed so that accompanying expenses were also the responsibility of the host country or company--not the MNC. Honeywell and Westinghouse provided good examples through their arrangements with Poland while Bendix exemplified a similar format in Yugoslavia. Bendix,

actually went one step further, in requiring annual royalty payments each year, even before production was operational. These payments provided an additional incentive to have the manufacturing operation underway as soon as possible, to help offset the outflow of capital. As well, this arrangement also contained incentives for Bendix, because the sooner the production was on-stream the sooner its received payments would exceed the minimal level.

The buyback or counterpurchase might also be viewed as a form of leverage, particularly in the area of quality controls. However, this position also provides for possible misunderstandings, as IH found on its Hungarian project. IH was rejecting the finished agricultural products, on the basis of inferior quality. Hungary, on the other hand, misinterpreted these actions to be an indication that IH did not want to keep its portion of the agreement in repurchasing the goods. Refusal on the basis of inferior quality was one justification which IH was permitted to use. The source of the misunderstanding appeared to lie in the fact that Hungary was not very familiar with Western standards.

Another form of leverage appears in the ability to suggest or recommend plant equipment and layout. If the firm is permitted to do so, without having to undertake additional responsibilities such as overseeing

actual construction, equipping, or even tooling, this apparently is even better. General Tire's comments that the company would not prefer to be the prime contractor in future agreements bears this out. The power to suggest or recommend equipment choices has two advantages. On one hand, the company is then able to suggest equipment that it would most prefer to be installed in the facility. On the other, working with new equipment at the start of a project provides an amount of time when the machines are under warranty, relieving the company of repair expenses. This provides the company with the greatest advantage in achieving high quality production from the start, and often even includes equipment representatives responsible for machine setup and some tooling. Thus, in effect, this provides additional help without more expenses.

It does appear that one of the best positions is that of sole proprietary ownership of the desired technology. Honeywell was in such a position, especially in regard to its sensor technology. However, it appears that some firms are able to achieve many of the results which might be accorded to monopolistic situations through strategic bargaining. General Tire, for example, was hardly sole proprietor of radial tire technology, but the other U.S. firms were less inclined to become involved in such a non-equity technology transfer. The

European firms were not as attractive, perhaps for political reasons relating more to the attainment of Most Favored Nation status than for technical reasons. At the same time, GT was able to avoid a required counterpurchase aspect to their agreement, because the European firms also did not want to accept such an arrangement. Thus GT was able to receive benefits and bargaining advantages not always available to firms not having sole rights to certain technology. Therefore, this was as a result of several factors: political justifications transcending the firm itself, and inside knowledge of competitor inclinations. GT has emerged from its current technology transfer with valuable experience and advice. Essentially, this might be summarized as 'document everything' supplemented by the admonition, 'always be prepared to stop the transfer with a minimum of loss.'

Contract format

Ellison's observation that the more general type of contract appeared to be the most successful approach to East European agreements did not appear to be borne out by the experiences of the firms in this study. In fact, Westinghouse, whose entire transfer was extremely detailed, appeared to have the fewest problems. General

Tire had a fairly large agreement (contract covered more than 300 pages) but considering the magnitude of the transfer, and some of the outcomes of their transfer, more detail regarding certain aspects of the transfer appeared to be desirable. Perhaps it would be more correct, however, to say that certain leverage aspects were missing from their arrangement, particularly in regard to tire production prior to completion of the acceptance tests. International Harvester, Honeywell, Clark, Westinghouse, and GT all stressed the opinion that the more specific the contract, the better.

Logistics and accommodations were one area where all firms felt that expectations should be extremely detailed as terms such as 'adequate' varied between partners. Specific details included such aspects as room size, bathroom facilities, and transportation schedules.

Westinghouse listed the aspects which the company was not responsible for--a list which conceivably could be too extensive to be practical if not done carefully. In this instance, however, it only helped to clarify tasks and generally aided the functioning of the project. This procedure would have been beneficial for GT, because on their project, the Romanians took the position that if GT had not stipulated what it would not do, GT had to do it.

General Tire's feeling appears to be that their real discussions with Romania did not seem to commence until after the contract had been signed. Many of these discussions appeared to revolve around interpretation of contract wording, with literal meanings being taken seriously, regardless of the accompanying context. GT's warning regarding the earlier negotiations was that throughout the bargaining sessions, extreme caution had to be taken to ensure that no words, figures or amounts were changed, proportion-wise, unless those changes were desired. On the other hand, GT felt negotiations, on both sides, had to be willing to compromise or to exhibit a willingness for give and take. Otherwise, GT notes, negotiations tend to be at a stalemate.

Firms still emphasized the fact that while a corporate name or a certain reputation might be the initial reason for gaining entry to a certain area or county, personal acquaintanceship was vital once negotiations were underway. Contracts were viewed as agreements between friends, and that friendship had to be forged before the contract would be viewed as ready to be signed.

Negotiations played a role over and above that of the final contract which was eventually drawn up. Several firms noted that the rapport generated during

the longer negotiating sessions often tended to pay off in the more efficient functioning of the agreement. One example here might be Clark Equipment whose initial negotiating session with Poland was brief (brief in comparison to most negotiations with countries in Eastern Europe) but functioning of the contract then required more personal interaction. This differed from Clark's agreement with Romania where the additional time spent in laying out contract details provided a stronger operational basis once the project was instigated. Overall, however, Clark still feels that out of the benefits of business with Eastern Europe in regard to contracts in that once the agreement is finalized, it is followed.

Expectations which did not materialize

Most of the firms involved in this study had some precognitions as to problems which would be encountered in these non-equity technology transfers. Some of these expectations did not occur at all, while others just had far less impact than originally anticipated. Honeywell had anticipated language problems, since the transfer involved countries with different languages, but no undue problems occurred in Honeywell's transfer in this area. A number of the firms had been

primed to expect low worker morale, with accompanying quality control problems, but these aspects did not appear to cause much difficulty. Instead, the companies universally were amazed at the technical skill and expertise possessed by the employees of their East European partners. The complaints with the trainees appeared to come, if at all, at the start of the project, with Clark or IH in Poland. For example, earlier reports, such as Hayden's, found corporate officers somewhat discouraged at times. However, over a longer period of time, these training problems appeared to have been overcome. In retrospect, these aspects did not appear that consequential.

Clark had anticipated more trade and interchanges to take place between countries within Eastern Europe, but found that this was not the case. Essentially, this trade gap appeared due to the hard currency shortage facing many East European countries. To overcome this deficit, trade was sought with outside nations or regions. For Clark, this turned out to be a disadvantage, as part of the corporate projection for the future was that the axles being produced in Poland and the transmission being produced in Romania might, someday, be combined with other components produced by other nations within the Soviet bloc. This remained a future possibility, but was not considered to be as viable as once projected.

Whereas the technical abilities of the workers on the projects in Eastern Europe appeared to be more skillful than generally assumed, several firms reported that their initial expectations as to the familiarity with specific manufacturing expertise were not fulfilled. IH, for one, had anticipated that the workers in Poland would possess quality control knowledge and perseverance which was initially lacking. It appears possible that in several instances, the workers in the countries themselves also believed the technology would be familiar. This misconception appeared to be the basis for some initial sources of conflict as the American firms felt the East European workers were not following instructions. However, when the American firms carried this sense of independence one step further and required decisions to be made by the workers, no decisions were made, as GT found out in the Romania project.

Future expectations, in general, appeared to be materializing far more slowly than originally had been projected. Firms who had completed their specific projects, such as Westinghouse and Honeywell, reported that future projects had not been ratified, although they intimated that some negotiations were in progress. Clark described the situation as 'more contacts, but fewer agreements.' The firms with projects yet in process also spoke of future possibilities, but in a less

comprehensive sense than had been the case in the early 1970's. There seemed to be several causes for this re-evaluation. First, there were instances where projects had been discussed, but not selected. One such example would be Clark's hopes to gain the construction vehicles contract in Poland, which was awarded, instead, to IH. Another example was a contract which Westinghouse hoped to receive, but which went to others. Second, the recession and slowdown in the economies throughout Europe in the mid-1970's scaled down many aspirations, and had reduced demand in several industrial areas. The third reason may be related to a more realistic appraisal of the potential in Eastern Europe with some firms scaling down their original estimates.

One reason given by companies who have refused to sell their technology is that such a transaction literally creates a competitor. Some of the companies involved with this study acknowledged that such a possibility did exist whenever technology is transferred, particularly when the firm's most recent technology is involved. However, none of the companies in this study appeared to feel that these agreements would turn out to be competitively threatening. Those companies with counterpurchase or buyback options hoped to use the MNC's international contacts to help meet their marketing needs. Others felt that their research and development would keep the

domestic company ahead of their East European counterparts. Several firms had designated regions or areas where their Eastern Europe partner would have full marketing and distribution rights to the product; thereby noting other areas or distributors where the MNC would retain marketing perogatives.

Surprisingly, the one discordant competitive note which was sounded in this study seemed to come from Bendix, but not Bendix, U.S.A. Rather, a protest was reported through one of the Bendix European subsidiaries which felt that the Yugoslavian project would become a direct competitor for the subsidiary. Bendix U.S.A. did not feel that was likely, particularly as the technology which had been transferred had not included any marketing commitments. The European Bendix subsidiary had an experienced sales force as well as access to the Bendix marketing information and support, factors which should definitely place it far ahead of the Yugoslavian operation.

Anticipation of political problems was not overtly expressed, but several companies did describe some initial uneasiness regarding their involvement with the communist system. No firms reported any problems in this realm, however, with the exception of GT's examples of minor harassment. In fact, most of the firms reported that while they assumed that some of the trainees on the

projects who were selected to be sent to the U.S. for training were members of the communist party, no mention was made of it in any training situation.

Unexpected occurrences

Most of the more unique events have been covered under other topics, such as the earthquake in Romania. However, it appears valuable to list some additional corporate observations here.

Rapport. The desire for a corporation's particular technology was the general incentive behind the initial agreements in each instance, but the future possibilities from that agreement appeared to hinge upon the rapport which developed from those technological offerings. Interestingly, Clark Equipment had developed a supportive relationship with Romania while IH had become involved with Poland. Clark encountered few of the problems which had plagued GT in Romania, which tends to emphasize personal factors over cultural or even technological ones. Clark also noted that corporate commitment to such technology transfers also was virtually essential in establishing a high degree of rapport among various members of the MNC's team, and that this commitment made involvement with others easier and smoother. Westinghouse noted that, regardless of future endeavors,

rapport was vital in accomplishing the current project; teamwork was viewed as essential.

Change. In retrospect, Clark Equipment noted that technology transfers often require the recipients to adapt to another group's working habits as well as to become familiar with a different set of machinery or equipment. When these changes are relatively large, such as in the technology transferred to Poland by Clark, all groups require additional time and effort just to adjust to the changes. Clark felt that such processes as adaptation to change, such as caused by extensive overcapitalization involved with massive equipment purchases, should be built into the technology transfer plans. This information actually might fall under the knowhow category, but transcends the process information.

Product source. Emphasis appears to be placed upon the insistence of the buyback or counterpurchase, especially in areas where hard currency is in short supply. However, such an arrangement often is less convenient for the firm transferring the technology because this means that payment (or partial payment) is postponed until production is underway. Thus, most companies prefer outright payments, at least for the disclosure fee. However, in these studies, IH in Poland had only an optional counterpurchase arrangement, but was beginning to see the long-run potential of having an additional

product source without having to finance or build such a facility. The growing consideration of this sourcing possibility speaks well of the project, and certainly provides an additional reflection of the skill of the Polish workers.

Quality control. Maintenance of standards appeared to be one of the primary focuses of most of these transfers--regardless of the inclusion of the firm's trademark or not. However, it was assumed that the products from the company's other divisions, especially those from the United States, were of uniform and consistent quality. However, Clark Equipment found that its own quality control standards had some problems. When it supplied some items to its Polish project for use in training of quality control standards, its own products did not measure up. Its approach upon this discovery was to improve its own quality control checkpoints.

Technological boundaries. Several firms reported requests on the part of their East European partners for technology which was either necessary or desirable but out of the MNC's personal domain. In such instances, the technology just could not be provided.

Several contracts had provisions for a two-way use of technology developed from the initial project. On one hand, this helped to assure the MNC that it would



have the right to the research and development taking place in Eastern Europe which stemmed from its technology. It also provided a basis for royalty payments back to the MNC, should use be made of the domestic company's technology over and above the uses specifically designated in the contract. Clark, however, had a conflict with its Polish partner over the limits of this technology. The Polish engineers maintained that their adaption had actually utilized very little direct technology from Clark Equipment. Clark, on the other hand, felt that their technology had provided the inspiration behind the new developments. In this instance, the controversy waged over the amount of royalties which Bumar owed to Clark. The projected solution was an amount compromised between the sums requested by each party. Should the compromise have failed, Clark was willing to resort to arbitration--which would have been the only instance to date where arbitration had been used in any of these particular projects. This incident contrasts with Clark's involvement in Romania. In this latter instance, Clark's joint development is written up to provide Clark with rights and financial compensation as the jointly developed transmission is sold.

Corporate developments brought about some changes during the course of the agreements. IH totally revised its international organizational structure,

resulting with a different group in charge of the Polish-Bumar project. At the same time, Poland had shifted some of its economic structure. However, neither change appeared to cause any problem, and, if anything, the shifts appeared to bring relationships between Poland and IH closer than before.

One situation arose in regard to Bendix and its subsidiaries. It is recalled that the original opening for this technology transfer occurred through Bendix's French subsidiary, DBA, which was involved with the Yugoslavian project. When DBA had not possessed the technology for the production of the friction materials for disc brakes, the American corporation had become involved, which had been described as one advantage possessed by MNCs with a wider range of technology and resources at their disposal. However, these wide-ranging contacts brought up a point of contention. Bendix acquired another subsidiary after the contract with Yugoslavia was in effect. This subsidiary, located in Europe, possessed the technology for a different model of friction material. Yugoslavia requested that this technology be provided, since the contract with Bendix stressed the point that all updating and advanced information relating to the technology was to be transmitted to Bendix during the course of the agreement. Bendix, however, felt that such a provision certainly

applied to its immediate operation, but did not apply to its separate subsidiaries. In this instance, a compromise was reached as a settlement. Bendix would provide the information, but the training in the production of this other formula would not be done in the United States, but at a European location. This training would provide the necessary information relating to the additional technology, but would not provide any supplementary information regarding additional processes or information.

Benefit to the corporation

Bendix, Westinghouse, Honeywell, and IH (especially in connection with its Polish agreement) all stressed financial gain as their primary reason for entering into non-equity agreements with their East European partner. The outcome of their arrangements (at least thus far) appears to have brought these expectations to fruition. Clark Equipment (in regard to its Polish operation) and General Tire, in Romania, expressed disappointment over the slower rate of their monetary rewards or product source. On the other hand, Clark was well pleased with its involvement in Romania as to the financial flows.

Alternative product source capability was also a benefit gained by several firms. Clark and IH, in

particular, found this possibility to be among the primary benefits of the transfer.

Obtaining a toehold in Eastern Europe was cited by most of the firms as an accompanying reason, but only Clark and IH had actually concluded a second agreement with another East European country. Bendix appeared to have run into an impasse in regard to its Soviet contract and other negotiations had not culminated in tangible projects. Thus, while the firms all felt they had expanded their corporation's reputation in this region of the world, increased involvement appeared to be a process which would take more time to develop than originally expected.

Additional advantages had materialized for some of the companies. Honeywell had sold more components and subassemblies than ever anticipated; IH had begun to realize the product source capabilities available through its Polish and Hungarian projects, and Clark was finding its joint development projects, especially in Romania, to be both financially and technologically beneficial. Westinghouse found its computerized approach to the transfer helped streamline its operations back in the U.S. Clark found the extraneous information gained from their East European partners beneficial, and several firms were benefiting from the joint research and development which was taking place.



Analytical Factors

Certain aspects stand out when studying non-equity technological transfer projects with Eastern Europe. Some of these factors appear to be particularly helpful in the progress of the technology transfer; some appear to be detrimental. In some instances, certain factors appear crucial, in that their absence might render a project undesirable or unprofitable.

Technology

Type. Certain technological characteristics appear to affect the ease with which such a transfer is able to take place. The transfer of the information appears to be perhaps the easiest step of the entire transfer. As such, those firms able to precisely define their technology would appear to be the most likely to successfully transfer this information to others. Westinghouse illustrated this feature through their elaborate computer printout transfer method. The fact that the Westinghouse technology was extremely complex and intricate makes this successful transfer all the more commendable. It also emphasizes the concept that the procedure used in transferring the information is more of a factor in determining the success of the transfer than the complexity of the material.

Familiarity with the technology appears to be highly important for the MNC. International Harvester, Honeywell, and General Tire all encountered difficulties in this regard. Each company had promised the latest developments in their respective technology, but encountered difficulties because the technology was, in part, unfamiliar even to the MNC. This is not to say that corporations should not attempt to transfer their most recent technology. The long-run advantages here include the benefits that, by doing so, the corporation helps to ensure component interchangeability and maintains a more viable repurchase or product source option. However, additional care should be taken in such instances to gain as much understanding of the information as rapidly as possible.

Planning. It might almost sound redundant to note that the best planned transfers appeared to be the most successful. However, MNC's virtually universally emphasized this point. Planning, in this context, ranges beyond the above point of having a thorough knowledge of the information to be transferred, to include a comprehensive, step-by-step approach to the transfer. This planning is to incorporate contingency actions as well as to detail all phases and aspects of the transfer. Again, Westinghouse, with its emphasis on detail,

probably contained the most intricate approach through their computerized checklists, but other firms supported the fact that the more planning done in advance, the more likely the transfer was to go smoothly.

Another issue here, which relates both to the type of technology and the planning involved, concerns the amount of information to be transferred. Complexity does not seem to be as crucial as the actual extent of the operation. Both Honeywell and Westinghouse transferred highly intricate information, but each transfer was relatively contained. International Harvester and General Tire were responsible for much larger operations, and found the magnitude of such transfers to carry a proportionately larger margin for potential problems. As well, planning in such instances, would also be required to be far more extensive.

Staging. Several aspects relating to stages of the transfer appear highly important. Wallender's observation that different approaches should be considered and employed by the MNC at different points of the transfer was borne out by several firms. Essentially, the approaches appeared to consist of earlier contacts which involved establishment of rapport and acquaintance-making sessions, followed by a period where the information was disseminated with close control over the initial applications. After this point, however, when it has been



determined that the essential ideas had been communicated, firms recommended a gradual weaning away, placing more and more responsibility in the hands of the local employees. Westinghouse made a film of the completed transfer, showing the products being successfully produced in Poland, as a tangible illustration of the conclusion of the project. In several instances, the conclusion of the project was softened in that, while the project itself was over, on-going involvement in the form of updates, or patent or trademark extensions were in progress, so the involvement was not abruptly cut-off.

The length of the transfer appeared a factor, but did not appear to be a clear-cut advantage or disadvantage. The shorter projects were certainly more manageable, but in such instances, additional agreements or other projects had not been forthcoming. The longer projects contained a higher risk in regard to payments and seemed to be accompanied by more difficulties at first, but this would be in large part attributable to the larger project size as well. Furthermore, the longer projects appeared to generate a high rapport and more likelihood of additional involvement.

Thus, it would appear that some general rules of thumb should apply in most technology transfers to Eastern Europe, including the following points:

1. The smaller, the better
2. The shorter, the better.

However, in these technology transfers, examples occurred which tended to support an opposite position. IH's technology transfer to Poland involved entire vehicles, a huge operation, including renovation of facilities and enormous equipment installation. IH is having one of the most positive experiences in its relationship with Poland, and its training difficulties appeared basically limited to the first few years.

General Tire's ten years plus building time project with Romania was one of the lengthier ones, but, in retrospect, its relationship with Romania improved over this time period. The unusual difficulties encountered on the project might have jeopardized the project completely if the time frame had been much shorter (on the other hand, the shorter the time frame, the less probability that such difficulties would be encountered in the first place). As it was, the teamwork required to succeed in the face of adversity was providing greater rapport between GT and Romania. Therefore, determination and concern that the transfer succeed appears to surmount other aspects such as size or longevity.

Training

Needs. Training needs on the respective projects appeared to fall into the same general categories, regardless of the particular technology involved. The East European workers exhibited higher skills in specific areas than anticipated, and did not appear to have extremely low morale problems. But the MNC's did observe that the broad spectrum of competency was often lacking, and that preparation should be made for supplementing any voids which were observed.

There did appear to be a general lack of positive incentives, combined with sometimes severe retribution for mistakes, which produced an unwillingness and even an inability to accept responsibility or make decisions. Thus, firms might indeed benefit from structuring the transfer so that all decisions were eliminated, or at least so that responsibility for those decisions would be absolved from the local workers.

Need for marketing and managerial or supervisory skills were also tantamount. Corporations might do well to build such training into the plans, and cost structure of such transfers, as they often were required to supply such expertise regardless.

Approaches. The method employed by Honeywell worked very well. Small groups of workers were brought

to the U.S. for training, but these trainees were then responsible for teaching additional employees once back in their own country. This teaching responsibility helped to cement the new information and skills in the original workers, as well as to spread the processes to others.

Adaption to local conditions was essential. This included the realization that the normal workday would most likely be impossible if cultural or political events were in the offing. It also included the realization that time off from work would be more likely in Eastern Europe than in the U.S., for reasons not usually acknowledged in the United States. On the other hand, such adaption also included compromises by U.S. employees, such as giving up lunch hours.

Overall, the motto of 'things take time,' combined with the admonition that some things will take even more time, might be important to remember in this training sense. It would also be particularly important to build this element into areas where quality controls were to be applied. All firms reported that the achievement of certain levels of quality were more difficult to attain than originally anticipated. On the other hand, combined with acquainting the workers for the reasons for such strict controls, all respective quality levels were achieved eventually.



Prior experience. This played an important role in the achievement of quality levels, on both the side of the MNC and of the host company or country. Such experience provided the MNC with a more realistic level of expectations, in most cases, while the host employees then were more aware of the expectations of the MNC and quality standards.

Prior experience is a two-edged item, however, if past experiences prove a deterrent to current training. Prior experience did not seem to be a panacea for all experiences which arose in the course of the transfers. In fact, assumptions based on prior experiences tended to be, at times, misleading. Clark, GT, Bendix, and IH all expected the East European trainees to be familiar with the basic manufacturing operations, or portions thereof, and to have a strong orientation to Western quality control standards. As it turned out, Westinghouse and Honeywell, who approached the training issues with knowledge based on past incidents insisted on strict adherence to each and every instruction from the very beginning and succeeded far more quickly. This was despite the fact that in both instances, the technology involved with the latter firms was probably more technical and required greater dexterity and quality control. Several firms discovered that unlearning or retraining was necessary, and also more difficult because the local

employees did not realize that their former techniques were not correct. This makes the admonition to follow all instructions exactly even more important, but illustrations regarding the reasons behind such a demand were also seen as most helpful. Company examples along this line included the reasons behind certain safety regulations, or even sanitary or cleanliness standards. On the other hand, unrealistic expectations or standards in most regards were never adequately followed, several companies reported.

Communication, from one language to another, was not found to be a major problem in any of the transfers on the level of training. Westinghouse utilized both languages whenever possible, as well as a system of lights and buzzers designed to facilitate understanding, over and above any particular language. Bendix made a point of written confirmation of all verbal messages. Actually, the tone of certain messages, such as the threatening approach used by the Romanians in some communication with General Tire, was detrimental to rapport, but major problems with languages did not appear to jeopardize any of the transfers.

Potential problems

Disasters. The possibility of major catastrophies jeopardizing a technology transfer always exists, but the likelihood is not that great. The only geographic occurrence affecting any of the transfers in this instance was the earthquake in Romania, and while it slowed the project, it did not curtail it. The possibility of disaster certainly encourages the inclusion of the Force Majeure clause, but it would appear that even the most drastic of events often will not destroy a transfer in or of itself. Actually, General Tire noted that the earthquake, ironically, pulled the two groups together, since both were so adversely affected by the event.

One aspect to consider, however, is the structure of the agreement in the event such an occurrence did take place. Even with application of the Force Majeure clause, the expenses involved in replacement or repair of equipment, or other accompanying problems, might easily be made the responsibility of the MNC unless other procedures are clearly stated.

Delays. It may be said that delays occurred in each of the projects making this aspect perhaps the most inevitable if not desirable of all project factors. However, the cause of the individual delays varied greatly. An admonition here would be to build in an adequate time estimate which included possible delays.

Some of the major reasons for the delays which were encountered on the cases studied included the following: recessionary economy, which affected both the obtainment of equipment and demand; hard currency shortages which prevented some materials purchases especially in large quantities; difficulties in equipment installation, tooling, repair, or maintenance; obtaining sufficient raw materials for production, or testing those raw materials to insure quality control; slow delivery schedules; difficulties in technological development in either home or host country, or both; accidents and a variety of disasters; an under-estimation of the time required; problems in achieving required production levels, either related to quality control or other difficulties--often a factor going back to a combination of equipment problems and training needs; and a combination of above factors, which compounded individual delays, and caused other difficulties such as expiration of warranties or other related problems.

Some of the delays might be fairly controllable, through more careful planning, maintenance of tighter control over equipment purchase, installation, repair, and usage, and raw materials acquisition; but other delays appeared more circumstantial or outside the control of the MNC and the local economy. Labor shortages or other labor problems were not a factor in any of

the cases involved in this study. In part, this might be one benefit of agreements with a socialist economy, but the possibility of strikes, or other stoppages of uncertain duration always remains a factor.

Misinterpretations. Numerous examples were cited regarding differing interpretations of contract terminology. Most of these examples, fortunately, did not involve the technology itself, but rather accompanying facilities. The problem was not one of translation, but interpretation. The term 'adequate' was viewed as indicative of one level of accommodation and transportation to members of the MNC and of another level to representatives of the host countries. The suggestion here was to spell out, in detail, the expectations in terms of size, facilities, transportation schedules or availability, and other details as deemed appropriate. On-site visits would also be most helpful in determining what might be provided or what alternatives were feasible, prior to the final contract signing.

Change. The impact of change, particularly upon the host country or company, was a factor generally overlooked in these technological transfers. This refers both to a macro level, country-wide, and a micro level involving individual workers. Adapting to change was relatively small on the part of the MNC representatives, as it generally meant little more than adjusting to local

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cultural conditions. However, the insurgence of high-level technology, particularly in transfers involving massive equipment purchases or radically different production techniques, required major adjustments for many workers from the host nations. International Harvester in particular noted this aspect, pointing out that some of the symptoms which appeared on the projects attributable to training problems were really based in the adjustment category. Firms might do well to include adapting to change training within their technological package.

Development limits. Joint development projects occurred on several projects. In some instances, the development was virtually limited to adapting the technology for the metric system or other local conditions or requirements. In other instances, the development took on a far larger magnitude, with completely redesigned products being the final outcome.

The eventuality of such joint development offers culminating in additional products appears high enough to warrant some consideration and foresight. Clark Equipment, despite its contract consideration on this subject, ran into a patent conflict over the extent of Clark input into a new product. Most contracts included clauses permitting the MNC to have access to and usage of any products developed from the information from the

transfer. Some included fees or royalties to be paid back to the MNC in most instances, as well as the access to the information--a reverse technology flow.

Competition. With high product quality and efficient production among the technology transfer goals, the possibility of eventual competition with the MNC did exist. However, none of the corporations directly involved with these transfers appeared to feel any threat at the time of the study. Interestingly, in several instances, subsidiaries of the MNC were the ones fearful of the possible competition, pointing out the extent of analyses which need to be done on multinational corporation's global operation before such technology transfers are authorized. In the cases here, no reason for concern was felt to exist in regard to the subsidiaries.

There had been some concern prior to acceptance of the transfers. This was exemplified by the extreme care which had been taken in a number of the agreements to delineate the territories which were to be the marketing or sales areas of the respective parties. No infringement thus far had been made upon across those designated boundaries.

Competition also did not seem to be a concern, as well, because the products being produced were either not viable products for other areas of the world,

including the home territory of the MNC in the United States, or were in such demand that the concern was to obtain enough products, regardless of the source of the production, to fill marketing needs. Awarding corporate trademarks appeared to be a point of leverage here. On one hand, the trademark helped to make the product more immediately competitive, but, on the other hand, unauthorized use of that product would have resulted in the withdrawal of the trademark. As such, the competitive threat appeared to lie more in the future, after the expiration of the agreement, when the respective production facilities were on their own, and free to market in more areas. At this point, the advancement of the MNC in its own product, combined with its marketing and sales expertise, was anticipated to be more than adequate to cope with the competitive possibility.

Restructuring. Because the technology transfers involved a period of years, ranging from five to twenty in the examples here, certain corporate changes might be expected. In the instance of IH, the group originally responsible for arranging the transfer was not involved with the operation of it after a major corporate reshuffling. Furthermore, Poland also made some administrative changes on a department level, which also resulted in different personnel involved with the

project. Neither of these changes made any appreciable difference on the project, but this was due to the additional care and concern taken on all sides to aid in a smooth transition. In any case, the likelihood of shifts in personnel and administrative arrangements appears high enough to structure the transfer in such a way that the operations will progress, regardless of the structure.

Leverage

Initial position. Technology transfer without an ongoing, equity basis has often been viewed as undesirable, usually because the ongoing factor helped to eliminate a possible competitor while the equity was seen as providing some basis for control. However, the firms engaging in these non-equity transfers stated that equity, of a majority as well as minority level, really did not provide sufficient control--particularly when the MNC was in a foreign country. Thus, the firms felt that their non-equity stance was no less powerful, and, in some instances, was perhaps the more potent because no misconceptions were involved. General Tire stated the company's position was to consider technology transfers as one type of operation, while the equity/non-equity question was an entirely different set of

considerations. The latter related to the financial measures available for such a project, while the former really dealt with the available technology and possible demand.

Firms did make note of the fact that, in the majority of instances, the most powerful position of the MNC in such technology transfers was at the start of the negotiations, which the host desired the technology of the MNC. Thus, firms stated that the negotiating sessions were the most viable times in which to utilize the most leverage in gaining desired concessions--financial or otherwise.

A company with a monopolistic hold over certain desired technology, often is able to name its price and contract format. This would somewhat accurately describe Honeywell's position. However, if the price is too high, countries unable to afford the technology will settle for another company with similar technology, if not the top of the line. In many instances, a company with a monopolistic hold over a certain product or process will refuse to part with this technology, such as the case with Michelin Tires, or Coca Cola. Honeywell's decision to supply its technology was partially based on the corporation's assessment of its product's projected life and the potential competitive aspects of Poland. Furthermore, despite a successful technology

transfer in that all technology was deemed satisfactorily transferred and all payments were received as scheduled, Honeywell has not become involved with additional transfers to Eastern Europe.

On the other hand, General Tire's willingness to sell its radial tire technology, as well as its base in the United States, overcame a lack of unique product knowledge.

Sometimes, a firm's reputation and location surpass its technology. Westinghouse was known for its ability to transfer intricate technology and its location in the United States enhanced its products which were reputed to be the most advanced and sophisticated. Westinghouse does have superior technology in certain areas, but its negotiating standpoint was enhanced through these accompanying benefits. In addition to the above mentioned aspects, a firm which might appear to be limited in its demands by the competition perceived to be in line for the same project is also able to use this competition to its own advantage. While such situations usually inhibit corporate bargaining, General Tire benefited from knowledge of its competitors in its dealings with Romania. Cognizant that its European competitors did not want to settle for a counterpurchase arrangement, or a joint venture, GT was able to exclude these factors from its negotiations, as mandatory provisions.

Corporate willingness to work with its East European partner appeared to be ranked highly--and, in some instances such as GT in Romania, was seen as more advantageous than the technology itself. Experience in technology transfer, especially the non-equity format, appeared valuable to both corporations and countries. The corporations benefited from background experiences and a tighter contract format. The countries appeared to rank such experience highly and give preference to such firms.

Ongoing leverage. However, some portion of leverage or control was viewed as essential to the operation throughout the transfer by all corporations, but their approach in obtaining such control varied. Essentially, the idea is the same as at the time of negotiations--have something in reserve which is desired by the other party. A summary of such elements which appeared useful to the MNC's in gaining control included updated technology, additional services such as marketing expertise or sales openings, additional technology which might be the basis for another project, the corporate trademark (although this was not always so), product repurchases, being the sole proprietor of certain technology, or having some other aspect desired by the other party.

In some instances, structuring the agreement to require teamwork appeared to be, in itself, a form of leverage for both sides. A contract which listed the specific responsibilities of both sides, often divided into certain stages, was also seen as virtually essential in many operations. An additional list of crucial duties which were NOT the responsibility of one party or the other was also seen as beneficial in clearing up misunderstandings and avoiding unexpected expenses.

One element providing a corporation with control or leverage throughout the transfer process is that of providing technology in stages--with always having another part in reserve. Clark Equipment stated that it does this in some transfers, if other control elements are lacking. However, it also pointed out that this need not be a necessity if the corporation has other items desired by the partner. For example, Clark's marketing connections and expertise were desired by Japan, an element which would keep both parties working together for their common benefit. General Tire had the advantage of possessing technology for off-the-road tire manufacture in its dealings with Romania. Thus, as far as possible, firms provided the technology over the period of the transfer, so that the final information would come only as the project was completed. Those firms unable to do this, had to seek out other forms of

leverage which approximated this step by step technology transfer, or provided another sought-after element.

The trademark was initially viewed as a high form of leverage, but it emerged as less if it were not highly visible, or became an either/or alternative to financial gain. The payments due to the MNC provided a chief form of control on the part of the host country, but agreements structured so that delays or other expenses were the responsibility of the host tended to have a more rapid completion time than other ones without this arrangement. Those firms demanding a minimum royalty fee, regardless of production, also found work delays substantially shortened. However, General Tire bottom line approach was to maintain the position of being able, at any time, to walk away with a minimum of loss.

Contract preparation

Negotiations. Mention has already been made of the importance of the negotiating session, in that it is usually the time of the most leverage for the MNC. As such, the concessions accorded and provided at this point will usually structure the transfer for its entire duration.

Corporate officials found negotiating sessions with Eastern Europe to be particularly arduous. Sessions

were long, arguments were numerous, and extreme care had to be taken in keeping prices and concessions within the desired range as quantities or time frames were shifted and revised. Since the contract, in the socialist state, tended to be the final law and arbitrator, corporations stressed the fact that the contract had to be clear, specific, and detailed. Those areas open to interpretation were seen as detrimental, particularly to the MNC. Personal contact turned out to be paramount. Invitation came via firm reputation, but closure on contacts was made on the basis of personal friendship. The length of the negotiating session provided both detriments and benefits. Those negotiations which culminated relatively soon usually indicated a higher demand on the part of the host country for the technology. On the other hand, such relative brevity did not permit many strong acquaintanceships to form. In the long run, this personal acquaintanceship had to be generated at one time or another, and some of the longer negotiations paid dividends in having fewer areas to be worked out on the actual projects.

Format. The ambiguity over such terms as 'adequate' has already been mentioned, but the lesson remains in that all general descriptors should better be defined. Firms with specific lists of responsibilities, for both parties, combined with certain tasks which were

not to be responsibilities, found their transfers made proportionately easier. Furthermore, such a listing provided a form of leverage, especially when combined with certain time segments. Inclusion of contingency measures, such as Force Majeure clauses, or transfer impossibilities, were seen as essential--not that such elements were actually anticipated, but that such measures provided a form of insurance for the MNC and host party alike.

Facilitating aids

Political involvement. Government intervention on either side is usually taken to be an inhibiting factor, but the MNCs in this study found the opposite to be true in many cases. U.S. government position in the early 1970's, when these transfers were being considered, was most encouraging of trade with Eastern Europe. The respective governments in Eastern Europe were desirous of increasing their exports as well as of updating the level of technology in the country. Therefore, the atmosphere on both sides was one of encouragement, and the transfers appeared to benefit from it accordingly. General Tire noted that higher government officials in Romania were willing to lend support and authorization if difficulties arose. Yugoslavian officials were able

to make decisions regarding the Bendix transfer without even consulting higher authorities.

This is not to say that political difficulties were nonexistent. Several firms, General Tire being a prime example, reported that security harassment was definitely evident. Visas for host workers coming to the U.S. for training were sometimes difficult to obtain. Care had to be taken that a certain distance was maintained between the local workers and the MNC officials in some instances.

On the U.S. side, the approvals for the transfers were often caught in bureaucratic red tape. Honeywell had to receive clearance for its sensitive sensor technology, and worked out the third-country holding arrangement to surmount any political barriers which might arise prior to the conclusion of the project and the transfer of the promised information. On the whole, however, governmental aid made the projects more accepted and operational.

Labor unions. No labor union objections to any of the transfers were reported. This may be due to the care which was taken by the individual MNCs to point out that no jobs were really being exported, and that such transfers were actually helping product sales. Individual protests by workers in the United States against dealings with the socialist bloc were noted, in one surprising

development at least, but were not considered any major problem. This appeared to indicate a general revision of thought by individuals in the U.S. and a greater acceptance of contact with the soviet bloc than had existed in prior decades.

Personal contact and support. Corporate commitment, from the top officials on down, was seen as a prime factor in the eventual success of the projects in that the MNC would be more willing to work at problems and contend with difficulties which might arise. The necessity of personal acquaintanceship has been mentioned, but should be reinforced as it appeared that this element was virtually vital to transfer operation. As rapport increased, so did communication, with a subsequent decrease in misunderstandings and problems.

Realistic timing. This aspect appears particularly crucial in regard to the time frame set for the project. Those projects with unrealistic time estimates were beset by frustration and feelings of inadequacy which were, in reality, unfounded. The cause of such minimal time estimates appeared to be controlled by factors outside the realm of the project itself, and may have been necessitated by negotiational issues. Regardless, an accurate assessment of the work to be done, and the time required to accomplish it, should be one of the goals of the project planners.

Transfer rationale

Financial compensation. The majority of the MNCs in these transfers had opted to accept the project primarily for financial benefits. As all firms reported that payments had been as scheduled, except for those where delays had slowed down the entire project, this aspect appears to be fulfilled. However, certain projects proved more expensive than originally anticipated, and this cut into the financial compensation which had been envisioned.

Suggestions to help ensure an adequate financial return on the technology and time invested in these transfers might be summarized as follows:

1. The greater the initial disclosure payments the better;
2. The sooner the initial disclosure payments, the better;
3. The inclusion of an annual escalator or percentage increase clause is most desirable;
4. The exclusion of penalty or holdback clauses is most desirable;
5. If set prices are required, build in escalator factors or allow for increased prices in original estimate;
6. Payment of an ongoing minimal royalty fee, regardless of production, is desirable;
7. Listing responsibilities, including expenses, is desirable, particularly if the MNC's expenses are laid out, with the host responsible for all remaining ones (with contract stating such issues).

The corporation found that delays, as well as the more obvious situations such as natural disasters, cut into anticipated financial benefits. Increased corporate travel, or additional training or other corporate involvement also proved expensive. Westinghouse found that a highly visible inventory control process reduced some of the waste and hence, expense, but several firms reported that inventory control was an area needing additional training in itself.

Financial flows appeared to have more of a relationship to economic conditions than to project descriptions. Clark found that its agreement with Romania had provided more financial gain than had its involvement with Poland, although the agreement with Poland was larger and had been in progress for three years longer. This was because the recession hit the Polish project at a crucial time, whereas the Romanian project was less affected by the world economy.

Firms found that incidental expenses, in addition to corporate travel, affected their revenues. These expenses included housing, additional transportation measures, and other accompanying benefits designed to make life in Eastern Europe more homelike for the MNC employees posted there.

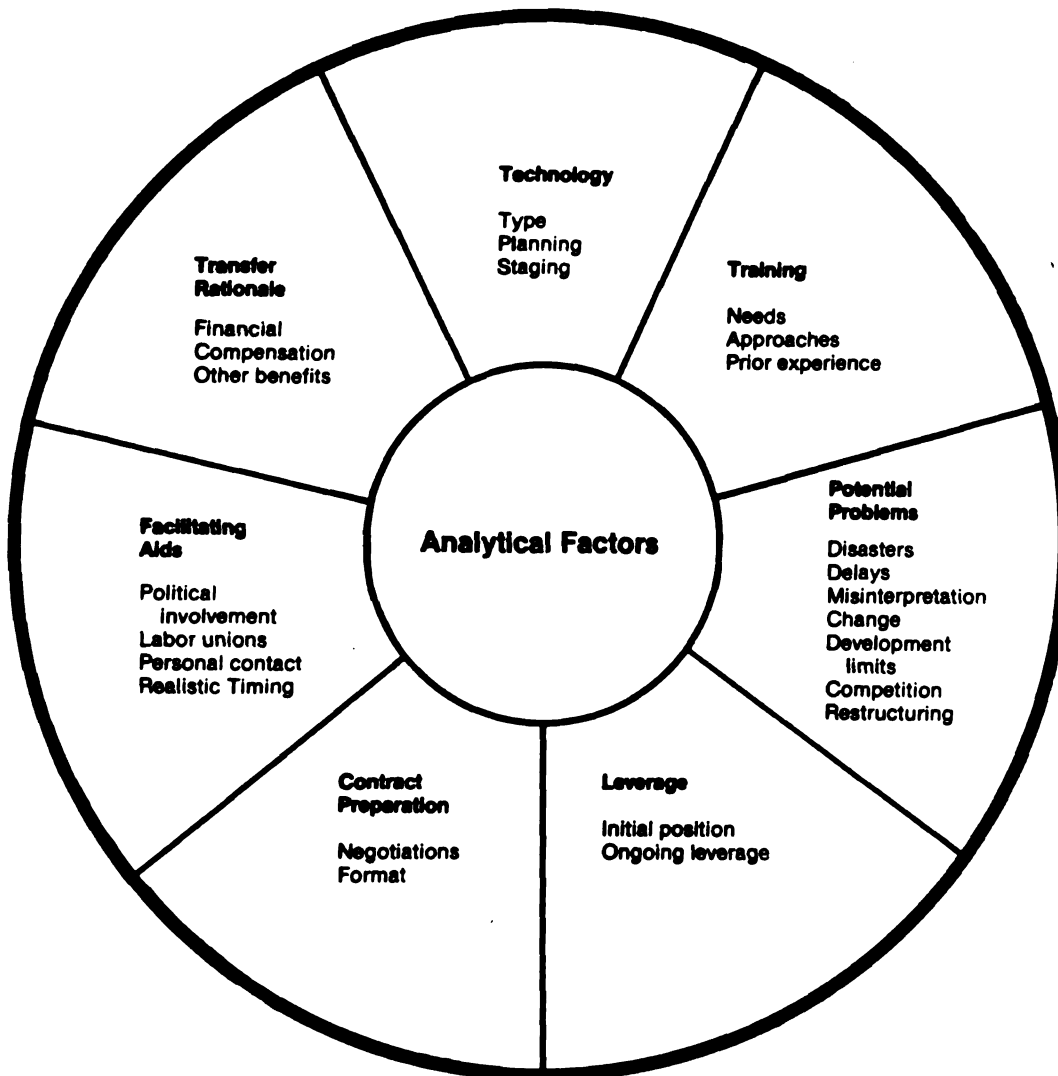
On the other hand, several firms reported financial gains over and above those predicted by the

agreement estimates through the increased sale of components or other equipment. These firms particularly found the technology transfer financially rewarding over and above the payments for the technological information itself.

Other benefits. The financial compensation may have been the initial reason for the technology transfer, but several firms, including International Harvester and Clark, actually felt that the long-run benefits of the transfers might out-weigh the immediate financial gain. Among those benefits cited were alternative product sources, and broadened product lines through the joint development activities which were taking place. Additional benefits included access to more information, related particularly to the transfer or even extraneous to it, and a toehold in a market area formerly non-accessible to the MNC.

The increased market concept, however, did not appear to be as fruitful as the MNCs had originally predicted. Two of the six companies had finalized two agreements, and many of the firms had broadened their initial transfer agreements, but several others, such as Clark and Westinghouse, saw highly desirable contracts awarded to other companies. This aspect appeared to come down to an increase in contacts but not necessarily contracts. See Figure V-1 for analytical results.

Figure V-1
The Technology Transfer



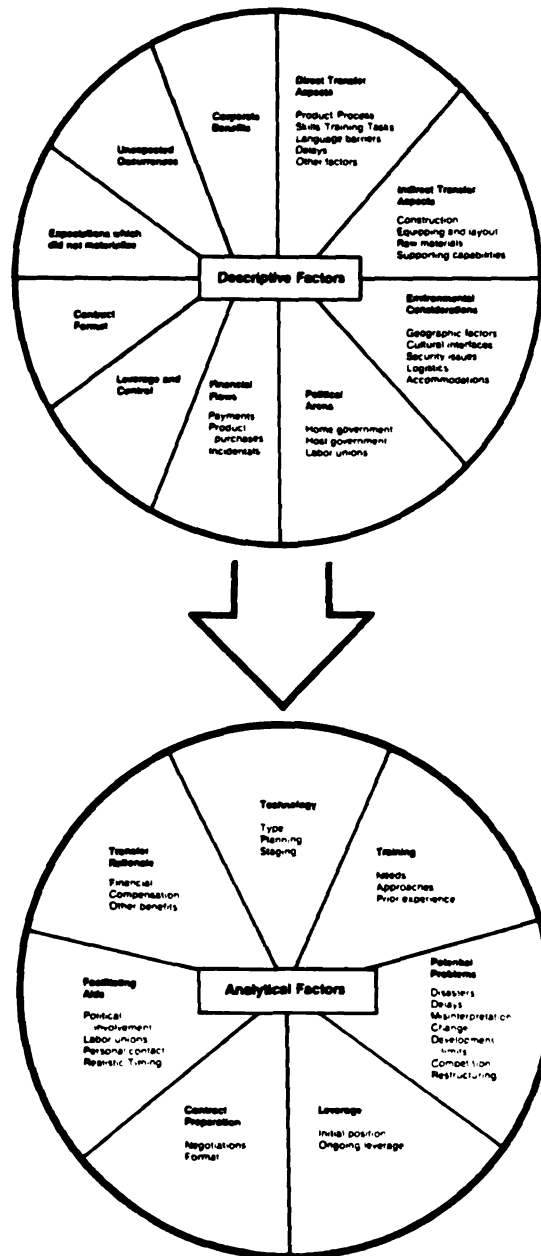
Analytical Factors
of the Technology Transfer

Conclusions

A study of the analytical factors, as drawn from the descriptive ones, provides a type of checklist for the corporation considering a technology transfer to the East European area which should enable the corporation to structure its expectations within more reasonable boundaries than might otherwise have been the case. The analytical factors do not provide easy answers for such a technology transfer, but rather present a framework upon which information needs to be supplied. See Figure V-2.

These analytical factors do support the assessment made earlier in Chapter Two that job exportation and national security issues are issues which, although worthy of consideration, are outside the immediate realm of the multinational corporation in the day-to-day workings of the transfer. These analytical factors also do not conclusively answer questions relating to competition. The creation of competition was a factor which apparently had not, to date, greatly affected the eight cases studies involved in this research. The firms involved with the transfers did not express any major concerns regarding competition. In fact, the absence of any problems regarding marketing territories appeared to have even allayed some prior apprehensions. However, the issue of competition did remain a viable possibility, however remote, for the future.

Figure V-2
The Technology Transfer



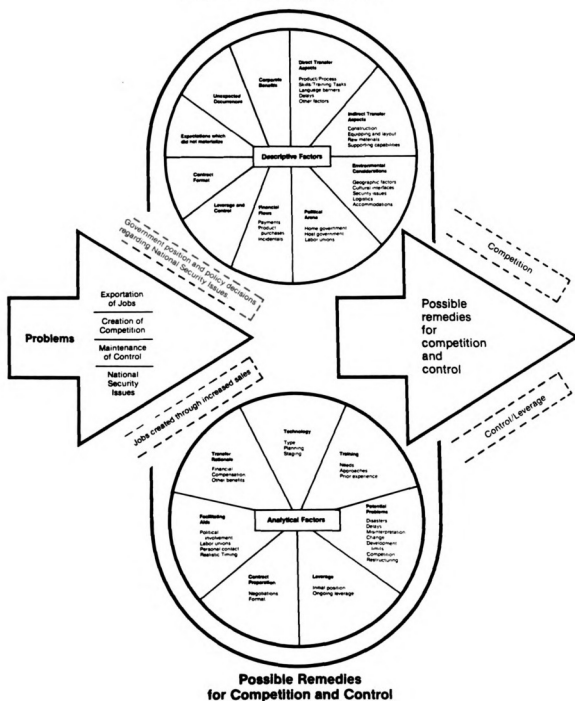
Descriptive Factors
and Analytical Factors

The analytical factors do provide a summarization of the means by which the individual firms are structuring their transfers to incorporate some viable leverage or control factors. These suggestions might prove valuable to corporations who have not considered non-equity technology transfers to contain leverage potential. The emphasis on the maintenance of a controlling factor or leverage throughout the transfer does not appear to be understated--those firms incorporating such an advantage appeared to have the most successful technology transfers, and the balance of power between the two parties appeared to provide a climate where rapport and mutual understanding was prevalent and satisfactory. See Figure V-3.

Limitations of Results

Some of the information regarding expectations compared to the results in this research has come from the contractual terms; however, most of the information originated with individuals whose perceptions must be acknowledged as personal viewpoints. Data from several individuals involved with the same project reduced some of the variations, although it is also to be realized that communication with several individuals may also distort expectations if these opinions are not reflective of the corporation as a whole.

Figure V-3
The Technology Transfer



Some of this research involved agreements which are currently in progress, hence, the results are also in process and not completed. Thus, the variation between expectations and results may change by the time the agreement is completed.

Even within this small sample, the products, countries, and firms have distinct variations--hence, these may affect the outcome more than some of the expected variables.

A relatively small number of situations are involved with this study, in one particular region of the world. As such, the generalizations derived may not be applicable to other firms, other projects, or other regions. However, the uniqueness of this pilot study in this exploration provides a benefit which is offsetting in that it extends the knowledge on such non-traditional transfers.

This research occurred during a period when relations between the United States and Eastern Europe were highly acceptable. Should political events intervene, however, the favorable governmental climate could fade, and increased contact with this portion of the socialist bloc might be proportionately more difficult.

This research also examined the transfers at a point in time when labor or other conditions were relatively favorable and calm. Upheavals in either the

United States or the countries of Eastern Europe would certainly change these results. Such upheavals are seen as being less likely, perhaps, in Eastern Europe, or among the MNCs but are not impossible or even unrealistic.

Future Research

Future research in the area of non-traditional transfers is needed in several respects. This study involved the approach from the multinational corporation-- a similar analysis might be done from the angle of the perceived results. Another approach might be to compare the non-traditional transfers in Eastern Europe against those taking place in other socialist regimes outside this bloc, such as the People's Republic of China, or in non-socialist regions around the world, particularly some of the third-world developing nations. Over a period of time, the entire concept of the non-traditional transfer itself would be an area for study; its increasing or decreasing acceptance and the variations which have been generally made in regard to this form of transfer.

APPENDIX A

Appendix A

List of Technology Transfers
Involved in This Study

<u>Representative Firm in Eastern Europe</u>	<u>Country</u>	<u>Company</u>	<u>Location</u>	<u>Product</u>	<u>Agreements</u>	<u>Time Frame</u>
Bumar Foreign Trade Enterprise	Poland	Clark Equipment Company	Buchanan, MI USA	Cast housing and axles	Technical Assis- tance Agreement. Trademark Rights Marketing Agreement (including buyback).	1972 to 1982 (ten years) plus royalty payments for 10 years starting on date of first product sale
Bumar Foreign Trade Enterprise	Poland	International Harvester Company	Chicago, IL USA	Crawler trac- tors, bull dozers, wheel loaders and pipe layers	License Agreement Trademark Rights (with an optional counterpurchase agreement).	1972 to 1982 (ten years initially, now extended to all items to 1990)
Metronex/Mera	Poland	Honeywell, Inc.	Minneapolis, MN USA	Class 41 Trans- mitter Including Silicon Sensor	Technical assistance Agreement (including testing kits). No trademark but Honey- well license acknowl- edgment.	1974 to 1979 (five years) with extension provision
Unitra Electronic Industry Union	Poland	Westinghouse Electric Corpor- ation (Semicon- ductor Division)	Pittsburgh, PA USA	Rectifiers and Thyristors	Technical Assistance Agreement. Patent License Agreement. No trademark but Westinghouse license acknowledgment	1974 to 1979 (five years).
Romania State Enterprise of Foreign Trade (Romchit)	Romania	General Tire International Company	Akron, OH USA	Radial Tire Technology	Technical Assistance Phase 1 Agreement. Technical Service Con- tract Phase 2. General Tire trademark avail- able after completion of acceptance tests-- license acknowledgment available from start	1973 to 7 Year year agreement to run from date of completion of acceptance tests
Universal Tractor Foreign Trade Company	Romania	Clark Equipment Company	Buchanan, MI USA	Power shift transmissions and torque con- verters	Technical Assistance Agreement. Trademark Agreement. Marketing Agreement (including optional buyback)	1975 to 1985 (ten years for each mode, starting on production date for that model and contin- gent upon royalty pay- ments)
Hungarian Railway Carriage and Machine Works (RMA)	Hungary	International Harvester Company	Chicago, IL USA	Tandem axles, plows and disc harrows, cyclo planters, grain drills	License Agreement. Trademark Agreement, Purchase Agreement	1976 to 1986 1977 to 1982 1979 to 1989 (ten year agreements for each product line)
Vozneininski Tehterini Kosiniet (Vardok)	Yugoslavia	The Bendix Corporation	Detroit, MI USA	Organic fric- tion material for disc brake pads	Technical Assistance Agreement	1975 to 1985 (ten years)

APPENDIX B

Appendix B

Questionnaire on Technology Transfer to Eastern Europe

The questionnaire which follows is the one used as the basis for personal interviews with corporate executives in obtaining the data behind this study of technology transfer. It was a guide for the interviews, not as a mail questionnaire. Use of the same structure in all interviews helped to provide a consistent body of information which was fairly uniform throughout all interviews. The points of contrast, therefore, in the collection of the information tended to stem from two sources; variations in the type of technology transfer taking place or varying corporate reluctance to discuss certain confidential aspects of the transfer.

Questionnaire on Technology Transfer
to Eastern Europe

Country: _____

Company: _____

Interviewee(s): _____

Location: _____

Date: _____

Part 1

Description of Involvement

I. Background

- a. General description of corporation as to types of products, number and location of subsidiaries, etc. around the world.
- b. Corporation's involvement in Eastern Europe.
 1. Prior involvement(s) (excluding agreement to be studied).
 2. Future or pending involvement(s)

II. Agreement(s) under study

- a. Number (and breakdown) of arrangement(s): (include date(s) (official start, and termination dates)
- b. Negotiations leading up to agreement(s): Who instigated, length of time, etc. (Include initial reasons both USA and host party were interested in agreement

c. Types of Involvement: select appropriate one(s):

- ☐ 1a. TURNKEY (construction of plant):
- ☐ 1b. TURNKEY (equip plant):
(suggest equipment):
- ☐ 2. Transfer PRODUCT technology (blueprints, etc.):
- ☐ 3. Transfer PROCESS technology (how to manufacture, etc.):
- ☐ 4. MANAGEMENT (how to RUN plant):
- ☐ 5. MANAGEMENT (training others to: (note whether on-site, or elsewhere, or BOTH): operate equipment, manufacture item:
- ☐ 6. Provide PATENT rights (if so, how long?):
- ☐ 7. Provide TRADEMARK rights (again how long? [give back?])
- ☐ 8. Purchase products on buy-back agreement: (details, was this essential?):
- ☐ 9. Other aspects?

d. Arrangements made with:

- 1. Country:
- 2. Group within country:
- 3. Factory, etc. involved:

e. Responsibilities of USA Corporation under (each) contract:

f. Responsibilities of Eastern Europe Party under (each) contract:

III. Time Frame

What tasks have been involved in the whole operation:

- 1. Set up:
- 2. Production:
- 3. Marketing tasks:
- 4. Other?

IV. Aspects of Involvement

A. Financial flows:

1. Any monetary payments to the USA corporation?
2. Monetary unit (currency)?
3. Products in exchange:
4. (1) Analyzed by, (2) Within company, (3) Elsewhere in country, (4) Elsewhere in East Europe:
 - a. Total units (esp. prior to production):
 - b. Parts (sub-assembly--going into production?):
 - c. Service pieces (for repairs on prior sales?):

B. Staffing

1. USA Personnel on project
 - a. Number of people involved
 - b. Visits, or length of time in host country:
 - c. Job areas or skills required
2. Costs of personnel (who paid)
 - a. Base pay (additional):
 - b. Fringes (additional?):
 - c. Travel, lodging, etc., abroad?:
3. Problems which have arisen with USA personnel:
 - a. Timing of staffing requirements:
 - b. Accompanying staffing problems (housing, family discontent, etc.):
 - c. Proportion of personnel used in getting production going, versus proportion used in training others:

4. Description of involvement with host personnel:
 - a. Number of employees involved:
 - b. Types of jobs or tasks to be performed:
 - c. Background of nationals:
 - d. Additional relevant description:
5. Problems which involved host personnel:
 - a. Skills deficiencies?
 - b. Morale low?
 - c. Quality control lacking?
 - d. Language problems?
 - e. Other?

C. Protection of Participation

1. Initial protection
 - a. Any controls (stated or unstated) in agreement, designed to help USA corporation: (such as holding back certain technology until all else is completed, etc.):
 - b. Any controls (stated or unstated) in agreement designed to help host partner (such as does not provide payment until all obligations met, etc.):
 - c. What guarantees were provided by USA corporation that all their responsibilities would be completed?
 - d. What guarantees were provided by the host partner that all their responsibilities would be completed?

2. On-going protection
 - a. Inspection provisions included for:
 - 1) the USA corporation?
 - 2) the host partner?
 - b. What protection was offered for the:
 - 1) patents involved?
 - 2) trademarks involved?
3. External protection: What provisions were included for solving disputes:
 - a. Arbitration clauses in contracts (where located, if so)
 - b. Force Majeure
 - c. Any court involvement?
 - d. Other?

V. Problems encountered (other than mentioned above)

- A. Connected with host?
 1. Construction/equipping?
 2. Staffing/training?
 3. Production (supplies, quality, quantity)?
 4. Approvals, red tape holdups?
 5. Others?
- B. With host government?
- C. With the transfer of technology:
 1. Product transfer?
 2. Process transfer?
 3. Management (operating plant)?
 4. Management (training others)?

- D. Any problems with unions?
 - 1. In USA?
 - 2. In host country?
- E. Any USA governmental opposition?
- F. Other problems encountered?

VI. Assessment

- A. What has made entire operation easier?
- B. What had made entire operation more difficult?
- C. Current view of opportunities being provided by this agreement: rank, if possible, for USA corporation. (1) Within country, (2) Within Eastern Europe, (3) Elsewhere
 - 1. Increased exports for:
 - a. Total assemblies
 - b. Subassemblies
 - c. Replacements
 - 2. Toehold in market leading to greater involvement:
 - 3. Fees being paid:
 - a. To offset prior product development costs:
 - b. To take advantage of technology before obsolescence occurs?
 - 4. Obtain source of product for supply elsewhere (gaining another manufacturing facility):
 - 5. Obtaining additional supply of raw materials:
 - 6. Means of hard currency from sale of product:
 - 7. Other?

Part 2

Variations or Changes in Involvement

VII. Variations as to:

- A. ___ Number or types of contracts comprising the arrangements:
 - ___ Dates of start:
 - ___ Dates of termination: (shortened, lengthened, other?):
 - ___ Other?: (Revisions in contract format, etc?)
- B. Unexpected occurrences connected with NEGOTIATIONS in arranging agreement(s):
 - 1. Sources of unexpected occurrence(s):
 - 2. Reason(s):
 - 3. Adaptation(s):
- C. Variations as to types of involvements
 - 1. Necessity to do MORE than anticipated:
 - 2. Necessity to do LESS than anticipated:
 - 3. Other variation(s):
- D. Variations in arrangements as to: (more approvals needed, different parties signing, anything?):
 - 1. Country?
 - 2. Group within country?
 - 3. Factory?
- E. Variations as to responsibilities of USA corporation?
- F. Variations as to responsibilities of Eastern Europe Partner?

VIII. Time Frame variations: What lags, speedups, etc. have occurred? Why?

- A. Set up?
- B. Production
- C. Marketing tasks?
- D. Other?

IX. Aspects of Involvement:

A. Financial flows: variations as to amount, timing, or form of payment? (Or, other aspects here?):

- 1. Monetary payments?
- 2. Monetary currency?
- 3. Products?
- 4. Review what variations occurred from what was expected. (1) Within company, (2) Elsewhere in country, (3) in East Europe:
 - a. Total unit sales
 - b. Subassembly sales
 - c. Service (repair) parts

B. Staffing

- 1. Variations in USA personnel on project
 - a. Number of people involved?
 - b. Visits or length of stay?
 - c. Job areas or skills involved?
- 2. Variations in costs of such personnel?
 - a. Base pay (increase, decrease?)
 - b. Fringes (increase needed, decrease?)
 - c. Travel (etc.?)

3. Problems involving USA personnel: what problems were anticipated?
 - a. Timing
 - b. Accompanying problems?
 - c. Operating vrs. training proportion?
 - d. Other problems which did not arise but were expected?
4. Description of host involvement: variations from expectations as to:
 - a. Number involved?
 - b. Tasks required to be performed?
 - c. Background of employees?
 - d. Other?
5. Anticipated problems involving host personnel:
 - a. Skill deficiencies?
 - b. Low morale?
 - c. Low quality control?
 - d. Language difficulties?
 - e. Other problems anticipated which have not arisen?

C. Protection of participation

1. Initial protection
 - a. Have the controls met any anticipated contingencies?
 - b. Have the controls been used by the host partner (if they exist?)?
 - c. Have the guarantees proved necessary for the USA corporation?
 - d. Have the guarantees proved necessary for the host partner?

2. On-going protection
 - a. Inspection provisions: have they been utilized by:
 - 1) the USA side?
 - 2) the host side?
 - b. Have any problems arisen regarding: (also, any anticipated problems which have not?)
 - 1) patents?
 - 2) trademarks?
3. External protection: Have any situations utilizing these occurred?
 - a. Arbitration
 - b. Force Majeure?
 - c. Court involvement?
 - d. Other?
- X. Problems encountered; what problems were anticipated which have not occurred?
 - A. Host problems
 1. Construction/equipping/
 2. Staffing/training?
 3. Production (supplies, quality, quantity)?
 4. Approvals, red tape, etc?
 5. Other?
 - B. What problems were anticipated but did NOT appear with host government?

- C. What anticipated problems did NOT appear in the transfer?
 - 1. Product?
 - 2. Process?
 - 3. Management (operating plant)?
 - 4. Management (training others)?
- D. Union problems which did not arise?
 - 1. In USA?
 - 2. With host?
- E. USA governmental opposition which did NOT arise?
- F. Other anticipated problems which did not arise?

XI. Hindsight

- A. What was expected to make operation easier, but DID NOT?
- B. What was expected to make operation more difficult, but DID NOT?
- C. View of opportunities when agreement was being considered and first arranged: (rank if possible) (1) Within country, (2) Within Eastern Europe, (3) Elsewhere.
 - 1. Increased exports for:
 - a. Total assemblies
 - b. Subassemblies
 - c. Replacement parts
 - 2. Toehold in market leading to greater involvement?
 - 3. Fees being paid:
 - a. Product development cost?
 - b. Utilize product before obsolescence sets in

4. Obtain source of supply of product
5. Obtain raw materials
6. Means of hard currency?
7. Other?

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