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(R) TRANSFER OF TECHNOLOGY*.

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PORTUGAL .

Mission report

Prepared for the Government of Portugal by the
United Nations Industrial Development Organization
executing agency for the United Nations Development Programme

Based on the work of Hubert A. Janiszewski

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INTRODUCTION

The present mission to Portugal took place between 16 April and 22 April 1978 and was carried out by Mr. Hubert A. Janiszewski, Industrial Development Officer of the Technology Group of UNIDO.

The broadly defined tasks of the mission were :

- (1) To appraise and evaluate the present status of the operations and organization of the Institute of Foreign Investment as regards its approval activities in the field of technology transfer agreements;
- (2) To prepare basic guidelines concerning evaluation criteria for technology transfer agreements by the Evaluation Department;
- (3) To discuss in detail the preparation at the Institute's end of its participation in the UNIDO scheme for exchange of information on contractual terms of technology transactions;
- (4) To identify areas of future co-operation and assistance of UNIDO to the Institute.

In fulfilling its tasks the mission has repeatedly met with the following staff of the Institute of Foreign Investment (I.I.E.) :

1. Dr. A. Vaz Pinto, President
2. Dra Maria Elsa Ferreira, Member of the Council of Management
3. Dra Maria Isabel R. Oliveira, Member of the Council of Management
4. Dr. Emilio da Costa Rosa, Director, Legal Division
5. Dra Maria do Cen Bastos, Director, Public Relations Division
6. Dr. V. Simoes, Studies, Services and Documentation Division
7. Dr. Pinto da Cruz, Evaluation Division, Technology Transfer
8. Nuno Cassola, Evaluation Division, Technology Transfer
9. Dr. Nuno Messias, " "

The mission wishes to extend hereby its gratitude to the above-mentioned staff members of I.I.E. for the excellent co-operation without which it would have been impossible to fully carrying out the tasks.

The mission findings and recommendations have been discussed to a certain degree with the staff of I.I.E.. However, full responsibility as to these recommendations and suggestions rests solely with the author of the present report.

ORGANIZATION OF THE I.I.E. AND ITS BASIC TASKS

The Foreign Investment Institute has been created by Decree n° 52/77 of 24 August 1977 and its scope of responsibilities is additionally described in detail in Decree -Law n° 348/77 of the same date; Decree n° 51/77; Decree n° 53/77; Decree n° 54/77; Decree n° 55/77; Ministerial Order n° 536/77 and Law n° 46/77 of 8 July 1977.

In principle, I.I.E. has been established for the promotion and regulation of all direct foreign investments in Portugal as well as for the transfer of technology agreements affecting foreign and domestic enterprises operating in Portugal, irrespective whether there is or whether there is not any foreign equity participation.

The I.I.E. became operational as of 12 January 1978 and its current organizational chart constitutes Annex I of the present report.

As may be seen I.I.E. is headed by three members of the Council of Management to which are subordinated the following divisions : the Evaluation Division; the Legal Division; the Division of Studies, Statistics and Documentation; the Public Relations Division and the Division of Administration.

From the mission's point of view, the key divisions involved in the process of evaluation and approval of technology transfer agreements are :

- (a) The Transfer of Technology Section at the Evaluation Division;
- (b) The Council of Management (which takes final decision about approval or disapproval in each case);
- (c) The Legal Division (acts as Legal Council to the Council of Management).

Currently, the following system of evaluation procedures in respect of technology transfer agreements has been applied :

Technical, economic and legal evaluation of all types and concerning all industrial branches is being carried out by the staff of the Transfer of Technology Section; recommendations of the Transfer of Technology Section along with full documentation are submitted to the Council of Management for final decision, with or without consultation with the Legal Division.

I.I.E. is currently evaluating and approving all agreements signed prior to 1973 (between 1973 and the end of 1977 evaluation and approval have been carried out by the Bank of Portugal as regards some 1,400 contracts) for which a deadline of decision was set as of 12 July 1978 and all contracts signed after 1 January 1978, for which there is an established time limit for evaluation of 90 days from the date of receipt of the contract for evaluation.

According to the available data, as of 17 April 1978 I.I.E. had received 536 agreements, on 46 of which decisions have already been handed over.

Estimations and data available indicate that out of 536 contracts about 50% are old agreements signed prior to 1973 and 50% are those entered after 1 January 1978. In the opinion of I.I.E. agreements signed prior to 1973 and currently under approval constitute the greatest problems due to delays of their approval and uncertainty of the parties as to the final decision to be taken by I.I.E..

ADMINISTRATIVE PROBLEMS OF I. I. E.

It seems that one of the major problems I.I.E. is facing at present is its understaffing, particularly with regard to the Evaluation Division and the Division for Studies, Statistics and Documentation, the latter one employing only staff on part-time basis. As far as can be ascertained, also other divisions seem to be understaffed, perhaps with the exception of the Legal Division.

The present understaffing of I.I.E., if continued and not solved within a very short period, may lead to the following negative consequences :

- Serious delays in evaluation activities affecting the general

environment and atmosphere around I.I.E.;

- Adverse, negative effect on domestic and foreign business communities vis-à-vis I.I.E. and Portugal as a whole;
- Decrease of quality of evaluation activities of I.I.E. in all sectors;
- Impossibility of fulfilment of all activities of I.I.E., particularly those related to in-depth studies of sectoral trends, statistics, access to data and information from outside sources etc. and therefore decrease of the role of I.I.E. as a major policy organ for the Government with regard to treatment of foreign capital and technology flow.

APPRAISAL OF EVALUATION ACTIVITIES OF I.I.E. IN THE FIELD OF TECHNOLOGY TRANSFER AND CO-OPERATION WITH OTHER GOVERNMENT INSTITUTIONS

As mentioned earlier, the evaluation activities in all its aspects are being carried out by the Transfer of Technology Section of the Evaluation Division by the present staff of 4 professionals.

As much as can be ascertained, apart of Decree 53/77 no other guidelines have so far been developed for evaluation and appraisal and as much as can be judged on the basis of individual interviews and discussions, these evaluations seem to be of rather superficial and incomplete nature.

As the staff of the Transfer of Technology Section consists mainly of economists without prior experience in licensing, the evaluations carried out tend to be confined to conformity with the Portuguese legislation, elimination to the extent possible of restrictive, commonly known practices and possibly decrease of overall payment, although without full economic appraisal.

As much as can be ascertained, no technical analysis is practically made, and often such important elements like guarantees, warrantees, technical and technological content of agreements etc. are overlooked.

Though, as mentioned earlier, no guidelines as to the overall evaluation and approval activities of I.I.E. exist, it should actually be mentioned that in its decision I.I.E. is guided by basic development goals of overall economic policy of the Government, attempting, inter alia, to reduce the

deficit of balance of payments, reduce high unemployment and the present high rate of inflation as well as to attract back direct foreign investments.

Thus, it seems that the current I.I.E. policy is to issue the decision on a case-by-case basis attempt to apply, to each case, the above economic policy strategy resulting in a number of cases in inapplication of comparatively liberal criteria of approval. It is, however, considered by the mission that long-term policy goals of the Government of Portugal need to be translated into specific policy guidelines which in turn will direct and orient I.I.E. in its work in the field of technology transfer as well as foreign investments.

Due to limited human resources, I.I.E. tends, in the field of technical evaluation, to leave these aspects to the technical abilities of the licensees, which in the long run should be eliminated as quickly as possible.

As much as can be ascertained, however, limited technical evaluation has been done for I.I.E. by the Ministry of Industry and Technology and other sectoral ministries and this practice should be continued and extended in the future.

Very limited and almost non-existent is the co-operation and exchange of information between the Portuguese Patent Office and I.I.E. and these relations should be improved without delay, particularly as regards information on foreign patents and trade marks registered in Portugal and Portuguese patents and trade marks filed.

In overall terms the technical staff of I.I.E. seems to be of high moral calibre which, however, should be strengthened by profound professional experience in this important and difficult field.

RELATIONSHIP BETWEEN I.I.E. AND DOMESTIC AND FOREIGN BUSINESS COMMUNITIES

On the basis of the discussions held, the impression was created that the new Foreign Investment Code as well as the establishment and functions of I.I.E. are yet not fully known by both domestic and foreign business communities. This may be due to the rather short existence of I.I.E., the overall political climate and lack of permanent contacts between I.I.E. and business communities. In the eyes of the mission, this element should be taken seriously into consideration and remedied without further delay. In this connection explanations were given that the Council of Management ~~took~~ took a difficult decision to start I.I.E. without full staffing and proper organization of the office in order to cover without further delay this important area of governmental activities.

PROBLEM AREAS IN EVALUATION ACTIVITIES OF I.I.E. IN THE FIELD OF TRANSFER OF TECHNOLOGY AGREEMENTS

The work at I.I.E. and the daily discussions both with the Council of Management and the Evaluation Division lead to the identification of the following major problem areas in evaluating activities, which will require perhaps further outside assistance and technical improvements :

- (1) I.I.E. has not as yet established major policy guidelines concerning the treatment of technology transfer particularly between parent and affiliate companies;
- (2) A great number of contracts actually being evaluated by I.I.E. deals with franchising operations (hotel, rent-a-car, bottling, etc..) which will require the development of specific and long-term guidelines for evaluating and approval purposes;
- (3) There is a definite need to develop specific evaluation guidelines with respect to at least the following sectors and types of agreements :
 - automotive, including assembly, operations, service contracts, etc.;
 - chemical and petrochemicals;
 - consultancy agreements;
 - textile and garments;
 - computer programmes;
 - management contracts.

- (4) An internal checklist giving a general orientation as to the scope of contracts and evaluation for daily use has to be established without delay (see Annex II);
- (5) In the opinion of the mission, prior to a decision, a discussion between I.I.E. and licensee/licensor should take place in order to explain the overall policy of I.I.E. and to give specific recommendations. Such discussions, provided also the licensor participates, would result in a much more thorough evaluation and quicker decisions, both at the end of the supplier of technology as well as of I.I.E.;
- (6) It is suggested that an economic evaluation will be based on the share of the licensor's profit (royalties) in the licensee's profit. Annex III constitutes the general guidelines in this direction which can be used by I.I.E..

This concept as well as other evaluation methods as used by other agencies of developing countries should be adapted to I.I.E. needs and use;

- (7) A time limit of, say, 60 days should be imposed by I.I.E. after handing over decisions in such cases, during which the licensee/licensor should comply with specific requirements. The non-observance of the stipulated time limit and conditions may lead to disapproval of a contract.

RECOMMENDATIONS AND PRELIMINARY GUIDELINES CONCERNING TREATMENT OF SPECIFIC ^{1/} TYPES OF AGREEMENTS

As mentioned earlier, one of the major tasks of I.I.E. is to formulate the basic policy guidelines and objectives in the area of treatment of foreign technology flow, taking into consideration present and future country needs, in collaboration with other policy-making institutions and taking into account prevailing economic problems of the country (high unemployment, deficit of balance of payments, overall technological dependency of industry, need of foreign capital, high inflation, etc..).

^{1/} The recommendations as made in the present report draw substantially on the experience of UNIDO in such countries like Mexico, India, Malaysia, the Philippines and Argentina. The author wishes to acknowledge the substantive contribution of such distinguished experts like Mr. V.R.S. Arni (India), Mr. S. Glembocki (Argentina), Mr. K.D.N. Singh (India) and others.

The recommendations as outlined below will specifically deal with daily operations of I.I.E., in order to improve its operations and effectiveness :

- I. The skills of the I.I.E. staff have to be generally improved, in particular in the areas of economic and technical evaluations. Some guidelines to this effect are contained in Annexes II and III of the report.

Hence, the further training of the staff should be foreseen, possibly in co-operation with UNIDO which may arrange for the visit of evaluation staff to other offices for transfer of technology in developing countries (Mexico, Brazil) or by organizing in Lisbon short and intensive training.

- II. A general improvement of the relationship between I.I.E. and domestic and foreign recipients/suppliers of technology is to be secured, particularly in the area of information as to the activities and the role of I.I.E. in supporting and assisting the local business community and industry and generally in increasing the negotiating capabilities of industry as such.

Here it is suggested that an information on the activities of I.I.E. in transfer of technology with enclosed legislation and formal requirements be sent to all companies in Portugal as well as suppliers of technology abroad. The same information should go to the Chamber of Commerce, the Association of Industries, etc..

Promotional meetings should continuously be held either with domestic or with foreign industrialists.

Furthermore, I.I.E. should initiate certain training programmes with or without UNIDO's assistance, specifically for the executives of Portugal's business communities.

- III. The extension of I.I.E. services in terms of advance consultation or evaluation activities is to be incorporated in the daily operations of the Institute.

- IV. The establishment and staffing of the Division for Studies, Statistics and Documentation should be completed as quickly as possible in view of, inter alia, the access of I.I.E. to ^{the} UNIDO exchange system of information on contractual terms, and supporting, analytical functions of I.I.E.. The frame for statistical and documentary work of I.I.E. has been already established and seems to be of high professional and useful level which has now to be put into practice.
- V. As mentioned earlier, specific evaluation guidelines are to be established for areas of current problems. These preliminary guidelines should take the following criteria into consideration and should serve as a basis for the development of specific treatment of those types of transactions.

CRITERIA FOR THE MACRO-ECONOMIC EVALUATION OF SPECIFIC TECHNOLOGY TRANSFER PROJECTS

The following basic criteria are suggested for consideration of the Evaluation Division in its economic analyses :

- (a) Total cost of the entire project;
- (b) Comparison of total costs of alternative projects;
- (c) Relation between total cost of the project and final price of the product (if possible also on other markets);
- (d) Aggregated value of the project; manufacturing costs and market price of the proeduct;
- (e) Foreign exchange balance of the project (covering some 5 years time);
- (f) Projections as to changes in the market share due to introducing a new product before and after project implementation;
- (g) Estimation as to likely degree of technological autonomy of the project.

SERVICE AND MANAGEMENT AGREEMENTS

These agreements usually constitute ^a peripheral or marginal part of the overall transfer of technology and in principle should or may be included in the scope of the regular licence or know-how contracts. For a number of reasons, however, where we may deal with multinational organizations and their associated companies, large franchising operations etc., these contracts play a rather important role and result in transfer of large amounts. Below may be found some basic

considerations which may be incorporated in the evaluation activities of I.I.E.:

- Service and management agreements may be divided into the following large groups :
- concerning administration and auditing organization;
- " financial organization;
- " legal assistance;
- " technological and commercial services.

The latter type of agreements is most common and most significant from the licensee point of view and may include the following :

- (a) Theoretical and practical advice on sales and commercialization of products;
- (b) Administration of credit lines and discount systems;
- (c) Displays, promotion and decoration advice;
- (d) Formation and training of personnel;
- (e) Overall supervision of enterprise operations;
- (f) Development of promotion and advertisement campaigns.

In respect of service and management agreements, the following criteria of evaluation may be taken into consideration :

- (a) There is a definite need to clarify in agreements the nature of acquired services and to disaggregate as much as possible above-mentioned services;
- (b) Departing point for the establishment of prices for services is above-mentioned disaggregation of agreements;
- (c) Payments should usually be linked with expected economic results;
- (d) With regard to administrative services costs they should be built into the overall administrative costs and as such linked with or related to sales by the licensee;
- (e) In respect of fully-owned or majority-owned companies (over 51% foreign equity participation), such arrangements should be part of overall costs of foreign operation by the parent company and eventually discounted from remitted profits without extra charges the licensee.

AGREEMENTS IN THE FIELD OF ELECTRONICS INDUSTRY

- (1) This industry is characterized by rapid changes in technology and innovative introductions.
- (2) Usually, assembly operations in electronics are labour intensive while for example chemicals for electronics industry (semi-conductors, etc..) are rather capital intensive. This situation may lead to an important decision by the government of the country - importer of technology.
- (3) Sales to an investment ratio tend to be high and profit maturity occurs quickly but is of short life.
- (4) Know-how is usually as important as managerial experience and access to international markets.
- (5) Patents are important in industrialized countries but the product/process innovation rate is so high that the effective time advantage of patent protection is relatively short (3 - 5 years).
- (6) Trade marks are important for so-called consumer electronics.
- (7) Straight licensing is usually applied with respect to components (standardized transistors, etc.), particularly with access to export markets; joint-ventures would predominate sub-assembly operations.
- (8) Acceptable royalty rates will be in range of 4 - 6 (7) % (small effect of high royalty rate on income sharing in high profit industry) for sophisticated technologies. Because of high value of management only minor adjustments in royalty rates for joint-ventures are suggested.
- (9) Royalties are based almost exclusively on sales values.
- (10) In this industry in some instances different rates of royalties for domestic and export sales may be considered.
- (11) In order to encourage transfer of technology to domestic licensees, a provision of "adjusted royalty calculation" might be incorporated wherein the costs for imported elements are deducted from the sales values before calculating the base for royalty payments.

AGREEMENTS IN THE FIELD OF CHEMICAL INDUSTRY (COMMODITY CHEMICALS)

- (1) In contrary to electronics, aging of technology in the chemicals industry affects mainly the process technology and not the products, and new technology has little effect on their quality.
- (2) Alternative process technologies have their highest impact on the cost of production, or in providing access to cheaper raw materials.
- (3) In the inorganic chemicals area, technical information and experience are more important than secretly held know-how (which predominates in some organic chemicals and most plastics areas).
- (4) Trade marks do not play any role in sales of chemicals and prices tend to stay stable over longer periods.
- (5) Patents hold an important position in process technologies, highest in secondary products like plastics, fibres, elastometres e'c..
- (6) Process guarantees play an important role in licensing since the cost of production is very closely related to effectiveness of use of raw materials.
- (7) For inorganic chemicals of low profit on sales and not based on high secretive know-how lump-sums are quite common. Capitalization of royalty at 0.50 to 1.0 % of sales value for 10 years would serve as a working basis for royalty evaluation.
- (8) For "high" and "medium" volume organics a uniform royalty rate between 2.50 - 3.0 % may be applied with no adjustments for joint ventures in principle.
- (9) For highly proven technologies, lump-sum payments may be accepted, although more advisable will be running royalties supported by the most favoured licensee clause.
- (10) Performance guarantees must relate to royalties or lump sums. The licensor's financial liability would be about 30% of NPV (net price value) up to 50% of NPV (depending whether proven or non-proven) of technology or licensor's profit.
- (11) Technical fees for basic and detailed engineering would be 10 - 15% of investment for reasonably large-sized plants.

AGREEMENT IN THE FIELD OF PLASTICS

- (1) As thermoplastics (PVC, poly-ethylene) are high-margin products with significant contribution arising from wide grades-mix of plants, the income-sharing concept of royalties would suggest a 1 to 2% premium for chemicals, which in principle will not adversely effect income sharing, while bringing the good and sophisticated technology. Royalty should be around 5% consisting of royalty and technical service components; while detailing continuous technical services of the licensor over the duration of the agreement.
- (2) Lump sums will not be favoured because of the necessity of continuous inflow of information on new products - both from the technical as well as marketing point of view. For the same reasons the duration of agreements tends to be longer (ca 7 - 10 years).
- (3) For thermosets (urea-formaldehyde) most of the considerations for commodity chemicals will apply, though they will not require 2.5 - 3% royalty rates.

AGREEMENTS IN THE FIELD OF PHARMACEUTICALS

- (1) Patents, know-how and trade marks play an interrelated and very significant part in the basic manufacture and formulation of pharmaceutical products.
- (2) Patents can apply to both products and processes, but product patents are important in pharmaceuticals industry (under which products can be only imported by firms which have obtained rights under patents for distribution).
- (3) For formulated products sold under licensors' trade marks, basic materials very often have to be purchased from the licensor or from the firm operating under licence from licensor.
Here, attention is also drawn to the often overpricing of such importations.
- (4) Domestic (licensee's country) legislation in the area of drug control is an important determinant of product use, pricing and distribution.
- (5) As to major commercial drugs of high unit value, only subsidiaries of the inventor-licensor firm participate in the manufacture. A third party - straight licensing - exists mostly for long standing drugs and in the area of formulations.
- (6) Know-how as documentation would be important in the manufacture of base drugs, but not very significant for most formulations.
- (7) Documentation on medical aspects of drugs and formulation, results of clinical tests, prescription literature, etc. (i.e. technical secret information) plays a very important role and must be considered a compulsory part of the know-how package.
- (8) Process improvement inflow is less important than information inflow on new products and clinical data.

Because the licensor/supplier will usually control prices of input (raw materials etc.), the concept that high royalty rates do not adversely affect income distribution in high profit industry cannot be applied.

It is recommended therefore that royalty base is defined as the difference between gross sales price of formulations and cif costs of drug base.

On this difference, royalties amounting up to ca 5% can be negotiated.

- (10) For generic drugs where there are several competing sources of base material supply, royalties based on sales values may be established.

AGREEMENTS IN THE FIELD OF MECHANICAL INDUSTRIES

The considerations below will apply predominantly to mass production plants manufacturing industrial and household goods including electro-mechanical products.

- (1) In this industry, industrial design and engineering will constitute major licensor inputs.
- (2) Assembly of components might constitute the manufacturing objective of the licensee and careful distinction between assembly and manufacture of components has to be made.
- (3) Trade marks are important and royalties or other periodical fees for licence would include a substantial component for trade marks.
- (4) Royalty rates should preferably be based on sales value but adjusted for components in order to encourage back-integration.
- (5) Where only assembly is involved and likely to remain over longer periods, royalties in the range 1.50 to 2.50 % may be reasonable.
- (6) Higher royalty rates for manufacture of components and accessories for mass production may be in some instances justified subject to deduction of imports.

TRADE MARK AGREEMENTS (TM)

Following are some considerations which may be used by I.I.E. in its evaluation activities :

- (1) It is suggested to consider that no royalties on trade marks be allowed for use in cases where the owner/licensor of a trade mark holds the majority equity in the licensee's enterprise.
A suitable scale for adjustment of royalty rates according to financial participation may be developed for evaluations.

- (2) Precise spelling out of the rights of the licensee to use a trade mark should be made in a contract, especially with regard to trade marks being used after expiration of an agreement and discontinuance of payment.
- (3) The licensee should be encouraged on a whole to associate local trade marks with those acquired under a trade mark agreement whenever possible and feasible.
- (4) Dangerous situations may arise in case of so-called composite agreements (know-how and trade mark agreements) where the applicable fee relates to the use of a trade mark and know-how is offered gratuitously (free of charge). In those cases where know-how fails to "perform" as warranted, the licensor may have no financial liability as he does not derive any income from know-how.
- (5) The primary aim of a trade mark agreement is to obtain high quality of products. Thus, the licensor usually retains the right to cancel the contract if quality fails to meet the set standards. The Evaluation Agency should protect the licensee from arbitrary cancellation provisions.

SOME COMMENTS ON FRANCHISE AGREEMENTS

A franchise agreement will cover usually :

- (1) The use of widely recognized trade or service marks in conjunction with a service system;
- (2) A long-term ongoing relationship between seller and buyer whereby the seller
 - (i) assists the licensee in the marketing of a product or rendering of a service (such as national/international advertising and training of the licensee's employees);
 - (ii) closely controls the quality of products and services distributed/ rendered.
- (3) Both parties agree to accept certain rules of business conduct. Franchising as such is a distribution system and not basically a production system which permits a uniform method agreed upon of marketing products or rendering of services.

- (4) The franchise agreement is very similar to the trade mark agreement and places highest emphasis on the controlled use of trade marks and on statutory means available for the protection, ownership and use of trade marks.
- (5) Franchisor's fee is usually a percentage of franchisee's (licensee's) sales value. No fee-franchise is possible if franchisor is supplier of any materials to franchisee.
- (6) The franchisee may consider payment of an additional fixed or variable fee for the advertising costs of the franchisor; however, it is recommended (in for example hotel franchise) to pay towards those advertisements which are beamed towards franchisee's clientele only.
- (7) Some problems usually arise with regard to the territory of franchise and the "national territory" should usually be the territory of use of trade marks with franchisee having also decision to appoint dealers on sublicensing basis.

VI. It should be reconsidered in light of the, so far, limited operations of I.I.E. in the area of technical evaluation to employ local technical consultants for key sectors like chemicals and petrochemicals, automotives, textiles and garments, metallo-mechanice, etc..

VII. In view of the requirements of in-depth economic evaluation of contracts, it will be necessary to collect from local licensees information on the expected rate of profits out from licensing investment. This in turn may require some modification of submission formate currently being used by I.I.E..

VIII. It should also be reconsidered that the licensee when submitting the agreement for evaluation and registration should submit not only the contract but also all relevant information without which the submission is not valid. This way, I.I.E. may gain additional time for proper evaluation and approval procedures.

- IX. It should also be reconsidered, whether on a case-by-case basis the licensee should submit on request a full economic feasibility report as to the proposed technology acquisition as complementary element for full economic evaluation.
- X. In view of the great staff problems at I.I.E. on one hand, and UNIDO's assistance given to the Ministry of Industry and Technology in the area of transfer of technology on the other, a closer co-operation of both institutions at the policy as well as operational level should be encouraged.

In this light, it should be mentioned that the Ministry has a fairly advanced study of 2,000 agreements handled by the Bank of Portugal during the period of 1973 - 1977 which ultimately serve as a background analytical material for major policy decision in the area of flow of technology, foreign investment, industrial property, etc..

It is recommended that I.I.E. will actively participate and collaborate with the Ministry in preparing the above-mentioned survey which is of great importance also for I.I.E. as a basis for the formulation of guidelines for technological longer-term policy of the country.

Specific attention in this context is called to the data on equity participation in enterprises engaged in technology transfer the access of which is limited to I.I.E., which should assist the Ministry in this specific aspect in order to make full use of the study and prepare as broad and complete a survey as possible.

- XI. It is also suggested for consideration, that all agreements evaluated are being submitted before a decision is made to the Legal Division for check-up and approval. From the legal point of view, such a practice will avoid any legal problems of various nature in the future.
- XII. It is further recommended that a more specialized evaluation system is applied, that is based on sectors thus leading steadily towards

acquiring very intimate knowledge of certain industrial sectors in terms of specifics of technology transfer.

With the growth and elaboration of a complex system for economic evaluation of agreements a unit should be eventually established which will be engaged in only such activities with regard to both currently evaluated cases as well as to drawing general conclusions and established guidelines on the basis of contracts approved and evaluated in the past.

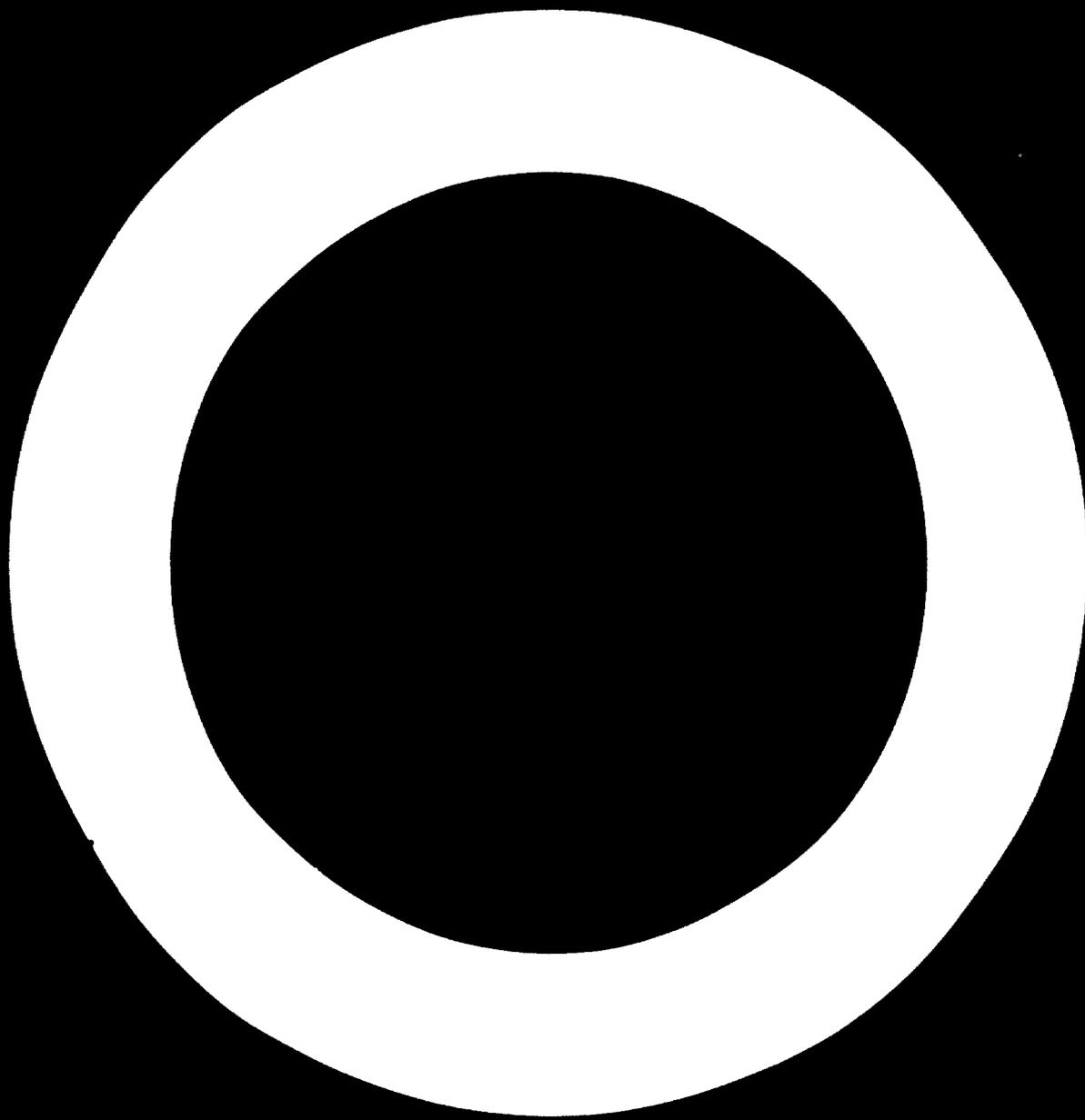
XIII. It is also suggested to employ without delay in the Section of Evaluation of Technology Transfer Agreements an experienced engineer in technical evaluations, who will check and steadily develop guidelines for technical evaluation on one hand, and on the other hand, as an immediate task, check the technological content of agreements in order to ensure full transfer of technology from the licensor to the licensee.

XIV. It is recommended that in view of the major information gap existing between the Portuguese industry and sources of information on alternative technology, an Information Unit be gradually established either at the Statistical and Documentation Division or at the Public Relations Division, the functions of which may include, inter alia :

- (i) assistance and advice to prospective licensees on sources of alternative technologies;
- (ii) advice and information on prevailing conditions of technology importation from alternative sources using either its own stock of information at I.I.E. or outside sources like UNIDO etc.;
- (iii) advice as to the conduct of negotiations when considering technology importation and advice as to the proper preparation of such negotiations.

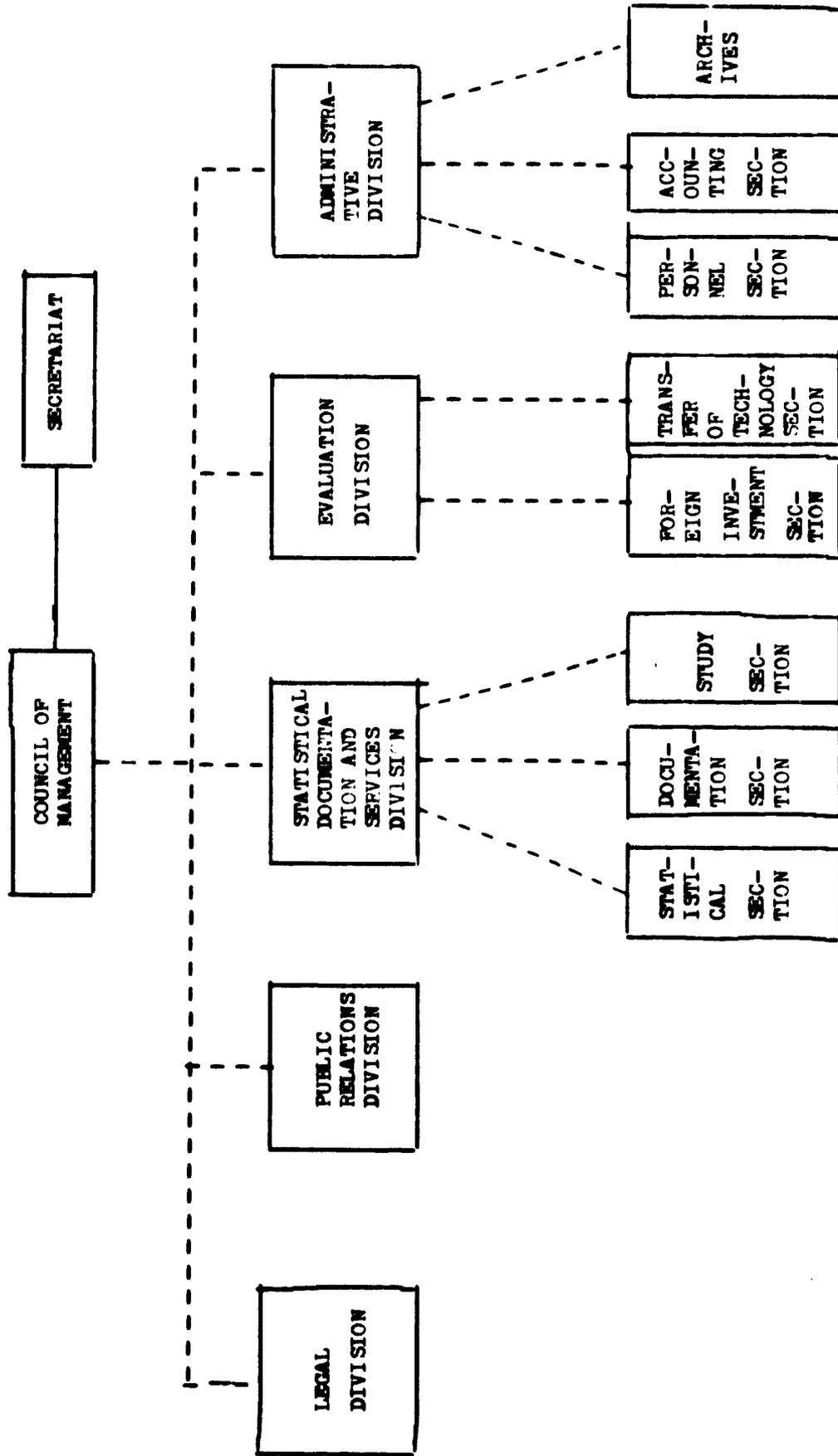
XV. Finally, it is recommended to extend the present project by, say, 2 - 3 more man/weeks with ^{the} purpose of enabling I.I.E. to introduce recommended improvements of its organization, work as well as evaluating guidelines which should be reviewed within a period of 6 - 9 months jointly by UNIDO and I.I.E..

Such a review mission will also assist further I.I.E. in the advancement of its operational activities and its proper role vis-à-vis foreign and domestic technology suppliers/recipients.



Annex I

**ORGANIZATION CHART OF INSTITUTE OF
FOREIGN INVESTMENT**



Annex II

**BASIC ELEMENTS OF CHECK-LIST TO BE USED
BY THE I.I.E. IN ITS EVALUATIONS ACTIVITIES
(without specific coments or interpretations)**

A. TYPE OF THE AGREEMENT

1. Licence agreement

- patent licence
- industrial design licence
- utility model licence
- trade mark licence
- plant variety licence
- cross licence

2. Technology transfer agreement

- technical information or technical know-how agreement
- technical services and assistance agreement
 - (a) training services
 - (b) engineering services
 - (c) instalation services
 - (d) start-up services
 - (e) operation and maintenance services
 - (f) management services
 - (g) research and development services
 - (h) technical marketing and commercial information services
- preliminary disclosure; maintenance of secrecy and option agreements

3. Franchise or distributionship agreements

B. PLACE, DATE AND PARTIES TO THE AGREEMENT

C. PREAMBLE; WHEREAS CLAUSES; RECITALS

D. DEFINITIONS OF KEY WORDS AND EXPRESSIONS

- (a) rights granted and scope of the agreement
- (b) product

- (c) component parts, spare parts, repairs, etc.
- (d) container and packaging material
- (e) process
- (f) licence, technology
 - invention
 - patent
 - trade-mark
 - know-how
 - technical information
 - technical data; operating and instruction materials
 - purchase and marketing information
 - basic detailed plant layout
 - engineering, management, start-up, operations and maintenance services
 - improvements
 - developments
- (g) plant and equipment
- (h) measurements (US, UK, metric systems)
- (i) field of use or activity
- (k) royalties, remuneration and related terms or elements
- (l) territory
- (m) legal entity

E. SCOPE OF LICENCE OR AGREEMENT

- (1) identification and description of technology
- (2) methods of acquisition
 - licence
 - trade mark
 - know-how
 - improvements
- (3) utilisation of technology formula
 - field of use
 - exclusivity or non exclusivity
 - manufacture, use or sale
 - specification of the territory
- (4) optional territory
- (5) export of products
- (6) extension, reduction or relinquishment of technology
- (7) conditions under which licence may or may not use competitive technologies

F. SPECIAL ASPECTS CONCERNING PATENTS

- (1) specification of the patents which are subject of the licence
- (2) patent marketing and indication of manufacture under licence
- (3) maintenance in force of the patent
- (4) recognition of validity of rights and assurance of non-contest
- (5) patent warranty and measures to be taken upon the invalidation of the patent
- (6) defense of the patent
- (7) working of the patent invention

G. TECHNOLOGICAL ADVANCES: IMPROVEMENTS AND DEVELOPMENTS WITHIN THE SCOPE OF THE LICENCE OR THE AGREEMENT

- (1) improvements made by licencor
- (2) improvements made by licence
- (3) Application for patent by one party
- (4) Transfer with or without the right to grant other a licence or sub-licence
- (5) Reciprocity concerning improvements or inventions
- (6) New products or processes
- (7) Research and development

H. KNOW-HOW; TECHNICAL INFORMATION

- (1) Scope in time of the know-how; developments in the know-how
- (2) Specification of know-how and the means for its transfer
- (3) Technical information
 - content of technical information
 - procedure of furnishing technical information
- (4) Disclosure of know-how
- (5) Guarantee of know-how
- (6) Guarantee offered for plant performance
- (7) Marketing of indication of manufacture of the products by virtue of know-how

I. TECHNICAL SERVICES AND ASSISTANCE

- (1) Training of licence personnel
- (2) Engineering services
- (3) Performance tests, start-ups and related services
- (4) Marketing and commercial information services
- (5) Management services

(6) Research and development services

J. SUPPLY OF GOODS, INTERMEDIATES, SPARE PARTS, COMPONENT AND RAW MATERIALS

- (1) Definition of equipment
- (2) Lease or sale of equipment
- (3) Source of procurement
- (4) Supply of drawings and other constructional data of equipment
- (5) "Tied" provisions and clauses

K. THE PRODUCTION PHASE

- (1) Subcontracting
- (2) Source and quality of raw materials etc
- (3) Schedule of production
- (4) Testing procedures
- (5) Supply of technical information to meet standards of quality

L. SPECIAL ASPECTS CONCERNING TRADE MARKS

- (1) Registration of Trade marks of the licensor
- (2) Assignment or transfer application for registration of Trade Marks to licensee
- (3) Registration of the licensee
- (4) Description of the Trade Marks to be used
- (5) Agreed products and sources concerning which Trade Marks may be used
- (6) Methods of use
- (7) Exclusivity or non-exclusivity
- (8) Termination of use of Trade Marks
- (9) Duration
- (10) Quality control of the product
- (11) Use of other control
- (12) Sale or produce of product under different Trade Marks
- (13) Price of products for which Trade Marks has been granted
- (14) Suspension or termination of use of Trade Marks
- (15) Assignment of licence and grant of sub-licence
- (16) Infringements
- (17) Non-use of Trade Marks
- (18) Price and payment

M. OTHER ASPECTS CONCERNING MARKETING

- (1) Products labeling; Advertising of publicity and other promotion activities

- (2) Channels of distribution
- (3) Sales prices of the product
- (4) Import of the product manufactured by licensor or third person
- (5) Export of products manufactured by licensee
- (6) Sale of same or similar products by the licensee

N. MANAGEMENT SERVICES

- (1) Budget and work programme
- (2) Appointment by licensee/licensor of personnel for the operation

O. COMPENSATION CONSIDERATION; PRICE, REMUNERATION; ROYALTIES; FEES

- (1) Terminology
- (2) Varieties
 - initial payment
 - lump-sum payment
 - series of lump-sum payment
 - royalties
 - computed royalties
 - special aspects of net selling price
 - maximum royalties
 - minimum royalties
 - plan and drawing fees
 - consulting fee
 - separate pricing or valuation of each element of the technology
 - maximum amount of price or cost of industrial property rights or the technology
 - indirect non-monetary compensation
 - (a) cost shifting or sharing
 - (b) feed-back of information
 - (c) acquisition of market and patent data
 - (d) supply of parts and components
 - (e) dividends and value increase of financial participations; capitalisation of lump-sum payments or royalties

P. SETTLEMENT OF PAYMENTS

- (1) Reports
- (2) Books of account; files etc
- (3) Designation of currency, remittance and exchange rate
- (4) Tax treatment of amounts payable by licensee
- (5) Credit terms and guarantees of payment

R. MOST FAVOURABLE TERMS AND CONDITIONS

- (1) As to royalties only
- (2) As to other terms and conditions
- (3) Specification of the countries in respect which the term and condition of concluded agreements are to be compared with existing licence

S. RIGHTS OF RELATED ENTERPRISES; TRANSFER AND ASSIGNMENT; SUB-LICENCING; SUB-CONTRACTING

- (1) Exercise or use by related enterprise
- (2) Right to grant sub-licence
- (3) Transfer ability and assignability
- (4) Sub-contracting
- (5) Disclosure of confidential information
- (6) Approval of Government authorities

T. INJURY OR DAMAGE TO THIRD PERSONS OR THIRD PROPERTY; INSURANCE

- (1) Responsibility of the licencor arising out of the licence
- (2) Responsibility of the licencor out of performance of its obligations under licence towards licensee
- (3) Insurance

U. DEFAULT; CHANGED CONDITIONS OR EVENTS; WAIVER; REMEDIES

- (1) Delay or or non-performance by the licencor
- (2) Delay or non performance by the licensee
- (3) Change in conditions or occurrence of events interfering with performance
- (4) Waiver

Q. ENTRY INTO FORCE; DURATION; TERM; TERMINATION; EXPIRATION; EXTENSION

- (1) Entry into force
- (2) Term of licence
- (3) Termination
- (4) Expiration and extension of the term
- (5) Renewal; Negotiation of new terms
- (6) Effect of termination or Expiration

V. APPROVAL OF GOVERNMENT AUTHORITIES

- (1) Approval of Government Authorities of the country of the licensee
- (2) Approval of Government Authorities of the country of the licensor

W. SETTLEMENT OF DISPUTES

- (1) Text controlling interpretation of the licence
- (2) Other rules of interpretation
- (3) Applicable law
- (4) Means of settlement of Disputes

X. MODIFICATION OR AMENDMENTS

- (1) Procedure
- (2) Approval of Government Authorities

Y. NOTICES, APPENDICES, ANNEXES

- (1) Designation of Addressee
- (2) Place of address of Addressee
- (3) Language of notice
- (4) Means of communication
- (5) Effective date of notice
- (6) Content of Appendices, Annexes etc
- (7) Conflict in wording

Z. EXECUTION

- (1) Authorized officers
- (2) Place(s)
- (3) Date(s)
- (4) Witness
- (5) Certification or legalisation
- (6) Locations of Execution in the licence

Annex III

SOME CONSIDERATIONS AS TO THE APPRAISAL OF ROYALTIES AND OTHER FORMS OF PAYMENT
BY I. I. E.

ROYALTY PAYMENTS AS INCOME SHARING DEVICE

Royalty may be described as one of the specific forms of compensation for industrial property rights or for technology and specifically as post-calculating recurring payments, the amount of which is determined as a function of economic use or result (production units, service units, sales of the product, profits).¹⁾ In its most popular form the royalty is expressed as a compensation calculated on the basis of fixed percentage share of the production or sale of products or services delivered by the licensee on the basis of acquired rights.

In the above-mentioned context, it is possible to say that royalty is essentially an income sharing device between licensor and licensee and in no way different from income sharing that occurs from equity holdings in a joint-venture enterprise.

Elaborating further, one may also express the opinion that licensing of technology consists primarily of "transfer of rights to use technology" and in this context royalty may be treated as essentially a lease payment.

As mentioned earlier, royalties constitute a post-calculated recurring payment determined as a function of economic use and usually appear in contracts as fixed percentage of sales.

In this context therefore the sales royalty may be expressed as ²⁾:

$$\text{Sales royalty} = \frac{\text{Payment to licensor}}{\text{Product sales price}}$$

As the payments to the licensor out from given transactions may be treated as the licensor's profit, the above-mentioned may be re-expressed as :

$$\text{Sales royalty} = \frac{\text{Licensor's profit}}{\text{Product sales price}} \quad \text{or} \quad \text{Rs} = \frac{x}{s}$$

and further as the following formula :

$$\frac{\text{Licensor's profit}}{\text{Product sales price}} = \frac{\text{Licensee's profit}}{\text{Product sales price}} \times \frac{\text{Licensor's profit}}{\text{Licensee's profit}}$$

1) WIPO Licensing Guide for Developing Countries, Geneva, 1977 - WIPO publication n°620(E)
2) See also Development and Transfer of Technology Series n° 1 by UNIDO, "National Approaches to the Acquisition of Technology, New York, 1977

where

- Rs = Sales royalty (or royalty); (%)
- S = Product sales price of sales values (\$)
- y = Licensee's profit (on sales) (%)
- P = Licensee's profit (\$)
- x = Licensor's profit (\$)
- z = Licensor's share of licence profit (%)

the formulae will be therefore :

$$\begin{aligned}
 1) \quad y &= \frac{P}{S} \times 100 & P &= \frac{y \times S}{100} \\
 2) \quad x &= \frac{Rs \times S}{100} & Rs &= \frac{x}{S} \times 100 \\
 3) \quad z &= \frac{Rs}{y} \times 100 & Rs &= \frac{y \times x \times z}{100}
 \end{aligned}$$

So, in a hypothetical case if the licensor estimates that for a product selling at \$ 100 the licensee's profit may be 20 \$ and the licensor wants a 25 % share of this profit a corresponding royalty rate the licensor will apply on sales will be 5%.

$$\begin{aligned}
 S &= 100 \text{ \$} \\
 P &= 20 \text{ \$} \\
 z &= 25 \text{ \%} \\
 y &= 20 \text{ \%} \\
 x &= 5 \text{ \$}
 \end{aligned}$$

where $Rs = \frac{y \times x \times z}{100} = \frac{20 \times 5 \times 25}{100} = 5 \%$

Above-mentioned may be re-expressed as follows :

$$\text{Sales royalty} = \frac{\text{Licensor's profit}}{\text{Product sales price}} = \text{Licensor's share of } x \frac{\text{Licensee's profit}}{\text{Product sales price}}$$

$$\begin{aligned}
 4) \quad Re &= \frac{x}{S} = z \times \frac{P}{S} \quad \text{or} \quad z = \frac{Rs}{y} \times 100 \\
 \text{i.e. } 5 \text{ \%} &= \frac{5 \text{ \$}}{100 \text{ \$}} = 25\% \times \frac{20 \text{ \$}}{100 \text{ \$}}
 \end{aligned}$$

or Rs constitutes 25% of 20% (of licensee's profit on sales)

The method of viewing the royalty as income sharing leads to an important concept of treating royalties (or any period payments) by the licensee as well as by the regulatory government agency.

EFFECT OF LICENSEE'S PROFITABILITY ON INCOME SHARING

Once the relation of the licensor's share in the licensee's profits expressed in terms of royalty on sales has been determined, it will be extremely useful to find out how far the royalty rate will affect the licensor's share of the licensee's profit in changing the rate of the licensee's profit on sales. A table drawn below is based on the equation 4) discussed earlier (data in column 3).

Table 1

Fixed Royalty Rate (%) Rs		Licensee's Profit on Sales (%) (y)	Derived Information of Licensor's Share of Licensee's Profit (z)
1	2	10 case	A 20
		20	10
		30	66
2	3	10	30
		20	15
		30	99
3	5	10	50
		20	25
		30 case	B 16.5

where $z = \frac{Rs}{y} \times 100$

The above table illustrates an extremely important finding : for any fixed royalty rate the licensor's share of the licensee's profit is highest while the licensee makes the least profit.

In other words, the lower the profitability the licensee may expect on sales, the higher the portion of this profit/being retained by the licensor at a given fixed royalty rate.

This fundamental finding leads to several implications, which should be taken into consideration both by the licensee as well as by the governmental regulatory agencies in developing countries.

Firstly, the royalty rates are to be closely evaluated when profitability is likely to be low, either in the low technology enterprises (cement) or in the early phase of the project.

Secondly, a high royalty rate should be acceptable for high-profit operations (electronic products etc.) for the income sharing result here would not be worse than the sharing which occurs in a low profit situation at a low royalty rate (see for example cases A and B of the Table).

Thirdly, stress should always be laid upon the distribution of income rather than on absolute magnitude of the remittance.

Finally, it may be put for consideration that royalty payments may be made after a lapse of period instead of being made right from the start of the operation.

In general, the above-mentioned implications suggest that a regulatory agency may attempt and reverse the process and specify what percentage of the licensee's profit constitutes a reasonable share of the licensor; once such a set of various categories of products is established the royalty rates may become self-determining.

SOME SUGGESTIONS AS TO THE PRACTICAL APPLICATION OF A COST SHARING CONCEPT IN ROYALTY RATE ASSESSMENT

In the ideal situation, the assessment of a royalty rate as a cost sharing factor in terms of division of the licensee's profit on sales will require a pretty accurate estimation or data on individual companies' profitability. In practical terms, however, assessment of profitability will appear at least difficult and therefore it is suggested to assess profit in its simplified form as profit or income. In this connection, a gross profit on sales (GP) would suffice and its percentage at the level of industry will be sufficient. Thus, no need to go to the individual company level.

Following the above, it will be necessary to establish a ranking system of various industries or groups of industries reflecting different rates of GP (gross profit on sales) and those should be matched with various rates of royalty.

Crucial for this type of matching at a given fixed royalty rate will be to combine it with ranking of industry groups in terms of their gross profit on sales. This may be established with the assistance of national statistics services in a relatively easy way.

For illustration purposes the following table II presents a five by five matrix or better income sharing grid which gives rather precise information on what, at a given royalty rate, will be the licensor's share in the licensee's profit.³⁾

Table 2

LP	G P RANKING (%)	ROYALTY RATES ON SALES (%)				
		1-2	2-3	3-4	4-5	5-6
I	Primary Industries 10-20	5-20	10-30	15-40	20-50	25-60
II	Industrial Intermediates 20-30	3-10	7-15	10-20	13-25	17-30
III	Consumer Durables 30-40	2-7	5-10	7-13	10-17	13-20
IV	Consumer Non-Durables 40-50	2-5	4-8	6-10	8-13	10-15
V	High Technology Products 50-60	1-4	3-6	5-8	6-10	8-11

The data on the licensor's share in the licensee's profit were derived from the earlier formulae that is $z = \frac{Rg}{y} \times 100$ (Table 1).

The grid says for example that at a 4 - 5 % royalty rate approved in group IV, the licensor's share in the licensee's income will range between 8 and 13% (depending on whether the GP is 40 or 50% and the royalty at 4 or 5% level). Comparing this information, let's say, 2 - 3% royalty rate for group I, one can say that here the licensor's "take" in relative terms may be much higher than with a relatively low "face" value of royalty rate.

By establishing continuously updated income share matrices, the regulatory body may, with a high degree of accuracy obtain precise information as to the distribution of profits between licensor and licensee from given transactions and take the necessary steps to amend excessive "take" of the licensor.

3) The data for the income sharing grid were taken from V.R.S. Arni's report on Assistance to the Ministry of Trade and Industry, UNIDO, 1977 (restricted publication)

At his end the licensee, evaluating different financial proposals for the technology, may also arrive at such analysis which will permit him to retain the maximum of the profit to himself.

DURATION AND ROYALTY RATE

No doubt worth analyzing are expectations in terms of royalty value of the licensor vis-à-vis expected and real sales by the licensee.

In this connection the following assumption can be made :

- A - Licensor's estimate of production (10 years period)....10,000 units
- B - Market value of production at sales price 50 \$/unit.. 500,000 \$
- C - Licensor's estimation of licensee's profit at 30% of sales..... 150,000 \$
- D - Licensor's expectation of his share in licensee's profit over 10 year period - 20 % 30,000 \$

A calculated royalty capitalized over a period of 10 years of 30,000 \$ may be expressed differently, for example as a lump sum royalty with no reference as to the duration, or may take the following forms :

ROYALTY VALUE AND DURATION PERIOD

- Table 3 -

Annual Volume of Production	Duration Period	Royalty Rate asked by Licensor
A 1,000 units	10 years	30,000 \$ for 10,000 units at 500,000 \$ sales gives -6% royalty
B 500 units	8 years	30,000 \$ for 4,000 units at 200,000 \$ sales royalty = $\frac{15}{100}\%$
C 1,500 units	10 years	30,000 \$ for 15,000 units at 750,000 \$ sales royalty = $\frac{4}{100}\%$

Here, one can see a difference between apparent character of royalty rate and real expectations which often will be expressed in absolute numbers.

Case B anyway may be reexpressed differently, i.e. as 15,000 \$ as down-payment with the rest at the royalty rate of some 7% without affecting in reality the absolute expected figure of the royalty value of 30,000 \$.

Here, Table 3 also illustrates obvious inconveniences of lump sum royalties both for licensee as well as for licensor, which in reality should be somehow adjusted according to the expected volume of sales.

EVALUATION OF LUMP SUM PAYMENTS; APPLICATION OF NET PRESENT VALUE (NPV) CONCEPT TO ASSESSMENT OF ROYALTY PAYMENTS 4)

A lump sum payment for technology can be considered as capitalized value of running royalties over a given period of time. However, simple arithmetical adding up of royalty payments as they would occur over the duration period of agreement is erroneous because the time - cost of money is in those cases neglected.

Therefore, it is advised to apply a discounting method, in this case Net Present Value (NPV), to evaluate the project payment. The net present value of a project is defined as the value which is obtained by discounting separately for each year the difference of all cash outflow and inflow occurring throughout the life of a project at a fixed, pre-determined interest rate to the zero point of time (year 1), i.e. to the point at which the implementation of the project is supposed to start. The NPV obtained for the years of life of the project has to be added to receive the project NPV.⁵⁾

$$NPV = NCF_1 + (NCF_2 \times a_2) + (NCF_3 \times a_3) + \dots \dots \dots (NCF_4 \times a_4)$$

where: NCF = net cash flow of a project in years 1, 2, 3,

a = discount factor in years 2, 3., corresponding to the applied discounted rate.

Applying therefore the NPV concept to the royalty payments, it may be observed that in the forward direction the time flow of royalty payments can be consolidated into lump sum NPV statements, and in the reverse direction a lump sum can be reduced to an average royalty covering the duration period.

4 + 5) Details of NPV concept applied to evaluation of financial feasibility of industrial project may be found in the Manual on Preparation of Industrial Feasibility Studies: UNIDO/ICIS.33 - 1977

In principle the NPV of future receipt of money is less than its future nominal value.

Accordingly, if 0.9 \$ are banked today, it will yield 1 \$ a year from now at 10% interest.

So in other words, the NPV of 1 \$ received a year from now is worth 0.909 \$ today. This fraction or cut-off rate is calculated by application of a compound interest formula :

$$\text{fraction} = \frac{1}{(1 + \frac{r}{100})^n}$$

where :

$\frac{r}{100}$ = discount rate of money (%)

n = number of years from zero year when money is received

r = is not the inflation rate nor the simple interest rate. It represents the cost of raising capital (demand and supply of funds) conditioned by the risk factor at the capital market.

It should be noted that non-banking financial institutions usually establish these discount rates for project evaluation.

In licensing operations $\frac{r}{100}$ is currently taken at 10 % in the USA.

For illustrative purposes the following are calculated discount rates of $\frac{r}{100}$:

zero year	:	1.0000	
year 1	:	0.9091	
year 2	:	0.8664	
year 3	:	0.7513	
year 4	:	0.6830	
year 5	:	0.6209	etc.

For illustrative purposes, table 4 will give hypothetical figures for the calculation of the NPV of royalties over a period of time.

Table 4

YEAR	VALUE OF SALES \$	ROYALTIES AT 3% OF SALES	NPV DISCOUNT FACTOR	NPV OF ROYALTIES in 1977
1977	10,000,000	300,000	1.0000	300,000
1978	10,000,000	30,000	0.9091	272,700
1979	15,000,000	450,000	0.8664	389,900
1980	25,000,000	750,000	0.7513	563,500
1981	40,000,000	1,200,000	0.6830	819,600
1982	50,000,000	1,500,000	0.6209	931,350
TOTAL	150,000,000	4,500,000	-	3,277,050

In the above-mentioned example the amount of 4,500,000 \$ spread over a period of time and the amount of 3,277,050 \$ paid as lump sum royalty are equivalent and the choice depends on the cash position of the licensee or of the foreign exchange position of the given country.

In this context, it should be also underlined again that simple adding up of royalties due in consequent years of duration of the contract in order to calculate the lump sum payment as an alternative to running royalties is very much erroneous and may lead in the majority of cases to excessive payments for technology.

As mentioned earlier, the NPV can be determined by using a compound interest formula through which it is possible to convert the running royalties into paid-up royalties and vice-versa :

$$R = R_0 \left(1 + \frac{r}{100} \right)^n$$

where

R = royalty payment made as n-th year

R₀ = NPV of future royalty payment

r = discount rate

n = year from "zero year" in which payment is received

In order, however, to reverse the the process, i.e. to obtain the semi-royalty equivalent to a fixed fee, the following formula can be used :

$$R = R_0 \left(1 + \frac{K}{100} \right)^n$$

where :

R = undiscounted total royalty payment over a duration of the contract = S_t

(S = aggregate sales value over contract period of n years

t = average royalty rate (to be determined)

R_0 = paid-up fee, fixed fee etc.
 K = discount rate (10 if $r = 10\%$)
 n = duration of agreement, years

Thus, taking again the example as shown in table 4, the formula will be reexpressed by :

$$(150,000,000) (t) = 3,277,650 \left(1 + \frac{10}{100}\right)^6$$

in which case $t = 3,8\%$ = average royalty rate

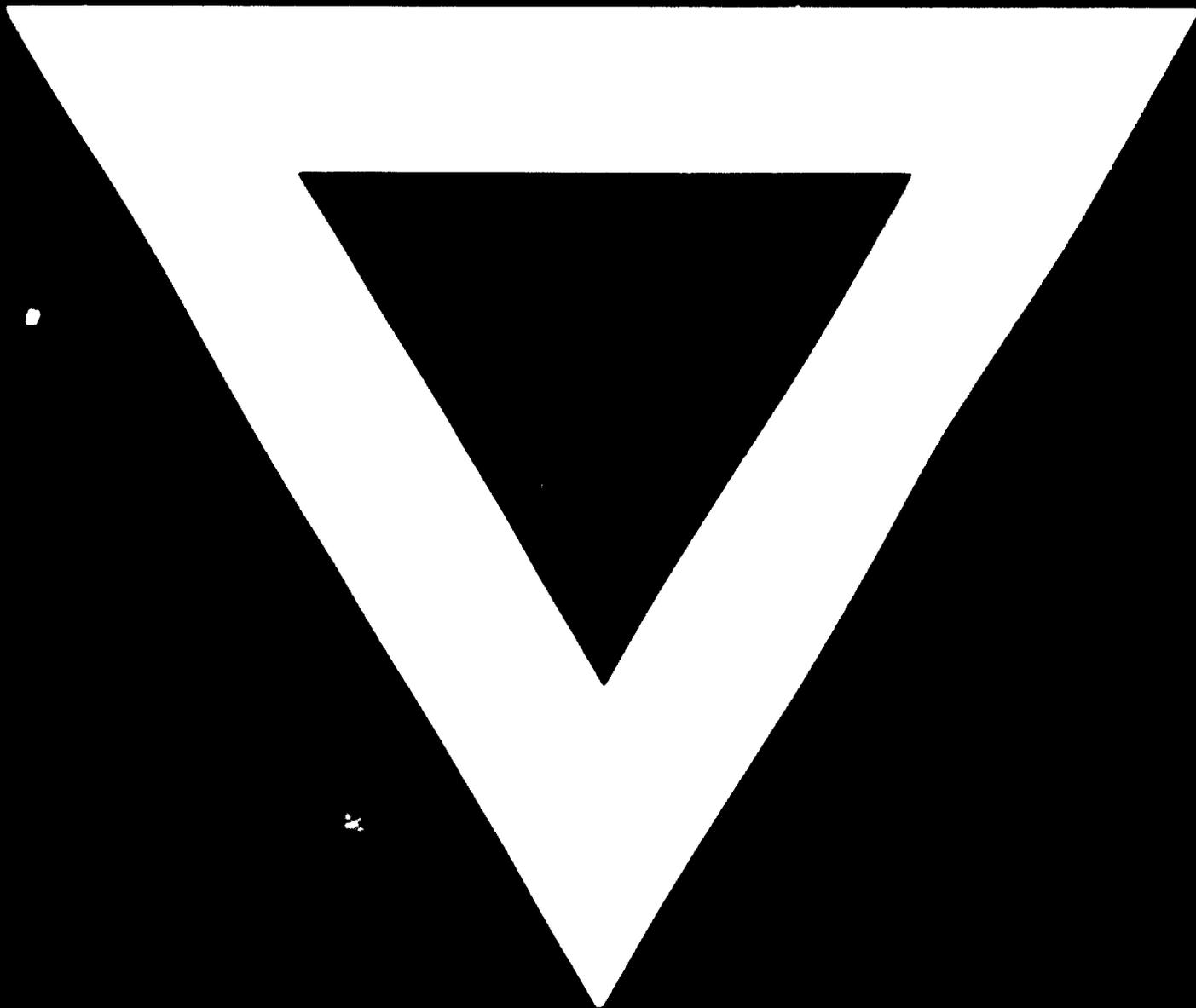
It is important to note that in the reversing process t does not equal 3% (table 4) because t here is an average royalty rate assuming that royalty income will be the same every year of the contract, i.e. a plant operates to capacity, which is common particularly to process industries.

It is advised that the NPV concept is applied routinely in evaluation activities of governmental regulatory agencies as a useful instrument of financial assessment of specific projects.



We regret that some of the pages in the microfiche copy of this report may not be up to the proper legibility standards, even though the best possible copy was used for preparing the master fiche.

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