



TOGETHER
for a sustainable future

OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.



TOGETHER
for a sustainable future

DISCLAIMER

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

FAIR USE POLICY

Any part of this publication may be quoted and referenced for educational and research purposes without additional permission from UNIDO. However, those who make use of quoting and referencing this publication are requested to follow the Fair Use Policy of giving due credit to UNIDO.

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

09401

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

Development and Transfer of Technology Series

No. 12

**GUIDELINES
FOR EVALUATION
OF TRANSFER
OF TECHNOLOGY
AGREEMENTS**

66541



UNITED NATIONS

GUIDELINES FOR EVALUATION OF TRANSFER OF TECHNOLOGY AGREEMENTS

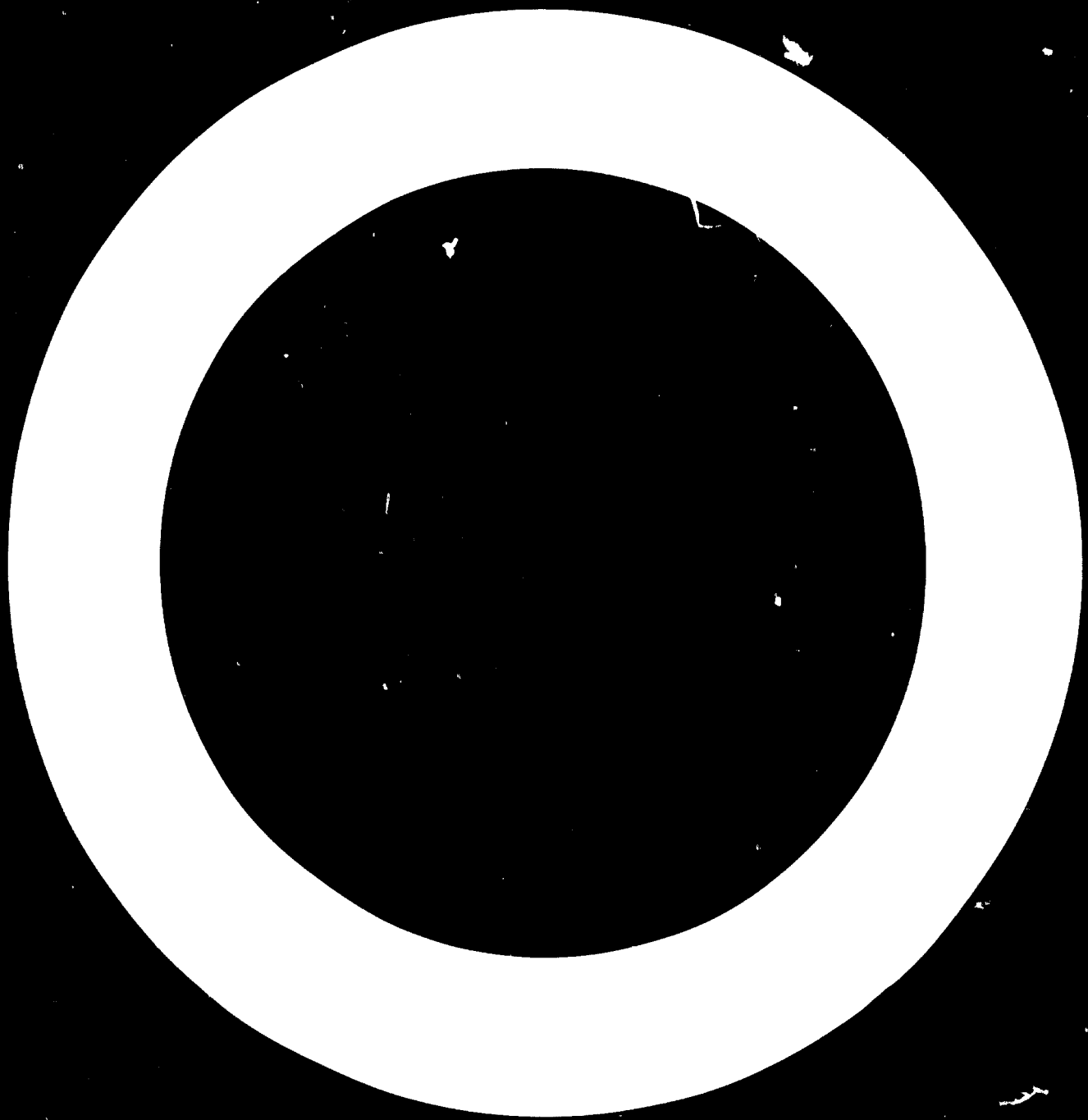
UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna

Development and Transfer of Technology Series No. 12

**GUIDELINES FOR EVALUATION
OF TRANSFER
OF TECHNOLOGY AGREEMENTS**



UNITED NATIONS
New York, 1979



The views expressed in this publication are those of the author and do not necessarily reflect the views of the secretariat of UNIDO.

Material in this publication may be freely quoted or reprinted, but acknowledgement is requested, together with a copy of the publication containing the quotation or reprint.

Preface

The present volume in the *Development and Transfer of Technology Series* represents a major effort of the secretariat of the United Nations Industrial Development Organization (UNIDO) to provide the business community and Governments in developing countries with a comprehensive text as an aid in dealing with technology transfer transactions.

In a sense the present volume is an extension of an earlier United Nations publication, *Guidelines for the Acquisition of Foreign Technology in Developing Countries*. It provides the reader with considerable amounts of practical information on preparing and negotiating various technology transfer agreements.

Chapters I-VI examine in detail several types of technology agreements—technical assistance, patent, know-how, engineering services, trade mark and franchise—setting out their objectives and suggesting options to the licensee and to the national regulatory agency, so as to reap the maximum benefit to the national economy. Also, considerable attention is paid to the subject of process performance guarantees, and methods of evaluation are outlined.

Chapter VII deals extensively with remuneration for technology, presenting concepts of evaluating its price and, again, presenting options to the licensee. Chapter VIII provides the reader with condensed information on legal and administrative provisions in technology agreements and suggests the wording of basic clauses. Chapter IX discusses criteria for selecting technology and presents particularly important issues concerning its selection in developing countries. Chapter X deals with the pricing of products for which readily recognizable reference prices may not be available.

The annexes contain extensive check-lists for use in evaluating and screening technology transfer agreements and remuneration provisions.

This study was prepared by Venkata R. S. Arni in co-operation with staff of the Technology Group of the secretariat of UNIDO. Kenneth E. Payne of the law firm of Finnegan, Henderson, Farabow, Garrett and Dunner has reviewed and commented on the legal matters discussed in the study. However, the opinions expressed herein are those of the author.

EXPLANATORY NOTES

References to dollars (\$) are to United States dollars, unless otherwise stated.

A dash (-) indicates that the amount is nil or negligible.

The following abbreviations are used in this document:

Organizations

EEC	European Economic Community
FDA	Food and Drug Administration (United States of America)
ICC	International Chamber of Commerce
NEMA	National Electrical Manufacturers Association

Economic and technical abbreviations

BOD ₅	biochemical oxygen demand (5-day)
psia	pounds per square inch absolute
DCF	discounted cash-flow method
DIN	Deutsche Industrie Norm
GPOS	gross profit on unit sales price
IRR	internal rate of return
LSLP	licensor's share of licensee's profit
NPV	net present value
PERT	Programme Evaluation and Review Technique
POS	product's sales value
PV	present value
ROS	royalty rate on sales

CONTENTS

	<i>Page</i>
INTRODUCTION	1
 <i>Chapter</i>	
I. THE TECHNICAL ASSISTANCE AGREEMENT	5
Content of technical assistance	5
Short-term services	5
Continuing services	6
General features	6
Warranties relating to continuing technical services	6
Legal considerations	7
 II. PATENTS AND THE PATENT AGREEMENT	 8
The patent system	8
The patent licence	9
General	9
In developing countries	9
Antitrust or competition laws	10
 III. KNOW-HOW AND THE KNOW-HOW AGREEMENT	 11
Comparison of know-how with patents and technical assistance	11
Definition, description and transmittal of know-how	12
Definition of know-how	12
Description of know-how—licensor's obligations	12
Transmittal of know-how	14
Parts of the know-how agreement	15
Viewpoint of licensor	15
Viewpoint of Governments of developing countries	15
Licensee's obligations in use of know-how	16
Exclusivity of use	17
Territory of use	17
Field of use	17
Site of manufacture	17
Volume of production	17
Right to sublicense	18
Use only by persons concerned	18
Secrecy period	18
Cease-use provision	18
Process improvements—rights of the licensee	19
Know-how and process improvements	19

<i>Chapter</i>	<i>Page</i>
III. KNOW-HOW AND THE KNOW-HOW AGREEMENT (continued)	
Performance of know-how—licensor's guarantee obligations	19
Specification of performance	21
Detection and measurement of deficiency	22
Remedies available to licensee for faults and deficiencies	23
Warranties and guarantees	23
Negotiating liability	24
Correcting defective performance and discharging obligations	25
IV. THE ENGINEERING SERVICES AGREEMENT	27
Interrelationship of parties	28
Division of responsibilities	28
Supervisory responsibilities	29
Design conference	30
Payments, payments indexing and payments protection	31
Payments	31
Payments indexing	31
Payments protection	31
Warranties and guarantees	32
Liquidated damages	32
Training of client's personnel	33
V. THE TRADE MARK AGREEMENT	34
Composite agreements	35
Approval of product quality by licensor	35
Cancellation provisions	36
VI. THE FRANCHISE AGREEMENT	37
VII. REMUNERATION	39
The concept of royalty	39
Assessment of royalty fees	40
Value added and royalty	44
Royalty rates and cost saving	44
Capitalization of royalty rates—the NPV method of assessment	45
Appraisal of technical fees	46
Lump-sum <i>versus</i> running royalties	46
Ways of expressing royalty rates	47
Minimum royalty rates	48
Summary: guidelines for considering royalty rates	48

<i>Chapter</i>	<i>Page</i>
VIII. LEGAL AND ADMINISTRATIVE PROVISIONS	50
Arbitration	50
Preamble to agreement	51
Definitions	52
Secrecy	52
Duration of agreements	53
Payments period	53
Secrecy period	53
Obligations period	53
Termination rights	54
Most-favoured-licensee clause	54
IX. SELECTION OF TECHNOLOGY	55
Reviewing the entrepreneur's choice of technology	55
Market factors	56
Investment factors	56
The discounted-cash-flow method	57
Cost-benefit analysis	58
Technology factors	59
Suggestions to the regulatory agency	60
X. PRODUCT PRICING	61
Functional substitutes	61
Pricing in the context of design, model and quality	62

Annexes

I. Typical technical provisions of a consultancy contract	64
II. A. Check-list for screening patent agreements or patent clauses in other agreements	65
B. Check-list for screening know-how agreements or know-how clauses in other agreements	66
C. Check-list for evaluating remuneration provisions	69
III. Know-how agreement: process disclosure information (licensor's services)	70
IV. Engineering agreement: scope of contractor's services	70
Bibliography	72

Tables

1. Effect of licensee's profitability on income sharing	41
2. Income-sharing matrix	42
3. Calculation of LSLP in straight licensing	42
4. Calculation of LSLP in a joint venture	43
5. Royalty rate and duration	43
6. Value added, royalty rate and LSLP	44
7. Capitalization of royalty (NPV)	45
8. Comparison of technology: investment and operating costs	57
9. Comparison of technology: pay-back period and foreign exchange	59
10. Pricing and design features	62

Introduction

Technology is a composite of techniques, constituted of craft skills (welding, shaping, assembling) requiring primarily the dexterity of hand and eye, and conceptual skills (knowledge and information), such as operating data, design engineering, construction, production and maintenance. However, "technology", in licensing terminology, is differentiated from "technique" in that it is composed of proprietary and non-proprietary (specialized) information and skills, use of which gives its owner a competitive or superior technical position. Eventually technology becomes obsolete or is incorporated in a set of techniques, readily available from numerous professionals who compete in rendering technical services.

Transfer of technology permits both immediate access to advanced means of production and control over the means of production, that is, control over supply. Such control, however, is not always accompanied by control over technology. This is achieved only when the skills, information and the technical excellence that make up technology are transferred to the national managers, supervisors and workers of an enterprise from where it can eventually diffuse into the economy. Control over supply is usually the direct objective of industrialization; control over technology, on the other hand, is an objective of development. Thus, the overall industrial objective of a country, particularly a developing country, would be to achieve both types of control. Subsequent growth would manifest itself in the multiplication (diffusion) of production points with similar technologies and the capability of both improving production techniques and diversifying the product range. Technology transfer should attempt to bring about this growth. To a great extent, the licensing agreement can be the vehicle through which this goal can be attained.

Control over the application of technology can be said to have two dimensions, "width" and "depth", and may lie outside the range of interest of an enterprise. However, "control" as used here differs from that involved in social policy, that is, it refers to autonomy over the use of licensed technology.

Width of control, easier of the two to achieve, requires that the enterprise obtain technological capability over all the stages leading to the manufacture of a product. An attempt can be made to achieve width of control through the provisions of the licensing agreement. For example, a government

may not approve a licensing agreement if only the assembly of imported parts, and not the manufacture of the parts themselves, appears as the objective of the enterprise or is the only technology that its supplier is willing to provide.

Where there are technology regulatory agencies, working within the framework of established policies, an agreement can be screened to see that provisions are included to secure this control. Such contractual provisions are discussed later in this text, particularly under "Description of know-how" (p. 12). The basic economic concern behind width of control is that the value added should be maximized at the level of the enterprise.

Depth of control, on the other hand, can be achieved only to a limited extent through contractual provisions. It involves both the percolation of technical excellence (which is at the heart of technology) to all relevant sections of a manufacturing enterprise (the people of the enterprise) and the emergence of management rights and competence in the use and application of technology.

Depth of control is fully achieved only at the end of a three-stage process consisting of:

(a) First, or access, stage. The transfer of capability from the licensor to a local enterprise is such that no technical direction from a non-enterprise source is required for achieving targeted (warranted) plant performance. That is, capability transfer can be said to have occurred even when expatriates, otherwise wholly accountable to the enterprise, maintain technical direction;

(b) Second, or absorption, stage. The warranted performance is obtained and maintained under the technical direction of enterprise managers who are nationals;

(c) Third, or control, stage. Freedom to apply the technology rests with the national licensee; he has the right and capability to use, diversify, propagate and develop information obtained from the licensor for the benefit of the enterprise which right includes application in areas external to that contemplated in the prime and initiating agreement.

This access-absorption-control model governs much of the material treated in this monograph and needs to be kept in mind.

On the basis outlined, it would be correct to conclude that some form of technology transfer has

taken place at the completion of each stage. It is, however, only through industrial and technological policies or programmes that the above-indicated order of progression can be achieved. For implementation, the licensing document in itself is a limited instrument.

Where technological infrastructure is weak, it may not be feasible to go beyond a particular stage, say, the access stage. Achievement of this stage itself may be a major accomplishment. However, if conditions needed for the control stage (see p. 18) are made explicit in an agreement, the licensor may not wish to license his technology or may raise royalties or similar payments without the recipient enterprise's being able to reap the full advantages of control.

Stress has been placed on the enterprise in each of the above three stages. In view of the dependence of many developing countries on licensors in developed countries, particularly transnationals, it may be difficult to obtain desirable technology if a contract permits licensed information to be used outside the enterprise or gives control over such information to a party that is not wholly within the enterprise. What is essential is that information that has been fully paid for should be available for unrestricted use within the enterprise.

The licence agreement is a formal instrument that serves several purposes: it is (a) a statement of the expectations of the parties that have come together to achieve a common, specified purpose; (b) a memorandum defining the rights and responsibilities of the parties, ensuring adequate commercial benefits to both; (c) a prescription for resolving conflict that may be anticipated in certain areas; and (d) a legal document whose provisions and undertakings can be enforced under the laws of the country in the context of which it is framed.

The general form and structure of the licence agreement is about the same whether executed between industrialized countries or between a developed and developing country. It is a universal and prime document in the transfer of technology, with characteristic clauses.

For the developing country, however, the licence agreement is not merely a document setting out the private interests and privately assumed risks of the parties to the contract: it must also serve the public interest. Government regulatory policies may require the enterprise to negotiate rights and obligations so that not only width and depth of control are achieved in the agreement, but also certain restraints and limitations are not accepted.

Since national policies, objectives and regulations differ among developing countries and change over time within a country, a common national approach to technology licensing cannot be enunciated. The bargaining power of some countries, and indeed of their enterprises, may be so strong that desirable

technologies will enter in spite of being subject to regulation. But, where technological infrastructure is weak or markets small and unsophisticated, it may not be feasible for a country to attract such technologies if regulation is too severe. Consequently, a realistic licensing policy should be formulated.

This monograph examines basic features of the licence agreement with a view to helping government regulatory agencies to examine concepts behind licensing terminology. It indicates the scope that exists for reshaping the obligations of the licensor and the licensee to meet the objectives of developing countries. In doing this, however, the basic principle of the licence agreement must be preserved - it must codify a workable arrangement.

From the viewpoint of the developing country, the licence agreement must be a vehicle for achieving national objectives and policies. However, since agreements are legal documents and are executed between two parties (not involving the Government of the developing country), primarily directed to achieving the purpose of the licensee enterprise, the national viewpoint can only find indirect expression. That is, in the developing country, the constituent elements of a licensing agreement would be so constructed that the national viewpoint becomes implicit. This occurs when the agreement (a) furthers national planning and development objectives (b) conforms with regulatory requirements and (c) provides for the viability of the enterprise so that it makes a desired contribution to the national economy.

It is possible to screen a licensing agreement to see whether it meets regulatory objectives. There may be explicit provisions, as for example, that the governing law of the contract should be that of the developing country. Or, regulatory objectives may be implicit, as for example, that there be no limitation on the licensee on his right to export to countries of his choice. Regulatory objectives may be incorporated in national legislation (e.g., Mexico's law on technology transfer), or they may be administrative guidelines, as in India.

However, provisions relating to national plans and development and to enterprise viability cannot be reviewed within a set framework. Since the purpose of the agreement is to transfer technology, the latter must, in itself, support such objectives.

By inquiring into three other objectives, the technological, technical and business objectives, as incorporated in an agreement, it becomes possible to test the agreement for conformance to the larger objectives. Thus, if it is national policy to maximize value addition at the level of the enterprise (a technological objective), know-how must be properly defined and described ("starting materials" and "product"—pp. 13-14). If it is to conserve a scarce resource, such as energy, the agreement should guarantee the rate of consumption of energy (see p. 24). Similarly, if the national objective in a

certain product area is to maximize its exports, product specifications must be clearly defined (technical objective).

Likewise, enterprise viability can be tested by examining the licensee's business objectives and determining whether the provisions of the agreement support such objectives. If the licensee is making large front-end payments, he should be protected by contract provisions that ensure that such payments are made against bank guarantees (p. 31); or if he wishes to have a strong competitive position in export markets (business objective) he should have negotiated for the full technology portfolio (patents, trade marks, exclusivity, market rights).

This study, therefore, also discusses ways in which the technological, technical and business objectives can be set forth in the licence agreement.

In several developing countries, technology agreements between nationals and foreign organizations must be submitted to a specified regulatory agency for approval.¹ Many other countries intend to move in this direction. The general practice is for the parties to submit draft documents to the agency for preliminary scrutiny, after which the final document is presented for approval and registration. The scrutiny procedure varies widely from country to country; and the agreement may be studied from various viewpoints—relevancy of technology (India), project feasibility (Malaysia), or economic and financial implications of investment (Mexico). As a result of this scrutiny, an agreement is usually modified and subsequently approved.

This monograph addresses itself primarily to the draft licence agreement in which one or more of the technology portfolio elements (know-how, patents, trade marks) or technology-related services (engineering, technical assistance) are present. Six types of agreement commonly used in developing countries are reviewed and methods of scrutiny suggested. Options open to the licensee are discussed. Three types concern industrial property (patents, know-how, trade marks); two, services (engineering contracts and technical assistance); and one, the franchise. Material under one subject may be applicable to another. This is particularly true for composite agreements, where various industrial property rights are combined with services in a single agreement.

Because the primary interest of developing countries is in access to technology, especially in the form of know-how, this subject has received extensive coverage. Concepts developed here as right-of-use and ambit-of-use are applicable to all areas.

Two areas of the licence agreement common to all types of agreement are examined in particular. These are remuneration and legal-administrative

provisions. Remuneration to the licensor, a subject of special interest to all regulatory agencies, is discussed in detail. Royalty (rate or lump sum) is viewed as the licensor's share of the licensee's profit. It thus becomes possible to develop quantitative guidelines, disassociated with evaluation of technical parameters, i.e., the technical content of a technology transaction.

Selection of technology, a problem often encountered by regulatory agencies, is also analysed.

Almost all the material is directed to analysts or review departments of regulatory agencies that routinely screen agreements to determine whether they conform to the public interest. However, the monograph may also be of use to business firms and entrepreneurs, particularly those who wish to obtain protection in certain areas, such as technical performance guarantees or full disclosure of technical information.

In three areas—patents, know-how and remuneration—check lists are presented. They can be used to ensure that critical elements of a transaction have been studied. They can be modified to suit the special situation of each country. To use this monograph no special qualifications are required of the reviewer or analyst, but prior experience in screening agreements may be helpful. The analyst need not be a lawyer, economist, management student or accountant, but some knowledge of licensing practices would be an asset. Equally, depth of technical knowledge of various industrial sectors is not required except for evaluating performance warranties and reviewing know-how transmittal, which are really the licensee's responsibility. How well he makes the evaluation depends on his experience and skills. However, the monograph does not offer the basis on which to construct a licence agreement.

A contract is finally a legal document. While the monograph does deal with legal terminology used in licensing, it does not concern itself with the exactness of legal expressions or their interpretation, really a matter for the attorneys of the licensor and the licensee. Except for the inclusion of certain mandatory clauses (e.g., governing law of the contract, effectiveness of the agreement after government approval) or exclusion of certain legal constraints (restrictive provisions), most developing countries do not screen agreements for legal exactness or comprehensiveness. In the last analysis, interpretation of the provisions of an agreement is a judicial exercise (case law, court disputes), which is country-specific and with which a regulatory body cannot be overtly concerned. Despite these reservations, the regulatory agency may require legal assistance in changing the wording of an agreement or incorporating certain clauses.

An important omission in this study must be noted. Where the licensor has a significant financial interest in the enterprise, the obligations exchanged between him and the licensee (partner) may

¹ See *National Approaches to the Acquisition of Technology*, Development and Transfer of Technology Series (United Nations publication, Series No. 78.II.B.7).

substantially differ in content from those involved in direct licensing. In a well-negotiated collaboration arrangement, licensor involvement can bring to the enterprise management: experience, established markets, rapid development of personnel etc., all of which are essential to business success. In a number of developing countries, Governments would indeed prefer this alternative to the mere transfer of technology. The premise in such collaboration is that the arrangement would be "well negotiated"—the licensor's control over the management of the enterprise would be proportionate to his inputs, and in the context of the developing country, the licensor's view of the objectives of the enterprise would be subordinate to national goals. These requirements give rise to conflicts whose nature and resolution are beyond the scope of this study.

Consequently, procedures for evaluating technology arrangements, accompanied by licensor investment, are deliberately omitted. However, it needs to be noted, that even where there is such financial participation, it is general practice for the technology transfer agreement to be a separate document from that which defines the corporate roles and rights of the enterprise partners (the "Heads of" agreements). That is, even though the partners may have a dominant agreement setting out their entire co-operation, a technology transfer (technology licensing) document is needed, and it is written as an "arm's length" agreement. Contractual provisions in this agreement are generally indistinguishable from those of the straightforward licensing agreement. To this limited extent, it can be screened and evaluated by the procedures recommended in this study.

I. The technical assistance agreement

Specialized technical information and services are required in the manufacture of products so that they will be competitive in the market-place. Such services may be needed not only in production but also in distribution (container technology, for example) and sales (technical services to recipients). Some segments of technical information (and, sometimes, technical services) may comprise industrial and trade secrets. To these the term "proprietary know-how" is applied, a subject examined in chapter III. In other cases, in addition to know-how, an organization may need to acquire patent licences so that the right of the organization to make and market its products is not challenged in the courts (see chapter II).

The terms "technical assistance" and "technical services" as used here strictly cover only that component of technical information and services that lies outside know-how and patents. An organization in a developing country may require technical assistance only, as in the manufacture of cement, timber products, edible oils, glass bottles, metal cans, base inorganic chemicals, assembly operations and other long-standing industries.

Operating companies rather than engineering companies will preferably be chosen as the supplier of such services, since then experience in both manufacturing and marketing becomes available to the recipient. However, many operating companies may not have all the expertise necessary to install a manufacturing plant. In these cases, the operating companies may employ engineering companies as subcontractors, or the recipient may directly subcontract for the necessary services.

Except when he supplies materials and machinery, the supplier's inputs are basically informational and managerial. Informational inputs include plant layouts, lists and specifications of equipment, product literature and sales aids, while managerial inputs include providing expert services—training the recipient's personnel in production management, co-ordinating supplies with plant erection and the like. Informational inputs can be considered elements otherwise obtainable in the public domain, and managerial inputs services otherwise available from independent professionals, that is, there is no supply of the "owned" information that is a characteristic of a know-how licence.

The value of technical assistance lies in the experience of its supplier in a specific production area; and thus he becomes a comprehensive,

convenient, competitive and single source of assistance, assistance that will enable the recipient to establish manufacturing facilities rapidly and economically and to exploit markets effectively.

Some of the supplier's services may be of short duration, as that of procuring equipment, while others may be the long-term, continuing services that enable the recipient organization to develop its manpower (training services) and progressively improve its performance in manufacturing, marketing and customer technical service.

While the terms "licensor" and "licensee" are sometimes used in technical assistance and technical services contracts to denote supplier and client, they are misnomers in the straightforward technical assistance contract and should be avoided. For a contract to be considered a "licence", there must be some right over which the licensor has legal claim and which he can consequently confer on the licensee by licence. Such rights arise in the area of patents and by legal convention (intellectual property rights) extend to know-how.

Drawing this distinction between proprietary and non-proprietary information strengthens the negotiating power of the recipient in two areas: (a) that of valuing information and services in money terms; and (b) that of accepting obligations in the use of the supplier's information.

In a technical assistance agreement the recipient pays for the information and services specifically listed. As will be discussed under "Remuneration" (chapter VII), such information can be evaluated and priced without considering the client's earning power or profitability. In the proprietary licence, however, the licensee's payments are for the right-of-use of the licensor's information, assessment of which is best made in terms of the licensee's potential profitability in the market-place.

Content of technical assistance

Short-term services

Short-term services are concerned with the design and construction of a manufacturing facility. They can be classified as (a) consulting and (b) engineering facilities.

Consulting services cover the assessment of markets, definition of products, investment analysis, ensuring raw materials availability, recommendation

of plant location, choice of technology, identification of equipment suppliers etc. While such services can be provided under a technical assistance contract, they may be carried out by the recipient himself or through an independent consulting organization. Annex I lists a set of typical services that can be obtained under consultancy contracts.

The recipient bears all the risks associated with accepting such services and implementing the recommendations. The supplier has only a professional responsibility in assuring that standards of "care, skill and diligence" will be those normally provided for such services. Consulting firms usually carry professional indemnity insurance, and the firm's liability under the agreement extends to failure to complete the services, loss or damage resulting from the consultant's contravening the recipient's written instructions, or failure to provide standards of "care, skill and diligence".

Engineering services are usually provided in an agreement that is separate from a continuing services agreement because it is for a short period and its character is different. It usually has a strong technical bias and is drafted in association with the engineers of the contracting parties. Unless it is a turn-key contract, the engineering agreement is usually based on a division of responsibilities between recipient and supplier. Thus, defining the scope of work of each party is an important task (see chapter IV).

Continuing services

General features

Once a manufacturing plant is established and performs to the supplier's warranties, the novice entrepreneur in the developing country becomes dependent on a continuous flow of assistance so that he can absorb the technology represented in plant (and product) and compete in the market-place. The entrepreneur, for example, needs to develop the ability to maintain the plant in top operating condition or to alter the product mix (product volume, quality, range and price) as market conditions change. Over time, he may have to make improvements and changes in manufacturing sequences as well as in product characteristics. Viability in the market-place may require extensive customer servicing, that is, technical services. The normal way of obtaining these services is to employ the supplier's personnel in key positions and then have them train local personnel—operators, salesmen and managers—so that, over the agreement period, the local personnel absorb all of the supplier's expertise.

Also, in most areas, recipients may not be able to produce locally—or even procure locally—all the materials, components and machinery spares needed for manufacturing the product. A technical assistance contract may, therefore, stipulate that the supplier

shall supply the items that are under his control and to indicate sources of supply for others. For those preprocessed materials, subassemblies, and components that are under the supplier's control, their pricing basis, that is, the method or formula by which their prices will be determined over the contract period, will have to be defined. Similarly, an enterprise may not have all the facilities to test raw materials and finished products in its early stages, and the technical services contractor may have to do such testing.

The technical assistance agreement for continuing services, therefore, is essentially a listing of all the long-term services that the supplier will perform, together with the pricing basis and procedures to be followed for securing these services and making payments. Because there is no transfer of proprietary rights, no limitations can normally be placed on the recipient with respect to the use of the information he receives. Thus, the supplier cannot limit the recipient's rights to expand or duplicate manufacturing operations, expand marketing territories or introduce new products based on acquired information. For the same reason, the recipient does not have to accept obligations to "grant back" improvements, maintain acquired information in confidence or return drawings and documents at any time. The technical assistance agreement should, in fact, be considered the equivalent of a purchasing contract for machinery, say, a diesel engine; that is, purchase implies the right of unencumbered use.

Warranties relating to continuing technical services

Since the confidentiality of information is not a significant issue in the provision of technical assistance, a recipient may require the supplier of such assistance to grant him, before contract negotiation, physical and personal access to the supplier's manufacturing or servicing operations. (In fact, the supplier can gain from this procedure.) Thus, a recipient can witness the working of various types of equipment, study the sequence of operations, and observe all the transformations that raw materials undergo to yield a product. By doing so, he learns where problems may arise and then can seek express assurances—warranties² that the supplier will deal with them if they occur.

In some areas the recipient may not be able to assess difficulties in advance because of reduced scale of operations, variations in raw materials, unconventional product mix etc. In this case, the supplier may have to warrant expressly that the technical objectives of the recipient—production rate, productivity, product quality etc.—will be met.

The supplier views the access he provides to the recipient as a means of narrowing down and limiting

² "Warranties" and "guarantees" are discussed in some detail later (see p. 23).

his risk. Warranties become specific and restricted in scope, in contrast to the situation that arises in the licensing of know-how, where, because the licensee is not given access to know-how in advance, the licensor must provide comprehensive assurances (see chapter III).

The supplier's warranties normally concern the rectification of deficient performance, i.e., through corrective action in those areas where he has provided specific warranties. The recipient, however, may have to bear all costs of rectifying defective operations except, perhaps, those for the supplier's personnel. If, however, the supplier has provided faulty specifications for manufacturing equipment whose performance he has warranted or has supplied the equipment itself, then he will be liable for the repair or replacement of the equipment, at his cost. In developing country licences it is usually acceptable to provide that the remedy for incorrect engineering is free supply of corrective engineering; that for faulty supply of equipment is free replacement.

In especially complex areas, some of the liability considerations discussed in chapter IV regarding engineering agreements and in chapter III under "Performance of know-how" may be applicable.

Legal considerations

The technical assistance agreement is drafted to conform to the contract laws of the client's country and resembles contracts executed for the purchase of machinery, consulting services and the like. Where such an agreement is associated with other agreements, such as the know-how licence or engineering contract, it is desirable, from the point of view of the recipient, to link the agreements by referring to them in the technical assistance agreement, even if there are different contracting parties. For the recipient this procedure ensures unity in project concept. Where such co-ordination is critical, details of the co-ordination should be listed. It also facilitates the client's approach to the various parties for co-ordination or remedy. While overlapping responsibilities should be envisaged and clearly avoided in the drafting of the various agreements, problems in this area may arise. Cross-reference to the other agreements can minimize a later conflict.

From the viewpoint of the recipient of technical services, a continuing services technical assistance contract should include the following provisions:

- (a) Definition of product (product design, specifications, quality, range, as applicable);
- (b) Plant capacity (and in chemical plants, operating range);
- (c) List and description of all supplier's services, including:
 - (i) Supply of licensor's technical personnel for construction, supervision, plant start-up, and stabilization of operations;
 - (ii) Training (local and overseas) of client personnel in production operations, maintenance, marketing, accounting etc.;
 - (iii) Assurances on supply of preprocessed materials, preassemblies, components over which supplier has predominant control;
 - (iv) Preparation of literature on operation and maintenance of plant, product specifications, technical service manuals (customer), sales data sheets etc.;
 - (v) Quality control procedures and in-plant inspection standards;
 - (vi) Productivity standards and aids to product costing;
 - (vii) Overseas testing services for raw materials, product etc.;
 - (viii) Assembly diagrams and drawings for mechanical or electrical products;
- (d) Pricing basis for use of overseas personnel and for the supply of items under (c, iii);
- (e) Communication of product and process improvements;
- (f) Where an independent third-party engineering firm is involved in plant design and construction, express provision that supplier of technical assistance will provide supervisory services (see chapter IV);
- (g) Performance warranties;
- (h) Supplier's liabilities in relation to plant performance (if any);
 - (i) Remuneration for services (see chapter VII);
 - (j) Provision that remuneration to supplier is for technical assistance;
- (k) "Linkage" to other agreements;
- (l) Governing law of agreement.

II. Patents and the patent agreement

The patent system

In developed countries the patent system plays the important role of stimulating inventions of industrial utility. In exchange for public disclosure of the full informational content of an invention, which gives the interested public the possibility of further improving it or seeking substitutes, the State, through patent law, confers on the patent-owner (patentee) certain exclusive rights for a limited period. These concern principally rights of excluding others from making, using and selling the invented product, technique or process in the national territory where the patent has been issued. Under patent statutes, the patentee has property rights over the invention, which he can himself exercise or assign in toto or in part to others (sell or license). That is, although the information of the patent stands published, the patentee obtains the right to prohibit unauthorized persons from using the patented information for commercial gain. The State provides for the enforceability of the patentee's rights. The "make, use and sell" rights are separate rights, and the patentee has discretion over the extent of the rights he confers on his licensees. Under use and sale rights, a patent system can operate to prevent the importation of a patented product or in some countries prevent importation of a product made by a patented process.

When the patent lapses, its information enters the public domain and thus can be freely employed by anyone without reference to the patentee.

What is patentable (i.e., what constitutes novelty), the variety of rights thereof, the duration of a patent's validity, the essential information that must be publicly disclosed, the experimental data, or prototypes that must be demonstrated to patent-issuing authorities, registration fees etc. vary from country to country. As disputes arise in the granting and working of patents and are settled in courts a body of case law develops in each country with which those involved in the drafting of patent licences must be thoroughly familiar.

A patent granted in one country is generally not enforceable in other countries. To acquire patent rights in such other countries, the subject invention must be patentable in those countries, and be, in fact so patented. However, a group of countries can evolve a common statute and provide protection to the patent, once accepted under the statute, in each of

the participating countries (for example, the African and Malagasy Industrial Property Office). It is important to note that the developer of a certain body of knowledge can be the owner of several patents, depending on the number of countries in which he has obtained patent protection and the number of patents he obtains on that body of knowledge. In this connection, the construction of the patent does not have to be the same in all countries. It will vary with the patent statutes of each country.

If a country does not have a patent law, the question of patents and patent licences does not arise. An individual in such a country can, consequently, freely employ the information of any patent (published anywhere) for commercial gain within that country. Furthermore, a patent that has been issued in country A but not in country B cannot be made the subject of a patent agreement in country B (except if the patented product is exported to country A).

According to the Paris Convention of 1883 and subsequent multilateral agreements, the inventor is generally given a 12-month period from the time of filing in the original country in which to file in another country, the period beginning from the date of the first filing. Thus a patent may be issued in the home country without its being invalidated in another country on the grounds that the novelty of the patent has been previously disclosed.

Patent offices in many countries publish patent applications within a few months after an application has been made. The patent is granted subsequently, often years later. In some countries novelty claims of a patent application are examined carefully before a patent is granted. In others, even in highly industrialized countries, there is little or no scrutiny for novelty, invention or priority.

A granted patent can always be challenged in the courts on many grounds, i.e., insufficiency of disclosure, abstruseness of claims made in the patent, priority dates of other inventors or prior disclosure. If a patent is invalidated by the courts, the patent licensee can suffer considerable erosion of the commercial rights he has acquired from the former patent owner.

The patent system in the early stages of a developing country does not primarily act, nor is it designed to act, as a stimulus to indigenous invention. It has the dual purpose of facilitating foreign

investment and providing a means of importing otherwise widely patented products. It is recognized that an owner of valuable knowledge is unlikely to invest in a country to exploit that knowledge unless he has the confidence that such knowledge can obtain patent protection, primarily the legal right to prevent its unauthorized use, i.e., infringement. A patent also provides the owner with a legal base for challenging the registration of patents of other inventors that in his opinion are unpatentable over his invention.

The patent licence

General

The licence is a legal agreement between two parties that sets out the privileges exchanged between the parties and the limitations (acceptable under law) placed on them in the exercise of those privileges. Technically, the governing law of a contract can be that of any country in respect of which parties to the contract have confidence. However, the designation in a license agreement of the laws of a third country cannot be used to avoid the consequences of the patent, antitrust or competition laws of the licensee's country. Thus, a product or a process patent licence in food products is not feasible in Brazil because patents cannot, by the country's law, be issued in this area. Similarly, in a patent system that provides for compulsory licensing in certain areas (for example, India's) an exclusive patent grant has limited value.

In developed countries, one of the most important forms of industrial property is the patent, and hence the patent licence is widely sought. The right to prohibit unauthorized use, which the patent owner (licensor) enjoys, can be passed on to the licensee, and this right is a major source of marketing strength for the licensee.

In developing countries

The existence of patent licence agreements in developing countries—or inclusion of patent-related clauses in a composite licence agreement—is usually a condition imposed by the licensor primarily for his own reasons. The entrepreneur (potential licensee) in a developing country, by and large, does not place high value on rights obtainable from a patent licence because of the small role that such rights play in his country and the uncertainty as to how national laws will protect patent grants or operate in the event of patent disputes etc. (i.e., absence of adequate case law). The licensee's predominant need is usually access to technology (know-how), technical assistance and markets—not patent rights.

Still, a licensee may require certain grants under patents, for example, the right to export to countries where the licensor has patents covering licensed products or processes. Or, the licensee may want to obligate the licensor to defend the licensee if a patent dispute should arise.

Also, the licensor may insist on incorporating patent clauses in a contract because he wants to protect his know-how, wherever feasible, by anchoring it to patents, thus obtaining legal rights to exclude unauthorized persons, including other licensors, from employing his know-how or parts of it.

When the licensee is required to enter into a patent licence agreement, or when he freely does so because of the competitive advantage he may gain from it, the licensee should know what are the minimum conditions that he can reciprocally impose on the licensor.

The following conditions will work to the advantage of the licensee:

(a) The licensor's explicit statement that he has registered patents in territory covered by the agreement and bearing on its subject matter;

(b) The licensor's listing of the patents that have been issued, their dates of registration and unexpired life;

(c) Particular listing of all the licensor's patents in countries for which the licensee has negotiated export rights;

(d) Express statement by the licensor granting rights to the licensee to operate under such patents and enumeration of licensed rights (i.e., the "make, use and sell" rights) thereunder;

(e) Acceptance by the licensor of the responsibility for acting to stop infringement in the licensee's national and export territories and for undertaking such efforts at his own (licensor's) expense or at an expense shared by the licensee and licensor are matters for negotiation;

(f) Representation by the licensor that licensed patents do not infringe on third-party patents or rights, and if courts find to the contrary, to absolve the licensee (indemnify licensee) of any and all damages, financial or otherwise, that may arise from such infringement (these are the so-called indemnification and "hold harmless" clauses);

(g) Release of the licensee from patent-related obligations, including royalties applicable, if for any legally determined reason the patent ceases to have validity in the licensed territory;

(h) Agreement by the licensor to keep all licensed patents in force throughout the life of the patents by paying applicable registration fees and meeting other legal-administrative requirements pertaining thereto;

(i) Agreement by the licensor to grant the licensee the right to patents throughout their life, even after the agreement expires;

(j) Agreement by the licensor to grant the licensee any more favourable rates granted to other licensees with whom the first licensee may compete;

(k) Agreement to grant rights under improvement patents with no increase in the royalty rate.

While the above-listed conditions are desirable in the agreement, large variations are possible in the actual formulation of its clauses. Variations result from the differing patent law of countries, differing bargaining power of the parties, existence of competitive third-party patents, government regulation (in both licensee and licensor countries, which may include antitrust considerations) and even differing legal skills available to the contracting parties.

However, great similarity in such clauses is also possible, particularly in agreements made within a country. Hence regulatory bodies in developing countries should be able to develop a set of standardized clauses for incorporation of the sense of such clauses, leaving scope for minor changes to be negotiated.

Sometimes there is a particular advantage in obtaining a patent licence because the key information in the licensor's hands, and which leads to competitive advantage, is contained in the printed and published information of the patent. Thus, there is prior disclosure of what the licensee would be receiving. In fact, the licensee can compare patents in a competitive product area and thus negotiate a favourable contract. In a pure know-how agreement, on the other hand, the licensee is in a poor negotiating position, since the licensor's information is obtained only after the contract has been signed (see chapter III). The licensee often prefers the patent-and-know-how licence, since know-how then supports the information of the published patent and can be somewhat evaluated in advance.

Annex II.A contains a check-list for screening patent agreements or patent clauses in a know-how agreement.

Antitrust or competition laws

From the point of view of "public interest" in the protection and promotion of competition, the United States and the European Economic Com-

munity (EEC) have developed antitrust laws that have an impact over a broad area of commercial activity, including licensing (patents, know-how etc.). Although such laws relate to persons and corporations in the United States and in the EEC member States, or those doing business in these territories, developing countries obtain some protection from the fact that licensors in these countries cannot, under some circumstances, impose certain unreasonable constraints even in foreign licences.

Antitrust laws apply to contracts which act to restrain trade unreasonably, thus affecting national economic interest, or to arrangements that tend to lessen competition through attempts to create illegal monopoly power (for example, through corporate acquisitions or market division). Where these constraints affect the foreign commerce, including licensing of the United States or EEC, an injured member of the public or the government itself (the United States Department of Justice) may be empowered to initiate proceedings in the courts or administrative bodies against those who have engaged in illegal activities.

In addition, the doctrine of "patent misuse" has developed in the United States. This doctrine prevents, *inter alia*, a licensor from imposing obligations beyond the scope or duration of his patent by rendering his patent unenforceable. For instance, a licensor may misuse his patent where he (a) requires a licensee to license patents he does not want in a package with those he does want; (b) requires a licensee to purchase or deal in the licensor's unpatented products; or (c) requires royalty payments after the applicable patent (or most important patent) expires. Under certain circumstances, these misuses may also constitute antitrust violations.

Licensing attorneys or regulatory bodies in the developing countries cannot be expected to have detailed knowledge of the antitrust laws of the United States and EEC and thus obtain protection as a result. However, there is a built-in advantage in dealing with reputable licensors, since their agreements have been drafted to take antitrust laws into consideration.

It should be noted that laws in developing countries that relate to unreasonable or unacceptable restraints (for example, Mexico's law of technology transfer), are often oriented to incoming technology, while the antitrust laws of the United States and EEC relate to incoming, outgoing and wholly internal agreements.

III. Know-how and the know-how agreement

For developing countries, by far the most important means of acquiring technology is the know-how agreement. Transfers of know-how take place partly because patent licences have little relevance in developing countries and partly because only highly competitive and reputed companies, who possess and use secret industrial information (which they have developed themselves) are sought as sources of technology. Most of these are the large transnational corporations that have developed extensive international markets and have established brand images. Furthermore, a know-how agreement with these companies provides the firm in the developing country with potential access to improvements in products and processes because of the research and development that is conducted by the transnationals, either in pursuit of their economic advantage or directed to the security of their markets and investments.

Comparison of know-how with patents and technical assistance

Know-how holds a position somewhere between technical assistance and patents. Like technical assistance, know-how is a package of technical information; unlike it, a substantial portion of the information is held in secret, which gives its possessor some technical and/or marketing advantage over those using information that is not secret. Like the patent, ownership can be ascribed to know-how, however, the owner of know-how, unlike the owner of a patent has no legal recourse to prevent third parties from developing and employing the substance of the unpatented know-how. That is, if two firms have developed the same know-how independently there is no statutory means by which one can prevent the other from using it. In other words, the first developer of information does not obtain by statute the important excluding rights he would obtain under the patent system.

Know-how should be regarded as information that is either unpatentable (i.e. lacks the legal definition of novelty) or is purposely left unpatented. However, in both cases, much of the information is held secret and thus is a valuable asset in the hands of the owner.

Know-how is often developed in support of a patent. If a firm were to obtain a "bare" patent licence, the published information of the patent would not normally be sufficient to produce a marketable product. Know-how, therefore, is a body of information that emerges from the practical experience of working the patent from the testing of raw materials, operational sequences, machines, products and markets.

An organization may, however, opt to develop the information itself if it has the necessary skills and can bear the costs and risks of development, or it can seek sources of this knowledge. In developed countries, where skills and entrepreneurship are abundant, know-how is often purchased after the decision is taken on whether to develop it or license it ("make or buy decision"). In developing countries, the decision to license is usually the more expedient, and the source is often the patent owner.

Know-how, from the viewpoint of most developing countries, has a closer relationship to technical assistance and services than to patents. Sometimes, indeed, it is difficult to separate know-how from technical assistance, since both are packages of technical information needed for carrying out a project. However, there are several reasons for drawing clear distinctions between the two, emerging from the viewpoints of the buyer of information and the government agency regulating technology transfer.

The licensee may need to distinguish the services and information he may be receiving through various contracts relating to a single project, such as the know-how licence, engineering services contract and the technical assistance agreement. He may, at other times, have to assume responsibility for co-ordination if several firms are supplying the different services.

The regulatory body, on the other hand, may wish to prevent recipients from accepting obligations beyond what would be considered reasonable for the protection and use of secret information, or making payments that are disproportionate to the advantage gained through know-how, or again, contracting for information that is irrelevant to, or will fall short of, the client's (and sometimes, the national) need.

In view of these client and government objectives, know-how must be expressly defined in the agreement.

Definition, description and transmittal of know-how

Definition of know-how

Whereas "patent" is precisely defined in the statutes of each country in terms of scope, duration and rights, no such clear definition of know-how exists even in industrialized countries, where there is abundant case law. Fundamentally, the nature, content and specificity of know-how is established or secured only in the licence agreement. Traditionally, the licensor declares he is in possession of "novel, valuable and useful" technical information, at least some of which he has held in secrecy. The licensee examines this claim (to the extent possible) and contractually accepts it. Through such a declaration and acceptance, the licensor seeks to use established laws, particularly contract and trade-secret laws, to create property (or proprietary) right and title in know-how. On this basis, licensors argue that in a know-how licence, the licensee obtains only a right-of-use,³ that is, a lease to use such information.

Of the four elements of know-how—utility, novelty, confidentiality and value—the latter two impose on the licensee a complex of obligations. Apart from compensation and legal-administrative matters, these obligations dominate much of the material in a know-how agreement. It is in this area that large differences appear in the approaches of developing and developed countries.

From the licensor's viewpoint, much of the value in his know-how lies in the secrecy in which it has been held. By maintaining secrecy, the licensor argues, he obtains commercial strength—excellence of product, reduction in investment or operating costs etc. Since the licensee wants such information transmitted, the licensor requires that the information he will transmit be held secret over a defined period or until such information becomes publicly available. Hence, a secrecy clause is fundamental to a know-how licence agreement.

A trade secret is considered in most laws as constituting any formula, pattern, device or compilation of information used in one's business that gives the owner an opportunity to obtain advantage over competitors that do not know or use it.

The laws of most countries recognize the existence of trade and industrial secrets. In some countries trade-secret laws have been enacted. Mexico's penal code, for example, contains a chapter on the disclosure of secrets. Also, contract law and common law recognize that a recipient of secret information can be obligated to maintain that information in secrecy.

³ In a patent licence, on the other hand, right-of-use is conferred on the published information of the patent.

However, obligations of secrecy (or confidentiality) should be extended to (and only extended to) information that:

(a) Is communicated to the licensee in written or other readily identifiable form, or, if disclosed orally, is later referred to and confirmed in writing;

(b) Is cited or designated as confidential;

(c) Was not known to the receiving party (licensee) before disclosure, as can be shown by his (recipient's) written records;

(d) Is not, or does not become, known to the general public;

(e) Is not subsequently received by the licensee from a third party having no obligation to the licensor to keep it confidential.

Independent of whether the agreement is between companies in developed countries or involves a company in a developing country, such criteria should form the basis of a secrecy clause and should be incorporated into the licence agreement.

Description of know-how licensor's obligations

In contracts drawn up in developing countries, a general description of the field of know-how (example, process for making polyethylene) conditioned by statements of novelty, utility, value and secrecy will be inadequate for the licensee.

In developed countries "prior disclosure" of know-how occurs quite often (accompanied by a separate secrecy agreement stating that disclosure does not confer on the recipient any right-of-use of disclosed information). This practice enables the licensee to evaluate incoming technology before entering into the licence agreement and reduces the need for a comprehensive description of the know-how in the agreement. In developing countries, however, such prior disclosure is not always useful, since skills of evaluation may be lacking. Furthermore, the licensor may not be willing to reveal secret information in advance of the agreement without strong assurance that the law of the developing country, particularly case law, protects trade secrets, breach of which would result in severe penalties for the misuser of information.

In this circumstance, and for the protection of the licensee in a developing country, the usual clause for defining know-how should be expanded into a description clause (although it may still be called a definition clause) because the licensee needs some advance information on the type of data or service that will follow from the agreement. Thus, the needs of a licensee acquiring know-how differ from those of a licensee seeking technical assistance (see chapter I), where because of its non-confidential nature, the

client can witness operations or discuss relevant technical matters before negotiating a contract.

Description of know-how should indicate its technical character, a matter of importance to both the licensee and the country. To say, for illustrative purposes, that know-how will be adequate for the manufacture of a toaster would be inaccurate if communicated know-how turns out to be training in assembly of purchased components. National needs, and the licensee's needs, may be primarily technical. In other words, the licensee desires to have the full knowledge of the licensor that is embodied in the technology-rich components of the toaster (heat-resistant plastic base, thermostat elements, heating coils, toast-release mechanisms, plating technology etc.). From the national viewpoint, use of such know-how would lead to value addition.

The description of know-how does not have to be so much of a technical specification of know-how (its technicalities) as an exercise in defining the starting point of know-how (i.e., manufacture of machine and its components from industrial raw materials; assembly of rice cooker from purchased components; formulation of insecticides from active imported materials; drug synthesis from indigenous intermediates etc.) and the key scheme or production route by which these starting materials would be converted to the final products of the enterprise (i.e., catalyzed liquid phase of oxidation of . . . ; nickel-seeded precipitation hardening of . . . ; injection-moulding and electroplating of . . . ; assembly of . . . ; induction-melting and shell-casting of . . .).

For a licensee in a developing country, even such detail may not be sufficient. The licensee may have to ask in what form the transmittal of know-how will occur. In a licence for a chemical process, for example, what constitutes know-how may be critical: does it comprise a series of equations for designing the plant, or is it a set of blueprints from which a plant can be constructed?

While a licence agreement aims at brevity, the inclusion of a description clause would not be inconsistent with normal legal drafting.

While legal phrasing may differ, the following is an example of a concise but adequate definition of know-how:

"KNOW-HOW shall mean a body of industrially useful, secret, novel and valuable information, and associated technical and other information and skills, lawfully in possession of the LICENSOR with right to transfer and currently employed by the LICENSOR (hereinafter called the TWO-STEP CATALYZED ISOMERIZATION PROCESS) as will be adequate and sufficient for the LICENSEE to design, construct and operate a manufacturing plant for PRODUCT, based on SAID RAW MATERIALS at designated CAPACITY and PRODUCT SPECIFICATION". (Capitalized words indicate other definitions in the contract.)

It should be noted that the above definition:

(a) Makes know-how a defined term in the contract;

(b) Specifies that only part of the total information is secret, i.e., indicates that secrecy does not extend to all information that is supplied;

(c) Makes provision for supply of supplementary information (technical and other information) to round the secret information;

(d) Provides for adequacy and sufficiency of information to meet the licensee's technical objectives;

(e) Implies that the transferred technology will be current technology;

(f) Indicates "starting materials" ("SAID RAW MATERIALS");

(g) Relates know-how to PRODUCT and plant CAPACITY (full definitions of these should be provided in the contract);

(h) Indicates production route ("TWO-STEP CATALYZED ISOMERIZATION PROCESS), but here PROCESS alone might suffice if it is defined elsewhere;

(i) Shows that the licensor has authority to licence know-how ("possession"), i.e., it is not pirated information: it is in lawful possession;

(j) Demonstrates that know-how is being industrially employed and is not experimental, untried;

(k) Implies that all of the licensor's know-how and information "as of date of contract" will be available (see "process improvements" later in this chapter).

In an agreement that involves only know-how, the licensee's payments are only for the right-of-use of know-how. As will be discussed in chapter VII ("Remuneration"), this association must be established and is necessary.

A clear definition and description of know-how in the agreement aids both the licensee and the regulatory agency in the developing country, namely,

(a) Separation from other of the licensor's inputs (as engineering) or grants (as trade mark rights), which may be of subordinate concern to the licensee;

(b) Understanding the (often) difficult interface between various sources of services, as know-how and technical assistance, so as to enable "interface management" and/or to evaluate (and to price) independent sources of such information;

(c) Establishment of the licensor's or service-supplier's accountability and liability for each phase and scope of service;

(d) Assessment by the licensee and government regulatory agency of the reasonableness of fees and payment provision therefor;

(e) Payments indexing (see p. 31).

Before proceeding further on contractual matters relating to know-how, it may be useful to contrast briefly know-how and technical assistance since these terms are often used interchangeably, and thus incorrectly.

While know-how is, in part, considered secret information, some of its constituent elements may be published information or information known to specialists. Also, some part of know-how may be obtainable from other industrial sources. The value of obtaining information from a supplier of know-how (licensor) is that it represents a preferred and superior combination of selected technical data which, when employed in a prescribed manner, will place its user in a competitively favourable position.

On the other hand, the value of technical assistance (information and skills) is that its supplier has experience in the use of, and provides ready and convenient access to, comprehensive technical (and related) information that may be well-known or fully available in the public domain. It is a form of professional service closely associated with manufacturing experience.

To illustrate, using the example of the toaster, knowledge relating to the assembly of its constituent parts could be obtained from a professional firm experienced in the assembly of household appliances. That would be technical assistance. However, the method of making the heat-resistant plastic base may be information that has been maintained in secrecy and whose use would reduce the overall manufacturing cost of the toaster. This information may be obtained only under the conditions applicable to a know-how licence.

Seen in this manner, technical assistance is a separate but complementary service to know-how, even though the supplier of both may be the same. Thus, it is usually possible to pay for each separately. The merit of separate remuneration is that the financial accountability of the supplier for each of the two services can be independently determined and contracted for in the agreement.

The illustrative definition of know-how given above can also be used to define technical assistance if the latter word is substituted for "know-how" and the words "secret" and "novel", particularly "secret", are deleted. If the licensee's payments are then associated with technical assistance, the agreement will meet the definition of a technical assistance agreement. However, it should be recognized that such payment will then only be for technical assistance—the licensor's services and inputs—and not for the right-of-use of information.

Transmittal of know-how

Very often a simple contractual undertaking by the licensor to supply know-how to the licensee (even if defined as already discussed) may be inadequate. The manner in which know-how is to be communicated often needs to be specified. The licensee in the developing country, for example, may not want to have a set of computer programs delivered to him. He may want more readily digestible information. In this case a "transmittal-of-know-how" clause could be built into the agreement.

The following would be a typical transmittal clause in a contract concerning mechanical equipment, say, tractors. (It is assumed here that an existing foundry-forge-machine shop facility is to be used whose set-up the licensor has found otherwise satisfactory.)

"TRANSMITTAL" shall mean:

(a) Complete documented set of up-to-date, correct, legible, reproducible manufacturing drawings (metric system, notations in English) of all components made by LICENSOR or subcontracted to his design and detailed specifications for all the parts purchased by LICENSOR for manufacture of TRACTORS;

(b) Complete set of up-to-date, correct, legibly reproducible factory standard sheets and engineering standards for the construction of special manufacturing machinery and for the setting up of manufacturing aids (as jigs, fixtures, moulds, dies, special tools, gauges) duplicating those used by LICENSOR for manufacture, assembly, inspection and testing of component parts of TRACTOR;

(c) Casting drawings for cast products together with pattern manufacturing drawings and data as parting lines, position and sizes of cores, chills, runners, risers and gates, together with written procedures for casting, removing parts and finishing;

(d) Procedures and prescriptions for the heat-treatment of all ferrous and non-ferrous metals used by LICENSOR;

(e) Details of plating and painting operations, together with specification of raw and auxiliary materials needed for plating operations;

(f) Layout drawings for assembly of tractor components and parts;

(g) Standard setting, machinery and fitting times for all machine tool operations;

(h) One complete set of up-to-date catalogues, printed price books and printed discount schedules of all parts normally purchased by LICENSOR.

Thus far, know-how has been dealt with as "hard" information, something that is tangible and can be reduced to data, drawings and graphs. However, there is also an intangible part—a composite of knowledge, organizational and operating skills (craft skills such as special welding techniques and computer skills) that are represented in human material—sometimes termed "show-how". While this intangible part of know-how may have been privately developed, it is usually not considered secret information with right of title. For this reason, such contributions of the licensor should be generalized and incorporated into a technical assistance clause or reference drawn to them in the definition of know-how (said "and other information and skills . . ." of the definition clause, p. 13).

Know-how should pass three tests. It should:

(a) Have industrial utility, i.e. have been used in some part of the world and be capable of meeting the licensee's technical objectives;

(b) By the secrecy in which a part of its information has been held, confer some competitive advantage on the licensee, i.e., demonstrate or guarantee some technical or marketing excellence (novelty);

(c) Be proprietary technical information, i.e., information the licensor has the right and authority to communicate—it is not pirated information or information that is in the public domain.

The licensee in the developing country (or the government agency scrutinizing the technology transfer agreement) may often not be in a position to evaluate, at least in depth, the validity of the above-mentioned criteria. Even a licensee in a developed country may be at the same disadvantage. The licensor must therefore provide assurances regarding utility, novelty and ownership. These assurances are generally obtained in the form of the licensor's representations in the licensing agreement (the "whereas", or recital clauses—see p. 51) and (partly) in the definition clause of know-how. Such representations must always be present in the know-how agreement.

Parts of the know-how agreement

Very broadly, the know-how agreement has four parts: (a) recitals and legal-administrative provisions; (b) definitions, grant of rights and obligations of each party; (c) remuneration to the licensor and factors that condition it; and (d) services and matter that may be adjunctive to know-how, such as trade mark rights or patents.

Except for (b), some of whose considerations have preceded this discussion and others of which

follow immediately, parts (a), (c) and (d) have been separately treated in this monograph.

Grant of rights, and obligations thereto, involves a complex of considerations and forms the most important and negotiable area of the know-how agreement. However, know-how conventions, as they have evolved in the transactions of industrially advanced countries, are inadequate for the needs of developing countries. Thus, the construction of know-how clauses, particularly in grants and obligations, is changing rapidly. Unit definitions, such as "territory" and "capacity", and definition clauses, such as "know-how" and "secrecy", form the substratum upon which grants and obligations are established.

Viewpoint of licensor

In the licence agreement the licensor attempts to protect the value of his know-how by placing certain obligations on the licensee. The licensee is asked to recognize the value aspect of know-how by implicitly or explicitly granting the licensor the right to set limits on, or regulate, the extent of use of know-how, that is, the licensee cannot freely employ know-how to his maximum benefit. For example, the licensee is not free to use licensed information to set up manufacturing facilities anywhere in the world or to use it for products unrelated to those negotiated in the agreement if he is paying for its use in a single plant or for a specified range of products. Consequently, obligations are imposed on the licensee to use know-how only in defined territories or over specified ranges of product.

Likewise, with regard to secrecy (confidentiality) of know-how, the licensor seeks to obligate the licensee to maintain secrecy by requiring the licensee to contract not to disclose the licensed information to persons other than those authorized by the licensor.

In brief, the licensor's approach to the know-how agreement is that it expresses a set of conditioned privileges granted to the licensee.

Viewpoint of Governments of developing countries

Governments of developing countries view with concern the excessive obligations licensees sometimes accept in agreements. There is a growing feeling that indiscriminate acceptance of technology has adverse social implications; that issues that arise in negotiations cannot be treated merely on the basis of the licensee's market and profit interests. In their view insufficient knowledge of the implications of licensing leads licensees to accept excessive obligations, the consequences of which are that limitations are placed on otherwise available markets, on value

addition (both at the level of the enterprise and the national economy), on diversification of product range, and on the desired diffusion of incoming skills and knowledge (paid for), which lie outside the cover of secrecy. Likewise, the view is spreading that the concept of right-to-use of know-how, implying lease or rental of know-how, is invalid. Regulatory agencies in many developing countries require that know-how, for which adequate compensation has been paid, be wholly transferred to the licensee enterprise.

Underscoring such viewpoints is the philosophy of developing countries that transfer of technology is a matter that extends beyond the private interests of the licensee, and that it should serve the public interest; incoming technology should eventually spread geographically to create new centres of production and new entrepreneurs while fostering skills that would lead to adaptation of technology and the development of new technology. By establishing regulatory agencies, Governments of developing countries aspire first to enrich and protect the rights of the licensee and secondly to create conditions for the desired diffusion of knowledge. Thus, a critical review of obligations is a specific task of regulatory agencies.

From the viewpoint of Governments of developing countries, the licensing agreement should establish that:

(a) There is permanent transfer of know-how and related technical information to the licensee; that expiration of the contract for reasons other than default by the licensee should not cause the licensee to cease operations, restrict his use in new areas of the knowledge gained, cause him to dispossess his knowledge (for example, through return of drawings and tools to the licensor) or inhibit him from establishing new industrial enterprises using such knowledge;

(b) The licensee acquires technology fully aware of all its critical and competitive aspects and can fully manage the operation of his plant both during the term of the contract and after it expires;

(c) The licensee is adequately protected in terms of the technical performance of the know-how by obtaining full access to the licensor's knowledge, training by the licensor and by contracting for product-and-process warranties;

(d) The licensee will be able to operate freely and effectively in the market-places of his choice by negotiating all aspects of licensing that relate thereto;

(e) The licensee is given adequate access to any process improvements the licensor makes in products and processes so that he will remain competitive in the markets of his choice;

(f) The amount and form of payments to the licensor are equitable in terms of gain to the licensee; that remuneration is for the licensee's principal

interest(s), i.e., for know-how (if that is his most important need) in a composite agreement, for know-how, patents, trade marks and services;

(g) The secrecy obligations accepted by the licensee are commensurate with the nature and value of the know-how and are not so pervasive, or of so long a duration, as to make it difficult for his employees to absorb skills or to use some of the personal skills they acquire should they leave the licensee's enterprise.

Annex II.B gives a check-list for use in screening know-how agreements or know-how clauses in other agreements.

Licensee's obligations in use of know-how

Since the licensor's views on the obligations he can place on the licensee may conflict with the need of developing countries to absorb and employ technology, both licensor and licensee will have to make many adjustments and compromises. Thus, there can be no one solution to this situation.

The following discussion concerns the extent of use of technology (which usually covers several clauses of the know-how agreement). To highlight issues that arise because of differing viewpoints, the conventional view of the licensor is presented first.

Unless otherwise contracted, the following are the most common restraints the licensor places on the licensee:

(a) The licensee does not have the exclusive right-of-use to know-how, i.e., the licensor retains all rights to license others as well as to use it himself, both in contract and non-contract territories. Exclusive rights to make, use, sell or import are separate rights, which the licensor may grant selectively;

(b) The licensee can use the know-how only in the territories specified in the agreement;

(c) The licensee can use the know-how only in the field set down in the licence agreement, i.e., he cannot use licensed know-how for manufacturing products not defined in the agreement (unrelated products usually). The reasonableness of this restriction is sometimes tested even in the courts of developed countries;

(d) The licensee can use the know-how only at the site (or sites) of manufacture identified in the agreement;

(e) The licensee cannot use the know-how to produce the licensed product beyond the capacity authorized in the agreement; the licensee also cannot expand the plant, or production, through use of licensed know-how without the licensor's express authorization;

(f) The licensee does not have the right to sublicense know-how to others;

(g) The licensee can provide access to know-how only to persons identified in the agreement, i.e., use by only the persons concerned (rights of access to and use of can be defined as separate rights);

(h) The licensee and others permitted access to know-how must contractually agree to maintain the designated information in confidence for the period agreed to (this secrecy period can extend beyond the period of use);

(i) The licensee's right-of-use to know-how is limited to the duration of the agreement; the right-of-use ceases thereafter; (as in item (c), this issue arises even in developed countries);

(j) The licensee cannot commercially employ any improvements he may make on the know-how without communicating them to the licensor and transferring the right-of-use to the licensor, free of cost (and other obligation).

Exclusivity of use

A non-exclusive grant of the right to use know-how is typical licensing practice. It implies that the licensor can license the know-how to a third party in the contract territory and also that the licensor himself can operate and use the licensed process in the contract territory. However, because of the small markets of most developing countries, the licensor may not want to reserve these rights-of-use. Hence the licensee may be able to negotiate "sole and exclusive" right-of-use. However, if the licensor feels that the licensee may not expand production to meet market needs or if the licensee's scale of production is too small, he may want to retain the right to license others in the national territory. In such cases, a licensee may not be able to obtain an exclusive grant without compensating the licensor by paying a higher royalty fee or accepting some other obligation such as to purchase the licensor's materials or to sell the product to the licensor. This procedure, however, may not be acceptable to the Government of the developing country. Further, if the country's objective is to encourage multiple production centres (or to avoid licensee monopoly) it may be a regulatory policy to disallow exclusive grants.

The licensee's exclusivity right, in the above context, is the use of know-how. There may be no concurrent exclusive rights to sell the product. Exclusivity in each area of import, make, use and sell must be considered in a licensing agreement. For instance, the national firm may be licensed to use know-how for manufacturing a component needed by the overseas licensor. As a subcontractor, the licensee would not have the right to make an independent sale. Similarly, in a know-how licence to an

engineering company, right-of-use may be restricted to providing engineering designs only for designated clients, not for use (of the know-how) by the engineering company itself. In another instance, negotiating exclusive rights to import the licensor's products may avoid independent action by the licensor to sell as a competitor the licensed product in the contract territory. Thus, the business needs envisaged by a licensee should be supported by express legal rights.

Territory of use

Territorial restraints on the use of know-how usually imply that the right of production is restricted to the national territory.⁴ If the licensee wishes to use the know-how for production in a different territory, he must negotiate the equivalent of a separate licence agreement.

Field of use

In some patent systems a field-of-use restraint may be an exercisable right of the patentee. While licensors carry the analogy to secret know-how anticipating that the law will uphold such a restraint, the licensee should accept it on the basis of reasoned argument, particularly if know-how is unpatented. In a chemical process, for example, unpatented know-how may relate to the production of acetaldehyde. Use of the know-how to make related propionaldehyde may not be permitted. However, there can be no restriction if the licensee were to use acetaldehyde to make acetic acid, since the latter conversion is not covered by the licensed know-how.

Site of manufacture

In an exclusive licence, a restraint on the site of manufacture should be considered unacceptable if all the licensee's production is subject to royalty. In all cases the site restraint should be considered an excessive obligation if the restraint is to apply after the contract expires (under conditions of normal termination). However, the licensor may wish to impose this restraint to protect the competitive position of his other licensees in the contract territory. In such a case the limitation may be considered on its merits.

Volume of production

During the term of the agreement, a restriction on plant capacity may be reasonable if a lump-sum

⁴In a patent licence, rights may be restricted to a region of the national territory, depending on national patent legislation.

royalty has been negotiated (see chapter VII). If there is a running royalty covering all the licensee's production, the licensee's right to expand capacity should not be limited.

Right to sublicense

The licensee should negotiate the right to sublicense on its merits, taking into consideration the higher level of compensation the licensor is apt to ask. Governments of developing countries (e.g., India) see in sublicensing a method of avoiding repetitive imports of technology as well as a means of reducing foreign exchange outgo by adjusted royalty schedules (see chapter VII).

Use only by persons concerned

The aim of restricting use of know-how to the persons concerned is to protect secrecy and thus preserve the value of the know-how. The objective is to prevent service suppliers, such as engineering firms (which obtain access to secret information for performing services for the licensee) from misusing the information for their own commercial gain. The licensee or national Government should have no objection to this restraint.

Secrecy period

Growth in a developing economy, where skills are short, is associated with mobility of personnel—those who at one location are learning skills (such as designing or erecting a plant) may later be employed by another enterprise at a different location because they have acquired these skills. In this context, requiring a licensee to honour secrecy commitments obligates him to withhold information from those who need to have access to it if there is reasonable suspicion that they may leave the enterprise. The problem is compounded when the secrecy period is excessively long. A licensee can protect know-how by having his employees execute a "back-to-back" secrecy agreement but only for a limited period, since the employees do not enter into any binding, reciprocally advantageous relationship with the licensee as the latter does with the licensor.

However, the enterprise in the developing country (or developed country) whether using licensed technology or not, does routinely require employees to execute a confidentiality agreement, an agreement that is deemed to be workable in the legal environment of the developing country. Hence the licensee's obligation to the licensor, in terms of information that percolates through an organization, cannot be greater than the obligation the licensee normally requires of his employees.

It should be kept in mind, however, that very valuable commercial technology may be available only upon acceptance of a continuing obligation to maintain secrecy until such time as the technology is generally known to the trade. Each situation must be separately evaluated to determine whether the commercial benefits attainable from a particular technology offset the detriments of continued restriction on use or publication of the technology. Obviously, certain secret technologies could provide very real competitive advantages for developing country enterprises in export markets.

The employee-related secrecy period is only one aspect of the larger problem. Secrecy can relate only to secret information (and not to all the information received from the licensor). Hence the secrecy clause must stand related to a "what-constitutes-secrecy" clause (see p. 12).

The use of secret information after the formal expiry of the know-how agreement sometimes raises problems (secrecy life often exceeds the life of the agreement). It is almost always an express social objective of Governments of developing countries to encourage the use of acquired information and skills (for which compensation has been paid) for the larger benefit of the economy. Although the licensee is obligated to maintain secrecy, he should be permitted to employ the secret information for purposes outside the prime purpose of its first acquisition. Thus, the licensee should be able to employ it for:

- Expanding facilities under his control
- Operating new manufacturing sites
- Enlarging product range
- Developing products or processes not contemplated in the agreement
- Making improvements, through research and development

Consequently, the contract should either expressly permit the use of know-how for the above-listed activities (after lapse of contract—period of know-how use), or the secrecy clause should be constructed so that it does not prohibit such use. Such a provision increases depth of control (p. 1).

Cease-use provision

In developing countries where scarce capital has been invested, a licensee's acceptance of a provision requiring him to cease using the know-how after the agreement has expired would sharply conflict with government objectives. Such a condition should be permissible only if the licensee wilfully frustrates the contract before its normal expiry. The concept of ceasing to use know-how is, in itself, complex: can learned skills be unlearned? Only if the manufacturing plant is dependent on the purchase of

proprietary components from the licensor will the cease-use clause be workable.

In the United States and the EEC countries, the licensee's right to use know-how after an agreement has lapsed has been discussed in various judicial decisions.⁵

A cease-use provision would be appropriate in a subcontract whose basic purpose, for example, is to have some firm merely make a product for use or resale by the licensor or a designated third party. The manufacturing firm here provides a service, just as an engineering firm would in providing design engineering (based on the licensor's know-how). In such special cases, the recital clauses of the agreement should make the limited purpose of the agreement clear.

Process improvements—rights of the licensee

The licensor of know-how holds the view that any improvements the licensee makes are the result of experience gained in using licensed know-how. He therefore obligates the licensee to supply him with all the details of such development, together with the right that the licensor can use such improvements. In turn, to maintain the licensee's competitiveness, the licensor agrees to furnish the licensee with his improvements. This, of course, is an equitable, reciprocal relationship.

In most agreements in most developing countries, the improvements clause is a simple statement. However, in agreements with sophisticated licensees or research organizations (in developed or developing countries), the improvements clause can become complex. It is beyond the scope of this monograph to cover these cases. However, the following are the areas where negotiation will be necessary:

Patentable and non-patentable improvements (made by the licensee or licensor)

Revolutionary improvements (for example, development of an entirely new catalyst)

Mode of access to improvements—i.e., procedures by which improvements will be learned of and communicated

Commercialized and non-commercialized improvements, i.e., does licensor or licensee have to supply the results of research and development that have not been commercially tested in the market-place?

Improvements made by other licensees of the licensor

Transfer of improvements made by third parties (e.g., a catalyst development), for which the licensor or licensee has made payments

Secrecy provision for improvements

Relationship to definition of know-how (see next section)

Exclusive or non-exclusive rights to use improvements

Know-how and process improvements

In the earlier definition of know-how (see p. 13) there is an undefined element relating to the possession of the know-how: there is no reference date for possession. Is it the date on which the agreement was signed? The date on which the know-how was transmitted? Some other particular date?

In many product areas, the date may take on considerable significance, since know-how is not a static body of knowledge. It grows and becomes enriched by the improvements made on it. Further, know-how is usually communicated to the licensee over a certain period, since it may involve personnel training, modification for the needs of a developing country, a licensee's absorptive capacity etc. Over this period, the licensor may have improved his technology.

For this reason, the reference date for possession should be stated as the date of the agreement, the date of disclosure of know-how or an arbitrary date that is mutually acceptable. In all cases a separate improvements clause will be necessary. Such a separate clause is, in fact, the usual practice.

However, it is sometimes possible to define know-how as "inclusive of improvements" (improvements defined separately) in which case the licensor is obligated to communicate improvements over the life of the agreement. This procedure is, indeed, recommended for the general case.

It should thus be noted that there is almost always a trade-off between rights and restraints in negotiating a licence agreement. The licensee may secure an exclusive licence right if he undertakes to import some components made by the licensor. Similarly, the licensee may trade off a site-of-manufacture restraint by accepting limited rights of sale in export markets. Consequently, a clause-by-clause screening by a regulatory body may be wasteful unless it makes allowances for the give and take between the licensor and licensee.

The restraints discussed above, however, are usually not considered restrictive practices.

Performance of know-how—licensor's guarantee obligations

When a firm contracts for a commercialized, patented process, it has the option of taking a "bare" patent licence and independently developing the

⁵ In the United States the right to continue to use secret know-how is determined by the intent of the parties in concluding their agreement.

necessary know-how for commercial application. In this case the patent licensor is not obligated, explicitly or implicitly, to guarantee the licensee that use and development of the patented information, the statutorily published material will lead to the licensee's commercial gain.⁶ Thus, the licensee bears the entire risk and cost of process development (know-how).

If, on the other hand, the client firm negotiates a know-how licence along with the patent licence, in order to ensure that the process performance shall be satisfactory, the licensor should be obligated to provide some guarantee or warranty⁷ that correct use of the licensed know-how will enable the licensee to meet his technical objectives. This obligation arises because the content and characteristics of know-how are usually unknown to the licensee when he enters into an agreement.

While a patent-related know-how licence has been discussed above, the same considerations apply to the straightforward purchase of know-how. One could, in fact, maintain that the licensor's guarantee in the latter case should be even more embracing than in the case of patent-related know-how because the patent at least reveals the key characteristics of the process (for which the know-how is supportive).

In some industrial areas, performance of know-how is more important than in others. In many cases, such as electrical and mechanical machinery, consumer electronics, mechanical appliances, cosmetics or hardware, the performance consideration is not critical for the following reasons:

(a) Prototypes and commercial samples can be seen and tested by the licensee before the contract is signed, or for items such as sewing machines or kitchen appliances, they can be disassembled and studied for key technological areas, i.e., the risk area can be identified (not possible for, say, a chemical product or a metal casting);

(b) National standards (NEMA for electrical machinery, DIN for electronic components, or FDA regulations for food products) may have to be met because of national legislation and these can be regarded as guarantees to be met by the licensor;

(c) Purchased parts constitute a significant element of product make-up and cost, and the licensor merely has to write in their specifications, identify suppliers etc.; know-how of purchased parts is not an element of the licensor's know-how and thus subject to his guarantees;

⁶The patent has to disclose, however, sufficient information for a competent firm or individual skilled in the art to practise the invention and thus to verify independently its technical claims; otherwise, it could be held invalid or be challenged.

⁷Warranty and guarantee are differentiated later, although there is a general tendency to use them interchangeably.

(d) There is no difficulty in specifying raw materials;

(e) The product results from a sequence of sharply differentiated manufacturing steps; defective manufacturing areas in plants going on-stream are easy to detect, are usually localized, and can usually be corrected at low cost. The cost of correction can often be roughly estimated in advance;

(f) Manufacturing machinery is not made by the licensor, but is obtained from standard machinery suppliers; failure in machine performance is corrected by the suppliers and not directly by the licensor;

(g) In most such areas, it is not necessary to start operations with a complete complex; backward and forward integration can reduce the licensee's risk and give him a chance of moving at the pace he chooses;

(h) Significantly, in most of these areas (appliances, cosmetics) know-how is ancillary to trade mark rights, the value of which to the licensee is the greater; that is, know-how is not sophisticated, but is oriented to ensuring consistent quality of the licensed product.

However, in the process industries—chemicals, plastics, pharmaceuticals, fertilizers, products made through fermentation, metallurgical industries, electronic products such as semiconductors and integrated circuits (where process routes cannot be identified by examining products) the licensee has a great need for protection regarding performance of know-how for the following reasons:

(a) While a wide variety of alternative raw materials can be used the licensor may have experience in using only a few of them; raw material specifications (impurity levels) may have a great effect on process performance;

(b) The relative rates of consumption of raw materials and energy (fuel, power, steam) strongly affect product cost and, therefore, the licensee's competitiveness in a particular location;

(c) The question of measuring performance arises only at the conclusion of the project, since there is little possibility of measuring performances in stages as construction progresses;

(d) The key pieces of equipment are custom built, and the equipment maker assumes responsibility only for their mechanical performance, not for process performance;

(e) There are considerable problems of ensuring equipment safety, disposing of effluents etc., which vary with site, raw materials, process and national legislation;

(f) There is considerable use of proprietary catalysts and like materials whose cost is determined by their life, which depends, in turn, on the licensee's raw materials and the licensor's process route;

(g) Gradual backward and forward integration is hardly possible; initial investments are large and unified, which means a high risk;

(h) Significantly, the know-how-licensor, engineering firm and construction firm are often different organizations, with different responsibilities. Hence responsibility for performance must be precisely stated for each of the several contractors.

A licensee usually has a choice of know-how suppliers. Well-established processes of reputed licensors who themselves operate licensed processes are least likely to cause trouble. Overstress on performance guarantees in such a situation is unlikely to give any added protection to the licensee. However, performance guarantees are important when there are known to be differences in sources of raw materials, required product specifications differ from the licensor's normal range, links in the process chain are untested, or equipment that is unfamiliar to the licensor (owing to government insistence) must be used.

If a licensee overstresses guarantees, the licensor may design the plant so that it incorporates unnecessarily high factors of safety. For example, to meet a guaranteed plant capacity of 40,000 tons per year of a product, the licensor may incorporate in his design a real capacity that is 20 per cent in excess. This excess may not be a marketable surplus and may merely result in raising the licensee's investment without a corresponding benefit. Similarly, covering too many process aspects with guarantees may be undesirable. Thus, guaranteeing capacity, yield, recovery, consumption of utilities (power, steam air) product specifications etc. may merely lead to unnecessary sophistication in the plant and higher licence fees, since the licensor's financial exposure, through assumption of corresponding liabilities, is increased. It should also be noted that a licensor may agree to provide some unusual guarantees, or extend guarantee coverage to the full needs of the licensee, but he may not, in effect, incorporate technological changes to achieve the purpose or he may not have the technical capability to do so; he may be providing guarantees just to meet a competitive claim, or, perhaps, merely to secure the licensee's order.

An additional consideration in process guarantees is: who should provide them. If an engineering firm offers guarantees for a process with which it is not familiar, or presents guarantees without a "back-to-back" agreement with a process licensor who is operating such a process, the guarantees, however complete they may appear, are, in effect, shadow guarantees, not within the right or capability of the engineering firm to provide. Negotiating guarantees in such a situation would be meaningless. On the other hand, if the licensor is a partner holding significant equity in the licensor-licensee firm, there is little point in stressing technical performance, since

then the licensor is sharing the licensee's risk. In short, while process performance guarantees are important, there cannot be a standard approach to them, nor are they always necessary.

Performance guarantees must be closely negotiated only in areas where its potential correction (a) may be very costly, (b) may take too long, or (c) can cause the licensee to incur a long-term economic disadvantage (for example, a lower selling price because the product is substandard).

In negotiating performance guarantees, the licensee faces the following issues and his rights therein:

- Methods of specifying anticipated performance
- Detection and measurement of deficient performance
- Remedies available to the licensee for defaults of the licensor
- Procedures for correcting deficient performance and discharging the licensor's obligations

It is presumed in the following material that if performance is defective, it will be due to a default of the licensor's. To determine this, the licensee must be using know-how properly.⁸

Specification of performance

Since a project is undertaken to meet the objectives of a licensee, it should be within his right to choose performance parameters over which the licensor's guarantees should prevail. The licensee should also have the right to determine which parameters are critical to him and their priority. In a chemical process licence, for example, the licensee may be unwilling to accept much variation in product purity, but he may not be quite so rigid on variations in volume; or he may want minimum use of electrical energy but remain (relatively) unconcerned about the percentage of raw material converted in the process.

⁸ In contractual terms the licensor could require that:

(a) The licensee is complying with all the technical standards, instructions and recommendations he has received from the licensor;

(b) The machinery, tools and equipment the licensee uses in the manufacture of the product meet the requirements specified in the technical documentation furnished by the licensor;

(c) The products and materials the licensee uses in the manufacture of products meet the requirements specified in the technical documentation furnished;

(d) The resources and skills the licensee applies in manufacturing the product are those of a manufacturer experienced in the manufacture of a product of similar complexity.

Clearly, these are conditions that licensees in developing countries cannot meet. Where they appear they will have to be weakened and the consequent higher risk the licensor incurs will have to be compensated for through a higher royalty etc.

Similarly, in a plant manufacturing mechanical parts, the licensee may want a low rejection rate, but be prepared for a higher scrap loss etc.

Specifying performance, in itself, is often difficult. Over a miscellany of industries, the statements or specifications given below typify performance parameters.

Product quality	99.8 per cent minimum pure acetic acid with less than 5 ppm Pb; "will be equal to or better than Indian Standards Specification 240B (1977)"; 98 per cent of product below 200 mesh, 100 per cent below 100 mesh, identical in all respects to licensor's own manufactured products
Yield	Units of product per unit of raw material, i.e., 6,000 washers per kg of 2 cm round bar; minimum 60 per cent recovery of all argon in feed gas. 85 per cent conversion of feed naphthalene to alpha-naphthol product
Production capacity	250 rice cookers of 3-litre capacity or 200 units of 4 litre capacity per 8-hour shift; 20,000 tons of hydrogen of 99.9 per cent purity per annum of 8,000 hours
Utilities consumption	Not more than 4 kg of 4 bar saturated steam per kg product
Rejection rate	Not more than one reject per 100 units of completed product tested under quality control test Y
Scrap loss	Not more than 3 per cent of 100 kg poured molten zinc
Shelf life	Not more than 1 per cent loss of volatiles per 100 cc vial in 30 days when stored at 35°C and 90 per cent relative humidity
Effluent	BOD ₅ of waste water less than 30 at all times, but average over 24 hours, tested hourly, below 20
Productivity	85,000 pieces per hour passing DIN specification 652
Catalyst consumption	6,000 kg of product per kg of fresh catalyst charged

Mechanical warranty

If machine Z was operated in accordance with Operating Manual OM-630 and maintenance is conducted as per Maintenance Manual MM-631, Machine Z will not consume more than 30 kg/a of Lubricant W; a 300-kg weight placed at point X of distillation tray will not permanently deflect beam Y by more than 2 mm at that point

These factors are, of course, interdependent. For example, a licensee may want X kg of product per year with purity Y with steam consumption of not more than Z kg per unit of product. For the licensor they constitute the "design condition" on which to engineer the project. For guarantee purposes, however, the licensee must view the economic loss he would suffer if there was deviation from the guaranteed conditions (say, purity and steam consumption in the above example). Thus, a 1 per cent loss in product purity might cause the licensee to lose, through the price discount he has to offer, \$100,000 a year. However, if steam consumption were to be 10 per cent higher, the licensee's incremental operating cost might be only \$30,000. Consequently, by applying the criterion of parameter criticality the licensee would bargain more closely with the licensor on product purity than on steam consumption. How that would relate to the licensor's liability is discussed later.

Detection and measurement of deficiency

In a turn-key project, the licensee does not take over a plant unless it meets all the guaranteed conditions. At some time, the licensee's technical representatives will visit the completed plant and following mutually agreed upon procedures (usually called "protocol"), carry out guarantee tests in the presence of the licensor. In general, the licensor company will have corrected any deficiencies that it has detected earlier in pre-commissioning and start-up tests.

However, where the licensee, licensor and engineering firm assume different responsibilities in plant construction, detection of defects, measuring them and identifying and allocating responsibility for them are quite complex matters because at the time of negotiating the contract the licensee is unaware of all aspects of know-how, that is, know-how is yet to be disclosed to him.

For a foundry producing speciality alloy steels, for example, the licensor may be responsible for training personnel (transferring know-how) in melting, pouring, casting and machining of alloy steel

parts, while the licensee's responsibility may lie in procuring and erecting all the equipment listed by the licensor in the agreement, including a furnace with special refractory. On the basis of the licensee's considerations of parameter criticality, the licensor may have warranted (in the licence agreement) that the refractory lining of the furnace, when properly laid, will have a minimum life of 700 heats if melting operations closely follow the operating manuals he will supply.

However, since the information is secret, the licensee does not know when the agreement comes into force, the type of refractory he has to use or what is the correct procedure for laying refractories. How, then, should the responsibilities be divided? How is a defect, if any, to be detected and measured?

To overcome this type of situation, know-how agreements provide for a "design conference" to be held between the parties after the agreement has been signed to discuss details. At this conference, know-how (in the example cited the type of refractory to be used) may be disclosed. Further, the roles and responsibilities of the licensee and the licensor are outlined in detail (in the example, the licensor agrees to supervise refractory laying as well as to inspect and approve purchased refractory). This protocol then becomes a binding agreement.

As for detecting and measuring defects, the agreement should provide for a test procedures conference, at which the schedules for guarantee tests are established. These schedules will be implemented once the plant is ready for operation (in the example cited, there may be a quick provisional test for refractory life).

Remedies available to licensee for faults and deficiencies

If it is assumed, in continuing the example of the foundry, that a defect has been detected and measured, for instance, that the furnace lining has only a life of 550 heats and this defect has been caused by some fault or oversight of the licensor (which he admits), what remedies are available to the licensee?

The standard approach to the problem, usually anticipated and provided for in the agreement, is for the licensor to make an effort to rectify the defect. Alternatively, the licensor may reimburse the licensee a portion of the fees he has received for the know-how or he may elect to pay damages as settled by arbitration. (See "liquidated damages", p. 32). By convention, it is the licensor's option to engage in correction, pay some preset compensation, incur some other obligation, or combine these in various ways.

For developing countries, where scarce funds have been invested and where the licensee's industrial knowledge is incomplete (particularly in the process industries), this unilateral option of the licensor is usually undesirable. The licensor should be contractually obligated to stay involved in the project until the defects have been removed or minimized, even if provision for such involvement requires higher royalty payments. Special attention should be paid to this point in straight licence agreements.⁹

The preferred approach is for the licensor to undertake to make repeated efforts to remedy defects at the licensee's site, failing which he will reimburse the licensee for all or part of fees received for know-how (as provided for in the agreement).

The licensor can compensate the licensee in many ways for admitted faults, usually by one of the following:

- Replacing defective equipment
- Paying liquidated damages
- Accepting lowered royalty rates

The licensor may provide "warranties" instead of "guarantees". However, what finally counts in a dispute is the legal interpretation of the terms of the warranty or guarantee.

Warranties and guarantees

When a machine (an example to typify equipment) is supplied to a particular firm, its seller may "warranty" (certify) that it will turn out, say, 6,000 crown corks per hour. If it fails to do so, the seller has the obligation to repair the machine or to replace it with a machine that works at the warranted capacity (repair and replacement at the supplier's cost).¹⁰ The buyer does not have any other rights under the warranty. However, it would be a clear misrepresentation if the seller cannot repair (or replace) the machine to perform as warranted, and the seller had no basis whatsoever for offering such a warranty. Although damages to the buyer will be decided at court, or through arbitration, in many jurisdictions the buyer, in the case of misrepresentation, can claim whatever he believes is his loss—say, the cost of a new machine and loss of profit incurred while the new machine is procured and commissioned.

However, the buyer's overall claim for damages or replacement will be entirely different if he had, for example, asked for and witnessed the seller's

⁹The licensor's involvement is almost automatic in a joint-venture, since correction benefits him.

¹⁰In the process area, where performance relates to the integrated working of its several parts, warranties extend only to rectification, since replacement is not always relevant.

machines operating at 6,000 pieces per hour, but is unable to achieve this rate at his plant for a factor not normally associated with machine productivity (say, ambient temperature).

When the licensor can demonstrate that his know-how has been widely applied and when there is no reasonable basis for him to anticipate difficulties in performance, it is his position that warranties are unnecessary. He may still certify (under the warranty clause), however, that, should stated performance not be achieved, he will replace or rectify the machinery he has provided. Thus, in such warranties (a term normally applied to equipment) there are limited remedies to the licensee.

However, in most process licensing in developing countries the situation with guarantees is entirely different from that related to equipment warranties. For example, the raw material a licensee intends to use may have an unusual impurity but one the licensor is confident will not affect the quality of the licensed product (in the example of the alloy steel foundry, refractory life). The licensor, to inspire confidence in his process (or to meet competition) undertakes to provide specific guarantees on performance parameters. By doing so, he accepts the liability to repair, or failing which, to compensate the licensee financially for the loss the licensee may incur through use of the licensor's incorrect process. However, as is not the usual case with equipment warranties, the licensor will confine his risk by setting an express limit to the money expense he is prepared to incur to set right the defect or to compensate the licensee.

Negotiating liability

How does a licensee then negotiate the licensor's liability in a licence that expresses performance guarantees? It is recommended here that parameter criticality be the deciding criterion. A typical illustration is given below.

In a chemical process licence, the lump-sum royalty in a five-year contract is \$1 million. The process is designed to yield annually 5 million kg of insecticide X at a purity of 99.0 per cent, involving a steam consumption rate of no higher than 4 kg/kg of product. It is the licensee's task to determine the criticality of these three parameters.

It is now assumed that the licensee expects the following situation at the time he executes the agreement (dollars per annum):

Sales value of pesticide at \$1.29/kg	6 000 000
Cost of steam at \$18/ton	360 000
Other operating costs, including labour	2 600 000
Fixed costs, including 10 per cent depreciation (on an investment of \$6 million)	900 000
Total cost of product	3 860 000
Gross profit	2 140 000
Net profit after tax	1 070 000

The licensee may also assess that a loss in purity of product will reduce its selling price to \$1.15/kg.

From the above figures, the following can be estimated (dollars):

Five-year loss of profit to the licensee for 1 per cent loss in production (product purity and steam consumption rate being unaffected)	760 000	
Five-year loss of profit through purity defect (all else remaining acceptable)	625 000	
Five-year loss of profit at 10 per cent excess steam consumption (all else remaining acceptable)	80 000	
Loss if additional steam boiler has to be purchased for meeting steam requirements if steam consumption is above 10 per cent of the guarantee	1 280 000	(1 200 000 for new boiler + 80 000 for excess steam)

What, then, is parameter criticality?

Steam consumption, it can be seen, is not critical so long as it does not exceed 10 per cent of the guaranteed rate. Beyond it, steam is the most critical parameter, since a costly additional steam plant would have to be bought.

A liability schedule (one of several alternatives) can be designed thus (dollars):

(a) Licensor's liability for steam consumption if consumption is above guarantee but does not require licensee to install new boiler:	None
(b) Liability for steam consumption if it is above 10 per cent of guarantee:	1 000 000
(c) Licensor's liability if the product does not meet guaranteed purity level:	625 000 ¹¹
(d) Licensor's liability for licensee's loss of production	
(i) Above 99.5% of guarantee level	None
(ii) Per 1 per cent loss in production capacity below 99.5 per cent in guaranteed level	300 000 per 1 per cent loss and fractions thereof ¹²
Maximum liability in all combinations of (a), (c) and (d)	850 000
Maximum liability of all combinations of (a), (b), (c) and (d)	1 000 000
Licensor's total liability under all guarantee provisions	1 000 000

¹¹ Liability higher than \$625,000 for product purity would not be possible, since that is the maximum real loss the licensee could incur.

¹² Although the licensee's five-year loss on net profit for the first 1% loss in production capacity has been calculated at \$760,000 the liability provision is kept at \$300,000 per 1%, since it is anticipated that the licensee will be able to improve on production efficiency, through his own efforts, over the five-year period.

The \$1 million maximum liability level is provided, since the licensor's lump-sum royalty is \$1 million.

In this example, the licensor is seen as risking his entire lump-sum royalty receipts. This situation would be the exception. There are almost always costs in transferring know-how (designing for the licensee's particular capacity, preparing drawings, precontract travel expenses, other contract-related expenses such as vendor and inspection services). Thus, the maximum the licensor can be expected to risk would be his profit on the direct licensing operation. However, even so, the licensee may not be able to negotiate the full amount, for the very concept of licensing assumes that the licensee elects to purchase know-how because it is less of a risk than developing it himself. Therefore, 50 per cent of the licensor's profit on licensing (profit has to be guessed at) is about the best bench-mark the licensee can negotiate.¹³

In the example of the insecticide, it was assumed that lump-sum royalties were applicable. What would be the case if the contract provided for a straightforward royalty, say, 3 per cent on sales value?

Under "Remuneration", it is shown that a royalty rate can be converted to a lump-sum, and vice versa, through the concept of net present value (NPV). In the example, a \$1 million lump-sum fee (on a five-year contract) is equivalent to a sales-based royalty level of 5.36 per cent, say 5.5 per cent. On sales of \$6 million, the royalty payment from the licensee is \$330,000 per year. A 1 per cent loss in production (see p. 24) is equivalent to $\$760,000/5 = \$152,000$ loss of profit to the licensee per year, or a royalty of

$$\frac{152,000}{6,000,000} \times 100 = 2.53\%, \text{ say } 2.5\%$$

Hence, for every 1 per cent defect in production, the licensee should have the option of reducing the 5.5 per cent base royalty rate by 2.5 per cent.

The licensee's risk should be calculated by engineers and business representatives of the licensee. However, precise calculations are often not possible because they must be based on various estimates.

Correcting defective performance and discharging obligations

A licensor admitting default in know-how performance usually has the choice of rectifying the defective area, paying the licensee liquidated damages, accepting reduced royalty rates or some

¹³In the example cited the licensor's profit on the licensing transaction can be estimated at \$900,000. The licensor may be prepared to stake \$450,000 as risk money. In this event, the liability would be roughly halved for each parameter.

combination of such factors. The expense of rectification is usually treated as a cost the licensor incurs in discharging his liabilities. If, in the cited example of the alloy steels foundry, the licensor had assumed a liability of \$100,000 against a guarantee of 700 heats for the lining but only 550 heats were obtained, the licensor may calculate his cost of rectification at \$20,000. He would incur this expense since it is to his advantage. If, however, the rectification led only to 600 heats and the licensor estimated that it would take him another \$30,000, and six months more, to bring the lining to 700 heats, he may decide, on some calculation of his (unknown to the licensee), that paying \$80,000 to the licensee (\$100,000 minus the incurred rectification cost of \$20,000) would be in his best interests. He would pay this amount, upon which and in accordance with the agreement, he would become free of all further performance-regulated obligations.

To the licensee, however, the extra 100 heats may mean an incremental profit of \$50,000 per year, a situation that is likely to occur in developing countries. Therefore, if the licensee had the option, he would have insisted that the licensor spend \$30,000 and six months. For this reason, as was earlier recommended, the licensee should negotiate that the licensor will always undertake to rectify defects; and only if that undertaking fails the licensor should pay compensation.

However, it can also happen that the licensor may be willing to spend \$30,000 and six months, but the licensee, calculating his loss on downtime (profits forgone in the interval), may not be satisfied. In such a case, a compromise settlement must be negotiated.

To permit these variations, seen only from the licensee's point of view, the agreement should include the following provisions:

(a) The licensee and the licensor agree to carry out performance tests as per agreement reached in the test procedures conference (p. 23);

(b) The performance tests shall be completed within *a* weeks after the licensor and the licensee have agreed to commence testing;

(c) If the guaranteed performance is not obtained in said period of *a* weeks (for no fault of the licensee's), the licensor shall within *b* weeks, commence rectification, all costs (defined later) of such rectification to be borne by the licensor;

(d) If within *c* weeks, or the licensor's expenditure of *x* dollars, the tests do not yield the guaranteed performance, the licensee will have the option of requiring the licensor either:

(i) To discharge his outstanding financial liabilities immediately;

or

- (ii) To undertake further rectification work at the licensee's cost until performance is obtained or such work is terminated at the request of the licensee.¹⁴

Since these provisions reflect the interest of the licensee only, in actual negotiations they will certainly be modified.

The definition of "cost" in rectification should be mentioned briefly. It may be in the licensee's interest, particularly in a country where there are tight foreign exchange regulations, to define the

¹⁴The licensee may also contract that if defective performance arises from default of the licensee, the licensor will correct, if such is correctable, at the licensee's cost.

licensor's cost so as to exclude the cost of indigenous labour and cost of indigenously procured materials, while fixing the licensor's per diem charges for overseas personnel.

This condition permits the licensee to avail himself of services and material that are not locally available and that can be offset against the licensor's liability (which would be in foreign exchange). By doing so, the licensee can obtain from the licensor a much larger "scope of service", which is extremely useful when rectification costs are likely to be high. However, the licensee's costs also go up because this definition of cost forces him to supply all local material and services needed for rectification, a sacrifice the licensee may be willing to accept.

IV. The engineering services agreement

The engineering services agreement, a short-term contract, is a listing of the technical work the supplier of engineering services is required to perform. Unless there are very substantial engineering innovations (such as a naphtha cracker in the chemical industry), the supplier does not place any extensive restraints on the client regarding site, volume of production, disclosure of improvements etc. as the licensor does in the know-how agreement. Even where know-how is employed (say, the particular design of a refrigeration system) the agreement places an obligation on the client to maintain its confidentiality rather than a restriction on right-of-use.

The non-technical part of the engineering agreement usually concerns the division of responsibilities between the supplier of services and the client and their mutual obligations. However, the engineering services agreement can be a complex, voluminous document.

The agreement becomes complex when process know-how is supplied by party A, engineering by party B, and the client himself assumes responsibility for certain services. In a developing country this would be the typical case unless there is a turnkey contract, where the process licensor (or engineering firm) assumes total responsibility for all services, handing over the completed working plant to the client at a contractually fixed date.

The length and complexity of the engineering agreement often arises from the scope of the supplier's services. These may comprise assessing raw materials, locating and preparing the plant site, recruiting personnel, obtaining government and municipal clearances, procuring construction materials and equipment, inspecting local and foreign-made machinery, constructing buildings, installing machinery, training operators and commissioning the plant.

In developing countries there is almost always a certain scope of work for the licensee arising from considerations of government controls on where a plant can be located, the types of services that must be procured locally, the levels of foreign exchange expenditure than can be incurred, procedures for government approval of imported equipment etc. In these circumstances, even the turnkey project is a quasi-turnkey project. There are thus areas in which the client has full responsibility, failure in which can affect plant performance.

Usually, the client has the option of using a process licensor, or an engineering firm, to handle the (quasi) turnkey project. For example, the client investing in a monochlorobenzene facility can ask the process licensor to do the engineering or have an engineering firm, experienced in chemical plants, design the facility (based on the process licensor's know-how). For this purpose, disclosure of some or all of the know-how to the engineering firm should be contemplated within the terms of the licence agreement. The client may assume for himself the responsibility for procuring all local materials and services while also designing and constructing civil or light mechanical structures and electrical utilities.

The most common situation is for the engineering firm to design (and perhaps construct) the basic plant, with the licensee disclosing to the engineering firm the process know-how acquired from its licensor. Typically, process licensors are operating companies without facilities or readily available personnel for executing overseas engineering jobs.

The ensuing discussion on engineering agreements is based on the assumption (oriented to the situation of a developing country) that (a) the engineering firm executes a design and construction contract in which (b) the client discloses to the engineering firm know-how acquired from the processor licensor, while (c) the client performs all non-specialized work either directly or by using local agencies and has full responsibility for it, and (d) the client independently transacts with the process licensor and the engineering firm for performance guarantees relative to their areas of work.

The entire objective of a client, in this context, is to establish a manufacturing plant at its first estimated cost, that will manufacture a product at a certain volume and cost and meeting a prescribed standard of operation by a given date. To achieve this objective, the client has to contract with both the process licensor and the engineering firm for scopes of services (responsibilities) that reinforce each other and do not conflict. However, anticipating the possibility of error (including the client's), the client has to assure himself that the licensor and the engineering firm will provide corrective services for achieving the objective.

It is assumed that all major procurement will be undertaken by the engineering firm (but procurement parameters will not be discussed). It is further assumed that a process industry (see pp. 20-21) is the

objective of the client (to provide a complex enough case for discussion).

By and large, the formal engineering services agreement is executed only after the client has reviewed a preliminary proposal, often termed "front-end" engineering. Based on know-how (partial or complete) made available to the engineering company, under cover of secrecy, the engineering company defines in the preliminary proposal the overall project, its principal services (design, procurement, construction, plant commissioning etc.), major equipment involved, duration of project execution and approximate cost. The document specifically states what services will be performed by the engineering company and what services will have to be carried out by the client (directly, or through subcontracting). After the preliminary proposal has been accepted, the formal, detailed agreement is drafted.

If the technical content of the agreement is disregarded for this discussion (for example, the specific equipment that will be designed, the detailedness of drawings that will be supplied and the timing for delivery of plant layout details (see "transmittal of know-how" for illustrative clauses), the important substance of the agreement reduces to:

Interrelationship of the parties involved and related agreements

Division of responsibilities

Supervisory responsibilities

Design conference

Payments, payments indexing and payments protection

Warranties and guarantees

Liquidated and consequential damages

Training of client's personnel

Interrelationship of parties

Since in the case under study the process licensor and the engineering firm are separate corporate bodies, their contracts with the client can be expected to be independent, internally consistent contracts without cross-reference to third-parties, i.e., the process licence agreement will not make any reference to the engineering contract and vice versa. A specific reason for following this procedure is that the contracting body can limit its liabilities to the specialized services it has agreed to render. However, this situation would not be in the best interest of the client. His objectives will be met only when the efforts of the two firms are well co-ordinated. Agreements must therefore anticipate that problems will arise that require consultation between the two firms directly, or, more usually, through the client. Thus, an engineering firm designing and supplying piping to a reactor vessel designed by the process

supplier must consider the compatibility of the materials of construction so as to avoid corrosion through the presence of dissimilar metals.

For this reason, it is good practice to refer to the third party in each of the engineering and process-licence agreements (usually in the recital clauses). That is, the engineering contract must acknowledge that the client has executed a process licensing agreement with Party X and that the client requires engineering work executed in the context of the process licence. Similarly, the know-how agreement must acknowledge the existence of an engineering contract Y.

Interrelationship is also necessary when the same firm renders both services but through separate contracts. Cross reference carries the implication that the client's overall purpose is not met if only one of the two agreements is ultimately fulfilled.

There may be more than one signatory to the contract on the contractor's side; for example, a know-how licensor and an engineering company (traditionally working as a team) sign a contract jointly. Although in this case the parties are automatically "interrelated", problems may arise from their respective liabilities. In developing countries the licensee will obtain higher assurance if each of the parties is made "jointly and severally" liable for all responsibilities assumed by either of them in the agreement. The same situation may be applied when a consortium of firms acts as the contractor.

Division of responsibilities

In its commonest form, know-how (particularly in process industries) is defined by the process licensor as "information and data adequate and sufficient for a competent firm to design and construct a plant" for stated objectives. It then becomes the function of the client, using the engineering company as the "competent firm", to transcribe know-how information, which can be termed software, into the physical plant, the hardware.

Since know-how is proprietary (secretly owned) technical information, with which the engineering company may be unfamiliar, the know-how licensor should provide all such information, as is required by the engineering firm. The wording "competent firm" is used to draw a line between material that is particularly necessary for establishing a plant (know-how) from material a professional engineering organization would generally have. Thus, for example, an engineering company may be able to completely design and construct an ammonia-based fertilizer plant based on published chemistry, engineering fundamentals and general construction experience. However, know-how in the ammonia-

synthesis reactor may substantially reduce investment costs. This, then, is the particular information that the process licensor supplies.

However, use of the term "competent" does not always or wholly make self-evident the division of responsibilities between the process licensor and the engineering firm. The usual practice, therefore, is to detail the scope of service of the process (know-how) licensor.

By accepted convention, the technical content of know-how services (in the process industry) is a statement of its "industrial chemistry". To take an example, the industrial chemistry of an ammonia reactor may merely be a statement of the catalyst used, its amount per unit volume of reactor, the temperatures, pressures, concentrations and flow rates at which incoming gases enter and leave the reactor and the material of construction of the reactor (process information). The responsibility of the "competent" engineering firm would then be to design the reactor (i.e., its dimensions, thickness of reactor walls, methods of placing catalyst, the valving of the reactor, supports etc.) and all the preceding, succeeding and auxiliary stages so as to convert raw materials to the product of the desired specification and at the required volumetric rate.

By restricting the scope of know-how services to industrial chemistry, the process licensor attempts to eschew responsibility in the engineering areas. He takes the position that he is merely offering the right-of-use to information that may be considered the development of a technical laboratory. The engineering that transcribes such information into the physical plant, the process licensor believes, is a professional skill over which the principle of right-of-use is inapplicable, and hence should be outside know-how.

Normally, it would be difficult for an engineering company, competent though it may be, to engineer all aspects of know-how without some assistance (services) from the process licensor. The know-how licensor, who has had operational experience, may have knowledge, for instance, that a particular engineering configuration of a piece of equipment works better—or would be more economical—than another.

For these reasons, the scope of service of a know-how licensor usually includes not only the supply of industrial chemistry but also some "functional engineering". In a more elaborate scope of work, it is sometimes called "basic engineering". Using this information, the engineering contractor can then carry out "detailed engineering" (besides providing other contracted project services—erection etc.).

Also, it would be a rare situation if the client's plant were identical to that used by the know-how supplier. There will be differences of size, raw materials specification, product mix etc. There are, at

most times, also some customized areas that take the licensee's particular environment into account. For these reasons, the process licensor may re-engineer part of his process. Such information forms a part of the services the process licensor will provide.

Annexes III and IV illustrate the scope of know-how-related and engineering services. (They are based on a commercial proposal in a developing country.) These schedules can be more (or less) detailed; and certain services, depending on the industry involved, can be performed by either of the firms.

Supervisory responsibilities

"Interface" problems must be anticipated wherever an integrated performance is desired but the responsibilities for achieving it are divided among two or more parties. For this reason reference has earlier been drawn to: (a) agreement clauses signifying interrelationship of the parties involved in the project and (b) the need for elaborating the scope of work of each party. In the engineering contracts interface problems are particularly important.

In this interface between know-how-related services and engineering, know-how comprises two parts: (a) information aiding the design and construction of plant and (b) information relating to plant operation. In the first area, the interface is mostly between the know-how supplier and the engineering firm, and in the second, mostly between the client and the know-how supplier. The term "mostly" is used to signify that there is, in both cases, a three-party involvement, with one of the parties playing a subordinate role.

During the design and construction of the plant, there may be specific areas in which the engineering firm may ask the process licensor (directly or through client) to review or approve certain aspects of design. For example, for reasons of cost, the engineering firm may have designed a system using a single heat-exchanger in place of two units recommended by the process licensor (as per functional design package). The licensor firm may view this design as potentially unsafe. Hence the licensor may be required to review the design proposed by the engineering firm. Similarly, in construction, the licensor's representatives may have to be present when a special catalyst has to be loaded into a reactor, since poor loading practices can affect the process. Thus, the licensor has a supervisory responsibility. In commissioning a plant, the licensor's area of responsibility, the engineering firm may have to express an opinion as to whether a particular vessel can stand an increase in temperature of, say, 5 per cent above design level.

While such review, supervisory and advisory services are normally provided by the contracting

parties, they may be cautious on the degree of liability they may be assuming in having their approvals and recommendations implemented.

It is to be noted that provisions in the agreement concerning supervision may involve the supervisor in liability. If some unexpected default or failure occurs, the party agreeing to supervise can be charged with negligence, a serious term with different legal connotations. A contracting firm accepting supervisory responsibilities can usually not limit, or assess, its liability in a charge of negligence, and therefore it takes out insurance to cover its risk. But even here it may not be able to obtain sufficient coverage unless the contract contains the necessary safeguards (protecting the supervisor).

Consequently, while supervisory services are required, the client should appreciate the legal implications for the contractor. This is not, however, a complex area of negotiation. Usually, the agreement contains clauses that provide that approvals are tendered in "good faith" but will not be "binding" on the client.

In the developing country, where there is insufficient industrial knowledge, certain problems arise from the need to harmonize the scope of work assumed by the client with the responsibilities and duties delegated to the contractor. The client may ask a contractor to approve the client's scope of work. However, if the duties are incorrectly appraised, the contractor may be involved in liability. To remove this risk, the client can give the contractor the right to accept or reject the client's supplies or services. For example, the client may have agreed to provide the foundations for machinery. To test their acceptability, the client can submit foundation drawings to the contractor for review. If these are rejected, but the client lays the foundations anyway, the contractor should have the right to register his disapproval, holding the client responsible for any performance shortfalls that may arise as a consequence. In a developing country, the client will rarely go ahead with what is rejected. In many of the decisions that such a client makes, he places emphasis on technical workability rather than on cost (i.e., a rejected service or supply will be reworked at the client's cost).

Division of responsibility almost always means some sacrifice of certainty in project performance, whether in terms of funds expended, time involved or operational reliability of plant. The divided-responsibility agreement is, in effect, a compromise requiring substantial give and take. In the engineering services area, it is particularly so.

Design conference

"Good faith" and "common objectives" are basic tenets of an engineering services agreement, for otherwise it would be an unwieldy document. It

would not be feasible to anticipate all the obligations of a contractor in an agreement, or to provide for all contingencies at least, when the primary agreement is executed. Each party should view the provisions of an agreement as the ultimate means of resolving a dispute in court or through arbitration when all other efforts to readjust or compromise have failed.

As said earlier, the engineering agreement is a listing of all the services to be performed by the two parties; usually the engineering contractor specifies which services he will perform and which he will not. However, details of the work to be performed cannot be furnished unless the parties, particularly specialists on both sides (electrical, mechanical, civil, instrumentation, control and other engineers) meet. Further, during project execution, compromises will always have to be reached on questions of time, cost and reliability, which cannot be anticipated when the contract is signed. Also, unless the contractor is certain to get the contract, he may not want to spend the effort to go into specifics.

For these reasons, it is useful to define in the agreement a design conference (see also "Performance of know-how" in chapter III), which is to take place after the agreement comes into force and at which project specifics are worked out. It is particularly important when know-how is complex and whose full disclosure will not take place until the know-how and engineering agreements have been executed.

The design conference, however, does not deal with substantive matters such as per-diem rates for engineering and supervisory personnel, performance warranties and large payments, all of which are within the scope of the primary engineering contract. Design conference meetings, of which there may be several, may, however, result in the drafting of minutes signed by the specialists of the two parties, which are binding on the parties, subject to the provisions made in the primary agreement.

The design conference is also useful for computing payments due the contractor for services he has completed, and more particularly, for permitting payment adjustments that often must be made relative to payments indexing (see next section) and for expanded or contracted scope of work.

Without conflicting with the warranties furnished by the contractor, the design conference also permits the client to accept tentatively the work stages completed by the contractor. This procedure (tentative acceptance) enables the contractor to obtain part payments while remaining responsible for the guarantees he has furnished on his scope of work. In short, the design conference, when included in the primary agreement, confers legal validity on the arrangements that the specialists make during the progress of work.

Payments, payments indexing and payments protection

Payments

In the uncertainties of the developing country, the problem of shared responsibility makes it difficult for an engineering contractor to provide the client, with any degree of commitment, a firm price for his services. None the less, for purposes of negotiation and division of work, it is necessary to have a working estimate. To provide the basis, the engineering firm may furnish the client with an estimate that there will be, for example, about 15,000 man-hours of engineering design work (desk work) and 1,800 man-days of field supervision in a construction job of 30,000 man-days. These numbers will form benchmarks for contract negotiation but may not be mentioned in the contract. Further, on the basis of pricing norms, such as \$12 per man-hour for draughting, \$20 per man-hour for engineering design and overhead charges of \$18 per hour for drafting and engineering design, and \$150 per man-day for construction supervision (travel and living costs borne by the client), the engineering firm may indicate its total design and engineering fee at \$X million.¹⁵ Once these figures are accepted by the client, the contract may only specify the money rates for various types of effort—the man-hour rates illustrated above—while giving the client the right to verify the actual expenditure of effort.

Similarly, if the engineering firm has construction responsibilities, there can be estimates such as erection cost per ton of equipment put into position, excavation and site-levelling charges per 1,000 cubic metres of earth moved.

The engineering firm's fees may be actual costs plus a fixed percentage, a flat sum plus a fixed percentage on time-related services or a wide variety of other combinations.

Thus, unlike the establishment of know-how fees, which involves judgement (see chapter VII) engineering fees can be determined and monitored more rationally. More important, not only is competitive bidding possible in the area of engineering services but the client can, on make-or-buy type of decisions, reserve to himself (or contract to others) project functions he feels are too costly when supplied by the main engineering contractor.

Payments indexing

For purposes of establishing the client's "good faith", to obtain working capital or to secure payments for completed work, the engineering firm may contract with the client for payment of certain

¹⁵ By independently estimating project cost, and using norms such as engineering services typically constituting 8-12 per cent of project cost, the client or a governmental body may be able to cross-check this estimate.

fixed sums at fixed times: say, 30 per cent of the total fee (or estimated fee) when the contract is signed, 20 per cent after 90 days, 40 per cent after 180 days etc. These payments may be either advances on contracted work, subject to reconciliation at a later stage (i.e., evaluation on the basis of design hours actually put in), or they may be straightforward payments with only terminal adjustments on the basis of agreed cost norms.

For developing countries, time-related (time-indexed) payments provide poor control. Except for the good faith payment made on the signing of the contract, the wiser course is to use event-indexed payments, i.e., payments due on completion of segments of work that are fully enumerated in the agreement.

Event-indexed payments, together with the design conference discussed earlier, permit the client to monitor progress of work closely. Event-indexed payments also permit reconciliation of payments when the contractor has, for example, completed only 30 per cent of work segment A but meanwhile has gone ahead and completed 30 per cent of work segment B (which was otherwise scheduled to follow A). This situation frequently occurs in practice.

Payments protection

Situations can arise when the contractor cannot proceed with work segment B because the client has delayed in completing his agreed scope of work. To cover this possibility, the contractor usually provides time-and-event indexes, e.g., payment to the contractor "on completion of work segment B, or within 38 weeks of signing contract, a sum of \$80,000".

To protect the client, such payments, including down payments when the contract is signed, should be regarded as advances made to the contractor. Further, where such sums are large, it would be within the client's right to secure from the contractor bank guarantees against advances made to him, i.e., the contractor would ask his bank to repay the client, on demand, any sums due him for accepted work left uncompleted.

The bank guarantee is an agreement by letter between the contractor's bank and the client in which the bank agrees to pay the client, on demand, stipulated sums that would be due him in the event the contractor fails to complete an agreed piece of work or complete it within a stipulated period. To be legally valid, the client would have to address a letter to the contractor on non-fulfilment of contracted work at the time he invokes the bank guarantee.

Bank guarantees are particularly important in terms of process performance guarantees when these are associated with financial liabilities. Before the commissioning of the plant, the licensor may be contractually asked by the client to furnish bank guarantees for agreed amounts.

The problem of certifying performance in relation to partial completion of engineering services may arise. For event-indexed payments, it is the usual practice for the client to certify that a particular area of work has been completed. The problem arises when a client so certifies, but in relation to a partial scheme of work, e.g., work segment A when work segments B and C have not been completed. While acceptable for purposes of making partial payments, the certification should be viewed as a tentative acceptance in terms of overall project responsibility. That is, certification of partial performance cannot relieve the contractor of the total responsibility he has accepted. Thus, if a plant fails to perform because of a defect (later discovered) in work segment A, the contractor cannot be absolved of his responsibility by virtue of the client's having previously certified that work segment A had been completed. Completion does not always mean acceptance.

Warranties and guarantees

Except for engineering innovations that constitute the know-how of the engineering firm, no process performance guarantees are expressed in the engineering contract. Hence, financial liability is not quantified. However, as a professional organization, the engineering company will have to warrant or guarantee (see also chapter III) that it will use "best practices" (engineering and construction codes) and that it will execute work consistent with the express conditions laid down by the know-how supplier but that such execution will not be automatically complied with in disregard of standard engineering practices involved in accepting and using unfamiliar information.

Aside from a performance-oriented guarantee, the engineering firm may also be asked to furnish an execution-oriented guarantee, i.e., the firm will complete a certain scope of work within a stipulated period. This is particularly important if large advance or front-end payments have been made that are left unsecured (without a corresponding bank guarantee). In such cases failure to perform can attract penalties as liquidated damages.

Where the engineering firm is also the process licensor, its warranty or guarantee posture would be almost identical to the one it assumes in the straightforward know-how agreement (p. 23). Because there is no subdivision of responsibility, such an arrangement is, in fact, to be favoured.

Liquidated damages

This is a complicated subject, significantly dependent on case-law, and thus, variable from country to country. However, since a licensee (recipient) should be aware of some of the rights

available to licensees in developed countries, a brief introduction is provided to this subject.

An agreement provides for liquidated damages when a licensor, or supplier, specifically warrants the performance of some factor as, for example, time in the context of delivery of technical documents, equipment, construction of buildings, installation of machinery. Liquidated damages are specified in financial (compensation) terms and are always defined in relation to physical units as time, capacity or yield. Thus, an engineering firm undertaking to supply engineering drawings by a certain date would warrant that should it not meet the schedule, due to fault of the firm, it would pay the purchaser liquidated damages of \$X per day for the period exceeding the guaranteed date of performance. Usually, there is a negotiated upper limit to such damages. Penalties on the licensor for process performance factors, as yield or capacity, have already been discussed for an illustrative case (p. 24). Where in that case, there is a financial liability on the licensor, to be discharged by the licensor, it is indeed a provision for liquidated damages. In the specific case of process performance, the purchaser should have the right to recover the costs necessary to correct the plant if the licensor is unable to meet a lower but acceptable level (so long as the recovery amount is equal to or below the specified liquidated damages provision). Provisions for liquidated damages, particularly for time-related services, are usually made under a liquidated damages clause.

The right to damages for negligence is a right of the purchaser independent of whether a damages provision is present in the agreement. Where a licensee believes there has been negligence on the part of the licensor/supplier, as a result of which he has suffered a loss, he would have the right to approach the courts (or go to arbitration) for remedy. The question of damages would be decided by the court after it assesses the validity of licensee's claims. However, proving that a supplier (or licensor) has been negligent is an extremely difficult task. Careful drafting of the recital clauses (p. 51) of the agreement can often bring added protection to the licensee.

Whereas provisions for liquidated damages are related to the value of the contract (supplier's fee)—say, 0.5 per cent of total contract fee per day of delayed delivery—the criterion for liability for negligence depends on the actual and consequential damages incurred. It is not related to the fees received by the supplier.

In some contracts in developing countries, licensors or suppliers set an upper limit to their overall liability under the contract(s). In view of the above discussion, such provisions should be resisted. The liquidated damages provision, however, should be present.

Training of client's personnel

The developing country sees in technology transfer not only the immediate access to advanced techniques of production but also a means of educating and training its citizens in the use of technological information and working techniques. Governments, such as that of India, often require a division of responsibilities between supplier (of know-how or of engineering services or both) and the client so that only highly specialized work is performed by foreign firms. In such a division it is implicitly recognized that project costs may go up (and project time be lengthened) because of the higher possibility of error by nationals in the process of learning.

To improve the capability of nationals, foreign

service suppliers may be induced to involve nationals in their area of work. Very often such a policy is of advantage to the service supplier himself, since he can quickly obtain information on local and site conditions, availabilities and costs of skills etc. However, the service supplier will want to limit the number of persons he will train, his responsibility for their costs of living and welfare, and the degree of access to information.

It is difficult to incorporate the client's right to training in engineering service contracts. To do so, the client may have to pay higher fees, or accept a lower liability of the supplier or some other trade-off. However, in the know-how area, training at the licensor's site is considered part of the process of know-how transfer. It is, therefore, a normal provision.

V. The trade mark agreement

Trade marks are distinctive visual and sometimes aural devices, words or emblems (symbols), or a combination of them, that a firm applies to the goods it trades in, or to the services it performs, to indicate to the public that they are the firm's goods or services. Trade marks play an important role in the market-place, since with their aid the consumer learns to distinguish between products of different manufacturers. Trade marks also serve to assure the public that the goods are consistently of a certain quality.

Unlike know-how, but like patents, there are distinct statutes in nearly every country that govern the ownership, registration and use of trade marks. Like patents, the trade mark constitutes a property right. In some countries, its ownership is established or confirmed only when the trade mark registering authority, established by the government, accepts the registration of a trade mark (after an examination procedure prescribed by law) in the name of a person or firm. In other countries, ownership is established merely by first use. Like other property, trade mark ownership usually can be transferred, but generally (since statutes of countries differ) the transfer must be recorded in the trade mark registry.

Statutes define the criteria of acceptance for registering trade marks, the "exclusionary rights" of the trade mark proprietor (the important right to sue for infringement), the territory in which the right of exclusivity of use of trade marks applies, and the obligations of the trade mark proprietor to keep his registration in force. One important distinction between trade mark rights and patent rights is that there is generally no statutory limitation to the life of a trade mark so long as its proprietor discharges his obligation to keep it in force.

Whereas patent statutes are designed primarily to protect the private interests of the patent owner (patentee) and his licensees in exchange for a public disclosure of the invention, the principal objective of trade mark legislation is to prevent confusion in the public mind in selecting branded or labelled products or services. Thus, the application and use of trade marks are closely governed by law. Consequently, with trade marks, in contrast to patents, the "permitted user" must be registered in many countries. In such countries, the user of a trade mark obtains full protection (ability to sue independently for infringement) only when (a) the trade mark proprietor has a registered trade mark in force in the user's territory for the specific class of goods concerned; and (b) the user is registered in that

territory through a conscious act of the proprietor. User registration, however, is not mandatory in all trade mark statutes. In those countries where registration is not mandatory, the right-of-use of a trade mark can be negotiated, and its user can have legal protection without being registered as a "permitted user".

The concept of licensing trade marks is relatively new in the world scene, and unlike patents, trade marks may not be licensable property in all countries. Since a trade mark is a mark used by a firm to indicate to the public that goods bearing that mark are manufactured by it, some countries take the view that transfer of the right-of-use of the trade mark to another party is not possible without the concurrent transfer of the goodwill of the firm.

In a trade mark licence, the proprietor of the trade mark (a) represents and demonstrates that he is the owner of a trade mark in a certain territory for a particular class of goods; (b) grants permission to the licensee to use the trade mark for that class of goods (or part of the class) and, where applicable, (c) undertakes to have the licensee registered (in the licensee's territory) as a "permitted (registered) user" of the trade mark for those goods.

In the agreement the licensor may stipulate that the licensee's use of the trade mark is subject to the licensor's approval or supervision of product quality. Such supervision is, in fact, mandatory in the trade mark law of many countries. The objective of the law in requiring supervision is that, in the public's mind, the licensee's goods should be of the same nature and quality as the goods traditionally identified by the licensor's trade mark.

By and large, a trade mark licence is a registered user agreement. While trade mark licensing is permitted in the United States, it should be noted that the United States does not follow the concept of "permitted (registered) user".

Another contrast between patents and trade marks is instructive. Whereas a patent in country A will not be granted if its knowledge has been previously disclosed, say, in country B, anyone, at any time, can obtain registration of a trade mark in country A if the mark's first user (or owner in country B) has not obtained registration in country A. In other words, the registering authority in a country will register a trade mark—and confer title to its claimant—solely on the ground that the trade mark

(otherwise acceptable) has not been registered by someone else. Once so registered, the original owner (in country B) can lay no claim to the trade mark.¹⁶

Again, although a patent owner can have one or more licensees in a territory, each independently deriving benefit from use of the patent, trade mark statutes of many countries will act to ensure that there will be no more than one "registered user" of a trade mark. This is particularly so for manufactured goods, where substantial contributions come from licensed technology. The objective here, again, is to prevent confusion in the public mind as to the source of the goods. Thus, while there may be several independent firms preparing and bottling a trade-marked soft drink, the sole sales rights to the beverage may rest with a single marketing company, which alone is the registered user of the trade mark.

Since in trade mark licensing the licensee derives commercial benefit from the association between the trade mark and the product, it is important for the licensee to obtain assurances from the licensor that he will keep the trade mark in force, and, more important, undertake to sue promptly for infringement in the event of unauthorized use by third parties. (The detecting of infringement and instituting of legal proceedings against the infringer (and bearing the costs thereof) are important contract matters.)

Correspondingly, for the trade mark licensor, it is essential that the "image" of his trade mark be upheld and left untarnished. Consequently, the licensor can place restraints or conditions on the licensee on the application and use of his trade marks. Usually the licensor contracts for the right to approve the quality of a product before the licensee applies the licensed trade mark to it. Furthermore, the licensor seeks to obtain the licensee's agreement that placing the trade mark on the product or using it in advertising will be such as to perpetuate, in the public's mind, the association of product quality with the trade mark.

A trade mark licence may be sought (a) because of its dominant aspect (e.g., sale of soft drinks); (b) as a useful but secondary part of a technical assistance (manufacturing) licence (e.g., commodity chemicals) or (c) as an important feature of a licensing programme—i.e., where the value of the trade mark and the know-how is approximately equal (e.g., household appliances). Except for (a), the life of the manufacturing agreement will be generally less than the period for which a licensee wishes to use the trade mark. For this reason, as well as to keep the legal aspects of trade marks separate from those of know-how or patents, most trade mark agreements in developed countries are executed separately.

¹⁶ Where the owner in country A intentionally pirated the mark, as is frequently done, the original owner's recourse may then be to have the pirate owner, for some consideration, cancel his registration or transfer title to the original owner. In some countries, if such pirating takes place, registration can be cancelled by litigation.

Composite agreements

In developing countries, however, two situations may lead to composite agreements. The first occurs when the licensee in a developing country, while ostensibly transacting a know-how or technical assistance agreement, is in reality negotiating a trade mark licence for the important marketing advantage it provides. This situation sometimes occurs because regulatory agencies do not normally approve a royalty-bearing trade mark licence. The agreement, in such cases, appears to involve a consolidated payment for technological assistance and trade mark rights when in fact the licensor is accepting only the obligation to transfer trade mark rights.

The second situation arises when a licensor tends to prolong the life of an agreement (and thus the period in which he receives income) by licensing a trade mark that otherwise is of secondary value to the licensee or to the sale of the product. Thus, when a patent has a short unexpired life of three years, its licensor may be able to extend its life artificially by tying in the patent licence with trade mark rights in a consolidated 10-year agreement. Similarly, in an agreement providing for technical assistance and the right to use trade marks, a licensor may transact a 10-year licence when in fact the "technical assistance" may be a nominal service of short duration.

However, a far greater danger is introduced when, in a composite agreement comprising, for example, trade mark and know-how rights (both equally valuable to the licensee), the applicable fee is wholly for the use of trade marks, while know-how is offered free. The danger here is that if know-how fails to perform as warranted (e.g., falls short of, say, design capacity) the licensor can be absolved of any financial liability because he ostensibly derives no income from the know-how. A solution to such a problem is, therefore, to draft a separate trade mark agreement, even if no fees are levied on the use of the licensed trade marks.

However, when a regulatory body reviews a contract, it should examine such combination of rights clauses in the context of the technology package. Here, the combination of know-how, patents and trade marks could confer an enormous advantage on the licensee. Attempts to break up such a portfolio, otherwise not in conflict with national legislation, could seriously endanger the licensee's economic advantages.

Approval of product quality by licensor

Since trade marks are valuable because of their reputation, trade mark statutes recognize the right of a trade mark proprietor to restrain the licensee from selling products bearing the proprietor's trade mark that fall short of the quality commonly associated

with the trade mark. The licensor exercises this right, as said earlier, by having the licensee agree to permit the licensor to supervise product quality.

However, the licensor may abuse this right of quality control. Important restraints from the viewpoint of developing countries are those leading to (a) compulsory (or implied) purchase of raw materials, intermediates and components from the licensor without which the licensor will not "approve" a product for trade mark application; (b) restraint on the volume of sale of a product (or part of product mix) which, by the licensee's choice, will not carry the licensor's trade mark; (c) restraint on the sale of products outside the purview of trade mark use; and (d) restraint on the licensee as to the use of his own trade marks on products bearing the licensor's trade marks.

In developing countries there would be no purpose in encouraging technology absorption if such absorption did not stimulate technical change or lead to the enlargement and diversification of enterprises. This purpose, indeed, is embedded in the concept of the term "control of technology" (see p. 1), that is, the licensee's right to use information, secured through a licence agreement, for the larger benefit of the enterprise, including the right to diversify into product lines not contemplated in the prime agreement. It is conceivable that, using acquired technology, the licensee may introduce products of local relevance that lie outside the licensor's range. To brand them with the licensor's trade marks (assuming he would permit it) is certainly incongruous, yet without such support commercial success might be jeopardized, that is, the absorbed technology could remain underemployed.

The problem then is one of evolving a new trade mark replete with goodwill. To do so, a trade mark owned and registered by the licensee may be affixed to goods branded with the licensor's trade marks until the new trade marks achieve an independent reputation. It may thus be good policy for a government to recommend that all products bearing a foreign trade mark (the licensor's mark) also bear (or have the right to bear) a nationally owned and registered trade mark, of which the right-of-use is not subject to any restraint placed by the licensor. (In practice, it would generally be necessary for the licensee to contract for the right to use trade marks of wholly domestic registration on products approved for bearing the licensor's trade mark).

The licensor may resist this dual trade mark policy. However, the situation can often be eased by (a) devising trade marks displaying local language or symbols equivalent to or explaining the licensor's trade mark; and/or (b) making certain contract compromises in terms of royalties, period of trade mark use etc.

Cancellation provisions

An important right of the licensor is to be able to cancel the licensee's right to use the trade mark if he violates the contract. The primary interests of the licensor are in the quality of goods and the proper use of the trade mark. However, the licensee should be protected against provisions for arbitrary cancellation.

VI. The franchise agreement

Franchising is a system of distributing goods or services that is often associated with high-reputation trade and service marks in which the franchisor supports, trains and to some extent controls the franchisee in selling the goods or in rendering the services. One of the oldest approximations to franchising is gasoline merchandising (the retail gasoline service station); but the more modern variant, with which developing countries are fast becoming familiar, is the hotel chain franchise. In developed countries, franchising is today one of the most rapidly growing forms of licensing. In modified form it may also become a prominent mode of business in developing countries, since it combines the best features of a large chain operation (owned and operated by a single large enterprise) and of an independent small enterprise.

The simplest system of franchising is the product distribution franchise, where a dealer (franchisee) works only with one company's product. The franchisor, for example, may have developed a range of cosmetics with a label that enjoys a good reputation. The franchisee is permitted to market this cosmetic in a system devised and supervised by the franchisor. Thus, the cosmetics shop will be of a style and construction that the franchisor's broad experience has shown to be most attractive to customers and is indeed identified with the product. The franchisor may also assist in locating a favourable site for the cosmetic shop. Typically, the shop is wholly financed by the franchisee.

A dominant service that the franchisor performs is to advertise the cosmetic and bear some or all of the cost of advertising. The franchisor also trains the franchisee in management practices, such as inventory control, pricing, and account keeping. However, the franchisor imposes duties and controls on the franchisee so as to protect the franchisor's trade or service marks and goodwill, i.e., quality of service rendered to customers, shop layout, the uniform of sales personnel and advertising signs. Of course, there will generally be the additional control that the franchisee, in the location approved by the franchisor, will distribute only the franchisor's trade-marked goods. Thus, even in a department store handling a variety of franchised cosmetics (numerous independent franchisors), the franchisor can require the department store to set aside an acceptable area as the sole site for the sale of the particular franchised cosmetic.

Another franchising system is the service distribution franchise. It takes a more complicated form than the product distribution franchise, since the franchisee may be marketing a product that has to be prepared, treated, assembled, processed or served in a way that is identified, or associated with, the service mark. Thus, in a franchised dry-cleaning service, the franchisee would have to dry-clean clothes in a form prescribed in detail by the franchisor; or in a franchised, fast-food restaurant, he would have to prepare food having the taste and appeal of the food associated with the service mark and serve it in a particular manner, e.g., quickly.

This more complex franchising system is known as the business format franchise. Here the franchisor transmits to the licensee the combination of right-of-use of the service mark; the know-how of cooking, preparing and treating; and the entire business format for sale of products and services, all integrated, closely supervised and controlled by the franchisor. In the hotel-chain franchise, for example, integration may involve the use of an international reservations system, a valuable asset to the franchisee.

In summary a franchise agreement exists when:

- (a) The use of a trade or service mark in conjunction with a service system is authorized;
- (b) A long-term on-going relationship exists between the licensor and licensee in which the selling firm:
 - (i) Assists the licensee in marketing a product or rendering a service (through national or international advertising and training the licensee's employees);
 - (ii) Closely controls the quality of the product distributed or the character of the service performed.

Franchising is a distribution system rather than a production system. It permits an agreed-upon uniform method of marketing a product or performing a service.

The franchise agreement is similar to the traditional trade-mark-user agreement and places highest emphasis on the controlled use of the trade mark and on statutory means of protecting its ownership. However, the franchisor, as in the case of the trade mark proprietor, can misuse his right of control, otherwise permitted by law, by incorporating tie-in clauses. Examples of such tie-ins are the

compulsory use of franchisor-supplied dry-cleaning solvents in a dry-cleaning franchise or the franchisor's flavouring in an ice-cream franchise, the compulsory location of selling or service units at sites owned by the franchisor, or by placing restraints on the franchisee that prevent him from entering into agreements with other franchisors.

The franchisor's fee is usually a front-end lump-sum payment plus a percentage of the franchisee's sales value. However, a no-fee franchise is possible if the franchisor, under an agreement, has the right to supply materials to the franchisee, although in many countries this may be dangerous because of possible antitrust violations. The franchisee may pay an additional fixed or variable fee for the franchisor's advertising costs. (In developing countries it may be feasible for the hotel franchisee to insist that he will pay only for those advertisements directed to his particular clientele).

One point that may raise problems in franchise agreements is the franchisee's "territory". In conventional trade mark licensing, associated, say, with the know-how to manufacture a product, the licensor, by virtue of domestic trade mark statutes, may not be able to restrict the licensee's area for the trade-marked goods to a territory that is a segment of a national geographic area; that is, different users cannot use the same trade mark (for the same class of goods) in the national territory. Furthermore, while the licensor may be able to (has the right to) constrain the licensee to use the know-how (say, make a product) only at a particular place (chosen by the licensee), he (licensor) may not be able to regulate the area in which the product can be sold. Thus, in this case, the territory of the trade-marked product is the whole of the national territory.

Franchising, however, is a dealer-distribution system giving the franchisor the right or option to

appoint dealers of his choice, i.e., select places in which trade-marked goods will be sold, such as retail petrol stations. Furthermore, since the dealer obtains "permitted user" rights only at sites acceptable to the franchisor, the franchisee's merchandising point becomes an approved site. The franchisee's territory is then dictated by the sheer logistics of the marketable area and is, therefore, not a licensed geographical area. It is this situation that permits the franchisor to allocate territory. However, a firm may be a national franchisee (with the right to sublicense in the national territory), in which case the problem of subdivision of the territory does not arise.

The objectives and advantages of the franchising system can also be obtained through the management contract. Typically, the franchise agreement is a standard printed agreement, common to all franchisees. The rights and obligations of all licensees are equal. This is a strength of the system. In the management contract, however, the rights of clients differ with their bargaining strength. The franchisor may also accept some obligations which are specific to a client. Even so, the franchisor's primary rights in the use of his marks will be expressed as comprehensively as in the straightforward franchise agreement. Governments of developing countries prefer the format of the management contract when the franchisor is a foreign firm because the requirements of a firm (licensee) in the developing country are strongly influenced by national economic policies, considerations of which cannot be expressed in a preprinted document that cuts across national boundaries.

Further treatment of this subject is not pursued since, at present, only a few developing countries have the institutional structures necessary to protect franchising.

VII. Remuneration

The cost of technology, or the cost of a licence, is a primary consideration of both entrepreneur and regulatory agency. However, their viewpoints and acceptance criteria can differ widely. To the entrepreneur, the cost of a licence is like any other cost, for example, interest on loans. He is satisfied so long as the potential cost-benefit relationship is in his favour and brings him greater advantages than alternative investments.

To the regulatory body, however, the use of overseas technology and proprietary rights has direct and indirect implications. Direct implications concern the size of the foreign-exchange outflow and the sharing of business gain between the licensor and licensee. Indirect implications concern value added, its influence on royalty remittances and the social cost of technology inflow and use.

Methods of evaluating social costs and benefits, a complex subject, vary from country to country. Such evaluation, indeed, establishes priorities in industrial development programmes and defines what types of technology inflow are to be promoted. This subject, however, is beyond the scope of this study.

In almost all of the discussion that follows, remuneration to the licensor is approached from the view that it must have a direct relationship to the specific economic purposes of a particular licensing arrangement. This pragmatic approach is applicable to all forms of licensing—patent licensing, technical service, know-how, trade mark and franchise, and to all types of fees—lump-sum, running royalties, down payments and their combined forms. The method recommended here involves the determination of the licensor's share in the income of an enterprise.

While judgement is certainly involved in the acceptance of fees for non-technology factors, such as trade and service marks, or export rights in patent licensing, the concept of income sharing provides a supplementing quantitative basis for the exercise of this judgement. The analysis presented here will, it is hoped, minimize *ad hoc* approaches to remuneration approvals—such as establishing fixed royalty levels, a practice that seems to be widespread in developing countries and one that often works to the disadvantage of both the licensee and the country.

It is recommended here that the developing country view remuneration for technology transfer (the transfer of technical excellence, skills and information) as it views tax incentives in relation to the enlargement of foreign capital investment. That is, remuneration (particularly, the royalty rate)

should be designed so as to lead to increased value addition at the manufacturing site by having the licensor's benefits tied to the licensee's increases in profitability and technological capability.

Because it is a term that occurs often in licensing agreements, "royalty" is used in the following material as a concept in its own right and as a substitute for any repeated payment that is defined on (or is related to) a performance parameter of the licensing arrangement—sales, production, cost savings etc.

The concept of royalty

"Royalty" probably has its origin in the royal franchise the crown gave to individuals or corporations for the exploitation of foreign territories or of a national resource such as minerals. The franchisee paid a royalty (or share of the proceeds) to the crown for the advantage he derived from the royal concession; at the same time the royalty was a token of his express acceptance of the crown's continued sovereignty over the territory or resource.

This view, it is postulated in the forthcoming analysis, has been preserved in the evolution of both domestic and international industrial transactions, with the concept of royalty extending to all forms of industrial property; payments are made for the use of such property, the ownership rights of which are established by national statutory law (patents, trade marks, copyright), civil law (trade secrets) or international consensus (know-how).

As a consequence, it can be held that payments arise in the licensing of industrial property because the licensee derives protected benefit from its use. Royalty can be considered a lease payment, not an outright payment. The lease arises from the fact that the right to use technology is more valuable than any specific services the licensor provides or the technical matter the licensor discloses to the licensee.

The benefits a licensee derives from the licensing agreement do not merely result from the permitted extent of use (territories, product mix), exclusivity of use and length of use. The access of the licensee, further, may not be limited to only one set of the licensor's industrial property rights, but may extend to others, or to the technology system itself (the interrelated combination of patents, know-how, markets and trade marks). However, the licensee will generally have a hierarchical order of needs—know-

how taking precedence over patents, trade mark rights over know-how etc. It is usually for such order of precedence alone that he is prepared to make a significant payment.

For legal exactness and enforceability, any payment made must be for consideration received (whether for know-how or patents or combination) and logically that consideration must be of the licensee's choosing. That is, a royalty payment should not apply to unwanted grants or to the general content of an agreement; it is not a payment for an agreement.

With this preamble, the focus of the following discussion is on assessing royalty or other repetitive fees for use of industrial property. Still, such assessment may be loosely extended to repetitive payments for services (as technical service/assistance) when other measurement tools or norms are not employed.

Assessment of royalty fees

From the point of view of assessing royalty fees the question to ask is: "What will the licensor, in effect, receive for the licensee's use of know-how?" rather than: "What will the licensee receive for his payment?" The second question focuses on content of technology, which is extremely difficult to evaluate, will the first focuses on the licensor's measurable benefit. Even for a licensor the question he would have to answer for himself would be: "What is the licensee prepared to pay?" rather than "What is my technology worth?" For, if there were indeed a "worth" to technology, its pricing would tend to be the same for all licensees irrespective of the volume of production or markets catered to—which it is not.¹⁷

One can best answer the question of what the licensor receives for the licensee's use of know-how by saying it is "a share of the licensee's income or profit"; for in a stable continuing operation royalties should be payable from the licensee's gross profit. Such a concept also gives the licensor freedom to vary the fee from licensee to licensee. Thus, royalty can be treated as an income-sharing device between licensor and licensee.

A common application of this principle is in the cinema business. A film distributor recognizes that a flat fee on film showings is not to his or to the client's advantage because (a) sizes of cinema houses differ (seating capacity) along with the number of shows per day; (b) the clientele varies with territory (urban, rural), which affects the prices viewers will pay for seats; and (c) the length of runs differs from place to place. For these reasons, the

¹⁷ The cost of developing technology is often associated with the "worth" of technology. This may be the licensor's research and development cost or the alternative cost to the licensee for developing technology independently.

film distributor defines his fee as a percentage of box-office receipts over the period his film runs.

Technical and economic matters such as cost of, or time for, production of a film, its length and quality are not, however, of direct interest to the proprietor of the cinema house. His interest is in the sales he will derive from "use" of the film and the share of sales income he must pay to the film distributor.

Royalties are usually formulated against the sales price or sales value. This construction is actually a representation of profit sharing as shown below:

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

which can be construed as:

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

or again as:

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

("Licensee's profit" cancels out in the above multiplication)

The above equality can be rearranged as

$$\text{Royalty rate on sales} = \frac{\text{Licensor's share of licensee's profit}}{\text{licensee's profit}} \times \frac{\text{Licensee's profit on sales}}{\text{on sales}}$$

$$\text{ROS} = \text{LSLP} \times \text{POS}$$

Thus, a licensee who can estimate his profit as a ratio of the product's sales value (POS) can also estimate LSLP for any chosen ROS.

The examples given below will make this clear.

If a licensor wants a 20 per cent share of the licensee's profit on a product whose sales price is \$5.00/kg and on which the licensor estimates¹⁸ the licensee's profit¹⁹ at \$1.50, the licensor would apply a 6 per cent royalty rate on sales price as follows:

Case A

$$\begin{aligned} \text{ROS} &= \text{LSLP} \times \text{POS} \\ &= \frac{20}{100} \times \frac{\$1.50}{\$5.00} = 6\% \end{aligned}$$

Equally, of course, a regulatory body can reverse the above calculation to define an acceptable royalty rate. Thus, if a regulatory body is willing to permit the licensor only a 10 per cent share of the licensee's profit, the acceptable royalty rate would be

Case B

$$\frac{10}{100} = (\text{LSLP}) \times \frac{\$1.50}{\$5.00} (\text{POS}) = 3\% (\text{ROS})$$

¹⁸ The licensor's risk lies in this estimate.

¹⁹ Profit is defined later (see table 3).

These two calculations²⁰ illustrate that for any stated royalty rate LSLP depends on the profitability of the licensee's enterprise, a matter of utmost importance to regulatory agencies responsible for approving royalty rates.²¹

The royalty rate, as an income-sharing device, is similar to the division of profits (dividends) that takes place between the licensor and licensee in a joint venture based on shared investment (equity). In the equity concept, the share of the licensor's profit is always a fixed percentage of the licensee's profit, while absolute receipts may vary from year to year. In the concept of royalty as an income-sharing device, the division of income will fluctuate with venture profitability, while absolute amounts may stay stable (same sales value from year to year).

There is another important consideration. If in case A (above), for example, ROS remains at 6 per cent and the product selling price at \$5.00/kg, but the licensee's profit decreases to \$0.50/kg,

LSLP would be:

$$\frac{\text{ROS}}{\text{POS}} = \frac{6\%}{0.50/5.00} = 60\% \text{ (versus 20\% in case A).}$$

That is, for any given royalty rate, LSLP increases as the licensee's profit declines. In other words, for any contracted royalty rate, LSLP is highest when the licensee makes the least profit (profit on sales).

Using the relationship:

$$\text{ROS} = \text{LSLP} \times \text{POS}$$

table 1 has been constructed. Two implications of this analysis are:

(a) The licensee or regulatory body should pay close attention to royalty rates when enterprise profitability is likely to be low. Low profitability may occur:

- (i) In the early phases of a project
- (ii) In export sales
- (iii) In low-technology industries
- (iv) In intense competition

(b) High royalty rates should be acceptable for potentially highly profitable operations (like electronic products, instrumentation), for the income-sharing result here could be no worse than the sharing that occurs where profitability and the royalty rate are both low (cases A and B of table 1.).

²⁰ For the use of the relationship, only absolute profits or POS should be applied. Profit as a percentage of investment would lead to erroneous conclusions. Profit on other parameters can usually be converted to POS.

²¹ The analysis presented in this section, in effect, points to the danger of arbitrarily fixing royalty rates for industry groups, disregarding venture (or industry) profitability.

TABLE 1. EFFECT OF LICENSEE'S PROFITABILITY ON INCOME SHARING
(Percentage)

Contracted ROS	Licensee's POS	Derived information on LSLP
2	10 (case A)	20
	20	10
	30	6.6
3	10	30
	20	15
	30	9.9
5	10	50
	20	25
	30 (case B)	16.5

(Where, besides a licensing arrangement, licensee and licensor make investments, the licensor's share of the licensee's income is enhanced, since profit, after adjustment for royalties, is also shared. The licensor thus repatriates two sets of payments, the first for the use of his capital and the second for use of his technology.)

This view of profit-related income sharing, again, permits a regulatory body to treat royalty in a manner similar to that involved in treating the financial aspects of equity participation in joint ventures. That is, the focus is on the rights of distribution of profits rather than the absolute amount of remittances. Thus, setting an upper limit to the royalty rate would be equivalent to setting a ceiling on dividend remittances.

It has been shown that income sharing favours the licensor when enterprise profits are low. To guard against this adverse sharing, royalty payments should be postponed to a time when the licensee's profitability is likely to be higher. Theoretically, the payments might begin three or four years after a plant goes into operation. If a licensor (who is not an equity partner) does not accept this arrangement, the licensee may be able to negotiate a lower royalty rate for the first three or four years, and a compensatory higher rate for the remaining years. Such a condition should be acceptable to a licensor, since a lower share may be compensated for by a higher absolute amount of royalty receipts.

However, when a project involves assembly operations (assembly of a toaster, for example), profit generation may be quicker and thus profit maturity quickly reached. Hence, by paying royalties from the beginning of operations there may not be an adverse impact on income sharing.

Similarly, if export volumes are likely to be large compared with the domestic level, and prices on exports low, it would be logical to have a lower royalty rate on exports than on domestic production (unless the earning of foreign exchange is an overriding consideration).

TABLE 2. INCOME-SHARING MATRIX¹
(Percentage)

Sector ^a	POS ranking	ROS ranking				
		1-2	2-3	3-4	4-5	5-6
Primary industries	10-20	5-20	10-30	15-40	20-50	25-60
Industrial intermediates	20-30	3-10	7-15	10-20	13-25	17-30
Consumer durables	30-40	2-7	5-10	7-13	10-17	12-20
Consumer non-durables	40-50	2-5	4-8	6-10	8-13	10-15
High technology products	50-60	1-4	3-6	5-8	6-20	8-12

^aNot a necessary part of the table, provided for illustrative purposes.

The above discussion also provides some very good reasons for generally avoiding the acceptance of lump-sum royalties because they fail to relate to the licensee's profitability.

The concept of LSLP is of greater concern to the regulatory body than to the licensee, for it provides a basis for setting broad limits on royalty rates based on estimates of profitability in various sectors of industry.

The difficulty in applying these concepts may lie in assessing a firm's potential profitability. In submitting an agreement for government approval, a licensee may not provide, or for reasons of confidentiality may not want to provide, profit data. Furthermore, profit has many definitions. In practice, however, it is not important to define profit rigidly or to obtain the enterprise's disclosure of its absolute levels. What should be gauged is the simplest and most readily identifiable representation of gain. Thus, gross figures present no difficulties. Gross profit on unit sales price (GPOS) is a sufficient yardstick, and its normal percentage for an entire industry, and not necessarily for a firm, is what has to be gauged. Rigorous calculations are also not necessary. Such fine tuning does not lead to higher credibility because of the uncertainties in business forecasts.

It is desirable to rank industry groupings according to POS and match them with royalty (ROS) classes. A 5 x 5 matrix, developed on this concept for country 1 is presented in table 2. Its construction is based on the formula:

$$\text{LSLP} \times \text{POS} = \text{ROS}$$

This table indicates, for example, that a 3-4 per cent royalty rate approved in the consumer durables industry (whose GPOS is estimated by the regulatory body at 30-40 per cent) gives a LSLP ranging between 7 and 14 per cent (depending on whether GPOS is 30 per cent or 40 per cent and the royalty rate is 3 per cent or 4 per cent).²²

²² If, however, only net profit on sales is known instead of GPOS and is 20-30%, table 2 indicates that LSLP at a 3-4% royalty rate will be 10-20% (see also table 3). That is, the licensee obtains 10-20% of the licensee's net profit.

²³ Copyright - V.R.S. Ami.

In approving such a royalty rate, the regulatory body will be exercising judgement as to whether a 7-13 per cent (or midpoint 10 per cent) income share to the licensor is an equitable²⁴ share considering the benefit of introducing durable goods into an economy.

POS rankings can, in fact, be readily made for various industry groupings from statistical data that are usually published by financial institutions, industry associations, chambers of commerce, central banks and national statistical bodies. However, for projects that may involve large royalty outflows, detailed estimates of enterprise profitability may have to be examined, provided that the regulatory body can obtain such information. Tables 3 and 4 illustrate the method of deriving income-sharing information

TABLE 3. CALCULATION OF LSLP IN STRAIGHT LICENSING

(Thousand dollars)

Basis: 3% ROS; no tax on royalty
Fixed investment - \$2,000,000
Depreciation - 10% per year
Corporate tax - 50%

Item	Amount by conventional accounting
1. Net sales value	2 000
2. Cost of materials	800
3. Other costs and expenses	700
4. Total operation costs (2 + 3)	1 500
5. Gross profit before royalty (1-4) ^a	500
6. Operation profit (6 = 5) ^b	500
7. Depreciation	200
8. Taxable profit (6-7)	300
9. Profits after tax (net profit)	150
10. Licensor royalty, 3% of (1)	60 ^c

$$(\text{LSLP})_{\text{gross profit}} = \frac{60}{500} = 12\%$$

$$(\text{LSLP})_{\text{taxable profit}} = \frac{60}{300} = 20\%$$

$$(\text{LSLP})_{\text{net profit}} = \frac{60}{150} = 40\%$$

²⁴ In such approval, consideration must be given to grants (exclusivity, free use of trade marks, export rights etc.) the licensee obtains and their impact on the national economy.

(POS) gross profit	$= \frac{500}{2\,000}$	= 25%
(POS) taxable profit	$= \frac{300}{2\,000}$	= 15%
(POS) net profit	$= \frac{150}{2\,000}$	= 7.5%

^a Royalty, in proper accounting practice, is deducted from gross income in calculating gross and other profit norms (see table 4). If this is done for table 3 figures, LSLP for gross profit, taxable profit and net profit becomes 13.6%, 25% and 50%, respectively.

^b See table 4, where operating profit is calculated differently.

^c In a 5-year contract, the licensor's total receipts (\$60,000 x 5) would be equal to the licensee's total profit in one year—line 8. This type of quantification can be used as a bench-mark for approving royalties.

for two enterprises, based on straight licensing in one case and on a joint venture in the other (where the licensor obtains both profit and a royalty). Table 3 further clarifies the various POS definitions.

TABLE 4. CALCULATION OF LSLP IN A JOINT VENTURE
(Thousand dollars)

Basis: same as for table 3 but with following provisions:
50:50 equity share
Fixed investment = share capital
No tax on dividends

Item	Amount	
	As viewed by licensor	By conventional accounting
1. Net sales value	2 000	2 000
2. Cost of materials	800	800
3. Other costs and expenses	700	700
4. Total operating costs (2 + 3)	1 500	1 500
5. Gross profit before royalty (1-4)	500	500
6. Royalty expense (licensor receipt)	See item 11	60 - see item 11
7. Operating profit	500	500
8. Depreciation	200	200
9. Taxable profit (7-8)	300	240
10. Venture profit after tax (at 50%)	150	120
11. LSLP vis-à-vis royalty (40% of venture profit after tax (licensor's requirement) = 3% ROS)		
12. Declared dividends		120
13. Licensor's share of dividends		60
14. Total receipts of licensor (6 + 13)		120
Ratio of licensor's total receipts to venture profit (14)/(10) = 1 : 1		
Ratio of licensor's royalty receipts (technology payments) to venture profit (6)/(10) = 50%		

In the type of POS calculations carried out in tables 3 and 4 the licensor tacitly assumes that:

(a) Royalty payments will be forthcoming over a reasonably long period (10 years or more is common in agreements in industrialized countries);

(b) Plant capacity and forecasted profitability levels are reached quickly and maintained from commencement of operations;

(c) Plant capacity (or production) is rated for maximum exploitation of the market over the period of the contract.

These are tenable assumptions in industrialized countries but may be untenable, from the viewpoint of the licensor, in developing countries. The Government of a developing country may, for example, restrict the duration of the agreement, restrict the size of plants to promote competition, or place limitations on price. Anticipating such restrictions, the licensor would tend to define his royalty rate as though these regulations did not exist. How the licensor calculates the royalties he expects is shown below.

Total market share of licensee, in country of licensee, over a 10-year period (licensor's estimate of what sales should be)	100 000 units
Sales value of production at \$50 per unit	\$5 000 000
Licensor's estimate of licensee's after-tax profit over 10 years	\$1 500 000
Licensor's expected share of profit over period of agreement at 20 per cent of licensee's after-tax profit	\$ 300 000

The licensor, now, can quote this \$300,000 figure as a lump-sum royalty (prepaid fee) without reference to volume of production and payments period, or he can re-express royalty rates for various combinations of duration and product volume. In each case in table 5, depending on the licensee's choice, the licensor's expected income stays at the minimum calculated value of \$300,000.

TABLE 5. ROYALTY RATE AND DURATION

Product volume per year (number of units)	Duration (years)	Royalty rate asked for by licensor
A. 10 000	10	\$300 000 for 100 000 units of \$5 000 000 sales value = \$300 000/\$5 000 000 = 6% ROS
B. 7 000	7	\$300 000 for 49 000 units of \$2 450 000 sales value = \$300 000/\$2 450 000 = 12% ROS
C. 20 000	10	\$300 000 for 200 000 units of \$10 000 000 sales value = \$300 000/10 000 000 = 3% ROS

The royalty rate is, therefore, an apparent number, while the licensor's real expectation is an absolute number (depending on the country). For instance, in case B of table 6, the 12 per cent royalty rate may appear to be a difficult number to negotiate. However, it can easily be modified to a down payment (or technical fee) of \$130,000 and a royalty rate of 7 per cent without affecting the absolute number of \$300,000.

It should be noted that the figures used reflect the licensor's expectations. Should sales or prices fail to reach the levels anticipated, any royalty strategy other than a lump-sum payment would be damaging to the licensor. This is the licensor's risk in accepting a rate payment as his compensation.

It may thus be concluded that consideration of royalty rates without reference to the payments period of the agreement and to the volume of production would be unfruitful. Thus, in approving royalty rates, a regulatory agency should consider at least four elements: (a) the quantum of the royalty rate; (b) payments period (which can be shorter than duration of the agreement); (c) annual volume of production; and (d) the licensee's potential profits at pre-maturity and full-maturity periods over the life of the agreement.

Value added and royalty

In developing countries value added in the enterprise should be a significant consideration in approving royalty rates. Thus, a country may want the components of a toaster to be manufactured rather than to import components to be assembled. Hence, the agency that considers royalty rates for approval should take into account not only the four elements mentioned above, but also the value added on imported components.

The ratio of royalty outgo to value added could be a criterion for judging royalty rates. Table 6 shows such a calculation. A higher royalty rate in case B (and hence a high LSLP) may be warranted because of the high value added. To obtain such value added, the licensee's investment and operating costs will rise and there may be a sharp reduction in gross profits (which the Government of a developing country can counteract through either lower corporate taxes or a protective tariff to permit higher selling prices).

The usual position taken by Governments (e.g., the Governments of India and Malaysia) is that the cost of imported components (c.i.f. costs)^{2,5} should be deducted from the sales value for computing royalties. If this is done in case A of table 6 (the approved prime royalty rate is 7.5 per cent), LSLP reduces to 15 per cent and the licensor's effective

^{2,5} Including subassemblies, preprocessed materials but not raw materials (ores etc.) that have little processing content.

royalty rate (actual royalty receipts to product sales value) to 4.5 per cent. This is generally known as the "components-adjusted royalty system".

This method of calculating royalty is likely to induce the licensor to provide technology for making components. The lower the import content, the higher would be his royalty rate. (Further, where the licensor himself supplies the components, the method avoids hidden royalties, i.e. overpriced components.)

TABLE 6. VALUE ADDED, ROYALTY RATE AND LSLP
Basis: 10 units sold
(Dollars)

Item	Case A	Case B
Cost of local raw materials ^a	30	90
Cost of imported components ^a	80	30
Cost of labour	10	13
Direct costs	120	133
Fixed costs	20	30
Total costs	140	163
Selling price ^a	200	200
Value added on imported materials	200 - 80 = 120	200 - 30 = 170
Licensee's gross profit	60 (200 - 140)	37 (200 - 163)
Royalty outgo (assumed)	15	21.25
(LSLP) gross profit	25%	57.43% (21.25/37)
ROS	7.5% (15/200)	10.62% (21.25/200)
Ratio of royalty outgo to value added	0.125 (15/120)	0.125 (21.25/170)

^a At enterprise level, i.e., actual costs at the door of the enterprise and sales value at the door of the enterprise. This avoids confusion from the margins taken by sole suppliers and sole distributors (if any).

Royalty rates and cost saving

In all the calculations given above, it has been assumed that (a) there is a product sold and (b) its price can be readily determined. However, there are several process technologies in which neither of these assumptions is relevant. For example, the change of a catalyst system in a chemical process can reduce consumption of raw materials, or a change in a solvent system may reduce consumption of energy. For these cases, cost of savings can be the relevant criterion for appraising royalty rates.

Thus, in the case of the catalyst system, an incremental investment of \$100,000 and an annual recurring cost increase in catalyst purchase of \$20,000 may reduce raw material costs by \$60,000 per year. What would be the value of this technology? It can be easily calculated that overall increase in total cost is \$30,000, i.e., 10 per cent

depreciation on investment and \$20,000/year on catalyst. However, this is counterbalanced by savings of \$60,000 per year in raw material—that is, a net cost saving of \$30,000. The licensor could ask for 50 per cent of this amount (LSLP) as a yearly royalty fee and yet the licensee could gain.

Cost savings could also be a criterion in selecting technologies. Suppose technology A was offered for a ROS of 3 per cent. Technology B, however, might reduce costs (improve the licensee's income) by \$30,000 over technology A on 100,000 units of production, selling for \$2,000,000. At an LSLP of 50 per cent, the incremental royalty that the licensee could pay for technology B would be \$15,000 for 100,000 units (of sales value equal to \$2,000,000), or an incremental royalty of \$0.15 per unit of product, or an incremental ROS equal to 7.5 per cent (15,000/2,000,000). That is, technology B would be licensable at 10.5 per cent with an advantage to the licensee.

Capitalization of royalty rates—the NPV method of assessment

Licensors often prefer to state their royalty expectations in terms of lump-sum royalties, or as a combination of lump-sum and running royalties.

The simplest approach to comparing royalty rates with lump sums, so as to apply a uniform royalty rate policy, is to reverse the methods of tables 5 and 6. This approach would, generally, be unacceptable because the declining value of money receipts over time is neglected. This is corrected for in the NPV method.

The concept of net present value (NPV), which is routinely applied in financial analysis of project payments and returns (see p. 57), can be extended to royalties. The objective in an NPV assessment is to capitalize periodic receipts by discounting future receipts in terms of the current value (present value) of money. In the forward direction, the time flow of royalty payments can be consolidated into a lump-sum NPV statement; and in the reverse direction, a lump-sum payment can be reduced to an average royalty rate covering the duration of the agreement.

While the arithmetic of NPV is quite simple, going through it will help in understanding concepts. The NPV of a future receipt of money is less than its future nominal value. If \$0.9091 is banked today it will yield \$1.00 a year from now at 10 per cent interest. Thus, the NPV of \$1.00 received a year from now is \$0.9091 today, discounted at 10 per cent. For two years at 10 per cent, the NPV of \$1.00 received two years (from now) is today \$0.8264. These fractions are generated using the compound-interest formula:

$$\text{Fraction} = 1/(1+r)^n$$

where r is the discount rate of money and n is the number of years from zero year when the money is

received; r is not the inflation rate or the simple-interest rate. r represents the cost of raising capital (demand and supply of funds) conditioned by the risk factors of the capital market as they affect the availability of public capital, bank loans etc. One of these factors is the interest rate. Financial institutions usually establish these discount rates for their own project evaluation programmes, and they would be the best sources of this information.

In licensing transactions, r is currently (June 1978) taken at 12 per cent in the United States. At the convenient 10 per cent rate, the discounting factors can readily be calculated to be:

Year	NPV factor
0	1.0000
2	0.9091
3	0.8264
4	0.7513
5	0.6830
6	0.6209

The use of NPV is illustrated in table 7, where 1978 is the first year of operation and the future annual incomes for 1979-1983 are discounted to obtain the 1978 NPV.

TABLE 7. CAPITALIZATION OF ROYALTY (NPV)

Year	Estimated sales value of goods (dollars)	Royalty income (dollars)	NPV factor	1978 NPV of royalty income (dollars)
1978	100	3 000	1.0000	3 000
1979	100	3 000	0.9091	2 727
1980	150	4 500	0.8264	3 719
1981	250	7 500	0.7513	5 635
1982	350	10 500	0.6830	7 172
1983	650	19 500	0.6209	12 109
Total	1 600	48 000		34 362

Table 7 shows that \$48,000 spread over 6 years or \$34,362 paid now as a lump-sum royalty are equivalent, and the choice of payment depends on the cash position of the licensee or the foreign-exchange position of a country.

Similarly, the average royalty rate for the duration of an agreement corresponding to a lump-sum amount can be calculated by reversing the above procedure:

$$P = P_0(1+r)^n = RS$$

where

- R is the average royalty rate
- S is the aggregate sales value over contract period of n years
- P_0 is the paid-up fee
- r is the discount factor (0.10 if rate is 10 per cent).

Thus, if \$34,362 is a lump-sum figure quoted by the licensor for a certain technology in which the sales value of the product would be \$1,600,000 over 6 years (the evaluation made by the licensee or the regulatory body), the formula will be re-expressed as

$$\begin{aligned} P &= 34,362 \times (1.10)^6 = 34,362 \times (1.771) \\ &= \$60,855 \end{aligned}$$

That is, \$34,362 paid up in year 0 (now) is equivalent to \$60,855 paid up in year 6. If it is further assumed that \$60,855 is paid out over 6 years on a sales value of \$1,600,000, the annual payment would be \$10,142 per year, or a royalty of $10,142/266,700 = 3.8$ per cent ($266,700 = 1,600,000/6$). More reasonably the average

$$\frac{34,362 + 60,855}{2 \times 6} = \$7,935$$

would be the appropriate yearly amount, and 2.97 (~3 per cent) the royalty rate.

Because of averaging, this rate of 3.8 per cent is not the same as the 3 per cent used in the "forward" treatment of the NPV concept.

For comparing a royalty rate and a lump-sum fee, the more useful method is to capitalize the royalty rate rather than reverse the compound interest formula as has been illustrated above.

Appraisal of technical fees

In the licensing of know-how and patents, the licensor bears few costs, if the cost of developing the technology is disregarded. As has been shown, the fee applied by the licensor for leasing industrial property is based on the concept of sharing in the licensee's earnings.

Still, in transferring technology, the licensor does often bear some direct licence-related expenses. They include the costs of negotiating the licence, the costs of preparing specific documents for the licensee (e.g., know-how transmittal), the licensor's travel and telex costs etc. and sometimes certain allocated costs, such as the time the licensor's personnel will spend in training the licensee's operators at the licensor's site. To recover such costs, or, alternatively, to provide for his working capital, the licensor may apply a fixed fee. At times such a fee may also act as a good faith payment to the licensor, insuring him, for example, against inadvertent disclosure or misuse of know-how by the licensee. Thus, a licence may involve a two-part fee, a down payment and a recurring royalty. Such a formulation may also be adopted for continuing technical assistance that otherwise has little to do with use of industrial property.

The concern here is more with evaluating fees for services of short duration, not involving right-of-use. Assessing the reasonability of such technical fees can be more complex than assessing royalty because there

are large incidental and allocated costs for the supplier that depend on the extent of the services rendered, which in turn varies with the responsibility and load the client can bear.

Most often, since services are obtained from, or could be obtained from, professional organizations such as engineering companies, competitive bidding may help to determine the reasonability of fees.

The surer way to assess such fees, and even to examine competitive bids, is to analyse services not from what is provided but the effort required to provide them and the rate for each service, which means considering man-hours of service. There are, of course, various qualities of service. The cost of a draughtsman man-hour may be low, while that of a man-hour for functional engineering of field supervision may be very high. Most often, at a given time, rates for such services are uniform. Variations, however, occur in the overhead charge that is superimposed on such services. Thus, for draughting, the charge might be \$12 per man-hour plus 20 per cent, for overheads, while for functional engineering it might be \$40 per man-hour plus 60 per cent.

Normally a service contract lists the supplier's man-hour rates and overhead percentages together with an assessment of the estimated man-hours required for performing all services requested. The client would have the right to inspect, or to have an independent consulting firm inspect, the time logs of the service supplier.

Assessment, however, requires experience. Thus, in a chemical plant, engineering services for a developing country may constitute 14-16 per cent of battery limits investment. The service bid is examined in the light of such experience. Equally, an approximate ratio of engineering man-hours to construction man-days may prevail for the industry, which may provide an independent check. For the protection of the client in a developing country, it would be useful to have the service supplier indicate (in the agreement) maximum payments for the services listed, with the client's right to audit time logs.

Lump-sum versus running royalties

In licensing industrial property, a lump-sum royalty is a payment made in lieu of running royalties and is not a fee for the professional services to be rendered. Thus, the licensor who receives lump-sum royalties should have the same obligations as one who receives running royalties, a condition that should be stated in licensing agreements.

However, while lump-sum and running royalties are conceptually the same, and arithmetically equivalent, there are reasons for choosing one form of payment over the other.

The advantages of lump-sum royalties (which may, sometimes, be paid in instalments over a short period) are as follows:

(a) The cost of the technology (or foreign-exchange burden) is known in advance;

(b) The licensor can be prevented from examining the licensee's accounts; normally it is the licensor's right to inspect the licensee's accounts;

(c) An upward movement of selling prices owing to local inflationary factors does not increase the licensor's income;

(d) It is feasible to compare competitive licensing offers, since complicating considerations such as duration and product volume are not involved;

(e) The absolute cost of a lump-sum payment may, for some reason, be lower than the NPV of running royalties.

Still, there are disadvantages:

(a) In a lump-sum agreement, the licensor does not risk income, a cardinal consideration in licensing;

(b) The licensor's interest in the licensee's enterprise is difficult to maintain over the period of the agreement, since he will have received his payments in advance;

(c) The expansion of the licensee's market through licensor participation—through process improvements, for example—is hindered, since market expansion brings no additional income to the licensor;

(d) The licensor can licence a competitor firm within the country on a different royalty rate basis, with the result that the licensee's income and markets could be jeopardized.

Similarly, running royalties have advantages and disadvantages. The advantages are:

(a) The licensor is made to share the licensee's risk;

(b) By offering a subsequent reduction in royalty rates, the licensor can induce growth in the licensee's market if the licensee's output falls behind market growth;

(c) If the licensor defaults in carrying out the provisions of the agreement, royalty payments can be stopped; similarly, if the licensee goes into liquidation, royalty payments terminate;

(d) Royalties ease the cash-flow situation of the licensee (or foreign-exchange outflow rate);

(e) Where a most-favoured-client clause is included (p. 54) a reduction in royalties rendered to another firm can immediately be passed on to the licensee, since it is simple to state the reduction;

(f) Royalty rates can be differentiated with respect to import and export markets etc. and can be contracted to change over time;

(g) At any time in a licensing contract royalties can be converted to a lump sum (with the approval of the licensor), thus limiting future liability for payments;

(h) Adjusted royalty rates are possible, i.e., the cost of imported components can be deducted from the product sales value in calculating the royalty base (components-adjusted royalty formulations become possible);

(i) Royalty rates can be readjusted if there is a failure in performance of know-how (p. 25).

The disadvantages of the rate concept are:

(a) Increases in prices of products owing to local inflation or taxation of inputs enhance the licensor's income without his making any contribution to the enterprise;

(b) The licensor's income over the contract period cannot be estimated with any certainty.

Obviously, running royalties have more advantages than lump-sum royalties. This accounts for their wide appeal. Subject to assessment per the NPV concept, the royalty rate type of agreement is to be generally preferred even in developing countries.

There are some advantages to combining lump-sum payments with those of running royalties. One of the best ways of doing this is to define in the agreement a terminal cut-off fee, that is, to define the accumulated amount beyond which the licensor will receive no further royalty income. Still another way is to obtain the option in the (royalty-based) licensing agreement of paying a lump-sum fee in lieu of royalties at any time during the life of the agreement, a more flexible arrangement than the first.

Ways of expressing royalty rates

As often stated, the licensor expects payments for the licensee's right to use trade marks, patents, know-how etc. However, in a licensing agreement, payment need not be indexed to anything, such as sales or production, but may be stated merely as an annual payment obligation. However, performance-based indexing (i.e., royalty per unit of production) clearly indicates the licensee's preferred measuring unit.

Production indexing, which means payment per unit of product produced (or sold—the definition is important), is simple when a plant produces only one or two products. It is a poor base if there is a wide product mix, or output is such that it cannot be measured in units, i.e., where a product has several qualities (different qualities of soap sold at different

prices). But the index has the advantage that changes in market price (i.e., through inflation) do not influence the licensee's royalty liability.

Sales-price indexing, a very common royalty base, is best used when identical products are not produced, i.e., a custom foundry, pharmaceutical formulations. However, one way of treating a sales-price index like a production index is to set in the contract either a maximum or a fixed sales price for calculating royalties.

In both production and sales indexing it is possible to provide for declining rates of royalty for production or sales exceeding certain values. These are usually termed "telescopic" royalty rates or "quantity-bracketed downward adjusted" royalty schedules. This method gives the licensee an incentive to expand markets.

Cumulative royalties are an alternative to the annual telescoping royalties. Here the royalty rate changes with the total accumulated sales from the date of commencement of production. They can be indexed to production or sales. The cumulative royalty statement can appear as follows:

- 3 per cent on first 100,000 units of production
- 2 per cent on next 200,000 units of production
- 1 per cent on next 600,000 units of production
- No royalties on units produced beyond 1,200,000 units

(To encourage exports, incentive royalties can be constructed, with absolute royalty rates increasing with increasing volume—a reversal of the above schedule).

If a schedule of cumulative royalties is constructed properly, a provision in the agreement for a payments period is redundant.

Profit indexing is the most lucrative and logical form of royalties to a licensee, since he incurs no payment liabilities unless he makes a profit. It is also of use to a regulatory agency, since LSLP is readily measurable. However, it is not a usual form because of the difficulty of determining profit in an enterprise, for example, in a multi-product company where the licensor's technology is only one of the technologies employed. Where wholly profit-indexed royalties would be unacceptable, combination royalties can be established, for example, 1 per cent on sales value plus 2 per cent on profits (with profit being determined by an agreed-upon formula).

Minimum royalty rates

Regulatory agencies of many developing countries do not permit minimum royalties on the ground that the licensor should share the licensee's risk in the market-place. However, where the license agreement provides for a down payment, it is difficult to distinguish it from a minimum royalty payment. In

fact, a front-end down payment can just be the capitalization of future minimum royalties.

It is recommended here that a minimum fee be accepted if the licensor has good reason to insist on it, but on the basis of reciprocity; that is, where a minimum royalty is provided for, the licensee should have the reciprocal right of placing a maximum limit on the outflow of royalty in any accounting year.

Summary: guidelines for considering royalty rates

The following principles are offered as guidelines for considering royalty rates:

(a) Royalties should be viewed as a payment for right-of-use of industrial property and not as a payment for the licensor's services or as a payment for the content of the technology;

(b) Royalties should always be for some consideration, some benefit to the licensee defined in the agreement, and that benefit should be of the licensee's choice (know-how, trade marks, patents etc.); that is, royalties should not apply diffusely to the content of an agreement but must stand in relation to the licensee's hierarchy of needs (e.g., know-how more than trade marks). Where possible, separate payments should be made for each element of the technology portfolio (e.g., trade marks, patents or know-how). The principal element of a technology portfolio should not be made to appear royalty-free with compensation tied to a less essential element of the licence package;

(c) Royalties should have a similar relationship to technology transfer (the transfer of technical excellence, skills and information) as fiscal and financial incentives have to investment of capital. The royalty rate should serve as a self-regulating incentive to the licensor to maximize value addition in the domestic enterprise, failing which the royalties to the licensor would become some fraction of the prime royalty rate (i.e., component-adjusted royalties);

(d) The income-distribution aspect of the royalty rate should be recognized; that is, the royalty rate should be considered an income-sharing device between licensor and licensee, expressing the licensor's share of the enterprise's profits;

(e) The sharing of income depends on the level of the licensee's profits. For a given royalty rate, LSLP increases when the licensee's profits are decreasing. Thus, royalty rates should be appraised in terms of the known or estimated profits of the enterprise;

(f) As a corollary to the above, in high-profit operations, permissible royalties (based on sales value) can be high without the licensor's receiving a disproportionately high share of income, while in low-profit operations, or in stages preceding the stage

at which an enterprise achieves profit maturity, royalties at any level may overly favour the licensor in income sharing;

(g) Any royalty rate evaluation should consider value added on imported components and serve to maximize the ratio: value added/royalty outgo;

(h) The approval of royalty rates should be considered in terms of the period over which payments will be made and the volume of production involved;

(i) To obtain the greatest flexibility in approving royalties, Governments should encourage potential licensor-licensee groups to present payment alternatives (lump-sum fees, running royalties or some combination), with the choice left to the Government.

(j) Lump-sum royalties should be viewed as capitalization of running royalties, and thus directly comparable with them. The NPV technique should be used for purposes of comparing running and lump-sum royalties;

(k) Any lump-sum royalty should be expressed in the licensing agreement as a payment "in lieu of running royalties" so as to convey expressly to the licensor that he has certain responsibilities to the licensee throughout the life of the agreement;

(l) Running royalties are preferable to lump-sum payments because they tend to link the licensor's gain and risk to the licensee's gain and risk throughout the period of the agreement;

(m) Royalty rates should also be viewed in the light of the licensor's grants—exclusivity, territories, use of trade marks, access to markets—which may be valuable to both the licensee and the country;

(n) Payments for technical services, engineering, consultancy etc. should be viewed as far as possible not as payments for what is provided as much as the effort required to provide that service.

Annex II.C contains a check-list for evaluating remuneration provisions in licensing agreements.

VIII. Legal and administrative provisions

Certain standard provisions, sometimes called "boiler plate clauses" are included in all licensing agreements, the most important of which are discussed below.

Some of the provisions have more of a legal than a commercial character. These are:

Identification of parties to the agreement, including or excluding subsidiaries
Assignability, transferability and divisibility of the agreement while it is in force

Force majeure

Official notices—addresses to which communications, notices, payments etc. are to be sent; arrangements for billing; effectiveness of date of notice

Arbitration

Governing law of contract; government approval

Cancellation

Effective date of agreement

Currency convertibility

Taxes and government fees

Sole understanding, i.e., no relationship to other agreements

Non-waiver (the waiver of any right for breach is not waiver of any other rights)

Authority behind signatories to agreement

Other standard provisions have both a commercial and a legal character. These are:

Preamble to agreement

Definitions

Secrecy

Duration of agreement

Best efforts of licensor

Third-party infringement (see "patents")

Termination rights

Most-favoured-licensee

With the exception of arbitration, the first set of the above-listed clauses will not be discussed, since no special viewpoint of developing countries exists concerning them.

Arbitration

In an international agreement, where the nationalities of the parties differ and the language is often a compromise of terms that can be differently interpreted, it is desirable to incorporate in the agreement a procedure for settling disputes. Further, in a commercial contract, such as licensing of technology, a quick procedure for resolving disputes benefits both parties. If no provisions for arbitration are made in the agreement and a dispute arises, it has to be resolved through the courts, whose rules of evidence, inquiry procedures etc. are cumbersome and costly.

Arbitration is a legally recognized procedure in most countries and on many issues may be used as a substitute for judicial proceedings. An arbitration provision in an agreement obligates the parties to arbitrate certain issues which are not issues of public policy. Use of arbitration leads to a decision, not to a judgement. An arbitral award is unenforceable unless it has the sanction of a court. Thus, the procedure laid down for arbitration must have relevance to the governing law of the agreement (which should be defined in the agreement), and it must consider the court in which the judicial award will be made.

An agreement may establish in detail the arbitration procedures to be followed, or it can simply stipulate use of the facilities of one of the recognized arbitration associations, e.g., the International Chamber of Commerce (ICC), Paris. The arbitration clause usually provides for each of the parties to appoint an arbitrator and for the arbitrators to choose a third person as umpire, failing concurrence in which, provision can be made for a court to appoint the umpire. Rules of arbitration can then be specified as those of ICC. It is also usual to state that the common decision of any two arbitrators shall be final and binding.

Some important considerations for developing countries are the:

Place where arbitration will be held

Language of proceedings

Bearing of costs of arbitration

Courts that will sanction the award

While these points may also apply to agreements between organizations in developed countries, the implications of foreign exchange are particular to

developing countries. For example, if the place of arbitration is the country of the licensor (or a third country), would the developing country sanction foreign exchange for the travel and living costs of the licensee's representatives and the umpire? If the place is the licensee's country, would then the licensee not be prone to refer disputes to arbitration frequently, since there is a cost disadvantage to the licensor? Again, if a dispute leads to a financial settlement adverse to the licensee, will the developing country be prepared to bear the foreign-exchange liability? Arbitration provisions must, therefore, consider these possibilities.

It is usual to provide that if a dispute is raised by one party, the arbitration site will be the country of the other party. The aim of such a provision is to discourage recourse to arbitration (it, however, does not solve the foreign-exchange problem). An extreme solution is to omit an arbitration provision and require all disputes to be settled in the court of the licensee's country.

Preamble to agreement

The preamble contains the recital ("whereas") clauses. Here, the purpose of the agreement is stated, and both the licensor and the licensee make certain representations. Scrutiny of these areas is vital even though clause constructions may appear to be serving purely legal ends.

The purpose of the agreement must be clear in the preamble and incorporate the objectives of the entrepreneur and the developing country (pp. 2-3). Several tests must be applied in this context. Is the purpose, or purposes, defined by the licensee? Is it the purpose of the agreement to make and sell a set of products, or is it to acquire certain rights (i.e., patents, trade marks), or is it both? Is the purpose to gain access to the licensor's technology and techniques, and manufacturing and marketing assistance, or is the purpose to obtain the right to make and sell a patented product?

Similarly, the preamble should make clear certain representations. Does the licensor own or control the licensed patent, know-how, trade mark, proprietary machinery etc.? If not, by what measure does he obtain the right to license? Is the licensor experienced in using the process, the subject matter of the agreement? Is the licensed product being marketed commercially? This is particularly important in areas of safety (electrical components), in critical areas of use (pharmaceuticals²⁶ and insecticides)—areas where national standards may not have evolved. Such representations are in the nature of warranty statements by the licensor, and in the event

²⁶ Developing countries should not become testing grounds for drugs and pharmaceuticals not commonly marketed by the licensor.

of a court or arbitral award would carry considerable weight in determining the licensor's liability. Similarly, if the licensor is offering services such as engineering or consultancy, does he represent that he is skilled and has experience in these areas? Also, is the licensor aware of conditions in the developing country? Has he visited the licensee's country and the proposed manufacturing site? Has he presented a preliminary technical proposal? Does the licensor recognize that the licensee plans to construct his plant over a period of time that is longer than the normal period in developed countries?

Because of the importance of these considerations, specimen recitals are given below (legal phrasing may be different in each case):

WHEREAS Licensor is engaged in the manufacture and commercial sale of products listed in Schedule A throughout Europe and has technical manufacturing knowledge, secret know-how and marketing information relating thereto and experience in the construction of plants for said products; and

WHEREAS Licensor has the lawful right to impart to others said know-how; and

WHEREAS Licensor owns or controls patents and designs listed in Schedule B and owns the registered trade mark SHARP in India and Australia and has the right to grant a licence for the use of such patents, designs and trade mark; and

WHEREAS Licensee desires to obtain an exclusive licence to manufacture products of Schedule A in India and exclusive rights to market such products in Australia and India under patents of Licensor and to the use of the trade mark SHARP in India and in Australia; and

WHEREAS Licensee desires to have imparted to him said know-how, access to marketing information and requires technical assistance from Licensor for constructing and working a plant rated at a capacity of 10,000 units of each product of Schedule A per shift at a site in Rohu, India, to be established within four years of the effective date of this agreement; and

WHEREAS Licensor's representatives have visited Rohu and reviewed site conditions and availability of skilled and unskilled labour and management personnel with Licensee; and

WHEREAS Licensor is willing to grant such rights, provide know-how, technical and construction assistance and Licensee is willing to accept the same

NOW THEREFORE in consideration of these premises and other considerations, the parties HEREBY AGREE as follows: . . .

Definitions

Definitions are used to describe and delimit the scope of the agreement. The description of the licensed technology usually concerns technical expressions related to product, plant, capacity, quality and specifics of the know-how. Careful definition of technical terms is of crucial importance in the construction of performance guarantee statements, a matter of concern to developing countries. Delimiting definitions apply to subjects such as exclusivity, patents and trade marks, for which there are usually standard definitions, often codified in statutes or judicially interpreted in case law. However, certain delimiting definitions may be specific to the agreement, such as patents and trade marks, territory and sales value (royalty base), and these definitions require a careful formulation.

Vague definitions of "product" as "insecticides", of "capacity" as "10,000 bottles per year", of "know-how" as "non-patented information", or of "royalty" as "6 per cent of sales value" can lead to disputes in the implementation of a project. Insecticides may only involve formulation of imported base material; "10,000 bottles" may not indicate per-shift capacity (thus, feasibility); unpatented know-how may just be information readily available in the public domain, and "sales value" may include packaging and freight elements on which royalty has to be paid etc.

Clear definitions strengthen interrelationships between the clauses of an agreement. Thus royalty rate must relate to licensed product, to know-how, etc.; of these, the definitions of know-how and of sales value are important. The definition of know-how has been extensively treated in chapter III. Sales value is discussed below.

In many agreements, the royalty expected by the licensor is defined in terms of the licensee's sales (i.e., the royalty base). The definition of the latter term varies greatly from agreement to agreement and if improperly constructed can become a major liability of the Government (via payments made by the licensee), upsetting judgements made earlier on the acceptability of a proposed royalty rate (pp. 42-43).

Sales value is, of course, the volume of the product sold multiplied by the price at which it is sold. But price has many constituent elements: cost of imported materials, local materials, labour, depreciation, interest, profit etc. including royalties. It also can include product-related taxes (sales and excise taxes), freight costs to distribution points, packaging costs etc. Price also can be the "list price", the price after cash and trade discounts etc. A sales-value definition of the type offered below (rather complex, but it indicates licensee options) can minimize misinterpretation and facilitate rapid computation.

Sales Value shall mean net proceeds realized by Licensee from sale of licensed products after deducting normal and customary cash and trade discounts, product returns, transportation charges paid by Licensee, sales and excise taxes directly imposed upon and paid by Licensee in respect of the sold product; further provided net proceeds shall be adjusted as follows:

(a) *The c.i.f. cost of components purchased from Licensor for use in the manufacture of licensed products shall be deducted from the net proceeds as determined above;*

(b) *Proceeds arising from sale of licensed products to controlled subsidiaries of Licensee shall be calculated at X per cent of net proceeds;*

(c) *Supplementary costs for export packaging, if any, shall be deducted in computing net proceeds.*

Secrecy

Secrecy can apply to many aspects of a contractual arrangement, namely:

- (a) To technical disclosures made;
- (b) To marketing and competition data supplied;
- (c) To the general content of executed agreements;
- (d) To conducting visitors around plants etc.

While (b) and (c) may apply to all types of agreements, (a) is relevant only when secret know-how is disclosed. (Along with "secrecy", the "duration" period over which secrecy must be maintained should be listed (see following section).

In a know-how agreement, secrecy cannot be made to extend to all technical information supplied by the licensor. For this reason, information not within the scope of secrecy should be defined (see p.12).

Secret data on marketing and competition that the licensor may supply to the licensee (or vice versa) largely help the recipient. Unlike technical information, there is usually no national interest in encouraging diffusion of such information. Thus, protection for such data may be valid.

The obligation to keep secret the material contracted for in an agreement, the contents of an agreement, is a sensitive topic in developing countries. The usual licence agreement does not contain such a stipulation and should be avoided.

Conducting casual visitors through plants is also not prohibited in normal agreements. An express right in this matter can be negotiated, if necessary.

Duration of agreements

The duration of the licence agreement has particular implications for developing countries. It is usually determined through negotiations between licensor and licensee, but often the regulatory agency of the government becomes involved. Regulatory agencies tend to set a single standard maximum duration for all technology agreements. The usual reasons for following such a policy are:

(a) It sets a time limit to the outflow of royalties;

(b) It helps to ensure that an excessive secrecy obligation will not be imposed on the licensee (know-how often has a limited useful life);

(c) It warns the licensee that he should absorb the technology within the period allowed (because after its expiry he cannot expect guidance from the licensor).

The advisability of setting a single maximum period for licence agreements nevertheless should be considered in terms of possible adverse consequences for the licensee. It may adversely affect the licensee in that it may limit or affect:

(a) His access to assistance from the licensor in developing export markets;

(b) His access to components, materials or specific services that may be available only through the licensor;

(c) The inflow of process improvements; for instance, unless the licensor derives some advantage, he will hesitate to disclose improvements in the last years of the agreement;

(d) Inflow of high technology based on secret know-how.

It should be noted that there are three types of periods, or durations, specified in licence agreements in developing countries in which regulatory systems exist. The intent behind them needs to be understood. These concern the period in which:

(a) The licensee is obligated to make royalty (or other periodic fee) payments—the payments period;

(b) The licensee must maintain in confidence the technical information disclosed—the secrecy period;

(c) The general obligations of the licensor and licensee are valid (for instance, export assistance by the licensor or improvement grant-backs by both parties)—the obligations period.

These three periods may vary widely, but a great deal of confusion can be avoided if in some situations a single period can be negotiated covering all aspects of the licence.

But very often the period for maintenance of secrecy is longer than the other two periods, particularly for "high technologies" not protected by patents.

Payments period

The payments period is the easiest to negotiate if the cost of the licence (see "Remuneration") is fully appreciated by the licensee. The royalty rate and the period over which royalties will flow are of concern both to licensor and licensee. But from the viewpoint of the licensee, the licensor's obligations can be more effectively maintained if fee payments are prolonged. This is one reason why lump-sum agreements for know-how are not recommended in this monograph.

Also, in the analysis of royalty as an income-sharing device, it was shown that LSLP is equitable (from the viewpoint of the licensee's country) only when the licensee's profitability attains maturity (p. 41). Further, it is desirable from the licensee's point of view, for royalties to be paid from profits and not from income in preprofit years. If the duration is excessively short, within which the licensee enterprise cannot achieve profit maturity, all payments made to the licensor may result in excessive benefits to the licensor.

Secrecy period

Regulatory agencies face the greatest difficulty in this area. Judgement factors alone can guide the determination of the period. The quality of incoming technology must be the consideration that finally resolves the conflicting needs of the licensor and the developing country. However, the licensor's understandable viewpoint must be taken into account: so long as his secrets are maintained, his information remains valuable and workable, i.e., he can license others, protect the enterprises he owns or work with two or more licensees in the same country.

Obligations period

The duration over which mutually exchanged obligations prevail must be examined in particular. Sufficient time should be available for the licensee to:

(a) Absorb transferred technology to the extent that the plant works at highest efficiency at full capacity;

(b) Obtain the confidence that he can operate the plant at the above conditions unsupported by licensor staff (the absorption stage of the technology transfer sequence, p. 1);

(c) Adapt and develop technology to suit local conditions and perhaps to innovate on learnt skills

and information (the control stage of the technology transfer sequence);

(d) Establish himself in licensed export markets (i.e., markets in which the licensor has agreed to support the licensee's efforts).

Each of the three durations should be clearly defined. Except for front-end payments, the payments period should normally start from the time the plant attains an operation level of about a third of its capacity.²⁷ The secrecy period should normally extend from the time the licensor discloses secret information. The obligations period is usually from the effective date of the agreement.

Using a bench-mark of five years for the obligations period, longer terms are acceptable when:

(a) Export markets have to be developed or supported;

(b) The licensor is dependent on the licensee for supply of physical inputs;

(c) The project involves licensor-aided, and intended, backward or forward integration;

(d) Components-adjusted royalty rates are the payment base.

Agreements of short duration would be beneficial when:

(a) Low-level technologies that can be absorbed rapidly are involved (i.e., assembly industries);

(b) The purpose of an agreement is implicitly or explicitly more to obtain trade marks or other marketing rights (in domestic markets) than use of technology;

(c) A component-adjusted royalty base is unacceptable to the licensor;

(d) Patents of doubtful validity or importance are involved;

(e) The licensor has a substantial investment in the licensee's plant;

(f) Technical and engineering assistance constitutes the primary input.

Legal phrasing and placement for the various durations can cause problems. It is recommended that under the usual "term of the agreement" title, the following be incorporated:

Except as provided under clause . . . (the payments clause that states the royalty rate and the period over which the royalty will be paid) and clause . . . (the clause that states the period over which secrecy is to be maintained—normally called the HOLD CONFIDENTIAL CLAUSE) the provi-

sions of this agreement shall cease to have effect after five years from the EFFECTIVE DATE of this agreement, unless renegotiated before the expiry of this period.

Termination rights

If there has been no breach of terms by either party, or if a breach occurred and it has been resolved, a contract usually expires after a stipulated time (period of active obligations). In industrialized countries, the lapse of an agreement may imply loss of rights under the licence use of know-how, manufacture or sale under patents, use of trade marks, exclusivity, inflow of improvements, and access to markets where trade-market goods can be sold etc.

By explicitly providing for termination rights, the developing country attempts to prolong the use of certain rights, the most important among them being the continued right to use know-how without payment (unless the agreement is renegotiated). Where a patent protects know-how and patent life extends beyond the duration of the agreement, the developing country requires the licensee to negotiate for the express right to use know-how for the balance life of the patent, even if higher initial royalties are required by the licensor. Terminal rights must also be examined from the viewpoint of secrecy obligations. Does the property right with respect to secret drawings, designs etc. move back to the licensor? Without revealing secrecy, can the licensee use know-how for expanding production of unrelated products?

Most-favoured-licensee clause

A most-favoured-licensee clause is one that states that the licensor will modify an existing licence to make it equal to a licence granted later to another party that contains more favourable terms on the same subject, usually the royalty rate (running royalty), since it would be impractical to modify all terms. A specimen clause is given below.

Licensor agrees that he will not grant a licence under the know-how defined herein to any person, firm or corporation at a royalty rate lower than hereby granted to Licensee without giving to Licensee the benefit thereof as of the date upon which any such more favourable licence shall become effective; in the event that Licensor enters into such more favourable licence, he will promptly notify Licensee to that effect and advise Licensee concerning the change in royalty rate affecting this licence, but it is mutually understood that no other terms of this licence shall become thereby modified nor waived nor shall this agreement be in any way otherwise affected.

²⁷ Accumulated royalties due to licensor up to the time the plant achieves one third of the capacity would be paid with the first royalty installment.

IX. Selection of technology

In developing countries where scarce financial resources, or other limiting resources, such as energy, have to be used to best purpose, regulatory agencies are often faced with the task of choosing one of a proffered set of competing technologies relating to a particular product (or process area): that is, the regulatory body has to choose between entrepreneurs who offer competing technologies.

Mostly, the approval of a certain technology is expressed in the governmental process of registering a collaboration arrangement between a national entrepreneur and the overseas owner of the technology. Approval of the technology to be employed by companies in the private sector is, however, not an express endorsement of it by the Government as much as it is the acceptance of the entrepreneur (an acceptable investor) and his collaborating terms with the licensor. It is recognized, in this process, that use of technology carries with it an element of risk, which should be borne almost solely by the entrepreneur. Risk is not always associated with the inadequacies or unsuitability of technology—it could lie in insufficiency of demand, underestimation of investment, court restraints (for instance, for patent infringement) or similar factors. In the public sector, however, there is implied government endorsement of the technology that a unit of the sector will employ. The regulatory body in approving a technology transaction is carrying out a limited exercise. Entrepreneurs who submit their proposals will have already evaluated competing technological offers. Also, the level of risk entrepreneurs assume may differ from that of government officials, because subjective assessments of investment levels, markets, product mix, product specifications, anticipated profitability etc. are brought into play.

Political and social factors also arise that influence the choice of technology. Because of tied credits offered by a donor country, the recipient country may favour applicants whose technology employs manufacturing equipment supplied by the donor country. Or, for reasons of social policy, an entrepreneur from a particular ethnic class or social grouping may be favoured even if use of the technology chosen by him did not bring the greatest advantage to the country (e.g. Malaysia). Still again, financial considerations may favour a particular technology, since the firm intending to use it may be able to obtain high foreign capital inputs which the economy needs; or, at the opposite end of the

spectrum, that technology may be welcome that is not tied to capital participation.

For these reasons, the function of a regulatory body can only be construed as that of:

(a) Reviewing the process by which the entrepreneur has selected a particular technology;

(b) Choosing between competing, but otherwise acceptable, technologies (competing entrepreneurs) by considering resource constraints (energy, foreign exchange, technical skills);

(c) Reviewing the technology in terms of the national economy, taking into account the:

- (i) Appropriateness of the national infrastructure for supporting the technology;
- (ii) Value added and other contributions that the technology will make to the economy;
- (iii) Capability of the recipient of technology to absorb and use it;
- (iv) Cost of the technology;
- (v) Source of the technology and its supporting portfolio (patents, trade marks);
- (vi) Terms that will control the use of technology (i.e., terms of the licensing agreement).

Reviewing the entrepreneur's choice of technology

The entire range of manufactured and processed products may be divided into three broad classifications (see also pp. 20-21) and three subclassifications as follows:

Broad classifications

- I. Extraction-based industries—ores, minerals, coal, petroleum etc.
- II. Assembly, or design-based, industries—automobiles, machinery, appliances, furniture etc.
- III. Process-based industries—metals, alloys, chemicals, refinery products, pharmaceuticals etc.

Subclassifications (essentially of III)

1. "Shaped-product" industries—castings, steel rods, plastic mouldings etc. (physical transformation of a single product of III)
2. Compounded-product industries (paints, cosmetics, food products etc.)
3. Combinations of (1) and (2) (garments, tires etc.—shaped products using various processed materials)

This classification is made so as to highlight a group of industries which can be readily reviewed by a regulatory body focusing on technology-related factors.

In the developing country it is difficult to choose the best or most appropriate technology for classification I and the key industries of III because technology factors are often subordinate to other factors such as government strategy, sources of funds, plant location, and export markets. For classification II, technology, again, is subordinate, but to other factors, particularly the management systems involved. However, for the technologies that fall within the subclassifications, the penalty for wrong selection (investment failure, foreign-exchange wastage or loss, etc.) may not be serious for the country. Furthermore, the largest number of private-sector industrial units are established in this sector; and consequently regulatory bodies most frequently encounter the problem of technology choice in this area. The discussion that follows relates largely to this area.

Technology, it must be noted, exists in a triangular relationship with markets and investment and not in a linear relationship, i.e., one following from the other. The entrepreneur's task is to choose a technology that will minimize his risks in investment and markets. This is the selection process that a regulatory body can usefully review.

Market factors

Market factors influence the choice of technology principally in terms of its viability with respect to product volume, product mix and product quality.

The selected technology should give an adequate financial return on a given base load—that is, the entrepreneur's share of the market under conditions of mature markets. However, while technology will tend to be matched to the base load, it must allow for anticipated variations above and below that base load. At the minimum load (a risk assessment of the entrepreneur), the selected technology should yield a return of investment at, or above, the discount rate (see discussion of discounted cash-flow method (DCF) that follows). The maximum load, of course, depends on the design capacity of the plant. Hence,

for illustration, that technology will be chosen to be employed in a plant that will give an adequate rate of return, say, 16 per cent on investment on a base, or operating, load of 10,000 units per annum but that will be capable of handling a load increase of 20 per cent (i.e., plant design capacity) and a minimum load of 70 per cent (at which point the return on investment is 12 per cent, the break-even point, the discount rate).

In terms of product mix, a selected product of the mix should be capable of economic runs. That is, a change of mix should not lead to a sharp rise in the average cost of production or rate of consumption of raw materials. In other words, technology should be flexible enough and readily adaptable to the contemplated product mix with "adverse" consequences (of changing mix) known in advance.

The choice of technology is, again, influenced by the product quality desired. Stringent product specifications (which normally may not be significant in the domestic markets of developing countries) can indeed require the use of sophisticated technologies. Investment costs and operating costs can thus rise sharply and threaten investment returns. By and large, the more usual problem in developing countries is to make plant and technologies, which are otherwise attuned to the sophisticated markets of developed countries, less sophisticated.

One of the objectives behind raising product quality is often to reduce the user's costs or to enhance the user's convenience in an environment of intense competition. Lower product prices or better packaging and distribution are often effective substitutes for over-sophistication and can be the trade-off in technology selection.

Investment factors

Choice of technology profoundly affects investment and operating costs. Technology A, for example, may require 30 per cent lower fixed investment than technology B, but the operating cost (cost of production excluding depreciation) for technology B may be 40 per cent lower. Selecting technology in such a situation, which is commonly encountered, is an exercise in determining what financial resources are available and evaluating economic returns. In one case an entrepreneur may select technology A because of limited funds or lack of foreign exchange, while accepting the disadvantage of high operating costs. In another case, tax concessions may make a project requiring a large investment attractive provided that operation costs are low (technology B).

A simple and straightforward method of comparison, which is somewhat arbitrary, is to compare "production costs", considered to comprise only two elements: direct costs and depreciation (with depreciation including a write-off on the cost of technology).

Table 8 gives investment and operating costs for two technologies.

TABLE 8. COMPARISON OF TECHNOLOGY: INVESTMENT AND OPERATING COSTS

Basis: market size 85,000-95,000 units/year

Item	Technology A	Technology B
1. Maximum capacity of plant (units)	120 000	110 000
2. Fixed investment (thousand dollars)	2 000	3 000
3. Cost of technology (thousand dollars)	500 ^a (running royalties)	300 (paid as lump-sum)
4. Direct costs per year at 80% capacity (thousand dollars)		
Materials	1 400	1 100
Energy	700	400
Labour	100	200
Total	2 200	1 700
5. Depreciation - fixed investment recovered in 10 years (thousand dollars)	200	300
6. Technology cost - recovered in 10 years (thousand dollars)	50	30
7. Annual production cost, (4) + (5) + (6) (thousand dollars)	2 450	2 030
8. Production cost per unit, (7)/(1) (dollars)	25.52	23.06

^aCapitalization of running royalty over 10-year period (see p. 45).

Although purchase of technology A will reduce the entrepreneur's investment and involve him in a lower royalty liability per year (since running royalties apply), technology B would be preferable because of its lower production cost.

This type of approximate analysis can be carried out quite easily by a regulatory body because the data required are straightforward and readily obtainable, and do not, in general, require the entrepreneur to disclose confidential material. However, such a calculation does not take into account the influence of *time* on the implementation of the project, cash flows, the growth rate of markets etc., and, importantly, the value of money.

The most efficient method of comparing projects is that of DCF, which is widely applied today. In comparison to the method shown in table 8, the emphasis in DCF calculations is on the performance of the project as a whole rather than on the advantages of using a particular technology. In other words, the potential of a good technology may be hidden by differences in project completion time, payments phasing etc., unless corrections for these differences are made.

The discounted-cash-flow method

The principle on which DCF evaluations are based is that money has a time value. One hundred dollars received now is worth more than \$100 received in a year's time because in the meanwhile it could have been used to earn a return (interest) by banking it. That is, \$100 invested today at 10 per cent will yield \$110 in a year's time. Therefore, the present value (PV) of a future sum can be calculated by reversing the above procedure. Thus, the PV of \$110 received one year from now is worth \$100 today. Similarly, \$121 received two years from now is also worth (has a PV of) \$100 today. In other words, \$121 discounted for 2 years at 10 per cent has a PV of \$100.

The PV of a future income at a discount rate r is obtained from the formula

$$PV = \frac{\text{Future income}}{(1+r)^n} \quad (1)$$

where n is the future year in which the income is expected to be received.

To carry this analysis one step forward, if the following occurred:

	Income (dollars)
At end of year 1	600
At end of year 2	200
At end of year 3	1 000

the PV of the income, at 10 per cent interest (discount) rate, is

$$\begin{aligned} PV &= \frac{600}{1.1} + \frac{200}{(1.1)^2} + \frac{1,000}{(1.1)^3} \\ &= \$545.4 + \$165.3 + \$751.9 \\ &= \$1,462.60 \end{aligned}$$

while the undiscounted sum would be \$1,800.

If, on the other hand, the three yearly receipts were \$400, \$300, and \$1,100, the PV would be

$$\$363.6 + \$247.9 + \$827.1 = \$1,438.60$$

Thus, \$1,800 received in the first sequence of payments is to be preferred if the method of discounting future income is adopted as a computation criterion.

In project evaluation, however, there are both expenditures (payments) and income (receipts) and these are in the nature of both capital and revenue. The DCF method disregards this accounting difference. In DCF calculations the lifetime of the asset has to be estimated; it is determined by engineers.

An engineering company, erecting a tall building in three years may expect to spend \$800,000 for a derrick and some other capital items (asset life, 3 years) but lease all other equipment. It may

anticipate the following pattern of expenditures and income (dollars):

	End of year 1	End of year 2	End of year 3
Capital expense ^a	-600 000	-100 000	-100 000
Payments to labour	-1 200 000	-3 350 000	-1 000 000
Payments for services	-300 000	-400 000	-600 000
	-2 100 000	-3 850 000	-1 700 000
Payments received	1 800 000	4 200 000	1 750 000
Net income	-300 000	350 000	50 000

^aResale price of derrick on completion of project is taken as zero. Usually, some of the assets will have a residual sales value. This value is added to "payments received" in the year of its expected receipt.

Discounting net income at 10 per cent, the PV of future income is

$$-\$272,730 + \$289,240 + \$37,565 = \$54,075$$

which is considered to be the net present value (NPV), since it takes into account the net discounted income over the life of the asset.

The engineering company may be borrowing and lending money to carry out the project and paying taxes. The costs of these inflows and outflows—interests and taxes—should be provided for and discounted. Any project will be profitable if its NPV is above zero (positive) at the assumed discount rate of 10 per cent.

NPV analysis permits choice between project alternatives, with higher NPV projects preferred. For project comparisons (different technologies) interest rates and taxes are not usually included. Depreciation is also not a factor in NPV analysis. Cost of repair and replacements is, however, included. The DCF method focuses only on money receipts and expenditures i.e., cash received and paid out. DCF is thus a cash-flow assessment. Quantities do not enter DCF calculations (cf. table 8). In effect, DCF analysis says: "Undertake everything that has a NPV of zero or more at a discount rate of X per cent."

The basic assumptions in DCF analysis are: (a) the applied discounting rate is correct; and (b) this rate remains unchanged over the project's life. But why a particular discount rate?

The discount rate, a factor that exists outside the enterprise, does not provide for inflation. It represents the net impact of the costs of raising various types of capital (equity, loans etc.) in the context of the demand and supply of funds and risk factors in the environment. Inflation factors are accounted for separately (see following material).

However, knowing the NPV of a project, say, \$1 million, gives no indication of whether the project is close to the margin of acceptability. For this another measure of profitability is needed. This is supplied by calculating the internal rate of return (IRR), i.e., the yield of a project.

The DCF method can be used to determine the IRR, which can then be compared with accepted norms of yield in a particular industry or economy.

The NPV of project A (using technology X) may be higher than that of project B (using technology Y); but to meet acceptance criteria, project A would also have to have an IRR above the prevailing yield rate. Yield calculations also permit choice between projects with the same NPV.

The IRR is calculated by setting NPV equal to zero and calculating the r of equation (1). The IRR is the rate, therefore, that equalizes expenditures to incomes.

In the example of the engineering company given above, the IRR can be calculated by solving the equation

$$0 = \frac{-300,000}{1+r} + \frac{350,000}{(1+r)^2} - \frac{50,000}{(1+r)^3}$$

for r . By trial and error, it comes out to be about 26 per cent, an extremely attractive undertaking if the yield rate in the industry was 15 per cent (say, dividend expectations on leading stocks).

These calculations assume no inflation. To account for inflation, the PV of a future income should be

$$PV = \frac{\text{Income in year } n}{(1+r)^n (1+i)}$$

where r is the discount rate, i is the anticipated inflation rate in year n , and n the year of income receipt. If, in the above example, inflation is taken as a constant 20 per cent per year, the IRR will turn out to be a little above 8 per cent, an unattractive project at the going yield rate of 15 per cent. Inflation considerations, however, do not apply in choosing technology.

Thus, in assessing technology alternatives, project returns should be the guiding financial criterion. Both NPV and IRR need to be compared, and the combined technology-project arrangement should be to maximize NPV in the alternative selected.

In addition to DCF analysis, the regulatory agency should also take qualitative factors into account such as potential deficiencies in the technical area (the qualities of inputs and outputs); availability of management skills (faults in these areas can seriously delay project implementation or mean utilization of capacity) and the use of economic data (asset life estimations or prices in an environment of competition).

Cost-benefit analysis

In developing countries, where labour is in oversupply and capital is short, the social benefits and costs of using capital, foreign exchange and labour must be weighed. With certain assumptions, it is possible to quantify social income and social costs, assess them over a given period, and obtain the present social value (PSV) of alternative technologies (the equivalent of NPV in industrial studies). Such an evaluation considers output value, cost of imported

inputs, and use of local materials and labour and relates them to government income (custom duties, direct taxes) and effects on other sectors of the economy. This type of analysis is outside the scope of this study.

A simple method, drawn from studies relating to social costs and benefits, can be used in selecting technology. An instance is presented below using foreign exchange as a selection criterion. The evaluation process requires the use of both explicit factors (numerical factors always applicable in technology decisions) and implicit factors (subjective assessment as to whether a particular numerical ratio is acceptable in the context of the developing country).

For example, by spending \$100,000 now on an imported mechanical excavator, a client in a developing country may save, in terms of labour, the local currency equivalent of \$200,000 in excavation costs (2:1 ratio). However, although the project may not suffer in reliability if labour alone is used for excavation, a client (or country) may not favour the substitution unless there is an advantage of 4:1 (or some similar ratio), an implicit factor. This selection ("trade-off") criterion will, of course, depend on the input evaluated. Thus, for imported machinery, the implicit trade-off factor may be 1.5:1 because local equipment may not be efficient.

An explicit factor influencing the choice of technology is the pay-back period, for which there is a standard method of calculation. Table 9 gives an evaluation of two technologies to illustrate the use of implicit and explicit factors.

TABLE 9. COMPARISON OF TECHNOLOGY: PAY-BACK PERIOD AND FOREIGN EXCHANGE

(Equivalent dollars)^a

Item	Technology A	Technology B
Difference in plant costs		
Imported content	-	+ 35 000
Local content	+ 70 000	-
	70 000	35 000
Annual savings in operating costs ^b		
Imported raw materials	-	14 000
Local raw materials	12 000	-
Calculation of pay-back period ^c		
Pay-back on local content	70 000	-
	12 000	
	= 5.83 years	
Pay-back on foreign content		35 000
		14 000
		= 2.5 years

^a At official rates of exchange.

^b Excluding depreciation.

^c The "explicit factor" is the standard calculation of the pay-back period. The implicit factor is to consider whether a quicker pay-back of foreign-exchange expenditure is more valuable to the country than a long pay-back period using only local currency.

Technology factors

Market and investment factors, as discussed above, may by themselves indicate technology preference. However, certain technical considerations (and economic considerations arising from them) may be used to support basic decisions.

Important technical matters that should be considered when technology is chosen are:

Annual hours of operation of plant

Maintenance requirements

Impact of increase or decrease in capacity on product quality and in material and energy efficiencies

Minimum consumption of critical or limiting resources (i.e., petroleum fuels)

Batch *versus* continuous operations and their impact on operating costs, plant maintenance, product quality and product mix

Possible pollution implications

Safety of workers and public

Effect of high and low operating temperatures and pressures on investment cost, on plant maintenance, and especially on life of plant

Inventory costs

An economic consideration arising from technical factors is the cost of correcting defective performance. This cost involves both investment and time factors, which can be assessed by NPV analysis.

Areas of technology that are likely to lead to defects should be examined (see pp. 24-25). Plant viability can be vitiated by deficiencies in capacity, raw material, energy efficiencies and product quality. Most often they can be rectified, but at a cost. The licensor's financial liabilities (expressed in relation to performance guarantees) may be invoked, but they may be inadequate to cover the total cost of correcting a deficiency.

Assuming that a 10 per cent deficiency can arise in capacity (or yield or quality etc.) the technical analyst must be able to identify the crucial equipment or process stages in technologies A and B that can lead to this shortfall and then estimate the likely cost (and time) of correction—and the consequent dependence on imports, if any. Sensitivity analysis is an additional tool.

In sensitivity analysis, the entrepreneur's loss of profit is calculated for each unit percentage loss of capacity. The calculation is repeated for quality defects (lower market price), increased rate of consumption of materials etc. The most critical of such factors—those that could lead to large losses—is then treated in terms of the cost of correction (the licensor may have to supply the necessary information). The cost of correction, of course, must be lower than the benefit obtained.

Suggestions to the regulatory agency

A regulatory body will find it very difficult to compare technologies on a quantitative basis without a large staff with intimate knowledge of markets, technologies and methods of investment analysis. Further, even if the agency's staff are so qualified, they may differ with the entrepreneur in their

subjective assumptions on applicable discount rate, asset life, credibility of the licensor's data, project implementation time etc.

The specific methods illustrated in tables 8 and 9 may be the most suitable for a regulatory body to apply. To support them, however, the qualitative implications of the factors considered in this chapter may be employed.

X. Product pricing

The relevance of product pricing to the subject of licensing is evident from its relationship, via enterprise profitability, to royalty rates. This relationship was stated earlier (p. 40) as:

$$\text{ROS} = \text{LSLP} \times \text{POS}$$

To approve a royalty rate or formula, a regulatory body has to assess LSLP, but LSLP depends on the profitability claimed by the national entrepreneur, which, of course, is closely related to the price he anticipates for his products. Thus, the regulatory body needs some yardstick to understand claims of pricing.

It is easier to assess prices of products in the context of a developing country than it would be for a new product being introduced on the world market because most products resulting from transfer of technology are import substitutes for which there are likely to be reference prices—either international prices or the prices the licensor obtains on his domestic market. However, because price depends on the volume of the product a licensee can sell in his emerging market, which is smaller than in industrialized economies, prices in developing countries tend to be higher than the reference prices. Other factors can also affect price such as cost of raw materials used, reputed product trade marks, tariff barriers, patent monopoly and exclusive know-how rights.

In many situations the domestic price does not depend on the actions of the entrepreneur alone. If there is competition in the domestic market from similar products, then there is a "market price" above which the entrepreneur's product cannot be sold. Similarly, if there is tariff protection (but no import quotas), the maximum price at which a product can be sold is determined by the landed price (c.i.f. price and tariff) of the imported product.

However, in many cases reference prices, even when available, cannot be applied directly, namely, when:

(a) Imports are banned (or tantamount to being banned); then the local firm obtains the best price it can;

(b) Functional substitutes are available (e.g., wallpaper and paint are interchangeable);

(c) There are various qualities of a product (e.g., soap) or various ways of designing or styling a product (e.g., garments or transistor radios);

(d) The product is a subassembly (e.g., a carburettor subassembly) for which comparative or reference prices cannot be established;

(e) The manufacture of a product is subcontracted, i.e., total plant production is contracted for a certain value;

(f) The product is a critical drug or pesticide for which substitutes do not exist and their use is essential in the social framework of a country.

Cases (b) and (c) are relatively easy to handle in terms of admissibility of price. The other cases require a multiplicity of techniques that can only be indicated in this study.

Functional substitutes

Wallpaper and paint can perform the same function of protecting a surface; a PVC pipe and a polyethylene pipe can carry the same liquids at the same pressure over equal distances; an incandescent light bulb and a fluorescent tube can light up an area equally well etc. In such cases, direct price comparisons are inconsequential, but price relevance can be considered in terms of the impact of price on the final cost to the user or on the user's savings.

Thus, 1,000 square metres of wallpaper may cover the same area as 15 kilograms of paint, last twice as long, but take 30 per cent more labour to apply. Reduced to these economic parameters, the trade-off price at which the new product (wallpaper) can substitute for an existing product (paint) can be calculated by ordinary arithmetic.

In the case of the fluorescent tube *versus* the incandescent bulb, the user's savings can be employed as the criteria to obtain price equivalence. The former's capital cost (depreciation) and working cost (energy requirement) for lighting the same area, for a stated illumination intensity, must be contrasted with that of the incandescent bulb. Thus, if \$100 can be saved over five years by using 10 fluorescent tubes, it may be equitable for a single fluorescent tube to be priced \$5.00 higher than the bulb. The consumer, over five years, will still save \$5.00 over the use of the bulb. (See pp. 44-45 where such a savings concept is applied to the pricing of technology).

A similar treatment can be given to the case of the two types of plastic pipe. Here, however, some additional comparisons can be made. The price-per-

unit-volume of product and price-per-unit-weight of product can, respectively, be compared with international price ratios.

The ratio concept, in fact, can be used to assess price in a variety of situations. Suppose pumps of 20-40 hp are to be introduced when the prevailing range is 5-15 hp. The proposed pricing of the new range can be tested against the reference domestic price by calculating the price as dollars per hp. (In fact, two reference prices can be used—the domestic prices of the 5-15 hp range and the import prices of the 20-40 hp range). The assessment criterion is that the price per unit horsepower for the new range should not differ greatly from that of the existing range (in fact, it should be lower because of scale factors). Thus, if pumps in the 5-15 hp range were in the range of \$40-\$50 per hp, it can be judged that the new pumps would be below \$40 per hp.

Similarly, if sheet steels are to be introduced in an economy when present production is only structurals, the price per unit weight of sheet steel to that of structurals should be roughly comparable to the corresponding international ratio, even if the domestic price of either product is well above international reference prices. In Poland and the Union of Soviet Socialist Republics, machine tools, steel manufacturing machinery etc. are indeed priced and sold on their weight so long as the degree of complexity of the equipment is about equal.

It should be noted that cost of production is not a factor in the attempts to evaluate price relevance discussed above.

Pricing in the context of design, model and quality

A firm may risk investment to compete in terms of design or quality. Thus, an electronics firm may

believe there is scope for introducing a 2-band transistor radio with a design (style) different from that of existing radios, with a lower weight and higher frequency range. Or a firm may believe a more foamy toilet soap with a lower discard weight can capture a segment of the total soap market. In these cases, price assessments based on function (paint *versus* wall-paper), savings, or ratios may not be relevant.

The criteria of "value judgement" can be introduced in their place. Table 10 illustrates the case for examining the price asked for a newly designed radio (having both quality and design changes) as compared with existing radios.

Evaluation criteria for cases (a), (d), (e) and (f) of p. 61 can be exceedingly complex.

In the monopoly situation of case (a), the manufacturer will tend to raise price by reducing volume. The demand projections of the manufacturer may not be verifiable by a regulatory body. While an international price may be a reference price, the domestic manufacturer can be expected to realize abnormal profits. Thus, the criterion of LSLP for royalty rate approval has to be used with great caution.

For cases (d) and (e), international or domestic reference prices are not generally available. Price judgements, however, can still be made to some extent by considering the value added by domestic manufacture, that is, if the subcontracted item is part of an auto engine block, the ratio of its price to value added (marketed price less cost of purchased materials) can be compared with the price/value-added ratio of another product for which the value added (and complexity factor) is about the same, say, an electric generator. (Value added for an existing

TABLE 10 PRICING AND DESIGN FEATURES

Factors weighed by user	Relative value of design feature to user (%)	Distribution of manufacturer's price relative to features (dollars)	Manufacturer's assessment of performance of his new product (%)	Reconstructed price of new product (dollars)
Compactness and weight	20	12.00	+ 10 ^a	13.20 ^b
Energy consumption	15	9.00	- 15	7.65 ^b
Frequency range of reproduced sound	25	15.00	+ 15	17.25
Loudness (wattage)	10	6.00	- 15	5.10
Style and appeal	15	9.00	+ 25	11.25
Price range	15	9.00	- 5	8.55
	100	60.00		63.00
		= price of radio as sold currently		= proposed price for new radio

^aThe manufacturer of the new model believes users will pay 10% more for the improved compactness he has designed.

$$^b \$13.20 = \$12.00 \times \left(\frac{100 + 10}{100}\right); \$7.65 = \$9.00 \times \left(\frac{100 - 15}{100}\right)$$

domestic product can usually be obtained from profit-and-loss statements of the firm). Weight ratios, horsepower ratios etc., as discussed earlier, should also be evaluated to obtain confirmatory data.

In the case of (f)—drugs and pesticides—there are many complicating factors, particularly if products are available only from controlled sources. Such situations also result from the patent system. Because of the legal rights of the patentee, the price of the same drug may vary widely between countries. And

from the viewpoint of price assessment, the price in a developing country is frequently higher than the price in a developed country, for no ascertainable reason. Prices, in these cases, can be evaluated only in approximation. One method that can be applied—and which indeed is sometimes considered by the patentee—is to relate total potential sales value of, say, a pesticide in a country to its gross national product (or to disposable income) and compare the ratio with that prevailing for other proprietary pesticides.

Annex I

TYPICAL TECHNICAL PROVISIONS OF A CONSULTANCY CONTRACT

Programme of work

Phase A. Market survey; raw material survey; preliminary site study

Market survey

Points to be included in the market survey are:

1. Review and summary of previous findings (if any) in field of investigation
2. Market data for past 10 years and forecast for next 10, stating assumptions made; summary of specific interviews with suppliers and consumers; the survey to include

Consumption by major product classifications
End use applications
Major clients, their equipment and facilities
Geographical distribution of market
Leading wholesalers, importers and retailers

3. Quality requirements with reference to
End-use applications
Competing products, domestic and imported
Export needs
Deficiencies in quality of existing products
4. Price history and forecast by grades (with assumptions used)
5. Merchandising and distribution methods used and cost of these functions, including
Customer servicing
Depot stocking
Transportation and delivery
6. Terms of payment, discount schedules, trade allowances
7. Competitor profiles; brand names
8. Tariffs, taxes and duties in industry
9. Price-volume sensitivities
10. Government policies
11. Approach to export markets
12. Structure of industry

Raw materials survey

Points to be included in the raw materials survey are:

1. Review and summary of available studies
2. Forecast of raw material requirements

3. Review of availability of raw materials and need for imports
4. Review of quality and specifications
5. Geographical location of supplies
6. Present utilization pattern
7. Raw material requirements
8. Transport suitability and bottlenecks
9. Delivered costs
10. Tariffs, taxes etc.
11. Contracting terms for raw materials
12. Government policies

Site survey

The site survey should appraise:

1. Alternative sites, relating them to market areas and raw materials
2. Availability of land, ownership, and cost
3. Suitability of terrain; development costs
4. Availability of infrastructure—transport, fuel, water, power, access, communications etc.
5. Availability of labour

Phase B. Detailed studies of selected alternatives; production facilities; investment analysis

On the basis of decisions taken on alternatives, the studies should:

1. Identify client's share of market, recommend product-mix and expansion needs; identify raw material sources
2. Complete detailed site studies of
Site boundaries
Costs of acquisition
Topography of land with respect to foundation conditions
Arrangements needed for, and costs of, utilities, effluent disposal
Rail and road system
Access to construction services and equipment
3. Define production facilities:
Prepare flow chart
Layout of plants, buildings and machinery

- Specify major process equipment
List alternative suppliers
Draw up safety requirements
4. Define implementation time; prepare PERT charts for major events
5. Define manpower requirements; construction, production, testing, quality control; maintenance; sales and distribution; management
Review industrial relations in industry and geographical area
Define social amenities—personnel services, housing, health, transportation, training
6. Recommend sources of technology, engineering and construction services

7. Capital cost and investment studies:
- Estimate capital costs (land, building, machinery)
Estimate non-construction costs (financing and legal expenses, personnel training, licensing and engineering fees, interest during construction)
Prepare cash flow statements (forecasts of revenue, costs and profits) and project returns (DCF etc.)
Propose financing plan, identifying sources of finance, interest rates, grace period for repaying loan, repayments schedule
Define loan contracting provisions
Present profit-and-loss statements and balance sheets for five years
Recommend financial policies

Annex II.A

CHECK-LIST FOR SCREENING PATENT AGREEMENTS OR PATENT CLAUSES
IN OTHER AGREEMENTS

- | Yes | No | Yes | No |
|---|----|---|----|
| | | | |
| 1. Is the patent licence a separate document? | | 10. Has the licensee had access to the published patents? | |
| or | | 11. Has the licensee negotiated rights of (grant of): | |
| Are there patent-related clauses in the agreement? | | Make | |
| 2. Does the patent licence support know-how,—i.e., is it essential for use of know-how? | | Use (as applicable) | |
| 3. Is the patent licence expressly sought by the licensee? | | Sell | |
| 4. Are several patents covered in the patent licence? Are they listed? | | in domestic territory? | |
| 5. Have the patents been issued in the licensee's market territories? | | 12. Are there similar rights for export territories? | |
| Domestic | | 13. Would the licensee be the sole patent licensee in domestic (national) territory? | |
| Export | | 14. Can the licensed product (or product produced through the licensed process) be imported by a party other than the licensee? | |
| 6. Is there a "most important" or "basic" patent? | | 15. Does the licensor represent that licensed patents are not infringing on third-party patents? | |
| 7. Does the patent have a sufficiently long unexpired life? | | ("No" would be inadmissible) | |
| 8. Do(es) the patent(s) relate to and define: | | 16. Is the licensee indemnified against third-party claims of patent infringement? | |
| (One or more elements may be involved) | | ("No" would be inadmissible) | |
| Product | | 17. Who has the responsibility for detecting infringement of the licensed patent? | |
| Process or technique | | Licensor _____ | |
| Design or model | | Licensee _____ | |
| Formula | | Both _____ | |
| Other Specify: | | | |
| 9. Is there a patent-related fee or royalty? | | | |

- | Yes | No | Yes | No |
|-----|---|-----|---|
| 18. | Who will bear the costs of litigation in the event that the licensor's patents are infringed?
Licensor _____
Licensee _____
Both _____ | 24. | Are any of the following restraints present, and if so, accepted by the licensee?
Site of production
Volume of production
Pricing of products
Sublicensing rights
Marketing area
Product mix (field of use)
Compulsory use of the licensor's personnel |
| 19. | Is the licensor's overall financial liability in the patent agreement specifically covered? | 25. | Will the licensee have rights to future patents of the licensor in field of use (particularly, patents on improvements)? |
| 20. | Can the licensee operate the process, make and sell the product, after the lapse of the agreement but before the lapse of the patent? | 26. | Are provisions for cancelling the patent licence (if any) acceptable to the licensee? |
| 21. | Is the licensee obligated to purchase
Patented _____ Unpatented _____
products or components from licensor? | 27. | Is the duration of the agreement defined? |
| 22. | Is the licensor obligated to keep all licensed patents in force? | 28. | Is the governing law of the contract (which is not a subcontract) that of the licensee's country?
("No" would generally be inadmissible) |
| 23. | Is a most-favoured-licensee clause incorporated in the agreement? | | |

Annex II.B

CHECK-LIST FOR SCREENING KNOW-HOW AGREEMENTS OR KNOW-HOW CLAUSES IN OTHER AGREEMENTS

- | Yes | No | Yes | No |
|-----|--|-----|--|
| 1. | Is know-how a key acquisition through the licence agreement? To be a key acquisition, a large payment for it must be involved and substantial part of the know-how maintained in secrecy.
If "no", review only starred questions. | 6. | Does the licensee want the following rights in market territories (for each market territory):
Right to make product?
Right of use of process?
Right to sell product?
Right to sublicense know-how?
Exclusivity to make?
use?
sell? |
| *2. | Does the know-how agreement include services such as engineering or technical services, or are they separately contracted for? | 7. | Are there special features to know-how (seen from licensee's viewpoint) such as:
Savings in investment over competitive technology?
Significantly lower costs of production over competing technology?
Product has a price advantage over those of other local producers? |
| 3. | Does know-how support a patent licence? (See also question 29.) | | |
| *4. | Is know-how defined as constituting, in part or whole, secret information? | | |
| *5. | Is there then an acceptable secrecy clause in the agreement? (See p. 12.) | | |

	Yes	No		Yes	No
Savings on a critical resource (raw material, power, foreign exchange, labour)?			(a) Field of use		
8. Can know-how be described as:			(b) Marketing territories (including export)		
Extending practically across the total plant?			(c) Site of manufacture		
Confined to a few critical areas?			(d) Volume of production		
9. Does the agreement define (see pp. 12, 52)			(e) Process improvements		
Product?			Outflow _____		
Process?			Inflow _____		
Capacity?			(f) Product quality		
Starting materials?			(g) Right-of-use of know-how after lapse of agreement		
10. Is know-how fully defined? (Check through items (a)-(k) of p. 13.)			(h) Compulsory purchases of engineering or materials from the licensor		
*11. Has the licensee received the prior disclosure of know-how?			16. Is duration of agreement defined (see p. 53)		
If "no", is there a know-how description clause?			From commencement of agreement?		
Not applicable			From a fixed date?		
Not significant			From commencement of production? (Would it be production at full capacity?)		
12. Has know-how been defined in the agreement as:			Is agreement period sufficient for absorption of technology?		
Know-how in the licensor's possession as of date of agreement?			*17. Is the secrecy period longer than the agreement period?		
Know-how in licensor's possession of a specified date or event (i.e., plant start-up)?			If so, is it acceptable?		
Know-how in the licensor's current possession together with process improvements that will come into his possession over the life of the agreement?			18. After lapse of the agreement can the licensee use the know-how for higher production? At new sites etc.? (See p. 18.)		
When will know-how be disclosed to the licensee?			*19. Is remuneration to the licensor clearly defined? (See annex II.C.)		
13. Will know-how comprise:					
Written information?			Performance of know-how		
Overseas training of personnel?			20. Does the licensor provide guarantees/warranties in respect of process (or product) performance? (See pp. 19-21.)		
On-site training of personnel?			21. Is the licensor financially liable for defective performance?		
Organizational advice?			22. Is there a specification of performance in the agreement?		
Combinations of above?			23. Mark W or G when a warranty or guarantee is given for each of the specifications listed below.		
Specify:			Volume of production per year/shift		
14. Is know-how transmittal defined? (See p. 14.)			Yield of product/productivity/material efficiencies		
15. Has the licensor placed any restraints on the licensee in respect of the following, and are they reasonable considering fees, markets etc.? (See pp. 16-19.)			Purity of product/product specifications		
Licensor can make _____ use _____			Consumption of utilities		
sell _____ licensed product in the licensee's territory (domestic and export)? The right is exclusive _____			Catalyst life/die life/refractory life		
non-exclusive _____					

- | | Yes | No | | Yes | No |
|---------------------------------|--|----|--|---|----|
| | | | Mechanical warranties | | |
| | | | Pollution and other statutory regulations | | |
| 24. | Are a design conference and test procedures conference defined in the agreement? (See p. 23.) | | (d) | If "yes", does the licensee have the option of approving the qualifications and experience of the licensor's personnel? | |
| | Not applicable _____ | | (e) | Will the licensor provide the following services: | |
| 25. | Are remedies available to the licensee for faults and deficiencies defined in the know-how agreement? (See p. 23.) | | | Plant operation manuals? | |
| | | | | Plant maintenance manuals? | |
| | | | | Proprietary materials? | |
| | | | | During term of agreement? Beyond term? | |
| 26. | For measuring performance, is parameter criticality defined by the licensee? (See p. 24.) | | | Quality control standards? | |
| | | | | Product testing facilities at licensee's site? | |
| | | | | Plant start-up services? | |
| | | | | Marketing support? | |
| | | | | Product literature? | |
| | | | | Customer technical service? | |
| | | | | Is the fee for these services included in the know-how fee? | |
| | | | 31. | Does the agreement contemplate expansion of the licensee's facilities? Are adequate provisions made for access to further services from the licensor and payments therefor? | |
| Discharge of liabilities | | | Process Improvements | | |
| 27 (a) | Has the licensor reserved to himself options in discharge of liability for defective performance? (See p. 25.) | | 32. | Is there a clause defining process improvements and corresponding right-of-use clause? | |
| (b) | Does the contract establish at what point and/or stage the licensor becomes hable for discharge of liabilities? | | 33. | Does the licensee have access to the licensor's improvements?
If "yes", how is "access" defined? | |
| (c) | Does the licensee have the option of accepting damages or requiring the licensor to commit himself to correct the process? | | 34. | Will the licensee only obtain improvements that have been commercialized by the licensor? ("No" may mean that all improvements will be disclosed.)
Will patented improvements be available to the licensee?
Is there a disclosure fee for improvements? | |
| * (d) | Does the contract provide that if the process or product cannot be corrected within the limits of the licensor's liability the licensor will correct the defect at the licensee's cost? (See p. 25.) | | 35. | Are there provisions for reciprocal flow of information and right-of-use from licensee to licensor? | |
| *28. | Are there specific provisions for settling technical matters by arbitration? | | 36. | Will improvements flow in both directions throughout the life of the contract? | |
| *29. | If the know-how is unsupported by patent licences, does the licensor indemnify the licensee if the know-how infringes on patents of third parties? | | 37. | Will the licensee's personnel be trained to use the process improvements?
Where? | |
| | | | 38. | Who will bear the training costs? | |
| Know-how services | | | | | |
| 30 (a) | Does the licensor agree to train the licensee's: | | | | |
| | Plant operators? | | | | |
| | Salesmen? | | | | |
| | Managers? | | | | |
| (b) | Will training be at: | | | | |
| | Licensor's site? | | | | |
| | Licensee's site? | | | | |
| | Both? | | | | |
| | Will the training include maintenance? | | | | |
| (c) | Does the licensor agree to provide his personnel at the licensee's site to effect know-how transfer? | | | | |

Annex II.C

CHECK-LIST FOR EVALUATING REMUNERATION PROVISIONS

- | | Yes | No | | Yes | No |
|--|-----|----|--|-----|----|
| 1. Does the licensor receive remuneration for: | | | 11. When will the licensee's operations attain profit-maturity? | | |
| Know-how | | | First third of agreement period | | |
| Patents _____ most important patent _____ | | | Second third of agreement period | | |
| Trade marks | | | Final third of agreement period | | |
| Technical service or assistance | | | 12. Considering impact of profit maturity on income-sharing, is the calculated LSLP acceptable? (See p. 41.) | | |
| Engineering | | | 13. Do licensee's operations consist of: | | |
| Consultancy | | | Conversion of basic raw materials? | | |
| Combination of above (if yes, specify) | | | Assembly operations? | | |
| 2. Is remuneration separate for each grant and service? | | | One- or two-step processing and packing operations (i.e., formulation of an insecticide)? | | |
| 3. If "no", is licensee's payment related to licensee's needs? (see pp. 39-40.) | | | 14. Considering question 13, what would be ratio of royalty outgo to value added? | | |
| 4. Is there a separate payment for short-term services? | | | Is it acceptable? (See p. 44.) | | |
| If "yes", see question 21. (See p. 5.) | | | 15. Are there sole suppliers of raw materials or sole distributors of finished goods? | | |
| 5. Remuneration (for know-how, patents, trade marks, continuing technical services) is in the form of: | | | 16. If yes, reconsider question 10 to answer whether profits are being maximized at the manufacturing level. | | |
| (a) Running royalties? | | | 17. What is royalty rate based on? | | |
| (Does rate change over agreement period?) | | | Sales value of goods? | | |
| (b) Lump-sum fee? | | | If so, is sales value defined? (See p. 52.) | | |
| (c) Combination of (a) and (b)? | | | Production units (sold products)? | | |
| 6. What is the duration (payments period) of agreement? _____ years. | | | Use of raw material? | | |
| 7. Does the licensee have the choice of electing 5 (a), (b) or (c)? | | | Licensee's profits (agreed definition of profit)? | | |
| 8. If "yes", are the amounts interrelated through NPV analysis? (See pp. 45-46.) | | | 18. Is there a ceiling on the royalties to the licensor? (See p. 47.) | | |
| What is ratio of NPV to fixed investment? _____ per cent | | | If so, what is its basis? | | |
| Is it acceptable? | | | Fixed or maximum product selling price | | |
| 9. What is the licensee's estimate of profit on sales? | | | Cumulative royalties | | |
| (If not furnished, what is regulatory body's estimate?) (See p. 40.) | | | Upper limit on total income over contract period | | |
| _____ per cent | | | 19. Is there a minimum royalty? | | |
| 10. Considering the relationship (see p. 40) | | | If yes, is there a reciprocal ceiling on the licensor's income in any given year? | | |
| $ROS = LSLP \times POS$ | | | | | |
| What is LSLP? _____ per cent | | | | | |
| Is it an equitable income-share for the licensor? | | | | | |

- | | Yes | No | | Yes | No |
|---|-----|----|---|-----|----|
| 20. Reconsider question 13. Would a components-adjusted royalty rate (see p. 48) lead to improvement in value addition?
Is the prime royalty rate high enough to induce value added? | | | Variable fee (based on fixed rates for services)? | | |
| 21 (a) For short-term services (see pp. 5-6), is there
A fixed fee? | | | (b) Has the licensor provided in the agreement, or elsewhere indicated, level of effort (i.e., man-days)? | | |
| | | | (c) Is the total cost of services in acceptable proportion to the fixed investment of the project? | | |

Annex III

KNOW-HOW AGREEMENT: PROCESS DISCLOSURE INFORMATION (LICENSOR'S SERVICES)

- | | |
|---|--|
| <p>1. Written description of recommended process for 10,000 t/a plant, including identification of all important and significant physical and chemical reactions occurring</p> <p>2. Process chemistry and conditions for achieving the grades of end-product listed in schedule X</p> <p>3. Process and material balance flow-sheets showing process flow, flow rates, compositions, physical properties, temperatures and pressures, energy balances</p> <p>4. Raw material, catalyst and product specifications</p> <p>5. Utility requirements (steam, air, fuel, refrigeration, electric power, nitrogen); raw material efficiencies; catalyst and consumption of supplementary chemicals</p> <p>6. Plant plot plan</p> | <p>7. Major equipment specification sheets and sketches, including special mechanical features (if any); materials of construction, corrosion allowances; design codes to be followed for critical equipment</p> <p>8. Description of major instrumentation, control loops and special alarms</p> <p>9. Effluent-handling diagrams to meet statutory requirements or best-known practice</p> <p>10. Operating manuals for key process stages</p> <p>11. Safety considerations report</p> <p>12. Important analytical procedures for process control, finished product and raw material analysis</p> <p>13. Plant start-up assistance (with licensor providing start-up engineers)</p> <p>14. Non-obligatory review of engineering design prepared for battery limits project</p> |
|---|--|

Annex IV

ENGINEERING AGREEMENT: SCOPE OF CONTRACTOR'S SERVICES²⁸

- | | | | |
|--|--|---------|---|
| <p>1. Detailed plot plan showing locations and elevations of all major equipment</p> <p>2. Piping and instrumentation flow-sheets, including:</p> <p>(a) Piping lists, giving line number, size, specification, starting and terminating points, insulation requirements;</p> <p>(b) Lists of safety valves, rupture discs, strainers, steam traps, ejectors etc.;</p> | <p>(c) Instrumentation lists, including pressure and temperature gauges, transmitters, recorders/controllers, showing type, recommended manufacturer, materials of construction, action and modes, ranges etc.</p> <p>3. For major equipment, the following will be specified in the engineering report:</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 30%;">Purr ps</td> <td>Type and speed, prime mover, seal, coupling, mounting flanges, lubrication and special features, if any</td> </tr> </table> | Purr ps | Type and speed, prime mover, seal, coupling, mounting flanges, lubrication and special features, if any |
| Purr ps | Type and speed, prime mover, seal, coupling, mounting flanges, lubrication and special features, if any | | |

²⁸ Work not specified here is assumed to be performed by client.

Direct fired heaters	Type of heater, pressure drop, safety features, code requirements, refractory, insulation	4. For imported customer-specific fabricated equipment, to provide specifications, dimensional drawings, service requirements and wiring diagram where applicable. Such data will be supplied to the extent that overseas suppliers of equipment (not associated with the Engineering Company) normally provide them to their local customers. (Where detailed mechanical drawings are necessary, the client can obtain them by making additional payments to suppliers willing to part with their designs. Such payments—at actuals—will be to the account of the client.)
Heat exchangers	Complete specifications, including mechanical rating as per standards used in United States of America	5. Mechanical design of all major equipment to be fabricated in (country) _____ (but no constructional details and/or shop drawings will be supplied)
Blowers and compressors	Type and speed, prime mover, seals and packings, couplings, dynamic loading, lubrication	6. Listing of utility requirements for key process equipment showing quantity, quality and feed point for each utility
Distillation column	Tray-type recommended, tray spacing and support rings, critical nozzle location and orientation for process, column internals, instrumentation, and safety valve connections	7. Local and overseas procurement service for major equipment
In-process tankage	Complete specifications, including sketches, sizes, construction materials, venting and pressure rating	8. Constructional supervision in key equipment areas (to be specified after design conference is held)
Equipment foundations	Data on dynamic and static loads distribution	9. Assistance in writing operating manuals
Electrical	One-line diagrams; grounding system details	

Bibliography

- Brazell, E. Edmunds. Licensing checklists. Havant, Hampshire, Mason.
- Finnegan, Marcus B. and Robert Goldscheider. The law and business of licensing. Rev. ed. New York, Clarke Boardman, 1977.
- Fisher, Thomas E. Foreign licensing checklist. *Trade-mark reporter* 51:570-477, 1961.
- Foreign Operations Service. Contracts and agreements. Essex, Conn. 3 v.
- Melville, L. W. Forms and agreements on intellectual property and international licensing. Rev. ed. New York, Clarke Boardman, 1977.
- National Industrial Conference Board. Appraising foreign licensing performance. New York, 1969. (Studies in business policy, 128)
- Foreign licensing agreements—contract negotiation and administration. New York, 1959. (Studies in business policy, 1959)
- Foreign licensing agreements—evaluation and planning. New York, 1958. Studies in business policy, 86)
- Patent council in industry. New York, 1964. (Studies in business policy, 112)
- Pallzein, Gatz and George Bronfen. International licensing agreements. Indianapolis, Ind., Bobbs-Merrill, 1965.
- United Nations. Guidelines for the aquisition of foreign technology in developing countries. Sales no.: 73.II.B.1.
- National approaches to the acquisition of technology. (Development and transfer of technology series) Sales no.: 78.II.B.7.
- The role of patents in the transfer of technology to developing countries. Sales no.: 65.II.B.1.
- United States Trademark Association. Trademark management: a guide for businessmen. New York, 1955.
- Wise, Aaron N. Trade secrets and know-how throughout the world. Rev. ed. New York, Clarke Boardman, 1977.
- World Industrial Property Organisation (WIPO). Licensing guide for developing countries. Geneva, 1977 (No. 620 E)
- Major provisions of trademark legislation in selected countries. Geneva, 1977. (No. 113 E)

The UNIDO Development and Transfer of Technology Series

- *No. 1 National Approaches to the Acquisition of Technology (ID/187), Sales No. E.78.II.B.7. Price \$US 8.00
- No. 2 UNIDO Abstracts on Technology Transfer (ID/189)
- *No. 3 The Manufacture of Low-cost Vehicles in Developing Countries (ID/193), Sales No. E.78.II.B.8. Price: \$US 3.00
- / No. 4 Manual on Instrumentation and Quality Control in the Textile Industry (ID/200)
- *No. 5 Technology for Solar Energy Utilization (ID/202), Sales No. E.78.II.B.6. Price: \$US 10.00
- No. 6 Audio-visual Techniques for Industry (ID/203)
- No. 7 Technologies from Developing Countries (I) (ID/208)
- No. 8 Process Technologies for Phosphate Fertilizers (ID/209)
- No. 9 Process Technologies for Nitrogen Fertilizers (ID/211)
- *No. 10 Brickmaking Plant: Industry Profile (ID/212), Sales No. E.78.II.B.9. Price: \$US 4.00
- No. 11 Technological Profiles on the Iron and Steel Industry (ID/218)
- No. 12 Guidelines for Evaluation of Transfer of Technology Agreements (ID/233)

In Europe, North America and Japan, all the numbers listed above are free except those marked with an asterisk, which are distributed in those areas in a separate sales edition at the price shown. Outside Europe, North America and Japan, all the numbers are free without exception.

Requests for free copies, quoting title and ID number, should be addressed to the Editor, *UNIDO Newsletter*, P.O. Box 300, A-1400, Vienna, Austria.

Copies of the sales editions should be ordered by title and sales number from an authorized distributor of United Nations publications or from one of the following offices:

For Europe
Sales Section
United Nations Office
CH-1211 Geneva 10
Switzerland

For North America and Japan
Sales Section
United Nations
New York, New York 10017
United States of America

G-556



81.08.20