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LICENSING OF ENGINEERING AND MANAGERIAL SERVICES 1/

by

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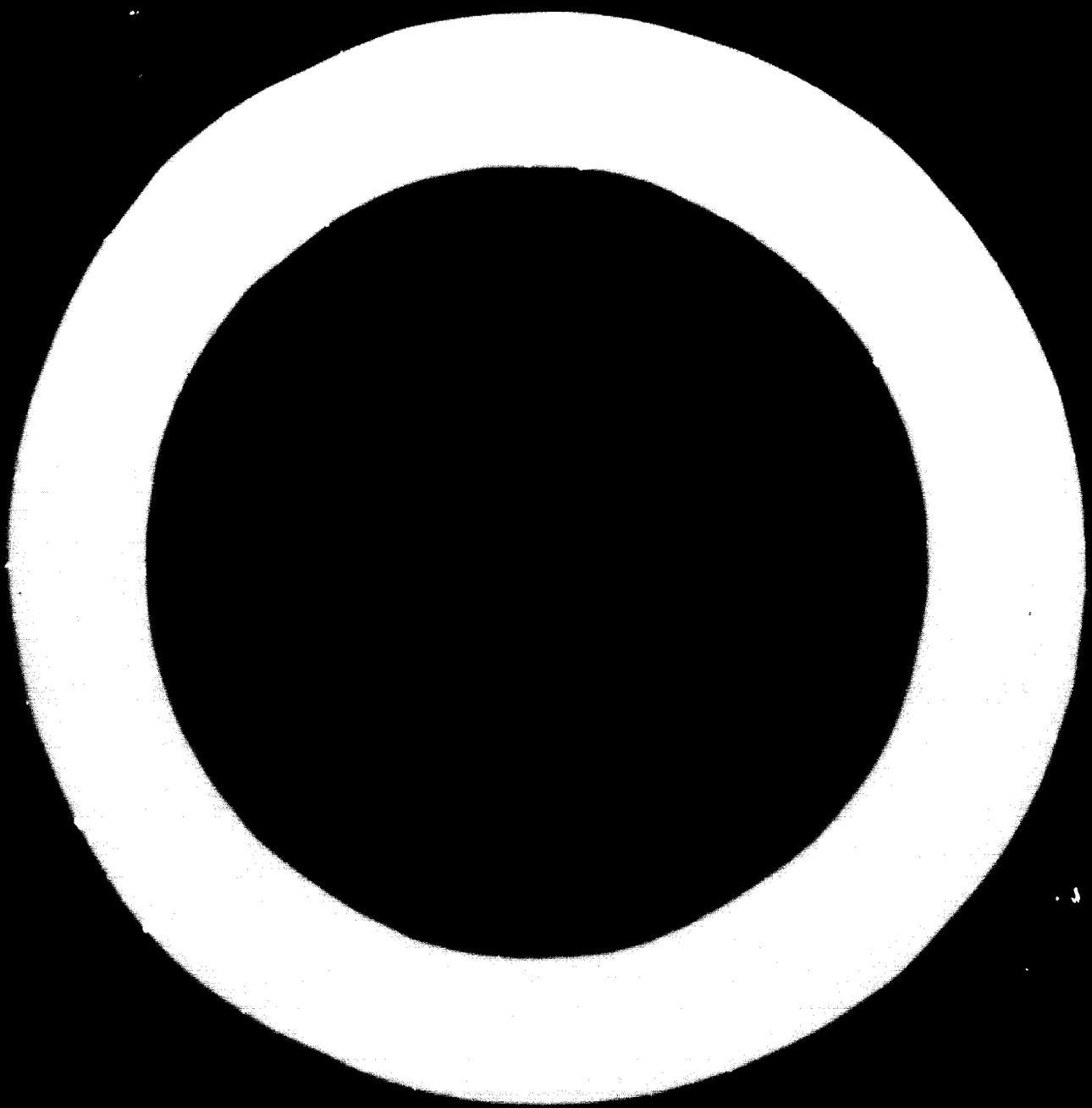

I. SCOPE OF PAPER

1. The objective of this paper is to evaluate the influence of environment in the developing country on contractual agreements between developing and advanced countries, with specific focus on engineering and managerial services. The 'buying' and 'selling' entities, in such arrangements, view the same situation quite differently based on their own evolutions of experience; there are tacit assumptions behind contractual terminology which are not read the same way. The motives and expectations of the concerned parties are profoundly determined by the social and political institutions of their respective countries and therefore it is not the legal framework alone which constitutes the communications barrier. By the dictate of circumstance, the firm in the developing country is both contracting on a specific issue and at the same time expecting to learn, to be educated, in the larger context. The firm in the developed country, similarly, is not just negotiating with an isolated organisation but is seeking new opportunities in the developing country. However, the eventual contract is not a linear, one-dimensional arrangement as would occur between firms within an advanced country, or in two advanced countries; the Government of the developing country directly and indirectly determines and approves the terms of contract. The overtones in such approval relate to the diffusion of learnt skills into the economy and their impact on efficiency, exports, etc - aspects which the ex-patriate firm could find extraneous.

2. In dealing with contractual matters that arise in engineering and managerial services, the pre-occupation of the parties is with the definition of project, determination of its needs and division of responsibilities in its execution. If such services are seen as a separate arrangement, isolated from know-how licensing, many of the legal problems connected with the latter regress to the background. This distinction also needs to be drawn so that the considerations in know-how and patent licensing, adequately treated elsewhere*, do not need to be repeated here. The

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* "LES NOUVELLES" of the Licensing Executives Society, USA as also the paper prepared by Mr.Kopelmanas for the UNIDO Expert Group Meeting on Licensing Practices, Vienna, July 6-10, 1970.

[illegible] paper is confined to the [illegible] through a composite arrangement [illegible] know-how), it is possible to notionally [illegible] (and management) services as a separate arrangement.

3. In its scope, this paper treats three types of engineering arrangements : (1) turnkey services (2) corporate know-how, and (3) straight engineering contracts. The subject of managerial services is notionally isolated for there is little loss of concept in doing so; further, as will be pointed out, it becomes applicable in only certain specific situations. In the three types of engineering agreements, the division of responsibility between the 'buying' and 'selling' organisations sharpens in the indicated order, and depends on the assessment of the 'buyer' of his need and capability. In terms of the developing country, this assessment has an important bearing on contractual terms, and being common to all three arrangements, it is treated separately and in some depth. Since, as will be shown, the term 'licensee' is not applicable to all types of arrangements, the term 'client' is used for the 'buying' organisation. In the interest of readability, the abbreviation "AC" is sometimes used to denote "advanced country", the source of contracted services, and "DC" for the "developing country", the generalised recipient of the services.

II. CONTRACTUAL FRAME-WORK

4. It is possible to conceptually distinguish between engineering and managerial services, as a category, from the other elements of technology transfer as patents, trade-marks, copyright and know-how. With the exception of know-how, the others enjoy both legal definition and statutory protection. There is 'ownership' in such property which enables them to be licensed i.e. only usable by others under authority conferred by the licensor; unauthorised use would constitute 'infringement'. For unpatented 'know-how' there is no recognised legal definition or objective title to its ownership; its proprietorship, worth (trade-secret) and right-of-use are created in the buyer-seller contract - and the legal obligations of

the parties derive from this prime agreement.

5. However, when we come to contractual agreements for engineering and managerial services, we are confronted with two questions : (a) is there 'ownership' to such information and (b) can it be licensed, i.e. an 'authority-to-practice' or 'right-to-use' conferred on the client? If so, how does one then distinguish them from know-how? Where the distinction is indeed difficult, the parties may agree to treat all of the information as know-how but the general desire of the developing country would be to differentiate them so that there are no constraints on the 'repeated use' of the transferred engineering information in other projects.

6. In the larger context, the developing country argues that engineering and managerial information (despite the suffix 'know-how' added to them sometimes) can be considered as assemblies of knowledge, aggregations of skill and accumulated experience, valuable in their concentration but in their constituent parts information which is already in the 'public domain'. It would indeed be difficult to differentiate such services, in principle, from the purchase of, say, specialised selling and distribution services. However, this is not to say there is no transfer of 'secret' information, for there could be: market research data, computer programmes for project monitoring, vendor evaluations, etc - but the question is whether the legal framework under which such services are negotiated needs the same scrutiny as in know-how licensing. Is it not more of a straight-forward commercial contract than a licence?

7. The agreement between the buyer and seller of engineering and managerial services, where such is separately contracted for, is in large measure, definitions of scope of work and the distribution of responsibilities. The agreement tends to be more complex than for the purchase of, say, distribution services, because of the intangible nature of the 'product' involved. When the dealing is between a developing and a developed country, many factors need to be considered which would not prevail when both the parties are within a country or when the agreement is between countries engaging in 'free trade'.

III. TYPES OF CONTRACT

8. While the conceptual definitions of "turnkey", "composite know-how" and "straight engineering" are dealt with under their respective headings, the developing country aims in them a desirable progression in the indicated order. That is, the comprehensiveness of advanced country services will reduce as the country assimilates the experience of earlier contracts. This is made to happen by the control exercised by Government in approval of contracts and allocation of foreign exchange. Further, the complex of controls that exist in the developing country, particularly in the 'planned economy', create a situation that the licensor cannot absorb single-handed responsibility even if governmental controls so permit. There are thus external conditions which enforce a division of responsibilities. This means that in no event is the "turnkey" project the integrated responsibility as would prevail in advanced countries. It is, at best, 'quasi' turnkey. The same applies to the other two types of contract. However, within the developing country, the usual definitions will apply.

IV. TRANSACTING PARTIES

9. To avoid complication, we will first consider only the transfer of engineering services. By and large, transactions between firms in the developed and developing country take place in one of the following forms :

i) between the respective Governments but channelled through identified firms. This occurs when 'tied' financial aid is provided by the advanced to the developing country. The term 'tied' implies that the buyer will make the bulk of his foreign purchases (goods and services) in the aid-giving country;

ii) between a foreign company and its DC-subsidiary (or joint venture). The engineering services could be provided (a) directly by the foreign parent (or holding) company to the subsidiary, or (b) the services could come through a contract between a third-party ex-patriate engineering firm and the parent foreign company.

iii) between an operating firm in the developing country and a foreign engineering firm, with the former both recipient and user of the tendered services.

iv) between an engineering firm in the developing country and an independent overseas engineering firm, with the ultimate recipient of services being an operating company.

v) between a foreign engineering firm and its subsidiary with services to benefit an operating company.

For quick reference, this has been diagrammatically represented in Fig.1.

10. It is at once evident that we are dealing with a complicated series of possible arrangements, with considerations being different in each case. The choice of path is rarely in the hands of the operating company, for if it were, it would most likely adopt the straight-forwardness of route(iii). To be most effective, the following 'external' conditions need to prevail in respect of route (iii):

1) freedom from currency controls,
2) freedom for foreign engineering firm to carry on business in developing country without need of specific Governmental approvals,
3) no limitation on movement of personnel, goods and services into and out of the country,
4) point of taxation at the choice of the supplier of engineering services (or provision for taxes to be paid by the recipient of services)
5) 'governing law' of contract at the choice of the parties to the contract.

11. These conditions do largely prevail either when contracts are executed between firms within an advanced country or when the transaction is between two advanced countries operating under 'free-trade' situations. However, they do not apply when the buyer is in a developing country because

its principal objectives are maximising use of native services, conservation of foreign exchange, greater reliance on local organisations to execute tasks, improvement of skills, etc. The long-term objective of most developing countries is, in fact, to eliminate external assistance as rapidly as possible by promotion of indigenous capability.

12. This 'conflict' between what is most effective and what is most desirable seriously affects the type of contracts that can exist. Despite the obvious inflexibility and short-comings introduced, yet the objective of the buying company in the developing country is to obtain assurances which the supplier would otherwise provide under free-trade conditions. The use of a consulting company, which could help, is many times inhibited by the same factors discussed.

13. The degree of sophistication in the engineering job, the nature of the contracting parties, currency terms in contract, foreign exchange position, time of construction, etc determine firstly, what type of contract will be negotiated - turnkey, composite services, straight engineering - and secondly, based thereon, the division of responsibilities between the parties to the contract. Each of these will be primarily dealt with separately.

V. TURNKEY CONTRACTS

14. In its most general context, the turnkey contract can be said to comprise of : a) supply of know-how; b) design and engineering services; c) procurement; d) construction & erection; and e) start-up.

To an extent, the choice of the turnkey alternative in a developing country is the same as that which obtains in an advanced country. In general these are:

1) where the engineering firm is strong in its own innovations, and which are, in economic terms, as important as process know-how e.g. a catalytic cracker,
2) where 'mechanical guarantees' are of over-riding importance, i.e. off-shore drilling platforms,

3) where engineering skill is highly specialised, i.e. nuclear power plants

4) where, over a do-it-yourself alternative

a) time saving is highly measurable in money terms
b) own resources, skills, experience are inadequate
c) turnkey quote from contractor is sizeably lower
d) single-point responsibility has significant management advantages
e) contractor guarantees are better

By and large the Governments of developing countries, like India, would not normally permit a turnkey contract for the considerations given in point(4) even though the client may opt for it and even though overall costs would be lower. The reasons will be explained later. However, there are three special and additional situations which often make the turn-key contract favourable in the developing country.

1) When there is a Government-to-Government "tied-aid" arrangement. Here, in order to have prior assurance that 'aid' will be utilised in the manner it is meant to be, the aid-giving country will often select two or three of its engineering firms with one of whom the client must place the turnkey contract. This pattern is also adopted by the World Bank, for example, to obtain assurance that its loans will be predictably beneficial.

2) where the foreign turnkey contractor can execute a project with a significant saving of time due to his organisational network and prior experience; in India, for example, fertiliser plants are many times turnkey-jobs if the assessment is that by finishing a project in, say, two years over a do-it-yourself alternative of 4 years, any additional foreign exchange expense of a turnkey contract is offset by the two year exchange savings in product imports.

3) where there are large purchases of equipment and materials to be made outside of the developing country and when procurement, expediting, inspection and shipment necessitate considerable dependence on a foreign engineering company.

There are many disadvantages to the developing country in a AC-DC turnkey contract :

1) there is inadequate transfer of skill (technical and managerial) to the developing country ('the bulk of skilled knowledge leaves the country when the job is over').
2) considerable foreign exchange would be spent when alternative DC-services can be tapped in conservation of foreign exchange.
3) such contracts do not encourage the establishment of indigenous fabrication and manufacturing facilities, service agencies, etc.

15. There are also some special and important considerations against the use of AC-turnkey services when the AC-firm does not itself OWN operating plants. For one, the AC-firm would not be able to most effectively train client company's operators since it has little control in arrangements made with a third-party. Secondly, an engineering firm is unlikely to get at that production and marketing know-how which can only accumulate with an operating company. For these reasons, when an AC-OPERATING company offers turnkey services, these are preferred. (In contracts linking a developing country with the engineering agencies of Socialist countries - say Rumania, in respect of petroleum refining - the developing country is often able to gain on the collective operating experience of many of the firms in the Socialist country. This is, of course, not possible with the 'market economies' of the Western European countries.)

16. We have so far looked at the pros and cons of the developing country favouring turnkey contracts with AC-firms. Are there limitations to AC-firms offering contracts to DC-firms? These limitations are listed below :

1) where the AC-firm has to furnish time, cost and performance guarantees when it has little knowledge of the productivity levels and skills of the labour it will use and over which it has limited managerial control.
2) where the AC-firm may have to give 'hold harmless' assurances against know-how infringements when it is generally not in a position to fully assess the legal and patent situation in a developing country.

3) where the AC-firm is limited in its ability to use modern erection, construction and excavation-machinery, etc since these may have to be imported (even where this is possible, there could be limitations on the ability of DC-personnel to operate and maintain them).

4) where the risks of a turnkey job are not commensurate with the size or scope of the turnkey project.

17. Use of Intermediaries in turnkey contracts:

It is a rare situation when the AC-firm, without using an intermediary located in the developing country, can carry out a whole project. The intermediary could be a subsidiary (or joint-venture firm), a site-team or a third-party engineering contractor. Where such is adopted, it immediately introduces a currency situation. The turnkey quotation then is invariably in two currencies (1) in the currency of the advanced country for services rendered by the firm "outside" the country and (2) in the currency of the DC-firm for payments to labour local services, custom's tariffs, local taxes, etc. While a "management fee", in terms of foreign exchange, is permissible for services rendered in reference to point (2), 'residue's after expense, or losses cannot generally be made up in the foreign currency. Also, a tax problem ensues which is later discussed. This is a serious limitation to AC-turnkey contracts.

VI. CONTRACTUAL MATTERS - TURNKEY PROJECTS

18. Tax implications, governing law, arbitration, guarantees, supervision liability and currency are problems which receive special attention in AC-DC contracts.

19. In most cases engineering incomes are free of tax in the developing country if the contract (a) is on a lump-sum basis (b) is executed 'outside' the country (c) is paid for in foreign currency, again 'outside' the country, and (d) if services are performed only once (i.e. if no periodic income accrues to the engineering firm through the use of the information, as in a straight know-how or patent license). These conditions influence contract drafting in that the contractor tends to legally separate the contracts for

know-how, engineering, erection, etc so as to qualify for the tax-free situation (even though he may eventually have to pay equivalent taxes in his home country). In some circumstances, the client in the developing country (but generally the Government concerned) may force the situation which will make the contractor's income liable to domestic taxes, for by this reason, the developing country is not only richer by the tax collected, but far more significantly, it saves on the foreign exchange portion of the tax.

20. On the other hand, in some cases, even when the tax situation would be of advantage to the contractor, he may be reluctant to separate out "know-how" from "engineering" either for reasons pertaining to his guarantee obligations or because he wants to maintain secrecy over most of the data he supplies to the client. If the client is a Government organisation, however, it may want to re-use engineering in other identical plants. This is a counterforce to the single consolidated agreement.

21. The engineering contract, even if separate, could be subdivided into component agreements if payments in different currencies are involved, i.e. dollars and rupees for a case in India. Thus, the erection agreement could be in rupees and the engineering drawings and engineering services agreement in dollars. By the use of a local intermediary it is sometimes feasible to avoid tax liability on local currency income.

22. There could also be separate 'supply' and 'services' agreements wherein foreign purchases of equipment and associated matters (say welding inspection services) are furnished under one agreement and engineering drawings, plant specifications, operation information and construction supervision - the services - are transmitted through another agreement. The first of these is always free of tax while the second could be taxed in so far as income is derived from services executed within the developing country.

23. This situation of separated contracts is not a problem of contract mechanics. Separation for a particular reason introduces several unassociated problems. Each separate agreement could have its own limitation of liability or responsibility which may or may not be desirable to one of the

parties. Each could have a different 'governing law' as each could be arbitrated differently. To the licensee, such an arrangement would be a weakening of the integrated responsibility of the contractor.

24. Where there are advance foreign currency payments, the Government of a developing country may require the turnkey contractor to furnish Bank Guarantees to the client to secure payments. Such guarantees are furnished by the contractor through his bankers with the bank undertaking to make good to client all funds advanced, and in respect of which the contractor may have 'failed' to carry out his obligations. This is an extremely difficult area to negotiate as it involuntarily brings in the banker's viewpoint. In India, for example, all Government organisations placing turnkey contracts require these counter-guarantees. Only in Government to-Government dealings, or (World) Bank-client fundings, are such guarantees of lesser importance. Bank guarantees may also be required to counter-guarantee contractor's performance-guarantee obligations.

25. In terms of contracting norms, the 'cost-plus' category of contracts are not favoured by developing countries as it introduces uncertainity of foreign exchange committment. A 'maximum' or upper-limit of foreign exchange expense is only sparingly accepted. Fixed-bid contracting is the general preference even though it could mean a higher contract value. Bonus and penalty provisions do not pose any special problems if arbitration procedures can be suitably worked out.

26. Definition of currency is sometimes necessary. 'Gold clauses' can be used but since the Government of the developing is a 'participant' in all foreign exchange transactions, the client's payment obligations are, in a sense, under-written by the Government. Of greater and practical concern to the licensor are (a) provision as to who bears the cost of currency conversion and remittance, i.e. how day-to-day fluctuations in the money market will affect the amounts transferred at the moment of its transmittal (b) what provisions are made in the event of devaluation/revaluation of currency in between the time the draft payment is made by client and actual payment collected. These periods could be long if special transmittal

clearances are involved by contractor's bankers. If this is negotiated through a specified bank then it may become necessary to obtain Bank's concurrence on the arrangements made between the client and contractor.

27. Governing law is, of course, a major problem area. Developing countries in general do not have adequate 'case-history' material and legal precendent so that the contractor can speculate on what court opinions could be in the event of difficulties. The contractor's preference could be for disputes to be resolved in terms of the laws of his own country and it is vice-versa for the client in the developing country. In India, the governing law is generally of the licensor's country in the case of know-how contracts and India's laws for engineering contracts. Key problem-areas are force-majeure, strikes and lockouts, change in statutes, etc.

28. Arbitration provisions are generally in terms of the rules of the International Chamber of Commerce in Paris, France but the 'locale' where the proceedings will be conducted is determined by who initiates the arbitration. However, the limiting conditions of foreign exchange sometimes force a situation in which the client may have to forsake his rights if, in his opinion, the costs of obtaining redressin a foreign country would involve a large initial foreign exchange expense (and for which Governmental approval might be difficult to obtain). It is to be noted that the client would have to use non-national legal and technical experts to proceed in a foreign country which only goes to enhance costs and the time involvement. The venue of a third-country, representing a compromise on cost considerations, is an alternative that is sometimes employed.

29. Process-performance guarantees involve considerable deliberation. In a turnkey job the contractor 'hands over' a fully performing plant which essentially means that he would have rectified any process defects that occured at start-up. However, since the decisions at this stage are essentially those of the contractor, the client is kept outside of the considerations and compromises involved. This may have time and cost implications which the client would be unaware of. "Involving" the client in such decision-making has obvious ramifications.

30. The developing country generally does not have the elaborate safety, construction, operating and manufacturing codes of an advanced country. This means that the contractor is asked to apply the "best practice". Thus, extraordinary provisions for pollution controls could be incorporated by the contractor having little relevance to the client's environment. This again is a difficult area to negotiate and 'guarantee'. In a straight engineering contract, on the other hand, the engineering company's overall obligations are limited in that the client will normally specify what has to be done.

31. The 'supervision' responsibility of the foreign contractor is usually a complex problem since different legal definitions prevail in respect of this term, and its possible consequence in 'negligence'. Associated with this are the policies of the domestic (DC) insurance companies covering the risk in negligence. A full turnkey job obviates the problem for the client but it is very much present in "quasi" turnkey jobs when the client supplies and manages labour. The usual posture of the contractor appears to be : remedy for wrong engineering is free supply of corrective engineering; remedy for faulty supply of equipment is free supply of replacement equipment, etc. Beyond this, the contractor accepts no further risk. This is almost always an acceptable attitude to the client in the developing country but failure to resolve the issue by overlooking it can have serious consequence to both the parties.

32. In some circumstances there is more than one signatory to the contract on the contractor's side. This may happen if the know-how is not owned or licensed by the engineering company but is offered by the engineering company in a liaised 'package deal'. In developing countries, the tendency would be to make each of such parties 'jointly and severally' responsible in respect of all the liabilities in the contract.

33. Patent indemnification in respect of know-how and engineering innovations could present problems since the contractor would not normally know, or even be able to study, all patents registered in the developing country. Again, the legal institutions of the developing country could introduce uncertainity. One way of resolving this situation is for the contractor-

licensor to at least indemnify client in respect of infringements on patents registered prior to the date of the agreement and agree to share costs on litigation that may arise from patents registered after that date.

VII. COMPOSITE KNOW-HOW

34. Composite know-how has an intermediary status between the turnkey contract and straight engineering. It is a 'mix' of know-how and engineering. It is, in terms of most developing countries, the most predominant form of technology transfer. Even the 'turnkey' contract (single-point responsibility) becomes quasi-turnkey in the developing country, varying from composite services only in degree. This is because the client's active participation is necessary to obtain government approvals, provide and manage labour, etc. The composite-services type of contract is also an evolutionary form of the turnkey concept as organisations in the developing countries progressively improve on their capability.

35. Two situations favour composite services: (1) the tendency of the developing country to maximise use of domestic inputs to conserve foreign exchange and (2) the major problems of a turnkey job in terms of managerial flexibility, supervision liability and understanding of the legal framework of the developing country. Composite know-how, in its limitation of services rendered, actually divides up the responsibility of an integrated concept between the client and the supplier. This division of responsibility is obtained at the cost and compromise of 'certainty' of project performance in terms of funds, time and the operational reliability of the plant. Despite this, the contract tends to be 'worked over' to ensure unity of concept.

36. Composite services could be rendered either by the engineering firm which has licensed know-how from a third party, or the know-how supplier could furnish the 'engineering'. Many situations favour the KNOW-HOW supplier as the contracting party. These are:

1) operational advantages - i.e. the client needs to depend heavily on operational guidance from the licensor on a long-term basis.

This happens in (a) plants producing a complex 'mix' of products wherein the 'mix' changes with fluctuating market conditions, eg. a refinery or a solvents plant (b) plants handling a product which undergoes continuous "specification" change or are subject to continuous variations in raw materials e.g. pharmaceuticals, frozen foods, (c) situations which involve pre-arranged expension and diversification of product range, etc.

2) associated committments - where there is (a) period payment of royalties (b) dependence on know-how supplier to also supply chemical intermediates, components, catalysts, etc (c) sharing of R&D (d) supply of funds, managerial services, training of licensee personnel, etc.

37. The composite services agreement could also result from the inability of either of the parties to decisively split up 'know-how' and 'engineering' and yet obtain a satisfactory assurance of plant performance. The know-how supplier undertakes to do the engineering (or get it done by someone he is familiar with) so that he can give the client an acceptable process-guarantee undertaking. To the licensee, the composite agreement is desirable when he is limited in his ability to carryout all or part of the engineering.

VIII. CONTRACTUAL MATTERS - COMPOSITE KNOW-HOW

38. Some of the problems already discussed under "turnkey projects" carry over with minor modification to the composite services contract. These are tax implications, governing law, arbitration, bank guarantees, currency and patent indemnification. However, the concepts in 'supervision liability', performance guarantees, operation and manufacturing codes change appreciably. A detailed indentification of responsibilities in 'scope of engineering' is a substantial addition to the composite services agreement.

39. Although there is a division of responsibilities, there is more of a dynamic interface between licensor and licensee in composite services than in the turnkey or straight-engineering contracts. To the developing country this is an advantage in that by licensee deliberately 'involving' himself

with licensor he learns new skills and knowledge, benefits from the inevitable 'show-how'. To the licensor, divided responsibility means a reduced obligation on process performance since 'best-under-circumstances' compromises are often made. It is to be noted that in a developing country its people are not trying to perform the job of the technician's or technology's ultimate capability; they are prepared to use a lower set of performance standards.

40. The engineering portion of the composite services contract is divided into that portion which the licensee believes he can accomplish and that portion he cannot accomplish (without impairing process performance). The licensor's scope of work then emerges as a 'residue'. In India, the tendency is to divide up work into :(1) engineering innovations that may be involved in process know-how, i.e. the physical configuration of a catalytic reactor (2) 'basic engineering', i.e. battery-limits specification of all major equipment like heat-exchangers, distillation columns, key process piping (3) 'detailed engineering' which would include P&I diagrams, mechanical specifications of equipment, civil and structural work, raw material and in-process storage, etc and (4) off-sites, utilities, effluents handling, etc. The first two are almost always in licensor's scope of work and the last two largely licensee's responsibility. Definitions often become complex because at the time of contract development licensee is not aware of all that will be transferred under know-how. Even under 'secrecy' agreements, the licensor will not supply full lists, and specifications of equipment because he is uncertain of the legal protection he has. Further, since licensee is unlikely to compensate licensor for developing such information prior to contract execution (because of foreign exchange limitations and government controls) the latter will not have developed adequate engineering information for the specific capacity, product-mix and raw material conditions of licensee's plant. Hence work-scope has to be defined under a trying situation. This is not all. The licensor's agreement to supply the 'engineering' or 'design' of a heat-exchanger, for example, can mean something different from what the client wanted. The licensor could have meant rating sheets showing heat-load, pressure-drop limitations, fouling factors, terminal temperatures, etc. - i.e. "information sufficient for a

competent heat-exchanger manufacturer to supply an adequate unit". This is often not what the client feels he had enquired for; he would have inherently wanted specification of type of exchanger, arrangement, size of tubing, number of passes, baffling, etc. - matters which the heat-exchanger manufacturer would normally decide and not the engineering firm. To get over the situation, firms in India have developed check-lists which incorporate much of their 'experience' in such contracting. Appendices A, B and C define the work areas and such classifications could be applicable to other developing countries.

41. These classifications (which are appended to contracts) are, however, not initially 'scopes of work' but actually a statement by the licensor that he has assessed his committment and priced it in that context. Actual division of work is worked out in a "design conference" after execution of contract and after licensee has obtained the know-how transmittal. At this point of time, further contracts could result in which licensor undertakes to procure, inspect and expedite 'foreign-purchased' equipment.

42. Since licensee has a responsibility to supply that portion of services and equipment which is indigenously available, problems arise as to their adequacy and 'mating' with licensor's supply. This involves an element of supervision by the licensor with all its liabilities. In India, this is resolved most often by the licensee giving the right to licensor to accept or reject licensee's supplies. If he 'rejects', and licensee is not in agreement and goes ahead with its installation, process performance shortfalls and penalties, arising from the rejected equipment, is to the 'account' of the licensee. While this could lead to a potentially argumentative situation in the event of below-expectation performance, the general experience is that the client will rarely go ahead with what is 'rejected'. In much of the decisions that licensee makes the emphasis is on technical workability in a situation, over the economic consequence. This is an important attitude which is specifically discussed later. One additional problem the licensor encounters in developing countries is that he is contractually asked to 'approve' licensees' detailed engineering even though he has no responsibility for it. This presents a difficult communications problem.

43. In an advanced country the licensor usually accepts liability in the event of below-design performance. This takes the form in which the licensor, at his sole option, agrees to rectify a process or engineering defect, at his cost, and/or to pecuniarily compensate licensee - on an agreed upon schedule of 'penalties' - upto a stipulated maximum liability. To the developing country, without alternative sources of quick remedial action, the exercise of this option is unacceptable. With its emphasis on technical over economic performance (say, physical output rather than operating cost), the developing country would normally insist that licensor undertake physical modification upto his maximum liability - and perhaps even above the limit but with the incremental cost to the account of the licensee. Further, to most effectively utilise the foreign exchange involved, the licensee would be willing to defray all of licensor's local currency costs (labour, etc.)

44. In the matter of overall contract liabilities, the 'division of responsibilities' concept recognises that compromises made in the circumstances of the developing country do not permit the licensor the free exercise of his know-how and engineering. Hence, it is usually possible for licensor to provide a lower 'liability cover' than in an AC-AC transaction. Where there is licensor participation in the equity of a DC-firm, quantitative expressions of liability are not usually called for since the licensor is, in any case, sharing the risk of investment.

IX. STRAIGHT-ENGINEERING CONTRACTS

45. A straight-engineering contract may result from one of the following considerations : (i) know-how supplier is limited in resources to undertake engineering (ii) know-how supplier traditionally works with a third-party engineering firm and recommends the same to client (iii) the developing country's foreign funds may be available in limited amounts of various currencies, forcing the situation that suppliers in two different countries have to respectively furnish know-how and engineering (iv) an indigenous engineering firm which is handling a contract requires supplementary engineering support (v) the client is expanding capacity or duplicating his facilities, the know-how for which already exists, etc.(The situation where the know-how supplier, in a composite services agreement, obtains third-

party engineering services through an "internal" arrangement is excluded for consideration here).

46. Situation (iv) is particularly significant. In the interests of promoting skill transfer, India, for example, encourages the use of local engineering firms for even channelling wholly 'outside' engineering (by giving tax incentives). Foreign engineering firms also prefer to work with a specific local engineering firm because it enables them to not only have a long-term involvement in the developing country but also because its engineering knowledge is 'contained' - as opposed to widespread fragmentation if engineering services are contracted indifferently. Often, because of limitations of private firms in funding initial expenses in large projects, government-owned engineering organisations develop. These too tend to have long-term rather than project-to-project engineering agreements with overseas organisations.

X. CONTRACTUAL MATTERS - STRAIGHT ENGINEERING SERVICES

47. Many legal problems of the turnkey and composite-services contracts are obviated in the straight engineering contract. Since there is limited proprietory information transferred, the 'protection' of transmitted material is of reduced concern to the supplier. Patent infringement, performance guarantees, supervision liability, operator training and the problems of the two-currency situation are of diminished importance. The tax problem also greatly simplifies if it is a 'once-only' transfer. Likewise, the selection of manufacturing and construction codes is simplified as the client will normally specify them. Further, since the very concept in such transfer implies that the developing country has constructional and managerial capabilities, it becomes possible to accurately define 'scope of work'.

48. This is so in particularly short-term project-to-project contracting. However, when the contract is between two LC & DC engineering firms, on a long-term basis, certain legal and payment problems arise. In regard to payment, governments of some developing countries will not allow a fixed percentage of the DC-engineering firm's profits to be repatriated, it will be argued that the foreign firms' assistance is not involved in all the

projects handled by the DC-engineering firm. A fixed-fee, like the minimum royalty, is also not permitted. Further, the DC-engineering firm would be required to obtain prior Government approval on a case-by-case basis, despite the existence of a long-term contract. The legal problems that arise are in the definition of the limitations of each of the engineering firms since the general programme may cover a wide area of cooperation. Where this is critical, the tendency is for such agreements to exist only between an AC-parent engineering firm and its DC-subsidiary. However, there may be Government regulations on the ownership and control of subsidiary organisations, vitiating the advantages of such assistance arrangements.

XI. THE TWO CURRENCY PROBLEM

49. Where there is a limitation to the free convertibility of currencies, any money-based analysis by the participants in an AC-DC contract involves both explicit and implicit valuations of at least two currencies. This is an unfamiliar situation to most AC-licensors and it influences contract negotiation and the division of responsibilities profoundly. There is explicit evaluation when a purchase decision is made in respect of the same currency. Thus, the decision on importing one of two differing electric motors from the US into, say, India would involve straight-forward engineering evaluation and economic analysis in terms of performance parameters. The same situation would apply if all decisions on goods and services are made by an AC-turnkey contractor for the building of a plant for a DC-client. However, when there is the need for client's participation in the decisions of what should be imported, the client would be evaluating the two currencies both implicitly and explicitly, with the bias of spending more of his local currency even if it enhances total project cost. But the significant point here is that, for various categories of goods and services, he will not be applying a CONSTANT local-purchase/imported-cost ratio in decision-making. It will vary with each of the types of goods and services involved.

50 For example, it could be evaluated that by incrementally spending foreign exchange of US $100,000 on a mechanical excavator, an Indian client could save the local-currency equivalent of US$200,000 in excavation costs (using straight labour and simple equipment). Since there is no loss of project

reliability in using only labour, the client would not favour the substitution unless he obtained an advantage of 4:1(i.e. a saving of US$400,000 in local currency). This is the implicit valuation. Let us discuss it a little further.

51. Figure 2 shows the impact of going to the two extremes of the purchase decision scale for four categories of 'goods'. The vertical lines show the widely different ratio's that become applicable on the basis of the implicit valuation.(It is to be noted that the foreign exchange rate is NOT involved in this calculation as it would apply to all categories of goods). What is important is that the trade-off between external and internal currencies varies with the category of goods: that in all projects there is a 'mix' of such currency ratios. The 'ratios' themselves result from considering availability, performance, reliability of goods, labour-content in the goods, country of purchase, type of credit, etc - largely non-arithmetic evaluations made by the licensee under the influence of his economic environment.

52. Operational-cost is also subject to the same type of implicit and explicit valuations. The explicit valuation involves determining 'pay-back' separately for the two currencies, reducing as much as possible the pay-back on the foreign currency expense by enhancing, if necessary, the pay-back and investment in terms of local currency. An example is given below showing that Situation B would be favoured because of the two-currency situation.

Currency Unit: US Dollars

	Situation A	Situation B
Cost of Plant		
1. Imported content	20,000	45,000
2. Local content	80,000	155,000
	100,000	200,000
Operating Cost Savings*		
3. Imported content (say, Solvent).	4,000/year	15,000/year
4. Local content	10,000/year	10,000/year
	14,000	25,000
Pay-Back		
5. Undifferentiated pay-back Period	100,000/14,000 = 7.15 years	200,000/25,000 = 8 years
6. Pay-back on local content	80,000/10,000 = 8 years	155,000/10,000 = 15.5 years
7. Pay-back on foreign content	20,000/4,000 = 5 years	45,000/15,000 = 3 years

*Includes depreciation under 'local content'

53. However, if in situation B there were no foreign-exchange operating costs, implicit valuation, of the type discussed earlier, would favour it even if payback was higher at, say, 12 years. (Items 5, 6 and 7 become identical for new Situation B).

54. The significance of this analysis to contract negotiation is that, in composite and straight-engineering services, the engineering firm is asked to redesign process and equipment to accommodate the two-currency situation in the developing country and which may be contrary to contractor's experience. The negotiation process is lengthened and contract provisions become voluminous in order to ensure this accommodation.

XII. TECHNICAL CONSULTANCY ORGANISATIONS

55. The technical consultancy organisation, as accepted in the West, is only of limited use in the context of developing countries. The DC-licensor is often perplexed by the situation that a DC-client, with all the draw-back of his inadequate technical background and experience, prefers to bypass the advantages of using an impartial adviser in evaluating what are generally complex technical alternatives. There are many reasons as to why the consultant is not used :

1. No decision in a developing country is a straight-forward technical decision: the client has to work within the guidelines set by his Government as to what product-mix and capacity is desirable in the context of the planned economy, where the plant unit is to be located, what raw materials should be used, etc. These have second-order consequences unique to each developing country.
2. There are foreign exchange "allocations" to projects; using a foreign consultant means reducing the nett funds investable in a project.
3. 'Skill-transfer' does not take place for by using the consultant client's learning process is inhibited.
4. The consultant may not have an operating base in the developing country so that he is readily available for subsequent projects, and

5. Where such is possible, consultancy companies generally prefer to operate wholly-owned subsidiaries which is contrary to the policies of developing countries.

56. In terms of licensor-licensee negotiations, this means that the licensor is asked to play the role of the consultant - he is asked to recommend an optimised product-mix, choose between competing suppliers, assist in project planning, recommend codes, approve sites, etc.

XIII. TECHNICAL VS ECONOMIC DECISIONS

57. The low initial levels of demand in developing countries, and limited facilities for promoting it, introduce the well known problem of 'economic size' of production units. Even where such is commercially feasible, fragmentation of capacity is brought by the social dictate of equi-regional distribution. The resulting higher cost of production is compensated by the higher market prices that prevail because of tariff barriers.

58. Also those decisions will be made which (1) favour higher or long-term technical reliability even if first-costs are increased, and (2) favour substitution of foreign exchange even if operating costs go up. Illustrative of case (1) is when, say, a stainless steel vessel is favoured when low-alloy steel unit would adequately suffice on the basis that skilled crews required for maintenance are not readily available. This could mean that an investment decision is made well above the break-even point of the economic trade-off curves. Illustrative of (2) is the situation that an expensive extraction system would be employed so as to use a locally-available solvent when the use of an imported adsorbent would involve a much lower operating cost. Consequently, in the negotiation process, the licensor faces a prospect which is contrary to the objectives of his process and his experience; in fact, he is confronted with the situation which says : we like your process but design it to increase operating cost! Therefore, unless there is considerable face-to-face negotiation, and the licensor makes effort to emphathise with licensee, there will be horrendous communications problems.

XIV. TRAINING

59. Developing countries see in training two opportunities : (1) ensuring success of the project at hand, and (2) enabling skill transfer. The latter concept, with its connotation of education, is difficult to communicate to the licensor. The training of plant operators, those who will routinely handle the plant, presents the least problem; in fact, it is very desirable to both parties to the contract. There are only some frictional interfaces in trainees' social attitude in licensor facilities, adherence to safety standards, access to plant-historical records, language, etc. much of which the contract document cannot provide for. Some difficulties arise in the area of compensating licensor for training, particularly when licensor and licensee cannot agree on what is a 'reasonable' training period. Lacking adequate experience, operator-trainees will want more time and this could depend on the assessment after trainees arrive at licensor plant and determine the magnitude of their task.

60. The frictional interface is enhanced when engineering training is involved. This occurs most often in composite services agreements and in agreements between two, otherwise unassociated, engineering companies. This has all the overtones of general education. The trainee-engineer does not merely aim to understand how his project has been engineered but extends his enquiries to the basis and the how and why of engineering design and estimation. Even where feasible, explanations could take up valuable, unassigned, time. The trainee in aiming at developing that expertise which will improve the overall capabilities of his organisation rather than staying focussed on the job at hand. To the licensor this appears as the development of competitive capability as well as loss of further opportunities in the client's country.

61. In many projects, the licensor is also asked to furnish training in areas such as welding (say pipeline welding, difficult metals) and other fabrication methods. This poses many problems to the licensor, particularly as codes would be different in the two countries. Further, the methods of fabrication will be different since the licensor would tend to be highly mechanised in his operations.

62. Training in the managerial area is significant when there is a parent-subsidiary or joint-venture relationship. Such training directly helps the licensor as it could improve the profitability of the venture. However, when the client's freedom to expand and diversify is limited by Government policies - or profit remittance controlled by dividend limitations - the impetus to train is reduced, particularly as managerial training is a long-term affair. An additional inhibiting factor occurs when Government policies move in the direction of fully paid-up royalties rather than term-based arrangements. This occurs because developing countries would rather commit what is a known reserve of foreign funds than take on a liability in terms of an uncertain future. There is nothing then to sustain licensor's interest.

63. "On-the-job" training at the licensee's site, to the exclusion of training in licensor's plant, will not generally be acceptable to the DC-client because it is not only a poorer transmitter of skill but also because a comparitive frame of reference is not available. This consideration in fact forms the basis of the client's preference for an operating company as licensor rather than the straight engineering company.

64. In the matter of compensation, the tax posture of the developing country plays an important role. In India, for example, the income to the individual 'trainer' in the country is taxable unless the duration of his stay is a short period. The licensor can receive a per-diem fee for the use of his personnel but the individuals concerned are compensated in local currency for their living expenses. In extended training the tax situation could be overcome only if licensee is obliged to absorb the tax. However in long-term employment, income is in the form of salary in local currency. It may be difficult for the licensor organisation to get a foreign-exchange payment in these circumstances.

XV. MANAGERIAL SERVICES

65. In a developing country there could be many categories of 'buyers' - subsidiaries, joint-venture companies, independent private sector firms (limited companies and family-owned), Government sector organisations (like

the Defence plants) quasi-government organisations (Central and State) which operate like public-limited companies but are government-owned, etc. Except in the first three cases, the social and political situation in a developing country does not permit the use of foreign managerial services unless, as in a steel complex, it is difficult to disassociate the technical component of the services. The protected market in such countries, and general absence of keen internal competition, dilutes the stress on management efficiencies in financing, production, selling and distribution. The profit orientation of public sector firms is further vitiated by considerations as the maximum rather than optimum, use of indigenous machinery and materials, the emphasis on substituting labour for capital and the "social costs" of the firm (as an entity) providing labour-housing, educational and medical facilities, etc.

66. Public-sector organisations often compete with the growth and proliferation of private firms by larger built-in capacities, pricing abnormalities, pre-emption of raw materials, preferential access to capital, etc. The consequence of this situation is that the foreign partners in joint-venture and subsidiary organisations feel it desirable that their firms use sophisticated management techniques and non-patriate services to compete in the monolous environment created by the public organisations. Even if this is with the full agreement of the domestic firms, there are even then Governmental controls on the number of ex-patriate personnel employed, their remuneration and duration of service. Despite this, the Governments do still recognise the importance of modern skills and innovation, for these in the process of time, permeate and diffuse into the general economy and eventually lead to competitive situations in terms of the export market. However, the use of third parties for managerial services would be an exceptional situation.

67. In joint-venture and subsidiary-parent contractual agreements, there would be little tendency to separate managerial from technical services - in fact, the contractual agreement is most often labelled "technical services", with specific compensation to the TC-organisation being a percentage of nett sales value. These agreements, of course, need the approval of the Government and will generally be taxable in the developing country.

68. Where the domestic organization is financed by Government-to-Government aid - this is largely in the Public Sector plants - it may happen that the aid-giving country stipulates the use of ex-patriate personnel for managing project implementation and its operation over a fixed period of time. In this case, there may be a separate management-services agreement. However, in these instances, the role of the firm, as an entity, is subjugated to the larger understanding between the Governments involved.

APPENDIX A

PROCESS DISCLOSURE INFORMATION & FUNCTIONAL PROCESS ENGINEERING PACKAGE*

(COMPOSITE KNOW-HOW TYPE OF CONTRACTS)

SCOPE OF INFORMATION & SERVICES TO BE SUPPLIED BY LICENSOR

1. Written description of process including identification of physical and chemical reactions occuring.

2. Process-chemistry modifications necessary to make various grades of end-products and flow-sheet of process.

3. Energy and material balance flowsheets, showing process flows, flow-rates, compositions, physical properties, temperatures, pressures, etc for a plant rated for a design capacity of ___ tonnes per annum, with "turndown" capability of ____ percent. (Stream factor used for design to be identified).

4. Utility requirements, raw material and catalyst specifications, raw material efficiencies, catalyst and supplementary chemicals consumption.

5. Basic plant plot plan (Battery Limits) showing suggested equipment layout.

6. Major-equipment specifications rated for design production rate.

7. For indigenous equipment that is to be fabricated by or through licensee, the licensor shall supply: basic-dimension sketches of major equipment as diameter, height, nozzles locations, etc; materials of construction; lining requirements, operating and design pressures, corrosion allowances and design codes to be followed.

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* Functional Process Engineering Package is grouped with "Process Disclosure" (or know-how) because, to the DC-firm, they look inseparable in terms of responsibility sharing.

For the (typical equipment of a chemical plant) the following <u>functional</u> information shall be supplied.

Pumps	:	Fluid properties, capacity, discharge head, NPSH
Blowers & Compressors	:	Suction & discharge pressures, gas properties, number of stages, T&P at each stage, BHP per stage
Direct-fired heaters	:	Thermal design & specification sheet, fuel to be employed, heating curves
Heat Exchangers(including reboilers, condensers, air coolers, etc.)	:	Thermal rating sheets (sample of such "sheet" is usually enclosed)
Accumulators, Separators, driers	:	Basic dimensions; special features, if any
Distillation columns	:	Number of theoretical trays, pressure drop per theoretical tray, top and bottom flows, pressures and temperatures, and side-stream conditions, column internals and fittings.

8. Utility 'one-line' drawings for steam 'Dowtherm', plant, process and instrument air, refrigerants, cooling and process water, electricals, etc.

9. Licensor to recommend list of equipment to be imported (to be determined in consultation with client) and based thereon, he shall supply: specifications, certified dimensional drawings, service requirements, schematic wiring diagrams.

10. Licensor to furnish basic P&I diagrams. Data for instrumentation (pneumatic or electronic as mutually agreed upon) to consist of:

a) Normal, minimum and maximum values of the variable to be measured or controlled

b) preferred material of construction

c) alarm systems

11. Effluent handling schematics.

12. Operating Manuals for key process stages.

13. Safety considerations report.

14. By-product identification and processing for disposal.

15. Important analytical procedures for process control and finished product analysis.

16. Plant start-up assistance.

17. Non-obligatory review of process engineering flowsheets & equipment dimensioning.

18. Recommendation of maintenance supplies, materials and spare parts for 2-year operation.

APPENDIX B

BASIC ENGINEERING INFORMATION & SERVICES TO BE SUPPLIED BY LICENSOR*

(COMPOSITE KNOW-HOW AGREEMENTS)

The 'Foreign Engineer' will, starting from Appendix A information supplied by licensor/client carry out process design to the extent necessary to supply client with adequate data for carrying out mechanical design, procurement, erection, etc.

In particular, the data required to be supplied by the Foreign Engineer is enumerated below :

1. Detailed plot plan showing locations and elevations of all major equipment.

2. Piping & Instrumentation flowsheets, including

   i) complete piping & instrumentation hook-ups for process & utility piping, including piping for start-ups, by-passes, emergencies, etc.

   ii) Piping lists giving line number, size, specification code numbers, starting and terminating points, insulation requirements.

   iii) Instrumentation lists, instrumentation control loops including any sequences or emergency shut-down requirements.

3. Data for designing equipment foundations, such as above-ground foundation plan, speed and load distribution details(moving machinery).

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*Division of work into Appendices A&B permits B to be a 'separated' agreement; it is also designed to permit an independent non-patriate engineering company to supply information as adjunct to Appendix A services.

4. Detailed mechanical design of all equipment to be procured outside of _____(developing country) where such will be specifically made for client. Foreign Engineer will also fully specify all equipment to be imported, sufficient for placement of orders.

5. Listing of utility requirements for key process equipment showing quantity, quality and feed point for each utility.

6. In addition to functional equipment information given in Appendix A, Foreign Engineer will supply mechanical design of all major equipment to be fabricated in _____(developing country) but not constructional and/or shop drawings. Such information will include :

In case of	Features
Pumps	: Type & speed, prime mover, seal, coupling, mounting flanges, lubrication and special features, if any.
Blowers & compressors	: Type & speed, prime mover, seals, packing, couplings, lubrication, physical properties of gases
Direct-fired heaters	: Type of heater, pressure drop, code requirements, refractory, insulation, safety features
Heat Exchangers	: Complete specifications, including mechanical rating sheets; materials of construction.
Distillation column	: Tray type recommendations, Number of actual trays, pressure drop per tray, column design, internals, nozzles.
Reactors	: Complete mechanical design

SERVICES

7. Foreign Engineer will assist in the development of detailed plant operating Manuals (Battery Limits).

8. Foreign Engineer will undertake foreign procurement, inspection and supply of all equipment designed by him, or where agreed upon, other equipment as pumps, etc.

9. While the major responsibility for construction will be borne by client, Foreign Engineer will depute his representatives during construction period.

10. Licensor/Foreign Engineer will assist client in pre-commissioning tests, without taking in process materials, to ensure plant is correctly installed from the mechanical point of view. While responsibility will be that of client, Foreign Engineer will satisfy himself that plant has been correctly erected and pre-commissioning tests have been properly conducted. For special equipment, Foreign Engineer shall supply testing procedures.

11. Since process design is carried out by Foreign Engineer, the responsibility of plant start-up will be borne by him.

APPENDIX C

LICENSEE' SCOPE OF WORK

(COMPOSITE KNOW-HOW AGREEMENTS)

1. Plot selection and site preparation

2. All off-site engineering and supply of utilities.

3. All civil engineering designs - buildings, equipment foundations, structures, drains, tankage, ducting.

4. All electrical engineering design related to power receiving, distribution, lighting, etc.

5. All instrumentation detail designs including assembly, layout and panel drawings.

6. Detailed layouts for process & utility piping; piping models.

7. Detailed mechanical designs of equipment to be fabricated in _____(developing country)

8. Analytical & control laboratories, equipment selection, installation.

9. Procurement, expediting, inspection, installation and start-up of all indigenous equipment and civil works, electricals, etc.

10. Clearing of imported goods, customs, transportation to site.

11. Provision of constructional and operating labour, supervisors, etc.

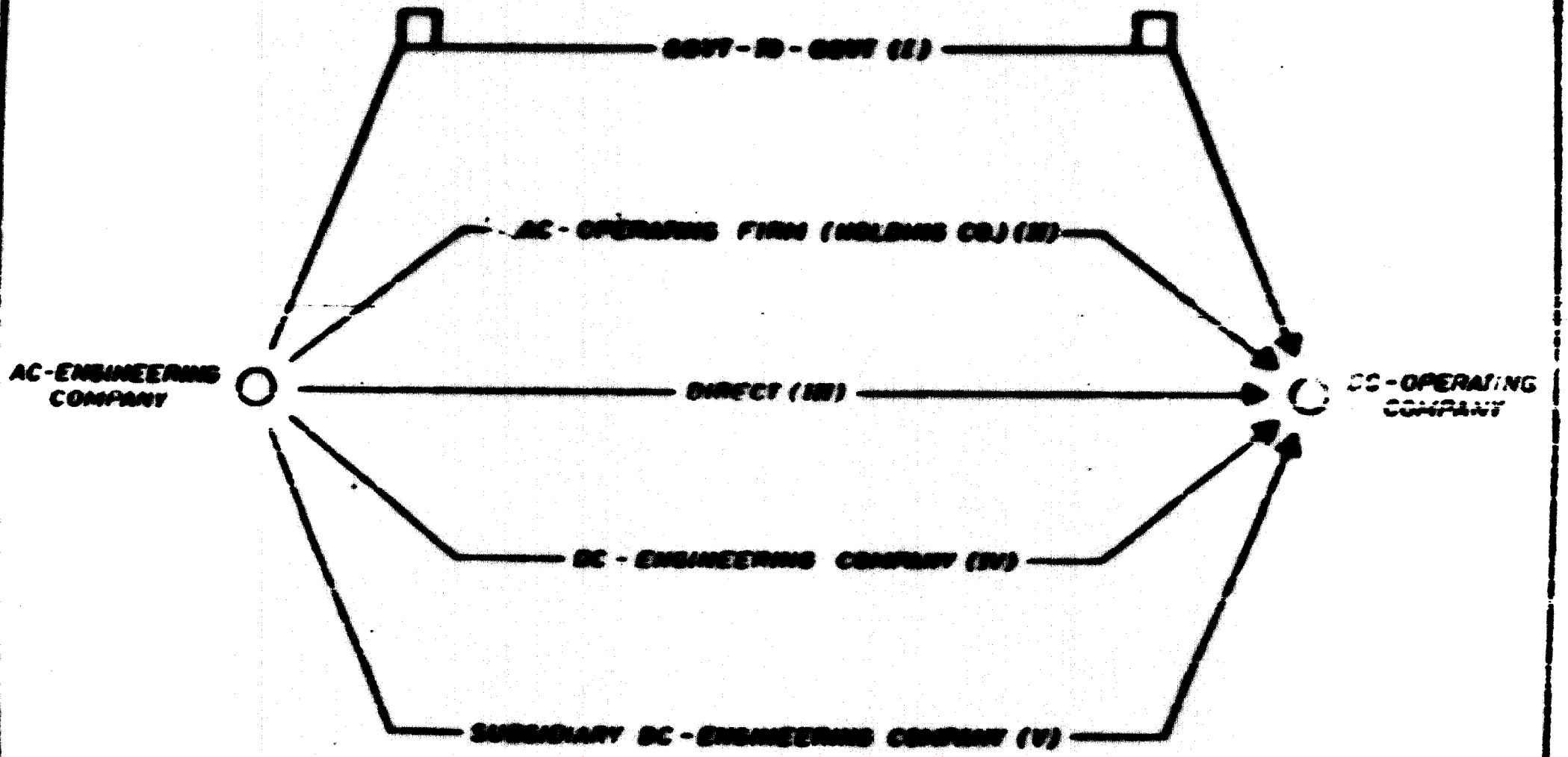


FIG.-1 ALTERNATIVE ROUTES OF ENGINEERING CONTRACTS.

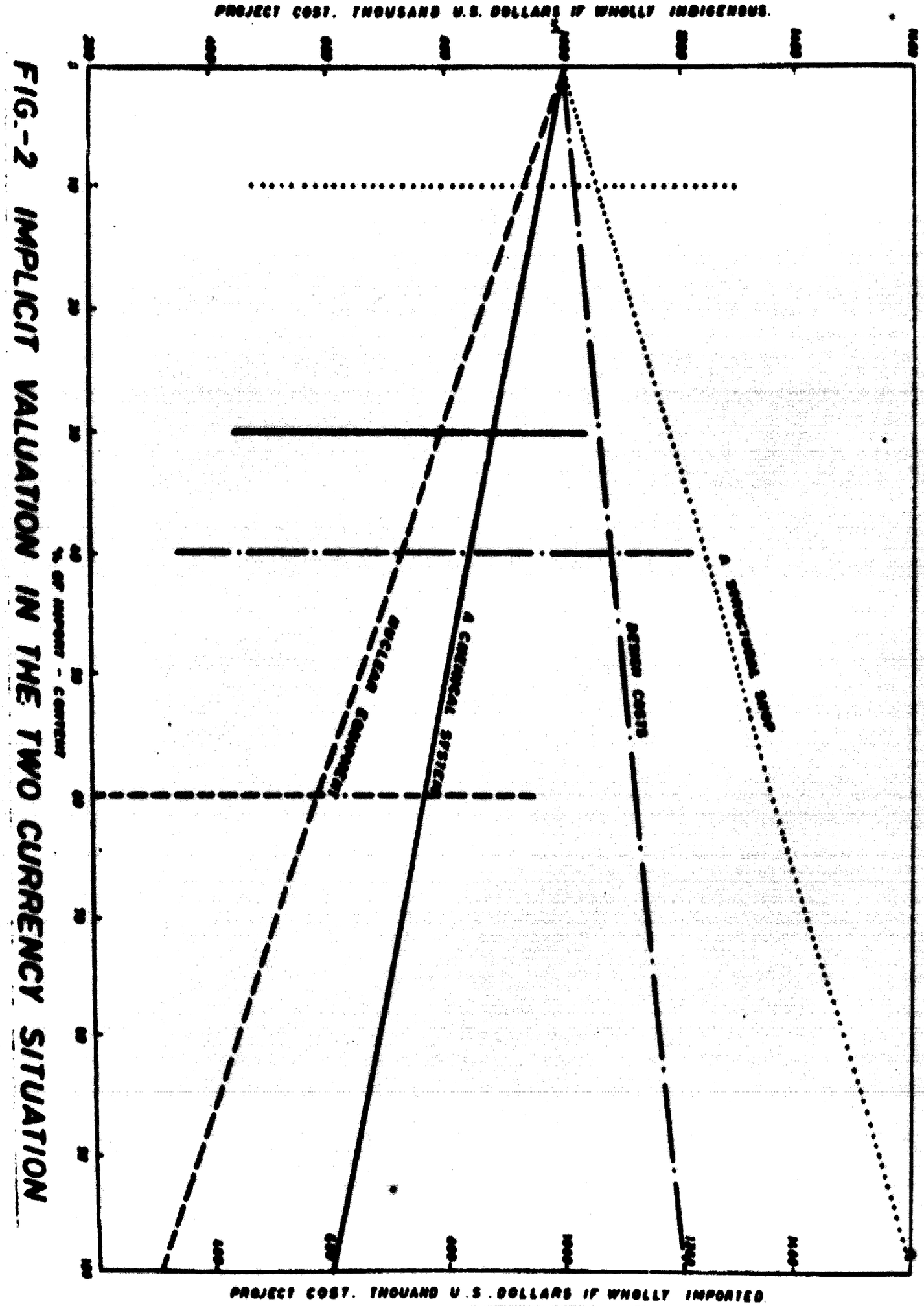
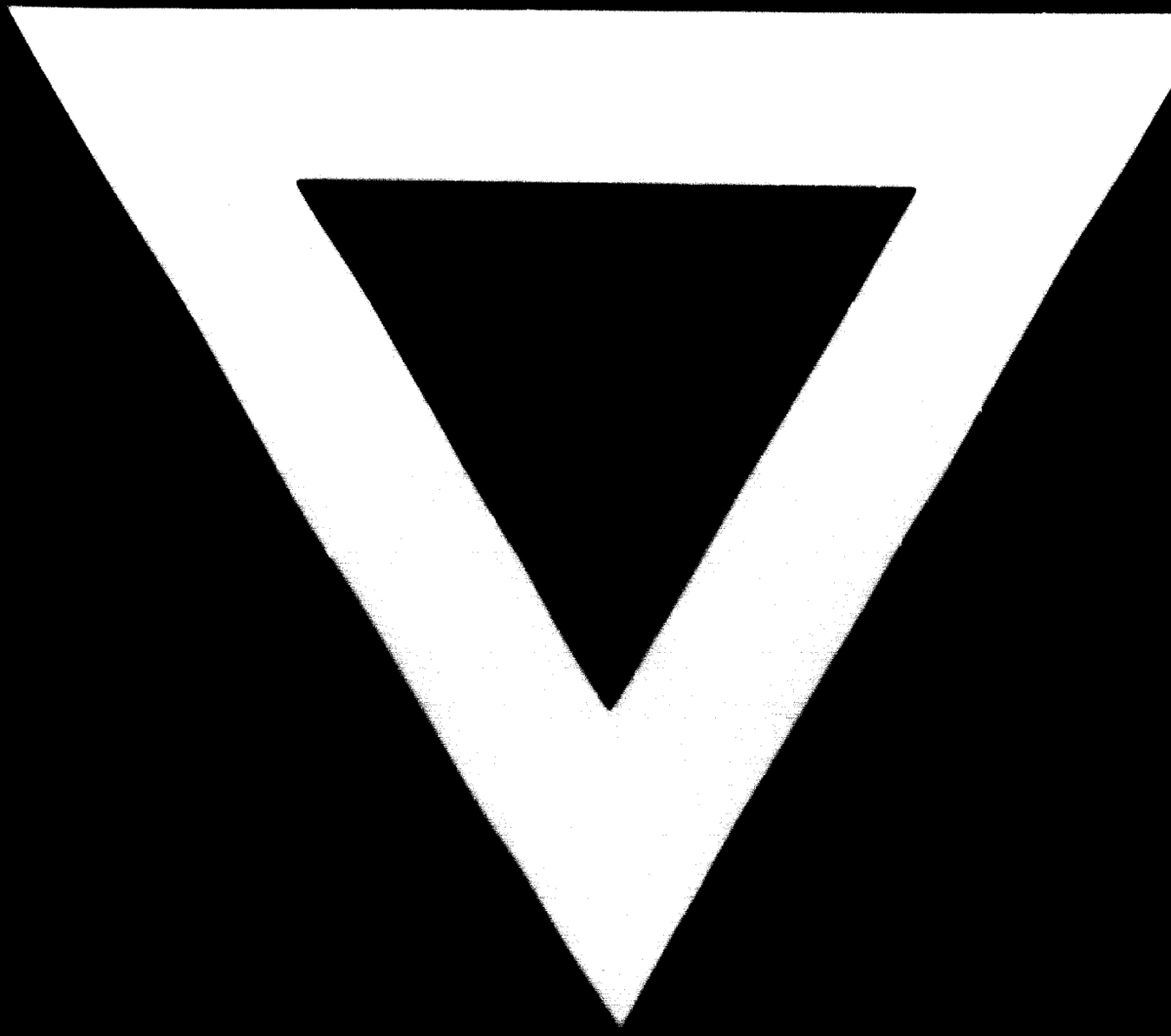


FIG.-2 IMPLICIT VALUATION IN THE TWO CURRENCY SITUATION



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