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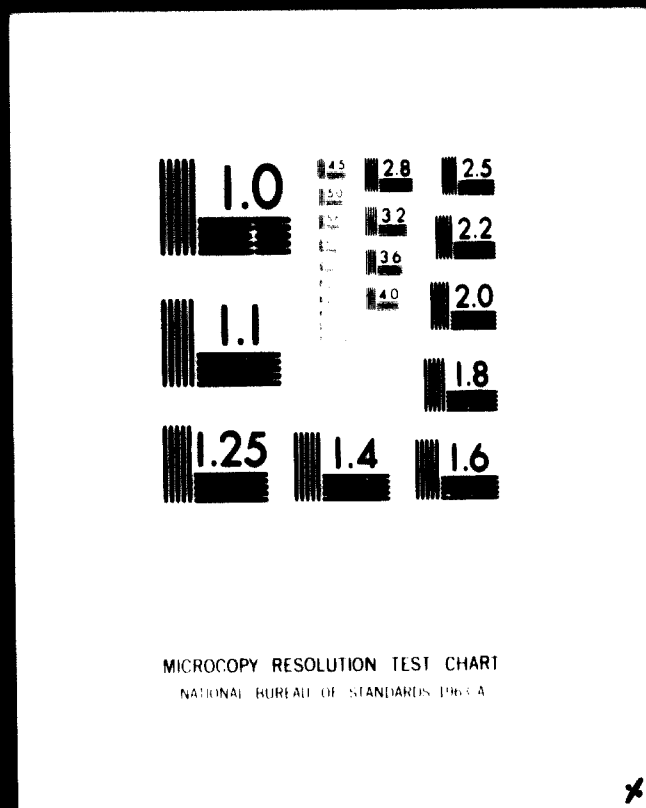
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ID/WG.259/9

United Nations Industrial Development Organization

**Technical Seminar on Contracting Methods and
Insurance Schemes for Fertilizer and Chemical
Process Industries**

Lahore, Pakistan, 25 - 29 November 1977

COMPREHENSIVE OUTLINE ON CONTRACTING METHODS^{1/}

by

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ID/WG.259/9

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1.0 Introduction

As introductory words it should be emphasized that the applying of the various contractual forms to be dealt with in this paper does not depend only upon their theoretical advantages and disadvantages, but on the entire economic-financing-investing system of the country involved. Even the most appropriate form considered suitable for a certain contract might fail if some important features of the overall investing system were not in accordance with the requirements of the selected type of contract. These reflections are made to convince my honourable audience about the great importance of thinking over the whole sophisticated system of "investment-financing contracting" before taking the decision as to the contract form on executing an investment task.

2.0 Preinvestment Investigations

2.1 Specifications, terms of reference, feasibility studies

It is still the subject of heated debate in various countries whether to precede the sending out of inquiries by having feasibility studies made in order to facilitate the working out of more accurate and carefully drawn up inquiries. Experience shows that inquiries which were not sufficiently thought over before submitting them to the bidders need so much clarification and further explanations between the bidders on one side and the buyer on the other, that time would be rolling by without beginning the design work.

Experiences induce one to realize that feasibility studies are a substantial means to examine from many points of view an idea concerning the technological development of a factory, or the creation of entirely new industrial branches or specific products thereof. Due to the high capital costs of such investments, a "multi-staged" procedure in the

preparatory phases is strongly recommended. Multi-staged procedure means the placing of an order for a feasibility study as the beginning of a completely new project. Such a decision of the customer proves correct at a later date in having saved time and even money. A lot of examples could be enumerated of the practice in the last two decades for having had to suffer significant losses on time and procurement prices because of having underestimated the role and importance of preliminary studies and feasibility studies.

2.2 Some features of the feasibility studies

The first question is to whom the inquiry for a feasibility study should be sent and how many bidders shall be invited. The answer depends upon the complexity of the project in mind. Generally, it should be sufficient to invite one or two bidders to have the study worked out.

Some fundamental development programmes in many countries were finally elaborated and pushed ahead of having examined the suggestions and budgetings of feasibility studies.

It should generally be remarked here that feasibility studies are not, of course, almighty medicaments and solution keys to judge whether a certain development plan shall be executed or dropped, but they represent essential auxiliaries to final decisions provided the fundamental data had been carefully collected, evaluated and submitted to the Bidder. The necessary data shall therefore be selected and put forward to the Bidder in a very careful manner, otherwise the "results" to be obtained from the studies might become deceiving and unusable.

2.3 Selection of Bidders

The next step after having obtained the studies is the elaboration of the inquiry to be sent to Contract engineering

bidders. The circle of Bidders is naturally broader than that of the feasibility study makers. The selection of the competing companies must be in accordance with two opposed points of views, namely the competition must be a real one to ensure the most favourable contractual conditions for the Buyer on one hand, and on the other hand inviting too many bidders must be avoided because of wasting time by long-lasting negotiations. The number of bidders must be to encourage a healthy competition but by no more.

The question emerges for the Buyer which companies shall be invited to bid. The main considerations in this respect may be the following:

- The Bidder shall have appropriate experience in designing and engineering, supplying or manufacturing and commissioning of the particular type of plant he is going to offer with special regard to its capacity desired by the Buyer;
- If the Bidder is not owner of the process in question, only licensee of the same, he still has to possess a good deal of experience in establishing such plants and the pertinent reference list must be put at the disposal of the Buyer;
- If the Buyer wishes to purchase the whole plant from the same Bidder/Supplier/, e.g. on lump sum basis, the majority of the Bidders will be very likely one of the well known engineering companies. When choosing these companies/as Bidders/ the Buyer should think over which kind of experience and background can be considered as more important for him, i.e., those concerning the process-technology or the manufacturing skilfulness of the different types of equipment and apparatus. On the present world market of contractors there are engineering companies whose background/e.g. owner/ is represented by one of the

renowned manufacturing companies of chemical products, i.e. the process experience is prevailing.

On the other hand there are engineering companies whose technical reliability is mainly in the machinery field because they belong to an equipment manufacturing group. These two points of view must be properly considered, and actions accordingly taken.

- Apart from process reliability and - in general terms - professional reliability, and well proved references of the Bidder to be chosen, their financial background must also be explored before inviting them to bid.
- With regard to encouraging the competition it has to be considered whether only the existing different processes should be called for, or the same process shall be offered by more than one bidder.

The above mentioned features are some of the many implications to be taken into account when making the very first steps for a large investment project.

Depending on the time-schedule of the Buyer, necessary arrangements should be made to visit some of the reference plants of the bidders, either before starting the serious negotiations with those who seem to have the best chances, or during the discussions. The owners of these reference plants are generally ready to acquaint the Buyer with the history of the plant technology and familiarize him with the results achieved by the Bidder during the commissioning of the plant. The information might be of greatest importance for the Buyer in judging the Bidder.

3.0 Different Types of Contracts

3.1 Identification of "lump sum", "turn-key" "reimbursable", etc., contracts

3.1 When drafting the inquiry for a process plant the Buyer has to decide the general character of the offer to be elaborated by the different bidders and the contract type to be concluded respectively. With this in view the Buyer shall indicate his intention in the inquiry. In the last years a number of national and international institutions undertook the task to work out the main features of the contract types. Among these it should be mentioned the so-called Red Book in the United Kingdom which is a model form of contract conditions for process plants suitable for lump sum contracts. Another handbook, also published in U.K., called Green Book, suitable for process plants on reimbursable contracts may also be recommended. As mentioned above, there were also other institutions which worked out the different types of contracts to be used in the business life of their respective countries.

The following will outline the major difference between lump-sum and reimbursable contracts. /Battery limits supply or turn-key basis/

3.2 Lump-sum Contract

In the frame-work of a lump-sum contract the contractor has to carry out his contractual obligations, specified clearly in the contract, in return for a lump-sum payment. All conditions of the contract, including the technical and the commercial ones, must be agreed upon before signature and the price of all services to be carried out by the Contractor have to be fixed regardless of the costs which will actually be incurred by the Contractor.

It is understandable that the Contractor, to avoid unpredictable losses, faults, etc., must include a good deal of contingencies in his price. The inclusion of the contingencies reflects certain risks for the Contractor in estimating costs that may arise during the execution of the

Contract. These risks might result in final losses or smaller profit, or even in losing the job if someone in the competition is less cautious or more optimistic / a "bolder gambler"/ and gives up some of the contingencies, thus being able to go down with the price when negotiating the contract.

The "lump-sum" price means for the Buyer not taking the risk of having cost overruns, at all; but on the other hand the Buyer cannot benefit from savings.

Lump-sum contracts were commonly adopted in many developing countries just to have the assurance that the basic costs will not increase eventually. This point of view is particularly important in cases of big investments like the establishment of a petrochemical complex or alike.

Inter alia this paper will draw attention to the fact that the lump sum price has its drawbacks for the Buyer irrespective of the fundamental advantages mentioned afore.

3.3 Reimbursable contract

Unlike under the "lump-sum" contract, under a reimbursable contract the Contractor supplies all the goods and services as specified; the Contractor, however, is reimbursed for all his costs regardless even for errors committed by him. It goes without saying, that, under a reimbursable contract, the Contractor is not compelled to include any contingencies in his price. Therefore the final costs to be borne by the Buyer should be lower than in the case of lump-sum contracts.

3.4 Turn-key contract

The "turn-key" contract represents a special case of the lump-sum type. It may be considered as a complex lump-sum contract, in which the contractor assumes the responsibility not only for designing, and supply of the equipment and the

guarantee for performance, but he himself is also executing the civil engineering works and the erection works at the site and therefore he can be held responsible for the total time-period of construction until successful start-up and acceptance of the plant by the Buyer.

In "turn-key" cases the Buyer places the responsibility of the Contractor for the whole plant area required by the letter / usually an undeveloped site or agricultural land/ and within the boundary of the area the Contractor has the full right to act at his own discretion, until the taking over of the plant by the Buyer.

Lump-sum contracts which were concluded by some of the more advanced developing countries in the past cannot be considered as "turn-key" ones, because the Buyer assumed also a lot of tasks he was able to carry out when establishing the plant. In most cases civil engineering is conducted by the Buyer who obtained the respective basic design data submitted by the Contractor. The Contractor normally undertakes the erection works as well which includes the technical supervision of the experts by the Contractor. Due to the special circumstances created by the distribution of the responsibilities between the two parties as described, the Contractor could not be held responsible for the total time schedule of the contract but only for certain phases of the over-all project schedule, like the delivery dates for technical documents, equipment and apparatuses, as well as for the commissioning period, with the exception of the duration of erection works at site. This latter period is frequently the cause for difficulties in establishing a reliable time-schedule for the whole investment period, prior to signing the contract.

As referred to above, with any type of non-turn-key contracts the Contractor is not responsible for the length of the erection works at site; however, if correctly stipulated by the contract he will be fully responsible for the commissioning period reckoned from the end of the erection works. The importance of the clause "reckoned from the end of the erection works" cannot be overemphasized, because this clause if incorrectly formulated will be the apple of discord between the Buyer and Contractor in this form of lump-sum contracts. The approaching of the end of the erection works gave many times the signal to both parties to initiate an "erection-journal war", to improve the "legal" position of each of them in a future suit by showering the other Party with written reproaches, "certifying" their omissions.

Anyway, it is not easy to define the "end of the erection works" in an clear cut way. It needs the spirit of collaboration between the Parties even when their interests are opposed, especially in the last round of the construction at site. The opposing interests are characterized by the fact that the Buyer intends to begin production on the plant as soon as possible/ even if, or just because he is responsible for having dragged out the time during a long period/whereas the Contractor wants to be sure of the success i.e. to demonstrate the guaranteed performance of the plant within the contractually prescribed period failing which he is hard hit by financial consequences. As the construction period of the plant does not jeopardize his time-limit liability under the contract, it is in the interest of the Contractor to delay or withhold the signature of the relevant minutes certifying the "end of the erection works" as long as possible.

The conflict between both of the contracting parties in respect of the crucial problem of the end of the erection must and can be lessened by mutual efforts, particularly by clear definition of essential operations to be executed in order to complete the construction at site. This definition can be given either within the framework of the contract or, what may appear as a more equitable recommendation in the last phase of the erection works the list of crucial operations to be carried out should be set up. Further additional agreement should be reached in which the parties decide to consider the erection works "as concluded under the contract" if the works listed have been carried out.

The foregoing is focussing upon only one important issue in the context of a usual lump-sum contract. The reason for emphasizing it was to exemplify the tension which occurs as a result of the opposed interests of the contracting parties in the framework of a lump-sum contract. The problem does not appear as such under a "turn-key" contract because of a lack of a strong interdependence in that case between the two parties in comparison with the usual lump-sum jobs.

The question whether to conclude a turn-key contract or to rest satisfied with any other form of a lump-sum purchase depends upon the following main circumstances:

- availability of skilled labour for civil engineering and erection works;
- lack of adequately qualified local engineering companies and subcontractors for construction and erection of plants;
- programming of the investment project, particularly in cases when Bidders offer especially favourable time-schedules for turn-key jobs,

It is evident that in case the necessary labour is not available, or insufficient, the balance of payments is not pressing and the Bidder was able to offer a very favourable time-schedule and the tendency of the product price level looks well, the turn-key purchase can be recommended, otherwise other forms of purchase shall have preference.

The reimbursable contracts might have different forms. The main forms are:

- cost plus a percentage fee;
- cost plus a fixed fee;
- target/shared over-run/;
- guaranteed maximum.

The type "cost plus a percentage fee" is wholly reimbursable, the others involve, to some extent, reimbursement to the Contractor of the costs he actually incurs. These forms except for the first one, are combination between the lump sum and reimbursable forms.

The question arises, under which circumstances should the Buyer decide whether to purchase under a wholly lump sum contract or to select one or another form of these combinations of reimbursable and lump-sum contracts.

It is not easy to give an appropriately generalized answer to this question, because it depends upon many things and therefore no general formula to be used for every case exists. In general terms, there are many countries in this world which have more or less similar difficulties to overcome when establishing new industrial branches and reconstructing their existing but obsolete production lines. Beyond this, the lack of hard currency is also, according to my knowledge, a fairly widespread "illness" in our time which justifies some strict regulations for savings of foreign exchange.

3.5 Advantages of Lump Sum Contracts

Lump sum purchases may be preferred in the following cases: and for the following reasons:

- in some countries there are rules governing investment, financing, budgeting of projects, etc. Under these rules the investor has to submit to the authorities - among others - economic efficiency estimates, including the ceiling costs on hard currencies, and it is the lump sum /firm/ system that meets best the requirements of this rule.
- when creating quite new branches of the industry, like petrochemical factories, synthetic fibre plants, etc., process considerations and the sometimes complicated mechanical problems involved may lead to decisions in favour of lump sum / complete/ purchases.
- in order to decrease internal organizational problems, and to keep responsibility in one hand, it may seem much more favourable to vest with a single Supplier, the Contract, with as much responsibility as possible and thus avoid concluding a lot of sub-contracts independent of each other.
- the lump sum bid offers the possibility of much more impartial evaluation of the competing quotations and therefore this kind of the competition can be better utilized for the interest of the Buyer.

These advantages should be taken into account when giving preference to lump sum purchases, certain disadvantages however should not be disregarded.

Due to the fact that a lot of years had elapsed since the signature of the first lump sum contracts concerning big chemical investments in various countries, the general features of the execution of these contracts may be assessed and reviewed.

The lump sum purchase is a relatively expensive form for the Customer because of the contingencies of risks, including that of price escalation. On the other hand the hard competition, especially in the last round of the negotiations may lead to lowering the quoted price by the Bidders, but there is sometimes no benefit for the Buyer from these concessions, which may result in supply of equipment of low quality and application of less costly materials that in the long run may prove unsuitable. Repeating of the final price quotation and the subsequent unfavourable impact of the quality of some equipment supplied, point to a general feature of this kind of contractual relationship, namely the divergent interests of Contractor and Buyer. In an earlier part of this paper the opposed interests of the contractual parties regarding the erection works were pointed out. The divergency of the interests, however is evident also in many other areas covered by the mutual contractual obligations of the Seller and Buyer.

The advantages and disadvantages have to be carefully considered before decisions are taken.

3.6 Preference for Reimbursable Contracts

As concerns reimbursable or semi-reimbursable contracts, this form appears recommendable in the following main cases:

- the extension of existing plants on the basis of a well-established proved process, i.e., the know-how is already available;
- the construction of a new factory, according, however, to the available know-how;
- in some cases when Contractors refuse to supply the plant on lump sum basis owing to too great risks for him;

- there is a fairly well equipped engineering organization existing in the country which is adequately qualified to undertake project management, subcontracting, equipment procurement and related services.

The application of the reimbursable types of contract is justified in all cases in which the Buyer feels himself strong enough to act as the prime contractor or to purchase the equipment at his responsibility with the assistance of an outside Contractor, the latter being the supplier merely of the know-how and/or of some key equipment respectively.

4.0 Contract preparation and timing

4.1 Inquiries and specifications

The lump sum purchase needs a careful preparation. The inquiries must be very exact, covering all important aspects of the case, otherwise the Buyer will have unpleasant surprise in respect of loss of time. An inquiry which is not carefully worked out, cannot be the firm basis of the bids, the bidders are obliged to put a lot of further questions, they must clarify many things before sending out their firm offer. These queries take much time and the accidentally incorrect answers might lead to offers being misjudged and the final decisions of the Buyer could therefore be wrong. Attention should be paid to the fact that the objective comparison of the competing offers is difficult enough in process plant cases. The more correct and comprehensive the inquiry is, the less is the danger of getting uncomparable and divergent bids. Considerable time saving may be expected. Special reference must be made to the changes of the specifications during the negotiations as compared with

the original inquiry. It is easy to advise, however, difficult to follow it, that the Buyer shall, as much as possible, avoid making changes on previous/original/specifications, particularly substantial ones. This is a real danger of wasting much time by a renewal of the discussions, expecting new offers, etc. Regardless of this precaution, the Buyer is sometimes forced to change his mind in the course of the negotiations owing to some substantial reasons and in such cases of course he shall not hesitate to do so, because the later he makes it, the graver are the consequences.

4.2 Preliminary bids

So far the significance of preliminary offers was not mentioned in this paper. These are an important means to avoid superfluous costs to the Bidder at a stage when the final concept of the project has not yet shaped up. In certain cases the feasibility study may be replaced by a preliminary offer which enables the Buyer to obtain the necessary approval to continue with his ideas.

4.3 Invitation to bid to selected Companies

The Buyer should indicate his intention regarding the type of contract in his inquiry sent to the Bidders.

Particular attention be drawn to the outstanding importance of the proper and exact specification of the inquiry. The following examines the case when the Buyer/Contractor/ on lump sum basis.

4.4 Completeness of the plant

The scope of delivery shall be indicated by the "battery limit", preferably by a plot plan annexed to

the bid and later to the contract, as well, to avoid any misunderstanding. An extraordinarily important provision of the contract is the engagement of the Contractor to be responsible for the completeness of the plant within the battery limit. This engagement means the following:

- "Should, during the erection and commissioning works, become obvious that something is missing which would be necessary to assure the proper operation of the plant, in full compliance with the provisions under the contract and those particular items of equipment, or bulk material, or spare parts, etc., are not exactly prescribed in an itemized form as included in the scope of delivery of the Buyer, the Contractor has to care for it, within the lump sum price under the contract."

The inquiry must clearly indicate the scope of delivery of the contractor and the exclusions thereof. The list of exclusions is an important chapter of the inquiry. The more extensive is this list, the easier can be negotiated the contract. The list of exclusions may contain, among others, the following items, in case of a lump-sum purchase:

- Civil engineering works
- Steam generation and power station
- Transformer and switch gear for electric power supply (substantial)
- Underground piping, sewage systems,
- Cooling water towers.

When drawing up the inquiry, the Buyer should specially pay attention to the possibly necessary additional units, like devices or processes to protect the environment, treatment of sewage-water, analytical laboratories for quality control of the product and/or by-products and/or

the intermediary products, etc. Regarding these circumstances, it is recommended that the Buyer make references to these in the inquiry and ask for the separation of these items in the bid.

4.5 Breakdown of the price quotation

The inquiry should require a detailed breakdown of the price from the Bidders. The breakdown should contain, in any case, the following:

- engineering fee, including that of the know-how
- licence fee
- price of equipment, bulk materials, etc., possibly according to the respective units of the plant
- daily allowance for the expatriates of the Bidders according to their special category.
- Price of any other services for which provisions are made in turn-key contracts as: civil engineering works and materials, erection of the plant, etc.

4.6 Specification of product quality and specific consumption figures

The Buyer is not generally in the position to indicate accurately in the inquiry all the parameters of the product quality. Moreover it is not in his interest to do so.

He should merely refer to the capacity of the plant required and give some figures concerning the product quality, like "admissible impurities". The Bidder shall present the exact figures and submit them in his bid in order to enable the Buyer to compare those with parameters offered by the competitors. However, figures relating to the specific consumption of raw materials and utilities should be asked for. These figures might be decisive with regard the production cost comparison. Distinction should be made between "guaranteed" and "expected" consumption.

4.7 Site selection and climatic conditions

The inquiry should specify exactly the most important figures relating to the local conditions/basic design data/ as to seismic data, climatic conditions,/prevailing wind directions/, the quality of the soil; it should also be indicated whether the new plant will be established at an undeveloped site/grass-roots conditions/or will be attached to an existing plant.

4.8 Specification of raw materials/feedstocks/and utilities and their availability at site

The quality of feedstock shall accurately be specified in the inquiry and later on, in the contract as well. Parameters of available utilities shall be indicated in the inquiry and in the contract. Among these, pressure and temperature of available steam and process-water and cooling water with indication of the ambient summer and winter temperature of the air, data on electric power supply, etc., should be given. Data on infrastructure, maintenance facilities, availability of accommodation for expatriate staff and local labour, description of means of transportation, etc., should also be provided.

5.0 Financial Aspects

Financing of the contract can be arranged in a number of different ways. Some of these are as follows:

- the contract stipulates cash payment conditions, whereas the Contractor is paid for his services under the contract by a first class bank having a credit agreement can be preceded by governmental financial conventions.
- the establishment of the plant will be based on a joint venture agreement with the Contractor
- the contract will be linked with a product buy-back deal, as payment for the services for the Contractor,

which implies provision of credit facilities for the Buyer.

The payment conditions, as a matter of fact, depend upon the financial situation of the Buyer, the prevailing rules in his country, the credit rules in the country of the Contractor, etc.

Payment in cash should be given preference, whenever possible. The contractual payment conditions are mostly linked with a bank guarantee for performance/performance bond/issued by the bank of the contractors. The bond usually amounts to a certain percentage of the total contractual price and could be used by unilateral decision of the Buyer if the Contractor did not fulfil his obligations under the Contract/e.g., non-fulfilment of the performance guarantee or other specific items of the contract/.

For working out clearly defined specifications for the bidders, it appears necessary to consider required or acceptable financing schemes for the project in advance. However, the bidders should be asked to submit contract price offers under cash payment conditions. This recommendation should be also followed when requesting preliminary technical and price offers.

Price offers that are not based on identical payment conditions cannot be evaluated and compared properly.

Payment conditions which take into account financing schemes for the whole project have to be agreed upon after having evaluated the technical offers and brought them to a comparable scope of supplies and services.

6.0 Evaluation of the Bids

Before evaluating and comparing the competing bids, it is indispensable to adjust the technical specifications

to make them comparable. The amended specifications have to cover the same scope of delivery and services.

All elements of the bid will have to be analyzed from the aspect, whether they represent factually the same scope of delivery or not. If there are differences - and this is mostly the case - the Buyer must apply an "equalizing estimation" which is preceded by clarifying discussions with the Bidders in order to explore the scope of delivery actually covered by the bid. The clearer is the definition of the scope of delivery in the inquiry, the less time is needed for the evaluation, as already referred to in the preceding chapters.

Proper evaluation of bids is one of the most important phases of the precontracting procedures. This work should only be carried out by highly qualified and experienced engineers and economists. Quite frequently offers have some weak points, either when the Contractor is reluctant to strictly follow instructions laid down by the buyer in the inquiry (specification for bidding), or if Suppliers are not sure about the scope of work and prices for items connected with subcontracting. The Contractor may not have had enough time to go into details, or he may have based sections of his offer on estimates only, instead of preliminary engineering of sections which he is going to supply for the first time. Preparation of an extensive offer is a costly exercise for any contractor, since there are almost no cases where even highly experienced contractors may be in a position to repeat previous tender specifications or adjust those by incorporation of specifications of items contracted for other clients. Those who are assigned to evaluate the bids should be aware, as well, of the Buyers capability to operate and maintain the equipment which is being offered.

The list of exclusions must carefully be checked by considering whether works for which the Buyer will be responsible can be carried out timely and according to the contractor's requirements.

Also, evaluators have to co-ordinate the specifications provided by the Contractor with specifications and parameters for Sections, which will be given for execution to other external contractors. This mainly concerns offsite facilities, external steam, water and electric power supply and any other items that distinctly were excluded from the scope of deliveries.

With large projects it appears, therefore indispensable for the Buyer to have a preliminary design/engineering layout for the whole complex ready before evaluating the bids.

If the Buyer's staff has no experience or may only inadequately be qualified to evaluate the bids and to discuss technical details with the Contractor and representatives of the licensor, consultants should be hired to do the work. However, in any such case external consultants should not be left alone, to act as the sole representative of the Buyer.

Without having assigned a proper project management team, the Buyer can hardly expect to have full control over precontracting and contracting procedures. When evaluation of bids, selection of the Contractor and project management is being sub-contracted to a consultancy company the Buyer may never be sure that his interest is rightly respected and represented. Consultants holding international status may be asked to provide the Buyer with unbiased advice, but even in this case a strong management team should be established for both project management and execution and preparation of the key-staff who is going to operate the plants.

7.0 Guarantee clauses

7.1 The Contractor's and Buyer's Attitude

The inquiry invites the Bidders to indicate the figures they are ready to guarantee provided certain preconditions are secured or fulfilled. The contract shall precisely stipulate all required guarantee values the non-fulfilment of which may have financial and other contractual consequences. Data to be communicated to the Contractor according to the foregoing paragraphs dealing with specifications for bidding/site conditions, feedstock, labour etc./ are the most important preconditions for which the Buyer is responsible and in case of non-fulfilment the Buyer will have to bear the financial consequences.

If the frame-work of a lump sum contract the Contractor is particularly eager to insist on the accomplishment of the preconditions, otherwise he considers himself as released from some of his engagements under the contract.

The guarantee clauses constitute an integral part of the lump sum contract with all their penalty and other financial and legal aspects including the bank guarantee to be issued by the bank of the Contractor as joint and several guarantor. The Buyer should be careful and not exaggerate the number of parameters to be guaranteed by the Contractor, to avoid increasing in a superfluous manner the risks of the latter, and consequently, an escalation of the price. The technical experts are always inclined to have more and more figures guaranteed. /Engineers who were working in industry for a long time and got involved in contracting or project planning will surely concede that this is a frequently encountered attitude./

7.2 Procedure for liquidated damages and arbitration, and penalty versus Bonus Clauses

The so-called "sanction" system of a contract, be it either a lump sum one or of the reimbursable type, directly affects

the price position of the Contractor. The contractor considers the penalty clauses of the contract as certain risks for him with financial consequences unless he meets his engagements under the contract.

In many countries it has become a general rule to demand penalties from the Contractor in case of non-fulfilment of

- his delivery obligations regarding technical documents, in due time /e.g. the entire time schedule for construction of the plant depends on timely execution of the civil engineering works in case those will be carried out by the Buyer/
- his delivery obligations of the equipment, materials, etc., in due time /the duration of the construction period would be extended in case of delayed delivery/.
- his performance guarantee.

As we chose to use Swiss Law as governing law, we avoid stipulating liquidated damages clauses in the contract, instead of this we speak about a "penalty" clause.

As to the so-called "bonus clause", the experts of some countries are against the application of such clauses in the lump sum contracts for technical-administrative reasons, like

- the penalty clause represents some kind of "punishment" to the Contractor for having failed to meet an engagement and this omission cannot be compensated by any act
- it is almost impossible to judge in advance of signing a contract which failure of a performance value to what extent could be compensated by the possible over-accomplishment of another performance figure and
- within which rate, after, say, four or five years.
- should "bonus clauses" be stipulated in the contract, the Buyer would have to care for keeping in evidence the respective production figures and there might be disputes on how to evaluate them.

It is one of the most crucial provisions of the contracts what shall be done if the plant does not operate satisfactorily and cannot be even repaired, i.e., the Contractor fails to meet his fundamental obligation under the contract. The contracts sometimes entitle the Buyer to repudiate the contract with all the consequences to the Contractor/preserved right to demand indemnification for production losses, etc./.

However, this repercussion might be too grave for the Contractor. Therefore other formulations may be preferred, e.g., the definition in the contract of the cases in which the "contract might be considered as non-fulfilled by the Contractor" and under which circumstances the arbitration court should be approached to decide.

7.3 Performance guarantee and sustained operation

In the last twenty years developing countries were faced with the very unpleasant experience in respect of the guaranteed performance figures. In numerous cases, the Contractor succeeded in demonstrating the guaranteed parameters, and the hence the Buyer signed the acceptance protocol. When the Contractor had left the site, after a relatively short period, the plant could not maintain the rated capacity level during day-to-day operation as expected. It operated on a much lower level in spite of the fact that all the operation instructions have been respected.

To avoid such circumstances, the so-called "sustained operation" clause is to be inserted into the context of the contract. Under this clause the contractor cannot start demonstration of the performance figures until the successful completion of the "sustained operation" period. The plant must not be "keyed up" for the test runs only, it has to prove its capability to run smoothly during a longer period.

3.0 Plant commissioning procedure

When the erection works were completed and the relevant protocols have been signed, the period of commissioning starts. The statement of the "completion of the erection works" is very important under the contract, as presented in the foregoing chapters.

The commissioning period is usually strictly limited to, say, 180 or 270 days, during which the Contractor has to adjust the plant, to effect the necessary replacements, to achieve the "sustained operation" and, finally, demonstrate successfully the performance figures. The contract shall describe precisely the whole procedure, including the methods of measuring the parameters, their mathematical evaluation, etc.

The commissioning procedure has to be described in details in the contract. Generally, the commissioning procedure goes on under the technical supervision of the Contractor. The test run will have to be performed in common observation of the representatives of the Contractor and the Buyer and the statements thereof must be made commonly.

If the Contractor is not owner of the process, only Licensees of it, the Owner's best specialists have to attend the test runs. The commissioning period needs the highest spirit of collaboration of all representatives at site, the respect of the mutual interests are most strained toward the end of the erection works and during the commissioning period.

The legal consequences of the non-fulfilment of the performance figures were referred to in the preceding section.

9.0 Specific Aspects of Contracts

9.1 Scope of the responsibility of the Contractor and the Buyer

The usual lump sum contract provides the execution of a lot of works as the duty of the Buyer, as mentioned above. /Not turn-key contracts/ the clear definition of the mutual responsibilities is indispensable. For example, from the

Buyer's point of view it is advisable to have the civil engineering design approved by the Contractor. The Contractors do accept such demands provided they will not be involved in technical faults, to be committed perhaps by the Buyer. Sometimes there are irksome negotiations on the responsibilities and the difficulties can be overcome only by having a mutual confidence in each other.

In order to facilitate the pushing ahead of the design and engineering work of both parties, technical conferences shall have to take place and the agenda of these should precisely be fixed in the contract.

As the execution of a lump-sum contract needs the close co-operation of the Parties, a precise time-schedule of both Parties has to be set up in the frame of the contract.

9.2 Responsibility for damages, insurance scheme to protect interests of both Parties

The lump sum contracts comprise provisions concerning the liability of the Contractor relating to damages caused by him, either directly or indirectly. The latter refers to so-called consequential losses, like loss of production, etc. It is a real problem how to protect the Buyer against big losses and at the same time how to protect the contractor against enormous costs which could incur in unforeseeable cases, apart from force majeure cases, which are properly settled under the contract.

It is recommended that the Contractor conclude an insurance contract covering damages to a reasonable extent and this sum might be provided for in the contract. Whatever the case may be, the Contractor must be liable for the direct damages due to his omissions and for the ownership of the know-how, in other words the Buyer must not become involved in right infringement disputes over the process offered by the Contractor.

The expatriates of the Contractor

The Buyer needs the presence of experts during the construction of the plant and during the commissioning. The contract shall provide for the exact allowances for these specialists in foreign and domestic currency and for all the conditions of their stay in the Buyer's country in full compliance with the prevailing rules and laws of the country.

To create the necessary financial resource for the payment of the expatriates of the Contractor, it is also usual to establish an estimate for these payments in the same currency in which the price has to be paid and to include it into the global contract price. The actual payment of the daily allowances in domestic currency for the people of the Contractor will be effected monthly against presence certification of the resident project manager of the Contractor at site. The fees to be paid in foreign currency have to be remitted to the Contractor against invoices.

10.3 Spare parts, operation, manuals

It is usual for the trouble-free operation of the plant to order spare parts for a period of two years. As it would be difficult to specify the items of spare parts before the signing of the contract, the Parties agree on an estimated amount to be specified later, during the execution of the contract. This procedure allows the Buyer to include the sum for spare parts into the credit facilities to be granted by the Contractor and his bank respectively.

The contract shall provide for all the necessary operation prescriptions, like

- start up procedures
- shut down procedures
- emergency procedures
- safety precautions

11.0 Training of the operating and maintenance personnel

Owing to the fact that the knowledge of the technology of up to date process plants needs very very careful study and personal practice, the personnel of the Buyer must be trained in one of the plants designed by the Contractor and/or operating according to his know-how, or to that of the licensor.

The relevant clauses have to be provided for in the contract.

12.0 Recommendations

Precontracting procedures

To shape up the most suitable form of inquiry and contract model, the Buyer should follow a multi-stage procedure. It is understood to start with

- either a feasibility study, preliminary design or project design which should be carried out by one or two preselected engineering companies;
- or with the invitation for preliminary offers and including reference lists and descriptions concerning the activity of the Bidders in question, and
- visiting some of the reference plants

Model contract and procedures

The Buyer should get acquainted with the fundamental features of lump sum and reimburseable contracts. The turn-key job is a special case of the lump sum one. Advantages and disadvantages of both models should be taken into account when decisions are being made.

The lump sum form should be preferred in cases of

- quite new processes and/or
- huge investments
- not having the necessary labour, skill and technical organization available at home
- getting favourable credit facilities and/or payment conditions/product buy-back etc./

The reimbursable form should be preferred in cases when

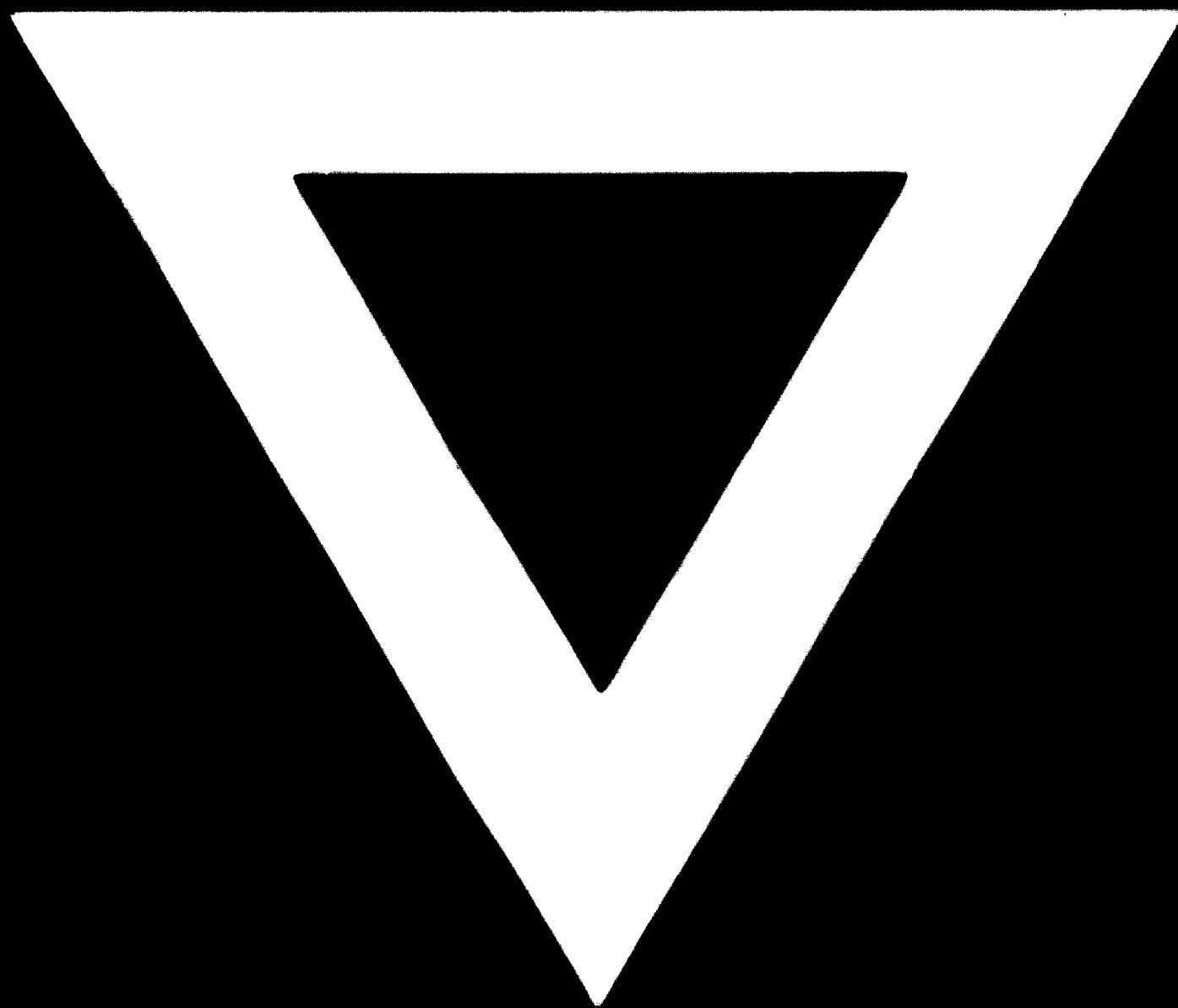
- the Buyer wants to save as much as possible foreign currency,
- the Buyer undertakes the main responsibility to establish the plant/project management/
- the Buyer wants to minimize the divergency of the interests of both parties
- the Buyer wants to reduce the time required for bidding and the contract discussions.

Use of consultants

It must expressly be recommended to employ neutral consultants for precontracting and contracting procedures who would have the charge to assist the Buyer's organization in preparing the evaluating the bids and negotiating the contract.

UNIDO's consultants are always at the disposal of the developing countries' respective organizations to assist the preparatory works, the whole contracting procedure as well. Their independence from any of the big engineering companies may assure for the investors the reliable representation of the interests of the developing countries.

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82.06.23

