we ask that the licensor be in a position to review our design and answer questions.

In return for the services and technology which the licensor provides, he sets and receives a fee, the amount of which depends mainly on the uniqueness of the technology involved. Because the client for a turn-key plant asks that standards for performance be met, such as quality of product, and consumption of raw materials, for example, the licensor in standing behind his technology agrees to risk a part of his fee to cover liquidated damages in the event of failure of the first performance test or to pay for modifications of equipment to permit a subsequent performance test to succeed. In perspective, this "risk" which the licensor takes is only part of the total turn-key contract risk.

As to questions of exclusivity or non-exclusivity, while Coppee-Rust avoids binding itself legally to one technology forever, in effect we make a choice of what we consider the best technology and take our chances on its future success. One encounters however many varieties in the decisions apart from exclusivity that licensors make in their relationships with contractors. A few of these are as follows:

Licensor permits a few contractors to sublicense technology, assigns countries to each, provides confidential information.

> This arrangement permits the contractor to plan his prospection and to develop a good working relationship with the licensor but does not take into account changes in politics, financing possibilities or recent experience of contractor.

Licensor permits a number of reputable contractors to sub-licence technology, no countries assigned.

> This gives broad coverage to licensor, but tends to disseminate licensor's confidential information and reduces incentive for individual contractors becasue contract price tends to be lower.

Licensor decides exclusive cooperation with a contractor only when specific case arises.

This lets the licensor safe-guard his technology and make a current judgement of which contractor is in the best position to win the contract but does not give the contractor sufficient time for preparation in his own organization.

Licensor does prospecting himself, lets decision of contractor to client.

> This works in the Western world, but not in developing countries when turn-key contract is desired. Engineer contractor is at a disadvantage time-wise and experience-wise when presenting the first project proposal.

Thus are pros and cons to the above schemes. Because Coppee-Rust has had successful experience with most of the above schemes, we indicate no preference for one above the other.

In summary, from the viewpoint of Coppee-Rust we consider the offering of licensed technology as an engineer-contractor to be a desirable activity, so we look to expand our offerings of licensed technology in the future. The way in which we are going about this is to analyze country-wise and market-wise our future markets, contact prospective licensors, and familiarize and indoctrinate our personnel on the new licensed technology as required.

**About the Speaker: Carl W. Weil is with the firm of Coppee-Rust, Brussels, Belgium.*

## ENGINEERING COMPANIES AS LICENSING ORGANIZATIONS

*by*
*Charles C. King.**

While Engineering Contractors have engaged in licensing for perhaps a half century in the petroleum refining and chemical fields, their activities in licensing have increased remarkably since the late 1940's as the engineering companies grew in size and diversified into new areas of technology. This growth has taken the engineering contractor to more countries of the world including the developing African and Asian countries and Eastern bloc countries thereby necessitating involvement in licensing to these areas. At the same time there has been a trend among owners of process technology away from holding such technology solely for their own use and in many instances they are now willing to license to others. The openness with which owners are willing to license their technology is perhaps greater among U.S. licensors than among foreign licensors possibly because of concern over the strong anti-trust laws in the United States. Often times European licensors are willing to license on a limited basis only where the license in question will not encroach on the process owner's market. Undoubtedly one reason why more companies are willing today to license their technology is that they have discovered there are substantial profits to be made from royalties — either paid up or running and in the case of their process technology there may be no other practical way for them to enter the market in a particular area.

The Engineering Contractor participates in licensing in either of two ways:

1. Develops and licenses processes of his own.
2. Through special arrangements with a process owner, offers the processes of others.

*Process Development by Engineering Contractors*

A limited number of engineering companies maintain their own research and development facilities which they use for process development with a view to licensing of processes so developed. Prior to the 1940's certain engineering companies participated in the research and development of petroleum refining processes together with operating companies. Patent pools and joint licensing programs were undertaken. Since the early 1950's engineering companies with research operations have turned their attention away from petroleum refining processes and rather towards petrochemical processes with some examples of out-standing success e.g. pyrolysis of hydrocarbon feeds to produce olefins. In fact the latter process technology is dominated by engineering companies rather than manufacturing companies.

The engineering contractor, in general, cannot develop all of the processes which he engineers. A large engineering contractor of process plants is building these plants using a wide range of processes and feedstocks to produce a broad spectrum of products. He has neither the manpower nor the financial resources to undertake development of more than a few of the processes for which he builds plants. The chemical industry itself is so diverse that no one company can cover the field with its own efforts. Thus the engineering contractor tries to concentrate his efforts on those processes which are within his capabilities and can best serve his purposes.

In the development of processes for license, an engineering contractor often takes on a partner at some stage of the research effort. The partner is usually a manufacturing company and the partnership results in the following advantages to the parties:

1. The manufacturing company gains preferred access to the technology for his own use and participates in the royalties from licensing to third parties.
2. The engineering company gains financial support for the very costly process development.
3. The process may be first demonstrated on a commercial scale by the manufacturing partner and thereby enhance the position of licensing third parties.

*Engineer-Contractor Licensing of Third Party Know-How*

The role played by the engineering company in the licensing of third party owned processes varies considerably. The relationship between owner and engineer-contractor may be one of the following:

1. Exclusive licensing and/or engineering rights either world-wide or in a defined geographical area.
2. Limited non-exclusive licensing and/or engineering rights.
3. Open non-exclusive rights.

Some mechanisms of operating which we have encountered are as follows:

1. Engineer-contractor prepares, negotiates and executes the license with the licensee under sub-licensing rights which have been passed from the owner to the engineer-contractor.
2. The owner prepares the license with assistance from the engineer-contractor, the engineer-contractor negotiates and the license is executed between the owner and the licensee.
3. The engineering-contractor performs the promotional sales effort. The owner then prepares, negotiates and executes the license with the licensee.

The choice among these latter modus operandi is dictated by the extent to which the process owner is equipped and prepared to handle negotiations himself. When he is not so equipped, the engineer-contractor is prepared to step in and take over these functions.

We must examine what an engineering contractor has to offer to a process owner that makes it beneficial to both parties to enter into either an exclusive or limited non-exclusive licensing arrangement. Among the benefits offered by the contractor are:

1. Acquaintance with a wide diversity of technology. There is little question that the engineer-contractor possesses an invaluable experience in selling many different processes the success of which creates the major share of his business.
2. Recognition of market competitiveness. The engineer-contractor is in contact with clients all over the world and is in a unique position to appreciate the competitiveness of any new technology. In this respect he has a broader exposure to the market place than most process owners.
3. Familiarity with the problems of scale-up from bench scale equipment to commercial plant. This is a problem with which the engineering organization deals every day. It is the very essence of his engineering skill. With broad experience in a wide field of processes he is particularly capable of solving the problems of scaling up a new process.
4. Engineering Capability for Improving and Optimizing already commercialized processes. Part of the engineer-contractor's stock in trade is a competent staff of engineering specialists. This together with computer technology capability can lead to improvement of any process which has not been so analyzed. Another aspect of this engineering capability is the ability to adapt a process to any particular local economic situation or other limitation on boundary conditions such as particular feedstock supply.
5. Ability to see possible broader application of the process than conceived or exploited by process owner. A process owner who has developed a process for his own special manufacturing needs may fail to see other potential applications for this process or he may have an inkling and not be in a position to go about broadly applying his process. The engineer-contractor with his broad exposure to the industry is better able to take an overall view and focus on the promising possibilities for the process.
6. World-Wide Selling Organization. The engineer contractor knows the clients. The large international engineer-contractor has a world-wide selling organization which can efficiently uncover and exploit the marketing opportunities for the owner's processes. This will save the process owner heavy sale expenses which he himself may not be able to furnish efficiently. For the small owner

mounting such a sales effort by himself may be virtually impossible. In many cases with both large and small owners of processes their principal interest is in their own manufacturing operations and they are not prepared to undertake a licensing sales effort.

7. Research by Patent Attorney. Where needed, the engineer-contractor can assist the process owner with the services of the contractor's staff of patent attorneys. Such assistance could include patent searches and filing assistance in foreign countries. The engineer's patent staff by uncovering patents in other countries could save the owner future embarrassment and expense in exploiting his process.

*Considerations in Determining Exclusive or Non-Exclusive Licensing Arrangement*

For both the process owner and the engineer-contractor there are a number of points to be considered before one can decide whether it is better to have an exclusive or a limited non-exclusive licensing arrangement. We will not consider further open non-exclusive licensing where the engineer-contractor seldom participates in the licensing which is rather carried out between process owner and licensee. The engineer-contractor then may sign an agreement of confidentiality and perform the engineering service.

The process owner may wish to license as broadly as possible. This might lead one to have many licensing agents on the theory that the degree of success in licensing is proportional to the availability. However, another more rational idea is to determine the number of agents on the basis of the market for the process. If a world-wide market for a process consists of twenty plants per year at fifty million dollars each, it is obvious that no single engineer-contractor can handle that volume of business devoted to a single process. On the other hand if the market for the process is one or two plants per year costing ten million dollars each, it is not sensible to have a half dozen engineer-contractors competing on the same process for that business. Where there are to be multiple licensing agents, the number should in some way be geared to the volume of business anticipated.

One method selected by some process owners is to analyze the market and then select engineer-contractors in different geographical areas in order to obtain world-wide coverage. At the same time the owner should try to select engineer-contractors who have the strongest possible technical position to sell his process.

At the same time if the owner has new and unused technology he is interested in limiting the number individuals other than licensees who have access to his technology to protect the confidentiality of his unpatented know-how. In spite of signing even very stringent secrecy agreements, the process owner is always concerned that in some manner his know-how will leak out and the best protection he has is to have as few persons as possible know his secrets. It is probably this factor more than any other from the process owner's point of view that leads him to exclusive licensing. There is however another factor. The process owner must educate the engineer-contractor in all aspects of his process including research data, design information and commercial operating experience. This education process is time consuming and costly. The process owner would like to do it as few times as he can.

There is an analogous technical problem for the engineer-contractor where there are multiple licensing agents. If the engineer-contractor makes substantial technical contributions to the design and/or improvement of the process he wants protection of his contributions so that they do not fall into the hands of his competitors without compensation. This problem is more applicable to some processes than to others and where it exists is another factor which leads one into consideration of exclusive licensing.

The decision to go exclusive or non-exclusive is strongly affected by the competitive situation of the technology. In these cases where the technology is relatively old and there are many competing processes in the field with perhpas only marginal differences between them, it is not useful for either owner or engineer-contractor to enter into an exclusive licensing arrangement. Through non-exclusive licensing one engineer-contractor may be able to construct several different owner's processes for his clients. For the owner in these highly competitive situations, he is usually negotiating directly with the client-licensee. The owner is then able to leave the licensee free to choose his engineer-contractor.

Where technology is closely held and there may be only one or two process owners, it is more usual to find either exclusive licensing arrangements with the engineer-contractor or the owner enters into non-exclusive licensing arrangements with a limited number of contractors. In this manner the owner obtains maximum protection of his know-how and the engineer-contractor is willing to expend the promotional effort to go out and sell the process. It is obvious that in entering into an exclusive or limited non-exclusive licensing arrangement, the process in question must be equal to or better than all other processes which may be offered by competitors for the venture to be successful. This condition is more apt to be met when a brand new technology has been developed or there are a limited number of processes available.

Exclusive and limited non-exclusive licensing arrangements carry with them a promotional obligation on the engineer-contractor to use his best efforts to sell the process. In many cases such agreements forbid the engineer-contractor to offer any other competing process. In return for this commitment and the considerable effort and expense incurred with promotion of the process, the owner often gives the engineer-contractor a share of the royalty for each project he sells or contributes to.

*Summary*

The engineer-contractor is playing an increasing role in licensing through development of his own processes and through licensing arrangements with third party owners of processes.

There are substantial advantages to be gained by owners of processes through entering into licensing arrangements with contractors because the engineer-contractor can make substantial contributions to processes of third party owners and the owner can advantageously use the sales organizations of the engineer-contractors.

Exclusive or limited non-exclusive licensing through an engineer-contractor offers substantial advantages to the process owner in many cases.

**About the Speaker: Charles C. King is Manager, Proprietary Sales and Licensing for the Lummus Company.*

## WORKSHOP SUMMARIES

The workshop summaries for the Pugnochiuso meeting will not be published in LES NOUVELLES because of space limitations. I have notes of the following workshops:

"Trademark Licensing — Problems in the ECC" — Moderator, Philip Mitches.

"Know-How Workshop" — Moderators, Jim Barrett and Jerry Weiser.

"The Licensing Department in Large and Small Corporations."

If you would like copies of these notes please write me and I shall be glad to Xerox them and send them to you.

Thelma C. Heatwole
Editor — LES NOUVELLES

## RELAXATION AND ENTERTAINMENT, PUGNOCHIUSO, ITALY