Australian Perspective on Licensing

Most technology imported or exported relates to practical know-how; insights into success given

BY ALAN L. LIMBURY*

In the past decade, discussion of the international transfer of technology has been virtually confined to a consideration of a small aspect of the topic: the licensing of highly sophisticated technology.

Detailed discussions of the proposed UNCTAD Code of Conduct for the Transfer of Technology and the prevention of abuses of licensing arrangements might have been constructive and worthwhile, but from the Australian viewpoint could have led to a loss of perspective of some of the more practical issues. Some of these issues are now considered.

WHAT TECHNOLOGY IS TRANSFERRED?

A comprehensive survey of licensing practices of Australian corporations conducted in 1981 by the Australian Industrial Development Association showed that most of the technology that is either imported into Australia or exported from it relates to practical know-how and shop floor techniques—therefore it is essential to appreciate that only a small percentage of technology transferred is patent-based or of a genuinely high level of sophistication. A much larger percentage involves the transfer of know-how. Most technology transferred between countries takes the form of individuals showing other individuals how to perform tasks using tried-and-tested methods.

The awarding of licenses to companies in other countries is only one method by which know-how can be transferred. It can also take the form of consulting services, planning and construction, putting into operation turnkey plants (complete with a broad mix of the requisite skills); supervising and running those plants, training staff and teachers of the recipient country, direct investment on a cooperative basis, and the secondment of source-country staff.

The key in all this is the human factor. Plant and equipment can only be operated safely, efficiently and profitably if those involved in running it know what they are doing.

THE RELEVANCE OF AUSTRALIAN TECHNOLOGY

One important reason why there is tremendous scope for increased cooperation between Australia and Asian countries, particularly the members of ASEAN, is that much of the technology that Australia has to offer is highly relevant to their needs. Much technology is tailored to industrialized-country needs. Usually, it is capital-intensive and labor-saving, whereas industrializing countries often need the reverse—labor utilization and capital saving.

From the technological viewpoint Australia sits between the highly-developed European and North American industrial societies and the industrializing nations of South East Asia. Until recently, Australia's economy was based overwhelmingly on primary industries. This has led to the accumulation of a considerable wealth of experience and expertise in areas of technology that can be readily applied in the ASEAN region.

Australian experience in coping with a relatively small domestic market has forced its industries to gain expertise in producing relatively small-volume runs at competitive levels. We have learned to modify overseas technology, to adapt it for small markets, and to rationalize numbers of product lines.

Further, Australian industry is geared to the development of natural resources, maximizing efficiency in the agricultural sector, particularly in dry-land farming, and in the practical application of science.

The many challenges to Australian companies in exploiting the resources of a vast country with a wide range of climatic conditions have created a wealth of experience in fields of development, construction, mining and transportation which are highly relevant to ASEAN countries engaged in large-scale development programs.

PRACTICAL STEPS THAT HAVE BEEN AND CAN BE TAKEN

It is in the area of practical application of proven technology that Australian companies are able to make a real contribution in the setting up of joint ventures with ASEAN partners.

Examples of successful cooperation are:

Milk

The establishment of joint-venture milk recombining plants by the then Australia Dairy Produce Board and local interests in Thailand, Singapore, Cambodia and Indonesia. In these cases Australia provided the raw materials (butter, oil and skimmed milk powder), the technology for a somewhat technical operation, the management skills, some of the capital, engineering design, and various other ancillary services. The local partners provided labor, and their government provided various tax and other concessions and land.

**Partner, Minter Simpson, Sydney and Canberra, Australia; paper presented at LES International Conference, Tokyo, 1985.*

The products are sold on the local market. The large population and its protein deficiency mean that the business opportunity and benefits are limited only by purchasing power and availability of raw materials.

Galvanizing

The Australian company, John Lysaght (Australia) Limited, since it started in 1921, has become the world's third largest sheet steel galvanizer and an acknowledged world leader in sheet steel technology. Over some years John Lysaght had experience in Malaysia in the steel roofing and wall cladding market. In 1973 a license was granted to a local company to operate a specifically-developed mini-galvanizing line, designed totally in Australia using Australian technology to meet the specific requirements of developing countries.

A normal galvanizing line designed to provide the quality of coating finish required by industrializing countries operates at 200,000 tons a year. The Australian company developed a special line with a throughput of only 40,000 tons a year, capable of providing optimum quality with acceptable economy of operation.

It combined the principles of the sheet-pot method with the techniques of continuous galvanizing to produce a consistent high-quality product. A training program for local personnel was provided, along with the technical advice necessary to the successful operation of the mini-galvanizing line. So great is the demand from this line that the local company has now installed a second line. Similar plants are now in operation in the Philippines, Indonesia, and Thailand, and negotiations are under way to install other such plants in India, Pakistan, China, and elsewhere.

Construction

An example in this field is that of concrete technology, in which Australia has built up a considerable reputation from innovations such as ready-mixed concrete. Early this century Walter Hume, a talented and determined Australian inventor, devised a revolutionary method of making concrete pipes. The process, using centrifugal spinning to give greater strength and durability, became world-famous. This Australian innovation is still the basic method used by a large part of the world's concrete pipe industry.

Mining and Smelting

Australia is an important producer of minerals and has a wide range of further processing facilities. An example of how the Australian private sector can contribute in developing countries is the setting up of world-rank mineral projects in Papua, New Guinea. These large development projects result in an effective transfer of considerable technology which is not the subject of formal license arrangements.

The Panguna prophyry copper ore body was discovered on Bougainville Island in Papua, New Guinea by Australia-based geologists in the 1960s in a very undeveloped environment. In conjunction with the Government of Papua, New Guinea, one of the world's largest copper and gold mines was brought into being.

Of the workforce of 4,000, almost 80% are Papua, New Guinea nationals. Great efforts have been made to train nationals to the maximum extent possible and to foster the creation of secondary industries in fields such as plant maintenance and transport. Australian companies are engaged in comparable developments at present at OK Tedi and Frieda River.

Manufacturing

Technology transfer through the medium of Australian companies establishing manufacturing operations in South East Asia has, until recent times, been fairly limited. However, some Australian companies have been active in the region for many years, expanding their activities from relatively small bases.

One example is ACI, which started a glassworks in Singapore in 1948 and now operates factories in every one of the ASEAN countries. It is instructive to look at the major factors that led to successful investment in manufacturing plants in South East Asia, and the way in which ACI handles them.

1. Commercial Viability—A loss-making enterprise is a burden to both the company and the recipient country. Plant size and technology level must be appropriate to the market size, quality and price requirements, and an adequate return on investment must be available, given reasonable management skills and reasonable economic and political conditions.

2. Sensitivity to Local Aspirations—From the very beginning ACI has been sensitive to the ambitions of people in all countries in which it operates to control their own destiny. In every operating company there is now significant, and in many cases majority, local ownership.

ACI has also trained local people in all aspects of managing and operating a manufacturing company. Thus, for example, Singapore Glass, in which every supervisory and management position, whether technical or commercial, was filled by an expatriate in 1948, is now staffed and run solely by Singaporeans, and every other plant in the region is progressively reducing the role of expatriates in the day-to-day running of the plant.

These two factors--commitment to local ownership and to local management—have been of major importance in the continued successful operation of ACI plants in South East Asia.

3. Commitment to Transfer Technology and Train People—The investing company must be prepared to transfer equipment and knowledge appropriate to the time and place. This includes commitment to maintain an appropriate level of technology. Otherwise, the first requirement—commercial viability—will cease to be met as competitors invade the market.

Technology and equipment are of no use without trained people to implement the technology and maintain the equipment. ACI has used the techniques of assigning expatriate skilled people to new plants (latterly drawing some of these from Singapore, rather than Australia), of bringing key operators and potential supervisors to Australian plants for training, and of providing short-term specialists on site in South East Asia under technical-assistance agreements.

4. Recognition of the Importance of Cultural Differences—Every nation has its own cultural heritage. Failure to recognize this, and to accord it the necessary importance, caused many embarrassments and difficulties in the early days. Nowadays, as much weight is given to a person's ability to mix with people of different backgrounds as to his technical or commercial skills before he is assigned to assist a South East Asian plant whether

for short term or for long term.

Agriculture

Much of the technology transfer that can be of use to the ASEAN countries is within the agriculture area. As I have already mentioned, the Commonwealth Scientific and Industrial Research Organization has developed significant technologies within the agriculture sector and these are frequently passed on to private enterprise for commercial development.

Education

Another reason there is considerable scope for increased cooperation between Australia and the ASEAN countries is the very considerable number of places in Australian tertiary institutions that are filled by overseas students, most of whom are from ASEAN countries.

A typical example of this is Monash University. Out of a total enrollment in 1984 of 14,000, there were 1,670 overseas students of which 1,291 came from Malaysia alone. Of these overseas students, approximately 800 were studying engineering or science.

This is welcomed by Australian industry. There are now thousands of scientists, technicians and engineers in ASEAN nations who are familiar with Australian methods and practices. This forms a close bond between our countries in many fields of technology and constitutes a sound base upon which to build cooperation in technology transfer.

Consulting

A wide and diversified variety of technology transfer is provided by way of the many Australian consulting organizations working offshore. Consulting can be one of the most effective ways of transferring know-how, because people from the recipient country will normally be involved. Such exercises result in permanent transfer.

The following is taken from a letter to me describing the grass-roots experiences of VIPAC, an Australian engineering laboratory, in providing consultancy services outside Australia. It demonstrates some of the practical problems encountered on a day-to-day basis:

"Vipac is a wholly Australian-owned engineering laboratory and consulting company, formed in 1972 with four engineers but now employing 52 personnel including 38 professional engineers and scientists, of whom 8 hold post-graduate qualifications in their fields of expertise. It operates from offices in all of the Australia mainland state capital cities with laboratories in Melbourne and Adelaide. In 1983 it opened a small office in Singapore.

"The company's field of technology is engineering dynamics. That is to say, engineering aerodynamics (performance of buildings and structures under wind, and internal pipe, duct or machine gas flows); thermodynamics (of building air-conditioning systems, solar collectors, passive coding, vehicle systems); machine dynamics (vibration of rotating and reciprocating machines as a maintenance predictive for diagnostic tool); structural dynamics (vibration of foundations and structures under environmental or machine applied excitation); and acoustics (building design and treatments, hearing conservation, noise control).

"In our technical areas we apply high-quality engineering and science in on-site investigation and problem solving. Sophisticated computers and instrumentation, valued up to US$100,000 must be shipped to the site, often a remote petrochemical or mining location. The physical hazards are great for the safe arrival of what is usually laboratory-style equipment, albeit 'portable.'

People Issues

The physical problems are compounded by the plethora of rules, regulations and habits of our various client countries in S.E. Asia. Of these countries Singapore is probably the easiest to deal with, allowing "foreign" companies to operate and to expatriate funds (with only 15% withholding tax on trading income less expenses).

Now that we are seeking to expand our staffing there we have started a local private limited company and have immediately struck two related problems.

"First, we cannot recruit suitably qualified staff (a problem even in Australia), and any we seek to employ there on a long-term basis have hassles with residency status.

"Second, since 'being there' has enabled us to win our first 'high-tech' jobs before we have appropriate local staffing, we have had to import most of the experts needed to carry them through.

Ownership Issues

"The local identity of the working company has been a big problem in Malaysia and remains a problem in Singapore. The Malaysian desire to achieve 40% local ownership and 30% bumi putra ownership by 1990 is indeed a worry. We have yet to meet any Malaysian nationals qualified in our areas of expertise. In Indonesia as a foreign company we can only deal with government and semi-government agencies.

"We are contemplating operation through a local P.T. company in order to service 'private' businesses. This is likely to cost us 15% commission, 15% local tax and 20% remittance tax, so our markups have to be around 44%.

Instrumentation and Hardware

"To prevent us from importing our instrumentation into various countries and failing to re-export (presumably selling it off in the meantime) we must lodge carnets or cash bonds equal to the value of any potential import duties. The carnets have to be secured inside Australia with matching bank guarantees. These in turn require us to provide the equivalent of first mortgage or cash deposits, both of which cost us operating cash.

"Redemption of these bonds is another problem, sometimes taking months to clear, and in the meantime locking up funds of thousands of dollars, possibly destroying the financial viability of the original contract. Remember that the contract task could have a value only a fraction of the cost of the equipment required to handle it.

"Indonesia has its special problems. Although direct government and oil authority (Pertamina) work has conditions that allow instrumentation in and out fairly simply, the cash bonds and "backhander" bribery techniques required to get timely clearances for exotic equipment are a serious deterrent to our involvement. Similar problems, although not so serious, have been found in Malaysia. Here, direct commuting between Singapore and the offshore oil areas avoids some of the "import/export" hassles.

Other Cautions

"Naturally, there are many other differences between our Australian and overseas operations, that will be common to other businesses. Cost of living, cost of transportation, costs of provision of bank guarantees for progress payments made, and costs of insurances—both for specific contract tasks and for the international trading situations as well. We have had problems insuring contracts for 'services only,' not 'hardware.' Also, the expiry dates of letters of credit and other details of banking documents between countries are of extreme importance and can delay drawdown by easily a week or more, over and above any client/customer delays.

"Because much of our work is related to problem-solving we strike some very real barriers with 'Chinese face.' Many of our potential clients cannot or will not admit that they even have problems (as everybody else does) and claim as a result they have no need of our assistance. This is a business development frustration that we don't see where engineers and operators of other backgrounds are involved. We are hoping that in time we will wear down these barriers. It was partly for this reason that we started operations in Singapore under a Chinese engineer (trained to PhD in Australia).

Benefits

"The Australian government provides export incentives by allowing a rebate scheme on business development expenditures that fall within these guidelines. Nevertheless, it takes up to two years to obtain these rebates and all expenditures have to be fully documented (e.g. "demonstrate that this claimed $2 expenditure really is for a taxi fare in Jakarta").

"Through all of this we are learning a lot and becoming more worldly in our commercial dealing, while at the same time allowing our best people to keep practicing their skills on serious problems at world class levels of expertise."

VAPOCURE

One of the most outstanding current examples of Australian private enterprise technological development and transfer is for success of Vapocure Limited in developing a unique process for the curing of paint. This development began with an Australian inventor Mr. Alan McInnes who, in the early 1970s, conceived the idea that it is not necessary to use high-temperature baking ovens to accelerate the chemical reactions involved in drying industrial paint finishes.

The major drawbacks of the high-temperature approach are the need for vast amounts of energy and the necessary exclusion of a range of heat-sensitive materials. In addition, the time required for heating, drying and cooling is an important additional cost factor in the production of goods.

As reported in *Newsweek* in March 1984:

"An Australian inventor has developed a fast-drying painting process that does away with the need for the high-temperature, energy consuming ovens that are commonly used to provide manufactured goods ranging from appliances to automobiles with a 'baked-on' finish. The Vapocure process, developed over the last 10 years by Alan McInnes of Sydney, uses a specially-formulated paint and a proprietory catalyst to which the paint is exposed in a room-temperature chamber. The reaction between the paint and the airborne catalyst causes the freshly painted surface to turn hard and dry in about 10 minutes."

Vapocure transfers its technology to existing manufacturers, rather than attempting to compete on world markets through the manufacture of its own product. The process is protected worldwide by patents and trademarks, and exploitation is taking place rapidly through a series of international licensing agreements with companies with the local knowledge, technical expertise and reputation to provide the highest quality service in exploiting the patented process.

Strategy

Vapocure's strategy is to enter into nonexclusive licensing agreements with paint companies or to select a company associated with the paint industry for the grant of an exclusive franchise for a particular territory, incorporating a disclosure fee and ongoing royalties based on the net sales of Vapocure coatings. The franchisee operates as the exclusive representative for Vapocure in a particular geographic area and then grants nonexclusive Vapocure licenses to paint manufacturers.

One such exclusive franchisee is the Du Pont Company, which has the exclusive franchise in the United States and Canada, with nonexclusive rights for its subsidiaries outside the United States. In Japan, Sumitomo Corporation holds the exclusive franchise and has already entered into nonexclusive license agreements with major paint companies.

The most recent franchise was entered into with the Best Court Company Limited of Taiwan, giving that company franchising rights in Taiwan and nonexclusive rights to manufacture and sell in Hong Kong, Malaysia and Singapore. A similar agreement was entered into with Daihan Paint and Ink Company in Korea and similar arrangements cover Europe, Scandanavia, Southern Africa, Australia, New Zealand, and South America.

Not surprisingly, Alan McInnes and Vapocure were voted one of the top 10 best performers in Australian business in 1984.

The Vapocure success story demonstrates that even today, an individual, with an idea and the determination to succeed, can benefit the world.