

Exporting Services, Technology

*Experiences of Australian exporter;
benefits to all parties described,
as are staffing needs*

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This paper is on the subject of the management, transfer and use of Australian technology overseas. As an example it cites the roles and experience of the Snowy Mountains Engineering Corporation in the overseas use of Australian technology.

SNOWY MOUNTAINS ENGINEERING CORPORATION

The Snowy Mountains Engineering Corporation (SMEC) is a consulting engineering organization of international standing, based in Cooma, New South Wales, with branch offices in Sydney, Canberra, and Perth, and overseas offices in Thailand, Indonesia, Mauritius, Bangladesh and Malaysia. The organization was established in 1970 by the Government of Australia to retain the skills and expertise that it had invested in the Snowy Mountains Hydroelectric Authority during the 25 years of investigation, design, and supervising the construction of the Snowy Mountains Scheme. The skills retained were to be used both in Australia and overseas. Indeed, countries overseas had already been receiving assistance from the Snowy Engineering experts since 1960 for such tasks as high-way construction and the development of hydroelectric potential.

Initially, staff was transferred to the new corporation as construction concluded on various sections of the Snowy Scheme. By 1975, the transfers were complete and the Snowy Mountains Engineering Corporation was on its own. The staff now numbers 590 persons of whom 430 are in the professional and technical fields.

I am the director of that organization and have two assistant directors at the top with me. Management is spread through six engineering groups and one administrative group.

That's one of my portfolios. Another is that of chairman of the APCC.

The Australian Professional Consultants Council is the council of Australia's planners, surveyors, quantity surveyors, engineers of all kinds, architects, management and agricultural consultants — most of

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the professional consultants in the export field.

Because of their wide and varied experience in Australia in all climates, conditions and terrain, these consultants have been invited to provide expert independent service to both government and private clients in many other countries. With their professional institutions and associations as councillors, these consultants work either individually for their clients or in permanent or *ad hoc* consortia with other consultants, assisted by the APCC.

The aims of the council are:

To provide for, and promote the engagement of Australia's professional consultants on international projects.

To disseminate information and monitor the results of the work performed.

To maintain ethical standards and quality of work.

To assist members in representations overseas and also in Australia.

To represent the interests of its constituent governing institutions.

A register of the APCC consulting organizations, their resources and their experience is maintained in the publication, *Consult Australia*, which is widely distributed for guidance overseas. Pamphlets setting out the role and aims of the APCC are freely available as another means of proclaiming the wealth of Australian resources available in this field of technology.

SMEC'S ROLE IN OVERSEAS CONSULTANCY

Because of my position in the APCC and as director of SMEC, therefore, I can look at the field as a whole and also take as a particular example the Snowy Mountains Engineering Corporation as one of the members of this enthusiastic team exporting its professional services overseas. SMEC of course works both in Australia and overseas. In Australia of late our larger assignments have been the Shoalhaven Scheme (the extension to Sydney's water supply), the Eastern Suburbs Railway, Dartmouth Dam, and the Wivenhoe Pumped Storage Hydro Scheme. But our Australian assignments are only a part of our total workload. More than two-thirds of our work is conducted overseas.

SMEC's fields of practice center on the skills of water and power engineering and rural development but, because of their nature, they embrace many supportive activities and considerably widen the scope to include: civil, electrical and mechanical engineering, hydrology and hydraulics, geology and soil mechanics, surveying, estimating, contract construction and supervision, irrigation, agriculture, economics, train-

ing, equipment procurement, and project management.

It is in these fields, then, that SMEC manages, transfers and uses Australian technology overseas.

TRANSFER OF TECHNOLOGY

And here I wish to place emphasis on the transference aspect. This means, of course, not solely the shipment overseas of our skills, their use on a project and their swiftly withdrawal; it's not "the transportation" I speak of but "the transfer". Through training of counterparts overseas and in joint practice with our clients we are, all of us, passing on our technological know-how to the client and his country. In effect we are working ourselves out of a job.

This is the lot of any country superior in technology. Fortunately, however, as our technology advances, the demand for sharing it increases—and complete technological self-sufficiency by any one nation is perhaps a long way off.

NATURE OF SMEC'S WORK

The work of the corporation follows the general pattern of the project development cycle: the feasibility-investigation stage, the design, the supervision of construction, and the maintenance and operation aspects of the completed project.

The types of project involving our consulting skills are many: dams, power stations, roads, bridges, irrigation schemes, flood control works, drainage and sewerage, tunnels, pipelines, pumping stations, urban and industrial water supply, land development and settlement, construction plant procurement, and maintenance.

OVERSEAS ASSISTANCE PROGRAMS

These projects, you will have gathered, may be individual structures (such as a water pumping plant) or interconnecting developments (such as a multi-purpose flood control and irrigation land development scheme). Many of them can be constructed only with the availability of large sums of money over considerable periods of time — money obtained through some aid agency. The construction of these developmental projects is one of the major areas of selling engineering technology abroad.

Bilateral Aid

Of the types of aid available to countries overseas the first I want to cover is bilateral aid. Bilateral aid usually originates in a country-to-country request from an economic planning department of the recipient nation to a diplomatic post of the potential donor.

Commonly, the bilateral-aid donor contributes about half the project costs (expended on expatriate expertise, imported technical equipment and specialized contract services). The recipient country is expected to contribute the other half (expended on wages of its own staff, buildings, local facilities and contracts, fuel and spare parts).

This general tying of aid (whereby the donor country

spends its component on its own goods and own services) although beneficial, often leaves the recipient country without freely spendable cash. In Australia's assistance programs, bilateral aid on many programs is more untied. Indeed, in the Papua New Guinea program, almost all of the aid is a cash grant — completely untied.

Multilateral Aid

Multilateral project aid, such as that extended through the United Nations Development Program, is similar to bilateral project aid, but instead of the single donor country, it is provided by United Nations member countries. Because this form of aid is generally concentrated in the very poor, small or limited-resource countries, further assistance is generally available for project evaluation and preparation — often in the form of a grant. This form of aid is generally motivated by humanitarian considerations and thus is more readily obtained by the very poor and very small developing nations.

Multilateral Project Loans

International lending agencies such as the World Bank, which uses funds from member government subscriptions, are responsible for the majority of development loans granted today.

Because they are loans and not grants a proposed project generally must have the potential to meet some predetermined economic criteria. These loans are often tied, in that the agencies generally restrict lending to meet the foreign exchange component in a project, often requiring the borrowing country to retain independent consulting engineers to work with the local counterparts to upgrade their skills. Further conditions may require that the loans be used for procurement of goods and services in member countries, and that the contracts be of appropriate size to attract bidders on an open international competition.

The current interest rate for say the World Bank normal loans is about 8%. Very underdeveloped countries are eligible for loans at very concessional rates from this Bank's affiliated organization the International Development Association (IDA).

Bilateral Project Loans

Before leaving the loan area I wish to touch on the Bilateral Project Loans. For engineering projects, this type of assistance commonly takes the form of a concessional loan to meet the costs of contractors or engineers hired from the donor country, or for the provision of plant, equipment and materials purchased in the donor country.

These tied bilateral loans have special interest to the wealthier industrial nations. Japan, for instance, has found them to be of great advantage in restricting tendering to its own organizations and industries for major construction contracts in other countries.

I could go much further in discussing the relative merits, disadvantages and advantages of this mix of funding processes and I shall briefly return to some of the technological aspects shortly. But the foregoing does illustrate the general areas of involvement by the consultant in the overseas assistance programs.

OBTAINING COMMISSIONS

In obtaining commissions overseas, the purveyor of technological services has a number of avenues open to him. Foremost is that he be known. He should be registered as a competent resource with the national and international agencies. Visits of introduction and renewal of interest must be made to the headquarters of loan agencies and to the prospective countries of operation. Sometimes consultants receive an individual invitation to submit a proposal but, in general, the process is to become so well known to the client that he will place you on a short list to be invited to submit proposals for an assignment.

In the engineering consultancy field this invitation takes the form of a letter of invitation requesting a proposal for the undertaking of a fixed item of work. The proposals are usually presented as bound documents setting out the resources proposed (in terms of expertise experience and quantity), the technological approach and work programs, and the factors affecting coordination with client and use of local resources. All these must match the terms of reference included in the invitation and developed to a stage whereby the loan or aid agency, government, or organization, can compare the technical competency and project appreciation proffered by the invited consultants.

The technical proposal is generally accompanied by the financial proposal which in theory is opened after technical comparisons between competing consultants have been resolved. In practice, the financial aspect will often mean meetings with the client to discuss the relative economics of feasible operations, and much time and effort can be expended in compiling proposals for commissions that are later lost.

I might add that winning a commission for one project may automatically mean withdrawing from being considered for another because of depleted resources — and this of course is the position of any organization in the tendering business.

Subconsultant

Not all responses are self originated. Many times an organization will act as subconsultant in an area of work where full resources are not available to the prime consultant. Joint ventures, junior partnerships, agent consultancy, are similarly employed for geographical and resource utilization reasons. In Nepal, for example, where the Snowy Corporation has been engaged for a number of years, the German aid agency (GTZ), has requested certain components of large projects to be undertaken by the Snowy people already on site with full communication, accommodation and technical staff engaged on similar work. Managing such technical work can further involve the consultant in more than his fair share of worries, dealing with as many as four countries, each with national requirements to be met.

Then, as I mentioned earlier, there are the professional associations such as the APCC that actively foster, nationally and internationally, the commissioning of their member organizations at governmental and commercial levels.

The Australian Overseas Projects Corporation

(AOPC) is another strong sponsor. Established in 1978 as a statutory corporation, its aim is to assist Australian private industry apply its expertise overseas, bringing to any venture its ability to act as negotiator, agent, principal contractor, or risk taker. I might add that another of my portfolios is that of Special Advisor to the AOPC, so I can see at close hand the value of this bridge between Australian skills and the needs of our potential overseas clients.

The trade commissions and trade missions often allow further contact with countries not previously approached. And of course all Australian government departments interested in overseas trade, commerce, and culture, are interested in you and the use of your technology overseas.

APPROPRIATE TECHNOLOGY

But what level of technology is required? Here there is considerable latitude because the answer is not cut and dried. It is neither fair nor logical to expect the recipient country to accept, with the technological input, the economic and social policies of the donor. Factors such as unemployment, urgency, material resources, climate, vary from country to country. This sounds like a truism — but it isn't rare to find one country's consultants imposing their concepts on another country's projects without appreciating the impact and ramifications.

So we do have a responsibility not only to furnish adequate technology but also to ensure that the technology is appropriate.

In the engineering sphere the subject generally boils down to "labor-intensive" versus "capital intensive" methods, but it also covers design criteria, and even affects the choice of the makes of machines.

Developing countries often have an appropriate local technology in mind but are inhibited in applying it by the terms of assistance wherein foreign resources are stipulated.

There is also a growing tendency for donors to extend a simple request into a complex development undertaking.

Design standards employed are often inappropriate to a country's level of development. This arises again because of the high level of foreign input encouraged by foreign assistance. It can result from a foreign consultant's own standard of excellence preventing his suggesting a low-cost approach that could result in something he would normally consider poor engineering. Or it may be that the client country presses for the high standard construction observed in the industrialized countries — he may want a superhighway where a third-class rural road would be more appropriate. These are but two examples to show the sort of pressures that exist despite the good intentions of all concerned, pressures that result in design standards higher than the recipients can really afford.

Demands

Demands are often made also by the aid agencies and loan authorities on a donor country to establish or revamp their institutional structure. While it is understandable that this may be necessary, can you

imagine a country receiving aid from separate donors for different projects when each donor proposes conflicting ideas on what institutions are required? Nor is it an easy task for someone from another nation to appreciate the repercussions his recommendations could have throughout the recipient's bureaucratic system.

Advanced technology, though, is sometimes the most appropriate. I'm thinking of the situation where the prime purpose of the project is to alleviate hunger or solve a severe health problem. If the solution lies in some food production program or drainage scheme then speed is of the essence. To take another case, a country without problems of underemployment also will not appreciate a labor-intensive approach but will seek instead to build up its technological know-how with the injection of foreign expertise that can quickly be absorbed to the benefit of that country's advancement.

As I say, its horses for courses, and the determination of what level of technology should be used will remain contentious in many of the areas in which we work overseas.

APPROPRIATE STAFF

One of the factors affecting the outcome of our work overseas that we can control, however, is the selection of the right people for the right place.

I say "place", not "job", because it's not the experience in the professional sense that I wish to stress. I'm talking of the problems of appropriateness in a different environment (climate, customs, language, life style). The most competent of professional men may fail in managing a project overseas because of some apparently trivial factor.

The consulting organization also has difficulty in finding people who are not only equipped for the task but who are also acceptable as experienced to the client country.

And it's not solely the expatriate, but also his wife and family who should be considered. In examining the suitability of a person for an overseas posting much more is required in the selection than would apply for a posting interstate. "Housing", "health", and "happiness" become the responsibility of the organizational structure equally with "procurement", "transport" and "materials".

CONTROL AND COMMUNICATIONS

In overseas work therefore, new backup sections must be developed in the home office. In the Snowy organization we found it essential to create a travel section looking after plane bookings, accommodation, visas, and so forth. A medical section looks after the health checks, medication, kits, drug clearance and the constant updating of health information required to support a team visiting countries so different in many ways from their home country. Stores and supply sections acquire a new importance in the light of the purchase and procurement, the shipping and clearance, that is needed for plant and materials used overseas.

The finance branch's role is extended into facets of overseas procedures hitherto unknown: taxation laws, banking and treasury regulations in other countries impose greater responsibilities on the accountant. Maintenance of the links with the overseas projects become imperative; new procedures and lines of communication must be established and maintained. Top management also must more than ever keep up-to-date on all aspects of the differing requirements and, through the project managers, be ready to apply themselves to problems unencountered in Australia.

COMPETITION

Australian consultants face heavy competition in the overseas marketplace. The pace of work requires perhaps a greater involvement on the part of the individual professional and technical man. He has to work hard there, not only to match the competition from his peers from Europe, Japan and America but also to accomplish more with the limited funds available.

Our salaries in Australia are high. Overseas, in competition with other consultants, they appear even higher. This disparity is compounded further by the degree of incentives and relief allowed by other competing governments to their consultants abroad. There have been increasing and encouraging signs, however, that the Australian Government in recognizing these constraints is seeking new ways to support the consultant overseas in his efforts to obtain commissions.

Already in existence are the tax remissions and incentive schemes of which you are aware. But greater regard must be paid to the vigor of competing governments if we are to continue to make inroads into this sector of export achievement. On a somber note, lately we have been somewhat dismayed to hear that the incentive schemes of our Export Development Grants Board may have to be phased out if Australia signs the Multi-lateral Trade Negotiations Code in 1982. Extension of these incentives or of substitute indirect incentives will have to be pursued.

BENEFITS TO AUSTRALIA

The export of Australian technology produces benefits to Australia far and beyond the profits achieved by the organization in the execution of an overseas assignment. Some of these are intangible, such as the forging and fostering of relationships with countries previously possessing no contact with Australia, the healing of old antagonisms caused by past political mishaps, the exposure of our people and life style to countries doubting our motives. More clearly seen are the results of expatriates encouraging our export markets by their unconscious promotion of Australian goods. New trade and commercial links, too, are created with the importation of technical and materials support facilities. Even more noticeable is the increase in the subservices that necessarily accompany the export of major items of technology to other countries. And of course there is the increased commercial and industrial activity that I referred to earlier in speaking of tied aid where the export of the donor country's

resources is an integral part of the assistance program.

BENEFITS TO RECIPIENT COUNTRIES

The most obvious benefit of the use of technology in the recipient country is the physical development of that country. To indicate the extent of the immediately visible results, here is a short list of the major works undertaken during the past 10 years by SMEC, only one of many consultants in the engineering field:

	COMPLETED AND/OR UNDER CONSTRUCTION	
Roads:	3 640 km in 9 countries	5 000 km
Major Bridges:	150 in 11 countries	N.A.
Major Dams:	5 in 5 countries	10 in 8
Irrigation:	9 300 ha development	20 000 ha
Tunnels:	6 km in 2 countries	18 km
Power Stations:	800 MW in 4 countries	1 800 MW

In the contract administration sector of our work the corporation is at the moment supervising contracts worth \$800 million.

Other advantages have been discussed earlier including the advancement of the recipient country's own technology through training and cooperative ventures. The Australian staff are influencing our life style in Australia to the benefit of other countries. They return home from overseas as unconscious envoys promoting their most recent exposure to the tastes and habits of another culture. Their opening of new routes of trade and communication allows the client country more facile access to the Australian marketplace and reinforces the bonds between the two countries. The opportunities for a recipient country to upgrade its own technology is enhanced through the visits of its own young technicians and engineers undergoing training in the donor country and, with each interchange, fresh understanding leads to easier cooperation in seeking the common good.

CONCLUSION

In speaking of the export of services and technology in the consultancy field, I may have overstressed the difficulties. The challenge exists but the goals are achievable. Some 10 years ago the corporation entered the field; in reviewing the decade last June we highlighted a number of facts. In the first 10 years, SMEC has:

- Carried out almost 800 assignments, 287 of which were outside Australia.
- Worked in a total of 32 overseas countries.
- Accounted for a total turnover of \$220 million in its consulting activities.
- Received a total of \$93 million in professional fees for work by its own staff.
- Paid \$15.6 million to other consulting firms for their input to corporation projects.
- Purchased a total of \$78 million of plant and equipment on behalf of clients.
- Worked for 179 clients, 115 Australian, and 64 overseas.
- Formed associations with 75 consulting firms, 55 of which were from Australia and 20 from overseas.
- Arranged 1,800 staff assignments to overseas postings.
- Been associated with projects with total capital value of \$2.2 billion.

The corporation, along with many other consulting organizations in Australia, has now become well established overseas. So far we have avoided the label of "exploiter" through thoughtful appreciation of the country, the task and the people, and through careful selection of the appropriate level of technology, staff and mutually-beneficial approaches. Australia is well known overseas for the integrity of its services and technology. May this continue to be so.