

vessel, which Yokosuka built for the deep-sea manned submersible Shinkai 6500, only 5 per cent of the instrumentation was imported. Nevertheless, similar equipment is in use on both vessels. Similar patterns are found for the two deep-sea manned submersibles, Shinkai 2000 and later Shinkai 6500.

The primary process of implementation is to buy one or two pieces of advanced imported equipment for testing. If satisfactory, they will be jointly developed and produced by domestic manufacturers and institutes, the reason being that foreign manufacturers lack maintenance capabilities.

Thus, it is advisable to sell equipment in large lots which render loss of technological know-how more affordable. Selling one piece of equipment on a one-shot basis is not recommended.

On the other hand, due to expensive research and development, most manufacturers do not deal in this type of trade unless they are approached by end users with special orders. It is often more economical for domestic manufacturers to import ocean industries equipment than to develop and manufacture it themselves.

Thus the best way to protect equipment-related technology is to secure carefully outlined agreements and strong relationships between business partners.

### Trade Barriers

For the majority of ocean industries equipment, customs tariffs are not currently imposed. One exception is underwater cables, which require a minimal levy.

No special permits or licences are required when importing ocean industries equipment. However, government regulations regarding manned submersibles are very strict. Since they have been created on a needs-only basis and are still in a developmental stage, such regulations can cause substantial time delays for first-time imports.

*Submarine regulations.* Government agency and ministry requirements for the operation of tourist submarines include:

- The presence of a mothership (support vessel) with two divers present for back-up. A mother ship and special communication systems are also required for one- and two-man one-pressure submarines.

- A separate transport boat for passengers.
- Communication and tracking systems connected to the mothership.
- Yearly safety inspection by the Safety Standards Division of the Ministry of Transport for any commercial passenger related submarine subject to this regulation, no matter how small.
- Restriction of tourist submarines to a predetermined, registered space and to a depth of less than 30 m.
- A special licence issued by the Maritime Technology and Safety Bureau for pilots of all one-atmosphere submarines.

The above regulations were extracted from publications issued by the Ministry of Transport, Safety Standard Division, Maritime Technology and Safety Section. English-language copies are available on request.

*Submarine inspection.* Manned submersibles are inspected by several divisions within the Ministry of Transport once the vessel has arrived in Japan. These inspections are very strict and time-consuming. Nagasaki University, for example, imported a two-man submersible for research work several years ago and is still waiting for it to be approved.

There are, however, alternatives to this practice. When the Coral Marine tourist submarine was under construction in Finland, a Ministry of Transport official was sent to inspect it during the production stage. This practice cut the inspection time from five years to one year and 10 months once the Coral Marine reached Japan.

This type of inspection method is also acceptable for one- and two-man submarines intended for the Japanese market. In most cases, however, the exporter and importer should be prepared for lengthy dealings with the Ministry of Transport.

Lloyds' approval is well respected in Japan and can reduce inspection time considerably.

*Other equipment.* Currently there are no special government requirements or regulations on instrumentation, communication support systems and ROVs.