Current State and Future Considerations about Technology Transfer through Technical Advisory Services in Korea

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Introduction

In rigorous economical and social circumstances in which Japanese construction industry is struggling, the so called fee business, which provides patents and know-how possessed by company to customer, is receiving much attention as a new form of business for the construction industry in the future. Opportunities of such overseas business for Japanese companies are increasing. Based on technical advisory services for LNG in-ground tanks, which is executed by OBAYASHI Corp.(OC), in Inchon, Korea as the fee business, this paper presents the current state and future considerations toward a suitable technology transfer considering about host country's situation and requirements.

General Description of the Project

The project consists of construction of two 200,000KL LNG in-ground tanks at Inchon LNG receiving terminal of Korea Gas Corporation (Owner), which is located at Inchon, about 40km west of Seoul, the capital of Korea (see Fig.-1), with construction period 52 months from June 1999. This LNG in-ground tank project, the first LNG tanks in Korea, is executed by Korean contractors with Korean finance. OC participates in the project as an advising company. Organization and contract diagram is as shown in Fig.-2.

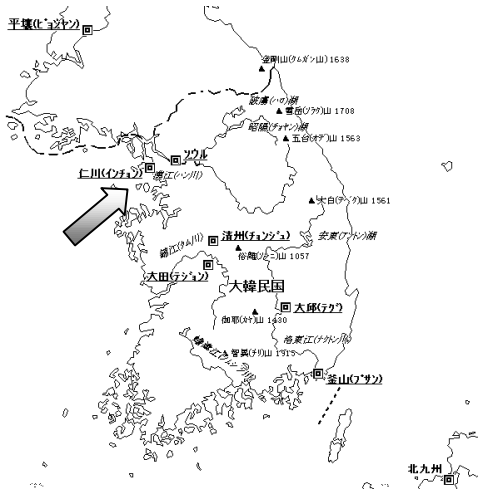

Fig.-1 Location of the project

General Explanation of Agreement

The owner of the Project conditioned to the local contractors that the contractor must obtain technical assistance from foreign contractors experienced in LNG in-ground tank. To comply with such condition, DAEWOO E&C Co., Ltd (DWC) has requested OC to participate in the Project, then OC and DWC have made a Technical Collaboration Agreement (TCA) in August 1999 for design of civil portion of the LNG in-ground tanks and related facilities, and for dispatch of engineers for execution of field advisory services. As of April 2001 nine engineers are dispatched by OC to the construction site of the Project as field advisors to execute the services in accordance with work contents described in TCA. TCA exempts OC from any obligation and responsibility regarding the performance of the contract between the owner and the contractor.

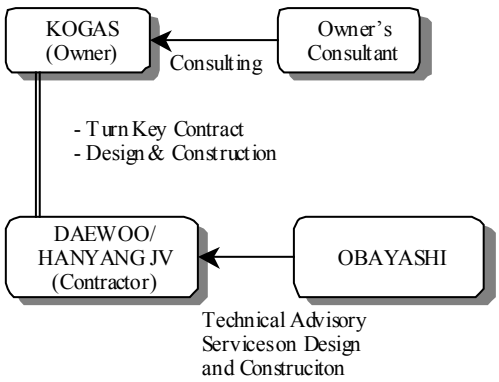

Fig.-2 Organization and contract diagram

Work Contents of Technical Advisory Services

The work contents for field advisors described in TCA are as follows.

- To advise on the interpretation in terms of construction procedure of the documents prepared by OC, and on the know-how on construction matters on site
- To advise on quality control method; construction performance and method, and any other necessary for construction
- To sign on the relevant documents for issues to be confirmed as witness

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Issues during Execution of Services

The following substantial issues have arisen during execution of the services as field advisors. Construction of LNG in-ground tanks requires comprehensive concentration of advanced technology with regard to design and construction in order to secure functions of the tank. In this project the field advisors neither manage construction work nor directly supervise the project and they only give advices to the local contractors who are in charge of actual construction work and supervision. During execution of the field advisory services, discrepancies about work order and work detail plan to construct the final aimed structure have sometimes occurred between the local contractors and the field advisors, who interpret and advise in terms of design concepts. The reason is that the local contractors' way of thinking about quality and sequence of the construction is sometimes different from design concepts made by OC in Japan.

Therefore the field advisors make advices in consideration of or paying attention to the following matters; 1) standpoint of local main contractors as if they are trading firms, 2) technical level of sub-contractors working on the site, 3) basic concern and way of thinking toward quality of the work in Korean construction industry, 4) request from the owner to keep construction schedule and to monitor the budget, 5) adherence to specifications applied to preceding similar tanks, and 6) possibility of adoption of local products and simplification of work.

Furthermore, the field advisors should make advices taking the following fundamental issues into consideration during execution of their services. The issues are; 1) what subjects the local contractors require, 2) how much disclosure of patents or know-how possessed by the advising company is to be allowed, 3) how to deal with cases that seem to be beyond the scope of agreement, 4) contents of the agreement, 5) claim for services beyond the scope of agreement, and 6) notification of incidents which may happen in the future to the local contractors and proposals of countermeasure when an advice is not accepted by the local contractors.

Results of Technology Transfer through Technical Advisory Services

Main purpose of this technical advisory services is to transfer highly sophisticated design know-how for construction of LNG in-ground tanks and to guide the local contractors in complying with strict technical design requirements. However a great concern, which has not been fully resolved since the beginning of the services, is how the field advisors should advise in order to keep design requirements and to fulfill indispensable conditions for the functions of the tank structure against demand of cost down and shortening construction period from the local contractors.

The field advisors are now executing services with an understanding that the below-mentioned ways of technology transfer are likely to be suitable for the concerned country. 1) Japanese design and construction standards and specifications should not be simply brought into the concerned country. 2) While keeping the minimum requirements on design and construction, the standards and specifications should be modified in order to match the characteristics of the concerned country's construction industry which is developed with its technology transition.

In compliance with the local contractors' demand, so far the technology transfer is under satisfactory progress through adoption of local products and proposal of construction sequence considering technical level and specification of construction work on the site within the range allowed in the design specifications. Consequently, not only the local contractor but also the owner has placed reliance on OC's technical advisory services.

Conclusion

Generally speaking, if Japanese companies transfer their patents or know-how abroad without verification of the host country's situations such as history of technology transition, current technical level, and range of supporting technology, the transferred technology will be like being forced on the host country and will not really take roots in the host country. Also an overall system ranging from raising of basic technical level to education of new technology should be established in the host country when a new advanced technology is introduced. In other words, although there are various forms of technology transfer, it can be regarded as a key of transfer whether the companies and their dispatched engineers can correspond flexibly to host country's need with accurate and prompt recognition of its demand and present situation. Therefore it is desirable for Japanese companies and their engineers engaged in technology transfer to change some of the fundamental attitudes.