Turnkey Construction of Factories in Asia

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OVERVIEW: An increasing number of companies are seeking to operate multiple production sites, and many are choosing sites in the ASEAN and other nations of the Asian Belt Zone. However, this poses numerous challenges, including the collection of local information and differences in culture, business practices, laws, and legal systems. In particular, many companies considering the construction of new plants are looking to resolve problems in a variety of fields, especially those that relate to know-how and conformance with local requirements. Based on its extensive past experience, Hitachi is able to supply integrated solutions for industry that extend from plant construction through to things like air conditioning, utilities, and waste water treatment, and that take account of local customs and the relevant planning and legal systems.*

INTRODUCTION

AS globalization proceeds, corporate interest in establishing offshore operations is growing. In addition to the necessity of conducting the various planning, design, procurement, and construction stages of an overseas factory construction project in accordance with local laws and work practices, such projects are also characterized by the need to deal with many different overseas companies. Corporate interest in operating multiple production sites is currently running very high, with many companies choosing to focus their international operations in Southeast Asia.

Japanese companies, for example, see about 30% of the barriers and challenges associated with overseas operations coming from differences in culture and business practices and differences in legal systems, and about 20% coming from the difficulty of collecting local information[(1)]. Companies are looking to resolve problems in a variety of fields, especially those that relate to know-how and conformance with local requirements.

Hitachi builds industrial plants, such as clean rooms and factories for pharmaceuticals, food, and chemicals, with a track record of operations in the Republic of Singapore and other parts of Asia in particular that dates back more than 30 years (see Fig. 1). Based on this extensive experience, the company is able to supply Asia and the rest of the world with integrated solutions for industrial plants that extend from construction through to things like air conditioning, utilities, and waste water treatment.

This article discusses the challenges facing the establishment of overseas operations and describes examples of relevant solutions.

CHALLENGES AND SOLUTIONS FOR OVERSEAS PLANT CONSTRUCTION

Companies seeking to establish operations in foreign countries often face a range of concerns that extend from basic planning through to construction and maintenance, including planning, site selection, standards and other destination country rules, application procedures, assessment of suppliers, and plant maintenance management (see Fig. 2).

Japan	40	Europe	1
Asia (excluding Japan)	24	Oceania	1
Middle East and Africa	7	Central and South America	1

As of September 2012

Fig. 1—Overseas Operations of Hitachi.
Hitachi has operations at 24 sites in Asia to support the construction of plants.

* The coastal region of Asia extending from Japan to the Arabian Peninsula, encompassing 24 nations or territories, including China, the Association of Southeast Asian Nations (ASEAN), India, and the Middle East.

Based on its many years of experience, Hitachi can provide comprehensive support for construction that considers factors such as ensuring that planning takes account of local design standards, and that work conforms with the country's legal system and other practices. The company offers a total plant solution that includes support for maintenance management as well as turnkey contracts that cover everything from earthworks to design, construction, and the delivery of plant and equipment (see Fig. 3).

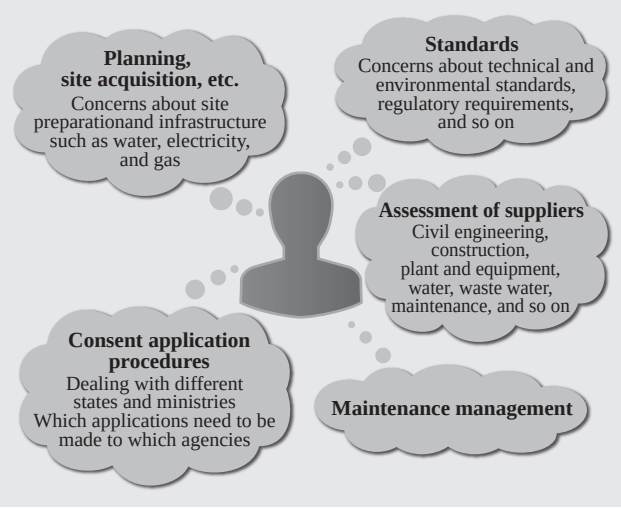


Fig. 2—Challenges Facing Plant Construction.
Plant construction needs to deal with local practices, including such things as design standards and the legal system.

ORGANIZATIONAL STRUCTURE FOR DELIVERING TOTAL PLANT SOLUTIONS

This section uses the example of collaboration between Hitachi and a company considering the construction of a new overseas plant to describe the organizational structure used to deliver total plant solutions.

A range of different factors need to be considered in an overseas construction project, a process that extends from basic planning through to construction and maintenance management. These include standards, regulatory consents, and environmental rules (see Fig. 4).

The customer initially considered entering into a turnkey contract with a local construction company in order to minimize construction costs. Under this model the work would be done by subcontractor companies that had a business relationship with the construction company (see Fig. 5). However, because of concerns such as the lack of information on quality assurance and similar, the customer decided instead to consider a collaboration with Hitachi. Hitachi then worked through a process with the customer's headquarters to clarify responsibilities, set up collaborative arrangements with the parties in the target country, and established a comprehensive organizational structure that could achieve a short construction time and high quality (see Fig. 6). This organizational structure allowed the customer to

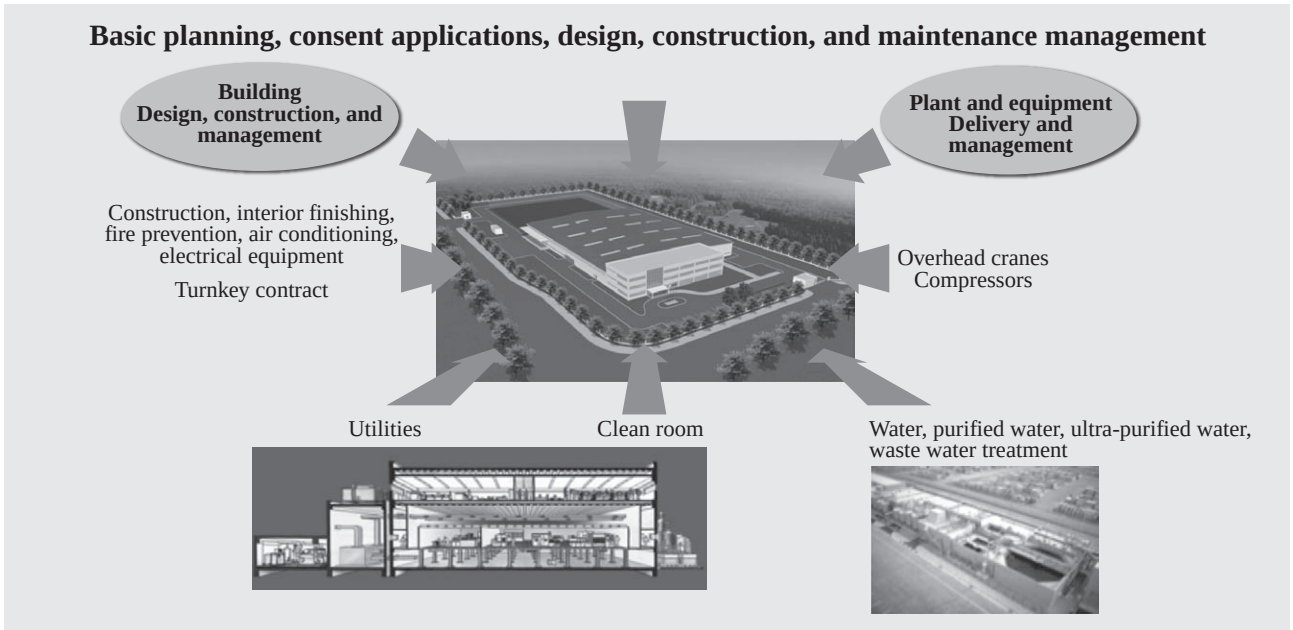


Fig. 3—Scope of Total Plant Solution.
Hitachi provides full support, covering everything from earthworks to design, construction, the delivery of production machinery, and maintenance management.

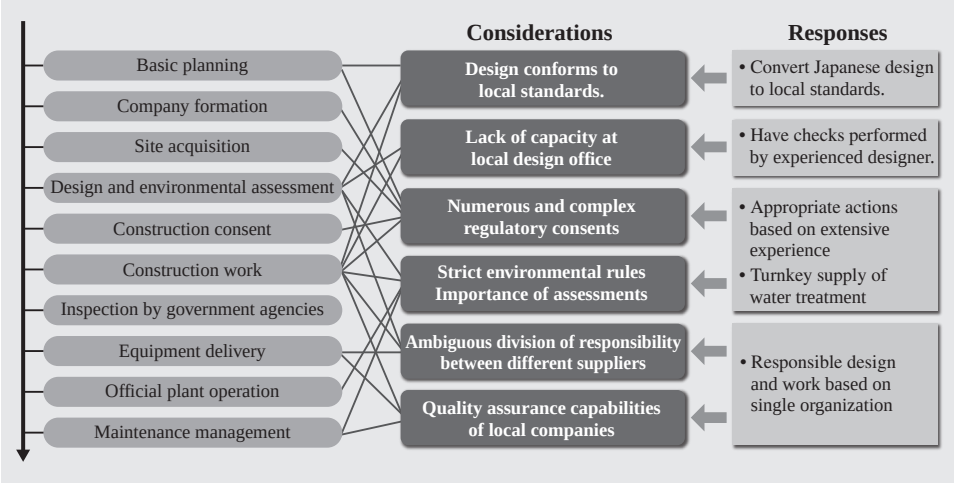


Fig. 4—Key Considerations for Overseas Plant Construction.
A range of factors need to be considered when constructing a plant overseas, a process that extends from basic planning to maintenance management.

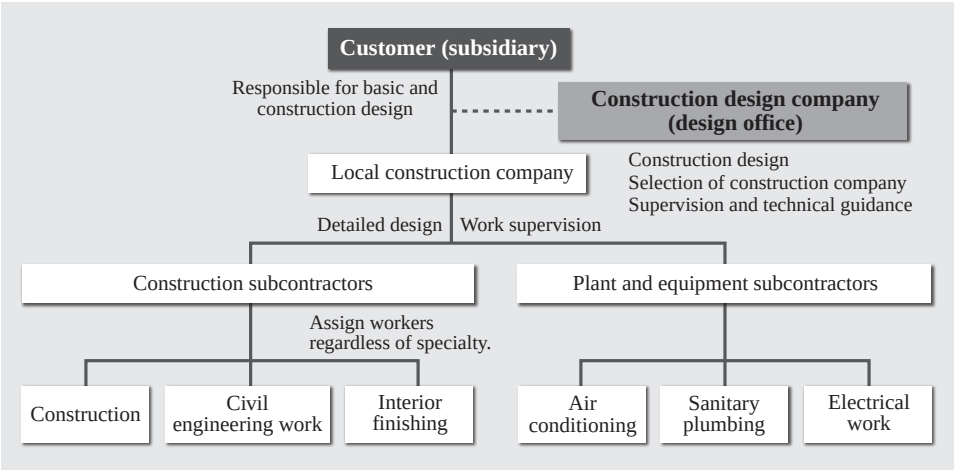


Fig. 5—Organizational Structure Based on Use of Local Companies.
This example is based on issuing a turnkey contract to a local construction company.

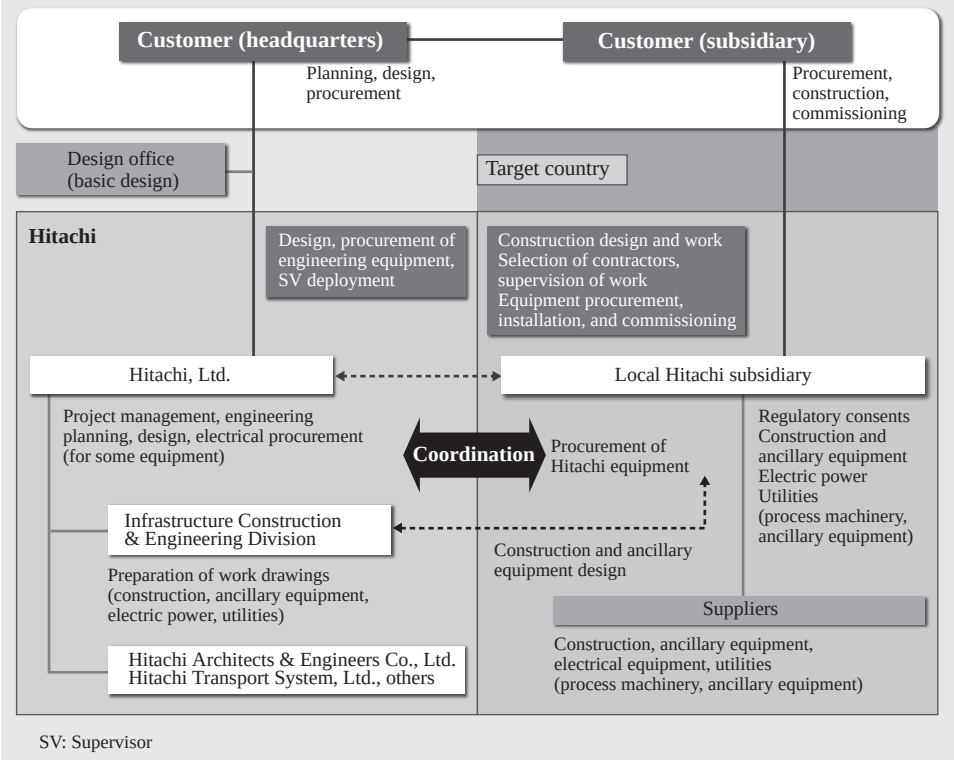
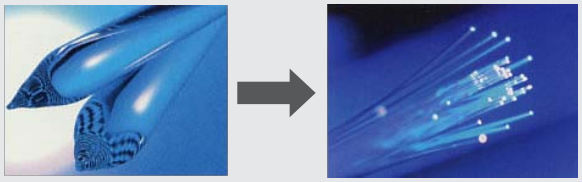


Fig. 6—Collaborative Arrangement with Parties in Target Country.
Clear communications and an unambiguous division of responsibilities can be achieved by establishing a collaborative arrangement between the customer and Hitachi.



Preform
(high-purity synthetic quartz)

Optical fiber produced from
synthetic quartz preform

Source: Product web site of Shin-Etsu Chemical Co., Ltd.

Fig. 7—Preform and Optical Fiber End Product.
The new plant produces glass rod from high-purity synthetic quartz.

focus on their core business, which was the industrial process itself.

CASE STUDIES

Turnkey Supply of Optical Materials Plant in China

Overview

The plant was supplied to Shin-Etsu (Jiangsu) Optical Wand Co., Ltd., a joint venture between Shin-Etsu Chemical Co., Ltd., the Chinese company Jiangsu Fasten Hongsheng Group Co., Ltd., and the Dutch company TKH Group N.V. It was established to produce preform (high-purity synthetic quartz), a material used in the production of optical fiber and for which the Chinese government is encouraging domestic production (see Fig. 7). Located on a 120,000 m^2 site, the new plant has a total working area of 64,000 m^2 and comprises a factory, an administration building, and 10 other buildings. The main factory is built of reinforced concrete (RC), includes a clean room, and has up to three floors. The planned annual preform production capacity is equivalent to 8 million km of optical fiber.

Features

Hitachi Plant Engineering & Construction (Suzhou) Co., Ltd. is a Chinese subsidiary of Hitachi and participated in the project from its earliest stages with backup from its parent company. This included conducting a feasibility study to assess the project's viability, and also plant site planning. With the cooperation of Shin-Etsu Chemical Co., Ltd. and Shin-Etsu (Jiangsu) Optical Wand Co., Ltd., the plant was delivered in late 2012 after a 14-month turnkey project that covered civil engineering, construction, air conditioning, electrical systems, and sanitary plumbing. The scope extended from planning through to design, procurement, and construction.

Despite the difficult business practices in China, Hitachi was able to coordinate with the customer and

Fig. 8—New Production Facility of Shin-Etsu (Jiangsu) Optical Wand Co., Ltd.
This is the administration building of the newly completed plant.

Fig. 9—Overview of New Production Facility of Shin-Etsu (Jiangsu) Optical Wand Co., Ltd.
This new plant was constructed through cooperation between the headquarters and local subsidiaries of the customer and Hitachi.

the various levels of local government to successfully complete the project in accordance with the basic plan of Shin-Etsu Chemical Co., Ltd. This included an emphasis on use of products sourced in China, with differences between Japanese and Chinese specifications being dealt with as necessary (see Fig. 8 and Fig. 9).

Turnkey Contract for Supply of Utilities to Brewery

Overview

Sapporo Vietnam Ltd. is a beer production and marketing company that was jointly established by Sapporo Holdings Ltd. and Vietnam National Tobacco Corporation. Sapporo Vietnam's new brewery in Long An plans to step up production progressively until it reaches 150,000 kL in 2019. This is the first time a Japanese brewer has established operations in the Socialist Republic of Viet Nam. The brewery

Fig. 10—Model of Long An Brewery of Sapporo Vietnam Ltd.
Annual production at the new brewery is expected to reach 150,000 kL in 2019.

site is located in Long An Province on the outskirts of Hoh Chi Minh City and was selected with a view to supplying the entire Southeast Asian market (see Fig. 10 and Fig. 11).

This new brewery is Sapporo Holdings' second production facility outside Japan, the first being in Canada. While Vietnam is currently thought to have more than 300 breweries, both large and small, it is a promising market for the future with a background of steady economic development and beer consumption that has already grown to be second only to that of China within the Southeast Asian region.

Features

Hitachi completed a comprehensive design and build contract for the supply of all utilities on the site. The contract was awarded in recognition of the company's track record with brewery construction in Japan and its experience in Vietnam. The supplied equipment plays important roles throughout the beer production process, including grid interconnection equipment, primary electric power distribution, steam, heating and cooling, compressed air, water treatment, waste water treatment, hot water, supply and collection of carbon dioxide, and a chemical dispensing system. In undertaking this construction project, Hitachi focused on the following points in particular.

(1) Construction of plant to same standard as in Japan or Europe

Assessment of performance and quality of locally sourced products

(2) Compliance with local environmental rules, laws, and standards

Familiarity with Vietnamese laws and standards

(3) Comprehensive construction quality management

A thorough approach to training local workers and managing construction quality

(4) Work management system designed for short construction schedule

A thorough approach to project management and establishment of work management systems able to cope with tight schedules

Work started on the plant in July 2010 and completed in November 2011, making it the first Japanese brewery to be built in Vietnam. The brewery has an annual production capacity of 40,000 kL.

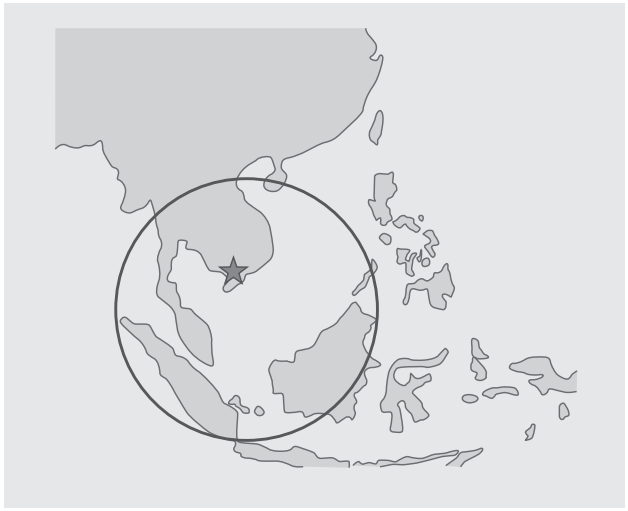


Fig. 11—Location of Long An Brewery in Southeast Asia.
While robust growth is anticipated in the Vietnamese beer market, the Long An Brewery was also built to act as a base for Southeast Asia.

CONCLUSIONS

This article has discussed the challenges facing the establishment of overseas operations and described examples of relevant Hitachi solutions.

The construction of overseas plants requires an organizational structure that is capable of performing design, construction, and maintenance management based on an understanding of the laws, standards, and

other practices that apply at the site. The response of Hitachi to this challenge is to offer total plant solutions in the form of turnkey contracts. This article has described examples of this approach used for the construction of plants in China and Vietnam. In this way, by providing comprehensive support that extends from basic planning through to construction and maintenance management, Hitachi is helping create an environment in which companies that are planning the construction of overseas plants are freed up to concentrate on their core business.

REFERENCE

(1) "Survey on Corporate Attitudes towards Overseas Expansion," Teikoku Databank (Jun. 2012) http://www.tdb.co.jp/report/watching/press/keiki_w1205.html in Japanese.

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