Meeting the Demands of the Growing Liquefaction Market

World Energy *interviews Philip Asherman, president and CEO of CB&I*

CB&I (www.cbi.com) is one of the world's leading engineering, procurement and construction (EPC) companies, specializing in projects for customers that produce, process, store and distribute the world's natural resources. CB&I is a fully integrated EPC service provider, offering a complete package of conceptual design, engineering, procurement, fabrication, field construction, mechanical installation and commissioning.

CB&I serves customers in a number of key industries including oil and gas; petrochemical and chemical; power; water and wastewater; and metals and mining. Its projects include hydrocarbon processing plants, liquefied natural gas facilities, offshore structures, water storage and treatment facilities, and other steel structures and their associated systems. CB&I has approximately 14,000 employees and operates from more than 60 locations worldwide.

World Energy: Tell us about CB&I's history regarding the liquefaction of natural gas.

Asherman: Our involvement in liquefaction dates back to 1965, when we designed and built the world's first liquefied natural gas (LNG) peak shaving plant. These units are used to liquefy and store natural gas for use during periods of peak demand. We have also been highly involved in the mechanical erection of liquefaction trains for baseload LNG export facilities. In 2004 we built an LNG train for a baseload plant in Australia, which has an annual capacity of 4.2 million metric tons, and in 2005 we completed a liquefaction facility in Bonny Island, Nigeria, which has a capacity of 4 million metric tons per year.

World Energy: How have CB&I's capabilities expanded to encompass the entire scope of the liquefaction facility?

Asherman: CB&I has grown dramatically in the past few years, and we have attracted a large number of experienced industry leaders in the areas of liquefaction and gas monetization. With the addition of their technical expertise to our existing base of LNG know-how, we recently secured our first full EPC liquefaction project in South America, where Peru LNG is building a state-of-the-art natural gas liquefaction plant and marine terminal at a site called Pampa Melchorita, 170 kilometers south of Lima.

This project not only represents the largest industrial project ever to be undertaken in Peru, but it is also South America's first baseload LNG export facility. In addition, it is the first liquefaction project for CB&I in which we have full EPC responsibility.

World Energy: Based on your company's knowledge of the market, what do you see for the future?

Asherman: The future of the LNG market continues to be bright, as more LNG import and export terminals are being built than ever before. March and April 2007 were record months for the importation of natural gas into the U.S. market, while Europe continues to build terminals to ensure security of supply. To support this demand, we are seeing the development of liquefaction facilities in the Middle East, Africa, South America, Asia and Australia. About a dozen liquefaction facilities are being built right now and should be brought online in the next few years. Many more facilities are currently being promoted, and these projects will probably go into development once the necessary resources are available.

In short, the natural gas market has gone from a regionally focused industry to a global one. And with the current backlog of demand for LNG, it should remain a highly active market for years to come.

World Energy: Where is CB&I helping with the design and construction of these LNG export facilities?

Asherman: For now, our first plant for which we have full EPC responsibility is Peru LNG, which, upon completion, will be capable of producing approximately 4.5 million metric tons of LNG annually. Currently, production is scheduled to start in 2010.

Elsewhere, we are back in Western Australia serving as the mechanical contractor to build a new LNG train for Woodside Energy's North West Shelf Venture LNG Phase V Expansion Project. Upon completion, the train will have a capacity of 4.2 million metric tons per year, which will expand the plant's current capacity to 16.3 million metric tons per year, making it one of the single largest LNG complexes in the world.

In addition to these projects, we are in discussions with several other developers to determine how we can help support their liquefaction needs.

World Energy: Tell us more about the Peru LNG job. Are there any unique features associated with this facility?

Asherman: As the only baseload liquefaction project sanctioned in 2006, Peru LNG has many interesting aspects. One of the most intriguing is the location. Extensive studies were performed along the coastline of Peru to identify an appropriate location for the project. The Pampa Melchorita site is environmentally sound and was deemed the best choice.

Gas reserves are developed on the eastern side of the Andes Mountains and will be transported to the plant via pipelines extending more than 400 kilometers. Because liquids are removed from the gas upstream of the terminal, the liquefaction train does not have to handle any other liquid products. In terms of design, we are using proven processes, equipment and technology. Our business model is such that we work with established process licensors for large baseload facilities.

World Energy: How will the Peru LNG terminal affect the current gas distribution infrastructure?

Asherman: From a location standpoint, the Peru LNG export terminal is strategically positioned to supply gas to the western coast of North America. While Peru LNG will be shipping supplies to terminals in Mexico and Canada, eventually it may provide natural gas directly to California.

World Energy: What about the balance between new liquefaction facilities and their regasification counterparts? Due to difficulties in siting new regasification terminals in certain areas, will building more liquefaction plants eventually create an imbalance?

Asherman: Well, presently, there is a substantial shortage of export capacity, so there's room to grow on the supply side for several years. The Peru LNG project will help the balance of LNG supply and demand.

And while there are some difficulties in siting regasification facilities in particular regions, new ones are still being built, while existing ones are rapidly expanding their capacities. For instance, the South Hook regasification facility that we are building in Milford Haven, Wales, will be, upon completion, the largest LNG terminal in Europe and will provide a significant new source of natural gas for the United Kingdom's national transmission network. In China, the Fujian LNG regasification facility, which is currently under construction, represents the country's first fully owned LNG import terminal and is scheduled for commercial operation in 2008. And in the United States, there's the design and construction of the Golden Pass LNG regasification facility near Sabine Pass, Texas. CB&I is currently involved in each of these projects.

World Energy: Are there any trends that indicate liquefaction facilities will be built using prefabricated modular units?

Asherman: Very much so. In fact, the LNG train we are currently erecting in Western Australia is being built using conventional prefabricated modules, which has never been done before for a liquefaction train. There are a total of 74 modules with a combined weight of approximately 17,500 metric tons. One of the main reasons behind using modular construction is the remoteness of the site and the resultant difficulty in securing construction labor. As LNG projects continue to be sited in increasingly remote areas where space is limited and skilled labor is in short supply, we will probably see the use of modularization become more common in LNG projects.

World Energy: What are some of the other challenges facing the liquefaction market, and how is CB&I planning to address them?

Asherman: As I mentioned before, there is currently a production shortage due to the limited number of qualified liquefaction EPC contractors. CB&I joining this elite club represents a significant increase in the industry's ability to meet current growth. One of the biggest challenges for any of these contractors is attracting qualified personnel and liquefaction experts. Fortunately, CB&I is an employer of choice and has successfully built and developed these resources to expand the capacity of the industry.

World Energy: Any final comments?

Asherman: Yes. Over the past few decades, CB&I has taken the steps necessary to be able to meet nearly all the capital project needs of the LNG value chain – from production and liquefaction to regasification, storage and distribution. However, we are not done yet. CB&I will continue to grow and expand its capabilities so that wherever our LNG customers are and whatever they need, we will have the resources to supply them with projects that are second to none.