FACTORY ON THE MOVE
Shale gas developments in North America have created a competitive natural gas environment and, consequently, lower gas prices. This has led to opportunities for several industries that produce gas-related products, such as methanol. Methanex Corporation, the world’s largest producer and supplier of methanol, wanted to benefit from the lower natural gas prices and increase its production capacity in the United States. The sooner it would realize this, the better. Therefore it was decided to relocate two existing methanol plants from Chile to Geismar, Louisiana. Compared to constructing a new plant, relocation would save between six and twelve months—valuable time to profit optimally from market circumstances and price opportunities. Not to mention the fact that this would offer significant capital savings.

In close cooperation between Jacobs Engineering and Mammoet, an entire methanol plant was moved from the most southern part of Chile to Louisiana, USA over a distance of 8,720 kilometers (5,450 miles).

One of the modules transported on SPMTs from the original site to the port.
special roads and bridges was necessary to facilitate the exceptional transport. There were many other challenges, including loading and sea fastening in the Straits of Magellan, an area notorious for strong currents and sudden storms.

Another challenge was offloading in Louisiana, where the Mississippi River levee was crossed via a specially engineered and constructed bridge—the soil conditions requiring a customized design for the bridge and its foundations.

Methanex’s Geismar I plant is targeted to be operational by the end of 2014.

The relocation was commissioned to Mammoet and involved an integrated package of services, lifting and moving almost 400 heavy components and modules and setting them up for reassembly.

First, the modularization was designed, so that the modules would be compatible with Mammoet’s equipment, the ships and bottlenecks along the route. Then, the Chilean plant was reinforced and split into the designed modules. In turn, the modules were reinforced and moved from their Chilean location to their new US home, along with many heavy components. All components and modules had a combined shipping volume of more than 12,145 metric tons (157,000 freight tons).

At certain points along the route, engineering and construction of special roads and bridges was necessary to facilitate the exceptional transport. There were many other challenges, including loading and sea fastening in the Straits of Magellan, an area notorious for strong currents and sudden storms.

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Jacobs Engineering: vision on reversed modular construction

Dismantling and modularizing activities are also described as Reversed Modular Construction. We asked Mike Autrey, Group Vice President at Jacobs Engineering, to share his company’s vision on this method.

Reversed Modular Construction—how does that work?
“We used expertise from our modular construction operation in Charleston, South Carolina and basically reversed the design process to support the existing equipment and piping in a modular fashion. After completing the logistical studies to determine the maximum module envelope, we evaluated the existing structures and layout to see where it made sense to create modules. In the end, we were able to modularize about half of the existing plant and reduce the re-installation by roughly 1.5 million work hours.”

What are the main challenges of disassembling a stick-built factory?
“One of the biggest challenges is the coordination of all the factors to be considered, particularly in an international arena. Size and availability of ships, land transport routes, tie-down methods, customs and insurance requirements; and in this particular project—US and Chilean environmental regulations and the seasonal variation in the Mississippi River level—play important roles in the disassembly execution plan. Limitations shift based on the locations involved in a particular project. Jacobs’ ongoing presence in both Chile and Louisiana was a key contributor to the success of the disassembly project.”

What were the transportation challenges for this project?
“It was an iterative process to identify the right combination of transport equipment and methods. But in the end, the transportation was able to accommodate the design, and not the other way around. The major route challenge was crossing the Mississippi River levee. Mammoet was instrumental in selecting the transportation equipment and securing the permits to make this all happen.”
Relocating the plant in five steps

1. Baton Rouge, Louisiana
   Engineering and coordination between Mammoet, Jacobs Engineering, and Methanex, determining the best approach and choosing the path forward.

2. Chile, Punta Arenas
   Continued engineering as well as mobilization of equipment and personnel to start the disassembly. Choosing the qualified subcontractors for shipping. Design and construction heavy haul route from Punta Arenas to the port, including excavations.

3. Chile to Louisiana
   Transport and shipping from Chile to Louisiana. Western Route: The western route through the Panama Canal was used for general cargo ships and heavy lift ships. Eastern Route: The eastern route was used for the loaded barges and semisubmersible vessels that were too wide to be allowed through the Panama canal.

4. Port of South Louisiana, Reserve, Louisiana to final offload location at Geismar, Louisiana.
   Heavy haul route design and construction, including a temporary levee crossing and heavy haul road, connecting to the plant’s heavy haul road. Transport to the Louisiana site and reassembly.

5. Geismar, Louisiana
   Setting all modules and executing all the heavy lifts. EPC final construction and commissioning.

South Pacific Ocean
U.S.A.

Geismar, Louisiana
Punta Arenas
Western Route
Eastern Route