

# Logistics meeting behind-the-scenes challenges

*Worldwide competition for equipment to extract, produce and transport energy is intense. Easily accessible fields are being exhausted, and high energy prices are making developments in remote locations more viable.*

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The economics of producing from smaller fields has given way to larger, complex projects that often require mammoth

components that are neither easily located nor easily transported. On top of that, natural and other disasters have disrupted normally reliable supply resources, causing timing issues, restrictions in the usable infrastructure, and a decrease in the number of vendors. Routine procurement and shipment of

materials is almost a thing of the past. The complexities of today's industry have made the role of logistics/traffic/transport specialists vital to cost containment and ultimate project success.

## Timing is everything

The major driver for every project in the industry today is schedule. Globalization has spread fabrication to facilities around the world. Offshore drilling and production systems can have hulls fabricated in Scandinavia or Korea and topsides fabricated in Louisiana, with their marriage at a facility in south Texas. Lead times and backlog caused by the demand

for materials have been greatly extended. It has been reported that space bookings for marine heavy-lift transport vessels are often 1-1 1/2 years in advance, with companies often booking space at the outset of a project in an attempt to assure that transportation will be available once the equipment has been fabricated.

As capacities and pressure increase, component size and weight are expanding as well. Where possible, it is prudent to design a module that can be consolidated to be single lifted or transported in its entirety. The vessel to move the structure and the capability to lift it then become critical issues. A recent example was the shipment of a living quarters module for a Gulf of Mexico production facility. The structure measured 65 ft high by 110 ft wide by 140 ft long and weighed 1,375 tons. It was shipped by barge from the fabrication yard in south Louisiana to be set on a topsides at a facility in south Texas. The lead time to secure barge transportation and design a skidway to move the module to loadout at water's edge was in excess of one year.

Missing a delivery or installation window can be catastrophic and cost prohibitive. There is a limited number of lift vessels available. Failure to meet deadlines can mean a significant time delay, with exorbitant production losses or extra costs incurred to rectify the missed timing.

## The aftermath of Katrina and Rita

The majority of the fabricators that produce modules for oil and gas processing skid packages are located



*The movement of a 330,000-lb vessel from a Houston-area fabricator to a Northern California refinery required patience, ingenuity and fortitude. The load was approximately 144 ft long by 20 ft wide and almost 19 ft high. The circuitous routing through seven states took more than two weeks at a top speed of 15 mph. The shipment required the use of a two-truck tandem vehicle with 74 wheels.*

along the gulf coasts of Texas and Louisiana. The impact on local economies of hurricanes Katrina and Rita in the fall of 2005 is well documented. What is not as widely reported is the disruption to the fabrication and transport capabilities of the region.

Many reputable facilities were closed permanently or are just now regaining their former capabilities. Power was disrupted for an extended time, facilities were flooded, and many

skilled workers permanently relocated from the area. The disruption caused a permanent reduction in the fabrication resource and has required a significant search for alternative sources that are often distant and less familiar with the work.

Barge and oceangoing tug availability also was curtailed by the storms, with many vessels irreparable or lost. Other vessels were diverted from service and supply activities to assist in the reconstruction efforts for New Orleans and are just now returning to service for the oil and gas industry.

## Aging infrastructure

The August, 2007, Mississippi River bridge failure in Minneapolis brought focus to the structurally deficient bridge infrastructure in the US. Disclosure of these inadequacies brought immediate changes to the permitting process for domestic land transport. Many state departments of transportation reduced load capacities from previous upper limits. In many instances, they are further requiring multi-axle steerable transporters, dual-lane dolly carriers, and other means of distributing massive loads for safe transport.

The application process to secure “superhaul” permits, needed for highway transport of loads weighing in excess of 100,000 lb, has been greatly extended. Whereas previous permits could be secured in two months or less, today, the time required often is tripled, and state-to-state mandates can vary widely. There is a significant shortage of bridge inspectors and transportation authority workers to conduct route surveys and approve permits, which further complicates the process.

Infrastructure problems have extended into international waters as well. The Panama Canal is currently planning construction on certain of its locks to accommodate larger vessels and their cargo. Because of high activity, current transit time through the canal is approximately 50 days. Upcoming construction will cause significant delays in getting large Pacific shipments through the canal. The backlog has resulted in shippers discharging cargo from Pacific locations for overland shipment at west coast ports that are already overburdened by demand.

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## 9/11 and global security

The events of September 11, 2001, changed the security of US ports and had a profound impact on security of fabrication facilities and ports throughout the world. Increased emphasis on proper documentation and scrutiny of cargo has added to the time needed to pass materials through customs.

New security requirements are being added routinely. Transportation worker identity credentials (TWIC) are now required of all workers and visitors to ports around the world. The procedure has increased background checks, has reduced the number of workers legally able to work at those facilities, and has greatly limited access. Goods often remain on docks for a specific period prior to loading to assure that they are safe for transport. Because of potential infestation and use of inferior materials, new regulations have recently been instituted to assure that wood products used for pallets and crating materials have been properly fumigated and approved for use by federal environmental protection authorities. All of these precautions add time and costs to the shipping process.

## Third-party partnering

Often, moving goods in local markets and providing logistics becomes the responsibility of a local agent and freight forwarder. Alliances with these third-party logistics (3PL) specialists are becoming increasingly critical so that local content requirements are met, import documents are correctly translated, and local regulations are properly followed. The 3PL firms need to be scrutinized closely and evaluated on their ability to anticipate and meet continual challenges. Areas recently experiencing high activity levels, including China, Russia's Sakhalin Island, and Nigeria, have little

infrastructure and can be difficult to logistically stage without expert local third-party intervention.

## Tools of the trade become sophisticated

Traffic and logistics experts rely heavily on electronic databases to track minute details. Mustang's proprietary *PACESETTER* project management system is one such tool used to track receipt of materials. This web-based system records activity from material requisition through purchasing and receipt of materials, tracking equipment as it travels from field fabrication through transport to installation. Similar tools are needed to keep all parties abreast of the schedule so there are minimal surprises. The progress of GPS has added to shippers' ability to continually track loads in transit.

## Early involvement is essential

The complexity of the projects, the increasing size of the components and equipment, globalization of demand, and relatively static inventory of lifting and transport vessels have fostered a close coordination between design engineers and logistics specialists.

Engineers have to understand the weight and envelope limits of what they are designing so that transportation alternatives can be planned. Vessel designers rely on logistics specialists to provide guidance on lifting accoutrements needed to assure safe handling during transit. Decisions in the project's conceptual planning or FEED phases that include movement of goods are essential to the viability of the execution plan. Logistics, traffic, and transportation experts have increasingly become a necessary ingredient in the success of any project and are a vital 'behind-the-scenes' asset.

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