Unlocking the supply chain for LNG project success

LNG report series

An interview with Andy Calitz, CEO
LNG Canada

What are the main current problems in LNG supply chains? For example, labor/skills shortages, remote locations, aligning partnerships, local content requirements, competition for scarce resources, environmental considerations.

A: LNG projects are typically the largest industrial projects in the world, requiring several thousand construction workers. Attracting and retaining experienced craft labour, foremen and supervisors is a key challenge, particularly for remote or hardship locations.

At LNG Canada, we seek to become the “Project of choice” by providing highly rated accommodation, ease of ability to travel to and from site, and a safe work environment to increase the attractiveness of the project to potential workers.

What is different in LNG supply chains versus other E&P projects?

A: The proposed new LNG projects are of a size not yet seen in British Columbia and resources are generally limited. To address this, LNG Canada will seek to reduce the total number of manhours on site through fabrication of module units that are shipped to site for hook-up and commissioning activities. This is referred to as “modularization”. Modularization requires a different supply chain approach compared to a conventional stick built methodology.

With a modularization approach, the capacity and assessment of module fabrication is key to enable an optimization of yards for varying sizes and complexity of process modules and piperacks. The supply chain requirements for modularization requires an earlier completion of the engineering and procurement requirements, affecting schedule and timing of bidding proposals to the market.

This approach is very different from typical E&P projects for offshore, due to the large increase in the number of modules and greater variation of module sizes. Greater effort is required to sequence the modules for transportation, delivery and installations at site, which affects the sequence of design completion and procurement activities so the fabrication yard space can be managed effectively.

How should traditional supply chain processes be adapted to remote locations and just-in-time requirements?
Can the LNG industry learn from supply chains in other industries in remote locations e.g. mining?

A: Traditional supply chain processes can be improved in terms of accuracy of the material tracking process, which can be achieved through workface planning. This is very different from a “just in time” process that does not support a remote worksite and workface planning, given the call for material is generally one to two weeks prior to execution of the work.
With respect to material management, we at LNG Canada are working closely with our supply chain counterparts in mining and other industries to ensure lessons learned are applied. LNG sites generally have good sea access allowing larger shipments of material to site, which tends to result in additional materials in each shipment. Having materials arriving on site earlier, compared to phased road and rail freighting, leads to the requirement to establish good laydown areas, warehousing, preservation and general material management earlier in the project.

**What work has been done to model the supply chain, its critical nodes and risks? How can ICT/software help?**

A: LNG Canada has held an extensive series of contracting strategy workshops to explore the various supply chain critical issues and risks. These workshops have been supported by supplier intelligence and global project lessons learned.

Given the modularization approach and significant movement of materials, a strategy for an overarching logistics management system has been investigated to support the end-to-end supply chain.

Software application will be adopted in terms of data management, centralized logistic systems and a centralized contract management system.

**How can gains/process improvements be shared between the client and contractor? What collaborative models can be used?**

A: LNG Canada’s Joint Venture partners have established client/contractor relationship programs that our company will leverage. These programs allow for performance reviews, sharing of lessons learned and have an aim of fostering mutual improvement for both client and contractor. Executive sponsors from both the client and contractors meet regularly to assess and improve performance and build working relationships.

One model that LNG Canada uses involves early engagement with potential suppliers to develop lessons learned early in the project phases. Lessons learned are used in the supply chain strategy and tactics workshops and through the design phases. Early contractor involvement is instrumental in the LNG Canada process so execution and constructability experience can be challenged and used to enhance the facilities design.

**How can supply chain knowledge and skills be retained?**

A: There are a number of ways to retain supply chain knowledge and skills:

- Ensure that projects resource highly respected Project Managers/ Directors and CEO, who will provide opportunities for success and build confidence in the project, and in turn attract the best staff.
- Provide incentives or penalties within contracts to retain key personnel/ leadership.
- Use framework agreement suppliers with established long-term relationships to retain and improve delivery and input via early supplier engagement.

**How can supply chain risk be dealt with and how does it relate to enterprise risk management?**

A: Supply chain risk can be dealt with by ensuring forward planning of activities; so much of the risk can be overcome during the supply chain/ contracting and procurement processes. This includes the governance required for the project, where risks are specifically identified with mitigations.

Another way to identify and align the project organization on key supply chain risks includes early engagement with contractors and leveraging previous project lessons learned. Further work to establish credible budgets and schedules, and ensure resources are available for delivery, will also support the de-risking of the project.
At LNG Canada, the project operates an enterprise risk management process with a continuous focus from the leadership team. Supply chain risks are managed in the same manner as other identified enterprise risks.

What are key supply chain issues relating to the environment, sustainable/ethical sourcing, local content requirements and compliance?

A: It is important that companies not only make commitments about how their supply chain will operate, but that they also make an effort to identify how to remove barriers for contractors to comply with these commitments.

As an example, a potential issue for an LNG project is that the project may develop at a faster pace than expected by local suppliers, who are either not mature in their business planning or unable to find resources to respond to bidding requests or the actual work requirements. At LNG Canada, we have been proactive through community engagements to explain contracting, procurement opportunities, and work requirements for our project. We have also encouraged businesses to register for opportunities on our project. In doing so, local contractors can better understand the opportunities, and we can complete the pre-qualification process with prospective contractors and suppliers at an early stage in the project.

We believe that the development of strategies that recognize the suppliers’ capabilities and provide local subcontract opportunities will result in growth and capability development of local suppliers over the period of the construction project which will then roll over into the operations phase and benefit the project and community in the long term.

LNG Canada has set out to be the project of choice for British Columbia. Every decision we make during the planning and design process will keep safety, economics, the environment and community interests top-of-mind. For example, LNG Canada has designed the facility to be one of the world’s best performing LNG facilities in terms of greenhouse gas emissions. Through a combination of energy-efficient natural gas turbines and renewable hydroelectricity, the LNG Canada project would emit less than half the greenhouse gas emissions of the average LNG facility.

Which different supply chain models are used? What are the strengths and weaknesses of each one? And, how is the transition from major capital projects to operations & maintenance managed?

A: Various models are being used ranging from Client based and managed contracts and procurement of critical and/or high value requirements, through to appointment of Contract Management Contractors to manage the supplier and execution of the works, through the turnkey lumpsum (EPF). All approaches are used for the purposes of managing risk and providing clear contracting accountabilities. The strengths and weaknesses of each are weighed to develop a strategy that allows the best management of interfaces and risks for successful delivery.

At LNG Canada, the operations and maintenance organization was resourced early in the project and has a role in providing valuable input into the design, operating and maintenance philosophies that the facility must support. The facilities will be designed for process integrity, operability and management of the operating facility at a minimum cost. Considerable focus is also provided by the operations and management organization to ensure a flawless start-up and the quality of the completed facilities.

During the handover phase, a process known as “Project to Asset” is applied that requires sign-off for completion over specific items per organization. For example, supply chain requires sign-off that all maintenance and services contracts and spare purchase agreements have been executed, that warehousing and material management and inventory management are fully functional, and all project surplus materials have been managed.
What innovations are occurring in LNG supply chains? What is the role of integrated operations/smart operations?

A: One of the main innovations that we are seeing a large benefit from is early contractor involvement. The ability to identify prime contractors or suppliers that can improve project delivery and de-risk the project has become increasingly important. When such contractors and supplies are identified, gaining their input for design and execution benefits at the earliest point possible has proven to provide significant benefits to the project.

We have also seen innovations in tools such as workface planning, material track and trace systems, inventory management software, and material management systems that help to eliminate waste and loss, and result in more efficient construction planning.

January 2015