COMMERCIAL QUALITY CONTROL: the missing link

Ted Berglund and Joseph Hughes, Dyplast, USA,
present a commercial quality control approach to building and operating LNG terminals.

In an era with disparate pricing, a multiplicity of owners/stakeholders, long-term price volatility, multiple concurrent plant constructions, a shortage of skilled personnel, and increasingly complex technologies, owners/stakeholders in LNG projects increasingly face new risks. Return on investment (ROI) could be high, unpredictable, or even negative. There are controllable impact factors (feasibility studies, contractor and technology selection, contracts, project management, etc.), and there are uncontrollable impact factors (price volatility, global demand, armed conflict, etc.).

This article introduces commercial quality control as an approach to move more impact factors to the controllable side of the ledger, and also as a way of better identifying and mitigating risks across the project lifecycle – beginning at project inception, but encompassing development, financing, construction and operations.

Late to the gate?

Capital-intensive LNG projects have historically, for the most part, successfully managed the technical aspects of the design, fabrication, construction, testing, and operations. However, while one may argue technical success was achieved, commercial success can sometimes be argued as lagging, or at least not optimised.

Figure 1. Commercial quality control to meet standards.

In an investigation several years ago, DNV GL concluded that only three of 22 LNG import terminals were delivered on time, and 50% of export terminals experienced significant delays.[1]

An investigation by Dyplast indicates that this record is not improving.[2] So, must owners simply resign themselves to greater contingencies in budgets? Is there an alternative? With so much expertise in the industry, what is missing? The concept of commercial quality control comes to mind.

What is commercial quality control?

Commercial quality control is simply a logical extrapolation and integration of 'traditional quality control practices' across the commercial spectrum.

Traditional quality control has become global standard practice for manufacturing, construction, and most other industries. So, why not take those basic principles and apply them across the broader aforementioned commercial activities (development, financing, siting, contracting, staffing, etc.)?

An analysis of stakeholder challenges/dissatisfactions across capital project industries (e.g. LNG, petrochemical, pharmaceutical, nuclear, transportation) over the past 30 years concludes that there are over 100 problematic issues across the project lifecycle that can be better managed by applying commercial quality control. The top five interconnected areas are addressed in this article.

Ownership structure

Small LNG facilities may have a single owner that is self-financing the project. On the other hand, the largest projects may have multiple owners and stakeholders, each with different short and/or long-term objectives. Owners may include multinational and cross-national organisations with varied structures (e.g. private or public incorporations, non-profits, joint ventures, consortiums, investors, and governments). The ownership structures may also vary considerably from the perspective of build-own-operate (BOO), build-own-operate-transfer (BOOT), and build-lease-transfer (BLT), etc. The commercial quality control approach strives for simplicity, but when simplicity is not achievable, there must be an aggressive focus on clarity and comprehensiveness.

A commercial quality control approach would begin by asking the same initial questions as posed in a traditional quality control approach:

- Who are the internal and external stakeholders?
- What are the organisational goals?
- What are the critical success factors (quantified)?

The added value of a commercial quality control approach at this stage is multi-faceted and dependent upon the details of the situation, yet one prime focus is to understand the motivations of each owner, potential owner, owner-influencer, and stakeholders with influence.

Far too often, the legal structure that will permeate all interwoven and downstream contracts begins to take shape without this critical perspective, understanding and integration. It can be stated with surety that downstream project risks can be materially reduced by addressing the conflicting stakeholder motivations within contract structures.

Although everyone may want the project to succeed, the reality is that each organisation (including different divisions within organisations) has its own agenda. A common example is a facility 'design/construction contractor' or an 'operator' who may also be a shareholder, enabling the ability to potentially arbitrage between earnings at the owners' level and those earned at the project level.

Another example application of commercial quality control at this stage, as in the traditional quality control approach, would be to define accountabilities and decision-making processes to the maximum extent possible. Many decision-making structures exist. The optimal structure depends on the ownership structure itself, but should ideally incorporate a predisposition for decisions that are in the interest of the project (not individual owners), as well as incorporate a process for delegation to the project management team, yet with an ample feedback/control loop with the ownership.

Contracts – or not

The essence of a contract is to set forth conditions that, if violated, have legally-enforceable repercussions. Terms addressing mutual rights, obligations, and recourses of the parties are, of course, conventional wisdom. Yet a commercial quality control approach acknowledges that the highest levels, such as memorandums of understanding (MoUs), letters of intent (LOIs) and contracts, spawn the second, third and fourth generation contracts, and are often drafted by parties who may not understand technical and construction realities. The 'DNA' of the first generation contracts becomes a determinant factor in the character and properties of the next generation. A commercial quality control approach strives to incorporate more wisdom and lessons learned, even at the MoU/LOI levels.

Again incorporating traditional elements, the commercial quality control focus on contracts can be

summarised to additionally incorporate measurability, auditability and controllability.

While most owners/stakeholder/contractors may acknowledge this in EPC contracts, the commercial quality control approach extrapolates into finance agreements, the subcontracting process itself, public relations, and offtake agreements.

Measurability

One aspect of 'measurability' would incorporate more detailed schedules and milestones into the ownership's structural contracts, with imposed flow-down across contracts. This gives stakeholders more control over the project management team, which at times may be more loyal to the contractors than the owners-at-large. Measurement protocols and reporting regimes would also be appropriate, including definition of the content of monthly reports in some detail to ensure the reports are sufficiently objective and quantitative. Too often, the monthly report contains excessive text that is intended to tell the story that the contractor wants the owner to hear.

The owner should also require periodic assessments from its contractors regarding the health of the contractor's subcontractors. This can be as simple as an annunciator panel process, whereby each contractor is assigned either green, yellow, or red based on agreed metrics. There have been instances when an owner deemed its contractor was 'turnkey' and, therefore, under-emphasised the appraisal metrics. This can be a major mistake, particularly if an owner ever needs to take legal action against a contractor, only to find out that they do not have the data to support the case.

Auditability

Auditability relates to full access to relevant contractor information, as well as participation in all meetings as desired. Auditability also ventures into the owners' authority to monitor and stay abreast of contractor activities and their staff. Commercial quality control endorses more detail in the top-level contracts (and flow-down terms) in the areas affecting such owner prerogatives. Such terms make it easier for the owners to, for instance, request meetings with subcontractors to personally assess qualifications, progress, etc. without first needing to negotiate the terms with contractors. This right must, of course, not be perceived by subcontractors as abusive. Embedded contractual terms can mitigate a contractor claim of 'interference by owner' as justification for delays or cost increases.

Controllability

Controllability can be built into contracts while still minimising the likelihood of change orders. The controllability of commercial quality control requires feedback, as well as a continuous improvement process built into the contract.

The continuous improvement process is dependent on the 'why' behind a failure, accident, delay, or other problem (per se a 'root cause analysis') – which leads to lessons learned that should be promulgated to all parties involved.

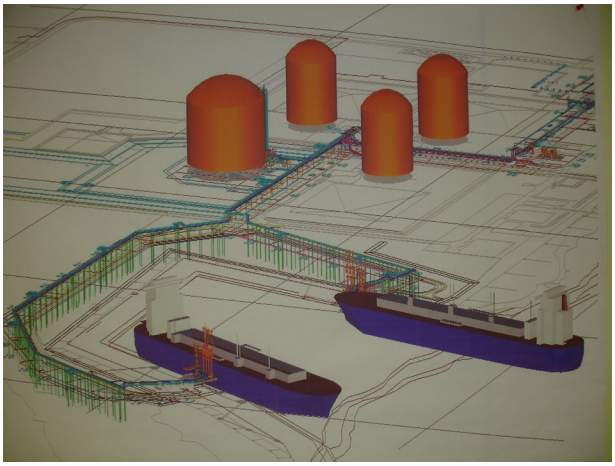

Figure 2. Elba Island LNG facility.

Fixed price vs cost-plus

Among the spectrum of contract structures debated, the option of fixed price vs cost-plus is toward the top of the list. There are arguments that fixed pricing is difficult, impossible, or simply not in the interests of the owners. Cost-plus, on the other hand, has its own obvious risks. Many contracts in industries adjacent to LNG use hybrid contracts that strive to achieve an optimal balance. The owner's cost of creating a hybrid cost/price model for contractors can be exceedingly small compared to the potential project savings.

Scope and change control

Another historic problem has been scope control and change control. The optimal scoping of a large LNG project is a massive undertaking. As in a traditional quality control programme, better planning and engineering at the earlier stages mitigate the risks of more expensive scoping problems later on. Scoping necessarily involves scope split among contractors and subsequently the interface controls necessary to avoid scope gaps.

The need for changes and the details of changes themselves should be identified early. There is a tendency at early stages in projects to be 'change adverse', often deferring problem resolutions to avoid facing a budget impact. Unfortunately problems are often more expensive to resolve later. The need for changes and details of changes themselves must also be well documented in accordance with a reasonable process that is executed with discipline – tied into a configuration management programme.

The accumulation of numerous small changes can have a fairly large impact on cost and schedule. The change control process must be established at the inception of the project, with a budget. The process must be proactively managed rather than being reactionary. As costs increase on a project, owners must understand the cause of the increase, in order to enable the lessons-learned to mitigate the likelihood of repeating a mistake.

People – the most valuable asset

With a large number of LNG projects simultaneously underway, there is often a scarcity of committed, experienced, and qualified human resources, from senior management down to labour. Technicians and construction labourers are particularly in short supply in some of the more remote regions where LNG facilities are being constructed.

The commercial quality control approach incorporates a focus on the quality of the human resources applied to a project. For instance, it endorses the common practice of allowing the owner(s) to assess the more senior staff within the contractors, and endorses some additional opportunity for the owner to meet and interface with subcontractors beneath the main contractors. Note that it is important that owners follow prescribed evaluation protocols understood by the contractors.

The concern over the quality of human resources is not limited to contractors, but extends to owners, investors, and other stakeholders. Owners require people who are familiar with the design and building of LNG capital projects.

Independent oversight – more cost or more savings?

It is an issue of leveraging competencies and loyalties. Owners and stakeholders may simply recognise that their core competence is to develop the next project. To delegate too much to turnkey contractors may be disadvantageous. Rather, it is appropriate to consider an owner's representative – an independent party motivated and capable of looking after its owners' interests. That third party with prior experience would put another set of eyes on the project to see if there are any issues that might not have been thought of previously.

Case study – Elba Island LNG terminal

Dyplast Products considers the commercial quality control approach helpful as it interfaces with multiple stakeholders, including owners, fabricators, distributors, engineers, specifiers, construction contractors, and indeed stakeholders within its own company.

Dyplast recently carried out work at the Elba Island LNG terminal in Chatham County, Georgia, US. The company's client managers were/are certified insulation energy appraisers. Rather than simply taking the order, the company offered design, delivery, storage, and installation information and comment, without superseding the directives of the client's engineer.

Dyplast-related contracts defined measurability, auditability and controllability, and, as far as possible, incorporated interface-controls with adjacent and downstream contractors. The company also applied comprehensive manufacturing controls and job management protocols, audited by third parties with documentation available to the client.

Alternative product availability allowed clients to select the optimal physical properties for particular applications (e.g. higher densities/strengths, higher temperatures, etc.). The physical properties were measured per ASTM protocols by independent third parties, and the processes audited.

Just-in-time deliveries were arranged when construction schedules could be advantaged.

Dyplast's advanced manufacturing processes adhere to the US Department of Energy's (DOE's) guidelines regarding sustainability and are consistent with ISO-9001.

Conclusion

There are few industries that rival LNG in technological complexity, global involvement, growth, price dislocation and volatility, regulatory impact, and stakeholder diversity. Risk identification, ongoing risk mapping, and risk mitigation can be complex within the LNG industry yet critical to optimise upside and minimise downside.

Traditional quality control has become a global standard practice for manufacturing, construction, and most other industries. So, why not take those basic principles and apply them across broader commercial activities, such as project development, financing, siting, contracting, staffing, and so on?

Commercial quality control overlays a cost-effective structure of measurability, auditability, and controllability, starting on day one across all commercial activities, with a feedback loop to stakeholders. Independent audits that compare current realities with past intent can be invaluable given the complexity of stakeholders and contract structures that often exist in a large LNG project. When an LNG project encounters problems, the prior engagement of commercial quality control can be the difference between success and failure for stakeholders. Additionally, commercial quality control can create a documented pedigree of the facility that offers the operations crew a wealth of understanding, not only of the 'plant', but also of the commercial environment within which it was conceived and built. **LNG**

References

1. 'Savings Possible by Managing LNG Project Risk', *Petroleum Economist*, (1 July 2011).
2. Dyplast's Confidential Survey (2013 – 2016) of Project Managers within turnkey, prime contractors for newbuild LNG projects.