

COMMERCIAL QUALITY CONTROL

The Missing Link

BACKGROUND

Dyplast's® [Technical Bulletins](#) are intended to provide in-depth and objective information and comparisons of various insulants, including polyisocyanurate versus polyurethane, polystyrene, cellular glass, fiberglass, elastomeric, and others aspects of selection and use. Our [Qwik Guides](#) typically offer abbreviated (one-page) technical perspectives, sometimes referencing Technical Bulletins. As always, if any reader credibly argues that Dyplast has materially *misstated* or *misinterpreted* facts, we will revise this and related documents!

Capital-intensive projects (e.g. petrochemical, refrigeration, pharmaceutical, LNG, etc.) have historically, for the most part, successfully managed the technical aspects of the design, fabrication, construction, testing, and operations. Yet one may argue *technical success* was achieved, *commercial success* can sometimes be argued as lagging - - or at least not optimized. Traditional Quality Control (QC) has become *global standard-practice* for manufacturing, construction, and in fact, most other industries - - So why not take those basic principles and apply them across the broader *commercial activities* (development, financing, siting, contracting, staffing, etc.)?

Late-to-the-Gate?

In an investigation several years ago, DNV GL (www.dnvgl.com) concluded that only three of twenty-two LNG import terminals were delivered on time, and 50% of export terminals experienced significant delays.

Dyplast's own investigation indicates this record is not unlike those in smaller, adjacent industries; and not improving. So, must owners simply resign themselves to greater contingencies in budgets? Is there an alternative? For decades there have been dozens of highly qualified consultants and engineers that offer to work with clients on a day-to-day basis, providing customized advice and solutions, etc. There are dozens that provide initial concept selection, feasibility studies, market analysis, risk management, due diligence, commercial advice, negotiation support, market strategy, and so forth. There are dozens that provide engineering, procurement, and construction (EPC), and there are dozens of software programs that assist in all facets. With all this expertise, what has been missed?



The concept of *Commercial Quality Control* comes to mind!

So what is Commercial Quality Control?

CQC is simply a logical extrapolation and integration of “traditional QC practices” across the *commercial spectrum*.



An analysis of stakeholder challenges/dissatisfactions across capital project industries over the past 30 years concludes there are well over one hundred problematic issues across the project life-cycle that can be better managed by applying Commercial QC. The top five interconnected areas are addressed below.

Dyplast's 50 years of mechanical insulation experience enables a retrospective viewpoint that can benefit going-forward approaches. To state the obvious, owners/stakeholders in capital-intensive projects increasingly face new risks in this era with disparate pricing, multiplicity of owners/stakeholders, long term price volatility, multiple concurrent plant constructions, shortage of skilled personnel, increasingly complex technologies - - and COVID. *Returns-on-investment* could be high, unpredictable, or on the other hand negative. There are *controllable impact factors* and there are *uncontrollable impact factors*.

CQC is an approach to move more *impact factors* to the controllable side of the ledger, yet also better identify and mitigate risks across the project life-cycle - - beginning at project inception yet encompassing development, financing, and construction to name a few - - and then through operations.

Ownership Structure

Small facilities may have a single owner that is self-financing the project - - the simplest of structures. On the other hand, the largest projects may have multiple owners and stakeholders, each with different short and/or long term objectives. Some may be passive, others active, and still others may be better described as *activist*. Owners may include multi-national organizations 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), among others. The CQC approach strives for simplicity, yet when simplicity is not achievable there must be an aggressive focus on *clarity and comprehensiveness*.

A CQC approach would begin by asking the same initial questions as posed in a traditional QC approach:

- 1) Who are the Internal and External Stakeholders?
- 2) What are the Organizational Goals (from the CQC perspective they may be matrixed)?
- 3) What are the Critical Success Factors? (quantified).

The added value of CQC 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.

Well, everybody wants one thing: to see the project succeed. Right? Reality is that each organization (frankly including different divisions within the organizations) has its own agendas. A common example is a facility “design/construction contractor” or an “operator” who may each 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 CQC at this stage, as in the traditional QC approach, would be to define *accountabilities* and *decision-making processes* to the maximum extent possible. Conventional wisdom is to avoid *decision-by-committee*, yet surprisingly many ownership structures have major decisions sometimes made by an *advisory board* that may at one extreme endorse “one person one vote” or the other extreme “most money-most vote”. Many alternative decision-making structures exist. The *optimal* depends on the ownership structure itself, yet should ideally incorporate a predisposition for decisions that are in the interest of the project (not individual owners), as well as incorporate of course delegation to the Project Management team yet with an ample feedback/control loop with the ownership.

More Prime Contracts - - or More Owner-Controlled Subcontractors

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 CQC approach acknowledges that the highest levels such as Memorandums of Understanding and Letters of Intent spawn the second- and third and fourth-generation contracts, and are often drafted by parties who may not understand technical and construction realities. The “DNA” of the first-gen contracts becomes a determinant factor in the character and properties of the next-gen. A CQC approach strives to incorporate more wisdom and lessons learned even at the MOU/LOI levels.

Again incorporating traditional elements, the CQC focus on contracts can be summarized to additionally incorporate:

- Measurability
- Auditability
- Controllability.

While most owners/stakeholder/contractors may acknowledge this in Engineer/Procurement/Construction contracts, the CQC 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* the contractor wants the owner to hear.

The owners should also require periodic assessments from its contractors regarding the health of the contractor’s subs - - and the sub’s subs. 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 “turn-key”, and therefore under-emphasized 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 they don’t have the data to support the case.

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. CQC endorses more detail in the top-level contracts (and flow-down terms) in the areas affecting such owner prerogatives. Such terms make it much easier for the owners to, for instance, request meetings with subcontractors to personally assess qualifications, progress, or whatever - - 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 can be built into contracts while still minimizing the likelihood of change orders. CQC controllability requires feedback, as well as a continuous improvement process built into the contract. Typically, the continuous improvement process depends heavily on *root cause analysis* of all significant failures, problems, and accidents - - followed by *lesson-learned* development and promulgation to all parties.

Fixed Price vs. Cost Plus

Among the spectrum of contract structures debated, the option of *fixed price* versus *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. For instance, contractors in a generally cost-plus contract should be constrained from, for example, selecting the most expensive insulation system to maximize profit (a





practice more common than perceived) - - even when there are better insulants for lower cost. 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 project is a massive undertaking. Better planning and engineering at the earlier stages mitigate the risks of more expensive scoping problems later. 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:



1. 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.

2. must be well documented in accordance with a reasonable process that is executed with discipline - - tied into a *configuration management* program.

The accumulation of numerous small changes can have a fairly large impact on cost and schedule. The *change control process* must be established in 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* in order to enable the *lessons-learned* to mitigate the likelihood of repeating a mistake.

People - - "your most valuable asset"

With the large number of projects simultaneously underway, there is often a scarcity of committed, experienced, and qualified human resources - - from senior management down to labor - - particularly during these times as a pandemic rages. Technicians and construction laborers are particularly in short supply in some of the more remote regions where facilities are being constructed.

As in traditional QC, a perfect process can fail when the people executing the processes are deficient in some way. The CQC approach thus 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 vet 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 owners must follow prescribed evaluation protocols understood by the contractors, so that this does not become a subjective *beauty contest* conducted by a blind judge.

The concern over the quality of human resources is not limited to contractors, but extends to owners, investors, and other stakeholders. The last thing the contractor team needs are inexperienced and unqualified individuals





within stakeholders second-guessing their effort. The owner(s) need people who are familiar with the design and building of large capital projects. Owner(s) need people with *wisdom* and who hopefully *know what's going on*.

Independent Oversight: More Cost or More Savings?

It's an issue of leveraging competencies and loyalties. Owners and stakeholders may simply recognize their core competence is to develop the next project. To delegate too much to turn-key contractors may be disadvantageous. Rather, it is appropriate to consider an "Owner's Representative" - - an independent party motivated and capable of looking after owners' interests.

That third party with prior experience would put another set of eyes on the project to see if there are any issues lurking that might not have been thought of previously.

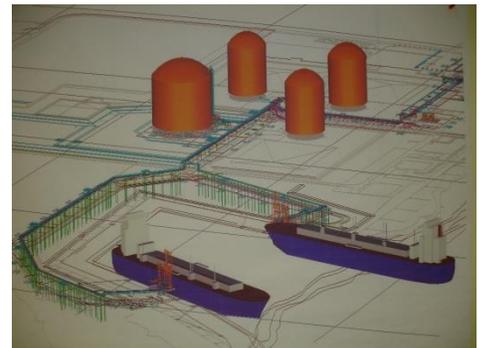
RUBBER MEETS THE ROAD

Possibly a better header would be "*polyiso meets the pipe*". Dyplast Products is of course a manufacturer of polyisocyanurate insulation for the global "low-temperature" applications. The *insulation system* could be considered a rather small part of a typical project, yet it plays a key and valuable role in delivering a product that offers superlative long-term performance while optimizing construction costs and schedules. Dyplast considers the CQC approach very helpful as we interface with our multiple stakeholders: owners, fabricators, distributors, engineers, specifiers, construction contractors, and indeed within our own company.



A Case on Point: Consider Dyplast's last role at Elba Island LNG terminal:

- Dyplast Client Managers were/are Certified Insulation Energy Appraisers
- Dyplast didn't just 'take the order'; we offered design, delivery, storage, and installation information and comment - - while never superseding the directives of the client's engineer
- Dyplast-related contracts defined measurability, auditability, and controllability, and to the extent possible incorporated *interface-controls* with adjacent and downstream contractors
- Dyplast applied comprehensive manufacturing controls and job management protocols, audited by third parties with documentation available to client
- Alternative product availability allowed clients to select the optimal physical properties for particular applications (e.g. higher densities/strengths, higher temperatures, etc.)
- 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 U.S. Department of Energy guidelines regarding sustainability and are consistent with ISO-9001.

