

A COMINDIS Feature: Top 10 Project risks in Plant Engineering and Infrastructure Projects

Top 2: Miscalculation and cost overrun¹

- Top 1 Unclear scope of works.
- Top 2 **Miscalculation and cost overrun.**
- Top 3 Design problems & defective works.
- Top 4 Extension of time & delay LD's / liability, costs of prolongation and inefficiencies due to disturbances and variations.
- Top 5 Deficiencies in commercial contract implementation (weak contract management, lack of notifications, and lack of collecting evidence).
- Top 6 Lack of experiences and resources (technical and staffing).
- Top 7 Contractual ambiguities (gaps, different interpretation of clauses, new clauses).
- Top 8 Difficulties in enforcing claims (absence of a neutral court, long and costly proceedings).
- Top 9 Relying on co-operation with weak third parties (e.g., planner, sub-contractor, or consortium partner).
- Top10 Compliance, unknown markets, customers & contractors.

Miscalculation and cost overruns belong to the most important risks in (EPC / turnkey) plant engineering. There are several reasons for this fact:

The customer requires usually that a contractor enters into the contract based on a proper examination of all the data relating to the facility: The contractor shall be deemed to have obtained and considered all relevant risks, contingencies and circumstances which may influence or affect the works. Thus, the expectation of the

¹ Please be aware that this publication shall not be taken as a legal advice. Any project requires intensive legal review and negotiations with the contractual partner.

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customer is very high. He expects an “omniscient” contractor, who submits a lump sum price on a turnkey basis.

The human factor

Although in many cases advanced software is used for complex estimates, the factual input is still made by human beings, and failures in the assessment of underlying assumptions do happen. Especially in miscalculation and cost-overrun situations ex-post evaluations often show that the failures and omissions are rather simple and were certainly not unavoidable.

The four-eyes-principle must apply. If an estimate is complex and requires the consideration of many different items (as service elements, prefabrication, construction, scaffolding etc.) and external factors (e.g. the calculation of unit prices), it seems advisable to have a reliable control mechanism in place. This means: either an independent expert reviews the estimate, or alternatively, a completely different team of internal experts (or even another company belonging to the same group of companies) is engaged to render a diligent peer review process. Sometimes this might be a burdensome process, however, it may disclose hidden failures and wrong assumptions.

An alternative way is to define the lump sum price together with the customer in an open dialogue, based on an alliance model or even on a complete open book's principle. This leads to more accuracy and reduces the risk of miscalculations and cost overrun significantly.

Risk factor time

A diligent estimate requires its time. Often also major international tenders are squeezed into very short schedules. The necessary visual inspections of the site are impossible or at least very (too) short. If the contractor in such a situation tries to meet the deadlines and makes bad compromises, this might impact the reliability of the estimate and significantly increases the likelihood of failures. Sometimes, it is therefore more advisable to require for an extension of time or even to abstain from participating in a tender, if the contractor believes that it cannot make a diligent estimate for the required scope of works.

Risk factor “non binding offers”

Many estimates are not only based on the contractor's own costs, but to a greater part on third party prices. This leads to the issue of bindings offers, which shall be the basis for any reliable price estimate. The contractor should require its sub-suppliers to provide binding offers, which include applicable terms and conditions. The binding periods must be longer than the binding periods of the contractor to avoid a situation in which the project has been awarded to the contractor, but the binding offers have lapsed.

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Unexpected costs

In some projects unexpected costs arise due to unknown statutory obligations, such as taxes and customs or administrative costs. It is always advisable to involve a local counsel / expert to investigate the legal and economic environment in the project country to check pitfalls. Another issue is the correct calculation of ancillary costs, like housing, energy, fees etc. These are often obvious for local experts but somehow hidden for others.

External factors as access to the site, weather conditions, underground etc.

Even if the project as such is perfectly estimated, it might be that other factors as the necessary costs to gain access to the site are underestimated. This can particularly be the case in complex infrastructure project in a difficult-to-access terrain (e.g. a road system including smaller tunnels and bridges or a pipe system in a brownfield facility). Here, the matter of access to the site is often a huge cost factor.

Sometimes weather conditions can play an important role. For instance for offshore projects or construction projects at coastal areas the feasibility is extremely dependent on weather conditions. If a crane operator denies working due to ongoing wind, or the laying ship cannot operate because of stormy weather, the project might face serious delays.

For any major projects which include earthworks, the estimate should base on reliable underground assessment. If such expert opinion on the ground is unavailable or unsatisfiable, the contract should foresee respective clauses.

Price Escalation and exchange rates issues

Major international projects in plant engineering are a long run, often even a marathon. During the project implementation costs might change significantly. This applies both to the personnel costs but also to the costs of raw materials (as fuel, oil and gas, energy, water and other consumables). Thus, even if an estimate was not wrong in the beginning, it could turn out later as insufficient, if the contract does not contain a price escalation formula.

The same applies for exchange rates of currencies. If a contractor gets paid in a local currency but must pay its subcontractors in EUR or USD, the exchange rate fluctuation might lead to a cost overrun and heavy losses. Therefore, currency hedging or alternative measures should be considered.

Cost overrun

To detect a cost overrun in a project at an early stage, a reliable cost-recording system and a qualified contract and claims management is of great importance. A cost overrun might have different reasons. First and foremost, the original estimate was simply wrong or even underestimated (sometimes knowingly for sales reasons).

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Second, in some cases a cost overrun is caused by inefficiencies or hindrances at the site, time prolongation or other factors. This must be handled adequately as early as possible.

To mitigate critical situations of miscalculation and cost overrun, an in-depth analysis of the project and the contract and potential mitigation measures are highly recommended. COMINDIS is specialized in plant engineering and dispute resolution.

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