The Role of the Engineer/Project Manager in Dispute Avoidance/Resolution

1. INTRODUCTION

Why are we all here?

Because the construction business is inherently risky. This talk will try to put into perspective the role of the engineer/project manager in managing those risks.

2. PRE-CONSTRUCTION

2.1 Formulation of Contract

The FIDIC forms of contract have become widely accepted, where English language is adopted as language of contract. Owners are increasingly looking at EPC forms, with the objective of transferring risk to the contractor. This can sometimes backfire, and may result in higher cost and increased claims exposure because of the uncertainties of heavy civil construction.

- **Example Project**

On a hydro project under development in northern Peru on the Santa river, the owner started off seeking almost full risk transfer under an EPC format and adopted the FIDIC Silver book. This resulted in an unacceptable price, negotiated on a open-book basis. The project manager had recommended the Yellow book, but this recommendation was not initially accepted by the owner. In a subsequent tender process, the EPC approach was dropped, the Yellow book was adopted and more reasonable pricing obtained.

- **Lesson Learned**

An equitable distribution of risk should be aimed for, which will result in lower final costs for your project.

2.2 Geotech Investigation and Interpretation

Owners sometimes are reluctant to carry out adequate investigations, because of time and cost pressures. The engineer must make a judicious assessment of investigation requirements and convince the owner that this is money well spent. The results should be incorporated into a Geotech Baseline Report, which is made available to tenderers. It is also advisable that a independent geotech expert be hired to review the engineer's recommendations and interpretations.

- **Example Project**

The Peruvian project owner accepted the investigation program proposed by engineering/project management, which helped to reduce risk exposures. On the headrace tunnel, the cover is too high to allow drilling, so geotech assessment was based on projection of surface geological exposures, except for one area where possible solutioning of carbonate was a concern; a borehole was executed to confirm the presence of the suspect rock type and provision made in the engineering for steel lining in the affected zone.

- **Lesson Learned**

Geotech Investigation is money well spent.

2.3 Optimize Project Layout to Reduce Uncertainties

This is just good, solid engineering practice, but nevertheless deserves inclusion because owners are again under cost and time pressure which may induce a tendency to skimp on engineering.

- **Example Project**

On the Peruvian project mentioned previously, the original layout attempted to maximize the head available by providing a tailrace tunnel, which crossed under a tributary of the Santa river. Surface geological inspection indicated the presence of alluvium at greater depth than anticipated, and an additional borehole was executed which determined that the tailrace tunnel had not sufficient rock cover to ensure trouble-free excavation. Layout was changed to eliminate river crossing, discharging direct to the Santa, accepting reduced head. Cost per MW did not vary significantly.

- **Lesson Learned**

The previous layout would undoubtedly have led to a potential claim situation. This demonstrates that dispute avoidance starts with basic engineering.

3. CONSTRUCTION

3.1 Project management to control the construction process in an equitable manner-avoiding adversarial relationships with constructor.

The Americans have coined the term PARTNERING to reflect the ideal relationship between the parties to a construction contract. All must have a single objective: to complete the project on time and within budget while maintaining quality standards. In practice, this is quite difficult to achieve, and project management must take an active role to prevent the development of adversarial relationships on site.

- **Example Projects**

Two projects in Nepal provide examples of how this can be put into practice successfully and vice versa. The Kali Gandaki hydro project in west central Nepal was completed from ground breaking to first unit on line in 5 years, which I believe may be a record for a medium hydro project in South Asia (perhaps excluding Bhutan). In the first phase of the critical excavation of the headrace tunnel, an adversarial relationship developed between the supervision and the contractor, stemming from disputes over rock support requirements. Personnel changes were made and a more standardized support methodology was adopted with the objective of maximizing advance rate. This took account of the value of energy per unit of time which far exceeded the additional cost of the support.

The Middle Marsyangdi hydro project in central Nepal provides an example of the cost to the owner when partnering is not applied successfully. The dam site is located at a narrow notch in the Marsyangdi river which provided an apparently ideal configuration. However, the geological history of the site was less favorable. Adjacent to the left abutment, an old river course had been buried by a mud slide of glacial origin. This required a cut-off through the heterogeneous mudslide material and the alluvium below. The original concept of jet-grouted cut-off was dropped as too risky, and an alternative design with a cut-off by *tubo a manchette* grouting and downstream pressure relief wells was put forward to the contractor. The contractor refused acceptance of the revised design, citing difficulty in obtaining insurance cover, and implementation was delayed while it was put to third party review. Project completion was delayed very considerably, with consequent construction cost increases bringing the cost per megawatt to over $4000, added to which were replacement energy costs incurred by the owner.

- **Lesson Learned**

These two projects in Nepal, both executed for the same owner, demonstrate that partnering (define it as you will) works.

3.2 Manage dispute board process/site visits during construction

The traditional format of the DB is three members, the first two select third as chairman. Periodic visits to site during construction enable members to get to know key staff on contractor and management sides, and observe actual ground conditions as construction proceeds. They can also offer guidance to cut off a dispute before it gets entrenched. These features are considered by the speaker as extremely important for a DB to reach equitable solutions to contract disputes

- **Example Project**

On the Lesotho Highlands Development Project, an agreement was reached between owner and contractors post award to appoint DB's, for the Katse Dam and Transfer Tunnel contracts. This was done after a seminar presentation by Al Mathews to the project outlining the advantages of DB's. At that time, the standardized forms for FIDIC contracts did not exist, so a form that had been successfully applied on the Ertan project in China was adopted with some amendments. This entailed modifying Clause 67.2 (amicable settlement) to incorporate the DB. One interesting stipulation provided in the agreement was that the considerations of the DB would be restricted to matters already brought forward under 67.1 (Engineer's Decision). The member selection process was modified: after selection of the first two members, when they had not reached agreement on a candidate for chairman, the owner proposed Al Mathews as chairman for the Katse Dam board and this was accepted by both members. A similar process took place for the Transfer Tunnel for which the owner proposed Colin Kirkland, who was accepted by both members. Both boards conducted periodic site visits, 2-3 times per year.

- **History Lesson**

This is an interesting slice of the history of DB's (or DRB's) which I think is valuable for an understanding of where we are today.

4. POST-CONSTRUCTION

The Engineer/Project Manager's role is not complete until all disputes are resolved.

- **Example Project**

On the Kali Gandaki project referred to previously, the project management made a recommendation for settlement of the major claims package, which was understood in discussions to be acceptable to the contractor. However, the owner rejected the recommendation and the dispute went to arbitration (no DB had been established although recommended by project management). The result was a finding in favor of the contractor for an amount considerably in excess of the project management recommendation.

- **Lesson Learned**

It may be more favorable to the owner to accept a settlement proposed by an independent party than to pursue arbitration. This applies equally to findings by a DB.

- **Example Project**

On the LHDP, a major dispute on each contract was referred to the respective board for adjudication. The result in one case favored the contractor and in the other the owner. The final result of any arbitration is not known to the speaker.

- **Lesson Learned**

The findings were considered to be equitable in both cases by the project management, and validated the decision to utilize DB's.