

# Looking for an alternative?

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The growth of such business has led Cemengal to find ways of improving its coordination in the way it tackles the different challenges it faces. For each project, this involves the achievement of quality, schedule and cost objectives. Depending of the scope of work, Cemengal will carry out – feasibility studies, site preparation, sourcing and procurement of equipment, transportation of equipment, erection and installation, start-up and commissioning and of course engineering.

The projects that Cemengal has completed in La Parrilla, Villasequilla, Saint Pierre La Cour, Tangier, Tarragone, Sète, M'sila, Gante, etc have different characteristics, but it is always mandatory for Cemengal to work through the five process groups in project management:

- initiating
- planning
- executing
- controlling
- monitoring
- closing.

## Quality

The first objective in such projects, fundamental to keep working for the main

*Within the last five years, Cemengal's inventory comprises more than 10 project management references, including assignments in the cement industry for complete mill stations, vertical mills, horizontal mills, concrete and metallic silos, discharging systems, cement packing machines, etc and in various geographical regions namely Europe, Africa and America.*

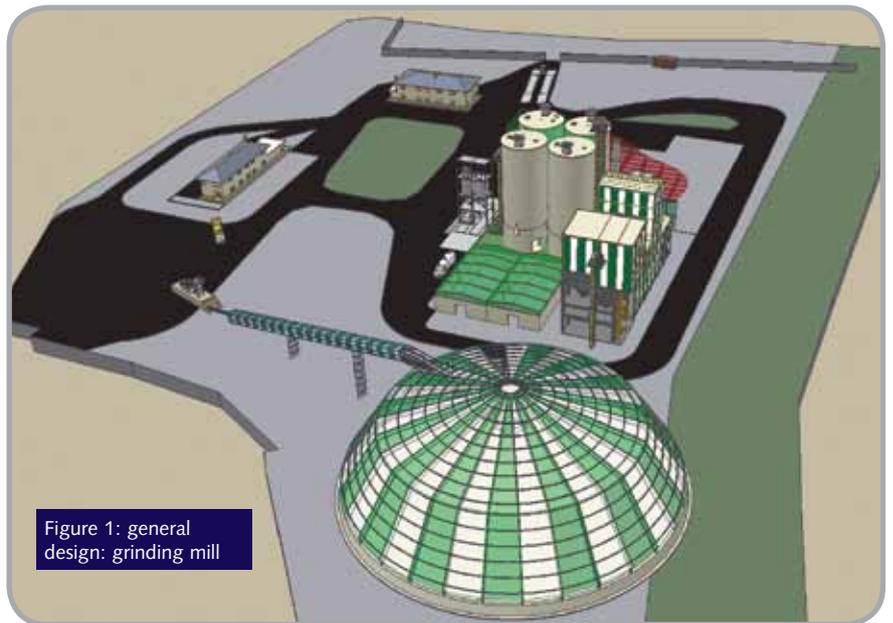


Figure 1: general design: grinding mill

cement producers, is the area of quality. A key lesson learned is that the quality standard process must be present first in the quotation and bidding phases, and especially during the engineering phase as this avoids important changes occurring in the selection of the equipment and during installation. Sometimes during long stages of engineering it is necessary

to start construction before the design phase is completely finished, but it is carried out strictly following the detailed engineered plans in order not to affect the erection stage. Once construction has begun, all the figures in the supply chain are reminded that any field engineers must be in continuous contact with the project engineers, prior to any engineering changes being made. This creates consistency between what has been designed and what is built.

For example, the integration in the engineering of the mechanical, civil, structural, electrical and services can entail installation for the passage of compressed air, water and gas piping, cable trays, sets of lighting, underground galleries and trenches, plus detailed aspects for equipment maintenance, spaces for passing and maintenance, etc which avoids interference and facilitates regulation compliance.

It is also important to indicate that the personnel related to the project must be familiar with the country regulations and its specific characteristics. There



Figure 2: detail design of mill and filter

Figure 3: erection of silo and installation of mill



are many different aspects to take into consideration, depending on where the project is taking place and what the origin and final objectives are of the client. Any quality action must be indicated in the Quality Control Plan (QCP) and Quality Assurance Plan (QAP) documents.

### Scheduling

The second major objective is scheduling. A main contractor must have the appropriate staffing levels able to make plans and schedules for large projects. From the beginning the engineering has to be scheduled, the sourcing and procurement, the installation and all the Work Breakdown Structure (WBS) in order not to induce any confusion about the priorities. To optimise this task, it must be factored in at a high level at the beginning stages and become more detailed with time. This is another key lesson, a well-

defined schedule from the beginning prevents extra-costs and a lack of quality.

Setting milestones and treating them as separate projects helps the general scheduling to be achieved and allows the closing of separate phases. The target should also not be so extensive that it

cannot be achieved. The schedule should not be too relaxed either, as it is important not to lose the control of the planning aims.

The psychological effects of a well organised schedule is also something to note, especially in large projects it is important not to lose sight of the general schedule and to know that pressures on the timetable will come from different sides: stakeholders, changes in the scope of the project, changes in the market (cement, steel, energy etc), technological changes, authorities pressures and any other pressure not foreseeable. It is well-proven that the correct preparation is to plan for the unexpected – risk management is key to success.

### Costs

Costs are the next stage in the process that define a project. The achievement of the contractor costs objective will be basic for quality and scheduling, and then for final client satisfaction. Two main ideas of cost limiting are known but are important to remember. They define project costs:

- a good definition at the engineering stage prevents extra costs in the future, during the installation phase and this also has an affect on the expected quality
- correct scheduling prevents costs increasing due to fast-sourcing, enlarging of installation times etc.

Experience, knowledge and the available tools allow Cemengal to arrive at a successful conclusion in the last three areas. But the process is more detailed than it seems. It is necessary to develop integration management, scope management, risk management, procurement management, communications management and human resources management.

Figure 5: erection of grinding mill



Figure 6: erection of raw meal storage



The main phases in a cement plant project are:

- basic mechanical engineering
- detailed mechanical engineering
- electrical and automation engineering
- procurement
- steel structure engineering
- civil engineering
- steel structure manufacturing
- metal works
- civil works
- steel structure erection
- mechanical erection
- electrical erection
- final assembly
- start-up
- production tests.

The integration is important to optimise the interferences between sub-projects, phases and contractors. As it shown in Figure 7 most of the tasks are overlapped, it indicates the necessary coordination between different areas into the company and usually between different contractors and then the scope management comes into the game.

There is a primary need to fix milestones for the delivery of the basic mechanical engineering to be able to deliver the loads guide drawing to civil works area. After that, the coordination between the detailed mechanical engineering, the steel structure engineering and the civil engineering must be optimised enough to allow the erection at the corresponding milestones.

Figure 7: project management – overlapping tasks

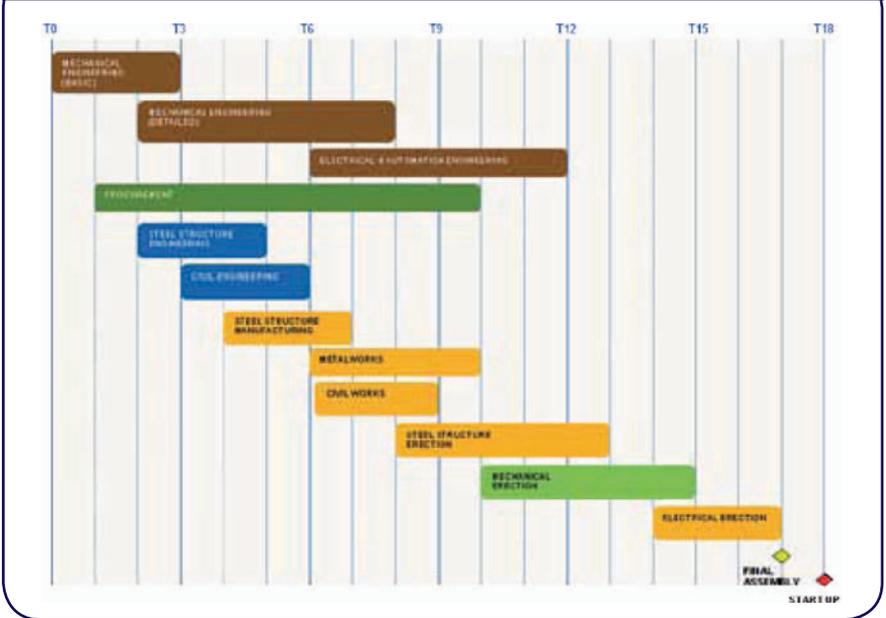


Figure 8: erection of grinding mill

Something similar happens with the erection phase, the erection of the buildings (concrete or steel) must be done in such phases depending on equipment installation and also take into account the services and electrical installation.

The logistics management needs a previous study taking into account the departure and destination country's features (geographic, taxes, infrastructures, politics, etc). This will have strong influences in time and costs, and must be included in purchasing negotiations. Transport must be optimised and it has also strong influence in the manufacturing schedule and in the general schedule as well.

In the construction of a cement plant there are external factors that must be taken into account in the initial phases of the project and not only in the erection phase, for example the difference between building a complete new plant, or building into an existing and operating plant (it can also be generalised for other



Figure 9: finished grinding mill

industrial plants). This affects the project control from the main producer, and also to other challenges as stronger (and logical) security rules, available space for installation and cranes positioning, narrow schedule due to production stops, etc.

The priorities of a project may be different and it is necessary to study all these points from the beginning.

### Summary

At the end, success is determined by the study of all the areas of project management depending on the situation that we have to face, the external influences, the internal situation of the company, etc. The experience of carrying out several projects with failures and success is always to remember that more earned lessons are learnt from the failures.



Figure 10: finished grinding mill