

# Achieving the goal

by **ABB Switzerland Ltd**

Complex projects are characterised by a collaboration of specialists from many fields and from different organisational units of one or more companies. These people can only implement a project efficiently and economically if there is smooth cooperation. Managing such a team to achieve the project goals (deadlines, costs, functionality and quality) depends on professional project management. Professional project management comprises all activities for planning the process and coordinating and guiding the team members. It is less concerned with the solution than with guiding the process to the solution.

The complexity and scope of ABB's projects is best illustrated with an example, such as the Cam Pha project. With an output of 6000tpd, it is Vietnam's largest cement plant, which started production in April 2008. ABB supplied the electrical equipment including HV and MV switchgear, MV power factor compensation, emergency power distribution, motor control centre (MCC) and uninterrupted power supply. A complete Industrial<sup>IT</sup> package with process control systems, Expert Optimizer system for kiln and cooler plus mill optimisation and an information management system.

Furthermore, ABB delivered MV fixed speed drives and all the variable speed drives plus LV-Motors. Services comprise the complete electrical engineering, engineering and design for the infrastructure and installation, erection supervision, commissioning and customer staff training.

Some impressive figures: 13 power distribution centres, about 750MV and LV Motors, approximately 800km cables, 19 process controllers with some 5000 I/O.

*In project business – is successful project management a key factor to the total business success? For more than a decade ABB has paid special attention to this area and implemented programmes and training for all levels of project management to reach a consistent project culture, implement standards in project management, utilise and share best practice in the operative business and to raise the qualification of project managers with relevant certification levels.*



Figure 1: Cam Pha cement plant, Vietnam

The PM had to coordinate four mechanical partners, the erection company, and beside the home-based project team, four local design partners. All in all, a very challenging job, carried out to the customer's full satisfaction.

ABB's PMs, fitted out with know-how and years of experience, manage the entire scope and duration of such a project. The company's single, responsible source and integrated management approach guarantee:

- Smooth phase-to-phase project transitions
- Thorough, consistent and detailed documentation
- Identify and leverage cost and time efficiencies at every stage of the electrical process.
- Effective focus on compliance with all contractual and local regulatory and environmental guidelines
- Maximum ability to identify challenges and cost efficiencies early
- Side-by-side works with the customer's project staff to achieve maximum integration and coordination of design, engineering and installation.

Most of ABB's project managers start their career as an engineer in a design department and gain practical experience with commissioning works on site. To keep the PM competence on a high level, ABB has established a Project Manager certification programme to:

- Expand and improve the PM knowledge, experience and personal attitude
- Continue the PM education and improve the quality of project management
- To better achieve the project objectives.

## Project-management process

ABB's Project-Management Process is hosted in a web-based navigator. This process description is the backbone of the ABB's ISO 9001 approach. A work-instruction defines the PM-process stage by means of a process-plan with activities and links to the relevant documentation/checklist/templates etc. The PM- process is structured in three main phases.

1. start-up
2. execution
3. closure.

Some process-steps are mandatory, other are given as guidance. It is the duty of the PM to add/adapt documents and templates or to create new ones, to match the project requirements.

Thus the PM, supported by the process-plan mentioned above, ensures:

- structured projects
- common methodology-similar environment for all of our projects
- auditing capability at any time without additional effort
- mandatory project analysis at predefined milestones
- Close out procedure with lessons learned and feedback.

Throughout the project-realisation three aspects have to be considered by the PM: he is responsible for the Project execution (SCOPE) in a given time frame (TIME) within a calculated budget. (FINANCE). In addition, he has to carry out overriding targets like customer satisfaction, financial success and risk limitation at an acceptable level for the company.

### Phase 1: project start-up

#### How do we start with a project?

The contract is signed or the customer has sent purchase order. Sales then prepare the necessary input documents for the PM:

- contract and annexes
- cost calculation
- supplier's quotations
- customer information, expectations
- risk, opportunities, possible grey areas.

All documents and information will be recorded in detail in the checklist 'Hand over from sales'. The duration of this phase is very dependent of the project complexity. The following activities are carried out by PM:

#### Contract analysis

- Verify the scope, costs, terms, conditions, time schedule, risks, etc.

#### Order entry into the business (ERP) system

- All costs, revenue generation, payment milestone dates, etc. This will form the baseline business data that will be tracked throughout the project life cycle.

#### Basic project planning

- Containing basic project schedule, work-packages, process plan, quality

plan, communication plan, customer documentation plan, and the project filing system.

Various other basic documentation, procedures and guidelines are the outcome of these activities.

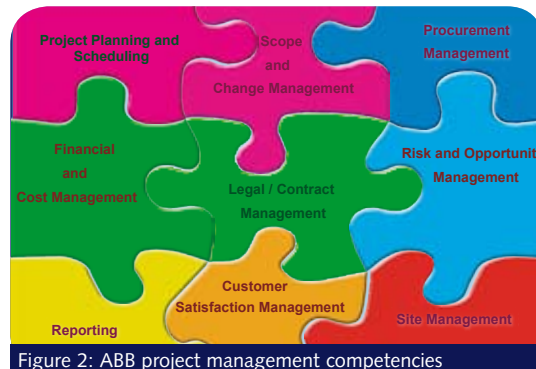


Figure 2: ABB project management competencies

Based on the basic project planning, the PM has to expand the project team with the resources required to successfully execute the project. Team members project specific roles and responsibilities have to be defined.

The initial development of the basic project schedule is based on a framework of target dates (start, completion, intermediate). Key persons in the project team beside the PM are the lead-engineer (LE), financial controller, quality manager, purchasing and forwarding responsible, the erection/commissioning coordinator and site-manager. Team structure, quantity and skill of the team members are dependent of the project set-up, complexity, scope, etc.

As ABB is a global operating company, it may be that two or more project teams located in different countries are involved in project execution, lead by one PM.

Once the project team is established, the PM organises and conducts an internal kickoff meeting. The purpose of this activity is to kick-off the project and to achieve internal commitment for resources and project schedule. The project team members will be informed of project scope, financial issues, project organization, communication plan, process plan, Health Safety Environmental plan, quality plan, project schedule, risks and opportunities.

The following customer kick-off meeting has the objective to ensure that all project-parties have a common understanding of the scope of supply and the detailed requirements of the

project, including project organisation, project basic schedule and how the project will be executed. The meeting involves the customer's project team and ABB participants selected by the PM.

The project start-up process review closes the project start-up phase. The review meeting has the objective of verifying the completion of all activities. Documentation, prepared during the start-up phase has to be reviewed in terms of completeness, consistency, etc.

Experienced PM and engineers, not touched with the project, shall also be invited to obtain their 'neutral' inputs and assessments.

One agenda item shall be collecting feedback from the project team as to how further improvement (of process, work instructions, etc) can be achieved.

### Phase 2: project execution

The project start-up has been completed, eg the project execution approach is defined, the project team established, and internal commitment achieved on a general basis. The project execution approach has been cleared with the customer and consists of repeating parallel activities, such as:

- planning and schedule management
- customer satisfaction management
- project team management
- financial and cost management
- procurement management, Shipping
- reporting activity
- risk management
- change management
- erection and commissioning.

#### Planning and schedule management

Based on the basic time schedule, the PM ensures that a detailed project schedule is developed prior to any work commencing on the project. Key dates to include:

- contract coming into force
- contract milestones
- receive of basic design documents/ standards to be delivered from customer, consultant, etc (eg motor-and consumer list, plant-layouts)
- commence of basic design- and engineering activities
- commence of detail engineering
- customer or third parties approvals
- procurement process
- forwarding process
- erection and commissioning.

The PM in conjunction with the responsible team-member will determine the Work Breakdown Structure (WBS) as needed for an adequate control, clarity and reporting purposes. For big projects, the time schedule is divided into hundreds of tasks and is regularly updated, particularly in project team meetings.

### Customer satisfaction management

Customer satisfaction means received value in relation to established expectation, as perceived by the customer. It is an important subject for all employees of ABB and is done in an active, regular communication between PM and customer, via meetings, phone-calls and video conferences. This is always an ongoing activity during the whole project execution and beyond it. In case of dissatisfaction, issue is addressed through the Customer Complaint Resolution Process (CCRP).

### Project team management

Managing and coaching of the project team is under the PM's duties and takes place throughout all project phases. Regular internal meetings are held with the project team, but the frequency depends on the project stage. This is an important part of the PM's managing of the project team, keeping informed of project issues and to ensure that all team members have the information necessary to perform the assigned project tasks. The following items should be covered.

- project scope as relevant for the phase of the project
- review project status and project time schedule
- identify resource conflicts
- identify additional information required and update action item list as applicable
- project changes
- project risk/opportunities
- review any open query.

The PM may also call individual meetings discussing specific items (eg, with forwarding responsible during the running shipping process).

### Financial and cost management

Beside the technical and time schedule issues, the PM is also responsible for the overall project cost control, supported by the financial controller. The business system (ERP) gives the opportunity, to watch costs on a nearly online base.

The performance of project management within ABB is followed up by means of an Internal Project Report (IPR). Within this summary IPR the actual figures for gross margin, net margin, Invoicing/payment/overdue, cash flow, and net working capital are monthly updated (linked to effective figures within the business system, and recorded for each project by means of project-IPR).

Based on the review result the PM in cooperation with the financial controller has to issue a detailed Cost to Complete (CTC) calculation which gives a convincing indication about the expected costs in view to the end of the project.

### Procurement management, shipping

Project procurement management is the process through which necessary services, materials and equipment from external and internal vendors are sourced. This includes all activities from the first project related contact with the suppliers until completed delivery, acceptance, warranty and payment.

Procurement management is done in cooperation between the PM and Supply Chain Management (SCM). Base is the list of qualified suppliers, previous deliveries, technical specifications, quality levels and commercial aspects. It's important to involve SCM early on. Equipment has to be purchased around the globe with contract-specific requirements and standards. Thus, the nomination of a project-specific purchaser and reliable shipping is indispensable, especially for projects which may contain up to 1500 single items that need purchasing, packing and shipping. This is a huge and responsible job coordinated by the PM.

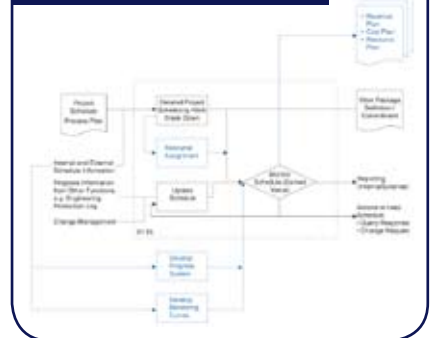
### Risk management

It's the duty of the PM to detect, analyse, manage, minimise, eliminated project risks regardless whether technically, commercial or other nature. ABB's PM process defines the first risk review to be done in the hand over phase. The risk review process follow-up will continue within the scope of the project-meetings. Monthly risk-review reports indicate the actual status, including measures to be taken, etc.

### Change management

Changes in contract scope and supply in the project execution phase are usual. The correct process handling of such

Figure 3: planning and schedule management



issues between the customer and PM are defined and recorded during the customer kick-off meeting. Experience shows, that a common change and deviation list is a practical tool to manage this subject. Extensive changes should be analysed for any impacts. There are different aspects to be considered for contract changes like feasibility, time schedule, costs, resources, possible contract changes, etc. Both parties should be aware concerning the consequences before agreement.

### Reporting activity

Project specific information will be periodically communicated to the customer, ABB management or other parties. Frequency of reporting is based on respective contract obligation or at least monthly. Important items to be reported to the customers are:

- project time schedule
- work-progress (engineering, manufacturing, test/inspection shipping, erection, commissioning)
- open items to be clarified ( technical, commercial).

Reports to the management comprise all financial figures, (see financial and cost management) project status, (similar to the customer report), risk and there management, customer satisfaction report, etc.

### Erection and commissioning phase

In addition to the other responsibilities, the PM in cooperation with the erection/commissioning coordinator and site-manager takes the responsibility for site activities such as: site mobilisation, erection and commissioning planning, equipment storage and handling, coordination with the erection company and mechanical partners, handling of site modification/changes, tests, training and customer acceptance. The site-manager

acts as the 'extended-arm' of the PM. In place of the PM he takes the responsibility for the site organisation, planning, work-progress, resources, etc. Close cooperation and exchange of information between PM and site-manager.

### Phase 3: project closure

Three steps characterising this phase.

- acceptance/take-over
- warranty/after sales service
- close out meeting.

#### Acceptance/takeover

The acceptance of a contract constitutes that ABB has fulfilled its contractual obligations and commitments to the customer.

Customer acceptance must be clearly documented, eg:

- time and place
- recipient/participants
- inspections, as applicable
- measures carried out
- agreed upon additional actions
- warranty period
- applicable signatures.

Any open action item including agreed upon time for completion should be listed.

#### Warranty/after sales service

Warranty scope and duration is based on contractual agreement in most cases. Warranty start and end date has to be clearly defined and agreed with the customer. The PM has to send a warranty expiration letter to indicate when the agreed warranty period is over. After sales service is the responsibility of others (local organisation, ABB Service, etc) who need appropriate information to perform their work. To comply with, ABB has established an official project hand over procedures with check-sheets.

#### Close out meeting/review

This final project-meeting initiated by the PM should document project successes and items to improve. Therefore, all team-members and all other parties involved in the project should attend.

The project close out review should, as a minimum cover:

- experience from participants
- comments regarding all project phases and steps
- major project events
- how internal/external suppliers have performed, delivery time, quality, co-operation, price
- project's financial and risks review
- experience with customer/consultant
- engineering reuse
- what have we done well
- what can be done better (Items to improve)
- lessons learnt.

### Summary

Project management includes organising, controlling, planning and reviewing resources and all activities which are important to achieve the project goals. To be successful, the PM qualities should include methodical competence, leadership, social and personal competence and technical competence. \_\_\_\_\_