Imagine the scene. You have just bought an aged property and you are going to refurbish it completely. You know what you want and you know how much you can afford to spend in order to make it happen. You also know that you cannot do it all yourself and you will need support from several different skills areas – all of whom will have to work together in a coordinated way. You will also need to procure a significant amount of equipment and materials on the way.

Most importantly of all, you want to be sure that, after the work is completed, you have achieved everything you aimed for, and you are satisfied with the result.

How on earth are you going to ensure that everyone involved knows what is required, when it has to be completed, and how they all need to work together to complete it in accordance with your requirements?

You are going to do this by preparing a ‘project execution plan’. The project execution plan (PEP) is the vehicle by which the project director or project manager communicates his or her requirements to everyone who is going to play a part in the successful achievement of the project objectives.

Ideally, in the client/contractor relationship, the client should prepare his own PEP, indicating to his own team such factors as the concept behind the project, the business case for going ahead, an explanation of the principles of the project economics, and a description of the intended method of contracting the work.

This article, however, is intended to support the contracting side of project execution and so we will address the PEP which the contractor’s project management should prepare, for the use of his project team.

**Why? when? by whom?**

Major projects are comprised of highly complex mixtures of tasks to be executed, quality standards to be met, budgets to be managed, interfaces between functions to be controlled, risks to be assessed, equipment and materials to be acquired, designs to be developed, contracts to be awarded, and so on…

The project director has to find a way to communicate his intentions – at least at such a level that his team has sufficient guidance to develop their approach to their own roles and responsibilities.

The reason he should do this is to recognise that, from the point of receipt of an inquiry document (Invitation to bid – ‘ITB’), a number of people in the organisation will be progressively mobilised to prepare the bid. (See Figure 1.)

For example, Phase 1 is when the ITB is introduced by the sales function to senior management, who will make a ‘bid/no bid’ decision. This decision could be based on one or more of the following considerations:

- Is the project within the field of expertise of the business?
- Is the range of competition too great, thus minimising probability of award?
- Is the work essential, in relation to the current order book?
- What is the level of risk? Is now the time to decline to bid at all?
- What are the expected margins from that market – or that specific client?

Should the decision be made to prepare and submit a bid, then Phase 2 is initiated and the next part of the team is mobilised:
The Bid Manager, to develop the structure of the bid, to define the schedule for its preparation, and to assign names to specific sections of the document to start preparing their input.

The Project Director/Manager, (who is sometimes also the Bid Manager) to address the technical parts of the bid, and to play the appropriate role, along with the commercial/legal people, in developing the approach to the required method of contracting. He is also the person who should prepare the execution plan.

The Commercial/Legal Manager(s), to start the process of reviewing the proposed contract conditions, to assess risk and to consider how to align his own company objectives with those of the client.

The Document Control Manager, to take charge of ensuring that the correct parts of the ITB are distributed to those named by the bid manager who have to make a contribution to the bid, and to ensure that all subsequent documentation generated during the bid period is managed and controlled efficiently.

The next step, Phase 3 of mobilisation, would normally include the following function heads, who would then mobilise the appropriate members of their disciplines to contribute to the bid requirements:

- Estimating
- Engineering
- Procurement
- Construction
- Commissioning
- Planning
- Cost control
- Document control
- Health, Safety and the Environment
- Quality management.

By this stage, a significant number of staff are involved and starting to work to what is highly likely to be a tight schedule to deliver the bid.

It is simply good sense, then, to provide them with guidance on how the business (in the shape of the project director) wants to execute the work so that they may all base their contributions on the same premise – that is all ‘singing from the same song-sheet’.

Of course, the benefits of describing the plan for the project go far beyond the bid stage. It is worth remembering that, whatever goes in the bid will, following award, become a contractual commitment – and so it is worth the effort to get it right.

When should it be prepared then? As the above shows, there is an optimum point at which enough information is available to a small community to allow a fair understanding of the project, but beyond which so many others are mobilised that a failure to inform would cause confusion.

The point at which the execution plan is released should be at the beginning of phase 3, preferable at a full bid team kick-off meeting, where the project director can present his plan and explain the rationale to everyone involved.

What does the execution plan contain?

In order to understand what should be covered in an execution plan, it may be worth considering the kinds of questions which arise from the team when a major bid effort is launched. (See Figure 2.)

Estimating

- What class of estimate is required – budget or definitive?
- How is the project to be awarded – lump sum/fixed price, or reimbursable or cost plus, etc?
- Where is equipment and material to be sourced – locally to site? Within European Union? Worldwide?
- Is there an equipment list?
- Where are all the available drawings?
- Is there a prescribed work breakdown structure (WBS) or cost breakdown structure (CBS)?
- Does the client expect a particular breakdown or structure of the estimate?
- Are we required to use the client code of accounts, or our own?
- Does the bid schedule allow adequate time for estimate reviews and estimate risk analysis?

Commercial

- How can we align our objectives with those of the client, in order to optimize our chances of winning, and establishing a rapport with the client?
- Do we understand the client business case, and what can we do to support him in realizing it?
- How do we avoid conflict?

Health, Safety and the Environment

- Which safety legislation is relevant?
- Is the client making any particular HSE demands which are unusual to us?
- Does the client have any legal requirement to observe local HSE regulations?
- When can we describe the project safety strategy to the team?
- Are we going to impose our normal safety demands which are unusual to us?
- Are there any specific, local, environmental issues?
- To what extent do we need to address the environment local to the site?

Engineering

- What is the status of design?
- Is there an equipment list?
- Is there any specialized, long-delivery equipment?
- How much of the equipment is designed by the suppliers?
- Where are all the available drawings?
- What are our expected deliverables?
- Is the concept agreed?
- Whose process licence is involved?
- What, if any, are the safety issues to be addressed in the design?
- Do we have to do any design during the bid period for the estimate?

Procurement

- What is the procurement strategy – local or worldwide?
- Are there any markets ruled out by the client for political reasons?
- Is there a client-preferred supplier listing?
- Is there an equipment list?
- Is there any specialized, long-delivery equipment?
- What type of contract will we have?
- How much involvement does the client want/need in the purchasing cycle?

Construction

- What is the exact location of the site?
- Which safety regulations are
Can we use international subcontractors or is there a prescribed local labour content?
What are the assignment conditions we can offer staff?
What is the nature of any heavy lifts?
Do we have to provide and manage a construction camp?

**Commissioning**
- Is commissioning within our scope?
- Which safety regulations are applicable?
- What is the client’s involvement?
- Do we have to train the client operators?
- At what stage does the client want to start operator training?

**Planning**
- What is the expected award date and what is the target completion date?
- Is there a prescribed work breakdown structure (WBS) or can we develop our own?
- Is there a prescribed cost breakdown structure (CBS) within which we must work?
- To what extent are we going to engage the planning and the cost control?
- What are the procurement and subcontract strategies?
- Is there an equipment list?
- Where are all the available drawings?
- What are the client reporting requirements?
- How is the project to be awarded – lump sum/fixed price, or reimbursable or cost plus, etc?
- How is the estimate being structured and what is the cost breakdown structure (CBS)?

**Cost control**
- Is there a prescribed work breakdown structure (WBS)?
- Is there a prescribed cost breakdown structure (CBS) within which we must work?
- To what extent are we going to engage the planning and the cost control?
- How are we going to manage the transition from the estimate to the control budgets?
- Who are the nominated budget holders?
- What are the cost reporting formats and requirements to satisfy the client?
- What is the strategy for cost trending and forecasting?

**Document control**
- Do we have to use the client document numbering system or can we use our own – or is it both?
- Can we use our own document management systems and processes?
- Is there a need to engage with the client asset register?
- What is the extent of client
involvement in the comment/review/approval cycle?
- Does the client have a prescribed document distribution matrix for their own organisation?

Quality management
- Can we apply our own quality management system to the project, or is the client insisting that we use his system (which could have major cost implications)?
- Do we have to make any major changes to our QMS for this project, or only the normal level of customization?

It can be seen from the above that there are several common areas of information which are of interest to different disciplines. It is easy to understand, therefore, that if no information is provided to them, each will make assumptions which may not be compatible with each other, and which would lead to inconsistencies in the response to the bid.

It is sensible, therefore, for the project director to take the lead and inform his team on the key topics which make a difference between a consistent and an inconsistent or, worse still, non-compliant, bid.

It is also sensible to realize that an inconsistent bid document may still lead to a winning tender but may later result in complex and expensive issues when practices and strategies across the project team start to diverge, because assumptions were made in the absence of clear direction.

How often should it be updated?
Every project is subject to change, and change even occurs during the bid preparation period. It is obviously important that changes should be communicated to the team, and the execution plan should be the preferred medium to achieve this.

The frequency cannot be defined but the potential reasons for re-issuing the plan certainly can. These are as follows:
- to communicate any change to the bid specification from the client
- to explain any internal changes of approach to the bid (for example – a change from the decision to procure only in the European Union to procuring worldwide)
- to address any legal or commercial issues which may require a strategy amendment which will affect the team’s action plan
- to communicate any change to the delivery date of the bid or, indeed, of the project itself.

To whom should it be made available?
The execution plan should quite simply be available to everyone on the project. The word ‘available’ is used in the context that it is preferable that it be issued to discipline heads so they can make it available to their staff – by means of personal presentation and explanation of its content and rationale.

One way or another, however, EVERYONE on the project team should know about its content.

To which other project tools does it relate?
The execution plan does not stand in isolation on a project. It should be the focal point of reference for guidance for many other project management tools. These are described below.

Health, safety and the environment
are of paramount importance to the people involved and to the reputation of the business. The protection of the environment is EVERYONE’S concern and all related issues must be addressed carefully. The execution plan should make a clear and formal statement of project intent on all HSE matters.

Project programme: the planning engineer is one of the most important ‘users’. It is his job to translate the defined scope of work into the integrated plan (for engineering, procurement, construction and commissioning) for the whole team to use to organize their work. He needs to know the scope, the material quantities, the details of the equipment to be installed, where it is all to be procured (he has to build in allowances for designing, approvals, purchasing, manufacturing, deliveries, shipping, customs clearances, etc. (some or all of which may be relevant).

He also has to ensure that he has planned for all the cost elements covered in the estimate, and has a strategy for engaging with the cost control process throughout the execution of the project. The third article will address the planning function in some detail.

Subcontract plan: the contracts function uses the information in the execution plan to develop the approach to subcontracting – local contractors only, or international, or joint ventures? They must decide which is the most appropriate form of contract to be used, start considering possible pre-qualification and tendering processes, and how risk is to be managed.

Engineering will take guidance on the standards and specifications to be used, the extent of the list of deliverables, the unique and total numbers of equipment involved, any long delivery or particularly complex equipment involved, and whether any further work has to be done on process or specification development.

Construction plan: the success of construction depends on everything which precedes it, and so the adherence of others to the execution plan has a major impact on the way construction progresses. Meeting the programme, making the progress and assigning the correct resources at the right time, are all key factors which emanate from the threads of the execution plan.

Quality management: from the description in the execution plan of what is to be done, the Quality Management system develops the approach to how the quality of the outcome will meet the requirements of the client.

Commissioning plan: this has to take account of the point in the construction phase when the plant is ready for pre-commissioning and then commissioning (which comes from the programme – see above) and what are the requirements about operator and training manuals – and when they have to be ready to train local operating staff.

Cost control: the structure of the budgets, which are derived from the
estimate, may be linked to a client-required cost breakdown structure, to allow the client to engage project costs with his own financial control system. Also, the control of costs may be delegated to named project budget holders and these must be identified and involved in the definition of the project cost control procedures.

The execution plan should provide valuable information on all of this.

**Progress measurement:** the measurement of progress of engineering, procurement and construction has to be considered carefully, and the objectives and requirements of the client and the contract, as defined in the execution plan, must be recognized in ensuring that the needs of the project are met. The measurement of the planned progress and the costs of achieving it, together combine to form one of the most important aspects of project control – the integration of cost and time.

**Reporting:** the client usually has clear requirements about reporting, so that he can align the progress and current costs of the project with his own business reporting structure. It is vital to define these in the execution plan so that the whole project team aligns with the same objectives.

**Legal and commercial:** it is the task of the legal and commercial function to protect the business interests of the contractor but also to align with those of the client. The execution plan should provide sufficient information about the project for them to be able to carry out their work effectively.

**Take-away messages**
Finally, here are some key messages which provide a basis for taking the execution plan seriously, and for using it as a significant tool for achieving better levels of benefits to the business.

**Be clear about what an execution plan is**
The project execution plan (PEP) is the vehicle by which the project director or project manager communicates his requirements to everyone who is going to play a part in the successful achievement of the project objectives.

**Understand why and when should it be prepared, and by whom**
It is prepared in order to communicate the project intentions – to allow the team sufficient guidance to develop their approach to their own roles and responsibilities. It should be prepared when the ‘core’ team understands enough about the project to set strategy but before too many of the team are mobilised and doing their own thing, and must be prepared by the project manager.

**Understand what it contains**
It contains sufficient information about how the project director wants to run the project to allow each of the team disciplines to develop their own approach within a defined structure. The objective is to facilitate the development of an integrated detailed plan which supports the overall strategy.

**Update it as required**
It should be updated whenever a significant change takes place which may have an impact on any of the participating disciplines, and which may affect the way the project is being executed, perhaps introducing further risk to its successful completion.

**Ensure that the right people have it, and that they know why**
It should be issued to all the discipline leaders involved in the project, and they should then share its contents with EVERY member of their own teams. It is essential that ALL participants are working to the same set of rules, and the execution plan defines these rules.

**What next?**
The next article will address planning. It will consider why planning is so fundamental to the control of a project in order to allow a focus on the key activities, and why planning of the project activities must be engaged with the control of their costs. It will also discuss the need for full integration across the project, the development of the manpower plan, and the requirement to measure progress.

---

* Eur Ing C.R.A. (Tony) Reid, BSc, CEng, MIEE, FACostE, MIOD

Tony Reid is a chartered (electrical) engineer, and a Fellow and Past President of the Association of Cost Engineers. He started his career in electricity supply, in commissioning, operations and maintenance.

He has nearly 30 years’ experience in project controls, initially in electricity supply, then in international oil and gas contracting, and more recently in a project management consultancy until he retired from full-time employment earlier this year.

He now operates as an independent project controls consultant, and can be contacted at email: crareid@aol.com.