

EPC contracts and NEC

Introduction

The NEC4 Engineering and Construction Contract (ECC) allows design allocation to range from the Contractor carrying out no design to having full design responsibility. As a result, it is suitable for use as an Engineering, Procurement and Construction Contract (EPC). ECC provides a range of available pricing approaches and secondary Options to define the risk allocation between Client and Contractor taking into account the needs of the Client and the level of risk the construction industry can accept. It also provides, through “Z clauses” for the Client to add provisions needed to deal with project specific issues and changes to the allocation of risk. In this way, ECC can provide for all EPC requirements.

Definition of an EPC contract

Under an EPC contract a Contractor is appointed to design and plan the scheme to meet the objectives and outcomes specified by the Client, procure the necessary plant, materials and subcontracts, and construct, test and commission the work. EPC arrangements are often termed as “turnkey” arrangements as the Contractor takes responsibility for the full design, procurement and construction of the project and hands over the key to the door of the facility at completion.

In such arrangements the Client provides a performance-based output or outcome specification that the Contractor has to achieve for hand over to occur. This transfers a greater element of risk to the Contractor, and the Client adopts a more “hands off” approach to the management of the contract. However, the benefits of managing risks by the use of the compensation events, Early Warning Register and programming provisions would still apply.

Selection of Contractor

The approach to selecting the Contractor will vary according to the needs of the project. The most usual options are single or multi-stage tendering, or the use of Early Contractor Involvement (ECI) as provided for in Option X22 of the Engineering and Construction Contract (ECC). It should be noted that Option X22 is provided for use with target or cost reimbursable contracts and is not used with the priced options.

In multi-stage tendering, the first action will be to identify tenderers who have the necessary financial, technical, and managerial capability to deliver the required project. Following this the short-listed bidders will engage with the Client so that, at the stage when final submissions are made, the Client is confident that the preferred tenderer has fully understood its requirements and is capable of providing an acceptable solution for the project.

The alternative approach of using the Early Contractor Involvement (ECI) Option X22 (if a target or cost reimbursable approach is followed) allows the Contractor to be appointed following a single-stage competition. The Contractor works with the Client in developing the design and finalising price and programme before the Client commits to constructing the work. Using this approach, care is needed in the selection process and in defining how the construction price is to be established. NEC has published a separate guidance on this topic.

Design allocation

The ECC provides for the level of design responsibility allocated to the Contractor to be stated in the Scope. In an EPC contract, the Contractor will normally take full responsibility for design. This is achieved by stating in the Scope the performance requirements the Contractor's design is to meet.

Unless the ECI option is used, any design proposals prepared, considered, and accepted in principle by the Client at the time of contract award are binding on the Contractor and can only be changed through instruction of the Project Manager.

The extent of design submissions is defined by the Client to determine the level of involvement it wishes to have in the design process. The detailed design submissions and acceptance process needs to be set out in the Scope, including the interface with the relevant approval authorities in the country where the construction work is to be carried out. Procedures and timescales need to be clearly understood and provided for. Detailed design submissions made during the contract can be changed by the Contractor, but must continue to meet the Client's requirements and be accepted by the Project Manager. The Contractor remains responsible for the submitted design and is liable for any failure, despite it having been accepted by the Project Manager.

Risk allocation

Under an ECC the risk allocation between the parties is determined by the main and secondary Options chosen, and by the listing of compensation events. The allocation of risk in relation to third parties and for damage and loss are set out in section 8 of the conditions as are the insurances to be provided to cover these liabilities.

Under an EPC contract, the main option will be Option A - priced contract with Activity Schedule or Option C – target contract with Activity Schedule.

The selection of secondary Options also governs elements of risk transfer between the Parties and the Client can determine the level of risk allocated to the Contractor under an EPC arrangement through their selection of secondary Options.

Compensation events are Client risks, which give the Contractor compensation for the time and cost effect of the event. The events listed in the contract as compensation events can be split into 3 categories.

- Change in Client requirements. As with any contract, the Client should ensure that its specified requirements accurately define its objectives. Particularly in an EPC contract, the Scope should not include unnecessary specifications.
- Failure of Client or those acting on its behalf to perform obligations. The interface between Client and Contractor should be minimised in an EPC contract, and effective management procedures should be included for handling necessary interfaces.
- Unforeseen events such as weather or ground conditions. To provide greater certainty as to the level of Client risk, the contract could include "reference conditions" or the like for ground conditions, and defining which weather measurements could give rise to compensation.

The ECC contract provides compensation events to define a risk allocation which is balanced between the Parties. If a greater risk transfer to the Contractor is required, an amendment to the contract using Option Z would be needed to remove or revise the relevant compensation events or other provisions of the contract.

Payment

NEC has a range of payment options which allows wide flexibility in how payment for the work is made. A quantity based remeasurement contract is not appropriate where the Contractor is responsible for the engineering of the works, and normally payment is made as a series of lump sums due when work reaches a specific stage. This would require the use of Option A of the ECC – priced contract with Activity Schedule – where payment is made for each group of completed activities. The Client specifies the groups – milestones for payment – and the Contractor adds items into the group to provide linkage with the programme.

As an alternative, ECC allows the option of using a target contract with Activity Schedule – Option C – under which the Client shares the construction cost risk with the Contractor. In this case, the Contractor is paid the cost of the work carried out plus or minus a share of the saving or overspend compared with the target set out in the Activity Schedule. While a lump sum basis is the common way of procuring EPC contracts, the use of Option C may be suitable for highly complex projects which carry unusual risks that would need to be priced for as part of any lump sum unless they are managed under an Option C target cost arrangement.

Control of time

ECC recognises the importance of time management and promotes best practice through extensive programme requirements.

The programme is at the heart of the ECC contract and forms a joint management tool. Whilst the Client involvement in an EPC contract will be less than in a traditional construction contract, an understanding of the Contractor's intentions in programming the work allows the Client to keep track of progress and be aware of the need for any actions.

ECC provides the flexibility for the Client to operate on a "hands off" basis or have a significant interface with the Contractor. Whilst the programme is under the control of the Contractor, the Client is able, through the regular updates to the programme, to understand the Contractor's intentions and to be able to plan any involvement it needs to make in the project. The frequency required for updates is determined by the Client based on the level of involvement in the project that it will have.

Testing and Defects

The testing and inspection requirements are outlined in the Scope and are therefore developed to be project specific.

This flexibility allows the Client to require a set of performance tests to be undertaken under EPC arrangements, as the design requirements under such a procurement model are commonly set on the basis of an output performance specification.

The performance of the works in these tests can also be linked to secondary option X17 Low Performance Damages. This provides for a reduction in payment if the work does not meet the required performance standards.

Extension into operational stage

EPC contracts do not normally extend significantly into the operational stage. Whilst some involvement by way of commissioning and proving performance is normally required, operation of the asset will usually be carried out by the Client.

If the Client wished to use an EPC approach but include the operation of the asset in the EPC contract (an “EPCO” contract), the NEC Design Build and Operate Contract could be used. This follows much of the procedures in the ECC, but provides for including the operational work which a Contractor would normally carry out under a term service contract.

The issues described above would apply equally to this contract arrangement. Payment arrangements would need to be structured to provide a linkage between payments made for construction and payments against the outcomes in the operational stage. If payment for construction was made solely or principally through operational outcomes, it would become a privately financed contract rather than an EPCO contract.

Engineering, Procurement and Construction Management (EPCM)

The increasing scale and complexity of major infrastructure projects and the significant risk that EPC arrangements impose has led to an increasing use of EPCM arrangements. Under this model the risk is spread over a number of different suppliers who are better able to accept and manage the risk allocated to them. Under an EPCM the Client appoints a Contractor to work with it in developing the objectives and outcomes for the scheme and manage contracts to develop the design, procurement of plant and materials, construct the scheme and test and commission the works. The stimulus to good management provided by the NEC forms makes it highly suitable for the coordination work required by the construction manager. The programme required by the contract is a vital tool in this coordination.

EPCM arrangements also bring additional benefits to the Client such as providing a greater degree of flexibility to define or change their requirements as the project is developed. It also provides the Client with a greater level of control over quality and compliance which can be a real benefit on complex and safety critical installations. Whilst the Client retains much of the construction risk in this model, it removes the risk premium that is inherent in an EPC contract.

The Contractor would normally be appointed under a NEC Professional Service Contract on a priced, target or cost reimbursable basis. Key Performance Indicators would be used to motivate and reward performance which met the Client objectives. Other consultants and contractors are appointed by the Client on the appropriate NEC contract form.

Design of the scheme may be carried out by the Contractor but more normally by a designer appointed under a NEC Professional Service Contract. Construction contractors are appointed to carry out the work under an ECC or Engineering and Construction Short Contract, and materials and goods suppliers are appointed under the NEC Supply Contract or Supply Short Contract. The flexibility of the NEC forms allows the selection of the pricing and secondary options to be made as appropriate for individual contracts. By including the NEC multiparty collaboration Option (X12) in the larger contracts, individual contractors are encouraged to work together on a collaborative basis for a shared benefit.

As an alternative, The Contractor managing the contract could be appointed under ECC Option F – Management Contract. Under this contract, whilst the Client reimburses the cost of subcontracted work properly incurred, the management contractor retains the performance risk.