
NEC4: Effective Preparation and Management of the Construction Programme

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NEC4: Effective Preparation and Management of the Construction Programme

Tim Willis

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Preface

I have been involved with the NEC (New Engineering Contract) family of contracts since the early 2000s' providing training courses and webinars both at home and abroad and accrediting *Project Managers* for the NEC 4 ECC. In the course of that time, I have provided training to and had the privilege of discussing their experience of projects with thousands of users across many sectors. I also practise as a construction lawyer, dealing with both contract advice for projects and disputes in adjudications, the courts and arbitration.

The central purpose of the NEC family of contracts has always been to provide a collaborative basis for those involved in projects to deliver the underlying content as effectively as possible. To achieve that purpose, the NEC family relies on procedures that are recognised as fundamental good project management. Other forms of contract include processes and as a construction lawyer it is often these processes that are the subject of scrutiny in the context of disputes, which centre around adjustments to contract prices or adjustments to dates for completion or other commercial risks. Typically, a dispute is a retrospective examination of the project based upon what information is available at that point in time to analyse liability.

The fact there is a dispute about such adjustments shows that the process was either not well designed or that a party is not following the process.

The NEC contracts seek to achieve an agreed adjustment to prices and completion or key dates, thus precluding such disputes and providing an agreed basis for the future delivery of the project. At the heart of this process is the Accepted Programme, providing an agreed programme of the relative contributions of those involved – be that the client or statutory undertakers or the contractor. The Accepted Programme also provides the basis for predicting the impact of events upon the programmed delivery to allow risk to be managed, contract adjustments to be made and commercial reporting to be up to date.

The Accepted Programme is a central document and yet programmes, and programming more generally, have a poor record in our traditional forms of contract, either playing little or no role in the commercial processes or being fundamentally mistrusted as document on which to place any reliance.

Without an Accepted Programme the NEC ECC contract does not function as envisaged. It is important, therefore, for clients and their contractors to give the preparation and management of this document proper regard.

The purpose in writing this book has been to seek to show what good practice in the preparation and management of the Accepted Programme looks like and the resources that it requires. There would appear to be a need for better understanding of this perhaps because programmes and programming are poorly dealt with in the construction industry. Therefore, contract preparation and management when using the NEC family requires a step-up in performance in this area.

There are too many examples of NEC projects where the programming is deficient and so the book also looks at the implications of failing to properly prepare and manage the Accepted Programme. The consequences as discussed are significant and wide ranging. Not least, anyone who has been involved in trying to resolve disputes will be all too aware of the cost of lawyers and experts pursuing a legal process and the uncertainty of outcome that plagues such disputes. The costs of disputes far outweigh the costs of thinking about programming at the procurement stage and properly resourcing the project management during delivery. The strain imposed by disputes on those involved in the project and the business should also not be underestimated. Good programming makes good business sense and makes for successful projects.

Tim Willis MA, FCI Arb, Solicitor Advocate, NEC4 accredited Project Manager and NEC professional.

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About the author

Tim has practised as partner in law firms, heading up construction and renewables teams and advising clients in the construction and engineering sectors, and as the director of multidiscipline commercial consultants in Hong Kong and the UK. He is an accredited NEC project manager and tutor for ICE training and provides accreditation training to project managers on the NEC4 ECC and training to clients on the NEC family of contracts. Tim has worked in the UK and Asia-Pacific on a broad range of projects and disputes under differing forms of contract and in differing jurisdictions. He is a Fellow of the CIARB, a member of the Technology and Construction Solicitor's Association. Tim is a former chair of the Adjudication Society and on the panel of UK Adjudicators. He originally qualified as a barrister and is a Solicitor Advocate dealing with all forms of dispute resolution. Tim is part of the Construction and Engineering Team at Irwin Mitchell LLP. He is also the owner of Willis Consultancy, providing training, advice and dispute resolution services.

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Chapter 1

Aims of the book

1.1. Aims of the book

Clients and the construction supply chain work in a web of interfaces and dependencies. All the participants plan their contributions from the most strategic level down to the detailed delivery of very specific content or timing of contributions.

The delivery of that content or contributions is often prescribed in a contract and the contract documents impose obligations that seek to manage the delivery of that content or a party's contribution.

The contract might impose a completion date or dates that the client considers important. The contract might impose constraints on how the other party may organise and deliver the content. The contract documents set these dates or constraints at the point it is entered into, but in the context of construction or engineering contracts the underlying content or timing of contributions is subject to change.

The management of change is a central function for clients and the supply chain. Clients and the supply chain have procedures for managing change and employ project managers or contract managers who have responsibilities to manage change. The dates set by a client may need to be adjusted and changes to content or constraints or external events will also impact on the timing of the delivery of content.

The contract often requires that the detailed arrangements are documented in a programme or schedule.

The general use of programmes / schedules and the dedicated function of 'the planner' or 'scheduler' who prepares and analyses programmes is an essential part of the construction and engineering sector and the delivery of complex projects.

The use to which the programmes or schedules are put can be prescribed in the contract or individual contributors may simply produce these documents for their own purposes and share them as they choose to.

The NEC family of contracts use the contract conditions to set procedures to be followed for risk management and to adjust the contractual position of the parties where risk or change impacts the delivery of their respective content or contributions.

The NEC contracts create collaborative processes. Of central importance to risk management is the management of time and the NEC contracts use programmes to manage time and adjust the contract.

By setting a contractual process the contract imposes on the parties a common structure and a minimum standard of procedure to allow the process to function. This has at the heart of it a programme that is subject to continual update and review. It has different functions in the context of the contract.

While clients and contractors may all be familiar with and have planning/scheduling resources, the uses for which they use these resources will differ.

The aim of this book is to identify to both clients and contractors the differing functions and uses of the programme in the NEC family of contracts.

The aim of this book is to place the programme into context in an NEC contract to allow clients and contractors to put in place the procedures and resources to maximise the benefits of using the contract.

The book concentrates on the NEC4 Engineering and Construction Contract (NEC4 ECC), but the book also considers other contracts in the family where detailed programming is required such as the NEC4 Professional Service Contract (NEC4 PSC), the NEC4 Term Service Contract (NEC4 TSC) and the NEC4 Facilities Management Contract (NEC4 FMC).

As will be apparent from the following chapters, programming is central to the NEC4 ECC contract.

The book will also consider the implications of not putting in place and following the procedures. The analysis shows that not programming in the manner envisaged creates significant risk to project delivery and that time spent in understanding the process required and putting it into effect is time well spent.

1.2. Terminology

In the NEC family of contracts, the parties to the contract and those who have specific roles within the contract are referred to in *italicised* font in the contract conditions and identified in the Contract Data Part One or Part Two. For the purposes of discussing specific NEC contracts, that convention is adopted in the text and reference will be made to the parties to the contract, the ‘*Contractor*’ and the ‘*Client*’, and to the ‘*Project Manager*’ and ‘*Supervisor*’. Where a more general discussion about forms of contract or industry practice is the subject, the italicised terms are not used, and the term employer may be used instead of client (with references made also to other functions variously described as the engineer or architect or contract administrator).

The NEC family of contracts and the naming conventions used is set out in Table 1. Reference is made in this book to other standard forms of contract published for use by the industry. Reference may be made to general families of contracts or specific contracts. A list of the other contracts referred to in this book is contained in Table 4.

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Chapter 2

Introduction

2.1. The unique nature of the construction industry

The construction of buildings or infrastructure is a collaborative process undertaken in a commercial context. We do not think of buildings or infrastructure as ‘off the shelf’ products. Instead, we construct them to specific requirements, to address specific needs with the resultant product a result of a complex interaction between the procurers and the supply chain.

There is great flexibility in the way that we arrange who will be responsible for the differing aspects of the construction process. Differing procurement practices have developed, and different clients or contexts require that we prioritise different aspects of the procurement to meet their objectives.

2.2. How construction projects are delivered and the NEC family of contracts

One of the objectives in procurement is to provide the basis for organising the delivery of the underlying content. The contracts that are entered into form part of an overall network to achieve these objectives.

The degree of collaboration, and the need to accommodate that as part of a procurement strategy, can vary depending on several factors such as the complexity of the result, the extent to which that has been prescribed, and the number of people who commercially share responsibility for the outcome.

The NEC family of contracts reflect that underlying reality by providing differing contracts to use in differing procurement structures and flexibility within contracts.

The NEC family include a framework contract for procuring work or services, term contracts for procuring the delivery of a service, works contracts, professional services contracts, supply contracts and other contracts that can be used or combined in different ways to procure and integrate delivery of the content of standalone projects. They can also be used under framework contracts to deliver broader procurement objectives across multiple projects.

The family differentiates between complex projects and simpler work and services requirements. Where there are simpler procurement needs, the family has ‘short’ versions of the differing types of contract – be that work services or supply of goods.¹

The *Client* must make the strategic decision about how to use or combine the contracts into a given procurement solution. Where short contracts are used, the standard drafting provides the procurement solution without further choices being necessary. Where the full contracts are used, the *Client* must make further selections to determine the contract conditions that will apply. The NEC family makes use of

¹ For a full list of the NEC family of contracts 4th Edition, see Table 1.

differing payment options to deal with pricing and price risk. For the full contracts, the NEC family also make use of secondary options² to allow further customisation within each contract if required. The *Client* makes the selection, and the drafting then provides the mechanism for delivering the required content in that context. So, there is considerable flexibility.

The strategic co-ordination of delivery is concerned with what content can be delivered over a period or within an overall budget structure and is based upon the *Client's* overall plan and objectives. Such plans and objectives are bespoke but having decided upon a procurement structure and content to be delivered each individual contract, whether for delivery of work or services, must programme the delivery into a fixed period dictated by the contract.³

Depending on where in the procurement structure the particular contract sits, the requirements in terms of programming differ.

The focus of this book is to consider how the works contract that would be used for a stand-alone complex project, the NEC4 ECC, manages the works to be delivered by a completion date in the context of specific requirements as specified by the *Client*. As we shall see, this requires detailed programming placing specific content and interfaces into a specific point in time. The detail and time-bound nature of the delivery gives the programme a structure and purpose that goes beyond strategic planning or aspirations and produces a commercially binding structure to the delivery of the content. It also provides the basis upon which the relative contributions are co-ordinated.

2.3. Requirement for planning from a contractual perspective

In a simple context, where the content to be delivered is well understood by the supply chain and requires little input from others, the planning of work may not be of particular interest to the client. That is reflected in the short forms of contract within the NEC family, whereby the contracts leave the question of whether a programme will be needed open to the *Client*.⁴

This, however, is somewhat of an exception that is appropriate where the underlying content is quite simple but, as we shall see, the underlying ethos behind this suite of contracts is to prioritise good communication, and in a complex project the programme itself plays a significant role in the management and communication processes.

This recognition of the use of the programme as an effective tool for collaboration is a development in which the NEC Engineering and Construction Contract has been at the forefront. Many of our traditional standard forms did not recognise the importance of the programme but, partly because of the experience gained from the use of the NEC Engineering and Construction Contract, a more general desire to see

² Secondary Options in the NEC contracts are identified as X or Y clauses that provide standard optional clauses to be selected by a *Client* on a project by project basis to meet the *Client's* needs.

³ Since the strategic and the detailed programmes are related, there is a strong argument for consistency of approach. The NEC family provides consistency at the project level – for example, the professional service contract has the same programming approach as the works contract.

⁴ NEC4 engineering and construction short contract clause 31.2: ‘the *Contractor* submits programmes to the *Client* as stated in the Scope’.

more effective collaboration has meant recent thinking has begun to attach greater importance to programmes. If we look at other standard forms of contract published, we see that there is variety in the importance attached to how the contractor will programme the work. Furthermore, some sectors of the industry have attached greater importance to this than others.⁵

The JCT contracts 2016 Editions used for much of building work within the United Kingdom are a good example of a traditional approach that it should be left to the contractor as to how it will complete the work and does not seek to use the programme as a collaborative tool. Instead, this suite sets out that the client's concern is certainty of price and completion date, which is to be achieved contractually by significant transfer of risk to the contractor and leaving it to the contractor to manage the risks transferred or face the consequences of not doing so.

If the contractor does not plan its work properly and is delayed, the client will have its remedy in the form of a claim for losses for late completion.

Such an approach has its proper place, but it is increasingly questioned whether that is an effective approach to procurement. Where the contractor is dependent on the efficient co-ordination of inputs not only from its supply chain but also the client or others outside of its supply chain the need to plan increases as it becomes necessary to co-ordinate the delivery of the underlying content and the contributions of all involved.

There is a further reason why understanding the plan for work is necessary and that is the fact that construction projects are by their nature subject to change. Even where we effectively plan the work, construction contracts must respond to risk that materialises post contract.

In the review of construction contracts carried out by Sir Michael Latham's *Constructing the Team*,⁶ traditional forms of contract were seen as adversarial in their approach and that they were a hindrance to the collaborative working processes necessary to deliver complex buildings and infrastructure efficiently and manage risk.

Contrary to this, however, the NEC family was singled out in this review as a form of contract that promoted collaborative processes partly on the basis that it does not seek to make price certainty the primary objective of the client over all others. Instead, the NEC family has flexibility in terms of pricing of content and risk along with the allocation of risk.

The full contracts all contain pricing options ('Main Payment Options'). The options give a range of pricing solutions from lump sum, re-measurement, target cost, cost recoverable to management contracts. For all options there are a sizeable number of 'compensation events' events that have the effect of allocating those risks defined as compensation events to the *Client*.

⁵ For example, compare the contracts produced by the Joint Contracts Tribunal (JCT) for general building with those of the process engineering industry, such as the Institute of Chemical Engineers, whose contracts are much used in the process engineering sector and contain detail programming requirements reflecting the highly complex and time critical nature of such projects.

⁶ Latham M (1994) *Constructing the Team – Final Report of the Joint Government/Industry Review of Procurement and Contractual Arrangements on the United Kingdom Construction Industry*. HMSO, London, UK.

Where content (be that work or services) is to be priced, it is on the assumption that there is clarity about what is to be priced together with the risk that is to be priced. Where that is not practicable because the content or risk is not properly price-able, the pricing options provide alternative solutions.

Where according to the chosen pricing option, content or risk is not to be priced or insured, it is held by the *Client* to be managed collaboratively. To aid that collaborative management the valuation of changes to pricing is based on the concept of 'Defined cost', which is a resource-based valuation based on the cost of the resources plus a fee. This resource-based method of valuation of change seeks to avoid the response to risk or change being driven by pre-determined pricing, concentrating instead on the cost of resources impacted.

In addition, the early warning procedure allows the potential for taking actions to avoid or reduce the effect of risks before they impact the works.

This approach to collaboration and management of risk requires clear project management to understand the potential impact of risks and the possible solutions to avoid or mitigate the impact of risk. The programme, in the form of an Accepted Programme, provides a detailed agreed basis to understand and respond to risk and how it will impact on the parties' relative obligations and contributions and the effect on the work to be done. The programme becomes a central tool in the management of the contract.

2.4. Why plan and why programme works?

From the contractor's perspective, planning and programming is necessary in any context but in complex projects it is even more so, not just to manage its own supply chain but also to manage and respond to risk. For the client, where it holds risk, it can reduce the cost and delay exposure through the efficient management of risk in the early warning procedure and avoid the cost of disputes over adjustments to Prices and the Completion Date through the compensation event procedure.

The programme sits at the heart of this approach by providing an agreed basis for collaboration, and a mechanism for forecasting and assessing the impact of risks that materialise post-contract on future activities to provide for the better management of risk and enable an adjustment of the contract (if required).

The drafting of the contract hard wires this risk management approach into the programming by making the programme, in the form of an 'Accepted Programme', a contract document. This, in turn, imposes contractual obligations, allocates risk, and provides a basis for an agreed adjustment to the Completion Date where risks materialise.

The programme in the form of an Accepted Programme is a dynamic programme constantly updated and revised as the project progresses and events or change impact upon delivery.

Good planning and the Accepted Programme are at the heart of the NEC contracts and serve the interests of both parties.

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Chapter 3

Function of planning and the programme

3.1. Introduction

Programmes are used to achieve several objectives in the context of a construction project. As outlined in the Introduction, the NEC family of contracts place a great focus on the management of the project. In this chapter, we will review how programmes are used to achieve a range of differing objectives in construction and how other standard forms of contract and the engineering construction contract compare in broad terms in delivering those objectives.

3.2. Construction programmes within a contractual context

The word ‘programme’ is used in many contexts and for many purposes. However, we are concerned with the programme as defined in a contract and here we consider how the programme that the NEC4 ECC requires compares with the other forms of contracts.

This is best done by considering several features that a programme prepared in line with the requirements of the NEC4 ECC ought to possess in comparison with the requirements, if any, of other standard forms of contract.⁷

In this book, reference will be made to programmes generally but in each contract the content and terminology may change, as may the function of the document or documents in question.

The NEC4 ECC refers to an ‘Accepted Programme’, which is defined as the last programme that has been accepted. It is a dynamic document. Its content is defined but it is not a single document or piece of information but a collection of documents and information that is provided to the *Project Manager* for acceptance.

The programme is essentially the information that the *Contractor* provides, which covers timing and interrelationship between work and other project content and the progress of the works placed in the framework of a completion date or other set dates.

Given the breadth of the information and differing ways in which it is treated in contracts, the word ‘programme’ can mean differing things in differing contracts. Even the terminology changes from contract to contract.⁸

⁷ The contracts chosen are bilateral contracts that assume a single stage procurement of employer design or design and construct. See Table 3.

⁸ The Chartered Institute of Building, CIOB Time and Cost Management Contract TCM15 uses terminology such as Working Schedule and Planning Statement to cover such content.

However, it is also true to say that there has been a development of the treatment of programmes in many of the standard forms considered. The FIDIC forms of contract and the IChemE forms now exhibit many of the features the NEC family of contracts contain. It is in general building work, within which the JCT suite of contracts are typically used, that there has, however, been the least development. The CIOB Time and Cost Management Contract by contrast has taken time management further than any other standard form of contract but its use has not been adopted by the market.

This greater convergence we have seen in the treatment of programmes is helpful in that it means that the industry will become better at responding to the challenge of producing and submitting detailed programmes. The NEC family has been in the vanguard of these developments.

Despite such developments, it is still the case that on many projects detailed programming information is not a requirement within the contract, neither in some projects are the full contractual requirements met.

3.3. Using programmes to monitor progress

Depending on the level of detail that a programme must contain and the frequency with which it must be updated, the programme can provide a record of progress. As we shall see in Chapter 5, the Accepted Programme can provide that record if it is updated in the manner envisaged.

Some standard forms of contract approach the monitoring and reporting of progress as a distinct function and place great emphasis on the reporting of progress without directly linking that information as part of the programming content.

For example, the FIDIC forms of contract deal with the programme and progress reporting as separate obligations. The emphasis in FIDIC is on ensuring that the progress reporting is full in content and provided in a timely manner.

3.4. Using programmes to control progress

A related but different focus of the programme in construction contracts is the extent to which it commits a contractor to progress at a specific rate.

The focus in that case is upon imposing potentially binding obligations on a contractor with the intention of being able to enforce the obligation to meet a completion date and potentially intervene if it appears the completion date will not be met owing to some failure of the contractor to progress.

Generally, there is no remedy outside of the contract for an employer who is simply concerned that the contractor is going slowly. Instead, any right to damages does not usually crystallize until the contractor has failed to meet the completion date. Rights to terminate a contract might arise in the case of very bad failure to carry out work but these are of limited use to an employer seeking to preserve a completion date. Added to this is the fact that invariably terminating a contract creates delay and inevitably disputes.

Some forms of contract do, however, seek to make a tighter link between progress and the achievement of the completion date.⁹ This clause gives the project manager the power to notify the contractor if the

⁹ See, for example, clause 13.5 of the Institution of Chemical Engineers (2013) *IChemE Red Book Fifth Edition*.