

nec users' group NEWSLETTER

NEC4 ALC adopted for Hinkley Point C services

SIMON FULLALOVE EDITOR

EDF and its Chinese partner CGN have chosen to use the new NEC4 Alliance Contract (ALC) to deliver an estimated £1 billion of mechanical, electrical, heating, ventilation and air-conditioning services (MEH) on the £20 billion Hinkley Point C nuclear power station project in Somerset, UK.

EDF and CGN signed the ALC with alliance partners Altrad, Balfour Beatty Bailey, Cavendish Nuclear and Doosan Babcock in September last year. Richard Bowman of Cavendish Nuclear has been appointed interim alliance manager.

All alliance partners were already preferred tier-one MEH contractors and, under the terms of the ALC, will now need to work together to deliver the complex installation of cabling, pipework and ducting in the power station's 2500 rooms.

Balfour Beatty Bailey had previously said it was preferred contractor for a £460 million electrical infrastructure package, while Doosan Babcock was in line for a £220 million heating, ventilation and air-conditioning package, Cavendish Nuclear was up for the balance of nuclear island mechanical erection works and Altrad led the bidding for £20 million of fire protection of services.

Mutual trust and collaboration

Hinkley Point C commercial director Ken Owen said, 'The foundation of our relationship with the construction industry has been one built of mutual trust, collaboration and fairness, with the NEC contract and its core principles being at the heart of the relationship.'

'With over 120 signed contracts to date, the transparency, rigour and discipline promoted by NEC ensures all parties collaborate, with the success of the project at the forefront of discussions. Our recent announcement to create the MEH alliance, based on the NEC4 Alliance Contract and in line with UK government and Institution of Civil Engineers Project 13 alliancing principles, signifies the latest stage of our journey to drive great collaboration between the project and its industrial supply chain.'

According to Owen, over 75% of the footprint of the new 3.2 GW power station is being delivered by NEC contracts (Issue 81). 'The main works contracts are generally being procured under the NEC3 Engineering and Construction Contract Option C (target contract with activity schedule) while the NEC3 Professional Services

Contract and NEC3 Term Service Contract are being used for services.'

He says NEC is being used for all site construction, engineering, project management, associated developments and site services, including worker accommodation.

Integrated and coordinated delivery

The MEH alliance will work across the site to integrate and coordinate the delivery of all main MEH, cabling and associated support services on the project in line with the project's priorities of safety, quality, time and cost. The work includes design and installation of around 3000 km of electrical cables, 110 km of piping systems and 10 000 items of mechanical plant.

According to interim alliance manager Bowman, 'Combined, the MEH alliance partners operate over 13 nuclear licensed sites in the UK with 20 000 directly employed nuclear experts and over 65 years of experience. Uniting our expertise brings together a host of knowledge and experience in delivering safe nuclear design, construction, modification, maintenance and decommissioning.'

The first of the power station's two reactors is due for completion at the end of 2025. When fully operational, the plant will supply 7% of the UK's electricity.



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Subcontractor Caledonian Modular recently completed £50 million of worker accommodation on two sites for Hinkley Point C tier one contractor Laing O'Rourke under a NEC3 ECC Option A (priced contract with activity schedule). The campuses at Bridgwater and Hinkley provide a total of 1496 en-suite bedroom in 44 modular three-storey buildings. The volumetric modules were manufactured complete with 96% of fittings and finishes, including external timber and stone-effect cladding, at Caledonian's factory in Newark, Nottinghamshire. The Bridgwater campus was completed in June last year followed by the Hinkley campus in December. ▼

It is time for clients to adopt the NEC4 Alliance Contract



RUDI KLEIN NEC USERS' GROUP PRESIDENT

In July last year the UK government published its Construction Sector Deal under its Industrial Strategy banner (HM Government, 2018). The 'deal' is ambitious in its vision, which is to transform construction delivery through: greater deployment of digital technologies, especially at the design stage; greater use of offsite manufacturing; and greater focus on whole life asset performance.

Those of us who have been around the industry a long time will now begin to yawn and wonder why – in spite of numerous previous initiatives – the industry remains transfixed in a previous century. Quality issues abound and the majority of projects do not come in on time or within budget.

However, there is a recognition in the Construction Sector Deal that things must now change. It says, 'The current business model of the construction sector is not sustainable. Construction customers and businesses across the supply chain are focused on the cost and risks of individual projects, and do not collaborate effectively.'

Transforming procurement

The deal acknowledges that maximising the potential of digital and manufacturing technologies to transform the industry is dependent upon the way we procure and deliver. This is where the new NEC4 Alliance Contract (ALC) comes in.

The ALC was launched last summer at the NEC Users' Group conference in London (Issue 92). It represents a fundamental shift in procurement, from hierarchical and sequential appointments to engaging a single team committed to integrating processes, working collaboratively and sharing risks and rewards.

The key to the success of alliancing is that the team should include all participants who are essential to ensuring the outcomes for the project are achieved, which means including all relevant specialist professions and trades.

The ALC is a multi-party contract and all members of the alliance 'buy in' to a governance structure that comprises an alliance board. The members of the alliance make up the board, which is responsible for ensuring the outcomes required by the client are achieved – the client sets the tone by setting out the necessary performance targets.

Making delivery more efficient

All participants have a shared interest in achieving what is best for the project. In this way process waste associated with more traditional delivery processes is much reduced. For example, the huge costs often incurred by the supply chain having to make designs work is often a significant factor in cost overruns and failure to complete on time.

Equally important is that the ALC is devised

to avoid or minimise disputes. Any murmurings of a dispute can be referred to the board for resolution and, if this proves difficult, independent expert determination can be resorted to.

I hope that government clients – and even private-sector clients – will soon follow Hinkley Point C's lead in using the ALC (see page 1). The Infrastructure Clients' Group should promote it too. In time, it will be interesting to capture experience of using this contract and gauge the extent to which marks a new dawn for construction procurement and delivery.

NEC has published guidance to accompany the Alliance Contract: *NEC4: Preparing an Alliance Contract*, *NEC4: Managing an Alliance Contract* and *NEC4: Alliance Contract Flow Charts* (NEC, 2018).

References

- HM Government (2018) Industrial Strategy: Construction Sector Deal, available at: <https://www.gov.uk/government/publications/construction-sector-deal> (accessed 22 November 2018).
- NEC (2018) NEC4 Alliance Contract: Guidance and Flow Charts, available at: <https://www.neccontract.com/NEC4-Products/NEC4-Contracts/NEC4-Alliance-Contract-ALC/NEC4-Guidance-Notes-Flow-Charts> (accessed 22 November 2018).

NEC in South Africa: an update



ANDREW BAIRD AND TREVOR GOVENDER

Most NEC clients in South Africa are those working on an ongoing portfolio of projects, the most notable being the continued expansion of the University of Mpumalanga in Nelspruit, Mpumalanga Province. Together with Sol Plaatje University in Kimberley, Northern Cape Province, a further R5 billion (£280 million) of additional facilities is planned to be delivered under NEC contracts at these two new NEC-procured universities over the next 5 years (see Issue 93).

Eskom, the national electricity supplier, has recently issued tenders under the NEC3 Term Service Contract for the provision of maintenance and outage repair services for boiler pressure parts and high-pressure pipework at various power stations. This contract is likely to be worth several billion

rand in value and for a service period of around four years.

However, the South African engineering and construction industry is currently in a major recession, with the government short of money and most of the government-owned entities making substantial losses and surviving only from state bailouts. These entities mainly use NEC for their procurement.

Providing best outcomes

Nevertheless, there are some major capital works on the horizon and the local NEC fraternity will be making every effort to ensure the collaborative style of NEC contracts provides best outcomes for these projects.

For example, the country's updated

Integrated Resource Plan 2018 was published in consultative form in August last year. This multi-billion rand electricity infrastructure development plan includes construction of new infrastructure as well as the maintenance and repair of existing infrastructure. It could provide much-needed relief for the industry in the long term provided it is approached and implemented responsibly.

Furthermore, president Cyril Ramaphosa has recently embarked on a drive targeting US\$100 billion inward investment over the next five years, including hosting a successful international investment conference in September last year.

NEC South Africa Users' Group

In the meantime, plans are still progressing for the establishment of a South African branch of the NEC Users' Group. This membership-based support service for local users will be led through the NEC UK office by Cheryl Waterman.

For further information please contact Cheryl Waterman at cheryl.waterman@neccontract.com

NZ arts hub restoration switches to NEC4

SIMON FULLALOVE EDITOR

The Arts Centre te Matatiki Toi Ora, a complex of 23 mostly heritage-listed buildings on a 2.3 ha site in central Christchurch, New Zealand, is using NEC4 contracts to procure the second phase of a NZ\$290 million (£150 million) post-earthquake restoration.



All primary consultants for the stage two works were engaged last summer under an NEC4 Professional Service Contract, including NEC project manager RCP. Others include Holmes Consulting Group (structural), Powell Fenwick Consultants (mechanical and hydraulic), Aurecon (electrical and communications), Rhodes and Associates (quantity surveying) and Insignis (programming).

Leighs Construction has been awarded the stage two works under an NEC4 Engineering and Construction Contract Option C (target contract with activity schedule) and started at the beginning of 2019.

▲ A new 33-room boutique arts hotel and rebuilt observatory tower will form part of the NEC4-procured stage-two restoration of the Arts Centre te Matatiki Toi Ora in Christchurch, New Zealand

Work released in packages

According to project manager Ben Harland of RCP, 'The flexibility of NEC has allowed us to progressively release the stage two works in packages as the scope is suitably defined, and introduces best-practice processes for managing the inevitable changes associated with this type of project.'

The arts, culture, education and creative-industries centre, which has occupied the gothic-revival-style former University of Canterbury buildings since the 1970s, closed to the public in 2011 due to severe earthquake damage. It gradually re-opened from 2016 following stage one works, which were carried out by three contractors (including Leighs Construction) using a mix of cost-reimbursable, measure-and-value and fixed-price NZ\$ 3910:2003 and 2013 contracts.

Stage two works involve restoring and converting the blocks that contain the observatory and former engineering, physics and biology buildings. These buildings will feature a new multi-purpose events centre, a 33-room boutique arts hotel and a restored 1896 observatory tower. The stage two works are expected to be completed by the end of 2021. ○

£9bn NEC4 roads awards

SIMON FULLALOVE EDITOR

Highways England has awarded nearly £9 billion of NEC4-based framework contracts for delivery of major motorway and A-road projects in England. Following a procurement process started in January last year (Issue 90), six-year framework agreements were signed with 13 contractors in November last year covering

eight regional lots worth a total of £8.7 billion.

All projects in the frameworks, most of which will be for conventional road widening and junction improvements, will be carried out under the NEC4 Engineering and Construction Contract Option C (target contract with activity

schedule). Known as the 'regional delivery partnership', the new framework agreements replace the £5 billion NEC3-based 'collaborative delivery framework' launched in November 2014 (Issue 70).

NEC Users' Group gold members Balfour Beatty, Bam Nuttall, Costain, Galliford Try and Skanska all picked up two of the five largest lots, each of which is shared with one or two other partners. Other successful Users' Group members included Farrans Construction, Geoffrey Osborne and Graham Construction. ○

NEC-procured Lima 2019 venues running on time

SIMON FULLALOVE EDITOR

The main NEC-procured athletics, swimming and cycling venues for the Lima 2019 Pan America and Parapan American Games are on schedule for completion in March 2019, four months before the opening ceremony on 26 July.

Peruvian contractor Cosapi won the PEN 500 million (£115 million) project for the venues at Videna in December 2017 under an NEC3 Engineering and Construction Contract (ECC) Option F (management contract). The

project includes a new 15 000-seat athletics stadium, aquatics centre and sports centre with retractable stands, plus enlarging and roofing an existing velodrome.

The Peruvian government appointed the UK Department for International Trade in April 2017 to provide support on the delivery of around £400 million of venues and facilities for the games using NEC contracts. DIT engaged Arup and Mace to provide technical and construction management support respectively.

Other venues clusters are being delivered at Villa Maria del Triunfo, Callao and Chorrillos, plus an athletes village at Villa el Salvador (see Issue 94). Lima 2019 president Carlos Neuhous Tudela recently confirmed that 95% of all works would be completed by March. ○



▲ NEC-procured Lima 2019 venues under construction at Videna showing (clockwise from top left) athletics stadium, sports centre, aquatics centre and velodrome

Collaborate

Connect

Celebrate

NEC Users' Group Annual Seminar
17 June 2019 - London
Register at:
www.neccontract.com/annualseminar19

Sellafield pilots outcome-based NEC contracts

SIMON FULLALOVE EDITOR

Decommissioning part of the UK's first plutonium plant is serving as a valuable pilot project for a novel NEC-based 'outcome-based contracting' (OBC) approach. The success of the project looks set to accelerate delivery of the UK's multi-billion NEC-procured nuclear decommissioning programme over the next 120 years.

The UK's Nuclear Decommissioning Authority (NDA) is using NEC3 contracts to deliver most of its £3 billion a year decommissioning work at 17 UK sites, £2 billion of which is spent at Sellafield. The OBC approach was developed by Sellafield Ltd, a publicly owned 'site licence company' responsible for safe remediation of the Sellafield nuclear site in Cumbria on behalf of NDA.

The £7 million OBC pilot project is for remediation of the Windscale Pile 1 east blower house. Completed in 1950, Pile 1 separated plutonium from spent nuclear fuel in an air-cooled graphite reactor but was shut down following a fire in 1957. Since then the building has served as office space. Accelerated demolition of the facility creates value for Sellafield Ltd by reducing associated future care and maintenance burdens as well as releasing the land for potential re-use in a heavily



congested area of the site.

The pilot project was let in June 2017 through Sellafield's NEC-based decommissioning delivery partnership framework to Cumbria Nuclear Solutions Ltd (CNSL), an alliance of James Fisher Nuclear, React Engineering, Shepley Engineers, Jacobs Stobbarts, Westinghouse Electric Company and WYG. Shepley is the lead contractor on the project and final outcome completion is scheduled for September 2019.

Defined outcomes

The project was let under an NEC3 Engineering and Construction Contract (ECC) Option A (priced contract with activity schedule) amended with 17 Z clauses for use as an OBC, with payments made on the achievement of outcomes defined in the works information. In all other respects the contract was unchanged from the standard NEC wording.

According to John Grace, OBC portfolio manager, 'The outcomes are driven by benefit to the customer rather than resource or monetary value. As such OBC incentivises the supply chain to deliver real business value to us rather than completing an amount of work. Ultimately it will enable us to afford accelerated remediation, meaning we can retire the care and maintenance burden for radioactive buildings earlier than originally planned.'

Grace says it was essential that transferring the risk of achieving outcomes was done in a way which was fair and transparent, as making the supply chain accountable in this way was a major

◀ Remediation of the Windscale Pile 1 east blower house at Sellafield is serving as pilot project for a novel NEC-based 'outcome-based contracting' approach

cultural and contractual shift from Sellafield's 'business as usual' approach. 'A substantial amount of time was therefore invested in early engagement and consultation with contractors to discuss the contract, which led to a smooth tender process and acceptance of the contract terms.'

The pilot project is being carried out in two distinct phases with a break in between. Phase 1 was solely for outcome 1, which was to design an acceptable remediation solution. This was delivered on time in October 2017 and led to the contractor receiving an order to proceed to phase 2.

Outcome 2, the retiring of care and maintenance burdens, was completed ahead of schedule in March 2018. The remaining outcomes, including reducing radiation risk, removing demolition waste and achieving 'final end state' are on course, with final outcome completion expected in September 2019.

Vital component

Grace concludes, 'The use of NEC in an innovative and highly collaborative way has proved to be a vital component in the success of this pilot project. Risks were identified and mitigated collaboratively during phase 1 and costs were agreed on a fully open-book basis.'

'The NEC requirement to work in a "spirit of mutual trust and co-operation" led to a high degree of mutual trust and openness being developed, with co-location of the client and integrated project team from phase 1 onwards. Subsequent risks were dealt with quickly through effective use of NEC early warnings and risk reduction meetings.'

'The learning has been so positive that other significantly larger and higher value remediation projects are now being prepared using the same contract model. The OBC approach, enabled by the NEC form of contract, is therefore revolutionising the way Sellafield Ltd delivers its multi-billion-pound portfolio of remediation works to the benefit of all stakeholders.'

In recognition of its pioneering work, Sellafield Ltd won the global NEC Contract Innovation through Additional Clauses Award in 2018. ○

Northern Ireland campuses

SIMON FULLALOVE EDITOR

Southern Regional College in Northern Ireland is delivering three new state-of-the-art campuses between 2018 and 2022 using NEC contracts. The College won the NEC Client of the Year in 2018 for its innovative use of the contracts to deliver a wide range of curriculum innovations and digital assets in addition to the physical buildings.

With 34 000 students and over 900 staff, Southern Regional College is the largest further and higher education college in Northern Ireland outside Belfast. The three new campus developments will replace four of its six campuses across County Armagh and County Down.

The College appointed WYG and Kennedy Fitzgerald Architects as a single integrated consultancy team for all three projects under the NEC3 Professional Services Contract (PSC)

option A (priced contract with activity schedule). WYG's roles include project manager, quantity surveyor and civil, structural, mechanical and electrical engineering designer.

Felix O'Hare & Co. Ltd was awarded the contract for the £35 million Armagh campus project in November 2017 under an NEC3 Engineering and Construction Contract (ECC) Option C (target contract with activity schedule). Due for completion in early 2020, the 14 000m² building will provide specialist accommodation across a number of curriculum areas.

ECC Option A (priced contract with activity schedule) will be used for the 4500m² Banbridge campus building, which will include a new design centre when completed in mid-2020. This will be followed by a £45 million building at Craigavon to replace existing

campuses at Lurgan and Portadown by 2022, again procured using ECC.

Digital model

The College has set a goal to create a digital model of its entire estate by 2022, including the three new buildings. In addition to supporting construction, operation and maintenance, the College wishes to use the digital model for ongoing educational purposes. The consultancy team was therefore briefed to deliver the new buildings in line with the UK government's Building Information Modelling (BIM) 'Level 2' standard.

NEC project manager Darren Price says, 'The challenge was to deliver both physical and digital assets in a way that would improve asset management but also form part of the educational curriculum. We also wanted to provide opportunities for staff, students and the wider community to inform the delivery process and benefit from any lessons learned.'

He went on to say, 'The requirements of the UK Construction Industry Council's Building

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Information Modelling (BIM) Protocol were incorporated in the ECC contracts and works information to support BIM Level 2 delivery. We also included a Z clause to allow delivery of the models to be used as educational tools by the college. This was completed by extending the definition of the protocol term "permitted purpose" to mean any educational purpose.'

Educational engagement

A number of bespoke clauses were included in the ECC works information to get the contractors to engage with the College's educational activities. 'The three projects are to be live learning tools during their design, construction and in-use phases. As part of this ethos, we specified college and stakeholder engagement as core contractor requirements,' says Price.

For example, the contractors have to deliver up to four class talks and presentations per term on agreed project-related construction topics, set project-based learning topics for student groups based around the works and their delivery, and arrange site visits for College staff and students.

The contractors are also required to engage and supervise groups of College trainees undertaking construction skills apprenticeships to carry out parts of each building. They have to use students' graphic designs and/or artworks in the new buildings, including 50 m² of wall-applied vinyls. In addition, drone footage, time-

lapse videos, 360° images and augmented reality signboards need to be provided for use in multi-media courses.

Innovative delivery

The ECC works information also identified a number of innovation deliverables required by the contractors. 'For example, we require the contractors to link the digital design model directly to their site construction processes. We also want to see programmes and costing information integrated with the 3D digital models, in other words "4D" and "5D" BIM,' says Price.

Contractors are required to use augmented reality to visualise, communicate and co-ordinate parts of the works, and operatives need to use wearable technology to gather and/or share data. Contractors are also expected to adopt modern methods of construction such as off-site fabrication and emerging techniques and equipment.

Further innovation initiatives can be agreed and instructed as changes to the works information as the projects progress. The aim is to incentivise the contractors to partner with the College in investing in innovation delivery as part of the projects.

Price concludes, 'Overall, the promotion of project ownership and partnering is consistently threaded through the ECC contracts, from the pain-gain share ranges

and percentages entered for the target option used, to the shared site accommodation on the ground. We have also encouraged contractors to use incentivisation rather than penalties in their supply chains.'

Southern Regional College chief executive Brian Doran comments, 'Winning the NEC Client of the Year Award is testament to the highly skilled, dedicated and talented delivery team who are driving our ambitious new build strategy to create world-class educational facilities for the future. With the support and commitment of the Department for the Economy and all our partners, we are really proud to be bringing these pioneering projects to fruition.'



▲ Southern Regional College's £35 million Armagh campus is being delivered under an NEC3 Engineering and Construction Contract Option C

Engaging suppliers early with NEC4



DAVID HUNTER DANIEL CONTRACT MANAGEMENT SERVICES

Early contractor involvement (ECI) is a secondary option (X22) available for use with the NEC4 Engineering and Construction Contract (ECC). The parties enter into a single contract to develop and agree the scope and prices before advancing to the construction stage.

Since being championed by Highways England almost two decades ago, engaging early with suppliers has become an essential part of the procurement strategy, particularly for complex high-value infrastructure projects where multiple stakeholders and constraints exist. Many NEC Users' Group members now use ECI.

Use of option X22

Option X22 is drafted for use only with ECC Option C (target price with activity schedule) and ECC Option E (cost reimbursable contract). This procurement strategy reflects the open-book, two-stage approach advocated by the UK Government Construction Strategy 2011–15.

Clients wanting to engage in ECI when using the other main options may use the NEC4 Professional Service Contract (PSC) or NEC4 Professional Service Short Contract (PSSC).

Alternatively, amendments could be made to option X22 maintaining a single contract approach, but great care should be exercised when making any changes and specialist advice should be sought.

An ECI clause for use with NEC3 ECC as a Z clause was published in January 2016. The NEC3 and NEC4 versions of the ECI clause have some

small, but not insignificant, differences. Clients wishing to use ECI with NEC3 may wish to adopt the wording of option X22 from NEC4, making the appropriate changes to align it with NEC3 drafting style and content.

Two-stage approach

Option X22 provides for two stages, the details of which are set out by the client in the scope. Stage one is the pre-construction ECI phase, with development of the scope, detailed design and agreement on price. Stage two is the construction phase, with completion of any remaining detailed design.

During stage one, payment follows the same rules of defined cost plus fee, as stated in the main option clause, including the contractor's key persons identified in contract data part two. The contractor provides regular forecasts of the total defined cost for stage one. For ECC Option C, the price for work done to date during ECI is included in the activity schedule (X22.3(9)) and added to the target price.

At the end of stage one, the client makes a decision whether to proceed to stage two and, if so, the project manager notifies the contractor. The client may decide not to proceed for any reason, for example failure to gain planning approval. Not proceeding to stage two is not a compensation event or one of the reasons stated in the termination table (clause 90.2) for termination of the contractor's obligation to provide the works.

Before the notice to proceed to stage two is issued, matters including changes to the budget and the price for the works must be agreed. If a notice to proceed is not given, the project manager issues an instruction removing the stage two works from the scope. The client may decide to have the construction work (stage two) performed by another contractor.

Budget, project cost and incentives

The budget (X22.1(1)), stated in contract data part one, is an amount declared by the client and used to compare against the project cost for assessment of the budget incentive. This means the client's costs for delivery of the project and not just what is paid to the contractor may be included, such as land acquisition, diverting services and consultants' fees. Certain events, such as changes to the client's scope, may give rise to changes to the budget.

When setting parts of the budget which are not amounts payable to the contractor, the client will need to consider the accuracy of estimates and what influence the contractor may have in its out-turn cost. Involvement by the contractor at project inception will increase opportunity for the contractor to influence project costs. However, the client will need to decide when it is appropriate to enter into contract and commence ECI, taking account of how developed the client's requirements are.

The project cost represents the total amount incurred by the client from payments made to the contractor and others for the items stated in the budget. During the ECI and construction stages, the contractor is responsible for preparing forecasts of the total project cost in consultation with the project manager (X22.2(5)).

If the project cost on completion of the whole of the works is lower than the budget, the contractor is rewarded with a budget incentive

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payment. If Option E has been chosen and the budget is exceeded, the contractor has no liability for the additional cost. However, other liabilities such as delay damages may apply.

ECC Option C provides an incentive to control and reduce the stage two construction costs using the share ranges and contractor's share percentage (clause 54). This incentive is different to the budget incentive as the target price is based initially on the contractor's commercial offer at tender and is subject to change during ECI.

The impact that the contractor share percentages and ranges may have on behaviours during the ECI phase needs careful thought. Whilst the ECI phase provides for design development and improved cost certainty, an unequitable share arrangement may disincentivise the contractor to reduce the target price during the ECI phase.

Programme and completion

The completion date for the whole of the works is agreed by the parties at contract award before starting the ECI phase. The first accepted programme will also exist before the ECI phase if it has been included in contract data part two.

However, the requirements for submission and acceptance of the programme (coreclause3) applies during the ECI phase. Any changes to the accepted programme arising from design proposals submitted by the contractor must be submitted to the project manager for acceptance (X22.3).

Clients wishing to use ECI for negotiating an improved completion date will need to use acceleration (clause 36) or alternatively amend the contract.

Conclusion

ECI with NEC4 ECC can be seen as having a number of benefits. It means having a single

contract to deliver ECI and construction work in separate phases, allowing the client to make an informed decision when deciding to proceed with the construction phase. Entering into a contract with ECI involves the client in commercial decisions which require careful consideration.

The contractor is reimbursed its cost plus a fee for the work performed during the ECI phase but there is no obligation on the client to proceed beyond this. Collaborative working in the design and planning process provides an opportunity to manage risks associated with buildability and the client's budget being exceeded.

For Option C contracts, there is also a reduction of risk to the target price being exceeded, improving the chances of a financial win-win scenario for the client and contractor. Procurement for design-and-build target price contracts is made easier too.

How effective is your NEC cost-assurance?



PHIL JOYCE THE ORANGE PARTNERSHIP

NEC clients need to keep a close eye on costs when using 'open-book' target-cost and cost-reimbursable contracts. These include the NEC4 (and NEC3) Engineering and Construction Contract Option C (target contract with activity schedule), Option D (target contract with bill of quantities) and Option D (cost-reimbursable contract).

Many clients choose to outsource cost checking. However, the success of this is variable and depends on several factors, including professional audit qualifications, methodology and independence.

We have recently developed a free cost-assurance health check tool for clients (TOP, 2018). Based on frequently asked questions from our NEC clients in the nuclear, defence, water and transport sectors, it intended to be a simple health-check for NEC users to self-assess how effective their current cost-assurance provision is.

The most frequently asked questions are as follows.

Cost of cost-checking

Question

How much should I spend on cost checking in open-book contracts?

Answers

NEC clients on open-book contracts often do not know what they are paying for cost-checking, especially when using generalist auditors. Frequently the amount of money spent on cost checking can be hidden among a basket of activities. So, as a client, the first step is to isolate the cost of cost-checking so you can understand whether you are receiving value for money.

Once you have isolated the cost, in our experience overall you should not be paying more than 0.1% of the value of costs checked. However, in practice this may fluctuate from

project to project because assurance costs should vary in response to an agreed level of risk. Riskier projects and areas should attract more cost checking and therefore the effort will cost more.

If overall you are paying fees and internal costs of less than 0.1% of costs checked, and amounts are variable dependent upon an agreed level of risk, you are likely to be spending an appropriate amount.

Choosing an auditor

Question

What does best practice cost audit methodology look like?

Answer

There are three key criteria a client should look for. First, a formal methodology based on international auditing standards; second, qualified auditors; and third, independence.

To ensure consistency and a meaningful output, there should be a formal methodology which auditors follow. It should demonstrate how the audit work is planned, delivered, recorded, reviewed and reported on. The most robust approach is that set out in the International Standards on Auditing (ISA) (IFAC, 2018), which is accepted as best practice recognised throughout the world.

The methodology incorporates the identification and assessment of risks through understanding the NEC contract and its environment. To be meaningful this can often include a review of your NEC contractor's accounting system and an in-depth analysis of transactions taken from its accounting systems as well as a review of the contract and structured interviews with stakeholders.

The standards require a professionally qualified auditor to interpret and apply them. We often see people without appropriate auditing and assurance qualifications, for

example quantity surveyors or engineers, conducting a very basic 10% substantiation approach to audit. While this may provide a client with some confidence they are paying the right amount, it should not be relied upon and often misses significant issues.

Cost checkers should be free and be seen to be free of anything which may detract from their independence and ability to raise concerns. The existence of conflicts of interest will undermine cost-checking activities as any concerns may be suppressed.

If your cost-checking activity is based upon the ISA, which includes a risk assessment, and is it being conducted by independent, qualified auditors, then it should provide confidence you are paying the right amount.

Reasons for cost-checking

Question

What output should I expect from an audit of costs?

Answer

The purpose of carrying out cost checking is to provide enhanced confidence or assurance that amounts being charged by your NEC contractor are appropriate. A written report of the scope of work done and any findings backed up with evidence is the basis for delivering enhanced confidence or assurance that amounts charged are appropriate.

Common issues should be discussed and reviewed at senior level. Looking at a programme level, issues which arise consistently across different projects may be identified and dealt with appropriately.

Where an overstatement or understatement is identified, you should always expect to see an explanation for the reason behind that mis-statement. There should also be an offer of follow-up work to make sure that it will not happen again and that any overcharges have been taken out of future applications.

Potential savings

Question

How much do you generally find?

Answer

It varies considerably. It depends upon: the competence of your NEC contractor in

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FAQS

ROBERT GERRARD NEC USERS' GROUP SECRETARY

This is a selection of recent questions to the NEC Users' Group helpline and answers given. In all cases it is assumed there are no amendments that materially affect the standard NEC4 or NEC3 contract referred to.

When are the prices not reduced?

Question

We are the project manager on an NEC3 Engineering and Construction Contract (ECC) Option D (target contract with bill of quantities). Clause 63.2 says, 'If the effect of a compensation event is to reduce the total Defined Cost, the prices are not reduced except as stated in this contract'. Does this mean the contractor still gets paid the same as the original tendered cost and pockets the difference in profit? I understand this is an incentive to the contractor but, with no incentive for the employer, why would I agree to changing the works information (assuming there are no time benefits with the change – and which would belong to the contractor anyway and the employer would have to pay more to accelerate and benefit from the extra time)? And can you please explain what the exceptions, 'as stated in this contract' could be?

Finally, the contractor has suggested a change to the works information provided by the employer, which will reduce defined cost. I accept the change and wish to give an instruction changing the works information. Should I reduce the prices when notifying the compensation event, confirm that the prices will not be reduced or notify a compensation event and instruct a quotation to be submitted?

Answer

The logic of clause 63.2 is that there may be compensation events that occur that reduce the defined cost where the risk and reward should lie with the contractor. The obvious example is clause 60.1(12), where the physical conditions may be better than expected. The exceptions stated in the contract are to be found in the other sub-clauses of clause 63 set out in the main option specific clauses (as well as some of the secondary options), so see clause 63.10 in Options A and B and 63.11 in Options C and D.

You will see that generally the secondary

option clauses allow for the reduction if the event is an instruction to change the works information. The only exception to that is in Options C and D, when the instruction to change the works information resulted from a proposal by the contractor which the project manager accepted – see the first bullet of clause 63.11 and compare it with the same bullet in clause 63.10.

With a risk-sharing contract, such as Options C or D, the contractor should be able to share in the benefits of the cost savings that it has proposed through the share mechanism set out in clause 53. You should remember that in these options the value of the compensation event only changes the 'target' and not what the contractor actually gets paid for carrying out the work, and therefore the contractor will never 'pocket the difference', as you suggest. Instead it would be the employer that did the 'pocketing'.

Project managers and subcontracts

Question

We are a subcontractor on an NEC3 Engineering and Construction Subcontract (ECS) using option B (priced contract with bill of quantities).

First, where we have submitted compensation event quotations, the project manager has requested a level of detail and substantiation (in some cases) which is extremely time consuming and therefore costly to provide. As these costs cannot be recovered as part of the compensation event, we are faced with a commercial loss before the compensation event is implemented (and when the compensation event is not implemented). We are not aware of any mechanism in the contract to protect us from what we consider the unreasonable demands of a project manager to provide such a degree of substantiation. Can you offer any advice in these circumstances?

Next, the project manager has (in some cases) made their own assessment of our compensation event quotations, which again, leave us at a commercial loss. Our understanding of our subcontract (and the standard provisions of the NEC3 ECC is that we cannot refuse to undertake works that are a compensation event which has been (in our view) unreasonably and

arbitrarily assessed by the project manager. We are not aware of any mechanism in the contract to protect our commercial position, apart from following the dispute procedures under the subcontract. Can you offer any advice in these circumstances?

Finally, are we able to decline to carry out an instruction issued by the project manager (or not submit a quotation for a compensation event quotation) if we do not believe we have the skills or resources to complete the work in the timescale indicated by the project manager?

Answer

If you are a subcontractor under the ECS, your contact is with the contractor and it, not the project manager, manages your contract. The contractor must satisfy itself as to your quotation. What the project manager does in the contractor's contract with the client is, to a large extent, irrelevant.

The wording of clause 63.1 in the ECS makes it clear that nearly all compensation events will be assessed prospectively, that is based on forecast defined cost, not retrospectively, based on actual defined cost. Therefore there should not be a lot of 'detail' of past costs to go into.

The contractor is limited in the way it can deal with your quotation if it is not happy with it. The contractor can either not accept it and instruct you to provide a revised quotation, giving reasons, or it can tell you it will make its own assessment. The contractor cannot ask for more information and you are not required to provide it. This has to be carried out within a stated timescale (see clauses 62.3 and 61.4). If the contractor does not do so within that timescale, then you are able to force it to do so, see clauses 62.6 and 64.4. All of this also applies to the project manager in the main contract, though the timescales are different.

As with all other subcontracts (and contracts) in the construction industry, you are required to obey any instruction that the contractor is entitled to give you under the contract. You are required to put the instruction into effect immediately, that is before you provide quotations (see the last sentence of clause 61.1 and clause 27.3). The protection you have against an incorrect assessment being imposed on you is the dispute procedure set out in the contract. This is often successfully used by subcontractors against their contractor.

With regard to your last question, the procedures and timescales involved in assessing compensation events are set out in the subcontract and the contractor is not able to issue an instruction changing these: you are both bound by these timescales.

As for the timescales involved in carrying out the newly instructed work, the contractor cannot dictate those either. If the additional work leads to delays in the planned subcontract completion, as shown on your accepted programme, then the subcontract completion date is extended by that period of delay as part of the assessment of the compensation event, see clause 63.3. ○

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accounting for costs; the clarity of the NEC contract – often the application of Z clauses can muddy the waters and mean that what constitutes defined costs are not clear; the level of collaboration achieved by the parties; the circumstances of your contractor; who has previously audited the contract and how

qualified and effective they were; and the level of risk in the project.

On average we identify overstatement of costs of 0.7%, however this can vary to between 0.1% to 30%.

References

IFAC (International Federation of Accountants)

(2018) The Clarified Standards available at: <https://www.iaasb.org/clarity-center/clarified-standards> (accessed 22 November 2018).
TOP (The Orange Partnership) (2018) Cost assurance health check, available at: <http://healthcheck.theorangepartnership.co.uk/Capitalprogrammesgeneric> (accessed 22 November 2018). ○



ICE Register for Accredited NEC Professionals

Below are new entrants on the Institution of Civil Engineers (ICE) Register for Accredited NEC Professionals at necprofessionals.ice.org.uk. The register recognises the technical and practical skills required of project managers and supervisors using the NEC4 or NEC3 Engineering and Construction Contract (ECC) and service managers using the NEC4 or NEC3 Term Service Contract (TSC). All individuals on the register have completed the relevant accreditation programme and successfully passed the stage 1 and stage 2 assessments.

Accredited NEC4 ECC Project Managers

Dylan Parry
Alex Russell
Steve Wong
Garth Wright

Fraser Dick
Rex Fan
Alan Kam
Jim Ko
Ken Kwok
Ruth Leung
Gregory Lo
David Norman
Graeme Riddell
Alex Russell
Mark Salisbury
Jonathan Shaw
Brendan Slattery
Francis Suen
Samuel Tam

Benjamin Taylor
Gail Thomson
Mark Wong
Edward Wong

Accredited NEC3 ECC Supervisors

Neil Hosford
Gabi Hazelden
Joe Lintonbon
Denis McElroy

Accredited NEC3 TSC Service Managers

Sally Coldrick
Ronald Li

NEC DIARY

07 January	NEC3: ECC Supervisor Accreditation	Hong Kong
14 January	NEC3: ECC Project Manager Accreditation	Hong Kong
15 January	NEC3: ECC Project Manager Accreditation	Hong Kong
22 January	NEC3 to NEC4 ECC Project Manager Accreditation extension	London
29 January	NEC3: Introduction to the PSC	London
30 January	NEC4: Introduction to the ECC	London
05 February	NEC3: Introduction to the ECC	London
06 February	NEC3: ECC Supervisor Accreditation	London
13 February	NEC3 to NEC4: TSC Service Manager Accreditation extension	London
25 February	NEC3: ECC Project Manager Accreditation	Hong Kong
26 February	NEC3: ECC Project Manager Accreditation	Manchester
27 February	NEC3: ECC Project Manager Accreditation resit	London
05 March	NEC3: ECC Project Manager Accreditation	Bristol
07 March	NEC3: Practical Application of the ECC	London
18 March	NEC4: ECC Project Manager Accreditation	Hong Kong
20 March	NEC3: Introduction to the ECC	Birmingham
21 March	NEC3 to NEC4 ECC Project Manager Accreditation extension	Birmingham
22 March	NEC3 to NEC4: ECC Project Manager Accreditation extension	Hong Kong
25 March	NEC3: ECC Project Manager Accreditation	Hong Kong
25 March	NEC3: ECC Project Manager Accreditation	London

Key: ECC – Engineering and Construction Contract, PSC – Professional Service Contract, TSC – Term Service Contract

NEC Users' Group members

A warm welcome is extended to all new members, highlighted in **bold** in the membership category lists below.

- PLATINUM**
- AVEE
 - Birmingham International Airport Limited
 - Department for Transport
 - Dounrae Site Restoration Ltd
 - General Nuclear International Ltd
 - Geoffrey Osborne Ltd
 - Gloucestershire County Council
 - High Speed Two (HS2)
 - Highways England Co Ltd
 - Inogy Renewables UK Limited
 - Inovyn ChlorVinyls Ltd
 - Lafarge Tarmac
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 - Belfast City Council
 - Bird & Bird LLP
 - Bolton Metropolitan Borough Council
 - Bristol City Council
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 - Buckingham Group
 - Contracting Ltd
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 - Cavendish Nuclear Ltd
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 - J Murphy & Sons Ltd
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 - Skanska Construction UK Ltd
 - Springfields Fuels Ltd
 - Synergie Training
 - Telford & Wrekin Council
 - The British Museum
 - The Coal Authority
 - The Orange Partnership
 - The Spencer Group
 - UK Power Networks (Operations) Ltd
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 - VVB Engineering Ltd
 - Wanwickshire County Council
 - Wood
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 - Yorkshire Water Services Ltd
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 - Beale & Company
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 - Bournemouth Borough Council
 - Brink Management & Advies
 - BAM Nuttall
 - Belfast City Council
 - Bird & Bird LLP
 - Bolton Metropolitan Borough Council
 - Bristol City Council
 - Brodies LLP
 - Buckingham Group
 - Contracting Ltd
 - CampbellReth
 - Canal & River Trust
 - Cavendish Nuclear Ltd
 - CCS Group PLC
 - CEVA
 - Central Procurement Directorate
 - City Fibre
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 - CMS Cameron McKenna
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 - CNS Planning Ltd
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 - Norfolk County Council
 - Northern Ireland Water
 - Northumbrian Water Limited
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 - The Spencer Group
 - UK Power Networks (Operations) Ltd
 - Vinci Construction UK Limited
 - Volker Services Ltd
 - VVB Engineering Ltd
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 - Wood
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