

Better Management (Risk and Change) through NEC Contracts in Hong Kong

Chu Hoi TUNG¹, Shoeb Ahmed MEMON^{2*}, Arshad Ali JAVED³

¹ Faculty of Science & Technology, Technological and Higher Education Institute of Hong Kong, Hong Kong, E-mail address: hoitungchu@gmail.com

^{2*} Faculty of Science & Technology, Technological and Higher Education Institute of Hong Kong, Hong Kong, E-mail address: samemon85@vtc.edu.hk

³ School of Economics and Finance, Massey University, New Zealand, E-mail: a.a.javed@massey.ac.nz

Abstract: Project delays, cost overruns, and disputes are becoming a norm for the construction industry in Hong Kong. Researchers argue that the inability of traditional contracts to manage risk and associated changes are perhaps the main points of contention. The Institution of Civil Engineers published a new engineering contract (NEC), NEC4 Suite of Contracts in this to facilitate better risk management through collaborative culture in construction projects. NEC aims to increase the chances of project success through its flexible nature of contracts, 'simple' and 'clearly written' documents and provision for the incentive by adopting a better management approach. This paper focuses on traditional and NEC contracts to compare risk management and change management aspects. Through literature review and preliminary interviews with three industry professionals, the paper is exploring how a change in traditional contracts can recuperate from disaster. Our interviewees in this work have extensive experience in traditional as well as in NEC contracts. The results suggest a proactive risk management provisions in NEC contracts does make a difference to avoid later escalation of issues. Whereas, management of change helps streamline all identified issues through a structured process without going in mediation or litigation. NEC, with its new approach to collaborative working, allows partners to be vigilant, yet gratifying in the project process.

Key words: New engineering contracts, collaborative working, traditional contracts, project success.

1. INTRODUCTION

Delays, cost overruns, and disputes are perhaps the most common terms we hear about construction projects in Hong Kong and worldwide. The manifestation of this terminology is so common that even unskilled workers on site are well aware of them. One of the reasons pointed by the researchers is the adoption of traditional contracts in project procurement, which does not allow necessary flexibility.

Aim of traditional contracts is to allow different project partners, i.e., organizations to work together for constructing a facility within specific rules and obligations Walker and Rowlinson [1]. However, the blurred lines of risk allocation and change management in traditional contracts develop severe competition among project partners to safeguard their interest, leaving behind project objectives. Here we use a general term 'traditional contracts' to refer to most of the contracts that do not allow flexibility for the project partners to resolve issues amicably, e.g., general construction contract in Hong Kong. It is well understood that these type of contracts are designed to follow a structured approach that does not cater much of the needed flexibility to overcome the uncertainty project might face in the construction process. There are many examples of such contracts around the globe, which triggered a new research direction into collaborative contracting and later started a development into new engineering contract by Institution of Civil Engineers (ICE).

NEC with a family of flexible contracts enhances collaboration and success for all the project partners. Family of NEC4 contracts consists of fourteen individual contracts for managing the supply chain in the construction process Mitchell and Trebes [2]. In this, every single contract reflects the core philosophy of mutual trust and cooperation, together with specific project needs. It provides a customized solution for each project, yet maintaining a general principle of fairness. Two key aspects that differentiate NEC from most of the traditional contracts are risk management and change management procedures. Although risk and change management are connected through early warning system in NEC, it entails a powerful signal for project partners to feel secure in any of the unforeseen situations. This is where most of the traditional contracts are blank or blurred because most of the change events in the project execution stage involve substantial risk, which deviates attention from collaborative philosophy to self-centred one.

Thus, the paper focuses on the traditional and NEC contract to compare risk management and change management aspects. A comparison of both would help understand the essential characteristics, which facilitate NEC adoption decision for the clients. Traditional contracts rarely incorporate comprehensive pre-construction risk management measures (early warning system, etc.). Instead, deviate risk from one partner to another without considering appropriate management of those risks. It creates a fundamental issue with traditional contracts because delivery models are the one to provide a formal mechanism for risk allocation and management Osipova and Eriksson [3].

2. LITERATURE REVIEW

2.1. Traditional Forms of Contract

Traditional contracts usually follow strict guidelines for the project partners to fulfil their obligations. There is very little to no room for any change in the contractual responsibilities of the partners. Architects and other consultants are responsible for reflecting clients' ideas into workable drawings Ojo et al. [4]. The contractor then constructs the facility. The level of rigidity promoted by these contracts enables all the partners to focus on arm length relationship because all the partners are trying to achieve their separate objectives in the project. The linkage of traditional contracts with overall project success and the collaboration has been in research discussions, and there are two divergent views; the first view contends that the traditional contracts can ensure project success if the project partners focus on the social side of the projects Kadefors [5] and Pinto et al. [6]. The second view presents an opposing picture of the story to focus on enforceable measures to ensure project success. Both of the directions have contributed much in the general understanding of the construct of project success. However, it is evident now that traditional contracts are unable to meet the increasing demand of clients, adjust with more complex projects and collaboration among project partners. Thus, it is argued for the adoption of collaborative contracts in project delivery Memon et al. [7], Harper and Molenaar [8], and Ke et al. [9].

2.2. New Engineering Contract

New engineering contract (NEC) as a new family of contracts developed by the Institution of Civil Engineers United Kingdom (U.K.) to provide a contractual arrangement for engineering projects. NEC has been in practice from quite a while. However, it could not receive much attention from the industry. Until, Sir Michael Latham, who reviewed NEC as a part of his work for the U.K. construction industry. He termed it as the most modern contract to address issues in a project Latham [10]. Later, various projects in the U.K. and several other countries adopted one of NEC contracts in the delivery of projects. The Government of Hong Kong started using NEC in 2009 when the Drainage Services Department awarded the contract of "Improvement of Fuk Man Road Nullah in Sai Kung" project. It was a successful pilot project, completed six months ahead of time with a saving of 5% of the contract sum Drainage Services Department [11]. After completion of the project, various public and private sector clients in Hong Kong adopted NEC such as Development Bureau, Hong Kong Jockey Club. Since NEC is a new approach in Hong Kong. Development Bureau of the Hong Kong Government has developed practice notes in order to facilitate project partners for informed decision making in the project process Development Bureau [12].

Table 1: List of projects adopted NEC in Hong Kong adopted from the Construction Industry Council [13]

Contract Awarded in	Project Title
2009	Fuk Man Road Nullah Improvement Project in Sai Kung
2010	Retrofitting of Noise Barriers on Fanling Highway
2012	Happy Valley Underground Storm Water Storage Scheme Design and Construction of Tin Shui Wai Hospital Fresh Water Supply Improvement Project to Cheung Chau Management and Maintenance of High-Speed Roads in New Territories East and Hong Kong Island
2013	Improvement Works at Mui Wo, Phase 1
2014	Photovoltaic System at Siu Wo Wan Sewage Treatment Works
2015	Tseung Kwan O – Lam Tin Tunnel – Road P2 and Associated Works
2016	<ul style="list-style-type: none"> • Secondary School at Kai Tak Development • Central Kowloon Route
2017	<ul style="list-style-type: none"> • Cross Bay Link, Tseung Kwan O

This new form of contract focuses on three key elements to allow project partners to work effectively. These principles set guidelines for the partners to trust each other. Simplicity and clarity provide an essential guide for the client to write contract documents without any ambiguity. Whereas, later two principles focus on working with good intentions to protect self and partners' interest in a project.

Simplicity and Clarity

NEC contract provides clarity of the information to all project partners through clearly written all contract documents in simple language Mitchell and Trebes [2]. Therefore, NEC reduces chances of information asymmetry among project partners in comparison to traditional forms of contract Construction Industry Council [5]. 'Simplicity and clarity' are evident from clear roles & responsibilities, risk allocation, and procedures suggested adopting in any occurring situation Broome and Hayes [14]. Projects partners without any formal knowledge of NEC may be able to understand contract easily because of shorter clauses NEC [15].

Flexibility

The concept of flexibility in NEC is evident in its family of contracts. It is often confused that the NEC is a single contract providing solution for every problem in projects. NEC does provide a solution to most of the problems in projects but with its family of contracts. Thus, providing flexibility for the client to adopt any form of NEC contract based on a specific project. NEC offers a structured approach to adopt various kind of options together with core clauses; which are based on principles of mutual trust and cooperation. Project partners based on client requirement and agreement between partners adopt secondary options. This provides the most suitable combination of contract clauses for a project. The flexibility of NEC is also evident from the adoption in the Hong Kong construction industry, where NEC is adopted together with standard amendments in the contract (commonly known as Z clauses). These clauses used in addition to core clauses, main option, and secondary option. Dispute resolution approach in Hong Kong NEC is different from the standard approach in NEC. Standard amendments in NEC contract in Hong Kong contain dispute resolution methods to be followed in any Hong Kong NEC project Development Bureau [16].

Stimulus to Good Management

NEC characteristics involve the precise allocation of responsibility within a project setting. It provides structured procedures to adopt in managing change, notifying partner for any possible issue with good intentions. It improves partner's confidence to work collaboratively. In addition to this, NEC provides sanction for the partners to utilize in the time of need but are suggested to use as a last resort

3. RESEARCH DESIGN

Researchers adopted a two-step approach to address the aim of this study. In the first step, literature review on traditional and NEC contracts helped to formulate critical areas in this study. These aspects are risk management and change management. Later, these two aspects are substantiated by interviews with three industry professionals having experience in traditional as well as in NEC contracts in Hong Kong construction industry. All three participants were asked about the difference between risk management and change management in both contracts using open-ended questions.

Table 2: Interview Participants

Interview Participants	Type of Organization	Project
Project Engineer	Contractor	Sham Mong Road Footbridge Project
Engineer	Client	Happy Valley Underground Stormwater Storage Scheme
Engineer	Client	Sha-Tin Signature Project Scheme.

4. RESULTS

4.1. Risk Management

Risk management in traditional contracts

As mentioned in earlier sections, traditional contracts are designed to deviate risk from one or more partners to the contractor (in most cases). Thus, the issue of improper risk allocation is central in traditional contracts Walker and Rowlinson [1]. Poor risk allocation and management in traditional contracts is evident from the number of changes in the project program (variation orders). Because of unrealistic project program submitted at the bidding stage, the various issues may increase the risk of delays and cost overrun Mitchell and Trebes [2]. As the contracts would not incorporate any change at a later stage, all the anticipated risks and associated consideration are made while submitting bid documents. Any change in the state of the project during execution would call for a variation order from the contractor, thus start of a never-ending process of self-centred behaviours. In practice, the contractor at the bidding stage does not have adequate time to prepare a comprehensive program in traditional contracts together with risk considerations. They rely on post-contract contingency measures to mitigate risk in the construction phase Marco et al. [17]. However, these post-contract contingency measures may not help in changing some of the fundamental risk allocation issues agreed in the contract.

This is why traditional contracts are not suitable for developing, adopting a useful risk strategy in projects Robert [18]. These considerations made traditional contracts vulnerable to delays, cost overruns, and disputes in projects.

Risk management in NEC

NEC risk management approach allows project partners to manage risk efficiently and effectively. Risk management begins with early identification of possible risk areas in risk register by project partners in contract data one and two Mitchell & Trebes [2]. Thus allows identification, inclusion, and later discussion of any concerned area for project partners. This plays a foundation for building trust among project partners. Further, early warning meeting/risk reduction meeting discuss issues identified at length for a possible compensation event. According to the NEC clause 15.1, project partners are required to adopt early warning system so that they can notify each other on the risk related to time, cost and quality Mitchell and Trebes [2]. Early identification of possible risk is motivated by the substantial benefits/losses project partners can earn in the process Robert [18]. All three interview participants from three different NEC projects in Hong Kong mentioned the usefulness of early warning and risk reduction meetings (often known as early warning meetings in NEC contracts) to mitigate risk before they become points of contention for project partners and the project. In the first project, one interviewee pointed out

that concrete supply was one of the risks identified by the project partners — this initiated risk reduction meeting for consideration of the issue for possible actions. After a lengthy discussion during risk reduction meeting, project partners decided to extend the project completion date. The second issue arose in project two due to the difference in ground conditions (underground utilities such as water supply, draining, and cable wires) were different from the drawings provided to the contractor. By following the NEC early warning system, the contractor was able to draw attention from the project manager. The early response from the project manager and associated design team on the issue lead contractor work with enthusiasm because the contractor felt project partners cared about them. The last project involved a critical deadline in opening a thematic lighting system. Contractor feared a delay in meeting the project deadline because there was a delay in project initiation. Through an early warning notified by the contractor, project partners meet a crucial deadline by using a temporary cable system.

Summary – Risk management

Risk management in NEC encourages parties to think out of the box to solve problems before they become a point of dispute Patterson [19]. It allows them to limit the issue to a more controllable one in terms of time and cost to the project. A systematic approach in NEC for risk management ensures due diligence of all the risk through early warning and risk reduction meetings. In comparison to traditional contracts, repeated interaction for risk reduction meetings and a manifesto for achieving the best outcome of the project ensures early resolution for the risks Akintan and Morledge [20].

4.2. Management of Change

Management of change in traditional contracts

A change in the current state of the project or activity results in variation order, which would require additional costs and time for the project. Traditional contract manage change by notifying engineer to claim on additional cost and time Besaiso [21]. Since the change is linked to the final contract sum, it requires a structured procedure to manage. Unclear information in traditional contracts leads contractors to focus on claims to recover the additional cost in the project, thus focusing on the self-interest of partners Cunningham [22]. These increased costs are recoverable through claims usually with a higher rate in bills of quantity submitted to recover as much as the possible. This is why most of the claims end up in time-consuming disputes and legal cases among the contractual partners because there are no such formal sanctions to these 'action and response' periods for the claims in traditional contracts Garcha [23].

Apart from matters related to the cost of the project, time plays an essential role in the management of change in traditional contracts. Because the traditional approach in claim management involves lengthy discussions without assigning a particular timeline for the decisions, increases the likelihood of disputes, Tochaiwat, and Chovichien [24]. This is why construction claims in traditional contracts may increase project duration significantly.

Management of change in NEC

Management of change in NEC is carried with compensation events. It is a formal approach for dealing with any change that might result in an extension of time or cost in a project. NEC provides a clear procedure to adopt for managing any change through compensation event procedure. Based on the core philosophy of NEC contracts, any change in the project is informed to the concerned party, and it is discussed at length to decide if there will be any realistic claim/compensation event under NEC clause 62.1 Mitchell and Trebes [25]. The procedure involves a comprehensive review of the event proactively Construction Industry Council [13]. Therefore, all the issues related to change are managed amicability during discussions or through compensation event submission. Later, all the decisions are further reflected in the updated program to facilitate the construction works at the subsequent stage. NEC compensation event procedure allows partners to appropriately analyse and complete the procedure together with the risk provisions, thus enabling them to submit a realistic quotation for a compensation event. This is one of the essential features, which traditional contracts do not allow. The appropriate risk consideration at compensation event incentivizes the contractors to claim appropriate amount since they

are not required a higher compensation to offset with their risk. Interviewees pointed out that a transparent risk allocation in compensation event procedure increases chances of project completion on time. It prevents loss on both sides of the table and adopts a more realistic approach to the management of change in NEC projects. However, another interviewee highlighted the supervision of NEC compensation event procedure by the project manager to reduce chances for any other issue. A clear timeline for project partners in compensation event procedure motivates early resolution of the issues in NEC contracts. This facilitates the progress of works since the four steps in compensation events are governed by a definite time bar, pointed by another interviewee. If the contractors cannot handle the compensation events according to the time restriction, they will not be entitled to any compensation.

Summary – Management of Change

It is in the best interest of the project partners to ensure project success. The traditional approach to the management of change through claims have seen drastic results on the project and the relationship among project partners. Adoption of new ways of managing change could better establish the construct of project success and inter-organizational relationships. Because of the clear procedure, together with a strict timeline for managing change, would improve the interest of the partners to focus on mutual interest. This is further strengthened by early identification and submission for compensation event together with a proper risk assessment for each event Walker and Jonson [26]. These two improvements in NEC allows the parties to identify and resolve early to prevent larger compensation event that can cause the loss in the project Construction Industry Council [13]. In response to the overall benefits of compensation events for the project, interviewees pointed towards a healthy competition among the project partners.

5. CONCLUDING REMARKS

Comparison between the NEC and traditional forms of contract in terms of risk management and compensation event is discussed in the above sections. Evidence shows that NEC can bring benefits to the construction industry in Hong Kong in terms of better risk management and management of change. NEC provides a platform to develop and nurture collaboration among project partners with the best interest of the project in mind. Thereby reducing delays, cost overruns, and disputes among project partners. Earlier research has shown that improved collaboration among key stakeholders leads to collaborative behaviour [27] and improved performance.

This paper argues that the use of NEC in Hong Kong may improve collaboration among key stakeholders of the project. However, a small number of trained NEC professionals and dominant adversarial culture in the industry Jayantha et al. [28] are two main reasons behind the slow adoption of NEC. Both these issues are, however, manageable through extensive training of professionals on collaborative lines of thinking.

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