

## Final Report

# IMPROVING NEC CONTRACT CHANGE MANAGEMENT WITH CCM

Professor Ming Sun, Tejas Oza  
University of the West of England, Bristol  
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## Executive Summary

This report presents the final findings of a two-year research project on measuring the benefits of a collaborative and workflow IT business support system for NEC projects. The Contract Change Management (CCM) system was the basis of the research carried out by the University of the West of England and partially funded by the government Knowledge Transfer Partnership programme.

The New Engineering Contract (NEC), initially published in its consultative form in 1991 and now in its third edition, facilitates the implementation of sound project management principles and practice. It encourages the transition from the adversarial culture to a collaborative one in construction. "The main aspect of this transition is moving away from a reactive and hindsight based decision-making and management approach to one that is foresight based, encouraging a creative environment with pro-active and collaborative relationships." However, "the NEC contract requires project managers to be on top of things on a daily basis. This is quite an onerous responsibility on the project manager. Daily means that they must have global and updated information on contract status in order to ensure that the contract is operated with minimum delays and that costs are properly controlled."

CCM is an internet delivered collaborative system, provided by Management Process Systems Ltd (MPS), which supports the implementation of the contract change management process. It has been used on hundreds of building and engineering projects in the UK. A user survey, conducted in August 2006, showed that 84% of the CCM users consider it as a 'good' or 'excellent' system. According to the users, CCM offers a range of both tangible and intangible benefits. Detailed survey results are published in an interim research report, entitled "Collaboration Support Realises Business Process Benefits for NEC/ECC Projects - The Internet CCM System", in November 2006 by the University of the West of England. It is available at:

<http://www.built-environment.uwe.ac.uk/research/cprc/publications/CCM-nov2007.pdf>

Following the survey, this research has developed methods for measuring both tangible and intangible benefits of CCM.

Tangible benefits refer to cost and time savings as a result of adopting CCM, which can be quantified in financial terms. The measurement of tangible benefits focuses on four key change management tasks that CCM supports. These are Early Warning; Compensation Event; Value Change before Instruction; and Value Change after Instruction. The process of each task is analysed for when CCM is used and when it is not used. Savings for each task are calculated through detailed process analysis of how the task is carried out with and without CCM. A spreadsheet tool is developed to allow users to assess the tangible savings of using CCM in their project by simply entering the numbers of times that these four tasks are performed. For example, for a typical project with 100 early warnings, 110 compensation events, 30 instances of value change before instruction and 80 instances of value change after instruction, a saving of over £52,000 can be gained in staff time and consumable costs.

In addition to tangible savings, CCM can also help project teams to improve process effectiveness, reduce risk of process failures and increase compliance with NEC requirements. These benefits are intangible, which cannot be easily measured in financial terms. However, they are as important as tangible benefits. In many cases, they are more important because greater certainty and predictability and less risk can potentially lead to bigger savings. This research adopted the Capability Maturity Model approach, originally proposed by the Software Engineering Institute at Carnegie Mellon University in 1991, to evaluate the intangible benefits of CCM. A Change Management Maturity Model (CM3) is developed, which provides a measurement framework for assessing a project team's capability in dealing with contract changes. The Model defines five levels of maturity - *ad hoc*, *informal*, *systematic*, *integrated* and *continuous improving*. Measurement is carried out on six key process areas - *management process*, *risk management*, *communication*, *management information*, *collaboration*, and *leadership/objectives*. Three case studies have been carried out. It is found that CCM, in conjunction with NEC, helps to improve project teams' maturity level in these key process areas from typical levels 1 and 2 to levels 3 and 4.

## The Authors

Professor Ming Sun is the Director of Construction and Property Research Centre at the University of the West of England. He is a leading expert in Construction IT research. He has led many research projects, including an EPSRC funded "Managing Change and Dependency in Construction Projects" (2001-2004). His publications include a book on "Understanding IT in Construction", published by SPON Press in 2004. Mr Tejas Oza is the KTP Research Associate for this project.

Download the full report from:  
<http://www.built-environment.uwe.ac.uk/research/cprc/publications/CCM-june2008.pdf>

For more information on CCM, visit: [www.mpsprocess.com](http://www.mpsprocess.com)



## Extract from Foreword

This report by Professor Ming Sun sets out both the tangible and intangible benefits of the CCM process support service for NEC based projects. However the generic nature of CCM is such that the process can be applied to any construction project whatever the Form of Contract. This is an important output of the study report because invariably cost (tangibles) and value (intangibles) are essential performance indicators dictating the procurement and delivery strategy for construction projects.

This is a comprehensive and worthwhile study directed at reducing business risk by improving the management of projects. Its findings and recommendations represent a move to improvement and "best practice"! But "best practice" requires practice so I hope those seeking to improve their construction management performance will seek guidance from this study report.

By David H. Williams, C.Eng, FICE

Founding Chairman of NEC Users' Group 1994-1997

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