

'PICKING UP THE TAB' - THE IMPORTANCE OF COMMISSIONING IN THE BUILT ENVIRONMENT

"It began with, of all things, a safety test"



"...the (completions) certificate was a lie. In order to sign that document, all safety tests had to have been successfully completed. And yet, one remained."

The characterisation of Mr Boris Shcherbina, a Soviet Politician, noting that three years after handover and operation of the Chernobyl nuclear power plant, the commissioning was not yet complete.

The rest, they say, is history.

PRESENT DAY

Buildings are designed to meet the needs of the people who live and work in them by creating a comfortable, productive and sustainable environment. So, why do construction contracts focus heavily on the construction process, with little or no emphasis on the future operation of the building?

The commissioning process in the UK, also known in the US as TAB (Testing, Adjusting and Balancing) can validate a building's usability, functionality, environmental comfort and performance criteria. Some may say that commissioning validates the future needs of the building. If this is the case, why do most standard form contracts fail to describe commissioning as an activity that defines completion?

Completion is an important contract mechanism that can directly trigger actions, obligations and often terminates commercial liability. The upfront cost of commissioning may have little significance on the final account, but it does serve the greater purpose of ensuring that:

- the building is operationally ready;
- the building performs to suit its required function;
- the MEP systems performance is a high standard for a longer term.

1 C.Mazin, *Chernobyl*, (Home Box Office 2018)

When a project fails to deliver on either of these points the expense can be significant. A further 30% of the construction costs can be lost due to insufficient preparation at handover.² As the integration and interface of modern MEP systems can be complex, the greatest challenge is often presented when the user is introduced. For example, training employees how to operate their building in the event of a failure and anticipate the actions of their customers.

The added expense often makes the headlines when a building fails to perform to its required function. In February 2019, an outage at a British Airways' data centre cost a reported £58 million, affecting 75,000 passengers.³ In August 2016, an outage at Delta Airlines cost a reported US\$150 million.⁴ Our financial markets have also suffered equivalent losses when systems fail, including high profile cases involving NYSE, RBS, HSBC and more recently TSB.

It is not just when systems fail that a project can become expensive. A study of 643 buildings carried out by the Lawrence Berkeley National Laboratory recorded a quarter of buildings had reduced their energy consumption by 30% following retrospective commissioning activities. On average, energy consumption was reduced by 16%.⁵



CHALLENGING THE STATUS QUO

Historically the definition of completion has been an ambiguous one, with emphasis on the fixed and not the fluid components of the building. Completion is often determined by an architect (acting as the contract administrator) and whether, in their “*opinion*”,⁶ the building is fit to be “*occupied or used*”. This is reinforced by Keating and Hudson who interprets the standard form definitions to be “*free from defects*” with exception of the “*de minimis principle*”, namely minor snagging.⁷



Chitty,⁸ Keane and Caletka⁹ suggest that completion “*may or may not*” be subject to testing and commissioning and that any reference to commissioning would have to be an express provision or prescribed in the scope of work and not considered to be ‘*de minimis*’.

Consider a contract administrator, commonly an architect, who is certifying completion based on the building being fit for occupation and free from defects. Is it correct for the architect to consider commissioning a ‘*minor snagging*’ item and not a defect? Theoretically, this standard approach is sound, until something goes wrong.

2 <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/gx-icp-operation-go-live.pdf>
3 <https://www.datacenterdynamics.com/news/ba-and-cbre-settle-dispute-over-2017-data-center-outage/>
4 <https://www.datacenterknowledge.com/archives/2016/09/08/delta-data-center-outage-cost-us-150m>
5 <http://cx.lbl.gov/documents/2009-assessment/lbnl-cx-cost-benefit.pdf>
6 SBCC, *Standard Building Contract* (The Joint Contractors Tribunal 2011)
7 AA. Hudson, *Hudson Building and Engineering Contracts* (Sweet and Maxwell 2018)
8 H.Beale, *Chitty on Contracts* (Sweet and Maxwell 2018)
9 PJ Keane & AF Caletka, *Delay Analysis in Construction Contracts* (Wiley Blackwell, 2008)

EXCEPTIONS TO THE RULE

More common on industrial projects, the FIDIC¹⁰ standard form contract goes beyond the static completion of the building to include a provision for “tests on completion”. A test on completion is to ensure, for example, that a power plant executes its required function (to generate electricity). Sounds like a good idea, so why are ‘tests on completion’ provisions generally only considered in industrial projects and not in commercial building contracts? Too onerous maybe. However, with increasing energy costs, climate change agenda and the reliance on systems such as internet connectivity, wouldn’t it make sense to focus a completions provision on the building systems and not just the bricks and mortar?

Progressive contracts such as NEC¹¹ and non-standard forms used in PFI projects seek to address this issue in two ways: by prescribing the appointment of an impartial authority and to include an express provision for testing. The impartial authority is a named person such as an independent tester or a commissioning manager, who is suitably qualified and experienced to validate the building services systems at completion. The NEC provision for testing must be further defined in the contract works information.

KEY TO SUCCESS

The phenomenon of disconnect between static completion and operational systems at handover can be described as “hard landing”. To “smooth the transition into use” the UK Government, in partnership with BSRIA,¹² drafted the Government Soft Landing (GSL) Policy 2012. The policy is mandatory for all new government projects and major refurbishments. Environmental certification initiatives such as BREEAM¹³ and LEED¹⁴ can provide a further layer of assurance with regards to building performance.

To promote a successful commissioning period and building handover the owner may consider:

- co-ordination and early engagement with the building operator such as a facilities manager;

- an express provision for a suitably qualified and experienced impartial authority, such as a commissioning manager;
- completion and final handover considered as two distinct events;
- completion being reached when the static components of the building are fixed and free from major defect;
- final handover being achieved when the commissioning process is complete and certified by the impartial authority;
- the building owner understanding the building performance criteria;
- the performance criteria bound in the contract, including any bespoke owner requirements; and
- the owner procuring the soft landings framework, reinforced with BREEAM or LEED certification.

CONCLUSION

The benefits of a successful commissioning and handover process are clear, the building should:

- operate as expected at handover;
- be free from any system failure; and
- operate efficiently for its entire life cycle.

As a building services and commissioning engineer advising building owners and contractors who are in dispute, I have found complacency to be a leading factor. Failures are often regarded as “teething problems”, “settling in”, blamed on any programme and budgetary constraints. I sympathise for contract administrators as they are bound to the terms of the contract and relevant case law. Therefore, the focus at completion is often diverted to ensure safe occupation and beneficial use, overlooking the benefits of a successful commissioning and handover process. I question whether building owners are aware of this risk when they agree to a standard form contract and whether or not contract administrators advocate the importance of commissioning in the built environment.

¹⁰ FIDIC, *Conditions of Contract* (FIDIC, 2017)

¹¹ NEC3, *Engineering and Construction Contract* (Thomas Telford Ltd, 2013)

¹² Building Services Research Information and Association

¹³ Building Research Establishment Environmental Assessment Method, UK

¹⁴ Leadership in Energy and Environmental Design, US

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