Case study 2 – Heathrow Terminal 5 - a new paradigm for major programme risk management

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Synopsis

Through the 1990’s the general sentiment in the construction industry was that major complex projects overran schedules and exceeded budgets. Reports such as Latham (“Constructing the Team”) and Egan (“Rethinking Construction”) endeavoured to promote a new approach to engaging with the supply chain and managing risk.

With this as a background to the imminent construction of its massive Terminal 5 Project, BAA developed an innovative delivery model. It created a unique contract between itself as client and its delivery partners (The T5 Agreement) which articulated a different approach to transparency and collaboration in managing risk and underpinned this with an alternative, holistic “all parties” approach to project insurance. Books have been written lauding the delivery methodology and even now, 6 years after completion, people who worked on the project at all levels talk proudly of their experiences and it is used as a case study in academic and professional circles.

Since completion of T5 in Spring 2008, on time and within its budget, no other project has utilised the T5 delivery model. Perhaps its construction success and hence a desire to emulate its approach has been overshadowed by the operational difficulties at opening that grabbed the headlines. Industry opinion is certainly divided as to whether the project is a success or a failure.

Many client organisations are implementing or at least testing a “partnership” approach between client and delivery partner(s) but by bolting this on to standard contracts and insurance strategies. The Olympics in 2012, the UK’s most prestigious major construction programme in recent years, was an outstanding success using a partnership model for construction delivery but relatively standard contract forms and insurances.

Perhaps the financial crisis, which started in Autumn 2008, soon after T5’s completion, changed the construction environment to obviate the need for radical delivery models. It would certainly appear that the need to acquire turnover in the construction industry since 2008 has created a much more benign commercial environment. Actual construction costs have proved year on year to be lower than inflationary predictions and there have been few headline grabbing overspends and delays as witnessed in the 1990s.

Are we being complacent? Is the corporate commercial experience – if influenced only by the last 6 years of construction performance – blinkered? Is the desire for construction turnover and low inflationary pressure creating a bubble that could burst at any time?

Perhaps clients with major long term programmes should be contemplating the scenario of a significant construction climate change and develop a strategy to pre-empt and provide a basis for mitigating any reversion to the destructive contractual environment of the 1990s.

This report explores the T5 approach to Risk Management – both the direct physical actions undertaken and the psychological implications – and suggests what aspects could be refreshed to incorporate more recent thinking and adopted to deliver a next generation paradigm in major Programme Risk Management.

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1 Constructing the Team, Latham M, HMSO, 1994
3 Terminal 5: Success or Failure, University of Brighton, 2012
Heathrow Terminal 5: Background

The 5th Terminal for Heathrow Airport was first proposed in a White Paper in 1985 in order to provide much needed additional capacity for the UK’s only hub airport, to relocate British Airways to one terminal from its split T1/T4 operation and to enable the whole scale reconfiguration of Heathrow from its original inefficient ‘Star of David’ layout to a modern multi-functional ‘toast-rack’ layout.

The complexities and interfaces for such a major scheme, with necessity for a new M25 interchange and relocation of a major water treatment works meant that planning permission was only granted in 2001 after the longest Planning Inquiry in UK history.

Advantage was taken of the protracted authorisation process to develop the methodologies (procurement and logistics) for completing the project in the most efficient duration – once Planning was granted – and a budget which would be truly representative of a final cost.

The construction environment throughout the 1990’s was filled with perceived failures such as Scottish Parliament, Jubilee Line Extension and The British Library and BAA considered how this environment could affect T5: “If things go as they normally do on major UK construction projects, the statistics say that T5 could be 3 years late, 80% over Budget and 6 people killed”. BAA elected to develop a new approach to managing the risk.

The opening date of 30th March 2008 was set in 2001 and a budget of £4.3Bn agreed in 2003. As a private sector client this investment constituted two thirds of BAA’s capital value. If the budget was wrong the very viability of the company could have been jeopardised.

The construction site, the largest in Europe at the time, covered 260 hectares, the size of Hyde Park. 8000 people were employed on site at its peak across 18 projects by 80 first tier suppliers.

The extended enterprise of the T5 Project is reflected by 20,000 lower tier suppliers involved in the project’s success, 30 airlines affected either directly or indirectly by the project’s impact on operations and the innumerable stakeholders who submitted or desired production of the 5900 public inquiry documents.

The project opened in 27th March 2008 3 days ahead of the 2001 schedule and was within the £4.3Bn budget set in 2003.

T5’s approach to Risk Management

The two pivotal components of the T5 delivery strategy to manage risk innovatively were the T5 Agreement and the T5 insurance strategy. Together these promoted the philosophies of:

- **All risk on client**: BAA held all the risk all of the time but with clarity about liability for cost impact separated from who is harmed by the risk
- **Shared liabilities**: all parties to the agreement share in the cost impact of risk on a strict no-fault basis with caps for the ability for any party to bear the cost impact and supported by commensurate insurances
- **Cultural Commitment**: the unusual nature of the agreement with explicit requirements on individuals and companies to be aware of and support each other through both formal partnerships and supportive behaviours of trust and cooperation created a strong psychological contract.
T5 Agreement

“The T5 Agreement: a totally new form of contract agreement... BAA carries all the risk and is insured for all that risk. If any problems arise the answer is not to find someone to carry the can but to work together to find a solution.

“It’s the most important enabling strategy we have... it is far more than a common contract. It gets you over a number of emotional hurdles at higher levels.”

The Agreement was 260 pages long which is comparable, if not less than, industry standard contracts on other major programmes once corporate and project specific amendments are incorporated. For example, the contract for Network Rail’s Thameslink Programme constitutes 319 pages. The T5 Agreement also had the advantage of being a stand alone document as opposed to most ‘standard’ contracts, which for copyright and/or contractual precedence reasons tend to be split into at least 3 volumes (e.g. standard contract, corporate/ project amendments and preliminaries), making them very complex to follow.

One of the most fundamental differences between the T5 Agreement and a standard contract is that multiple parties (namely the key delivery organisations) to the Programme were signatures to it. It is also significant that the Agreement was signed by the Companies’ Managing Directors rather than their legal representatives.

Although BAA were still clearly the client, the multi-party contract emulates partnering concepts by replacing a traditional client/ contractor hierarchy with an all-equal team which creates a psychological effect to promote risk sharing amongst the parties. Having the operational directors sign the Agreement perhaps created a much stronger moral commitment to driving success as opposed to a separation between the execution of physical works and an obscure contract perceived to be protecting the party’s liabilities. It was certainly evident that company executives felt the obligation to resolve any issues arising personally.

The Agreement has all the requirements of a Contract: what is required from each party by when; how costs will be reimbursed; each parties’ rights in the event of a dispute and how such disputes would be resolved. There is no underlying contract form though the drafting is similar in many respects to the (then current) NEC Contract and this would probably have been used should any dispute have escalated to require external judgement. In the event this is a moot point as no disputes escalated to this level – an accolade for a programme of this magnitude.

The Agreement continually reiterates the importance of:

- Interdependent parties collaborating to deliver the project and to manage risk for the common good of the project;
- Sharing the risk of failure
- Shared decision making particularly in relation to costs, responsibilities for implementation, payment,
- Parties being transparent and particularly regarding risks they may be aware of;
- Parties being non-adversarial
- Integration and overlap of design and construction

A cost reimbursement model was incorporated so that only actually incurred costs were paid for (with a fixed overhead and profit margin). To validate costs BAA found it necessary to introduce a cost verification system administered by a 3rd party.

Contingencies for risk impact were established (related to perceived exposures) and allocated to each Project Team and this was drawn down by the collective team in accordance with the actual evidenced impact. If the cumulative risk impact was ultimately lower than initially envisaged, the parties to that area of the programme collectively shared in the saving.

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7 Terminal 5 – a construction epic; NCE T5 Supplement, Feb 2004, p5
In addition there was an incentive scheme based on achieving progressive schedule milestones, funded from a contingency commensurate with the cost impact of delay risk.

In the event of cost excesses greater than budget plus contingency, BAA would reimburse but the ability for any company to earn profit on the excesses was constrained.

**Insurance Strategy**

The philosophy for insuring the project was to cover *all* primary parties to the Project on a joint basis with no necessity to determine a single point of blame (i.e. “no fault” basis).

This covered Construction “All Risks”, 3rd Party Liability and, in a first for the construction industry, all Parties’ Project Professional Indemnity.

Excesses on each policy in the event of an insured incident were attributable to a Project Team rather than an individual party thus reducing the potential to try and transfer liability to another party within the team.

The advantages of a project-wide owner controlled insurance for “Construction All Risks” such as to assure adequate coverage across all the supply chain and interfaces, provide an economy of scale and simplify claims management are well recognised and this approach continues to be used by many construction client organisations.

Likewise an owner controlled policy for 3rd Party Liability is commonly used by clients to assure adequate coverage for 3rd Party risks and was particularly important for BAA’s construction teams as they worked in close proximity to expensive aircraft and sensitive airport operational systems.

The all Parties’ Professional Indemnity cover for redesign and/or reconstruction arising out of any defect in design remains unusual in construction, though policies are still available. The advantages are the same as those for the other covers; e.g., economy of scale, adequate coverage across all suppliers and simplified claims’ management.

However there are two particular aspects of the PI coverage to note:

- Designers appeared to be much more open to collaborate with contractors and solve issues rather than be protective over corporate liability;
- Resolution of design issues was much faster than can typically occur if a project has to stop and wait for separate insurers to resolve who is liable (in practice it is probably rare for a single party to be wholly liable and clients will have to cover some of the costs).

One downside identified on T5 was that the cost savings from the owner controlled policy (i.e. that suppliers would reduce their costs on the basis that they did not have to provide the insurance cover) were difficult to extract from ‘global’ policies or general overheads.

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8 T5 Risk Management Summary, Bartlett M. BAA 2006
10 Willis, Owners’ Protective Professional Indemnity (OPPI)
11 Heathrow’s T5: History in the Making, Op Cit
12 Ibid
Construction industry: what is the current prevailing environment and what is the status of risk management?

Economic conditions 2008 to date

In the first half of 2008 construction costs were continuing their pattern of several years and rising month on month with forecasts projecting this to continue for the foreseeable future. However, in late Summer 2008, it became apparent that the growing global financial crisis would indeed affect UK construction. By November, 2008 there was an almost complete halt in house building in the UK and construction contractors began to worry about maintaining turnover volumes and profit expectations.

BAA’s response to this paradigm shift was particularly interesting. The company reconsidered what actual inflation might impact construction forecasts by developing a bespoke inflation index for Heathrow construction activity and removed uncommitted general inflation provisions across its projects. This action ringfenced approximately 10% of ‘costs to go’.

Since 2008, tender prices have stayed very competitive and whilst forecasts have suggested that inflationary uplifts are required, in practice, actual costs have continued to be lower than these expectations.

There is a danger that this inflationary windfall has masked a degradation or at least a failure to improve general management of risk. From a budget of £9.3Bn set in 2007 prior to the economic crash, the Olympics returned £528m which at just over 5% is approximately half what BAA achieved.

Now we are in 2014, there are a number of indicators to suggest the construction economy is turning again. There is a growing body of evidence that the general UK economy is improving. House prices have been rising for several months. The likelihood of an interest rate in the next 12 months is growing. Unemployment is dropping and the general mood in the UK and Europe is more optimistic than has been seen for several years.

Perhaps we are on the cusp of a boom period for construction – major public spend on infrastructure projects is seen by the current UK Government as a key component to support economic recovery. If the supply chain has been operating in a repressed state with years of underinvestment, the limited remaining capacity may now be able to charge a premium for its services.

Wage agreements for many of the major construction trades have been below inflation for several years, reflecting the restricted availability of work. If the market has indeed turned, it is likely that individuals will believe rate increases above inflation are justified and this could be supported with collective action organised by their Unions.

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13 Tender Price Indicator, Gardiner & Theobald, Oct 13
14 Heathrow Airport, Mid Q Capex Report, BAA, 2010
15 Tender Price Indicator, Gardiner & Theobald, Oct 13
16 Olympics budget rises to £9.3bn, BBC, 15 Mar 07, [http://news.bbc.co.uk/1/hi/6453575.stm](http://news.bbc.co.uk/1/hi/6453575.stm)
17 London 2012: Olympics and Paralympics £528m under budget, BBC, 19 Jul 13, [http://www.bbc.co.uk/sport/0/olympics/20041426](http://www.bbc.co.uk/sport/0/olympics/20041426)
Risk Management Maturity

There has been a significant growth in partnering supported by the new British Standard for Partnering, BS11000 which provides accreditation for partnerships\(^\text{18}\) but these are frequently overlays to traditional client/contractor contracts. Whilst the Olympics demonstrated excellent performance in the use of a Delivery Partner, it is not so obvious what the ‘partnership’ was. The Olympic Delivery Authority’s strengths primarily stemmed from a well structured, intelligent “thin client” and an expert Delivery Partner with accountability for full program management. The Delivery Partner and suppliers were engaged through independent NEC3 contracts\(^\text{19}\).

Clients such as Anglian Water and Network Rail have created partnerships with cited success but other long term partnerships such as the successful 16 year BP/Lend Lease Alliance have been sold off or disbanded.

There have been no ground-breaking evolutions in contracting strategy and even NEC has had limited increased market share. Network Rail continues to utilise an ICE Contract Form.

Reports continue to be written stating that the industry is not doing enough to manage risk and truly embrace the ambitions of Latham and Egan: “Since Sir John Egan’s Task Force published its report Rethinking Construction in 1998, there has been some progress, but nowhere near enough. Few of the Egan targets has been met in full, whilst most have fallen considerably short. Where improvement has been achieved, too often the commitment to Egan’s principles has been skin deep.\(^\text{20}\)”

The Infrastructure Risk Group which was set up in 2010 as part of the Treasury’s Infrastructure UK Task force to drive increased efficiency in construction produced its recommendations for enhanced risk management in 2013: “. the mitigation of risks could receive significantly more focus, a simple step that could offer major benefits for the next generation of infrastructure projects.\(^\text{21}\)”

The IRG’s recommendations cover:

- Enhanced cost & risk estimation, moving away from standard provisions to bespoke risk based assessments
- Active risk management: incentivised mitigation, efficient contingency management and greater co-operation between organisations to share in risk management
- Develop common, industry wide, methodologies and share best practice beyond company boundaries

Alongside industry specific recommendations, new Standards have been developed or refreshed\(^\text{22}\) \(^\text{23}\) \(^\text{24}\) \(^\text{25}\). Yet, despite this plethora of additional guidance, there is still no accreditation system for a risk management framework and it is therefore difficult to demonstrate that an organisation has a framework truly compatible with these Standards.

Without this level of benchmarking and consistency, the ability for organisations to come together and collectively manage risk efficiently, as is essential to deliver complex construction projects – whether through formal alliances and partnerships or more traditional supply chain relationships, will be dependent on the skills of the specific managers involved in the project and a bespoke tailoring of the individual organisations’ approach to suit the common Programme objectives.

\(^{18}\) BS11000 Collaborative Business Relationships, BSi, 2010  
\(^{19}\) Learning Legacy, Jacobsen J, ODA, Oct 2011  
\(^{20}\) Never waste a good crisis, Wolstenholme A, Constructing Excellence, Oct 2009  
\(^{21}\) Managing Cost Risk & Uncertainty in Infrastructure Projects, Infrastructure Risk Group, 2013  
\(^{22}\) ISO 31000, Risk Management – Principles & Guidelines, BS, 2009  
\(^{23}\) BS31100, Risk Management – Code of Practice & Guidance for the implementation of BS ISO 31000, BSi, 2011  
\(^{25}\) Risk Management, Internal Control & the Going Concern Basis of Accounting, FRC, 2013
Framework for a new paradigm in Major Programme Risk Management

The overwhelming consideration from this Paper is that the construction climate between 2008 and 2014 has been predominantly beneficial to clients and forecast costs for long duration programmes have been able to be maintained perhaps through superlative management but more likely due to the influence of economic conditions that have enabled actual inflationary pressures to be lower than originally forecasts.

Secondly, the Paper argues that these conditions cannot be sustained indefinitely and indeed there is a growing number of indicators to suggest the tide is turning already to conditions which might be more reflective of a 1990s construction environment: an environment symbolised by a supply chain able to charge prices far greater than historic ‘benchmarked’ prices as used to generate budget estimates, a necessity to seek new entrants to augment the supply chain who will be keen to take the work but will not have the maturity and experience to deliver it and essential individuals and collectives in a strong position to seek additional remuneration.

The experiences of construction client organisations and their managers over the last 6 years may limit their capacity to foresee and pre-empt the changing conditions.

The prognosis is that the risk management approaches deployed over the last 6 years will not be adequate to mitigate the consequences of a change in construction climate and a new paradigm is required to truly address the likely sea change.

Construction clients could treat the new conditions encountered – when they eventually become unavoidable – as change events but the forward thinking will pre-empt the scenario as Shell did so successfully in the 1970s with the price of oil26 and perhaps secure a similar market advantage.

The considerations that T5 went through in the 1990s might be far more appropriate to review in this scenario and if they are, then the conclusions that that programme came to and the risk management strategies it deployed – combined with more recent thinking might be would be equally pertinent. For example:

- Acceptance that clients ultimately carry all of the risk and only transfer some aspects of liability for some forms of impact at a defined cost for a limited period;
- Doing something radically different (“changing the game”27) when engaging the parties to a programme will generate a less complacent team, less reliant on historic mitigation strategies and more risk aware. This would reflect T5’s Agreement and BS11000 by engaging the team under the full concepts of partnering rather than overlaying it on standard contracts. An innovative step would be to expand this partnering to more than just the delivery team and include key stakeholders such as the end user(s);
- Ensuring the Client has full visibility and ability to influence contingency expenditure and continuously corroborate that it is being spent on true risk rather than change or inefficiencies. A new approach to establishing contingencies associated with risk impact rather than the current Mean/ P50/ P80 slices in common use might have significant advantages as most teams now know how to manipulate this standard method to their advantage;
- Developing efficient, holistic insurance programmes with insurers actively involved in reviewing a Programme’s risk promotes enhanced cross-party risk management and reduces frictional costs – or delays – which are not directly attributable to the event itself. Insurance adds no value when it is a latent cost recovery safety net post-event; and
- Escalating risk management so it becomes a key tenet of the client organisation’s decision making through a coordinated Programme to Enterprise process will generate greater awareness of emerging issues and ability to redirect the Programme as required to suit the evolving business.

26 Scenarios: The Art of Strategic Conversation, Kees van der Heijden, Wiley, 2005
27 Infrastructure Risk Group, op cit