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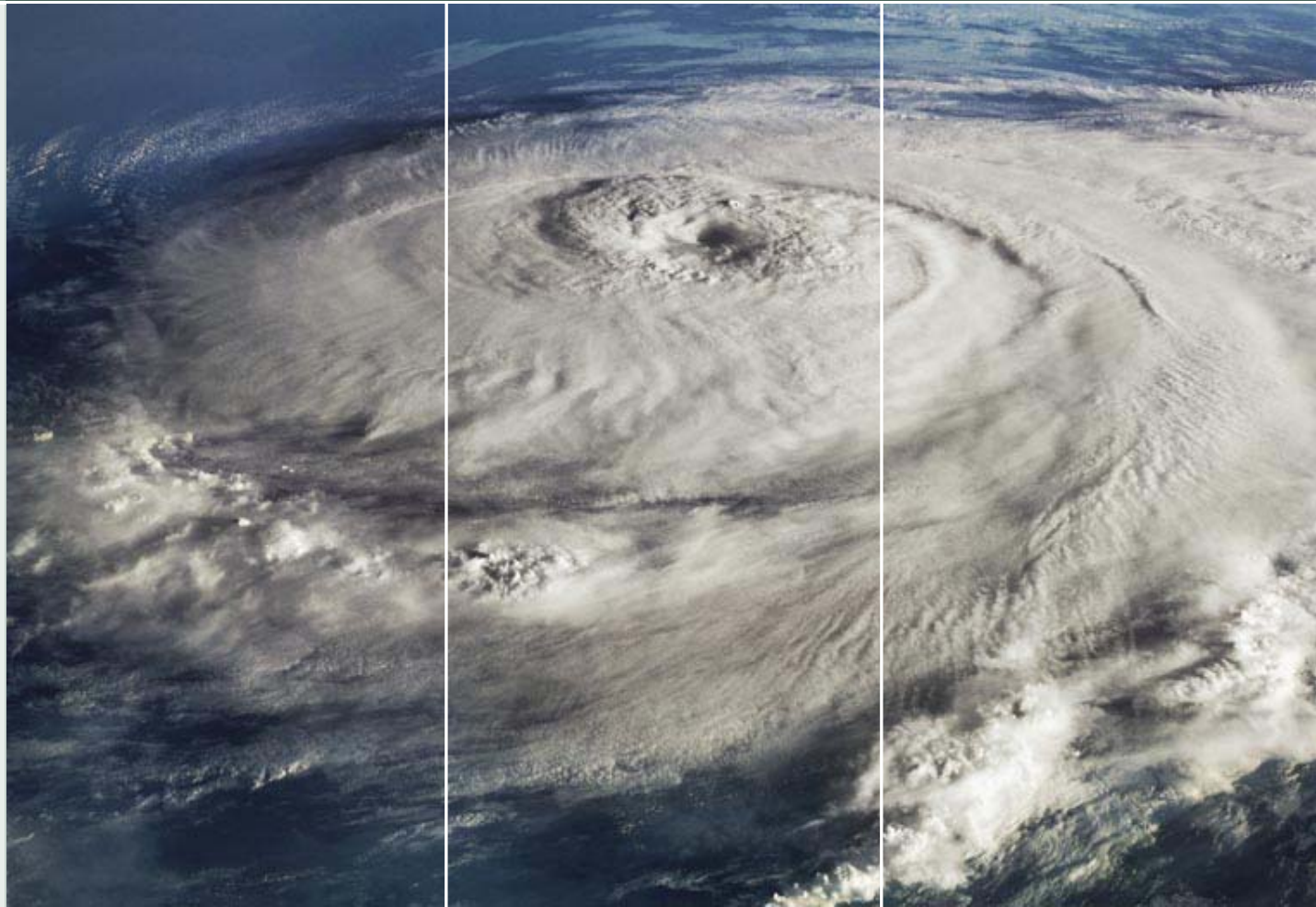


# The perfect storm

## Underwriting the construction of Heathrow Terminal 5

Richard Williams  
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Gleneagles





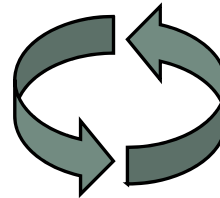
# Introduction

- Swiss Re's Industrial Risk Insurer unit provides risk transfer solutions to corporations around the world
  - through regional units and global industry practices
- 18 years experience in insurance with Swiss Re
- Chartered civil engineer
  - 12 years' experience in contracting
- Presentation refers to Construction All Risk coverage
- Thanks to Sharon Doherty's 'Heathrow Terminal 5 – History in the making'
- Presentation takes client confidentiality into account

# The perfect storm

- Came to the insurance market November 2001
  - one year before policy to incept; wise precaution
- Perfect storm brewing
  - turbulence in the construction industry and in the construction insurance market

**Construction industry**  
Failing to deliver



**Construction insurance industry**  
Value destroyer

- Turbulent atmosphere
  - potential to produce violent tumultuous storm of epic proportions and tragic consequences



## Being bold

- T5 25 years in the making; four year public inquiry
- Projected cost GBP 4.4 billion; to increase passenger capacity by 30 million people per year
- Construction period November 2002 to March 2008
- Area of site 260 hectares (size of Hyde Park)
- Terminal floor area equivalent to 50 football pitches
- 10 km of tunnels
- 20 000 suppliers, 50 000 in integrated teams, 8 000 workers – 18 canteens!



# Speaking the same language

- Many were sheltering after recent battering
  - who would dare to put to sea, and why would they?
- Perfect opportunity to try something different
  - for those whose life is construction
- Risk and opportunity
- BAA takes all of the risk all of the time
- Struck a chord with Swiss Re – all about risk
- Broker saw the opportunity



## Playing as one

- Procurement strategy
- Integrated teams
- T5 Agreement
- Management of risk from the outset
  - throughout, from the top
- Insurance a part of the solution
  - not part of the problem
- Full engagement with decision takers and capacity providers – the ultimate risk carriers



## Best practice

- Complementing the underwriting approach
  - in line with TCOP thinking
  - understanding of/comfort with project
  - Risk transfer/alignment of interest/wording/pricing
  - Post underwriting – risk monitoring
- Risk monitoring essential and complementary
  - insurance provided on basis of expectations
  - expectations benchmarked against TCOP
  - deviations addressed



## Fair conditions set

- CAR only (No DSU, TPL placed separately)
- Estimated contract value GBP 2.4 billion
- Deductibles
  - Working deductibles – responsibility of suppliers
  - ‘Buffer/DIE’ – responsibility of T5/BAA captive
  - EEL deductible SIR by T5/BAA captive up to aggregate limit then drop down to buffer
- Tunnelling loss sub limit
- DE5, guarantee maintenance





## History in the making

- CAR risks –several incidents but either not covered or fell within the contractor’s retention or DIE
  - SIR suffered no erosion
- Therefore zero loss ratio for insurers
- Opened on time, to budget and to specification
- In contrast to the film, this story has a happy ending
- Involved a leap of faith
  - but with a calculated risk, well managed and profitable
- Risk brings opportunity!



## Underwriting T5 – *the perfect storm*

**Speech by Richard Williams**  
**Head, Engineering & Construction Industry Practice**  
**Industrial Risk Insurer, Swiss Re**

IMIA conference  
16 September 2008  
Gleneagles

This presentation relates to the Construction All Risk Policy only. Credit is given to the book by Sharon Doherty, *Heathrow's Terminal 5: – History in the making*, which served as an aide memoire.

### CHECK AGAINST DELIVERY

The Terminal 5 building at London's Heathrow airport (T5) took about 25 years to evolve from an initial idea to its final realisation. This included a public inquiry lasting nearly four years. The project eventually came to the CAR insurance market for quoting in November 2001, more than a year before work was due to start on site.

This lead time for insurances was a wise precaution, given the two storms that were brewing at the time: one in the UK construction industry and the other in the construction insurance industry. The UK construction industry had a reputation for consistently failing to deliver major building projects to time, budget and specification. The construction insurance industry also had a reputation for underperforming, even being labelled as a value destroyer.

Those familiar with the film *The Perfect Storm* will recognise the analogy. The storyline related to the effect of two turbulent air masses which developed over the North American Eastern Seaboard and combined over the Atlantic to produce the 'perfect storm' – a violent, tumultuous weather event of epic proportions and tragic consequences.

The situation in the UK construction industry was best summarised by Sir John Egan in his 1998 report of the Construction Task Force, *Rethinking Construction*, where he commented on the poor performance of the construction industry. He observed the low and unreliable rate of profitability, the drop in investment in R&D and capital, the crisis in training and recruitment and the price focused procurement strategies of clients. No one was happy – neither clients, contractors, suppliers, politicians, nor investors.

At the same time, the situation in the construction insurance market was that there were few players in the market still willing or able to deploy capacity in construction insurance. This was for two main reasons. First, due to the poor engineering and construction results emerging from the underwriting years of the late 1990s (particularly in the tunnelling sector). Second, the crisis created by the World Trade Center attack, which forced surviving insurers to consider carefully where to employ their scarce capacity to the best profitable effect. Construction did not feature as an attractive area.

So the perfect storm brewing had the potential to be disastrous for any company bold enough to 'put to sea' and get involved in insuring the project. However, these conditions also offered scope to do things differently – a chance for opportunity to rise out of adversity. It was time to be bold.

## **Being bold**

In contrast to the film, this particular perfect storm in fact produced conditions that enabled everyone to think again how best to approach constructing and insuring a major project. The end result, as we now know, was a successful and happy outcome.

One of T5's slogans was "History in the making". This was designed to bring to all those involved in the construction a sense of pride and an appreciation of the importance of what was being achieved. The following statistics help illustrate the mammoth scale of the project.

- Projected total cost GBP 4.4 billion
- Construction period November 2002 to March 2008
- Increase in passenger capacity at Heathrow to 90 million per year (previously 68 million)
- Site area 260 hectares – the size of London's Hyde Park
- Terminal floor area equal to 50 football pitches
- More than 10 km of tunnels, mostly connecting into existing underground networks
- 20 000 different suppliers
- 50 000 people, working in integrated teams
- 8 000 manual workers – 18 canteens!

The broker who accepted the challenge of generating interest in the market was Marsh, who was fortunate enough to have a client with a great story – one that recognised not only the challenges but also the opportunity to engage with underwriters in a way never tried before in order to sell a new and exciting proposition. Here was a client who saw risk as an opportunity rather than a barrier. In particular, they saw the opportunity to engage with an insurer who understood the language they were speaking and had the ability to mobilise capacity.

While I had been working for more than 10 years as an underwriter in the market, and a civil engineer by trade, I had never been comfortable with how heavy civil engineering insurance had been handled by buyers, intermediaries and sellers. As a consequence, my philosophy had been to abstain from many of the heavy civils placements, thereby avoiding many of the loss-making instances of the past. Swiss Re had, however, been sowing seeds in terms of telling interested parties what would attract us into the market. So, when Marsh learned of BAA's approach towards construction and insurance, the broker knew it had a receptive partner in Swiss Re.

## **Speaking the same language**

At our first meeting in Zurich, BAA's opening gambit was "BAA takes all the risk all of the time". As Marsh knew would be the case, this immediately struck a chord with me. Here was a client who recognised and accepted that it took the ultimate responsibility for risk; who knew that, when push came to shove – when systems failed – it was its own reputation, its own shareholders, its own customers, and its own bank balance that would bear the brunt. Risk was top of BAA's agenda and at the forefront of the company's consciousness; they recognised that managing risk was crucial to the success of the T5 construction project. Admittedly, BAA had learnt the hard way, through its experience of the Heathrow Express tunnel collapse in the mid 1990s.

As an insurer, we are very aware that risk is our business. However, with respect to large civil engineering contracts, it was rare to hear risk management being discussed at meetings between the insured and insurer. Discussions centred around dimensional 'hard' facts such as the length, depth, or height of the permanent works or data such as ground conditions, programme and breakdown of values. Talks hardly touched on organisational and managerial

'soft' aspects, such as who is responsible for risk and the importance of the risk management function within the organisation. Nor was it common to discuss processes for identifying and managing risk, and how those processes are incorporated into the management of a project. In other words, the focus was very much on the 'what?' rather than the 'how?'

Here, probably for the first time in civil engineering, we heard a client who recognised that risk was not just for insurers but that managing risk was at the centre of their operations, too – and they told us how they were going to manage it. We spoke the common language of risk management, risk retention, risk appetite, risk transfer, risk control, risk mitigation, risk acceptance, and elimination of risk. Of course, the big advantage for us as an insurer is that we benefit from the client managing all of the risks, as this includes those to which we are exposed.

### **Playing as one**

So, how did BAA go about managing risk? It started with its procurement strategy: the company recognised that to get the best, it needed the best – and that getting the best should not be compromised by the individual interests of the firms engaged in building T5. The company recognised that getting people to focus on a single, common goal was best achieved by getting them to work as one team – the T5 Team. This would be an integrated team whose members would all pull together in one direction and not be diverted by other interests. A team whose first priority, when confronted with a problem, would be to seek a solution rather than to attribute blame. So, BAA's procurement strategy was focused on selecting the best people for the job and motivating quality in execution by removing the normal commercial pressure that can sometimes sideline those responsible for delivering the end result.

Because conventional contractual arrangements were not conducive to this working ethos, a new one was designed: the T5 Agreement. The T5 Agreement embodied the same philosophy applied by Egan when he produced *Rethinking Construction* – which is no surprise given that he was CEO of BAA when this innovative integrated team approach was first mooted.

Essentially, in return for BAA owning the risk, providing insurance and being a hands-on client, suppliers were given a guaranteed margin based on an open-book relationship. The quality of work needed to be, at the least, best practice – and there was a shared incentive approach that rewarded exceptional performance. Loss of profit and payment of insurance excesses, as well as relationship protection, provided suppliers with the incentive to get it right. "BAA owning the risk" meant that monies for financing risk were not in the pockets of the suppliers but stayed in BAA's own, and BAA was then able to use this capital for risk management and contingencies. This framework did not, of course, guarantee success, and nor did it promise to be any better than traditional procurement methods. But, as one of the gurus behind the T5 Agreement said to me when I challenged him on this point, "it could hardly be any worse!"

So having decided that it should own all of the risk all of the time, along with putting in place an innovative framework with the potential to successfully deliver T5, BAA also needed to ensure that the right measures were established to manage and mitigate that risk.

The company created an infrastructure to manage risk using risk registers. This meant producing documents which set out exactly who was accountable for each aspect of risk management, the process and measures for delivery. This was backed up by workshops and regular meetings to ensure that risks were being identified and managed. Risk management was at the centre of the project management process. Furthermore, the risk management process was driven from the top: Tony Douglas, T5's managing director, was personally involved in the detail and setting the tone.

BAA also recognised that this innovative contractual approach could prove challenging to implement, in that it required certain behaviours which would not necessarily come naturally to those involved. Consequently, the firm employed an HR specialist (namely Sharon Doherty, author of the T5 book) to set up an induction procedure to ensure, as far as possible, that the ethos embodied in the T5 Agreement was realised.

The atmosphere and environment on site was very different from any I had personally experienced in my construction career. You really got a feeling of the pride and sense of purpose shared by everyone. As well as the "History in the making" slogan, various posters caught my attention. For example, the emphasis on safety was epitomised in a poster which drew attention to the effect an accident has on your friends and loved ones – if you do not care for yourself, then care for those who are most affected. Posters empowered the workforce to stop work when they considered a situation to be unsafe, and to call on a senior manager for support. Likewise, when completed works were being damaged through carelessness, a series of posters appeared bearing the message "Respect my work".

### **Best practice**

I said earlier that the BAA story struck a chord when they first explained their approach to successfully delivering T5. This was at a time when certain players in the insurance market were looking at how the industry could identify characteristics of tunnelling projects which were indicators of successful delivery. This was being undertaken in collaboration with clients and their consultants. To me, it seemed that what BAA was saying coincided significantly with what was being developed in the Tunnelling Code of Practice (TCOP): that risk management should be at the core of the decision-making process from conception to final realisation of a construction project and, most significantly, that the client had a very important role in ensuring that risk was correctly allocated and catered for – something which entailed a high degree of transparency. It seemed to me that BAA was practicing what the TCOP was preaching, and it made total sense.

It was therefore obvious that the frequent on-site presence of Dr Terry Mellors, the principal author of the TCOP, would be welcomed by all parties to confirm that the risk management theory was being implemented in line with everyone's expectations – expectations that were benchmarked against the TCOP. Primarily, he was there to give comfort to insurers, but similarly his presence created added value for the insured. Of course, Terry did find many shortcomings – particularly in the early days – but this only served to reduce the 'unknown unknowns' and helped enable T5 to stay on track.

### **Fair conditions set**

Insurers' involvement was encouraged and embraced by BAA right from the start. BAA was very keen for us to share our perceptions and experience. Very early on, we carried out an exercise to confirm the maximum probable loss assumed at inception; we brought in experts who then discussed their findings with all parties. When a significant programme change was made to the external envelope activity, we gave input in order that a risk assessment could be made to confirm the effect on the overall risk profile. As fire started to take over as the main risk, we implemented a programme of fire surveys in coordination with T5's management.

Insurance had an important part to play in the T5 Agreement. The Agreement created a structure that allocated a realistic amount of financial risk, along with providing sufficient security to let suppliers be comfortable in handing over risk to BAA. The structure also enabled BAA to use its captive, and to take credit for retaining risk by way of this vehicle. The structure

very much served to ensure an appropriate alignment of interest between suppliers, BAA and the insurers.

Of course, the deductible structure was not the only measure of risk transfer and alignment of interest. The wording also determined the balance between insured and uninsured risks. Here, our guiding principles were as follows:

- Insurable risk only – no entrepreneurial (trade) risk
- Damage triggers only
- Unambiguous
- All extensions limited, defined, measurable and in proportion
- Alignment of interest maintained

Otherwise, we were prepared to provide insurance cover in as broad a form as BAA was prepared to pay for it.

The features of the finalised insurance deal were as follows:

- CAR only (no DSU; TPL placed separately)
- Estimated contract value GBP 2.4 billion
- Two layers primary GBP 250 million and GBP 250 million x/s GBP 250 million
- Underlying deductibles
  - working deductibles – responsibility of suppliers
  - 'buffer Difference in Excess' – responsibility of T5/BAA captive
  - Each and Every Loss Deductible – self-insured retention by T5/BAA captive upto aggregate limit then drop down to buffer level
- Tunnelling loss sub limit
- DE5, guarantee maintenance

I cannot over emphasise the importance of the insurers' involvement in monitoring risk management on site once the terms and conditions had been agreed and accepted by both parties. This was an integral part of the underwriting process.

Acceptance of the risk had been made on the basis of certain expectations by us – 'promises' made by the client. There is no 'steady state' with construction projects: progress means change and change needs to be managed – and this involves a decision-making process which should be based on a risk assessment. We had made a substantial financial commitment on this basis and it would have been negligent of us not to have confirmed that expectations were being met. Of course, it is not up to insurers to replace any shortcomings in risk management being carried out by the insured, rather it is up to us to bring them to the insured's attention and for the insured to address it. Unlike property insurance, where there is some track record with respect to risk, there is no such luxury in construction. We start with only with expectations of what should happen. It is up to us to confirm whether these are being fulfilled.

### **History in the making**

Of course, not everything went to plan. There were incidents and accidents and some losses. That these happened was extremely disappointing but not unsurprising – despite risk management, there are always residual risks – and the fact that we charged a premium shows that not all risk can be eliminated. However, all the losses were to the contractors' and/or T5 account and did not trigger the CAR insurance. Those concerned did not revert to type. The

focus was on overcoming problems and learning lessons, rather than attributing blame and pursuing insurers.

Although impossible to prove one way or other, I also believe for BAA that it was a far superior result than could have been achieved by traditional methods. They did finish on time, on budget and specification. And although there were some well-publicised teething problems on handover (not all of their making – and indeed providing useful lessons for the future) these were temporary and should not be allowed to overshadow this world-class achievement.

In contrast to the outcome of the film, this particular perfect storm – the storm that brought ‘all hands on deck’: client, suppliers, broker, insurers and consultants for the construction of T5 – turned out to be a perfect opportunity to do it differently this time. For all concerned it was a first and a leap of faith. We took a calculated risk, managed it well and profited. History was made.

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