

Hong Kong International Airport. An MPA seminar held at the Institution of Civil Engineers, 1 Great George Street, London, 25 April 2001.

MPA events are confidential, although this summary has been compiled so as not to breach confidentiality. Full proceedings and entry to MPA events are available only to members.

Participants

More than 50 participants attended the seminar and the following organizations were represented:
 Airport Authority of Hong Kong, BAA Plc, Balfour Beatty Major Projects, Bank of America NA, BMCE Bank, British Energy Generation Ltd, British Trade International, Capital and United Kingdom, CMS Cameron McKenna, Costain Group, CSE International, David W Myles, Defence Procurement Agency, Denton Wilde Sapte, Freshfields Bruckhaus Deringer, Halcrow, Imperial College, Kellogg Brown & Root, Linklaters & Alliance, MEPC, Mott MacDonald, National Air Traffic Services, PA Consulting Group, PLC Consultants, Thames Water Utilities Ltd, The Institution of Civil Engineers, The Underwriter Insurance Company, Union Railways, WS Atkins Consulting Ltd

The new Hong Kong International airport at Chek Lap Kok, a successful project which has received numerous awards for design, construction and operational efficiency, was built to replace the old Kai Tak airport. It was a challenging project by any technical or logistic standards—land reclamation, two runways, an immense terminal building, a complex contract structure and a huge international workforce—but the most difficult part of the whole project lay in its unique political context.

Hong Kong was to be handed back to the People's Republic of China on 30 June 1997. The design and construction of the new airport straddled the handover date and the project was a source of protracted wrangling between the sovereign powers. During that period, no permanent airport authority could be set up and no commercial funding could be obtained.

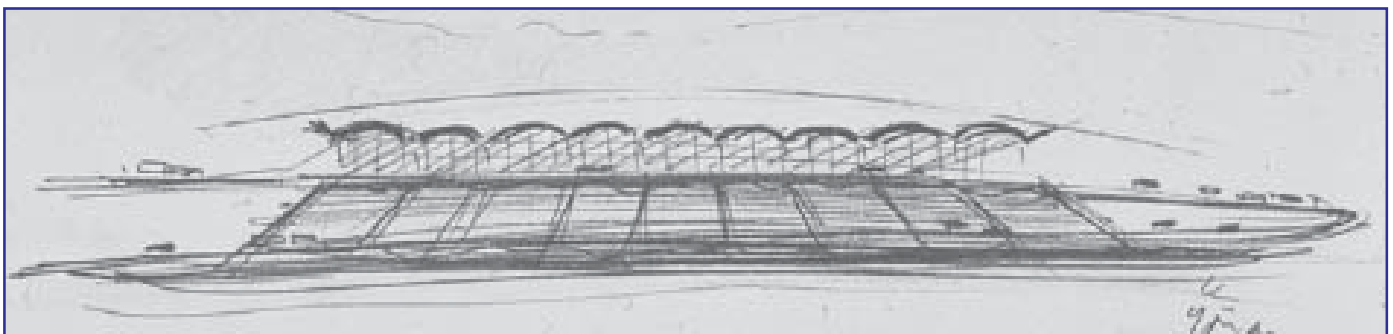
Hampered by uncertainty, the project moved slowly forward, working to a tight timetable and a project value cast in stone in 1994, with no allowance for inflation. A permanent authority was created in December 1995 and set up its own management team. The new airport was completed to the “maximum extent possible by June 1997” and opened on time on 6 July 1998.

Lessons learnt

On meetings and communications

- Quarterly review meetings were seen as one source of success, as these meetings were a non-contractual forum in which the management team, the designers and the contractors could speak their minds. There was a warning to all project directors/managers to be alert since bad news travels slowly to the top.
- Whatever the scale and complexity of any major project, a project director/manager must keep short lines of communication, be involved and keep control of the project.
- The Disputes Review Group, which attended all the quarterly review meetings, was seen as a necessity. Although never

Sir Norman Foster's original sketch of the terminal building (below)



Thumb-nail sketch of project

From start to finish

1974 Site identified

1982 Planning and financial studies carried out, but with an economic downturn and political uncertainty, the project was deferred. However, in 1989, with the growth of passenger traffic and cargo, the need for airport could no longer be ignored.

1989 Hong Kong government announced the Airport Core Programme, to build a new airport and supporting road and rail infrastructure.

1992 Programme started in March

1994 Bid documents ready, with timetable and value set

1997 Handover 30 June

1998 Airport opened 6 July

1999 Second runway operational in May

2000 North-west concourse extension was opened in January

Size of project

Land area 1,248ha (3,084acres)

Opening capacity: 35m passengers and 3m tonnes of cargo per annum

Works contracts 220

Other contracts 100s

Estimated cost £155.3bn

Design of direct works £4bn

Design of facilities for franchisees and government £2bn

Workforce of 21,000 from 30 countries

Terminal building

Size: 550,000m³ with 38 gates and 31 remote stands

Contract worth £800+ million

Power input 60MW

Reinforcement bars 70,000t

Design consortium: Mott Connell, Foster Associates and BAA

Other key players in design: Ove Arup, WT Partnership and O'Brien Kreitsberg

Construction consortium: British-Chinese-Japanese JV (Kumagai Gumi, China State/Amec, Balfour Beatty, Maeda Corp)

formally used, it tempered the whole proceedings and resolved issues before they became disputes.

On contracts

- The conditions of contract were extremely onerous, but contracts in Hong Kong always are. The Hong Kong Contractors Association did a good job in modifying some of the harshest conditions.
- Should the electrical and mechanical contracts have been novated to the main contractor to reduce the number of interfaces? Or did those contracts warrant an independent contractor? The second course of action was chosen, for which the management team was later criticized. However, any client before embarking on a major project must ponder that question.
- Any contract must apportion risk carefully to allow risk to receive its proper reward. After all, if you fail to reward a contractor for his ability to undertake risk in a business that he knows better than the client, you might as well revert to direct labour schemes.

On design

- Freeze the design as early as possible, but realize that change will occur even where it is not, in principle, tolerated and put in place effective procedures to control it.
- Integrate members of the original designer team into the management team, to ensure the integrity of the design is maintained throughout the construction.

On the presence of the client

- The lack of a client operator was a major hindrance to the project. The requirements of the owner/operator must be built into every stage of the project as it develops.

On safety

- Safety, covering both design and construction methods, must be looked at right at the beginning.

On systems

- Allow adequate time for testing systems.
- Take a belt-and-braces approach to systems and design one system for today and one for the near future, as with the current pace of technology change designing for the far future does not work.

People issues

- It is not the wording of the contract that ensures success or failure, rather it is the attitude of the people involved. A genuine team spirit must be created with all team members having a "can do, will do" attitude.

| | Year | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|--|------|------|------|------|------|------|------|------|------|
| Advanced works | | | | | | | | | |
| Site preparation | | | | | | | | | |
| Construction support facilities | | | | | | | | | |
| Initial civil engineering works | | | | | | | | | |
| Baggage-handling system | | | | | | | | | |
| Airport people mover | | | | | | | | | |
| Terminal building superstructural envelope | | | | | | | | | |
| Terminal building fit out | | | | | | | | | |
| Terminal building E&M services | | | | | | | | | |
| Airfield works | | | | | | | | | |
| Landside infrastructure works | | | | | | | | | |
| Ground transportation centre works | | | | | | | | | |
| Communication systems airportwide | | | | | | | | | |
| Testing and commissioning phase | | | | | | | | | |
| Trials phase | | | | | | | | | |
| Airport opening | | | | | | | | | |

Construction programme of the Hong Kong International Airport (as built)