Special Report

Berlin Brandenburg International BBI
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The BBI vision
Dr Rainer Schwarz, CEO, Berlin Airports

Constructing the new airport
Manfred Körtgen, Managing Director
Technical Service/BBI

The architectural concept
Olaf Nozon, Project Manager, Terminal
Technical Planning and Construction

Merging three airports into one
Roland Böhm, Aviation Coordinator BBI,
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Liaison Officer

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TÜV Rheinland supports BBI

TÜV Rheinland is a leading group for the provision of technical services worldwide and stands for neutrality, objectivity and competence. It has over 490 locations in 60 countries on all five continents. With a workforce of 13,300 employees, it achieves a turnover of approx. € 1.1 billion a year. The guiding principle in the Group is sustainable development of safety and quality.

In the aviation and airport sector, the aviation industry, airlines as well as the airports and authorities belong to the long-standing customers of the TÜV Rheinland. In order to provide an efficient service the TÜV Rheinland Group opened a TÜV Rheinland Airport office in July 2009 at the airport grounds in Berlin-Schönefeld.

TÜV Rheinland is, among others, involved in the inspection activities at the Berlin Airports and therefore has extensive experience at its disposal, which for the application for approval of the building of the new BBI Airport Terminal will be useful. Additionally, TÜV Rheinland can profit from its experience of among other similar projects at airports Frankfurt/Main and Düsseldorf.

During the planning phase of BBI TÜV Rheinland already took into consideration the necessary inspection of the systems and the components. TÜV Rheinland certifies the compliance as well as the functional suitability of technical systems with the following assessments:

- Evaluation of the realization of the highest fire protective requirements related to air-conditioning and fume ventilation systems
- Maintaining the environmental conditions by the construction of the power centre.
- Conception of the emergency electrical safety networks

The crucial point was the inspection of the fume ventilation concept in the terminal and in the unique underground railway station because the subterranean railway station is at the same time the foundation of the terminal. Hereby, the number of passengers had to be considered with the aid of the air traffic activities. As well as the building aspects TÜV Rheinland supports, among others, the BBI with the construction of the new computer centre in cooperation with the “Ingenieur – Technik Scholz GmbH” in matters of concerning questions on Quality Assurance.

In addition TÜV Rheinland performs workshops about new requirements and modifications such as the new Machinery directive for the BBI.

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Berlin Airports CEO Dr Rainer Schwarz has ambitious plans. Presently, Berlin Airports’ traffic places it in the top 15 in Europe – the aim is to get into the top 10. Merging the three airports – Tegel, Tempelhof and Schönefeld – into one is central to that strategy and will ultimately increase capacity to 40-45 million passengers per year. Schwarz told Ross Falconer that “it is a big chance for us to achieve much higher growth rates”.

The Berlin airports are, cumulatively, the fastest growing in Germany. The company enjoyed record-breaking results in 2008, with more than 21 million passengers flying to and from Berlin for the first time. Achieving such positive results – an increase of 1.4 million passengers on the previous year – is particularly significant in light of the global economic situation. With passenger growth of 7%, Berlin Airports’ growth in 2008 was ten times higher than the average of all German airports.

Berlin Airports continues to report increasing passenger numbers, with around 1.7 million passengers handled in November – up 4% year-on-year. A total of 19.4 million passengers were handled in the first three quarters of 2009. Throughput was up 7.8% at Schönefeld, reaching more than 521,000 in November, while almost 1.2 million passengers were recorded at Tegel – a 2.4% increase. Schwarz expressed delight that the present figures show just how robust the market in Berlin is.

The capacity of the terminal on opening will be 25 million passengers per year. Further satellite buildings will be added and those will eventually mean a capacity of 40-45 million passengers, which will give the region the required capacity for the next decade.

The current challenge is to accommodate growth within the system of Tegel and Schönefeld airports until Berlin Brandenburg International BBI opens. Berlin Airports has invested in the old infrastructure over the last few years in order to achieve this and offer its airline customers the capacity to grow. Bundling that into BBI will undoubtedly help. “We clearly need more capacity – we will double capacity. For the first time, the capital region is going to get an airport that offers transfer services. There is no hub operation at the moment and BBI is capable of handling transfer traffic,” said Schwarz.

Less than 2% of traffic is transfer traffic at present and it is only considered possible to increase this by bundling traffic into one airport.

Ambitious timeframe

The BBI construction site is the size of more than 2,000 football pitches. A total of €2.4 billion is being invested in the airport, in addition to multimillion outside investments. The six-storey BBI passenger terminal will be 220m long, 180m wide and 32m high. A 715m long main pier will be built in front of the terminal and, according to current plans, will have 15 jetways. The terminal will be completed by a 350m long north pier, which is intended for walk boarding, and a 350m long south pier with 10 jetways.

There will not only be eight check-in islands with a total of 112 check-in desks, but also around 120 airline check-in machines at BBI. Passengers will be able to use these machines to print out their own boarding cards, for example for flights booked on the internet. "We are heading towards paperless ticketing, which is hassle free and will ease the way for passengers through the terminal," said Schwarz.

The biggest challenge concerning BBI is the ambitious timeframe – it will open in just two years, on 30 October 2011. That will be preceded by a six-month trial phase that will evaluate operation of the new terminal and master technical system.

Three years into construction of the German capital’s most important project, it is running on schedule and many important steps have been taken, notably the procedure that allowed the closure of the iconic Tempelhof in October 2008; it was, noted Schwarz, “even harder to close an old airport than build a new one – the right idea is to do it step by step”. The remaining airline customers
moved to Tegel or Schönefeld. A second important step highlighted by Schwarz was the sale of Berlin Airports’ handling activities. In April 2008, it agreed to sell its 51% stake in GlobeGround Berlin to the Frankfurt-based WISAG Group; Lufthansa also sold its 49% stake to WISAG Group at the same time. Schwarz said: “We are no longer active in the handling field. The sale of GlobeGround Berlin to the fast-expanding WISAG Group represents the best option for all GlobeGround employees, all of whose jobs have been secured. Against the backdrop of a liberalised market the new owner will be focusing on preparing the company to face the challenges of the future.”

‘BBI taking shape’

Construction of the new Capital Airport is the most significant development project in the capital region. In June, the milestone of 1,000 days of construction was passed. After three years of construction, the building site is beyond recognition – an airport is now visibly rising up out of the ground. Work on the steel construction for the terminal hall roof began in late August, structural work on the north pier has been completed and work on the south pier, aprons, taxiway systems and the new runway, is progressing well. The topping-out ceremony for the BBI terminal is set for spring 2010. From May 2011, the airport will be tested thoroughly in extensive trial runs.

“The BBI project has really gained momentum this year. We recently passed the 1,000-day mark for the building work; we are well within all our deadlines and the funding has been finalised,” said Schwarz. “Our goals are ambitious, but by 2011 the Berlin and Brandenburg region will have a high-performance, world-class airport which will enable us to position Berlin up there amongst the top ten leading aviation locations in Europe. Europe continues to suffer from substantial bottlenecks in air traffic capacity. BBI will allow us to double the capacity currently available in Berlin and will consolidate our position in aviation, one of the key industries of the future.”

Travellers will enjoy the very latest state-of-the-art infrastructure. When passengers arrive by tube or train they will arrive in the basement of the terminal, where lifts will take them directly into what is described as “a very friendly departure hall”.

**Construction of the German capital’s most important project is running on schedule.**

**The BBI construction site is the size of more than 2,000 football pitches. A total of €2.2 billion is being invested in the airport, in addition to multimillion outside investments. The six-storey BBI passenger terminal will be 220m long, 180m wide and 32m high. A 715m long main pier will be built in front of the terminal.**
Berlin-Brandenburg Capital Airport. BAM is involved.

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It will take only 20 minutes for the airport shuttle to travel the 20km into the Berlin city centre. “The train station will have six tracks with very good train connections. The catchment area has been changing dramatically over the last few years. Two million passengers from Poland travel from Berlin each year – that is 10% of the total. For the west Polish people, Berlin is almost their home airport. The highway system around the airport is also already finished,” said Schwarz.

BBI is the region’s largest economic driver. The order volume for BBI is currently €1.5 billion, with companies from the region having secured 64% of the total order volume. This highlights the Berlin Airports concept of supporting local small and medium-sized enterprises. Indeed, Matthias Platzeck, Minister President of Brandenburg, said: “BBI is one of Europe’s most significant building projects and is a success story for regional SMEs. We will continue to implement our tried-and-tested BBI concept for SMEs in future, too. The BBI construction site is the region’s key growth driver even now.”

**Berlin-Beijing connection**

Schwarz heralded the launch of Hainan Airlines’ service from Beijing to Berlin Tegel on 5 September 2008, describing it as the start of a new chapter in relations between the two capital cities; the aim is to further expand the long-haul route network from Berlin. “It is now possible to fly from China to Central Europe in less than 10 hours. 40,000 passengers a year already fly from Berlin to China. Up to now, passengers had to change in Europe and just accept the fact that they had to fly via London, Frankfurt or Amsterdam for example. This flight is much more convenient for these passengers.”

Berlin is the top travel destination in Germany and ranks third in Europe. As the headquarters for the Federal Government, the city is becoming increasingly important for politics and the economy. Berlin is also the ideal starting point for connecting flights within Germany and Europe. Flying to Berlin from Asia is around one hour quicker than flying to one of the hubs further west in Frankfurt, Amsterdam, London and Paris.

Schwarz said: “We aim to cooperate closely with BTM on attracting the ever stronger middle-class of China to Berlin. ‘Europe in 14 Days’ – no other location provides the perfect starting point for our Chinese visitors than the metropolis of Berlin. Conversely, Beijing provides the perfect basis for tourists from Germany to travel to the Land of the Rising Sun with its 5,000-year culture.”

**‘A hub in the heart of new Europe’**

BBI is the ultimate construction site. Contracts worth more than €1.5 billion have already been awarded, and up to 3,000 workers will be employed on Europe’s biggest airport construction site by the end of the year. “Three years ago, there were only fields and meadows here. Today, the blueprint of the airport is clearly recognisable. 2011 will see a new player on the German aviation market – BBI. The road ahead is clear: in building BBI, Berlin is creating a hub in the heart of new Europe. The goal is to take the Berlin-Brandenburg region into the top 10 airport locations in Europe with BBI. Twenty years after the fall of the Wall, the metropolis Berlin has been put back on the map of Europe in terms of air traffic.”

Particularly significant was completion of preliminary construction of the train station, which effectively meant take-off for the terminal building. This had to be completed before work could begin on the terminal, as the rail station is situated directly underneath the main terminal.
Clearing the way for Berlin’s new major airport

Within the framework of a consortium, we are developing the new Berlin-Brandenburg International capital airport for you and creating more than 1.6 million square metres of manoeuvring surfaces and auxiliary areas.

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- Laying cables
- Underground fuelling
Construction programme on schedule

Manfred Körtgen, Managing Director Technical Service/BBI, outlined details of the BBI construction programme, as well as job creation, the labour market and the competitiveness of the Berlin-Brandenburg region.

BBI is currently the largest construction site in Germany and the largest airport site within Europe. To give an idea of the scale of the development, the total surface area of the new airport will be 1,470 hectares, the project involves 10 million cubic metres of earth movement, a two million sqm fixed area for air traffic – including a new 4,000m long runway, 87 aircraft stands for the first construction stage up to 2011, approximately 36,000km of cable pipes and a 21km fence. Impressive numbers indeed, which give the scale of the project. Körtgen acknowledges that the biggest challenge, of course, is time – BBI will open in less than two years.

"After three years of intensive building activity, most of the work on the new BBI has already been completed. All key technical facilities at the airport are on schedule," he said. "Now the focus is on the terminal and its two piers. The steelwork on the roof construction for the terminal is well underway and will be completed early next year. Then we can celebrate the topping-out ceremony in spring."

By late August, the majority of the concrete work in the main hall of the terminal had been completed and work could commence on the steel construction for the terminal roof and on the steel and glass facade. A major logistical feat: the two caterpillar cranes, which are currently on the west side of the terminal lifting the first steel components, are so big that 60 trucks were needed to assemble just one caterpillar crane. Each of the steel components is being assembled bit by bit on the terminal. The total weight of the steel components required for the future terminal roof is around 10,000 tons, the heaviest single component weighing 123 tons. Concrete work on the aprons, taxiway systems and the new south runway is also well underway. The milestone of 1,000 days of construction work was reached in the summer. "Those who look at the BBI construction site – after 1,000 days of construction work – to the south-east of Berlin will immediately see: what was once Potsdamer Platz in the 90s is now the BBI airport construction site. The place where Berlin’s future is being built," said Körtgen. "We are currently in one of the most exciting phases of construction: BBI is rising up from the ground. A face is being given to the airport. The terminal, new runway, and road and rail link are clearly taking shape. Now everyone can see what 1,000 days ago only planners and architects were able to recognise: an airport is being built here."

The go-ahead was given for interior work on the BBI railway station in July, when Berlin Airports handed over the first preliminary construction section of the underground BBI railway system to Deutsche Bahn; subsequent work has started on interior and railway technology. Körtgen said: "Handing over the preliminary construction section of the rail link marks yet another milestone towards realising BBI. We are delighted that the handover has taken place on schedule, allowing us to now take an important step forwards."

Village relocation

Although BBI is being built adjacent to Schönefeld, it is a completely new airport. The airport plan in Körtgen’s office shows that Schönefeld is in the north, while most of the new BBI airport is in the south. “The only thing we will still use from the old airport is the former southern runway, which will be BBI’s northern runway.
Manfred Körtgen, Managing Director Technical Service/BBI, outlined details of the BBI construction programme, as well as job creation, the labour market and the competitiveness of the Berlin-Brandenburg region.

An additional challenge was the little village of Diepensee – situated close to our new terminal – that had to be removed first and then rebuilt in another location,” he said.

The relocation of Diepensee and parts of the village of Selchow to the west of BBI has been essential to the project. The relocation of Diepensee was completed in December 2004, and the partial relocation of Selchow was successfully carried out in July 2005. The residents of Diepensee were involved in virtually every aspect of the planning to ensure that the character of their former village would be maintained at the new location.

Innovative construction

Körtgen highlighted the geothermic equipment as a very special and innovative construction. Because of the special circumstances of the airport area, the planners used a combined pile-raft-foundation for the terminal. Due to the geothermic installations in approximately 230 of the more than 800 bored piles, the ground can be used for heating as well as for cooling the BBI terminal. “Together with a combined thermal pump construction that can be used both as a heat pump as well as a cooling pump, we can use a range of temperature from two degrees Celsius up to 24 degrees Celsius for cooling in summer and heating in winter. With this technique we can guarantee 15% of the required heat and 31% of the required cooling.”

The dimension of the pipe system needed for this technique is approximately 65km long.

Berlin Airports takes environmental concerns very seriously. While this has not directly influenced the materials used, there is a person responsible for environmental affairs, another responsible for emission control and – among others – at the end of the project Berlin Airports will have allocated approximately €34 million to a compensation fund of the Nature Conservation Agency for impairments of the soil that cannot be compensated.

In the 1990s, the infobox at Berlin’s Potsdamer Platz was a huge magnet for visitors. Today, the BBI construction site draws in the people of Berlin and Brandenburg. The 32m high BBI Infotower, which is in the midst of the construction activity,
offers visitors a view over the construction site. “It is something to give all of the people interested in this new airport a chance to see what’s going on,” said Körtgen.

The Infotower is attracting an increasing number of visitors, particularly now that construction works of the terminal building itself have begun. It affords a wonderful view over the construction site, the old airport and, when the weather allows it, a fantastic view to the radio tower at Alexandersplatz.

Körtgen said: “In 2011, when we open BBI, we will close Tegel – there will be only one international airport in this region. We can concentrate all activities here and have a door to the world. We want to be a mini-hub to the east.”

BBI: ‘A job machine’

Körtgen described BBI as “a job machine”. BBI’s status as an employment generator will see up to 40,000 new jobs created in the region – two new jobs are being created every day.

Berlin and the Brandenburg region are expected to profit from the dynamic development of Berlin Airports. Spending by direct and indirect airport employees, as well as the purchasing power of arriving passengers, will result in increased employment. The expansion of Schönefeld to BBI is particularly important for the labour market and the competitiveness of the Berlin-Brandenburg region.

The construction of a single airport will solve the costly and inefficient fragmentation of the region’s air travel market.

Improved air transportation connections will strengthen the capital city region as a location for research, congresses and trade fairs. The expansion of the sales and employment markets, the growth in the number of passengers, additional purchasing power and location effects will generate around 39,400 additional jobs in the region by 2012. The total employment effect of BBI in 2012 is expected to be around 73,000 jobs.

This is augmented by the one-off effects of construction work for the BBI project, which involves capital investment totalling €2.4 billion, thereby creating jobs in the planning and construction industries and with their suppliers. The construction of BBI is the largest infrastructure project to be undertaken in eastern Germany. Gross added value to the region is expected to amount to some €2 billion. Körtgen explained that steadily increasing passenger numbers are bringing tangible increases in the number of jobs at Berlin’s airports and in the region as a whole.

BBI is not only creating capacity for further growth in the Greater Berlin area, it is also securing thousands of jobs and helping to generate an employment boom.

Because of the special circumstances of the airport area, the planners use a combined pile-raft-foundation for the terminal. Due to the geothermal installations in approximately 230 of the more than 800 bored piles, the ground can be used for heating as well as for cooling the BBI-terminal.
The road to BBI

1996
Decision by the partners Berlin, Brandenburg and the federal government: BBI, the international airport for Berlin and Brandenburg, will be built in Schönefeld. Tegel and Tempelhof will then be closed.

1999
Application for permit: Flughafen Berlin-Schönefeld GmbH (FBS) submits the planning permission application after only two-and-a-half years.

1999
Agreement on resettlement: Signing of the contracts for socially-tolerable resettlement of Diepensee and partial resettlement of Selchow.

2000
Citizen participation 1: Presentation of the planning documents in the neighbouring communities of Schönefeld Airport.

2001
Citizen participation 2: Hearing of private objections and so-called public bodies (authorities, associations, clubs, churches, etc).

2003
Beginning of the measures for the commencement of construction (resettlement, archaeological investigations).

2004
Permit: After extensive examinations and considerations, the authorities decide in August on the BBI airport project (planning permission decision).

2004/2005
Conclusion of the resettlements: Prior to commencing BBI construction work, the "resettlers" from Diepensee and Selchow move into their new houses and apartments in Königs Wusterhausen, Selchow and Groß Ziethen. Continuation of the preparatory measures for construction (construction site clearing, drainage for the water used in construction, etc).

16 March 2006
The Federal Administrative Court gives the green light for the expansion of Schönefeld Airport into the new Capital Airport Berlin Brandenburg International BBI.

2006
Set up of the construction site: Building of the construction roads, the central concrete mixing plant, the construction site areas, beginning of the relocation of lines, request for tenders for the initial construction work, preparatory work for the runway connections to the northern BBI runway.

2007
Beginning of construction of the railway tunnel and the subterranean railway station, beginning of construction for the utility supply lines and waste disposal, beginning of construction of the northern and southern taxiway system, beginning of construction of road connections, closure of the current northern runway.

2008
Demolition of the old northern runway and closure of the gap in the new A113. Completion of GAT. Beginning of construction of the terminal and operational roads, beginning of construction of the new southern runway and aprons. Closure of Tempelhof Airport.

2009
Completion of structural work and beginning of structural expansion, facade, roof for the BBI Terminal. Completion of structural work for the railway station and beginning of construction of the main terminal ring road. Extensive work on supply and disposal.

Further planning:

2010
Completion of structural work on the terminal ("topping-out ceremony"); start of operations for the fire department, building for special equipment, winter services, ground traffic services.

As of May 2011
Trial operation of the new terminal and master technical system.

30 October 2011
Beginning of BBI operations: As of 2011, air traffic for the Berlin-Brandenburg region will be bundled at BBI in Schönefeld. Closure of Tegel: With the commencement of operations at BBI, Tegel Airport will be closed.
Central to the design concept is the idea of short and direct distances on the passenger journey from ticketing to boarding. BBI consists of a central building with attached piers and satellites. All of the main processes – check-in, security, baggage handling – occur within one building. The terminal is situated between the two parallel runways – north and south. “The terminal is axis-symmetric and has grids that are each 43.75m by 43.75m; these grids consider the most common Code Letter C aircraft, as well as other development space for check-in areas. Furthermore, it is aligned to the structural system of the train station,” said Nozon.

The clear orthogonal structures, supported by daylight guiding in the aforementioned grids, are designed to maintain simple pathfinding and orientation for the passenger. “The terminal building, with its delineated facades and clear, geometric forms, borrows an array of elements – from Schinkel to Bauhaus. The main roadway entry is conceived as a tree-lined avenue, reflecting the scenery typical of the region’s cities and countryside.”

The 220,000sqm terminal building has a roof area of 49,000sqm, while the main pier is 715m long and 34m wide. The main pier will have 15 jetways. An additional two boarding positions will be installed, one walkboarding pier-north and one boarding pier-south with 10 jetways, two satellite terminals can be built in the midfield area and additional apron areas can be opened up, when necessary.

The design brief

Key elements of the design brief included: highly cost-efficient planning, building and operation; the ability for modular growth; all functions under one roof – handling the needs of the traditional and low-cost airlines; and integrating future functional aspects or enabling their integration in the near future. “To achieve this we had to permanently review the design and stay in intensive contact with the airport departments and airline users. A review of all design stages by planners and later users, and the integration of the user needs were necessary to ensure an overall acceptance,” said Nozon.

Fundamentally, it is necessary that the design is able to achieve the required traffic volume – a capacity
for the year and the rush hour capacity. Simulation tools were used to determine the passenger flow and capacities for each service, such as check-in.

It is essential that the terminal is accommodating to transfer passengers and that there is good integration of the different modes of transportation. There will be a direct connection, via lifts, from the train station to check-in. Moreover, a passenger shall not walk more than 750m between the check-in hall and the central market place to their pier. The main pier has three levels of boarding – for Schengen passengers, non-Schengen passengers and arrivals. This will shorten the transit process.

"Simple orientation is aided by a symmetrical design, orthogonal sequence of rooms and a standardised construction grid, which is supported by artificial light and daylight; the wayfinding is intuitive," said Nozon.

High efficiency is a pre-requisite in terms of investment and operational costs. It is a highly efficient construction that makes use of standardisation, and no special formats, as a means of achieving efficiencies. Economic operating and maintenance costs are a pivotal element in the planning for BBI. As part of this, the development engineers have placed a high value on ensuring that the individual buildings and structures achieve optimum energy consumption levels. In addition to the use of highly innovative heat recycling systems, the planning concept explores the integration of regenerative energy systems, such as geothermal systems or the use of rainwater for cooling.

**Design objectives**

The copious use of natural daylight is an important feature of BBI. According to Nozon: "Natural daylight and a logical structure within the building enables the passenger to learn the principle of the airport functions without help, which is an important part of the intuitive wayfinding concept. Integration of regenerative energies is an important objective."

The twin objectives of making BBI visually appealing and achieving a smooth, efficient passenger process are not mutually exclusive, explained Nozon, but are part of the main concept. "Different service
functions and sectors obtain a different room character. The main check-in hall must provide sensibly ordered features such as ticketing, quick check-in, bagdrop, information and having a farewell drink; we will meet this goal with a clearly arranged hall." The central marketplace on the other hand must be able to present to the passenger all of the shops, bars and restaurants from a central place. Wayfinding will be accompanied by an integrated colour and material concept; all passenger areas are vested with durable natural stone and all counters will be wood veneer – the intention being that there will emerge a recognition by the passenger.

BBI has been designed by the planning group pg bbi: Planungsgemeinschaft Flughafen Berlin Brandenburg International, formed by the architects J. S. K. International Architekten und Ingenieure GmbH and gmp Generalplanungsgesellschaft mbH, and IGK-IGR Ingenieurgesellschaft Kruck mbH for the technical building equipment. "They were chosen by the airport authority because of their good competition design sketch and their design ideas," said Nozon. "The existing airports never had an influence on the design process. Only the southern runway of the old airport will remain and be deployed as the new northern runway. We have given the airport a whole new face. The old airport is going to be rebuilt and will be used for commercial use and service and maintenance operations for aircraft."

**Simple passenger processes**

What can passengers expect when they first enter BBI? Nozon explained that passengers will find themselves in a light and friendly entrance hall, ensuring easy processes without creating stress and discomfort. "The materials used for the single processes have been appropriately chosen. Wood is, for example, used in areas where the passenger needs warm and welcoming materials. The warm colour of the floors accompanies the passenger from entering the building up to the boarding gate."

There will be a 2.5km long feeder road from the A113 motorway, which will have an avenue style – with trees on both the left and right hand sides – to integrate the airport into the local surroundings of Brandenburg. "The drive-up itself is a generous gesture – it welcomes the passenger. The check-in hall has a representative character but does not appear pretentious. Passengers will find all necessary services in a daylight blessed room," said Nozon.

**Innovative elements**

Important architectural elements include the planned integration of regenerative energies and all functions being positioned under one roof – handling the needs of both traditional and low-cost airlines, as well as the short distances passengers will have to travel and the highly efficient processes. The planning was focused on the needs of aviation and non-aviation activities in an equal way; both functions are positioned in an optimal way to ensure a maximum functionality for both needs.

The membrane roof, in addition to the glass lines which span it, gives the check-in hall different moods depending on the time: during the day, natural light saturates the glass lines and the membrane does not appear very dominant; in the night, the sky will be visible through the glass lines and the grids of the membrane will be illuminated.

"The biggest challenges in terms of finalising the architectural concept were the need to permanently review the design to find acceptance for it and integrate all user needs, and securing the building permit," said Nozon. The design evolved over time to serve the needs of the aviation and non-aviation functions. "We had to react to the intense growth of low-cost traffic and designed a separate low-cost pier, which is connected to the main pier in order to maintain the principle of a one-roof terminal design. To ensure a high security level for all passengers, inbound and outbound, we integrated an additional arrival floor for the separation of arriving and departing passengers," said Nozon.

The 220,000sqm terminal building has a roof area of 49,000sqm, while the main pier is 715m long and 34m wide. The main pier will have 15 jetways. Additional two boarding positions will be installed, one walk boarding pier-north and one boarding pier-south with 10 jetways.
BBI – more than an airport

Berlin Brandenburg International BBI will offer first class business and investment prospects. It is set to become a compact hub and a first-rate business and commercial centre. The concept will see BBI become the marketplace of the metropolis and the focus of the entire capital region.

The potential turnover is huge – BBI will initially handle up to 73,000 passengers per day on opening in 2011. To that can be added the number of people coming and going, inquisitive sightseers, shoppers, business people and the thousands who will be working there. Even the renowned Friedrichstraße and Kurfürstendamm will not be able to compete with the sheer numbers.

The transport connections will also be impressive. The train station will be located directly beneath the terminal. The Airport-Shuttle will take 20 minutes from Berlin city centre, while the S-Bahn will be another rapid transit system transporting travellers and visitors to BBI Airport City. The new A113 motorway link is already complete. “People can see that the airport is not so far from the city,” said Siegle.

Gateway to the capital

BBI Airport City is being constructed at the very heart of the new airport grounds, in front of the main terminal. It will see an investment of €200-250 million. "Interest in general is very high in this project. It is a major project for the region and there is a chance to combine infrastructure. We are in a corridor between East and West Europe. This is a big chance for this airport and region in general. The new airport will be a gateway to the capital region," said Siegle.

There are various building plots for investors along a central plaza for six to seven floor buildings across a 148,000sqm area. A mixture of Europe-wide tenders opened in Q3 2009. With the Airport City, the investor builds the building, based on leasehold, but the airport company still owns the land – that is the big difference in comparison with the Business Park, where the land is sold.

BBI Business Park Berlin

Siegle explained that up to €250 million will be invested by third parties in the first part of the Business Park. The largest industrial estate in the capital is being constructed a few minutes to the north-east of BBI. The total area offers around 109 hectares of plots. The first phase of development will provide infrastructure for an area of approximately 16 hectares – construction work began at the beginning of Q2 2009 and is scheduled for completion at the end of 2009.

Marketing activities for the BBI Business Park Berlin are progressing with great success, with a significant proportion of sites already sold. BBI Business Park Berlin will be a new centre of economic activity. It offers a selection of sites, which can be flexibly divided up into individual, purpose-developed plots that are suitable for use as commercial and industrial units.

The prestigious entrance on the B 96a is expected to become a top address for offices, hotels, services and smaller logistic units and services. Upwards of six hectares on both sides of the entrance will provide a total floor area of 130,000sqm around a central piazzetta.

The new airport will bring national and international destinations ever closer. There is also direct car and lorry access from the Business Park to the terminal and cargo area. Destinations in Eastern Europe, Asia and the entire Pacific region are around an hour closer from BBI than from the established hubs in Western Europe. Indeed, Air Berlin recently launched a service from Berlin to Phuket.

South-east Berlin is already the economic area with the largest growth in the city region – a trend that will be strengthened with the BBI development.

BBI is much more than just an airport; its visionary concept will make it a preferred business and investment location. Harald Siegle, Head of Real Estate Management, Berlin Airports, outlined plans for the BBI Airport City – a city within a city – and the BBI Business Park Berlin – the largest industrial park in the capital.
Merging three airports into one

Moving from a three-airport system to BBI is a complex exercise requiring meticulous coordination. The man leading the team responsible for this preparation is Roland Böhm, Aviation Coordinator BBI, Aviation Management, Berlin Airports. He detailed the logistics of closing two airports and opening a new one.
Tegel and Schönefeld airports have separate aviation departments and Böhm’s team is responsible for merging those towards BBI. “In order to merge three airports into one, we set up the Operational Readiness and Airport Transfer (ORAT) project. This involves the training of staff, trials and the merger itself,” he said.

Such is the complex nature of this task and the attention to detail required that Böhm keeps a clock on his desk that counts down the years, months, days, hours, minutes and seconds to BBI’s opening on 30 October 2011. It is a constant reminder and while there are still almost two years to go, the countdown has very much begun.

“There are up to 200 companies/entities that need to move, such as Lufthansa and GlobeGround – the biggest handler. There are a huge variety of companies that we have to take with us. Part of this project is huge coordination. We are already in consultation with the airlines and ground handlers,” said Böhm.

Tempelhof was closed on 30 October 2008. After 80 years of flight operations and 123 years of aviation at the airport, it was an emotional time for the residents of West Berlin, as Tempelhof is the cradle of aviation in Germany and one of the oldest airports in the world. With the opening of Berlin Brandenburg International BBI, the historical split of the capital’s air traffic will come to an end. The closure of Tempelhof is an important milestone in the realisation of BBI. Tegel, the city’s second airport, will be closed after the opening of BBI.

**Overnight move**

“It will not be a dramatic logistical exercise moving equipment from Schönefeld to the BBI site – it is just a few kilometres. The one we are focusing on is Tegel. The challenge is defining the equipment needed in the last hour at Tegel and the first hour at BBI – fire equipment, ground handling equipment etc. This will literally be moved overnight. Most of the equipment will be moved weeks before or weeks after. The task is to find out what essential equipment needs to stay until the last minute – it is about prioritising,” said Böhm.

Tegel handles 14-16 million passengers, which Böhm considers a manageable size to move. There is a very good road connection between Tegel and Schönefeld. Additionally, the date of the move in 2011 is 30 October, which is also the daylight saving date, so an extra hour is gained for the move.

“BBI is regarded largely as a construction project, but it’s also a logistical and organisational project. We have to set up new procedures to integrate people and processes. We will look at how other airports in the world manage the different stages of such projects,” said Böhm.

His team has, for example, been in contact with their colleagues at Munich, who have experience of such Operational Readiness and Airport Transfer (ORAT) projects.

**Logistical challenges**

The new tower will start operations six months before the opening of the airport, with Air Traffic Control operations beginning a little before the operational starting date of BBI itself. “At the moment we are setting up systems to identify equipment and volumes; we are setting up processes and how to approach problems. We are going to provide a framework for the whole period of the merger and for the trial period; it will be a framework with guidelines for the move. The idea is to move most equipment before security goes live,” said Böhm.

Among the logistical challenges already undertaken was the need to build new taxiways, which involved closing down the existing south runway for a period of time and using the northern runway before it closed to build a new motorway link.

“It was a huge effort. We worked closely with the airlines, ATC and the construction department and construction companies,” said Böhm. “The final milestone of handing over the site to the Highways Agency was met. That has been the biggest thing – otherwise operations at Schönefeld have been largely unaffected.”

Construction of the BBI terminal will be complete in May 2011, after which there will be a six-month trial period. “The outcome of the trial period must be that everyone is confident. Our goal is that passengers shouldn’t notice anything severe – that it runs smoothly. It is important to take it as a big opportunity,” said Böhm.
BBI – The Green Airport

The new BBI airport will have a positive ecological balance. Berlin Airports is investing €170 million in ecological measures. Karsten Holtmann, Environmental Planning for BBI, outlined how environmental considerations and protection have informed the project from the early planning stages.
Concentrating Berlin’s air traffic at a single airport offers ecological benefits over the current airport system; it will reduce land use and disturbances from noise and traffic. These benefits will be partly facilitated by the closure of the inner city airports – Tegel and Tempelhof – which was a key consideration in planning approval being granted. The ecological impacts of BBI and how they will be dealt with were a fundamental element of the plans submitted.

Economic operating and maintenance costs are a pivotal element in the planning for BBI. The development engineers place a high value on ensuring that the individual buildings and structures achieve optimum energy consumption levels. In addition to the use of highly innovative heat recycling systems, the planning concept is also exploring the integration of regenerative energy systems, such as geothermal systems or the use of rainwater for cooling.

“The energy efficiency concept involves power heat coupling systems, regenerative energy systems, energy management systems, innovative air conditioning of buildings, innovative building climatisation, and a rain water utilisation facility for cooling. In terms of geothermics, the heating of the building is not such a problem – in summer it’s cooling it. A special system will provide one-third of the cooling we need – water is heated in winter and cooled in summer,” said Holtmann.

He explained that carbon dioxide emissions will be reduced by 9,000 tonnes per year with one airport, with a reduction in CO₂ emissions per passenger of approximately 5%. “By concentrating the traffic at BBI, we are making one airport out of three. We try to be as effective as possible in terms of operations. The feeder service will be multi-modal – we will attract as many passengers as possible to the trains,” said Holtmann. It is expected that up to 50% of passengers will travel to and from the airport by train.

**Noise Protection Programme**

Positively, BBI will provide sustainable relief in terms of noise and transport pollution for some 100,000 people from Berlin and the Brandenburg region. At BBI, aircraft noise will be largely limited to the airport grounds themselves due to the new airport’s Midfield concept. Moreover, strict noise control regulations will apply. There will be extensive protection for Schönefeld residents due to the Planning Stipulation Decision. The number of people exposed to aircraft noise will be minimised. The existing airport affects approximately 226,000 people, BBI will substantially reduce this figure to 60,000 affected people.

The comprehensive protection of BBI residents will be achieved as a result of the Noise Protection Programme. The noise protection zone is calculated on the premise of 360,000 flight movements per year; it covers an area of 130sqm.

**Ecological monitoring and compensatory measures**

The BBI planning permission decision imposes numerous conditions to compensate for the impact on nature and the landscape and to limit this to a minimum during construction. For every tree that must be felled on the construction site, new trees are planted in various areas surrounding the airport, and a replacement is found for every single pond. Ecological monitoring of construction by a team of experts – ARCADIS Consult GmbH – commissioned by Berlin Airports ensures that these conditions are met. Ecological monitoring of construction involves regular visits to the construction site and advising the site manager. It relates to the entire construction site, as well as infrastructure measures to be carried out off-site such as road and rail connections and relocating lines.

“Tree protection is one of most important parts of our ecological monitoring. We are landscaping with 40km of tree-lined roads, 10km of hedges and biotope connection structures near waters. Trees are being planted to replace those that need to be destroyed,” said Holtmann. “We have constructed 65 hectares of new parks in the countryside and are planting 160 hectares of forests. All of these measures are part of biotope connection structures.”

Measures to avoid and minimise damage to the tree population range from protecting the roots using fences and burden sharing, through protecting the tree trunks to using optimised construction methods. This helped to save three 200-year-old oak trees standing off-site to the south-west of the small town of Selchow. The oak trees are situated right in the path of the supply and waste disposal lines for BBI. According to technical plans, open cut tunnelling was envisaged for laying the lines. For this, the trees would have to be felled. Instead, however, a construction method was used whereby the pipes were bored 2.5m below the oak trees, so that the old trees could be preserved.

**Nature conservation**

“Unusually, we also had to relocate a few thousand frogs. They were collected from their previous habitats and relocated to newly created stretches of water to replace their usual habitats. Species include Eurasian spade foot toads and common toads, and moor frogs,” said Holtmann.

The relocation of amphibians took place before construction began. As early as 2005, Berlin Airports created four replacement waters off-site in close consultation with the nature conservation authorities. The relocation was a success and the development of the amphibians in the replacement waters is under constant ecological monitoring.

Holtmann also highlighted bat protection as another important measure. Bat research had to be carried out when demolishing buildings and felling trees. The old trees in particular were checked for ‘bat occupation’. The trees in which bats were sitting were marked and only felled once the bats were relocated to their winter quarters. As a rainwater storage reservoir for BBI, the Rotberg reservoir was also extended and upgraded in such a way as to provide an ecological safe haven for the bats.

Of course, not all construction interference can be compensated for with practical measures. Therefore, Berlin Airports agreed to make a compensation payment of €34.3 million for irreplaceable green areas to the Brandenburg Nature Conservation Agency.

**Concrete plant**

Another important element in the ecological construction consultancy and supervision is the concrete plant on the construction site, which provides traffic relief to the surrounding area. “The capacity of the plant is 900m³ per hour or 10,000m³ daily. This provides massive traffic relief on the surrounding area – 600,000 truck runs to 2011. That is very important for the authorities,” said Holtmann.
Central to the liaison strategy is the Visitor Center – ‘airport world BBI’, which has for many years already been open to the general public to learn everything there is to know about BBI. Staff are onsite daily to give presentations and answer enquiries. “Right from the outset, residents from the surrounding area have been able to come here to inform themselves about the entire operation and most importantly the added inconvenience BBI could cause them,” said Meichsner. “As a parallel operation we take an ‘Infobus’ on tour around the neighbouring villages to inform people within their own communities about the future pressures that BBI could bring them and their rights in this. It is also an important information point for the noise protection programme.”

Regular meetings are held with the Mayors from all of the local communities, as well as the various District leaders. The aim of these meetings is to keep everyone informed of the latest developments in the construction of BBI.

The main fears and worries expressed by the local community concern a reduction in quality of life, property loss and security risks. “There is little that the airport can do to act against these concerns. On the one hand, the noise protection targets will be achieved and clarification work is undertaken. But one hundred percent security cannot be guaranteed,” said Meichsner. “We work steadily with the local municipalities, alongside regional marketing, on initiatives demonstrating that with airports such as Frankfurt and Munich, property prices rose dramatically after the rise in passenger figures and have not fallen again.”

Noise protection

Noise protection standards are explained in detail in the Planning Stipulation Decision for BBI – above all on passive sound insulation. Schönefeld Airport has voluntarily undertaken a noise protection plan for some years now – a fact that has helped and informed the BBI project. “We are working on the onion skin principle – working from the inside outwards. Communities located within the area of highest risk of noise are being supported first. We, together with engineering specialists visit the flats and homes affected to assess the level of risk. Following on from this, we work together with the residents and also the owners to establish the best

Engaging the local community

Constructive dialogue with the local community is a key part of the BBI strategy; there are significant ongoing efforts to ensure the public is kept fully informed about the project. The aim is to allay any concerns that naturally arise around such huge developments, and to convey the vast benefits of BBI as an economic and employment generator. Ross Falconer spoke with Rosemarie Meichsner, Neighbourhood Liaison Officer.

Berlin Airports brought the construction site to the city with a promotional tour through Berlin, which involved handing out leaflets about BBI and the construction site tours. As part of this campaign, ‘Armin’ the construction site mascot provided photo opportunities for children.
possible measures to take to solve these problems as laid down in the stipulation. In total, ca. 25,000 households will be covered by these measures,” said Meichsner.

Specific attention is paid to buildings such as kindergartens and schools. In these cases BBI works hand in hand with the local municipalities and their residents. After the status reports are made, careful attention is also given to other issues arising from the noise protection plan, such as fire prevention. Finally, after careful discussions with all parties involved, agreement on how best to achieve optimal noise protection is reached.

A forum for dialogue

Meichsner explained that there has always been, and to some extent still is, a strong pressure group campaigning against the development of BBI. However, since the Planning Stipulation Agreement and the Court Judgment, this group has recognised a need to refocus its energies. “Cooperation is now running well. We have established a forum for dialogue. Within this forum all problems are described and discussed and potential solutions sought.”

While the main responsibility for information provision for the general public still lies with the Visitor Center, the BBI Infotower also has an important role to play. Tours to inspect the BBI construction site begin from the Infotower and it is also possible to visit the Infotower individually. Despite there being no major advertising campaign, this has attracted great interest. “It is essential that the general public can witness for themselves how BBI is growing,” said Meichsner.

Many have even recognised the potential of the Infotower as an interesting event location. “We have brought the construction site to the city. The first wave was a promotional tour through Berlin handing out leaflets about BBI and the construction site tours. As part of this campaign, ‘Armin’ our construction site mascot accompanied us to provide photo opportunities for children,” said Meichsner. “The second wave comprises enormous billboard posters featuring our mascot to point the way to the construction site and its tours. Armin invites the general public to see his construction site. The third wave will be a wide sweeping advertising campaign in Berlin’s various daily newspapers.”

The local community stands to benefit enormously from the merger of three airports into one. BBI will be a substantial economic and employment generator, as well as a great source of income for the surrounding municipalities through taxes. BBI will create up to 40,000 new jobs in the region. “Already, the surrounding municipalities are experiencing a huge demand on real estate. The municipality of Schönefeld is now completely debt free and we anticipate it becoming the richest municipality in eastern Germany,” said Meichsner. “Also, as far as unemployment figures are concerned, we are looking forward to being on a par with figures published for the Munich outskirts – only 2-3% unemployment.”
BBI will have a much-expanded commercial offer in comparison with the existing Berlin airports, with retail and food and beverage (F&B) space totalling 20,000sqm. “With BBI, the goal is to exceed the expectations of passengers with the retail offer,” explained Dr Norbert Minhorst, Head of Non Aviation Management, Berlin Airports. He outlined the commercial proposition.

Currently dominated by concrete and steel, this area will in future greet passengers at BBI with modern shopping and recreational facilities where they can relax and enjoy the pleasant atmosphere. Around 150 shop and restaurant areas on more than 20,000sqm provide a great deal of space for regional, national and international brands. The tenant selection procedures for the non-aviation areas in the new BBI terminal are already underway and will be completed in 2010.
Retail space was at the forefront from the earliest design stages of BBI, such is the growing importance of non-aviation revenues. Berlin Airports worked very closely with Pragma and The Design Solution to identify retail concepts. A key idea is to create a big marketplace. Because of the one-roof concept, no matter where passengers are going they will walk through the same hall.

“The first important thing is to have a good terminal – each process must be very functional. There must be passenger convenience – they must be relaxed. If all the stress points, such as security, are passed and the passenger is airside, then they still have excitement and they are ready to spend money. We play an important role – we are part of a chain,” said Minhorst.

It was announced in December that Berlin Airports has selected Gebr. Heinemann as the first BBI tenant. It will operate the Duty Free/Duty Paid shops in the new airport. The Heinemann concept is based on showcasing a wide range of products from Berlin and Brandenburg. Berlin Airports will be renting four areas to Gebr. Heinemann, totalling 3,000sqm.

Interestingly, BBI will combine the business travellers from Tegel with the low-cost passengers from Schönefeld. The key is to find a retail mix that fits all groups of passengers. “Our concept is to bring them together in one marketplace and have different sections within that marketplace,” said Minhorst. “We know where the shops and F&B outlets will be and more or less how many. When BBI opens, the ‘wow factor’ will be the terminal itself. Then when passengers get airside the marketplace will not be what they expect. The offer will exceed their expectations.”

Berlin Airports started the letting process for retail space in August 2009. There will be 150 retail and F&B spaces in the new BBI – 120 airside and 30 landside. A three-stage Europe-wide letting process is being conducted to allocate space: 1 – Pre-qualification: Interested companies have the opportunity to submit an application; 2 – Invitation to tender: Each space is advertised individually. Pre-qualified applicants from stage one are requested to submit an initial binding financial offer. A concept, business model and strategy must also be submitted together with a business plan; 3 – Negotiation: The airport enters into negotiations with the best bidders. The aim is to obtain the best concept and most profitable solution for letting.

The letting process will continue until Q2 2010. The non-aviation segment is becoming increasingly significant. The proportion of Berlin Airports’ overall revenues generated from non-aviation activities has increased from just under 20% in 2000 to the current level of 33%. The aim is that this share will be increased to 47% by 2010.

Minhorst explained that there are essentially three groups of potential concessionaires. Firstly, existing concessionaires will be invited to participate; secondly, those companies that have requested space will be sent the tender documents; and thirdly, there will be particular retailers and F&B companies that will be especially asked to take part. “Everyone who wants to be in can be in. There will be a level playing field,” said Minhorst.

There will be a strong local flavour to the offer, with some brands and F&B outlets typical of Berlin. “People have to be able to recognise that they are in Berlin as soon as they step into the airport.” This local flavour will be mixed with a variety of key international brands.

Revenues per passenger will be much higher at BBI than they are today across the existing Berlin airports. “It is very important to get a return on investment. It is important to show investors that the concept will be good,” said Minhorst.

The proportion of non-aviation revenues is growing strongly; Berlin Airports has doubled retail space in the last three years. It is, said Minhorst, on its way to a modern retail offer. “We are now able to meet the expectations of passengers,” he said.

The BBI landside offer will include a ‘goodbye bar’ on the departures level, while on the arrivals level there will be bars, a florist, a convenience store, car rental desks and facilities for staff to buy something. The main attraction though will be airside, which is where 80% of retail space will be located. “Passengers will walk through security directly into a walk-through duty free shop. On one side of the Mezzanine level will be a food court. Here, we want to attract people to big international brands,” said Minhorst.
The Berlin-Brandenburg Aerospace Alliance (BBAA), the Transport Technology Systems Network (FAV) of the Technology Foundation Berlin, the Technology Foundation Brandenburg, the Brandenburg Economic Development Board (ZAB), Berlin Partner and Berlin Airports (FBS) have joined forces to ensure that the new BBI generates widespread attention as a modern airport in Europe.

A wide-ranging dialogue focusing on technology is intended to offer businesses and academics in the capital region the opportunity to demonstrate their potential and capabilities in realising the BBI project. Berlin Airports will raise specific issues to be discussed in workshops, enabling both sides to gain better insight into requirements and implementation options.

"BBI is an opportunity for the introduction of newer technologies. The two governments had the idea to give the discussion floor to local companies developing technologies – to present to the airport authorities. Berlin and Brandenburg are funding part of the cost of the project," said Weigmann.

It is a coordinated approach to evaluating available technologies and provides easier access to the providers of potentially interesting technology. "What is new for this approach is that I am based at the airport but not an airport employee. This gives me much better access to the daily problems of the airport. I am an 'Embedded engineer' – a connection between the airport and the companies outside," said Weigmann. "I have regular discussions with the airport about interesting topics and prioritise them. I invite relevant experts to the airport to give a presentation."

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Reliable, proven technology

The project was launched in July 2007 and among the workshop meetings that have taken place was one focused on video technologies for security and surveillance; “Security services worldwide are requesting that airports have video surveillance technology. We looked at identifying the behaviour of people and how you analyse these things,” said Weigmann. The 15 presentations addressed the technological, organisational and legal issues surrounding the use of video equipment at and in the airport. One basic principle was underlined by each of the presentations: prior to installation of a video system, the respective task, ambient conditions and responsibilities must be specified. Image processing and analysis of video sequences can considerably simplify work in control rooms. The interplay between personnel in the control room and operative personnel on the ground must, however, function smoothly. Nevertheless, fully-automated image interpretation such as that currently being worked on by researchers cannot replace the trained human eye – at least not for the time being.

Another meeting examined the possibilities of merging data from different infrastructures – street, rail and airport. Do you gain by having data on how passengers travel to the airport? What can you gain or change about airport operations? "What might be interesting is if you know a car is approaching
can you give the passenger a personal service, such as give them the closest parking for their departure area?” said Weigmann.

A seminar on biometrics focused on the technology as a means of ensuring that only authorised people gain access to secure areas. “We looked at the impact of introducing biometric technology. Does it add to security? One of the issues with finger print recognition is health; with iris or face recognition you don’t have to touch anything. I enjoyed the willingness of people to discuss – it was a lively discussion,” said Weigmann.

“We have to make sure that when I present the information I do not influence the investment decision. All information is made public. The topics we look at are those where there are already solutions. I look at whether it makes processes faster and/or cheaper.”

There are two prerequisites that will determine whether a technology is chosen – cost and time. The solution must be a commercially viable, reliable, proven technology.

Project ‘Modern Airport - Testbed for New Efficient Technologies’ was launched with the aim of putting the innovative potential of businesses and academics in the capital region of Berlin-Brandenburg to optimum use in realising and operating the future Berlin Brandenburg International Airport BBI, and at the same time provide incentives for developing new products and procedures.

Dr Uwe Weigmann, Project-Manager, spoke to Ross Falconer.
The new ATC tower

A key element of the BBI project is the new ATC tower, which will concentrate the Berlin Airports’ towers into one location. The topping-out ceremony for the new DFS control tower took place on 3 November.

The tower project is progressing on schedule; realisation began in January 2009 with the laying of the foundation stone for the new tower and topping-out has been reached in 10 months.

Dr Rainer Schwarz, CEO, Berlin Airports, said: “The topping out ceremony for the DFS tower is a clearly visible sign of the progress that is being made on the construction of the BBI. We are very pleased to be working so productively with Deutsche Flugsicherung GmbH on this important project.”

With a height of 72 metres, the BBI Tower will be the second-highest control tower in Germany. Construction will be completed by September 2010 and the tower will start operating in the third quarter of 2011. According to traffic forecasts, once it opens, 250,000 aircraft per year, with a daily average of 700, will receive permission to land and take off from the BBI Tower.

“For BBI, we are intending to use an elliptical layout for the tower cab, so the local controller and the ground controller for the corresponding runway are sitting almost in a row,” said Frank Zimmermann, project manager, DFS. “Furthermore, there are four columns in the centre of the cab which are carrying the roof, with the positive effect that the window frames can be produced thinner – this leads to better conditions of visibility for the tower controllers.”

The process of installing the equipment begins in summer 2010. Handover is planned for July 2011 – three months ahead of the BBI opening itself. That period will be used for the controllers and technical staff to get accustomed to the new procedures and new equipment. The transition will be a complex process, containing night-time tests, technical handovers and an operational weekend. The handover itself will take place overnight.

“We are going for tried, tested and, especially, inexpensive technology. It is planned to bring into operation an A-SMGCS and a new HMI for the flight data processing system,” said Zimmermann.

Key requirements are that the tower is able to process the forecast amount of traffic – 250,000 movements per year (or more than 21 million passengers); independent runway operation; four thresholds in sight; and the ability to accommodate apron control. These requirements will be fulfilled by making the tower 72m high, positioning the tower almost at the Airport Reference Point and planning a special dedicated container for the accommodation of apron control. “The requirements are determined together with the user – the Berlin air navigation services unit. This includes operational and technical requirements, as well as requirements for the training programme. Furthermore, we are working very closely with the Berlin Airport representatives in terms of planning operational procedures and apron control,” said Zimmermann.
BAM Deutschland is meeting the challenges of the Berlin-Brandenburg Capital Airport at a record pace. For the Schönefeld Airport’s upgrading to the Berlin-Brandenburg Capital Airport, the BAM Deutschland AG has demonstrated its expertise as a high-performance partner for technically demanding projects.

On Europe’s largest airport construction site, the Stuttgart-based company is developing the passenger terminal’s building pit and the projecting main pier (lot 1) with a spoil of 380,000 square metres and the ground integration of 160,000 square metres. In the second lot, BAM is responsible for the foundation and shell of the same terminal with a main pier. The total area amounts to 225,000 square metres.

With the extremely complex and tightly deadline assignments involved in special foundation construction, the logistical and construction-based challenges in these dimensions necessitate the full knowledge and motivation of the more than 1,000 BAM employees working in project management and on the construction site. The most modern equipment and machines – e.g. 32 cranes and 8 truck-mounted cranes – are in operation for the Capital Airport.

The core business of BAM Deutschland is the development of major projects on a turn-key basis, with a complete range of services offered around the construction. Hotels, sport and event sites, schools, universities, office buildings, hospitals and shopping centres are generally built. A part of the Royal BAM Group, which is headquartered in Amsterdam, BAM Deutschland offers its customers the reliability of one of the largest and most successful construction companies in Europe.
Clearing the way for Berlin’s new major airport

Schönefeld commercial airport is to be developed into the new Berlin-Brandenburg International capital airport by 2011. Germany’s largest ongoing infrastructure project – named BBI for short – requires men and machines in equal measures. Alongside the construction of a new terminal and further specific buildings, more than 1.6 million square metres of manoeuvring surface and auxiliary areas need to be built; comprising 1.4 million square metres of concrete and 220,000 of asphalt. The total area is equivalent to around 300 football pitches.

A consortium comprising EUROVIA (technical lead management) and the Max Bögl construction firm (commercial lead management) has been assigned to the development of the so-called airside surface construction (southern runway, taxiways and apron areas). The contract is worth around €217 million.

Beside the surface construction works, the extensive building measures include complex canalisation works, cable laying and deconstruction works in the old runway area, as well as the construction of an underground aircraft fuelling system. The digging involved in this project will see over 10 million cubic metres of earth moved on the BBI premises during the construction phase.

A look back
Despite the fact that the long wet periods in the winter of 2007/2008 didn’t allow the extensive earth-moving works to begin until April, by the end of 2008 around 90% of the necessary mineral soil movements had been completed. Land improvement in the plane area and the subsequent ground stabilisation were also completed, meaning that by the end of 2008 over 600,000 square metres of base course had been laid out of a total of 1.6 million square metres. During the same period a tour de force saw around 95% of the canalisations being constructed. This meant that, with the completion of four pump stations, including a central soil filter, a key milestone for the takeover of the old airport’s drainage system was finished on schedule. The political closure of the Berlin-Tempelhof Airport had a time-critical effect on the difficult construction works in the security zone of the BBI main airport with the immediate air traffic that it brought. Despite this and the adverse weather conditions, the new manoeuvring surfaces required to cope with the additional capacity use from Tempelhof were completed by November 2008. Work began on the fuelling system in summer 2008.

A look ahead
By the end of July 2009 around €150 million worth of construction works had already been completed. The final completion of the ground stabilisation took place in August 2009, and three pavers were used to install the concrete (around 850,000 square metres) by autumn. Work began on concreting the new southern runways in May. The majority of the manoeuvring surfaces were completed by 2009. The secondary navigation paths are to be realised with a lead time from the installation of the concrete and will, therefore, be largely completed this year. Furthermore, structural works on the rainwater pump systems were completed by the end of 2009. The operation and fence construction works are being commenced with earnest so that all services can be completed on schedule in 2010.

The rescheduling and clearing operation issues involved in a project of this size require permanently flexible solutions and substantial logistical efforts by the consortium in order to bring the needs of the many groups, and the spatial and temporal wishes resulting from this, in line with the vision of the client. In this situation the respective size and diversity of the services provided by both consortium partners, and the successful cooperation of each individual involved in the construction, proves advantageous to the client and ultimately to the air traffic passengers. Therefore, until this extraordinary building project is concluded, the consortium will continue to ensure that air traffic remains uninterrupted and that the airside ground works are completed on time and to a high quality.
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