By Thomas Spencer

Despite Europe's economic in house fighting there are continuing efforts to co-develop a tactical and strategic airlift aircraft – the Airbus A400M.

This joint European venture between the UK, France, Germany, Spain, Belgium, Luxembourg and Turkey first began as the 'Future International Military Airlifter group' project in 1982. What is now Lockheed Martin and the Airbus consortium sought to develop a replacement for the Hercules C-130. However, the complexities of diverse military requirements and a lack of international political will persuaded Lockheed to leave and pursue a less ambitious Hercules upgrade – the C130J "Super" Hercules. Requisite capabilities that Lockheed thought perhaps too ambitious were dimensions of the cargo hold and pay load specifications. A wider cargo hold was required to allow transport of armoured vehicles; this would necessitate redesigning the fuselage and therefore require the development of; a new power plant that could carry these loads and new wings capable of bearing them.

Airbus Military relaunched the airlifter project in 2002 as a European endeavour in which Airbus consortium member states agreed to deliver the aircraft. Again, the base performance specifications agreed that the aircraft should be capable of carrying wide loads of up to 32 tonnes, over a range of 2300nmls. Strategic management of the project was assigned to OCCAR, the European Organisation for Joint Armament Cooperation, with partner nations agreeing to purchase a total of 220 aircraft. The work share among these nations was agreed proportionally to the total number of orders placed by each country.

However, in 2010 the total number of A400M orders was downgraded to 170 aircraft when partner states agreed to lend €1.5 billion to Airbus's proprietor EADS, to help meets project overspend costs. At this stage South Africa dropped out of the project, whilst Britain contributed to the €1.5 billion by reducing its orders from 25 to 22 aircraft. OCCAR succeeded in renegotiating the contract with Airbus Military; mainly to address an extended avionics development programme.

Having encountered setbacks the aircraft will now enter service in 2013. Pre production aircraft are underatking the extensive trials that are usual with modern aircraft. Final assembly of the first production A400M has begun, which the French Air force will receive in the first quarter of 2013. The United Kingdom's first example is expected in 2014. It will be introduced into service as a logistical and medevac transport aircraft. Subsequently a progressive programme for the certification of military operations; for air drop, low level flight and air to air refuelling, will be conducted.

Given its extensive operational requirements it was perhaps inevitable that the aircraft would take additional time to develop. Initial work estimates were intended to draw on Airbus's civil

experience, but in the event they underestimated the demands of developing a military aircraft.

The A400M will bridge the gap between requisite tactical and strategic airlift capabilities: That is to say the aircraft offers strategic airlift qualities of high cruise speed, intercontinental range and a large cargo carrying capacity, whilst also tactical characteristics such as combat off load. Accordingly the Royal Air Force (RAF) has revised its plans to re-wing 10 of its C-130k strategic aircraft, opting only to re-wing 5 aircraft in line with their planned retirement upon receipt of the A400M.

The RAF identifies the A400M "as an extremely flexible aircraft that will provide both Tactical and Strategic airlift capability." Once in service the 22 aircraft will be accompanied by an existing tactical fleet of 25 C-130J Hercules along with a strategic fleet of 7 Boeing C-17 A Globemaster aircraft. The RAF cites that with greater reliability the A400M fleet will be cheaper to operate and maintain than the C-130K and J fleets. In short, the RAF is relying upon the delivery of the A400M to replace the aging C-130K and provide greater operational capabilities.

A400M will exceed the operational remit of the C-130J and complement the C-17 with its strategic airlift capabilities. This is achieved across four theatres of operations; aerial delivery, aerial reconnaissance, combat off load and logistical transport. Specifically A400M will be able to execute both low level (150 ft) and high altitude parachute drops of troops and support equipment, and is adept at landing on short and austere airstrips. These capabilities are further complemented by its ability to perform air to air refuelling operations, both as a dispenser and receiver. This next-geneartion 'work horse' once operational will form the backbone of the RAF.

The aircraft will eventually have a highly sophisticated Flight Management System (FMS), which will be the most advanced piece of military transport avionics in existence. There is a rigorous development programme to introduce functionality for air to air refuelling (AAR), dropping loads and personnel, and low level flight (LLF). LLF will be the last part of this development, completed in 2018. Essentially the LLF is a hybrid between a civil FMS and a military GPS. Notably the A400M's FMS will have three times the lines of computer code compared with that of the Airbus A380 super jumbo. Despite initial underestimates of the work involved Airbus is efficiently driving its avionics supplier – Thales - forward in agreed phases.

British manufacturing has taken a lead role in engine and wing production for the A400 and is pioneering new technologies, which arguably will maintain the UK's competitive edge in the aerospace industry: Development of the A400M's turbo prop engine, TP400, is being engineered by Europrop International (EPI), a consortium consisting of Snecma (France), Rolls-Royce (UK) and Motor-turbine Union (Germany). The engine powers the largest and most sophisticated propellers in the western hemisphere. This will deliver thrust of 11,000 shp per unit, whilst using 20% less fuel than other comparable turbofan engines. Rolls-Royce has main responsibility for project management, working in close collaboration with Airbus. EPI estimates production of the TP400 engine will be worth more than €4 billion over the life of the A400M programme. The A400M is currently undergoing 300 hours flight testing, in order to complete

route proving for civil certification.

Notably, the project's worth exceeds monetary value when set in context with the future of British aerospace engineering. Traditionally Britain has led the world in the design and construction of metallic wings. The A400M wing has utilised carbon fibre, British industrial interests rest on the successful application of this technology. The A400M wings have been designed and are assembled at Airbus Filton (Bristol), where Airbus has invested £70 million in an A400M wing manufacturing centre. At the centre's opening in 2006 the then Minister of State for Defence Equipment and Support - Lord Drayson said: "The A400M is a vital part of the UK's future military capability... basing the manufacturing facility here in Filton further reinforces the UK's tradition as Europe's centre of excellence for hybrid composite wing technology." An Airbus UK A400M memorandum to the UK Parliament says that the wing's development and production will generate 950 jobs. Further it emphasises that additional training for these engineering roles will acquire new skills in designing and assembling wings built in metal and carbon fibre composite.

However, the site is set to lose its runway at the end of 2012; the owners BAE Systems claiming this strategic asset 'not to be cost effective'. Airbus has stated it will not purchase the runway, planning only to maintain and develop the site as a static asset. At which point it will transport wings via lorry to Avonmouth docks and ship them to the continent. Notably planned wing production at Filton is only up to 2014. Annual costs of operating the runway are approximately £15 million. Set in context, the £3 billion paid to BAE for its costly and late production of the now axed Nimrod MRA4 would have kept Filton's runway open for 200 years.

Had BAE accepted Virgin Atlantic's recent request for a long term lease of the runway then Filton could have positioned itself for possible A400M maintenance and modifications contracts. Whilst the RAF's fleet will be serviced at Brize Norton, its extensive service life conceivably could demand the expertise currently offered by Airbus Filton.

A 'static' aerospace manufacturing site will only ensure deficiencies in 'hands on' wing engineering capabilities and will isolate British wing manufacturing from its European partners, who will undoubtedly exploit their advantage of live runway assets. Britain could lose its competitive edge in designing, developing and manufacturing large aeroplane wings. To date the Minister of State for Transport Theresa Villiers, who has responsibility for British aviation, has stated that 'the government cannot interfere with BAE's commercial decisions'.

Set in context, the A400M project is invaluable to the United Kingdom's wing manufacturing industry. The collective engineering efforts of this project are on course to deliver an aircraft fit for defence in the 21st century. But further exploitation of the benefits arising require recognition of the strategic premise of the preservation of the nation's manufacturing assets - which cannot be left to industry alone.

Thomas Spencer has an MSc in International Security from the University of Bristol.