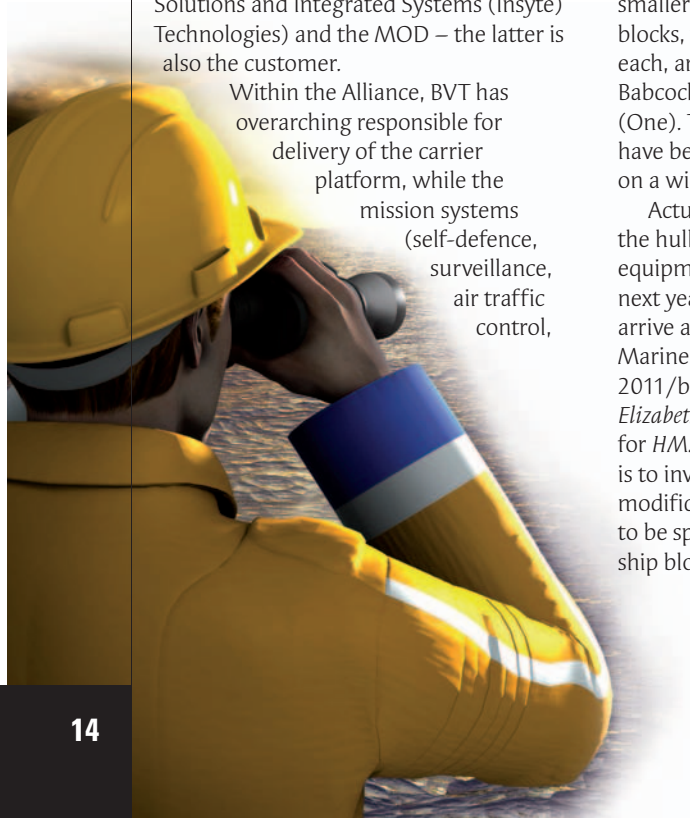
Work ahoy!

The two new aircraft carriers destined for the Royal Navy are the largest surface warships ships yet to be built in the UK. Within the £3.9 billion total spend, some £1.5 billion is to be sub-contracted. Andrew Allcock asks, 'where is it all going?'

The two new aircraft carriers may not be due to launch until 2014 and 2016, but work packages worth hundreds of millions of pounds have already been placed. Indeed, the importance of this spend has latterly been pointed up by Chancellor of the Exchequer Alistair Darling who highlighted the carriers as publicly funded projects that will help support the economy during its troubles.

The two carriers, *HMS Queen Elizabeth* and *HMS Prince of Wales* – to be launched in that order – will together cost some £3.9 billion, of which around £1.5 billion is to be sub-contracted by the so-called Aircraft Carrier Alliance – the group responsible for delivering the project. This group comprises BVT – a joint venture between VT's and BAE Systems' naval ship businesses, Babcock Marine, Thales UK, BAE Systems (including Submarine Solutions and Integrated Systems (Insyte) Technologies) and the MOD – the latter is also the customer.



Within the Alliance, BVT has overarching responsible for delivery of the carrier platform, while the mission systems (self-defence, surveillance, air traffic control, mission planning) is the responsibility of, BAE Systems Integrated Systems (Insyte) Technologies. Design and procurement activity is spread across the UK within the Alliance members.

Although the contracts for the manufacturing phase were only signed by Alliance members on 3 July this year, there had – as is typical for large military projects – been years of work preceding this, which is why the issue of work packages has been so swift. As programme director Geoff Searle, based at Alliance offices in Bristol, explains, work packages will be, or have been ordered so as to make sure there is no late delivery of parts which would impact delivery of the final product.

The main hull structure of each carrier comprises four so-called super blocks upon which are placed in excess of 20 smaller upper blocks. The four super blocks, weighing thousands of tonnes each, are being built by BVT (two), Babcock Marine (one) and BAE Systems (One). The contracts for the upper blocks have been subject to competitive tender on a wider basis.

Actual build of the four super blocks of the hull starts next year, so procured equipment deliveries will occur in earnest next year. The equipped super blocks will arrive at their final destination – Babcock Marine, Rosyth – for final assembly end 2011/beginning 2012 for *HMS Queen Elizabeth*, and end 2014/beginning 2015 for *HMS Prince of Wales*. Babcock Marine is to invest £35 million in dockyard modifications, with a further £15 million to be spent on a 'Goliath' crane to move ship blocks into position; it will be the largest crane in the UK, reportedly having a height of 60 m, a span of 120 m and load carrying capability of some 1,000 tonnes.

Interestingly, large as these carriers are they are themselves designed to make use of what Aircraft Carrier Alliance platform design director Simon Knight calls 'Lloyds Commercial' equipment – wherever possible, standard kit.

WHO GOT THE CASH?

So where has all the work/money gone? Well, of the £3.9 billion overall cost for both carriers, about £3 billion is shared out among the Aircraft Carrier Alliance members directly, although some of this spend will flow down the tiers.

The upper blocks amount to about £400 million of the £1.5 billion sub-contract figure, with the remaining £1.1 billion split into some 120 work packages, says Mr Searle. Some 50 workpackages had been placed as at the end of September (see box item page 16 for a list of some – not all can be declared for commercial reasons), with another 50 to 60 having been put out for competition and with selection imminent (again commercial reasons are cited as preventing the naming of these companies). So, the majority are either on contract or have suppliers selected.

The 120 work packages constitute about 95 per cent of the £1.1 billion, says BVT's CVF programme director, with the remainder being high volume, low value items such as junction boxes, light fittings, notice boards, and so on – these will be firmed up over the next 12-18 months. Additionally, some things that

Spending almost £4 billion gets the Royal Navy two of these. Although the first will not be lanched until 2014, contracts for materials and equipment totalling millions of pounds have already been placed. The vast majority has been placed with UK-based firms and work will flow through the various supply tiers

are affected by advancing technology, such as PCs and telephones, will be bought as late as possible to avoid saddling the project with dated technology. This thinking also affects the Mission Systems element, purchase decisions being delayed by a few years.

Over the past two years, meetings have been staged to attract suppliers to the project. It is claimed that at peak, the carrier contract will support 10,000 jobs in the UK, and supplier organisation Northern Defence Industries (NDI) says that 5,000 of these are within the wider supply chain outside the main shipyards. NDI represents more than 200 small and medium-sized enterprises throughout the North East and Yorkshire and has been involved in the aircraft carrier project right from the beginning.

Only some £36 million of the sub-contracted £1.1 billion has been or will be placed outside the UK, Mr Searle adds, although sub-contract work from UK-based companies receiving work packages may flow outside the country, of course.

One of the most notable early work package awards was the steel contract. In March of this year an order for 80,000 tonnes of steel was placed at a value of £63 million. The recipient was Tata-owned Corus, with 90 per cent of the tonnage being produced in the UK. Corus will start rolling steel for the aircraft carriers later this year, it was said. The firm's Scunthorpe and Dalzell steelworkers will produce plate steel for the ships' hulls, while Skinningrove will manufacture bulb flats – steel used to stiffen the construction. Dent Steel Services (Yorkshire) will be providing warehousing, shotblasting and painting services. This amount of steel is the same as was required for Terminal 5 and three times that for Wembley Stadium.

Also placed earlier this year, in April, was a £13 million contract for the manufacture of aircraft lifts for the two carriers – MacTaggart Scott of Loanhead, Scotland, was the recipient. There are two external lifts for each carrier which bring aircraft to the deck, effectively moving aircraft up/down the outer starboard side of the ships.

More recently there has been the announcement of the award for the Highly Mechanised Weapon Handling System. This £33 million contract was revealed on 1 September and has been awarded to a division of Babcock Marine.

Another large contract (£27 million), this time for modular cabins and wet spaces plus furniture, has gone to Hertel (previously McGill Services), which has its Marine Services business based in Middlesbrough and Newcastle. There are some 400 cabins/wet space modules per aircraft carrier.

But the largest single contract so far was announced on 6 October, for the carriers' propulsion/power systems. Worth £235 million, it is being shared between members of the Power and Propulsion Sub-Alliance, which comprises Rolls-Royce (£95 million), Thales (£40 million), Converteam (£80 million) and L-3 Communications (£20 million).

It is estimated that some 80 per cent of the £235 million will be spent in the UK. The award includes main and emergency power diesel generators from

Finland's Wärtsilä Defence, placed in December of last year (see box, below).

The two aircraft carriers will be driven by gas turbine generated electricity – the largest Royal Naval vessels yet to be so propelled. For each ship, two Rolls-Royce Marine 36 MW MT30 gas turbine alternators will provide over 70 MW; four diesel engines will deliver approximately 40 MW, with the total installed power approaching 110 MW – enough to power a town the size of Swindon, it is claimed.

The gas turbines and diesels are the largest yet to be supplied to the Royal Navy, their combined power feeds the low voltage system and supplies two tandem electric propulsion motors that drive a conventional twin-shaft arrangement, fitted with fixed-pitch propellers. The bronze propellers are each 6.7 m in diameter and weigh 33 tonnes (to be made in Sweden).

The geographical locations said to benefit from this huge contract will be: Rolls-Royce – Portsmouth, Bristol and Dalgety Bay in Fife; Converteam – Rugby and Glasgow; L3-Communications – Bristol, Burgess Hill and Barrow-in-Furness, Cumbria. Thales has some 50 UK locations but is headquartered in Weybridge.

For Rolls-Royce the equipment tally takes in four MT30 gas turbine alternator sets (two per ship); total package integration of the prolusion plant; shaft lines and propellers; steering gear, including rudders; ship stabiliser systems; low voltage electrical distribution system. For Converteam the equipment roster is: high voltage equipment; electric power control and monitoring system; propulsion equipment; high voltage system and electrical system analysis. For L3-Communications it is: integrated platform management system (provides automation needed to control and monitor power propulsion systems); condition monitoring system. Thales is leading the power and propulsion element of the carrier project.□

Where's the business gone so far?

Identification friend or foe	Selex Comunications	£7 million
Blown fibre optical cable plant	Brand-Rex	£4 million
Integrated Navigation and Bridge System	Northrop Grumman Sperry Marine	£10 million
Main diesel generators	Wärtsilä Defence	£19 million
Emergency diesel generators	Wärtsilä Defence	£3 million
Steel	Corus (and Dent)	£63 million
Flight traffic control	TEX ATC	>£1 million
VLA	AGI	£8 million
Aviation fuel module (AVCAT/AVTUR)	FTI	£5 million
Fresh water generation (reverse osmosis)	Salt Separation Services	>£1 million
Highly mechanised weapon handling systems	ALSTEC	£33 million
Aircraft lifts	MacTaggart Scott	£14 million
Sea water inlet strainers	SPX Pleanty	<£1 million
Ballast water treatment	Hyde Marine Incorporated	<£1 million
Pumps	Desmi	£5 million
Ships lists – food provisions and naval stores	ALSTEC	£3 million
High pressure salt water diesel generators	Wärtsilä Defence	>£1 million
Hangar doors	ALSTEC	£2 million
Eductors	Northvale Korting	<£1 million
DIESO (diesel fuel oil)	Filters Facet International	<£1 million
DIESO centrifuges	Westfalia	<£1 million
Bollards and fairleads	Fendercare Marine Solutions	<£1 million
Anchor and chain	Fendercare Marine Solutions	<£1 million
Air compressors HP	Compair	<£1 million
Cathodic protection	Corrintec	<£1 million
Nitrogen module	Parker Hannifin Ltd	<£1 million
Breathing air module	Hale Hamilton	<£1 million
FW cooling and heat exchangers	Alfa Laval	>£1 million
Uptakes and downtakes	Darchem	£8 million
Modular cabins and wet spaces	Hertel	£23 million
Furniture matrix	Hertel	£4 million
Galley equipment	Kempsafe	£3 million