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**Support:** Teams working together to keep build on track Page 6



News from  
the Aircraft  
Carrier  
Alliance  
Issue 7  
May 2012

# carrierwaves



## Superblock revealed

### CONSTRUCTION PROGRESS

The first major stage in the assembly of HMS Queen Elizabeth is complete.

Sections of the ship, which are being crafted at yards across the country, have been arriving at Rosyth Dockyard on the Firth of Forth, where assembly is taking place.

Since last summer, several major sections of HMS Queen Elizabeth, weighing thousands of tonnes, have been assembled.

Now the first 'superblock' is complete, and the programme to

Completion of dock cycle A is major step in build programme

deliver the nation's flagships has taken a huge step forward.

Programme Director Geoff Searle explained: "Superblock 03 is the mid-section of HMS Queen Elizabeth. Getting to this stage, where the first major section is now fully assembled, marks a big moment for the programme.

"To put it in perspective, if it were a complete vessel, superblock 03 would be one of the largest in the

Royal Navy. It's still some way off from being a complete aircraft carrier, but already weighs almost as much as one and a half Type 45 Destroyers!

"It's a critical achievement and means we can now prepare to enter the next stage of integrating the blocks that make up the forward section of the ship.

"Completing the first superblock is necessary to keep the

programme on plan and, thanks to the skilled and hard work from everyone involved, we remain right on track."

Superblock 03 is made up of Lower Block 03, the flight deck sections and the flight deck extensions, called sponsons. It brings together parts constructed on the Clyde, the Tyne, at Appledore in Devon and in Rosyth.

To create the structure, the Babcock heavy lift team used the

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## Contact

[FOR MORE INFORMATION]

To request further copies or to submit a story for the next edition, please contact John Fyall, ACA Communications Manager at [john.fyall@baesystems.com](mailto:john.fyall@baesystems.com)

**Carrier Waves** is now being made available online as an interactive PDF. The link to access the latest version will be distributed via email. If you would like more information on the new format, or would like to request **Carrier Waves** as a standard PDF, please contact John Fyall, ACA Communications Manager, at [john.fyall@baesystems.com](mailto:john.fyall@baesystems.com)

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# F-35B for Queen Elizabeth Class

### ANNOUNCEMENT

The Government has announced the selection of the F-35B Joint Strike Fighter as the fast jet that will operate from the Queen Elizabeth Class aircraft carriers.

The F-35B is a Short Take Off and Vertical Landing (STOVL) capable aircraft. This means the Queen Elizabeth Class aircraft carriers will be built to support them.

Programme Director, Geoff Searle, explained: "The STOVL capabilities of this aircraft call for some specific designs. HMS Queen Elizabeth and HMS Prince of Wales will be built with a ramp at the bow and we'll be developing the flight deck with visual landing aids designed specifically to help pilots guide



F-35B testing at sea

the aircraft safely back down.

"We have plans to develop the ships to support this aircraft, and we are now putting them into

action. We will now work with the Ministry of Defence to ensure both ships meet their requirements."

## Moving 4,000 tonnes is a delicate business...



### SECTION MOVE

Two giant sections of Lower Block 04 (LB04) were brought together for the first time in a precision move at BAE Systems' Govan shipyard.

Using a fleet of 132 remote controlled transporters, a huge section, weighing more than 4,000 tonnes, was carefully manoeuvred 100 metres across specially reinforced concrete. In a two-hour

move, the section was carefully lined up with the rest of the block, which will collectively form the aft section of the hull.

Almost the full length of a football pitch, the structure, which is the largest section of hull under construction, is so large that it stretches beyond the doors of the ship build hall in which it sits. The complete section will weigh more than 11,000 tonnes and is expected to move to Rosyth in November.

### Superblock revealed

FROM PAGE 01

giant Goliath crane to move more than 5,000 tonnes of sections into place with pinpoint accuracy.

Sean Donaldson, Babcock QEC director, said: "The heavy lift team has the operation of Goliath and the meticulous planning required for these complex operations down to a fine art. It's a precision job, with no margin for error."

While the heavy lifts have been developing the structure of the superblock, hundreds of skilled workers have been busy inside the block, doing everything from fitting beds to installing hundreds of kilometres of cables and pipes.

Geoff Searle said: "The successful construction and assembly of the Queen Elizabeth Class depends on a combination of skill, timing and teamwork. The Aircraft Carrier Alliance is bringing all the right elements together and is proudly delivering the nation's flagships."



# New milestone in HMS Prince of Wales build

## HMS PRINCE OF WALES

A new chapter in the construction of the second of class, HMS Prince of Wales, opened in Portsmouth recently as Commander-in-Chief Fleet Admiral George Zambellas cut the first steel for Lower Block 02.

The forward section of the hull will weigh about 6,000 tonnes upon completion and will house the ship's machinery spaces, stores and switchboards, as well as some of the accommodation, including 85 cabins.

Commander-in-Chief Fleet

## Next stage begins on construction of forward section

Admiral Zambellas said: "These two ships – each of which will be in service for more than 50 years – lie at the heart of our national security posture. With the equipment that will operate from them, they will be pivotal to the UK's ability to project power at range for decades to come."

Meanwhile, the bulbous bow for HMS Prince of Wales, constructed

by Babcock at its Appledore facility, made the 780-nautical mile journey around the south and east coast to Rosyth.

Sean Donaldson, Babcock QEC Project Director, said: "Less than two years after completing the bow sections for the first carrier, we are again celebrating an important step in the carrier programme with the arrival of this section for HMS Prince of Wales."

In Govan, work on HMS Prince of Wales has been forging ahead for the last year. Now the ship's mid section – LB03 – is already weighing in at more than 2,500 tonnes.



sections of the flight deck, it's crucial they are aligned with absolute precision while they are integrated into the build.

But now, engineers at Rosyth have developed a new system which allows them to perfectly align and support each sponson.

Willie Richards from the Babcock

Heavy Lift team said: "Sponsons are very large and complex shapes, so to help us work with them, we developed the Synchronous Lift System. This is a really clever piece of kit which gathers information from lots of sensors to accurately calculate just how each sponson needs to be supported.

"It uses 48 individual jacks, operated by a touch-screen controller. Once a sponson has been moved into position by Goliath, the Synchronous Lift System keeps it supported and can make minute adjustments to its position, ensuring it's in exactly the right place.

"In fact, it's so accurate it's been able to keep an entire 40-metre section of flight deck level to within just three millimetres."

## News in brief



## Power up

In a major milestone for the construction of HMS Queen Elizabeth, workers in Portsmouth completed all the wiring and powered up the ship's first installed switchboard on LB02.

Paul Bowsher, Project Leader in Portsmouth, said: "This is a massive result for our teams."

## Best in UK

Two Aircraft Carrier Alliance apprentices have been named as among the best in the UK.

Mechanical Fitter Claire Grant, 22, who works for Babcock at Rosyth, took first place in a national competition to find the best trainees of 2011.

And David Crawford, 20, who works for BAE Systems Naval Ships at Govan, won the Craft Fabrication Achievement at the company's apprentice of the year awards.

Claire and David are two of more than 700 apprentices currently playing a part in the construction of the aircraft carriers.



Claire Grant

# Jack be nimble

## ASSEMBLY

Sponsons, the extensions to the Queen Elizabeth Class flight deck, are notoriously tricky to work with.

They weigh about 800 tonnes, they're irregularly shaped, and their centre of gravity is off-centre, meaning lifting and levelling them can be extremely challenging.

And, because they are key

**Follow us**

Almost 1,000 people regularly receive news, the latest pictures and build updates about the programme through Twitter.

To join them, search for @QEClassCarriers and you'll get all the latest information from across the alliance as soon as it's released.

You can also find the most recent tweets at [www.aircraftcarrieralliance.co.uk](http://www.aircraftcarrieralliance.co.uk)



# The strongest

A robust supply chain is the driving force behind the production of a new class of ships.

## SUPPLY CHAIN

Building any new class of ships is an incredibly complicated task.

But when the vessels in question are the largest and most powerful warships ever constructed for the Royal Navy, with accommodation for hundreds and an on-board airport operating fast jets and helicopters, the job doesn't get much more demanding.

As such, the task of delivering the Queen Elizabeth Class is too big for any one company to undertake alone, which is why the Aircraft Carrier Alliance (ACA) – the partnership of BAE Systems, Thales UK, Babcock and MOD – was born.

However, with each ship made up of

almost 13 million parts in about 700,000 pieces of equipment, it takes more than the ACA members alone to create them.

"A programme of this size and importance

requires a truly world-class supply chain to bring it to life," said ACA Supply Chain Director Dougie McInnes.

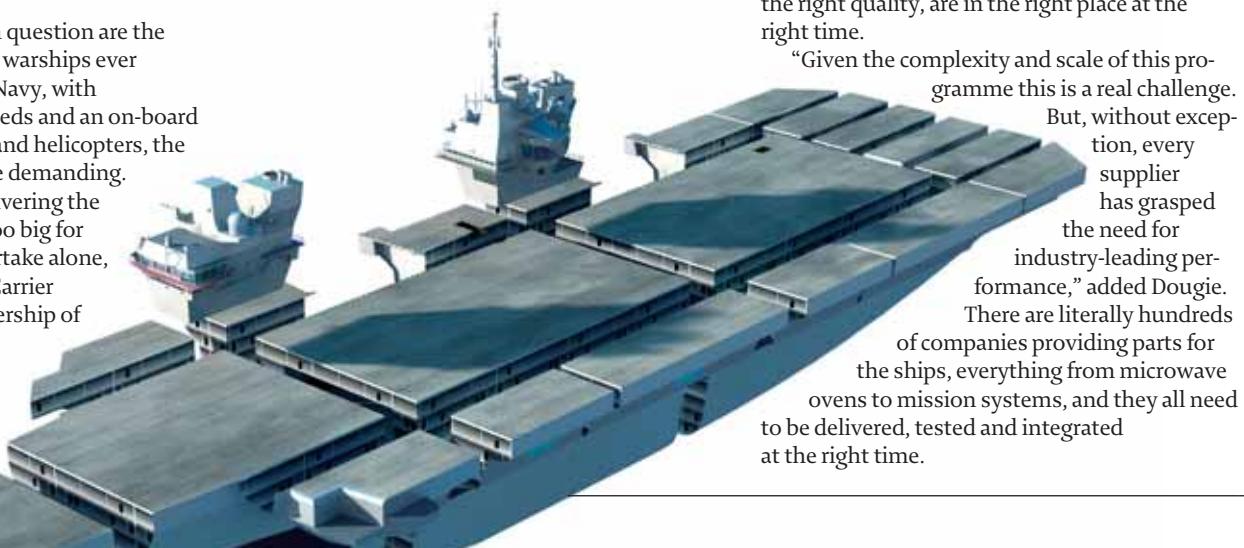
"We need to make sure the right parts, of the right quality, are in the right place at the right time."

"Given the complexity and scale of this programme this is a real challenge.

But, without exception, every supplier

has grasped the need for industry-leading performance," added Dougie.

There are literally hundreds of companies providing parts for the ships, everything from microwave ovens to mission systems, and they all need to be delivered, tested and integrated at the right time.





Thousands of people are working to create the new Queen Elizabeth Class

## Facts...

- There are more than 300 companies involved in the programme, ranging from multi-national organisations to small, specialist companies
- The vast majority of the supply chain is based in the UK
- Contracts worth more than £1.6 billion have been placed
- More than 5,000 people are involved in the supply chain.

# link...

## class of aircraft carriers

And making this complicated supply chain a success are thousands of skilled workers across the UK, each aware of their role in supporting what will become the centrepiece of the UK's defence strategy for decades to come.

Dougie said: "The Queen Elizabeth Class is a truly national endeavour. The huge depth of skills the programme is supporting and the work it is generating is remarkable.

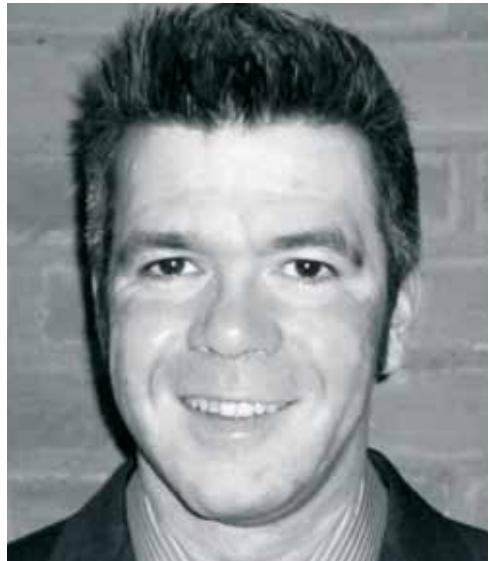
"Suppliers all over the UK are providing an incredible range of equipment and services, but the one thing they all have in common is a huge sense of pride that they have been able to contribute to these ships and play a role in this historic programme.

"Going forward, it is really important that the supply chain, as a whole, works with us as we install, commission and test every aspect of the ships to make sure we can meet our customer's requirements."



## Case Study

Kevin Jones, Kempsafe Project Manager



## Win secures firm's future

Southampton-based Kempsafe's contract with the Aircraft Carrier Alliance was not just the biggest in the company's 50-year history. It also protected the business from the global recession and helped to safeguard the jobs of all its 20 staff.

Kempsafe Project Manager Kevin Jones said: "Our contract to provide galley and laundry equipment to the QE Class was the most valuable piece of work this company has ever secured.

"The fact is it came along just in time to reduce the effects of the recession. We're not a large company, so without this work, there's no telling what would have happened to some areas of the business.

"It has certainly assisted in guaranteeing the employment of the 20 members of staff here at Kempsafe.

"But what's more, delivering such a large contract has put us in a stronger position than ever to compete for more work in the future.

"It gave us the opportunity to upgrade our facilities and our skills. All our customers, present and future, know we can deliver to the volume and standard expected by the Aircraft Carrier Alliance and we're really proud to be playing a part in this historic programme."

**"We are really proud to be playing a part in this historic programme"**

Kevin Jones, Kempsafe

## News in brief

### A real heavyweight



To move huge sections of aircraft carrier across the country safely, the teams responsible need to know how much they weigh.

But how do you accurately measure the weight of blocks several storeys high and the best part of 50 metres wide?

ACA Project Leader, Paul Bowsher, said: "Understanding the weight and centre of gravity is really important when it comes to arranging for sections to be lifted, floated or moved by barge. It means we know exactly what we need to do to prepare for a safe operation. We weigh each section at least three times to make sure the readings are accurate."

### Keeping safe



The Chair of the Health and Safety Executive, Judith Hackitt, visited Rosyth to see first hand the ACA's commitment to Safety, Health and Environment.

Judith Hackitt said: "It is encouraging to see the commitment to create a safe work environment for the project team at Rosyth. Strong leadership on health and safety is essential on projects of this scale and encouraging workers to take ownership of health and safety promotes a spirit of teamwork."



ACA is working with the Royal Navy to keep the carriers ship shape



# Network of support

The work of teams across ACA will keep ships operational

#### PLANNING AHEAD

When a ship weighs 65,000 tonnes, doubles as a floating airport and can operate as a headquarters for military action and humanitarian relief, keeping it in peak condition is no small task.

But that's the challenge facing the Aircraft Carrier Alliance, as it is not only constructing the new class of ships, but is helping the MOD develop processes to keep them properly supported and maintained

throughout their 50-year lifespan.

In fact, the design and build contract has a built-in requirement to make sure the ships are put together so key parts can be properly serviced. Spares, technical data, support equipment and training all need to be provided too.

ACA Support Director, Derek Holliday, explains: "The Aircraft Carrier Alliance is delivering not just a new class of ships, but also an entire process to make sure they can continue to meet their requirements for decades to come.

"There are dedicated support

teams in place across the whole ACA, working hand in hand with areas like engineering, procurement, shipbuild and commercial.

"And of course the Royal Navy personnel, who join the programme at the end of this year, will be key to developing the right level of support. They will assist with maintenance right up to delivery and will help commission the ships' systems."

With the painted areas of the ship exceeding the size of Hyde Park, even routine tasks such as cleaning and preservation will need extensive shore support. And all the support needs to fit around the operational tasking of the ships. The aircraft carriers will operate as part of a task group, including frigates, destroyers and support ships, and so co-ordinating support across the whole task group will add to the challenge.

Derek said: "We'll need to find innovative ways of smoothing the peaks and troughs of maintenance so we can keep the ships in top condition and maximise their operational availability."

Shore Integration Facility at L-3's offices in Bristol allow team to test crucial systems

# In control of the situation



Setting up the new Shore Integration Facility

## POWER AND CONTROL

A new Shore Integration Facility (SIF) that mirrors just how the Queen Elizabeth Class control centre will look and operate has been created in L-3's Bristol offices.

The control centre is home to the Integrated Platform Management System (IPMS), which controls and monitors more than 40 of each ship's vital systems, from the gas turbine alternators to the ship's cameras.

Iain Milne, who is responsible for delivering IPMS, said: "With so many crucial systems required to operate simultaneously on each ship, it's vital we can make sure they all work flawlessly

and in harmony. The SIF lets us test all these systems before we install the hardware and software on-board. And we can reconfigure it to represent a variety of different scenarios depending on which system we need to check out."

The Bristol facility is set up to be a representative layout of the control centre, so the kit can be operated and tested in a realistic setting.

Iain said: "It could be possible to

**"The SIF lets us test systems before we install the hardware and software"**

Iain Milne, IPMS project

have Royal Navy operators who will one day be at sea on one of the QE Class sitting at the same workstations they will eventually find on-board, facing precisely the sort of challenges they could encounter at sea."

2012 is a busy year for the SIF, as the first software release will be delivered in late summer. However, this is just the beginning, as there are multiple releases scheduled.

Iain said: "Each release will add functionality to the ships, but they also demand more exhaustive testing and de-risking to ensure the Queen Elizabeth Class delivers exactly what is required of it when the ships are delivered to the Royal Navy."

## News in brief

### F-35 takes-off

The first UK test pilot to fly the F-35 Joint Strike Fighter has described what it's like to fly the fifth-generation jet after he took to the skies earlier this



Squadron Leader Jim Schofield

year. Squadron Leader Jim Schofield said: "The F-35 has the best handling of any jet I've flown, which means it's going to be easier to land on a ship than current aircraft. And pilots can devote all of their attention to the mission."

Squadron Leader Schofield's flight is the latest in a series of milestones for the programme, which include the opening of the UK production facility at Samlesbury, where sections of the new aircraft will be produced.

### Beat the Block II

Once again, a group of enthusiastic cyclists from across the ACA have accepted the challenge to 'Beat the Block'.

Around 50 cyclists are setting off from Portsmouth at the same time as the 6,000 tonne LB02 section, which is being barged all the way up the east coast to Rosyth.

Event organiser, Kirsty Noble, said: "The cyclists are determined to arrive at Rosyth before the block does, and to raise thousands of pounds for charity at the same time."

See the next Carrier Waves to find out how they got on, or get live Twitter updates via @QEClassCarriers.

Channel at Naval Base to be made deeper and wider

# Digging deep in Portsmouth

## SUPPORT

Portsmouth Naval Base will be home to the Queen Elizabeth Class once the ships have been delivered to the Royal Navy.

But although the base has hosted thousands of vessels over the years, it has never played permanent host to anything the size of HMS Queen Elizabeth or HMS Prince of Wales. So a fundamental part of the future support challenge is the £140 million project to prepare the base for their arrival.

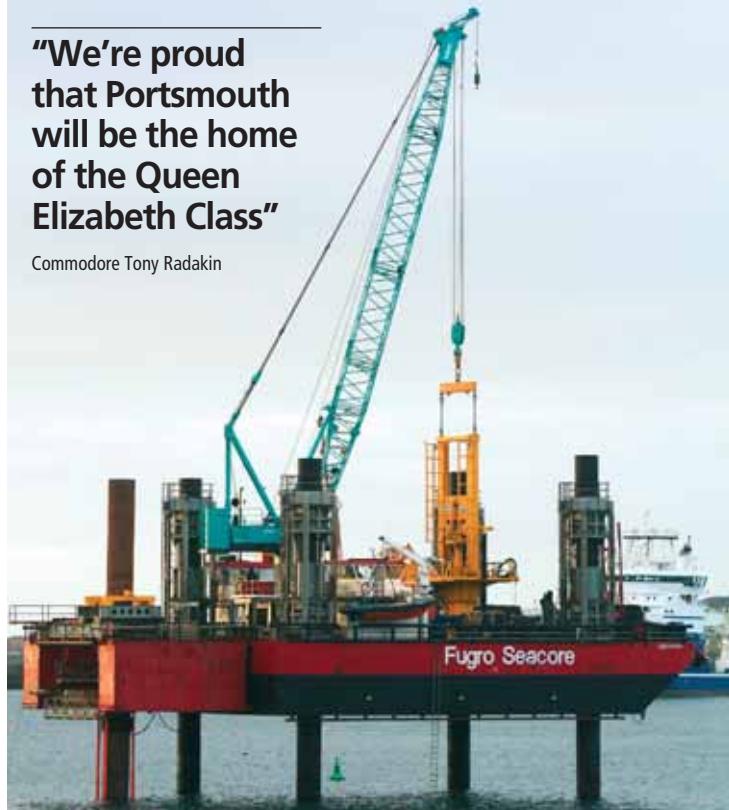
Commander of Portsmouth Naval Base, Commodore Tony Radakin, said: "We're really proud that Portsmouth will be the official home of the Queen Elizabeth Class. But their sheer size means we have to do a lot of work to prepare for their arrival."

The aircraft carriers are so large that the channel that leads to the harbour is currently too shallow to accommodate them. Analysis of the environmental impact of the works required and of the carriers' presence has been running since 2004. During the winter, a specialist drilling rig (pictured) took more than 200 borehole samples of the sea-bed, some as deep as 30m, to prepare for the dredging operation.

Commodore Radakin said: "We will be making the channel deeper

**"We're proud that Portsmouth will be the home of the Queen Elizabeth Class"**

Commodore Tony Radakin



and wider to allow the ships to get to the harbour and expect to be moving about 3.5 million tonnes of the sea bed over the next few years.

"We'll also be making several changes to the jetty where both ships will berth. We have to make it much stronger and we'll also have

to cater for additional support services, and even a significant increase in demand for electrical power."

Subject to planning consents and approvals, dredging and shore-side construction work will start in early 2014 and complete by the time the first carrier completes sea-trials.

## Diary dates...

2012 is getting busy, here are just some of the key events that are taking place over the next few months. Timings can change, but you can find all the latest images and news at [www.aircraftcarrieralliance.co.uk](http://www.aircraftcarrieralliance.co.uk)

### May

- Lower Block 05 arrives in Rosyth from Portsmouth.

- Lower Block 02 leaves Portsmouth, scheduled to arrive in Rosyth at the end of the month.

### June

- Centre Block 02 arrives in Rosyth from Merseyside.
- Rosyth dock flooded and superblock 03 floated out.
- Lower Block 02 floated into Rosyth dock, followed by superblock 03.

### July

- Bulbous bow craned into

Rosyth dock.

### August

- LB02 and superblock 3 skidded together.
- Integration of all mid and aft sections under way.
- First steel cut on LB04 for ship two.

### November

- LB04 – the largest section yet – arrives at Rosyth.
- Full hull integration under way.

## News in brief

Proud to be Safe

## Safety campaign

'Proud to be Safe' is the name of the ACA's new safety campaign for 2012.

ACA Head of Safety, Health and Environment, Andy Forbes, said: "We're combining attention-grabbing posters and leaflets with toolbox talks and presentations to raise awareness of some key safety issues with workers across all ACA sites."

The campaign will concentrate on different ways of keeping safe throughout the year.



## New ACA microsite

The award-winning ACA website regularly receives more than 5,000 visitors every month.

Now, with the launch of the Rosyth time-lapse microsite, visitors can watch the assembly of the carriers first hand – no hard-hats required!

Time lapse videos can be found on the ACA website's media section. [www.aircraftcarrieralliance.co.uk](http://www.aircraftcarrieralliance.co.uk)

## Game on

The ACA has developed a unique set of 3D games based on building and operating the QE Class.

Housed in a specially designed pod, and controlled using a Wii balance-board, the games challenge users to build an aircraft carrier and to land an F-35C on the flightdeck.

The games will visit special events around the country.