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Big picture: images show the evolution of the carrier **Pages 4 and 5**

News from
the Aircraft
Carrier
Alliance
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carrierwaves

The 'ski-jump' is the final piece of the hull to be moved into place



Big jump in progress

RAMP COMPLETION

The final piece of the HM Queen Elizabeth hull is lowered into place

the aircraft ramp or 'ski-jump' of HMS Queen Elizabeth into position.

The 130 tonne section is the final piece of the 65,000 tonne HMS Queen Elizabeth's main hull to be assembled and signals the

end of an important chapter in the delivery of the nation's flagships.

Programme Director Ian Booth said: "This event means a pivotal chapter in the delivery of HMS Queen Elizabeth has been

completed. The ship here in the dock is a truly magnificent sight."

"Everyone involved in the programme to deliver HMS Queen Elizabeth should feel tremendously proud of what we have all achieved to get to this point. Thousands of men and women across the country have worked together

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The Aircraft Carrier Alliance celebrated the creation of the UK's biggest ever aircraft carrier as the final piece of the hull's main structure was lowered into place.

Under the watchful eyes of shipyard workers, the Goliath crane gently manoeuvred the front part of

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From the Programme Director

IAN BOOTH

WELCOME

This is an exciting time as we push hard for structural completion of the first ship here in Rosyth.

The images on pages four and five show just how much has been accomplished in a short space of time.

But the team is doing much more than the assembly of the first ship. All over the UK, Aircraft Carrier Alliance staff are busy integrating and testing the mission systems and power and propulsion elements that will bring HMS Queen Elizabeth to life.

Stories on pages six and seven will help give you an insight into the wider scope of this programme and



the challenges beyond shipbuilding. Of course, there is more work than ever taking place on the second ship

"Staff are busy integrating and testing the mission systems, power and propulsion elements"

Ian Booth, Programme Director

whose blocks are rapidly taking shape in six different build yards around the UK.

I hope you enjoy this issue of *Carrier Waves* and feel as proud as I do of the men and women that are driving hard to deliver these superb warships to the Royal Navy.



RAF Sqn Ldr Jim Schofield, who performed Britain's first day and night take-offs and landings at sea in the F35

F-35 put through its paces

Lockheed Martin's F-35 Lightning II has notched up more than 10,000 flight hours and has taken to the air over 6,000 times.

The Anglo-American stealth strike fighter – two generations more advanced than the legendary Harrier it replaces – was put through its paces

during its second concerted spell of sea trials recently during 18 days aboard the assault ship USS Wasp off the Eastern Seaboard of the USA.

A combined Royal Navy-Royal Air Force team supported the trials – including pilot RAF Sqn Ldr Jim Schofield, who performed

Britain's first day and night take-offs and landings at sea in the F35.

UK teams also carried out maintenance work on the two F35Bs and tested loading and unloading dummy weapons in its internal bomb bays.

INTERVIEW

David Shepherd is the newly appointed Head of Ship Two. And as HMS Queen Elizabeth nears structural completion, more eyes than ever are beginning to focus on the second of class, HMS Prince of Wales.

What does your job involve?

Head of Ship Two is a new role, and it is my responsibility to bring together all the teams and all the knowledge required to deliver the second ship to time, to cost and at the highest quality.

So, no pressure then?

Just what you would imagine when your role profile says 'deliver an aircraft carrier'! But joking aside, it is all about teamwork. My job is to make sure we are gathering all the information we can from ship one and applying it to ship two. We have already identified new methods of working and organising that will help us make building the second ship as smooth as possible.

**What takes up most of your time?**

The most important aspects of this job are ensuring that all the thousands of people involved, spread across different companies

and hundreds of miles apart, understand they are part of one team and for success we need to work together for a common goal. I'm laying the foundations for HMS Prince of Wales' arrival at Rosyth, and building the teams, plans and people so we can hit the ground running when the first sections arrive next year.

What's been the best moment in your job?

This job is a new role, but I have been with the programme for more than three years and in that time watching the main hull sections skid together was an awesome sight.

What's your biggest challenge?

Finding the time to do everything I want to. We are learning lessons every day, so making sure everyone across the Aircraft Carrier Alliance benefits from our combined knowledge is crucial.

Continued from page 1

as one team in a remarkable demonstration of British skills and capabilities.

"This vessel will play a historic role in the defence of this nation for generations to come.

"Now our focus turns towards fitting HMS Queen Elizabeth with the sensitive electronics and systems she will need ahead of her leaving the dock for the first time next summer, while work continues across the country on the second of class, HMS Prince of Wales."

The facts

- The final ramp section weighs 130 tonnes
- The ramp stands more than six metres high
- It is the last of five sections of ramp, all built in Rosyth
- Together, the ramp sections weigh almost 300 tonnes
- The ramp or 'ski-jump' is a British innovation and allows aircraft to take off with larger payloads.

A significant step for the programme

The Secretary of State for Defence, Philip Hammond, announced a significant step forward for the programme when he confirmed in November that terms had been agreed on the contract to deliver the nation's flagships.

Under the revised agreement, the total capital cost to Defence of procuring the carriers will be £6.2 billion and any variation above or below that price will be shared on a 50:50 basis between government and industry.

Programme Director Ian Booth said: "Once implemented, this will put us on a sound footing for delivery against stretching but achievable schedule and cost targets, while providing a strong commercial incentive to deliver.

"The nation has entrusted the Aircraft Carrier Alliance with delivering these important and iconic ships and we know we can rise to the challenge."



The Secretary of State for Defence, Philip Hammond, has agreed contract terms

**OCTOBER 2011**

The first big lift into a very empty dock

**NOVEMBER 2011**

The first of many sponsor sections

**MAY 2012**

LB02 arrives under bridges

2011 - 2013 A carrier is created

PROGRESS

The programme to deliver the nation's flagships has been under way for several years. But it has only been in the last few

months that the unmistakable shape of the first ship has begun to appear.

Since 2011, thousands of tonnes of sections have been brought to Rosyth. The largest required

meticulous planning and engineering to ensure they were brought into the dock safely.

Assembly Director Stuart Leonard said: "The last two years has been quite incredible to be a part of.

To see the way the team has come together to make our plans a reality has been beyond impressive.

"Now we stand on the verge of delivering a truly remarkable and world-class warship."

**FEBRUARY 2013**

Final bow section fitted

**MAY 2013**

Aft sections fitted



The system uses QR codes to determine where you are in the ship, and to plot a course to where you want to go



Know where you're going?

INNOVATION

Engineers have devised an ingenious solution for safely navigating through HMS Queen Elizabeth

Imagine walking into a building 15 storeys high, with more than 3,000 rooms. Most of the corridors look similar and there is no receptionist to guide you or even any windows to help you get your bearings.

How do you find the room you need to be in?

Welcome to the newest challenge with working onboard a huge and almost complete HMS Queen Elizabeth.

But now a team of engineers has devised an ingenious app-based solution to this very particular problem.

Integration Support Engineer Phil Applegate explained: "HMS Queen Elizabeth is large and complex and, with lots of work in progress, finding

exactly the room you need to be in can be quite challenging, particularly for people who are new to the ship.

"Satnav wouldn't work on the ship, but by loading a custom-designed programme with

schematics of the ships, we have created our own navigation app specific to the QE Class."

Users scan one of many QR codes posted throughout the ship with a mobile phone handset. This tells them where they are and can create a route to take them exactly where they need to be.

Phil said: "We have configured the app to use only safe routes and, just like a normal satnav, if one route is closed it can quickly calculate another.

"When it is up and running, this system will reduce the time spent navigating around the ship searching for the right compartment, and will also ensure workers don't stray into areas that may be hazardous."



"The app will reduce the time spent navigating around the ship searching for the right compartment"

Phil Applegate, Integration Support Engineer

Long Range Radar now in position

In one of the final lifts by Goliath for HMS Queen Elizabeth, the massive Long Range Radar (LRR) was positioned on top of the forward island.

The ten-tonne radar houses some incredibly sensitive electronics, but the heavy handling team, now very experienced in Goliath crane operations, moved it into place swiftly and safely.

Heavy Handing Engineer Neil Bennett said: "It was great to see the forward island completed with this lift. Although not the heaviest or most complex operation, getting the Long Range radar into position is a great milestone for the programme as it really underlines the huge progress we've made in assembling HMS Queen Elizabeth."

The LRR will provide air surveillance over



The Long Range Radar is moved swiftly and safely

hundreds of thousands of square kilometres of ocean. It can detect and track up to 1,000 targets as much as 400km away,

which is equivalent to a ship sitting in the North Sea simultaneously tracking aircraft over Inverness, Cardiff, Belfast, and London.



'We need to work as one team'

ALLIANCE

Aircraft Carrier Alliance staff based at Rosyth, where both ships are being assembled, come from lots of different places. Now, as the programme develops, teams are routinely composed of people from different companies.

Recognising this, overalls and branding with individual companies' logos are being replaced with one design – the Aircraft Carrier Alliance.

Babcock's Sean Donaldson said: "We all need to work as one team to deliver these ships, so putting our parent companies branding together is an important step in recognising that we are all part of one team – the Aircraft Carrier Alliance."

aircraft carrier
alliance
Delivering the Nation's Flagships

Hostile intent

Sensors active on board HMS Queen Elizabeth picked up a series of unidentified aircraft recently.

Although hundreds of miles away, their speed, flightpath and the on-board friend or foe interrogator identified them as 'red air' – possible hostiles. As soon as the contact was spotted, staff in the Operations Room immediately organised the required air defence and a pair of F-35B's were scrambled to intercept. The situation was assessed, actions cleared and the hostile aircraft were shot out of the sky.

The entire engagement took less than 30 minutes.

This 'as live' training exercise, conducted at HMS Collingwood, proved that the Aircraft Carrier Alliance is moving rapidly towards delivering a hugely capable platform.

The ACA's Kevin Sutton said: "We have been working with the Warfare School at HMS Collingwood to test our new Combat Management System, and throughout all of the tests it has proved able to deal with any scenario."

As the assembly of HMS Queen Elizabeth nears completion, the focus moves from the creation of a vessel to the creation of a warship.

Rear Admiral Steve Brunton explained: "Mission Systems are the pieces of equipment that put the 'war' into 'warship'."

"Over the next few months more work than ever is going to be directed towards testing, fitting and setting to work the sensitive equipment that is necessary for HMS Queen Elizabeth to take her place as the nation's flagship."



Public logs on for the latest

Thousands of people now keep up to date with the latest news from the Aircraft Carrier Alliance online.

A dedicated website with regular updates gives a detailed weekly view, as well as a broad monthly update of progress.

Our Flickr site is proving a big hit.

Hundreds of photographs charting the development of the ships have been viewed millions of times and are regularly printed in the media.

All key moments of the process that are captured on video are regularly uploaded to the YouTube channel. CGI and time-lapse videos

have been seen hundreds of thousands of times.

On Twitter more than 4,000 people keep up to speed with events and on Facebook an unofficial supporters page has become the 'go to' site to talk about the latest developments.



flickr



Diesel generators slotted into place

The final two Wärtsilä Diesel Generators have been fitted onto HMS Prince of Wales' Lower Block 04 in Govan. Check out the time-lapse video at www.youtube.com/QEClassCarriers

Celebration run for centenary

To celebrate 100 years since the launch of the first HMS Queen Elizabeth, the Ships' Company of the new HMS Queen Elizabeth ran 'bridge to bridge'. The 40-mile course took the team from the Forth Bridge to Kincardine Bridge and back again, raising money for the Royal Navy and Royal Marines Charity. Lieutenant Chris Bugg said: "It was a long day but for a great cause."



News in brief

Staff move onboard ship

In an engineering milestone, 15 Engineering Liaison staff moved their desks onboard HMS Queen Elizabeth in September.

The team provides information to aid installation with engineered solutions.

Alan Sharp said: "We are realising the benefits already. Being onboard instead of in an office on the dockside means we are in the best place to help and get a better understanding of the issues facing production teams."



Ken Woodward delivered presentations on the importance of workplace safety to staff

SHE is top priority for the alliance

Ken Woodward, who was injured in a workplace accident, held a series of presentations for staff recently as part of the ongoing campaign to encourage safe working across the alliance.

Andy Forbes said: "Ken was blinded during a workplace accident and his presentation really brought home to people the massive, life-changing impact a serious injury can have, not just on the person involved, but on their friends and family too."

"There is a huge amount of work to accomplish as we move towards delivering the Queen Elizabeth Class aircraft carriers, but the number one priority at all times is keeping safe."

"We should all be proud to work safely."