

Type 31 Programme briefing

Friday 9th October 2020

John Howie

Chief Executive, Marine

Good afternoon, and welcome to the Babcock Type 31 programme briefing. My name is John Howie. I'm Chief Executive of Babcock's Marine sector. The purpose of today is to give you an update on our progress with the Type 31 frigate programme since we're almost a year into the contract. Ideally, we would have been welcoming you to our Rosyth site this afternoon. However, the current situation with Covid-19 means that we're all having to do things a bit differently at the moment, so rather than postpone we decided to try something new and meet you virtually. So, thanks for your attendance in these alternative circumstances.

I should just emphasise at the start this is an operational update, so there will be no new financial information disclosed. As a reminder, we are on a closed period, so we are not able to talk about current trading in the business. If you do have any investment-related questions, Simon McLaughlin and Sam McGregor are on the call to step in if we need them.

So, hopefully you can see the slide pack. I'll pass by slide 2, which has just got the standard disclaimer. You'll be pleased to know, unlike a radio ad, I won't read it out really fast, and I'll move on to slide 3, which is the agenda. So, let me tell you a bit about the flow for the next hour. I'm going to run through a short high-level overview to give you a flavour of where we are currently with the programme. Then we have some really interesting video input from the business leads who are actually running the programme to give you an operational perspective, as well as a word from our customer. After that, we'll open the session up to question and answer, and we'll give you the chance to ask any questions that you may have. As I said, it should be about an hour in total.

Moving forward to slide 4, most of you will be aware of what Babcock does, and be familiar with our role. So, just a brief word on that and where Type 31 fits into our business. As you can see here, we are really proud of the work we do that helps save lives, supports national defence, and protects our communities. In doing this, we deliver bespoke, quite complex engineering services, and we do that for customers in the UK and, increasingly, around the world, with a focus on helping to improve capability, reliability, and availability of their most critical assets within our four sectors of marine, land, aviation, and nuclear. Of course, we underpin all of that with a deep understanding of technology integration, some quite unique infrastructure, and some complex specialist training.

Moving on to slide 5, we are the MoD's second-biggest supplier in the UK. We provide long-term programme support across all of the armed forces, and it's right at the heart of the business we are. Many of the things that we do are unique, and they are absolutely critical to our customers' operations, and that gives us good long-term certainty, as does the fact that we have visibility of their 30-year procurement and support programme, and the 10-year equipment plan that sits behind that, so we've got really good long-term visibility, both in workload and in likely funding. That allows us to maximise opportunities and drive value for money solutions for UK taxpayers. Of course, increasingly these days we have a growing international footprint, and it's both growing in size and growing in importance for us as a business, and technology and innovation increasingly underpins everything that we do.

Moving on to slide 6, I'll just talk about the marine sector. The next couple of slides are really an overview of the Marine business. Three main pillars. Firstly, supporting the Royal Navy in the UK and wherever they operate, and that's the foundation for our business. We're focused on building our international footprint. We've got positions in Canada, Australia, and New Zealand that are right at the heart of that, and we're growing a position in Oman, and we've now opened a facility in South Korea which is a growing market for us, both in defence and in energy and marine markets. In a technology sense, for those who might have been at DSEI last year, if any of you were able to visit that, you may have seen our iSupport technology, and the work we're doing on digital twins, data analytics, predictive modelling of warship systems and structural analysis have got the potential to completely transform the way we deliver through-life support, building higher barriers to entry, and sustaining the sort of margins that our shareholders have come to expect from us.

Moving on to slide 7, the Marine business has got a really strong UK base with about 7000 employees across the UK and internationally. This slide doesn't include our UK nuclear submarine business in Clyde, Bristol, and Devonport, which employs essentially about the same number of people again, so there's real strength and depth in this business. Rosyth, for Marine, is our manufacturing centre. Our gas handling business is based out of there, but that's where the Type 31 programme is centred, and it's our place for advanced modular manufacturing. We've got a number of RN training sites, so although we operate the Clyde submarine base operations through our Nuclear business, in Marine we provide submarine escape and rescue training, as well as operator and maintainer training for the Astute-class submarines.

Our equipment business is headquartered out of Bristol, providing weapons handling and launch systems for submarines, as well as payload handling systems for surface warships like Type 26, and then on the south coast we have the rest of our naval training business and our warship support business based out of Devonport, as well as our work supporting the Royal Navy's principal weapons systems such as Phalanx and the large-calibre guns. You can see there, internationally our footprint is mainly Canada, Australia, and New Zealand, but with a growing presence in Oman and Korea, as we said.

So, moving on to page 8, let's now talk about the Type 31 specifically, which is the purpose of the briefing.

Slide 9, just to give you a bit of background on the programme. Many of you will be aware that we won this contract after a really robust competitive tendering process, stiff competition, and at the end of that, Babcock's Team 31 and our Arrowhead 140 solution were down-selected by the UK MoD to build five Type 31 frigates, and that happened in September last year. We signed the contract in November,

and that contract requires us to deliver five general-purpose frigates at an average unit price of £250 million per ship, with all five ships being delivered by 2028.

Crucially, Type 31 is seen by government and by Babcock as a pathfinder programme for the delivery of a new shipbuilding model which we think will help invigorate and sustain the UK maritime enterprise, and give the MoD a different way of procuring less-complex warships. The programme is based around a core of UK-focused ship design and build, and that aligns quite closely to the government's prosperity agenda, and we do think it's got significant export potential. We're the prime contractor and the programme leads. We have Thales as our main partner, they're the combat system provider and integrator, but we also have other major suppliers like NTU, BAE Systems, MAN, Renk, L3, Tyco and Raytheon, and others.

A bit about the team. Team 31 is made up of Babcock, Thales, OMT, who are the original developers of the platform design we're using, our own Fraser Nash, and BMT, and together that is our highly accomplished team that comes from across defence and commercial ship design, and has got the combined experience and capabilities needed to deliver a programme of this complexity.

The two blue boxes at the bottom of page 9 tell you what the Royal Navy are looking for in this platform. They're looking, essentially, for a ship that is both capable and adaptable. Critically, it has to be affordable. Defence budgets, like all other government budgets, are always tight, and they wanted something that had the capability to be exported, and we'll come back to that later. I won't dwell on the box on the right, but that's the operational requirements they're after. This, essentially, is a general-purpose frigate. Its role is to take part in counter-drug operations, maritime security, and convoy support in the Gulf. So, it's a general-purpose ship. It's not a specific anti-submarine warfare or air warfare ship.

Moving on to slide 10. So, where are we in progress terms? Well, the good news is that we are in line with our contract schedule, and that's despite the issues we've had with Covid-19. The whole country, the whole world, has been impacted by the pandemic. We have been able to sustain our contract schedule, and that's huge testament to the teams that are involved in this, and how quickly they adapted to the situation. I'm also delighted that our spend is in line with our programme assumptions, and that's despite the fact that we've now placed sub-contracts for 73% of the material value, including nearly all of the more complex packages such as the combat system, propulsion, heating and ventilation, and the main guns. If you've seen any of our media releases in recent months, you'll see these orders that have been placed. That includes some of the long-lead items like main engines and diesel generators from MTU, gearboxes from Renk, shaft lines and propellers from MAN Energy Solutions, and the guns from BAE Systems, all placed in accordance with our schedule. We've hit every milestone in the contract in accordance with the timescales we agreed with the MoD.

It's important to say that the Arrowhead 140 design we offered the MoD is based on a proven wet design, a proven-in-service design, the Danish Iver Huitfeldt frigate, and I'll come back to that in a few minutes. But it's also really important to bear in mind that we built into this programme the fantastic experience we have of being a core part of the UK aircraft carrier alliance, and lots of the lessons about how to effectively design and build warships, how to engineer out cost and time, have been built into our plans for this programme. A big part of the programme is also about the investment that we're making in advanced manufacturing equipment and technology, and you'll hear some more about that from our engineering director in the video sequence.

I'm sure you'll remember the programme has got an export element to it. It was called Type 31e, E for export, and we are continuing to work with UK Government on potential opportunities, and there are a lot of countries interested in this programme. I can't go into any details at this stage, but some of those opportunities are live and quite exciting, and they cover a range of people who just want to buy a design, through to people who want ships built in the UK, people who want ships built in their own country with technical support, people who want to help with supply chain. So, there's a whole range of them, but they're a great way to introduce Babcock into new markets.

If I move on to slide 11 now, the Iver Huitfeldt, why did we choose that? Well, it's an in-service NATO standard frigate. We've enhanced it to bring it up to date with modern legislation, to make changes to it that make it suitable for the Royal Navy's operating profile, which is slightly different to some other countries. It's a proven hull. It's in the water, and the customer has got nine years' operational feedback on it. The Royal Navy know this ship well from the operational sea training work they do, and we knew that they liked it. It's a proven design. It's 50% bigger than the Royal Navy requirement, which makes it significantly easier to build because there's lots of space. It's been deliberately designed to be modular, and that takes both time out of the build sequence but also, critically, cost.

Moving into the Type 31 variant of that, what we're offering is an adaptable, cost-effective, modern, global frigate that meets the Royal Navy requirements now, but also has the space to modify and grow those requirements in the future. Its smart-build credentials mean that it is optimised for pre-outfit, with open compartments that enable rapid assembly. Again that helps take cost and time out of the programme. We're using commercial off-the-shelf equipment. That's embedded into all the on-board systems, which crucially minimises through-life cost - we're the support contractor, so we do care about through-life cost - but it also means that we're carrying very little development risk on equipment. We're buying proven equipment, often equipment that's modern versions of the equipment already installed on these ships. There's significant design margins for upgrade through life, and that's really important. It means that we have absolute confidence that we can hit the performance requirements in the contract. Actually, we've got significant margin beyond them, so we know we've got grounds there, and that also means the Navy can adapt this ship through life, knowing that it's got the capability to be modified.

At the heart of the decisions we've made is Thales' TACTICOS combat management system. That's a proven-in-service open-architecture system. Most of the combat system equipment that will be fitted to it has already been integrated to that platform. This CMS has been sold to 24 different navies. It's installed on 150 different ships. So, most of the functional integration has already been done, and again that's another huge de-risker for us. So, again, very low non-recurrent cost, which helps keep the cost of the platforms down.

Moving on to slide 12, I won't dwell on this, but the slide's intended to just give you a flavour of the capability. The ship has got a baseline mission system, but it has the ability to be modified to add other equipment should either the UK or an export customer want it. The ship has got quite a flexible combat system, three guns, surface-to-air missile system, a new 4D radar that the Royal Navy are really quite excited about, and a range of other capabilities. So, this is - it's not intended to be a high-end war-fighting platform like Type 26, but neither is it the gunboat that some people have suggested. It's at least as capable as the Type 23s that it replaces.

Getting on to slide 13, some of you might think this slide looks familiar. It is the same slide that we shared with you at our half-year results last November. As I said earlier, the programme is on track and the financials that we set out before still apply. A key thing that's happened in recent months is, we've successfully undertaken a whole-ship preliminary design review. That's a major review of the robustness and maturity of the design. That passed. We passed through that gate. It went really well. The review was undertaken by an independent panel, so it's not Babcock convincing ourselves that it's all in good shape. It was an independent panel made up of ex-BAE Systems employees and people from other parts of industry who've got proven expertise, and the feedback on that was really quite heartening. Of course we've got things to do. Any good review will always give you actions, but fundamentally the design is in good shape.

High-level programme says that the first cut of steel is in mid-2021. First ship in the water, 2023. All five ships delivered to the customer by 2028.

Moving on to slide 14, we'll just talk a little bit about the infrastructure investment in Rosyth. As a result of the current pandemic, the majority of the Type 31 team have been working from home, but despite that, as I said, we've been able to keep hitting out milestones. That just proves the adaptability and flexibility of our workforce. But we've also been able to keep our on-site preparations going too, ready for the start of manufacture. We're building a new 145-metre-long assembly hall. The piling work for that started at the end of August. That consisted of setting approximately 5000 piles to various depths throughout the building and hardstanding area in front of it to prepare the ground for the appropriate loads and foundations for the building itself, so that's quite a key part of the infrastructure development.

The other piece of it is the enabling works to some of our manufacturing bays in order to allow us to install a new PULSE line, which is a state-of-the-art automated panel manufacturing line, and that's a cornerstone of our digital transformation programme for Rosyth. It will create significant efficiencies in the manufacturing process. Lots of the steel preparation and assembly work that's traditionally done by hand, on Type 31 will be done robotically. The ship's design is optimised for that, so we should get significant gains out of that.

Moving on to slide 15, I mentioned earlier the challenges around prosperity. As I said, Type 31 is a pathfinder programme for the UK National Shipbuilding Strategy, and part of that was about making sure there's a strong warship build sector in the UK for the long term. It's also about ensuring that we've got something we can export, and to make sure that we spread the benefits of shipbuilding around the UK, and I know that's something UK Government are getting increasingly excited about, the role of shipbuilding as a job creation and prosperity vehicle.

The programme is as much about people as it is about product. It'll build on the successes we've already made with our supply chain. We're mobilising the team in Rosyth, in Bristol, Devonport, and in the Thales facility in Crawley, and we'll get up to a maximum headcount of about 1250 people across the UK, together with a further 1250 in the wider supply chain in the UK. We're investing in the UK supply chain, and that will support the next generation of apprentices and graduates through the partnerships we have in place with universities and colleges, and will sustain a number of highly skilled jobs across the country. We'll be putting in place about 150 new technical apprenticeships on the back of this programme, as well as upskilling our existing employees so that they can provide the levels of efficiency and quality that this programme will require.

Moving on to slide 16. I put this slide in because I think it's important to acknowledge there's been some scepticism out there about how we can possibly deliver a programme like this to time and budget, so I thought I'd put this together just to talk you through it. There are really six reasons in my mind why historic ship procurement programmes have ended up with cost and programme overruns. The one at the top of the list is probably one of the two that hurts the most, and that's when we'd, euphemistically we'd call it, concurrent engineering, which basically means designing the ship and building it at the same time. The legacy of some programmes is that you can spend significant percentage of your planned work-hours re-working the production product to take account of design change, and of course modifying the design itself. Because we're using a proven-in-service design, and we have access to a detailed 3D design model, we already have a mature design. We are only modifying it to bring it up to date with current legislation, to reflect the current RN requirements, and to build in a new combat system. Those are relatively minor changes in the grand scheme of things.

The other thing that punishes warship builders is the functional integration of the weapons and sensors with the combat management system. In the case of Type 31, the TACTICOS system is open-architecture, so the interfacing process is much more straightforward. Because it's in service with 24 navies, nearly all of the equipment we're planning to fit has already been functionally integrated with the core software for another programme, so the software integration risk for us is relatively modest.

Weather is a big problem, especially if you're in Scotland. I'm looking outside and it's raining at the moment, surprise, surprise. All of our build and assembly work will be undertaken under cover, except for fitting the ship's mast. That's a huge productivity gain because we won't lose time through wind and rain and cold. You can see there some others. I would also just mention that the customer recognised their role in previous programmes, and the impact that customer change can have. This contract was deliberately written by them, and by us, to inhibit the customer's ability to introduce change. Yeah, the platform might get modified, but that will happen after it's been handed over by us. What they want here is for us to get on and design and build the ship cleanly, without disruption. So, I think that's a good place for us to be in overall terms.

So, I think that's probably enough from me. I think now probably time for us to hear from the experts, and for those of you watching on the webcast to get a chance to see our progress.

Video

Graeme Thomson

Programme Director, T31

I'd like to take the opportunity today to talk to you about the progress we're making on the Type 31 contract we signed in November 2019. The contract is a capped contract with an average unit price for the vessel of £250 million. The contract also requires us, rightly so, to pursue UK prosperity options, and also look for potential export opportunities for this design. We have made good progress on the design. We have adopted the Iver Huitfeldt model from the Danish Navy as the basis for the Type 31, and have recently transferred the model across into our own systems, and are continuing to develop it to meet the requirements of the Type 31 programme.

We are also at this time working on a number of other fronts. Apart from just progressing the design work, having completed functional design in June 2020 we're now in detailed design, and developing that model around the production outputs and delivery for - ready to start construction in 2021. In addition to that, we have made significant investment in our infrastructure, with extensions of bays and the investments in PULSE lines, and also the building of a new assembly hall which will be able to contain two Type 31 frigates side by side, under cover. From there, those ships will be floated out ready for testing and commissioning.

As well as production and design, we've also got work going on in placing our major sub-contracts. We have placed contracts for everything from outfitting to mission systems, and continue to do so looking at the opportunity to maximise our UK footprint and generate the prosperity we seek from this contract. At present, 400 people are working across Bristol, Rosyth, and with our partners Thales at Crawley.

Admiral Paul Marshall

Royal Navy

Today we're celebrating a milestone in Type 31, and that really is the start of the development of the combat management system. I think I'm most proud of the fact that the Royal Navy and CNS, our acquisition authority, has been willing to challenge orthodoxy, to do things differently, to really work with industry to get a better outcome in terms of the budget that we've got, and maximise the capability as a result.

John Mansfield

Thales

The next three or four years are going to be extremely busy. First main challenge is to deliver the project. That is the real responsibility that's been entrusted with us. Task number two is going to be delivering on the export and prosperity commitments within the project, and then task number three is more of a business objective. We need to be able to stand up our mission systems business and make sure that we can mature and grow the capabilities and skills that we need in the UK to deliver on those first two commitments.

Graeme Thomson

Programme Director, T31

In this current environment, however, most of those people are working from home, and it's a great credit to everybody's effort that we've continued to make progress on the programme despite the challenges that working from home brings. We look forward to delivering the production outputs, ready to start production next year.

Dean Blood

Mobilisation Director, T31

I'm here today to give you a quick update on the significant infrastructure and facilities investment that we're making over the next 12 to 18 months to support the frigate build through to 2028, initially. The investment takes place based upon three major elements, the first one being a brand-new, all-inside, totally weather-insulated and windproof assembly hall based approximately 200 yards from where I'm stood now. That will house two frigates side by side. The second element behind me is an investment in refurbishment and an extension to the existing bay here in Rosyth to house a fabrication panel line. The final part itself, of course, is the refurbishment of the buildings, buildings which have been around now for 40, 50 years, and subject to, and in need of, significant investment in order to make them up to scratch and meet the minimum standards we require to support the build.

Work has been advancing well on all fronts. Enabling works, such as concrete removal, new pile mats, and importantly putting down new foundations, is well underway on the new assembly hall and on bay two. There is an element of futureproofing on both of them to support the flexibility of perhaps different ships other than Type 31 moving forward. The inside of the assembly hall is scaffold-free. It will have digitisation, which will be covered later, to support the latest manufacturing processes and systems. That fundamentally gives us an efficient and effective approach to shipbuilding that we've not used before, but will give us gains in order to meet the productivity requirements and needs of the Type 31 programme.

Finally, as we're poised to take receipt of all this construction and infrastructure, it's important we make good use of it with process and systems in order to make sure it's as efficient and as effective as we possibly can, and that will be covered in a later section following on from this one.

Darren Goodwin

Project Procurement Manager, T31

So, the Type 31 programme is a significant project which will generate prosperity in line with the National Shipbuilding Strategy. The scale of this investment, principally in design, engineering, project management, procurement, and advanced manufacturing skills, has an enduring positive impact on the UK. To support that agenda, our emphasis is on the UK suppliers with large companies and SMEs. Major contract awards have already been underway since the start of 2020, and we continue to engage with key suppliers about the capability to support the programme. We are already working with major suppliers like Thales, Lloyds Register, Tyco, Darchem, and L3 to name a few, and we continue to engage others as we place more contracts in the lead-up to first cut steel.

We actively work towards using UK suppliers, both as direct sub-contractors and [sub-tiers], and we estimate just over 75% of our supply chain spend will be with UK suppliers. Our supply chain starts with local regions and extends right across the UK. We already have a large existing supply base across Babcock, but we also refer to trade shows and supplier events we have been involved in, and we engage local industry bodies like Scottish Enterprise, as well as supporting local meet and buy events with Fife Council. We have membership of both FPAL and JOSCAR, which again are useful sources of information to identify a wide range of suppliers, large and small.

The Type 31 programme is a significant project, and is expected to support an additional 1250 roles within the wider UK supply chain.

Neil Young

Engineering and Technology Director, T31

You've already heard today around the great investments we're making in the physical infrastructure and equipment which will allow us to build the Type 31 project, but I want to talk to you about the equal investment that we're making into our digital and data skills that are required to deliver the project in an efficient and controlled manner. This all starts with our design engineering tool, and the start of the digital thread for the asset. We've invested heavily in new design software which can be integrated in with the smart production techniques to deliver designs to the panel line and to the pipe shop. They allow us to efficiently nest plates to reduce waste, and increase our sustainability for the project. They allow us to deliver the code to the robotic welding machines on the panel line to deliver the welding for the panels as they are made up into their units.

We also have invested heavily into digitally enabling our workforce, both providing them with the skills they require, but also with the equipment and tools they require to access and look at the design data and equipment data as it is delivered to them. This means that it could be tablets to access this on, screens, or we're also looking at augmented reality and VR for allowing them to train beforehand for the project, so they really get a view of the ship as it gets built up.

We're investing heavily as well into our stores and our digital stores, which allow us to plan projects to make sure that materials are delivered on time to our workforce when they need them. We're also then looking at further investments to drive that deliver. Going beyond this, we're moving into commissioning and acceptance, and mechanical completion as we proceed through the Type 31 project, and to do that we're enabling acceptance as we go into the PDM system that we have. This will mean that as we go through, we are progressively accepting the project digitally and signing off internally, so we know that when we come to vessel acceptance everything is in the place it should be.

Beyond that as well, we're working with our colleagues in our support business to make sure that our data can be handed over to them in a seamless manner from design and build to support of the asset, because the support costs are something that we're passionate about as well for our clients.

Also, to assist in modern technology, we're working with local universities and high-value manufacturing catapults to deliver the next generation of techniques that we require for both the digital manufacturing and industry 4.0, but also for the techniques that we need in advanced welding and NDT. With this investment, the project is not only secure for Type 31, but for future projects as they come up, so it will benefit the other projects on site as well, plus the future projects that will come as far as the National Shipbuilding Strategy.

Commander Dave Jones

Navy Ships Acquisition, Royal Navy

The Type 31 project is a great opportunity, not just for the Royal Navy but for everyone involved. Designed to succeed in a wide variety of tasks, they will be on the front line of the Navy's surface fleet for years to come. Whether operating independently or as part of a balanced task group, they will be at the forefront of our efforts, delivering persistent forward presence across the globe alongside our allies to address emerging threats, protect UK interests, and assist those in need. Based upon the proven design of the Iver Huitfeldt class, currently in service with the Danish Navy, the Type 31 is designed for growth. Not only can these ships successfully deliver the vast majority of tasks that a fleet is required to conduct today, they have excellent potential to adapt to meet future requirements. As well as being good for the future evolution of the Royal Navy, this helps make the Type 31 more attractive to other navies, increasing export potential.

The Type 31 is the Navy's first opportunity to realise the National Shipbuilding Strategy, and we are confident that they will enable the wider transformation needed to deliver a strong warship building sector in the UK for the long term, contributing to broader prosperity and British industry.

Type 31, the realisation of the target to deliver five ships at an average production cost of £250 million per ship. The Royal Navy and Defence Equipment and Support worked in unison to successfully execute a new competitive procurement process, the first major warship procurement in a generation to do so. The lessons from this experience are already being applied elsewhere.

The progress made by Babcock, Thales, who are delivering the mission systems built around the TACTICOS combat management system, and the wider supply chain is commendable. In addition to the ongoing detailed design and analysis, infrastructure works are underway at Rosyth to upgrade and digitise facilities, and deliver more effective design and manufacture processes allowing innovation and the chance

to use 21st-Century technologies. The Ministry of Defence looks forward to continuing our work with all of those companies, developing the relationships and links that will deliver the Navy the best capability possible.

The Type 31 team, both here in Navy Ships Acquisition and in Defence Equipment and Support, are committed to delivering a class of ships and a capability that will be at the heart of the Navy's operations, providing new weapons systems, new technologies, a proven hull design, designed to deliver more effectively the tasks that form much of the Navy's core roles, and doing so for a fixed price and at pace. It is a demanding ask of the Navy, ministry, and industry, but as a naval engineer a professionally satisfying one to be part of. Providing the Navy the basis from which to re-examine and improve how we conduct our core roles and provide a sustained footprint and global presence well into the 21st Century.

Q&A Session

Joe Brent, Liberum Capital

Hi, good afternoon.

John Howie

Hi, Joe.

Joe Brent, Liberum Capital

Two questions, if I may. Firstly, could you give us some indication of how fixed the price is, and if there will be some sort of variance, potential variance on that? Secondly, clearly a lot of capital investment. Could you give us some indication of what the financial cost of that is, and over what time period?

John Howie

Yeah, no problem. So, if I take the price, you've seen the part about average production cost of £250 million. The MoD have said, through the National Audit Office, their total budget for the project is £2 billion, which includes a lot of their costs, but also includes cost for the government-furnished equipment, et cetera. But another key thing that's in it is to do with some of the inflation of the elements. So, the contract has got a mix of firm and fixed price elements, so there will be some inflationary escalation as we go through.

Joe Brent, Liberum Capital

Thank you.

John Howie

On the Capex front, the total investment that we're putting into the programme is a shade over £50 million, and that investment has been made not specifically for this programme. It's been done to deliver the programme, but it gets us a capability that we can deploy on other future projects, be it export programmes or energy and marine projects. So, we recover part of the cost through Type 31, because it's obviously providing us with programme benefit, but beyond that we will recover the balance through future contracts.

Joe Brent, Liberum Capital

Wonderful, thank you so much.

John Howie

Thanks, Joe.

Sash Tusa, Agency Partners

Pretty good, thank you. Good afternoon, John. I've just got a couple of follow-ups. So, to be absolutely clear, production cost, average production cost, £250 million, that is what Babcock books directly, but you're clearly also purchasing some of the government-furnished equipment. I mean, the BAE statement on the armaments said that you had acted as the procurer for that. So, does that go through your £250 million per ship, or is it just that you're authorising the paperwork for that?

John Howie

Yeah, so there's two categories of equipment in the programme, Sash. There's equipment that we are providing as part of the programme, and that includes the guns, the Thales mission system, the integrated navigation and bridge, et cetera, and then there's the government-furnished assets, which would include things like the Sea Sceptre missile, and a lot of it actually is information as well as equipment. So, our £250 million doesn't include the cost of the GFE, but it does include the cost of, effectively, the baseline equipment including the guns, the engines, gearboxes, propellers, et cetera.

Sash Tusa, Agency Partners

Great, thank you. Another question. What sort of learning curve should a shipbuilding programme of this length, because clearly, five ships, assuming that they are all absolutely identical, it's the sort of production length that any warship builder would be delighted to get. What sort of learning curve are you targeting, and how does that differ from what you achieved on the carrier programme?

John Howie

If I was being honest, I can't remember what the learning curve is. Yes, we have built a learning curve in, as you would expect on a five-ship programme. So, there's a couple of key - if I just tackle the carrier comparison. The learning curve we achieved in the carrier was actually quite significant between ship one and ship two, but you do have that challenge that you've only got two ships, so you get basically one chance to refine the way you did it the last time. Whilst that was quite successful for carrier, we should do quite a bit better here because we get to repeat it over five. Any of you who've been to Devonport and looked at the Type 23 frigate life extension programme, we've improved ship-on-ship as we refine and tweak the way we do things.

I think the other part of it is looking at how you bring down the UPC overall by using things like under-cover build, designing the build methodology so that you don't use any scaffolding, which was a big cost driver on the build of the carrier. So, we've tried to engineer out a lot of the things that are big variable costs. We talked earlier about reducing design re-work, but to take your core point, yes, there is a good learning curve across the five ships. I can't remember off the top of my head what the percentage is, but we have built that assumption in, partly on the basis that we, having built four ships for Ireland, and some of us have got experience like Type 23 build, Type 45 build, and so there are reasonably well-understood norms for these things.

Sash Tusa, Agency Partners

Thanks very much. I've just got one last question. You said that the Arrowhead 140 design that you are building was - I think you said it's 50% bigger than the Royal Navy's initial requirement, or at least initial specification. I know that a previous First Sea Lord, I think talking about the carrier programme, said steel is cheap and air is free, but I find it quite hard to believe that 2000 tonnes of extra steel plus scaling up the entire propulsion and heating/ventilation system and so forth to cope with that i.e. net free. So, I just wonder if you could talk about those trade-offs.

John Howie

Yeah. So, first of all, why did we pick a bigger ship? It sort of goes to the second part. We picked a bigger ship because we knew it was a design that customer wanted. I've also had a bee in my bonnet for a long time about the importance of building things which are more capable than you can currently see a need for, on the basis that things change. The Type 23 frigates are not performing anything like the role today, in many cases, they were originally designed for, because the world's a changed place, and that's something that brings a price with it. This is the point where I get to give credit to people like Mark Harvey and Sean Donaldson in the project team, because I originally had the same concern as you. Yeah, steel's cheap and air's free, but chilled water isn't, and propulsion isn't.

What they demonstrated to me quite effectively with the Arrowhead design is that whilst you're paying extra for some of those facets, you need some of them anyway to build in design margins for end of life, but actually the extra cost that you incur is more than offset from the production benefits you get, from the fact that the ship's been designed really quite cleverly to be simple to build. I've never seen a design like this that's got such straight pipe and cable runs, such big airy compartments like main machinery spaces, where the impact you get on the outfit cost of actually assembling the equipment into the ship are really quite dramatic. So, in the round, although it sounds counterintuitive, a big ship proved to be more cost-effective to build than a smaller ship.

That's why we offered the competition a ship that was 50% bigger than the other two competitors were offering, because we'd been able to prove to ourselves that you can take account of the extra materials through the production benefits that you get of making it much easier to build. We talked about the panel line. The steelwork going through the panel line. Because the panel sizes have been optimised for a standard panel line, because they're flat plate, they're much easier to fabricate and assemble. I have to say, I was really quite impressed by what OMT have done with this design. Sorry, longwinded answer to your question.

Sash Tusa, Agency Partners

No, lovely. Thank you so much.

John Howie

Okay. So, I think just to say thank you for joining the call, thank you for your interest in the programme. I hope that gave you a valuable update on the programme and reassured you that, despite what some people say in the market, this programme is running exactly as we hoped it would. Of course there are challenges ahead. There always are in complex programmes, but we've got a really good team and a good set of sub-contractors, and hopefully that success will continue. Thanks for joining us, and have a great weekend.

Ends