

Innovating for the future

Technology is changing the way we work and what we deliver. That means our customers are increasingly turning to us for tomorrow's technology solutions. The impact of the COVID-19 pandemic alone has shown us that.

Over the last year we have taken a hard look at how we can foster innovation and technology across the Group. It was clear that whilst there were areas in which we excelled, we needed to be more flexible and proactive in driving and sharing innovation across the Group.

The responsibility for business performance and customer delivery rests on all our people, so innovation in Babcock goes beyond the technical engineering and digital domains. Innovation is vital to our service delivery and business performance, so it matters in all our operational and functional areas. It can range from continuous 'lean' thinking to larger 'landmark' capability development programmes.

That's why, as well as acting on key themes in our technology road maps, we are growing our innovation platforms and knowledge transfer networks – encouraging our people to be curious and to collaborate, to put good ideas into practice.

We believe this is an important factor in increasing our operational efficiency and our access to new markets – whether that is in deploying our full capability internationally, or exploiting the growth of new asset types and operating environments facing our customers.

As our customer requirements have changed and evolved, we've also been looking at new ways of innovating and how we can harness the wealth of expertise we have in Babcock and share that knowledge in ways that will make a real difference to how we run our business.

We know we can do things differently and we know we need to do things differently.

My appointment to the new role of Babcock's Chief Innovation & Technology Officer is a sign of the Group's commitment to driving change.



Jon Hall, PhD
Chief Innovation & Technology Officer

Fostering innovation

Over the current financial year, working together with our leadership team we will nurture and foster innovation within Babcock, supported by our new people Strategy (see page 22). We will build on our inherent engineering ingenuity, harness the expertise of our people through knowledge-sharing platforms and continue to invest in our technology capabilities both in the UK and internationally. This focus on innovation will be promoted by increased collaboration and reach across the Group, aided by our 'lean' or operational excellence programmes.

We will drive growth through our extensive technology programmes, but we also need people who understand the increasingly complex world of digital systems and data; people who can translate and transform that data to bring about real, tangible benefits to how we design, build and look after our customers' assets.

So investing in next generation skills will be a key enabler of how we work with our customers and manage their assets, and our businesses. We will create a Babcock Digital Academy to build wider digital awareness across Babcock. This will be a network to integrate and embed the latest thinking around data exploitation and digital technology, and an opportunity to share ideas and best practice. Using technology such as machine learning to assess corrosion, for example, will drive significant efficiencies, reduce costs, increase availability and tap into new markets – whatever the industry.

We have also started an internal campaign to encourage our own people to innovate, and to 'think BIG' and contribute through our new knowledge-sharing hub, BIG Ideas. I'm delighted that so many of our people have jumped on board since we launched the hub to have their say. It isn't just about platforms of course; it's how we share information, and our people are critical to achieving that.



Randika Vithanage, Senior R&D Engineer, using a high temperature ultrasonic roller probe at the University of Strathclyde's Technology Innovation Centre laboratory in Glasgow.

Strathclyde Case study

Innovation through collaboration: Our strategic partnership with Strathclyde.

At Babcock, successful collaboration underpins much of what we do. That's why working in partnership with academic partners such as the University of Strathclyde means we can deliver real innovation to address some of the most important engineering challenges facing us today.

With our recently launched strategic partnership, our longstanding relationship will allow us to focus on activities which will drive innovation and enable technology integration in the critical work we do. Knowledge transfer is also fundamental so we'll have the right platforms in place to ensure we're learning from this at every step.

We'll focus on technology areas such as autonomy and trusted systems, data analytics, and advanced manufacturing and inspection. Our people will also benefit through our planned Babcock Digital Academy, in which Strathclyde will have a role, to support all these projects.

We'll build on existing successes such as our Prosperity Partnership; a five-year collaborative research project, co-funded by the UK EPSRC, involving Babcock, Strathclyde and other academic partners, focused on delivering new technology solutions to prolong the life of the nuclear assets we manage.

Again, our focus will be on driving down costs and improving availability. Over the next two years we will deploy this research into industrial application and generate real world impact. There will be a particular focus on deploying informatics solutions, in-process and autonomous inspection capabilities and field trials of infrastructure remediation techniques. All of this helps us to provide deeper engineering support and increased efficiencies for new and existing customers.

A more structured collaboration means we can bring all of that innovation together and plan greater continuity of engagement and insight.

Professor Sir Jim McDonald, Principal Vice-Chancellor of the University of Strathclyde said: "Our innovative collaborations, such as the Prosperity Partnership, are already generating impact across industry and academia. Our partnership means we can now look forward to exploring new areas of research and translating the outcomes to both support innovation and develop solutions for industry challenges.

"It also means we can offer students and staff valuable industry experience through internships, placements and secondments, as well as providing Babcock with a critical source of future talent."



Airbus H145 helicopter operated by Babcock in Italy.

Cranfield/Odin Case study

Innovation unlocking AI potential

At Babcock we manage complex and critical assets, and to get the best out of these assets and deliver increased efficiency for our customers we need to understand the data we're working with.

In our Aviation business the Innovation and Technology team have been working to develop a cutting-edge data and analytics capability to allow us to make better-informed decisions to prolong asset life, increase availability and reduce cost.

The first phase of Project Odin has just been delivered, with our UK Onshore Team supported by research with our partners at Cranfield University.

Odin uses advanced data analytics and artificial intelligence garnered from the aircraft we manage. Using the most advanced data analytic techniques we can bring data from different sources together which provides valuable insight into system availability, usage, spares management and maintenance scheduling.

Hayley Belmore, Director UK Onshore, explains: "The Onshore business benefits from a number of great systems collecting a plethora of useful data. Extracting, validating, improving the quality of the data and bringing the information together in an intelligent way to help us better understand the business had previously been a challenge. We now have a fantastic platform giving us accessible, quality data to facilitate decision-making."

Odin is one of the most exciting programmes Babcock will be offering. As well as developing its reach across existing aviation fleets, we'll also look to incorporate it into new areas such as smart buildings and hangars. This in turn will support our customers' need for sustainability and give us both opportunities for growth. We'll work alongside them so they will be able to make data-driven decisions and incorporate new technologies such as unmanned air systems.

Partnerships

As well as our people, it's the strength of the organisations we partner with that really makes a difference to the work Babcock does, whether in defence, emergency services, or our civil nuclear business.

That's why we're collaborating with some of the most respected academic institutions and industrial partners in the UK and internationally. Our partnerships enable us to stay abreast of developments, and to share the innovation that research brings with our customers, our people, and our business.

Our assets are complex and critical with long lifespans, so these programmes allow us to better understand their lifecycle, prolong their use and deliver increased operational efficiencies and enhanced output.

Innovation is good ideas put into practice, and our partnerships are a critical part of how we do that.

Over the coming year we will expand the number of research projects with our academic partners. These include Strathclyde, Cranfield, Edinburgh and Exeter universities where we are working on areas such as the application of digital twins, condition monitoring and predictive modelling to prolong the life of nuclear assets.



Royal Navy's 4.5" Mk8 Medium Calibre Gun © Crown Copyright 2021 Image: UK MOD.

Digital & data technology

Case study

Continued investment in digital and data technology

We continue to invest and innovate across our technology programmes, including our iSupport360 approach where we have a strong focus on using data to enable better asset availability management, in projects such as Odin. This includes a recent application with the Royal Navy's 4.5" Mk8 Medium Calibre Gun. Here we've created a digital twin to better predict performance and define maintenance requirements – demonstrating innovation and value in the real world use of digital twin technology in legacy assets. Expanding our data exploitation in contracts like these not only increases availability to benefit our customer, it benefits Babcock through KPI incentives and by driving down our costs and inventory.

Working in partnership with our customers and original equipment manufacturers we are implementing similar programmes across a number of existing assets that Babcock supports or operates, including the UK Royal Navy's Type 23 frigates, UK Army platforms such as Bulldog, military aviation platforms and infrastructure, civil aircraft and civil nuclear power plants.

We are also putting this digital approach at the core of new platform development such as the Type 31 class frigates and the Dreadnought nuclear submarine programme, where we are working with our supply chain and wider enterprise to establish a digital thread at the design stage which can live with the platform throughout its lifecycle – data that can be shared across all stakeholders operating and managing the asset and will reduce costs both now and throughout the life of the assets.

These partnerships also support the work we do with the Advanced Nuclear Research Centre and the Advanced Manufacturing Research Centre and this investment is being realised in the Arrol-Gibb Innovation Campus at our Rosyth site. We will trial advanced technology applications that will support our major manufacturing programmes, including the Type 31, ensuring we meet the programme's challenging targets.

Our integration of advanced manufacturing and MRO technology will directly support cost advantage across our current programmes. Equally, our access to international markets for Type 31 'export' and other future programmes will be enhanced by the ability to transfer these new solutions, for in-country build.

We have a busy and exciting year ahead of us. I am inspired by our people every day, knowing what we can achieve and deliver, as a team and as a company.

That is why for us, innovation isn't just in that cutting-edge piece of technology, it's in our people, it's in our partnerships – it's in what we deliver and it defines not just who we are but what we can be.