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Foreword

BY SIR SIMON BOLLON



Space, and our assured access to it, is fundamental to the UK's defence. Not only are satellites and space-based services vital to modern life, but space is increasingly becoming a target for disruption in modern warfare.

There is a real and present threat from our adversaries who seek to enhance their military capabilities in this rapidly evolving domain. With the advent of UK Space Command earlier this year, the UK's capability, development and delivery in this area continues to evolve.

As identified in the 2020 Integrated Review, operating within the Space Domain – and the need for the UK to develop suitable capability to counter threats in this operational environment – is essential. Moreover, if we fail to understand how to operate in space or fail to integrate space with all Domains – known as Multi-Domain Integration – as well as our allies and partners space capabilities, we will lose our competitive edge.

Over the coming years, DE&S will continue to grow its space expertise as part of the pan-MOD delivery of space capabilities. This will

ensure our ability to anticipate and react to this rapidly evolving domain. We will assess how best to harness and develop skills to respond to future space-related demands as well as continue to forge new international partnerships and strengthen existing relationships. Collaborating with other countries, agencies and organisations will improve the resilience of space assets and ensure the long-term sustainability of space activities.

The creation of UK Space Command is a key step in building our operational capability and capacity in this Domain. Space Command is a Joint Command staffed from all three services, the Civil Service and key members of the commercial sector and receives its direction from National Space Council via the Space Directorate within MOD. To enable DE&S to effectively support Space Command, our dedicated Space Delivery Team has been established to provide a single interface for the delivery of new capability. This new team will be part of the Integrated Battlespace Operating Centre (IBOC) within Strategic

Enablers, which is coordinating DE&S' efforts across the Space Domain.

The emphasis on Space in the Integrated Review and the funding allocated to it in the Spending Review highlight its importance. Defence needs to innovate to stay ahead of its adversaries: DE&S needs to deliver those innovations, at pace, to offer real operational advantage to our clients, and play our part as a key delivery agent. This requires us getting cutting edge technology into the hands of the user as quickly as possible. However, we need to be much more agile and innovative in how we do that.

It really is inspiring to think of the possibilities ahead and how space will develop over the next 50 years. Space continues to be a key sector for Britain's future, and I am immensely proud that DE&S will be playing a key role in realising the potential of UK's space technology.

SENIOR LEADER COMMENT

Simon Dakin, DE&S Director Integrated Battlespace

Talks to Desider about how DE&S will play a key role in the Space Domain

The Space Domain is of critical importance to our nation in so many different aspects of our lives. Be it communications, surveillance, Global Positioning Systems, navigation or timing among a multitude of other technologies. It's easy to take for granted that space underpins a huge range of everyday tasks – both at home and work – that would simply not be possible without space related technology.

Rapid technological change is transforming the business world and it really is a hugely exciting time to a part of that. It is vital for Defence to keep up, harnessing technologies often developed in the commercial sector, and exploiting them rapidly to ensure the defence of UK interests at home and abroad. However, we should remember that space is both a congested and contested environment. While it's fabulous to look at new ways of exploiting space, we also have a key role in defending our capacity to operate. Key to that will be meaningful and strategic collaboration. As we develop and learn more in this domain our focus on collaboration with our clients, industry, international allies, our partners across government and alongside research establishments, really is fundamental. The commercial space sector moves rapidly. With DE&S being a key delivery agent for UK Space Command, we must engage the market in a different manner to exploit opportunities and access a wide range of non-traditional defence suppliers.

This is an extremely exciting opportunity for defence and I'm delighted that DE&S is stepping forward in our role as a key delivery agent. This brings some incredibly interesting opportunities for our people to engage in a new area of critical defence capability.



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SENIOR LEADER COMMENT

FEATURE

Air Vice Marshal Harvey Smyth, UK MOD Director Space

Discusses how the UK's military aerospace capability is changing and the role DE&S must play in exploiting new technologies in the space sphere

Space is critical to the success of multi-domain integration and integrated warfare – it absolutely underpins everything we aspire to deliver as part of the recently published Defence Command Paper. From a space perspective, the next 10 years are every bit as important – and as exciting – as the 10 years that preceded Neil Armstrong standing on the moon. By 2024, humans will have returned to the Moon. And by 2031, we could very well witness the first humans landing on Mars. In parallel, other hitherto science fiction initiatives will have become reality, such as asteroid mining for highly precious metals like platinum. Such dramatic changes will undoubtedly provide new and complex challenges for Defence.

Having only stood up in April 2020, MOD's Space Directorate is operating in an environment of constant competition – an entirely different and evolving landscape from what we've been used to over the past few decades – and if we aspire to be globally integrated at the speed of relevance, we must all recognise that space is the key integrator, alongside being an operational domain in its own right.

Following the outcome of the Integrated Review, Defence Command Paper and the publication of DSIS, there are two key areas that DE&S will be fundamental to. Firstly, innovative research and development, and secondly, agile procurement through novel commercial paths. These key areas of work will ensure that the UK remain at the forefront of space technology and continue to evolve in line with future threats.

It's common knowledge that military aerospace capability and satellite communications are changing. But the complexity of this and trying to capture the future ambition of the next 20 years will need a lot of analysis and liaison with the space commercial sector, our partners and allies, and academia. The development and delivery of new technical capability at a rapid pace will be key to this.

Space is such a fast-paced – and now easily accessible – environment. We can't afford to do endless tests and concept demonstrations, where more often than not, nascent capability can get stuck and isn't operationalised for the end user at the front line. In today's new Space race, we are witnessing small start-up companies turning around trials extremely quickly – months, not years – and DE&S must endeavour to emulate this approach, while remaining mindful of the need for appropriate checks and balances.

It's crucial that we remain ambitious with the new defence Space programme. We must be more focused, taking calculated risks and not be afraid to implement the much vaunted 'fail-fast approach'. To be innovative, we have to stretch the boundaries and break through barriers we may not traditionally challenge in extant procurement processes.

What's key for DE&S is its relationships. Historically we've concentrated on big primes, but if we are to truly succeed at agile acquisition in the space domain, we need to look across the whole Space sector. In the past, it would be the norm to have a more client to supplier relationship - quite formulaic. But it's time to move beyond that and properly team with the commercial sector in a much more meaningful way. This will help us move forward as a whole collaborative force. We've proven that we can do this - take the Artemis or F-CAS programmes for example. DE&S needs to remain completely interlinked with its partners and operators while challenging capability acquisition in novel ways.

There are exciting times ahead. In the past our space programme has firmly centred on satellite communications, primarily delivered through the Skynet programme. During the recent IR we were able to land the proposition that a broader, more ambitious Defence Space Programme is required. Especially as it will form a critical part of our future approach to Integrated Warfare.



First and foremost, we intend to further deepen our Space Domain Awareness capabilities. We must intimately understand the Space Domain if we are to enable decision-making to protect and defend it. In parallel, to sustain an enduring and agile command and control, we have recently stood up UK Space Command: responsible for the day-to-day business of Space operations, training, and capability generation. We are working extremely closely with DSTL to help pull-through existing research and development projects. In the longer term, we continue to develop classified capabilities that will afford a more 'deliberate' approach to space control. Lastly, but perhaps most importantly, as a thread running throughout all future space development, we will establish better space education and training, working with allies and commercial partners to ensure that we develop the most relevant through-life space learning programmes for our people.

So, with the new Defence Space Programme in place, and the hard-won funding now profiled to allow us to begin putting our foundations in place, it is indeed very exciting times ahead. However, we need to be mindful that whatever it is we're doing cannot fall foul of being 'space for space's sake' - someone at the sharp end needs to be better off because of our efforts. Take GPS for example. It has revolutionised how we do things in Defence. GPS is timely, efficient and precise. Without it, soldiers in the field could take an extra half an hour to reach their destination as they'd still be using map and stopwatch techniques – similar analogies also apply to the maritime and air domains. Whether it de-risks their job, makes their work more efficient or provides better operational advantage – let's remember our overall goal: protecting our Armed Forces and providing Defence with the combat edge it requires to prevail in today's world of dynamically constant competition.

FEATURE

Marcus Bruton, DE&S Space Team Leader

Talks to Desider about how DE&S will fit into the UK space strategy

In his statement to the House on the 2021 Integrated Review (IR), the Prime Minister announced plans to setup UK Space Command to lead on UK military space operations, workforce generation and space capability development and delivery. Space is fundamental to our day-to-day lives, expanding our technology and military operations. The establishment of Space Command – a joint command staffed from all three services, the Civil Service, and key members of the commercial sector – is a vital step in the development of a coherent strategy to understand and operate in space. Ultimately, protecting UK interests.

The publication of the Integrated Review and the Defence Command Paper highlighted the increasing importance of Space as an operational Domain in its own right as well as highlighting the need for the UK to develop space capabilities.



Following the stand up of Space command, DE&S established its own Space delivery team to effectively support Space Command as a key Delivery Agent. DE&S' role is to provide a dedicated, single interface for the delivery of space capabilities. After an initial transfer of existing, space-related projects and people from DE&S' Joint Sensor and Engagement Networks (JSENS) and the Future Capability Group (FCG), the DE&S Space delivery team was created earlier in the year. The emphasis on Space as a domain in the IR indicates that the team will continue to evolve and expand, which means that DE&S must be ready to play its part as a key delivery agent in the Space Domain.

Our Space delivery team currently runs three main programmes for our clients in Air Command, Space Command and Strategic Command. These programmes are of significant national importance both militarily and from a UK economic perspective.

The first focuses on Positioning, Navigation and Timing that provides global navigation and timing to a variety of clients. This is crucial and is the UK's link into the international Global Positioning System Memorandum of Understanding.

Additionally, our Artemis programme is an operational capability demonstrator programme which will aid the government's aspiration to capture 10% of the global space market by 2030.

The DE&S Space delivery team's role is to work as part of a defence enterprise spanning DSTL, Defence Digital, front line commands and government to support our clients delivering and exploiting space. We are a new team that is expected to grow as we support our clients in the years ahead.

Our partnerships will be key to our success and we are excited to collaborate with our partners and support UK Space Command as one of their key delivery agents.

FEATURE

FEATURE

NEWS

Merlin support contract secures 1,000 jobs



Photo by Jay Allen

Around 1,000 UK jobs are being retained by a new support package for the Royal Navy fleet of Merlin helicopters.

The current period of the Integrated Merlin Operational Support (IMOS) agreement with Leonardo Helicopters guarantees the upkeep of 55 aircraft – 30 Merlin HM Mk2 and 25 Merlin HC Mk4/Mk4A – until March 31, 2025.

Seven Merlin HM Mk2s are currently onboard aircraft carrier HMS Queen Elizabeth, while three Merlin HC Mk4s are onboard Royal Fleet Auxiliary ship Fort Victoria as part of the first operational deployment of the UK's Carrier Strike Group.

Merlin aircraft provide anti-submarine capability, casualty evacuation, troop ferrying and medium lift of up to 3.8 tonnes if required. Armed with Sting-Ray torpedoes, Mk11 depth charges and the M3M.50 calibre machine gun, both aircraft variants also carry out secondary roles including search and rescue.

Three of the Merlin HM Mk2s are equipped with Crowsnest: a high-powered radar and mission system providing crucial early warning against threats to the Strike Group.

In March 2006, AgustaWestland – a subsidiary of Leonardo S.p.A – was awarded the original IMOS contract, saving the MOD and UK taxpayer

approximately £500-million in support costs over the following 25 years. There is a new pricing period every five years.

The latest IMOS Price Period 4 (PP4) – worth £699-million – was negotiated by DE&S and developed in collaboration with the Royal Navy to include all requirements at operational bases and on the frontline.

DE&S Director Helicopters, Keith Bethell, said: "IMOS PP4 represents a step-change in support to the front line, ensuring we meet the needs of the Royal Navy by better understanding, and delivering to, their demand.

"It is a significant contract improvement which has been achieved through close working collaboration with Navy Command and Joint Helicopter Command as the clients, and with Leonardo Helicopters as the prime contractor, to ensure we can rapidly respond to operational support requirements."

IMOS supports around 200 jobs at Leonardo plus 800 in the wider supply chain including Lockheed Martin, Leonardo Electronics Division and SERCO.

The work carried out by Leonardo staff at RNAS Yeovilton and RNAS Culdrose in Cornwall ranges from routine servicing to deep maintenance.

To provide the best possible helicopter availability for front-line commands, the contract also includes technical and logistical support services. This provides materiel spares availability and additional support provision to the Mk4 synthetic training systems.

Nick Whitney, Managing Director of Leonardo Helicopters UK, said: "Leonardo is proud to support the UK Carrier Strike Group's seminal deployment this year, which will see the AW159 Wildcat and AW101 Merlin helicopters embarked on several units delivering the best rotary wing maritime capability available today, and demonstrating worldwide interoperability within the Task Group alongside NATO, allies and partner nations."



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NEWS

£230-million support and training contract for Poseidon

A contract worth more than £230-million for the RAF's Poseidon Maritime Patrol Aircraft fleet has been signed with Boeing Defence UK (BDUK), creating more than 150 UK jobs.

The majority of the 153 BDUK jobs will be based at RAF Lossiemouth – the Scottish home of the Poseidon fleet – and will provide aircraft maintenance support and personnel alongside a comprehensive training package for aircraft crews. The remaining 46 jobs will be spread across sites at Bristol, Yeovil and Gosport.

Specialising in anti-submarine warfare, the Poseidon P-8A is the RAF's multi-role maritime patrol aircraft. Working alongside the Royal Navy and close maritime allies such as the United States and Norway, Poseidon locates, identifies and tracks potentially hostile submarines operating around UK waters.

Defence Secretary Ben Wallace, said: "Our new Poseidon fleet continues to grow from strength to strength and is already defending the UK's maritime interests at home and abroad."

"This contract with Boeing Defence UK secures our critical submarine-hunting aircraft capabilities while also creating a home-grown training enterprise and creating over 150 British jobs."

Negotiated by DE&S, this latest contract builds on the £470m investment the Poseidon programme has already driven to RAF Lossiemouth and the local area, creating and sustaining jobs and boosting the local economy.

The Poseidon fleet is operated from a £100m strategic facility at Lossiemouth, opened in September 2020. More than 300 jobs were supported during the facility's construction. It has a three-bay hangar, accommodation for squadrons, training, mission support and two state-of-the-art flight simulators.

RAF Lossiemouth has also undergone a £75-million upgrade to the runway and other operating surfaces. It will be the future home of the UK's fleet of Wedgetail Airborne Early Warning surveillance aircraft, building on Scotland's crucial role in UK and NATO defence and security.

DE&S P-8A Poseidon team leader, Malcom French, said: "I am extremely proud of the P-8A delivery team and what is yet another example of great delivery by DE&S."

"Placed to a tight timescale and encompassing exacting requirements, this contract helps enable the full range of capability that Poseidon brings to be realised, sees our modern aircraft fully supported, and our personnel being trained from state-of-the-art facilities."

Nine Poseidon, based on the Boeing 737-800, have already been ordered by the UK. Five aircraft named 'Pride of Moray', 'City of Elgin', 'Terence Bulloch', 'Spirit of Reykjavik' and 'Fulmar' are all now operating out of Lossiemouth, with four more to come later this year.

The new investment in the Poseidon fleet is supported by the £24-billion increase to defence spending over the next four years and will ensure the aircraft can continue to undertake its vital role in securing our seas and combating rapidly evolving threats.

Our new Poseidon fleet continues to grow from strength to strength and is already defending the UK's maritime interests at home and abroad.

Photos by Lee Matthews RAF



NEWS

DE&S places contract to design future combat air system

DE&S has secured a new contract with British industry that will drive forward a major national and international endeavour to deliver the next generation of combat air.

Forming a key part of more than £2-billion of UK Government investment in future combat air over the next four years, the Combat Air Strategy Team placed the contract that is initially worth around £250-million.

The contract will enhance UK skills and technology, support 2,000 jobs across the country and enable the UK to surge forward with key activity to design and deliver concepts for a world-leading new combat air system with international partners.

Vice Admiral Rick Thompson, DE&S Director General Air, said: "This announcement marks a significant moment in the UK's ability to protect our people, assets and interests - and those of our allies - for generations to come."

"The DE&S Combat Air Strategy Team has worked tirelessly on the contractual arrangements of this new phase of work with a wide variety of stakeholders including our

industry partners. This is a hugely exciting project with innovation at its core, and DE&S will continue to play a key role in its delivery."

The announcement was made by Defence Secretary, Ben Wallace, at BAE Systems' Warton site. BAE Systems is one of the four founding members of 'Team Tempest', which also includes partners Leonardo UK, Rolls Royce and MBDA UK. Around 800 of the jobs supported by the contract are based in the North of the UK, across sites in Warton, Samlesbury and Brough.

Defence Secretary Ben Wallace, said: "This announcement marks a momentous step in the next phase of our Future Combat Air System, with a multi-million-pound investment that draws on the knowledge and skills of our UK industry experts."

"Boosting our already world-leading air industry, the contract will sustain thousands of jobs across the UK and will ensure that the UK remains at the top table when it comes to combat air."

The programme to design a future combat air system is a major international endeavour,

and the UK will deliver it with international partners. The UK, Italy and Sweden signed a Memorandum of Understanding to collaborate on the project in 2020. Together the three countries aspire to develop the concepts, sharing workload while maximising their national expertise as they strive towards a common goal.

The contract placement formally marks the start of the programme's Concept and Assessment phase. It also aims to drive a digital revolution in the sector, putting it on a 'digital first' footing whereby simulated design and testing could potentially significantly reduce costs, time and even environmentally damaging emissions.



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NEWS

DE&S secures multi-million upgrade for Type 45 destroyers

The Royal Navy's Type 45 destroyers will receive a £500-million upgrade to enhance their firepower capability under contracts placed by DE&S.

Supporting more than 100 highly skilled jobs in Bristol, Stevenage, Gosport and Bolton, two contracts will develop the cutting-edge air defence systems of the Type 45 destroyers.

MBDA UK has been awarded an 11-year contract to integrate the Common Anti Air Modular Missile (CAMM) into the Type 45 destroyer's Sea Viper weapon system. In addition to this, a ten-year contract with Eurosam will provide an Aster Mid-Life Refresh (MLR) programme of work to missiles that the Type 45 destroyers currently use.

DE&S Maritime Anti-air Weapon Systems team leader, Captain Matt Stratton, said: "The placement of these contracts cements the next step in the UK's development of the Type 45 Destroyer's Sea Viper capability and is the result of a tremendous amount of activity between MBDA and the MAWS delivery team.

"The introduction of the UK produced CAMM as the inner layer missile in conjunction with a refresh of the fielded ASTER 30 outer layer missile will provide the Type 45 with a significant uplift in Anti-Air capability into the future as the Type 45 delivers the backbone of Air Defence to the Royal Navy's Carrier Strike Group.

"These contracts are the critical element of the Sea Viper Mid Life Refresh programme which will sustain the weapon system through to the platform's out of service date. We now enter the incredibly exciting demonstration and manufacture phase where we will bring this capability to the hands of the end user."

Outlined in the Defence Command Paper, the investment to upgrade the Royal Navy's Type 45 destroyers will support the lethality of the surface fleet.

Currently the Type 45 destroyers use a combination of short-range Aster 15 and long-range Aster 30 anti-air missiles to engage with and destroy enemy threats.

To facilitate the introduction of CAMM to the vessels, a new 24-missile CAMM silo will be added in front of the current 48-missile Aster 30 silos, therefore increasing the overall missile capacity of the vessels by 50% with a total capacity of 72 anti-air missiles per destroyer.

CAMM also provides a means to accurately and effectively engage small, fast inshore attack craft, hovering helicopters and low-speed targets alongside defeating their more traditional high-speed air targets.

The Aster 30 missile system refresh is a tri-national sustainment and enhancement contract between the UK, France and Italy which includes investment in a dedicated UK embodiment facility at Defence Munitions in Gosport, Hampshire.

DE&S CEO, Sir Simon Bollom, said: "The introduction of the UK produced CAMM missile in conjunction with the current Aster 30 missile will provide the Type 45 with a significant uplift in anti-air capability into the future as the Type 45 delivers the backbone of air defence to the Royal Navy's Carrier Strike Group."

The Royal Navy's Type 45 destroyers are among the most advanced in the fleet and carry out a range of activity, including defence from air attack, counter-piracy and providing humanitarian aid.

The first Type 45 destroyer is expected to have been overhauled by summer 2026.

Minister for Defence Procurement, Jeremy Quin, said: "Enhancing the capabilities of the vessels, this investment reaffirms our commitment to provide the Royal Navy with the most advanced technology and defensive systems.

"Supporting over 100 local jobs, industry expertise will be vital in maintaining the longevity of the Type 45 and central role in the Royal Navy's surface fleet."

The placement of these contracts cements the next step in the UK's development of the Type 45 Destroyer's Sea Viper capability and is the result of a tremendous amount of activity between MBDA and the Maritime Anti-air Weapon Systems team.

NEWS

Hybrid Electric Drive vehicles power forward through trials



Innovative hybrid technology that could offer multiple technical and operational enhancements are being trialled under a £9-million Technology Demonstrator project (TD6).

Led by the DE&S Futures Team – part of the vehicle support team in the DE&S Land Equipment Operating Centre (LEOC) – the hybrid technology will use greener, cleaner energy.

Since December 2019, the team has ensured the successful delivery of TD6 project in support of the Army. The team has explored and experimented with Hybrid Electric Drive (HED) technology on wheeled vehicles by using commercially available technology to integrate HEDs in different drive configurations. Testing an evaluation has been carried out on a MAN Support Vehicle, a Jackal reconnaissance vehicle and a Foxhound patrol vehicle. Through testing and evaluation, DE&S aim to capture a plethora of data across industry and academia on HED technology.

Project stakeholders include DSTL, Millbrook Proving Ground, Jacobs, NP Aerospace, Rheinmetall MAN, MAGTEC, SUPACAT, GD Land Systems UK and RBSL who have worked together to deliver the project. Despite the project schedule being affected by the Covid Pandemic, three HED vehicles were fabricated and are now being trialled and tested at Millbrook Proving Ground. The initial benefits of the HED technology was proven at the TD6

Demonstration Day in early July, attended by a wide audience from across the Army Capability area, DE&S, and industry.

Brigadier Anna-Lee Reilly, Head Vehicle Support Team at DE&S, said: "I am very pleased to see the successful delivery of the first stage of TD6 for the Army. From the demonstration day, it is clear that Hybrid Electric Drive technology has great potential. As a business, we are committed to delivering net zero capabilities and have pledged to reduce the carbon footprint of the equipment solutions we deliver to support the front line commands in achieving their net zero targets by 2050. We look forward to supporting the Army in taking this forward."

Once fully developed the vehicles could potentially be used as a mobile source of power on the battlefield or could be used to provide

electrical infrastructure to support humanitarian operations. This would replace the need for multiple, energy hungry generators. Initial testing shows that the MAN HED SV vehicle is capable of producing over 500 kilowatts of power which could replace nine generators on the battlefield while the electrical output of two and a half MAN HED SV vehicles could power an entire field hospital or provide emergency power to relief teams in a disaster zone.

The use of hybrid electric drives could also provide an operational tactical advantage as the vehicles can move faster and are quieter around the battlefield.

Testing and trials on the vehicles are expected to last until late 2021. Following this, they are planned to be transferred to the Armoured Trials and Development Unit in Bovington for further trialling.

We are committed to delivering net zero capabilities and have pledged to reduce the carbon footprint of the equipment solutions we deliver to support the front line commands.

NEWS

DE&S secure additional world-leading Protector aircraft

A further 13 world-leading Protector aircraft will be built for the RAF after DE&S signed a £195-million contract with General Atomics Aeronautical Systems Inc.

The initial production contract, awarded to General Atomics last summer, saw the company build the first three innovative Protector aircraft, as well as three ground control stations and other associated equipment.

The recent contract amendments now order the balance of 13 aircraft, four ground control stations and other support equipment to complete the current planned fleet of 16 aircraft which will more than double the capability provided by Reaper.

Protector will replace the current Reaper Force when it is introduced to the front-line and is considered a step change in capability for the RAF.

The cutting-edge platform will be capable of being flown anywhere in the world while being operated by personnel located at their home base at RAF Waddington, Lincolnshire where it will enter service by mid-2024.

Minister for Defence Procurement Jeremy Quin visited GKNA's Cowes site to see first-hand how the programme benefits UK industry as they manufacture the V-tails for Protector.

Defence Minister Jeremy Quin said: "Our fleet of sixteen Protector aircraft equipped with ultra-modern technology will provide the RAF with a vast global reach allowing us to monitor and protect the battlespace for hours on end.

"The Protector programme involves industry across the UK with vital parts of the aircraft

manufactured on the Isle of Wight, supporting highly-skilled jobs for years to come."

The commitment to a 16-strong Protector fleet was outlined in the Defence Command Paper and is supported by the £24-billion uplift to the defence budget over the next four years.

With 12 UK industry partners, the programme is bringing together world-leading technology and service providers to work with GA-ASI, supporting over 200 UK jobs with £400-million being reinvested into UK industry.

Charlie Hazeldean, Head of Remotely Piloted Air Systems, said: "I am delighted the purchase of a further 13 Protector aircraft has been confirmed enabling us to ensure the RAF will have the increased capability needed to operate effectively in the modern battlespace."

Protector will have to meet stringent NATO and UK safety certification standards meaning it could operate in civilian airspace. It will also be deployed in wide-ranging Intelligence, Surveillance, Targeting and Reconnaissance (ISTAR) operations where its ability to fly consistently for up to 40 hours, offers the RAF vastly improved armed ISTAR capability.

If requested, Protector would be made available to support civilian agencies in the UK, for example in search and rescue and disaster response missions.

The aircraft will use enhanced data links and carry next-generation, low collateral, precision strike weapons - the UK-made Brimstone missile and Paveway IV Laser Guided Bomb.

The fleet will also have advanced anti-icing and lightning protection, providing the RAF with

unprecedented flexibility to operate in adverse weather conditions.

The first two Protector aircraft have been completed and will remain in the US to be utilised in the test and evaluation phase of the programme. The first aircraft delivery to the RAF will be in 2023.

Defence Minister Jeremy Quin said: "Our fleet of sixteen Protector aircraft equipped with ultra-modern technology will provide the RAF with a vast global reach allowing us to monitor and protect the battlespace for hours on end."

Photo General Atomics



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NEWS

Success for innovative man-over-board system

Members of DE&S' Future Capabilities Group (FCG) have been involved in trials of remotely-piloted systems which aid in the rescue of Royal Navy personnel who fall overboard at sea.

In a 'man-over-board' situation, the largest warships do not have the necessary manoeuvrability to reposition quickly enough to affect a recovery. In addition, dependent on how rough the sea is, their boats cannot always be launched.

With the rapid onset of hypothermia in cold waters, resulting in a very real risk to life, there is a pressing need to get the person out of the water and into some form of shelter while either the ship, sea boat or helicopter are actioned to make a recovery.

Under Project Minerva, FCG has been working with the NavyX team, the Royal Navy's autonomy and lethality accelerator team – to test the Minerva system both at the Royal Navy's Diving School at Horsea Island, Portsmouth, and more recently on a civilian boat.

The heavy-lift Minerva systems, which drop life-saving equipment and hover over the location until rescuers arrive, have been tested extensively by the Royal Navy tech experts.

NavyX and DE&S have completed trials alongside industry partners Malloy Aeronautics and Planck Aerosystems.

FCG project manager Jamie Jarman said: "This is an exciting and innovative project to be involved in.

"The trials have successfully demonstrated that this system can identify the location of someone overboard and drop a life raft to allow them to exit the water, rescuing the risk of hypothermia.

"The collaboration between DE&S, industry and the Royal Navy has been excellent, and we look forward to building on this great work."

During the trials, a Minerva T-150 drone was successful in locating a dummy in the water at Horsea Island, deploying a test package which could one day contain a life raft and hovering above the dummy to signpost their location.

Royal Navy crews perform extensive 'man overboard' drills, ensuring they can quickly and effectively rescue anyone at sea.

The introduction of a remotely-piloted system means it could be used to fly out to where the person is and hover – making it easier for the ship and seaboard to identify the casualty's location.

With its ability to drop objects, the system could also deliver a life buoy and other survival equipment. Following the success at the Diving School, sea trials started on an industry boat to test the smaller T-80 Minerva drone.

The system was able to be controlled to take off the moving vessel and fly out to sea before returning.

In one step further, the system was programmed to land itself on a mat attached to the boat's deck – meaning once it had taken off it would use its on board systems to track where it needed to land.

The DE&S Future Capabilities Group continues to work with industry to explore and de-risk new capabilities against Front-Line Command needs.

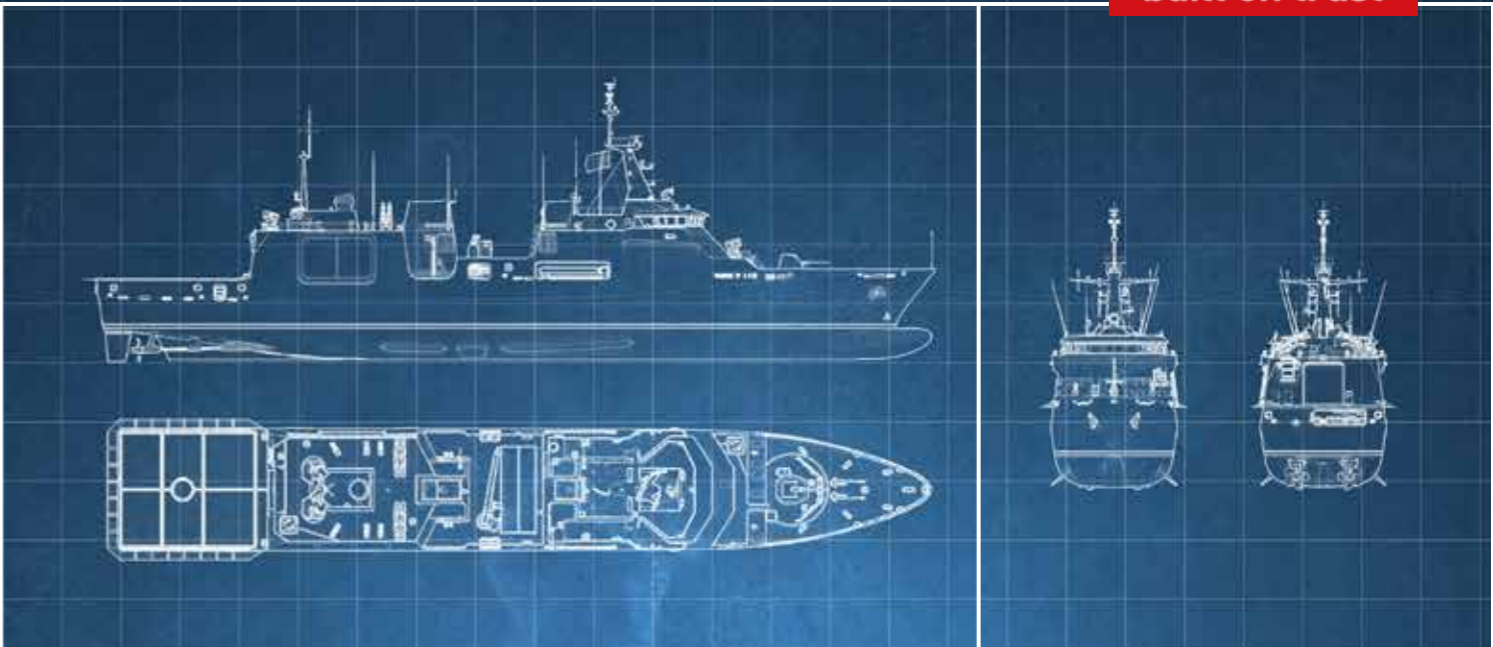
Photo Barry Wheeler



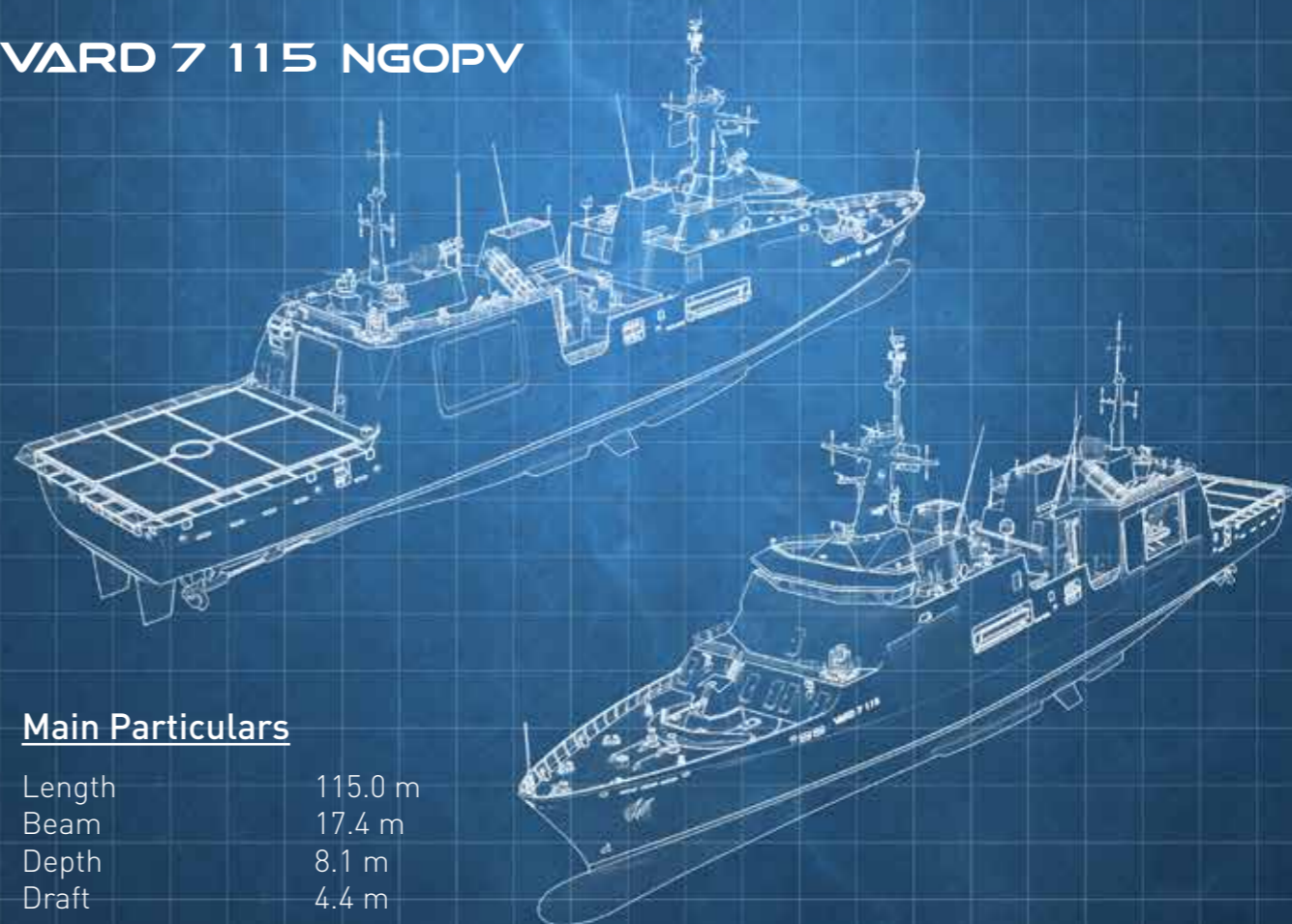
Picture shows larger T-150 platform

The collaboration between DE&S, industry and the Royal Navy has been excellent, and we look forward to building on this great work.

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NEWS

News in Brief



New Aircraft coolers delivered to RAF

Twenty-five new aircraft coolers have been delivered to the RAF and are being used in operations around the world.

The large, specialised coolers are protecting mission critical systems of UK Transport and ISTAR aircraft including Rivet Joint (Airseeker), Poseidon (P-8A), C-17 Globemaster, Atlas (A400M), Voyager and C-130.

Negotiated by DE&S, the contract provides new and efficient aircraft coolers to replace older equipment. They are more reliable and approximately 20% more cost effective to operate. The new units are multi-fuel capable and less harmful to the environment, as they use a smaller amount of refrigerant.

There is a requirement for the internal environments of large-bodied aircraft to be conditioned with cool, dry air - without running the aircraft's engines. This allows all aircraft avionic systems to be fully tested and maintenance activities to be undertaken pre-flight.

Even in the cooler UK climate, aircraft avionic systems generate heat when operating, which if not addressed can eventually have a detrimental impact on the serviceability of mission critical systems.

Simon Hardwick, DE&S Air Commodities project manager, said: "This superb effort by all involved relied heavily on the professionalism, support and commitment of the Royal Air Force, DE&S Air Commodities team, Babcock and the equipment manufacturer, JBT Aerotech UK Ltd."

DE&S receives award from Bridgwater and Taunton College

DE&S recently won Bridgwater and Taunton College's (BTC) Large Employer of the Year award thanks to its Engineering Advanced Apprenticeship scheme.

The award recognises the employer that showcases its dedication and demonstrates the success apprenticeships have brought to their organisation.

DE&S employs more than 400 apprentices, many of whom study at BTC during the first year of their apprenticeship, learning and developing skills for a long and successful career within either DE&S or its sister organisation, the Submarine Delivery Agency.

DE&S was declared the winner having demonstrated ongoing commitment by giving apprentices excellent opportunities, recruiting dedicated scheme managers and maintaining a close working relationship with BTC.

Ron Foord, contracts manager at BTC, said: "DE&S deserves recognition for its ongoing commitment to their apprenticeship programme which has continued to develop over several years, ensuring individuals on their programme are given excellent opportunities to gain careers in their chosen sector."

Rapidly deployable bridges delivered early to Royal Engineers

The first set of 17 Medium Girder Bridges (MGB) have been delivered to the British Army ahead of schedule.

In late 2020, DE&S awarded Stockport-based WFEL a £46-million contract to supply 17 new MGB.

The new MGB bridging sets will be used by the Royal Engineers and can extend up to 31 meters. They can also be configured to cross both water and land in a variety of operational and emergency disaster relief scenarios.

Lieutenant Colonel Brad Hardwick, Senior Staff Officer responsible for the Military Engineering Combat 2028 programme for the British Army, said: "This modernised integrated capability will give the British Army ever greater freedom to delivery military effects at a time and

place of its own choosing, as part of the overall Modernising Defence Program."

The British Army has made use of MGB since the early 1980s and the new bridging systems supplied by WFEL will provide new, lightweight, medium gap-crossing capability and form a significant element of the manoeuvre support capability for the British Army's STRIKE Brigade.

Mike Batty, DE&S Operational Infrastructure team leader, said:

"The bridges provide a bedrock of essential support to troops on both Military and Disaster Relief operations. Receiving them ahead of schedule gives us confidence that our delivery partners understand how vital this equipment is to our Armed Forces."

Starter Bomb Disposal robots delivered to British Army

The final batch of Explosive Ordnance Disposal (EOD) robots – known as Project Starter – have been delivered to the British Army - taking the total in service number to 122.

As part of an £89-million contract, DE&S worked in close partnership with L3Harris Technologies to deliver the remote-controlled robotic systems that provide advanced EOD capabilities worldwide.

The initial contract was awarded to L3Harris in 2017 to deliver 56 robots for use on contingent operations. The contract was extended in July 2019 for an additional 66 robots for use on Military Aid to Civil Authorities (MACA) operations within the UK, Cyprus and Gibraltar.

Project Starter is being actively trialled and assessed by a number of military and law enforcement agencies around the world and the British Army have deployed robots in the UK, Cyprus, and Gibraltar.

Equipped with high definition cameras, lightning fast datalinks and haptic feedback, the robot is purpose-built to operate in extreme conditions and offers support for high-calibre EOD disruptors. Its unique haptic grip controller provides precision that is critical to complex tasks, allowing controllers to feel what the robot's arm can while keeping the user out of harm's way.

Additionally, the tough, all-terrain treads and Starter's manoeuvrability and mobility – provided by Starter's rugged track system – makes the robot suitable for rough terrain.



Celebrating 25 years at MOD Abbey Wood

DE&S is celebrating 25 years since Her Majesty Queen Elizabeth II officially opened MOD Abbey Wood.

Collaborating globally with defence companies and international allies from governments and the Armed Forces, civil servants and military colleagues have provided the UK armed forces with everything from boots to fighter jets in this time.

Reflecting on the vital work that has taken place at the site for the last 25 years, Leader of South Gloucestershire Council and Cabinet Member for the Local Economy and Devolution, Toby Savage, said:

"Abbey Wood is the largest employer in South Gloucestershire and is a valued asset to our district, bringing thousands of high-skilled jobs and contributing to our vibrant local economy.

"We are proud of the many years of history that the MOD has here in South Gloucestershire, with many employees living in the area and being integral to our local communities."

Jack Lopresti, MP for Filton and Bradley Stoke, added:

"It is no secret I am passionate about defence having served as an Army reservist in Afghanistan. The hard work undertaken at MOD Abbey Wood over the past 25 years was, and continues to be, crucial to the success and reputation of our Armed Forces. I look forward to it remaining an asset to our community for many years to come."



NEWS

Production of next-generation war fighting vehicle begins



Work to fabricate key components of the Boxer Mechanised Infantry Vehicle is being carried out at WFEL's new production facility in Stockport after the production line was officially opened by Minister for Defence, Jeremy Quin, recently.

Minister for Defence Procurement Jeremy Quin, said: "This is a significant milestone for the Boxer programme, as these modernised modular vehicles become one step closer to being delivered to the British Army.

"Supporting 120 jobs in Stockport, vital knowledge and industry expertise will be central to building armoured hulls and assembling the finished Boxer vehicles required for future Army capabilities."

The Boxer programme will deliver over 500 vehicles to the British Army. They will be made up of four variants: an infantry carrier, a specialist carrier, a command vehicle and an ambulance.

Most of the fleet will be built in the UK by main contractors WFEL and Rheinmetall BAE Systems Land (RBSL) who will be supported by a nationwide supply chain. This will secure around 1,000 jobs all over the country and create an ambitious UK apprenticeship scheme.

Major General Darren Crook, DE&S Director Land Equipment, said: "This is a significant step for the Boxer programme which we, alongside our industry partners, continue to deliver at pace. This is a first-rate vehicle which we look forward to entering service with the Army".

The Boxer can be deployed round the world to deliver soldiers around the battlefield,

travelling long distances quickly, cross country, under enemy fire and in the most challenging environments. It has a modular design, meaning that the same vehicle base platform can be quickly reconfigured with different modules to fill different roles. They are expected to be ready for service in 2023.

Supporting 120 jobs in Stockport, vital knowledge and industry expertise will be central to building armoured hulls and assembling the finished Boxer vehicles required for future Army capabilities.

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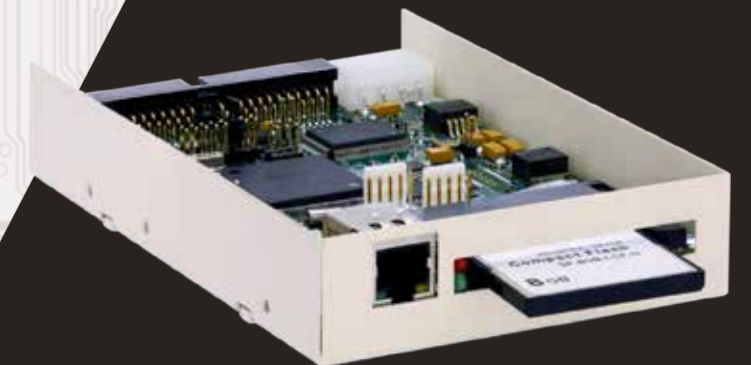
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PEOPLE

Emily Gulson

Job title

Maritime Environmental Practitioner in the Ships Domain Environmental Centre of Expertise (ECO E)

What does your role involve?

My role is to provide environmental expertise to the Ships Domain. Some days I can be reviewing outputs from other industry partners, other days I can be conducting our own Environmental Impact Screening and Scoping (EISS) workshops on behalf of the project teams. Ultimately though, my role is to ensure that MOD Shipping remains compliant to UK Legislation and MoD Policy, and make sure we meet our environmental requirements.

What do you most enjoy about your job?

I enjoy sitting in a domain-central team and being able to support all of the teams within the Ships Domain as opposed to being dedicated to one project. It's rewarding to know that my work is making a difference and helping teams meet their environmental requirements, which many struggle to do without the environmental expertise that the centre of expertise provides. It's really refreshing, if not challenging, to be working with an equipment team one week, and a major platform team the next.

What keeps you energised about working at DE&S?

There is so much variety working at DE&S. There are so many different projects to be part of and opportunities to work with industry partners and military personnel so there's never a dull day. In a big organisation it's easy to feel like just another cog in the machine but I can safely say that I know my part is essential to keeping a smooth operation.

Who or what has shaped who you are?

I can't pinpoint a single person who has shaped who I am, but the easy winners are my family and a handful of teachers I had throughout my time at school and university. They helped to instil my drive, my passion, and my hunger for success but also the importance of looking after yourself and not getting lost in the crowd.

What do you enjoy doing in your spare time?

I'm currently doing a full renovation of my house which takes most of my time! Otherwise, you'll find me pottering about in the garden, or spending time with my gorgeous Welsh Collie pup.

What might surprise people about you?

Despite my master's degree, I never planned to go to university. I applied to the Royal Navy and only applied to university as a backup but didn't put any effort into my application as I was dead set on the Navy. Unfortunately, that didn't work out on medical grounds, so off to uni I went, and I actually really enjoyed it. I happened upon DE&S by chance when looking at graduate jobs 5 years later, and now I've come full circle working with the Navy in a totally different role and feel like I'm exactly where I'm supposed to be.

What's the best advice you've ever been given?

RTFQ - read the flipping question, and ATFQ - answer the flipping question!

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