Speech: Defence Secretary Keynote Speech at DSEI 2017 – 13 September

INTRO: PERIOD OF CHANGE

It's a huge pleasure to be back at the world leading DSEI.

Apart from the fact this exhibition has grown in size and scale, with some 141 international delegates here from 60 countries, it has remained a remarkably stable landmark in an otherwise turbulent world.

Since last time we were here the UK has had two elections and a referendum in which the British people decided to leave Europe.

Meanwhile, on the international front we've seen North Korea threatening nuclear Armageddon, Russia maintaining its aggressive posture, waves of cyber crime like the Wannacry virus hit our hospitals and businesses and, touching on our theme today, terror, which has spread across the globe hitting us here in the UK in London and Manchester and recently devastating innocents in Barcelona.

At the start of the year the Doomsday Clock moved thirty seconds closer to midnight it seems they weren't exaggerating. As the danger proliferates defence's stock rises and the demand for the best kit goes through the roof. And today you'll find us making maximum use of our capability; whether it's sending HMS Ocean, C-17 and Puma Mk2 helicopters to the Caribbean to support humanitarian efforts in the wake of devastating Hurricane Irma, dispatching our Typhoons to bomb Daesh and protect Black Sea skies or deploying Challenger and Warrior to Estonia to provide critical reassurance to our Eastern European allies.

In an age of technological marvels and transnational threats this level of activity appears to be the new normal, which is why our response is evolving to meet new challenges.

It's based around three key elements:

1. CHOICE

The first is choice.

We've chosen to grow our defence budget by 0.5 per cent each year.

In 2015 our forces received some £34bn. In 2016 £35bn. This year it will be £36bn. And next year it will be £37bn. We're using that money to invest in the full array of high end kit across all domains.

In the past year you'll have seen a flood of announcements, from sailing new carriers to naming Dreadnought submarines, from buying Apache attacks helicopters to testing Ajax armoured vehicles and from the arrival of more

F35s, to last week’s announcement about future frigates.

And our new fifth generation kit offers much more than firepower and protection. These are flying, driving and floating sensors able to soak up information and instantly relay it from the battlefield to the battle station.

More than that, capabilities like dreadnoughts and carriers give us both a strategic nuclear and a strategic conventional deterrent, ensuring that whatever the future holds in the 2040s, 2050s, 2060s, the next generation will have the tools to cope.
Innovative choices

But we’re not just choosing to spend but choosing to invest in innovation, putting aside £800m so that by working with industry and academia we have the disruptive capability to keep ahead of the curve.

Take big data.

We’ve given 30 firms a share of £3 million pound to develop machine learning algorithms and artificial intelligence so it can crunch all the big data collected by our vehicles and translate it into a four dimensional picture of the battle space.

Or there’s the sort of ship’s brain we tested last year. It’s able to root through information and recognise threats in much the same way as a human being recognises fear, allowing the crew to predict where system failure might occur next.

Inevitably, such technology triggers dire warnings about the march of machines. But software isn’t a substitute for soldiers, sailors or pilot, it’s there to optimise our time. Computers are simply better at rifling through data and doing mundane tasks.

ANNOUNCEMENT: ROBOTIC BOMB DISPOSAL

Just as robots are better suited to picking their way through bomb strewn battlefields.

That’s why today I can announce we’ve signed a contract worth up to £55m with Harris Corporation for 56 bomb disposal robots. Equipped with high-definition cameras, lightning-fast datalinks, an adjustable manipulation arm and tough all-terrain treads, these sophisticated systems use advanced haptic feedback that allows operators to ‘feel’ their way through the intricate process of disarming potentially the terrorist’s favourite weapon the Improvised Explosive Device from a safe distance.

Robots will never replace humans.

It takes a soldier to search a house, calm a villager, win hearts and minds in a war zone.

But we’re letting the machines take the load so people can get on with hard

work of saving lives.

ANNOUNCEMENT: ACTIVE PROTECTION SYSTEM

At the same time, we're making sure our troops have the tech to protect themselves in difficult and dangerous situations.

So today I can announce Defence Science and Technology Laboratory (Dstl) has placed a £10m contract with Leonardo to improve the survivability and protection of Land Armoured Vehicles, by fitting them with an Active Protection System.

This can detect and defeat threat missiles within 100 milliseconds less than half the time it takes a human to react to a visual cue.

Providing a shield against Rocket Propelled Grenades and Anti-Tank Guided Weapons.

ANNOUNCEMENT: DRAGONFIRE

When it comes to weapons we're also devising some of our own.

If you haven't seen it already allow me to point you in the direction of the naval stand where you'll find a prototype of Dragonfire a directed energy weapon or laser to the layman.

Science fiction has become science fact.

Even more remarkable we've come up with a bit of kit that will appeal as much to the accountant as the warrior because, instead of spending hundreds of thousands on missiles the energy in a high-intensity laser costs pennies.

I know you like to try out new capability but I'm afraid this one isn't a working model.

Its state-of-the-art precision targeting system that can knock out a target up to six kilometres away.

I'm afraid we couldn't take the risk of over eager guests pressing the wrong button.

But don't worry Dragonfire will soon be tested on a British warship.

You come to DSEI to be wowed and I hope we've whetted your appetite.

But I don't want to overdo it so I won't mention our hover bike that's being tested on the water outside this building.

I've talked so far about innovative Defence decisions we've made that you can actually see here at DSEI.

But I haven't mentioned the way innovation is now influencing Defence below the surface, the way it's now woven into our tactics, honing our pioneering cyber techniques against Daesh in Iraq and Syria.

Nor have mentioned how innovation is transforming our approach in the boardroom.

Since the 2015 SDSR international threats have intensified.

So, rather than resting on our laurels, we're currently conducting a National Security Capability Review.

Defence will be a critical part of this cross-government refresh led by the National Security Adviser.

Our aim, across Government, is to ensure that we are implementing the 2015 Strategic Defence and Security Review in the most effective and efficient way possible.

The fact is, though our budget might be rising, so too are demands.

That's why we must keep asking searching questions, re-examining whether we are making the right choices, so we can prioritise the right things.

Critically, the UK isn't alone in going through this process. So too are our closest allies – the United States and France.

1. COLLABORATE

Choice is key to addressing the threat we face.

The second aspect of our approach is collaboration.

If we're going to make the most of all our resources we need to do more to work together across the Defence Enterprise.

Carrier is a case in point. Built in blocks by over 10,000 people across the UK, before being shipped to Rosyth for assembly, it is a truly co-operative nationwide enterprise.

Or consider F35, an innovative partnership between BAE Systems and Northrop Grumman working alongside our Defence Electronics and Components Agency in Sealand. So successful in its bid that it wasn't just chosen as the European repair hub for F-35 avionic and aircraft components, but as the global support provider, sustaining hundreds of jobs directly and thousands more high value jobs across the supply chain.

From the start the F-35 programme itself has been not simply an exemplar of domestic collaboration, but of international collaboration, where we're proud to be a Tier One partner with the US, and to build 15 per cent of each and every aircraft.

And as Britain's looks to go global we see our equipment as a platform for stronger partnership.

Consider P8 maritime patrol aircraft.

A few months ago we struck an agreement with our fellow P8 nations Norway and

the US, to pursue closer co-operation on training, logistics, and support and address the changing security environment in the North Atlantic.

1. COMPETITION

International success brings me to the third element of our new approach to defence competition.

I'm a big believer in competition.

I know it's power not just to strengthen our industry and bring in the wealth that benefits the UK, but to bring down prices as well meaning we can afford to buy even more kit.

And as we look to life post Brexit and seek to spread our wings across the world, it's high time we do more to compete for a share of this international export market.

We've already got an enviable reputation in advanced manufacturing, we're leaders in intelligent systems, we already build wings for half the world.

And the UK continues to perform strongly in the international market, securing defence orders of £5.9bn in 2016, retaining its position as the second largest defence exporter globally over the last ten years

But now it's time to build exportability into our thinking from the off, aligning it with the requirements of international clients, allowing for the open architecture that can plug and play with different bits of capability.

In other words, the sort of pioneering approach we've adopted with Type 31e.

Government has laid out a clear challenge to the sector to design and build five new lighter, General Purpose Frigate to replace the General Purpose variants of our ageing Type 23 Frigates with a clear in-service – of 2023.

Type 31e will be flexible and adaptable.

The aim is in the name. E…stands for exports

Above all we've set the price we want each frigates to cost.

At no more than £250m.

That's the maximum price.

This is a competition.

And I want to see great companies competing to lower the cost

But it's also a pathfinder

We haven't built frigates for another country since the 70s

We're changing all that

This frigate will rock the exports boat and it’s a model for the way we will approach shipbuilding in future

Yet we’re not just focusing our export drive on ships but planes.

The UK and its European partners are fully focused on working with industry to maximise Typhoon’s export potential in the worldwide combat air jet market.

And the MOD, in particular, are pleased to now be supporting and leading some of those campaigns in Europe, the Middle East and South East Asia, where we believe Typhoon meets the requirements of our international partners.

We’ve already seen the first plane delivered to Oman earlier in the year and more orders for Kuwait.

And today you’ll see for the first time our Land Ceptor missile able to blast high speed, evasive, low signature and complex airborne targets out the sky

It’s already in high demand with the Italian Army

Even as we look to sell more platforms, we’ll continue banging the drum for British systems, from Scotland to Southampton, whether it’s defensive aid suites, digital jammers or laser target designators, whether small satellites or secure communications.

So we’ve got high hopes for UK companies.

And what better place to bring the message home than DSEI, where the kit is the star of the show and where the globe’s investors gather in one place.

All those looking to become exporters will find help at hand.

Not only is our Defence Growth Partnership now working with industry to anticipate future market opportunities, but we’re now adopting a Team UK approach, packaging up the vast array of expertise our nation has to offer so that international customers looking for solutions into anything from subsurface systems and synthetic environments to persistent surveillance or information systems, needn’t hunt around for the right contact, but can simply go to our Team UK representatives and get the details they requires.

There’s a UK team stall in the hall here today waiting to work with you to face up to the challenges to come.

CONCLUSION

So two years down the line Britain’s transforming its approach.

And if you needed convincing that MOD really has changed its style look at the experts who make up our new innovation advisory panel.

The former owner of a racing car company and an astronaut.

The message is clear.

The UK's moving at pace.

And we're about to hit the heights.

News story: Armed Forces Muslim Personnel Complete Hajj

Led by Islamic Religious Advisor to the Chief of Defence Staff Imam Asim Hafiz, the Hajj was a chance for British Muslim Armed Forces personnel to reflect on the role of their religion as part of their service. Hosted by the Kingdom of Saudi Arabia Armed Forces (KSA AF), the Hajj took place over the first weekend of September, around Eid celebrations.

Hajj, meaning 'to intend to journey', is the fifth pillar of Islam and requires all Muslims who are able to make a pilgrimage to Mecca and locations of historical significance related to the Prophet Abraham. The group, which consisted of personnel from the Army and Royal Air Force, visited the Holy Mosque in Mecca, Arafat, Muzdalifah, and Mina. In addition they visited the Prophet's Mosque in Medina.

Captain Tim Rudkin, from the Royal Electrical and Mechanical Engineers (REME) said:

> We have learnt a lot about ourselves and confirmed that Islam is not only compatible with military life, but supports the Armed Forces' values we strive to embody.
>
> This journey has no rival to anything I have done before, with representatives of almost every country it is the largest gathering of people in the world, sharing common goals and values, coexisting peacefully.

During the group's visit to Medina, the pilgrims visited the Prophet's Mosque and toured the site of the Battle of Uhud. Afterwards they travelled to Mina where they stayed in a tent city and performed the daily stoning of the jamaraat against three pillars where the devil appeared to the Prophet Abraham. The UK personnel also met with the KSA AF's Head of Religious Affairs Major Muhammed Al Sadan, who spoke of the importance of Hajj and Islam's compatibility of serving in the Armed Forces.

Sergeant Ahmed Dhalai, from MOD, said:

> The military gives me the strength to become a better Muslim. My chain of command not only understand the significance of this journey, they actively encourage it as an opportunity to reflect and aim to be a better person, both in and out of the military.

The group also met with the Malaysian Chief of Defence Force General Tan Sri Raja Mohamed Affandi Bin Raja Mohamed Noor, Sudanese Major General (Pilot) Hussein Muhammed Othman, and Senior Bangladeshi officers who offered words of encouragement on religious tolerance and explained the importance of Hajj, not only as a religious obligation for Muslims but as an experience to reflect on as ambassadors to develop greater understanding of faith in our militaries.

Corporal Ceesay Ali, from 1 Medical Regiment, said:

> Without doubt this journey I have made is going to make me a better Muslim, a better person, and a better soldier. It has provided me with personal and professional development, as well as allowing me to meet my religious obligation

The Armed Forces personnel entered a raffle across the three services to join the 25,000 pilgrims from the UK travelling to Mecca this year.

A diverse and inclusive force is a stronger force, and the MOD encourages and celebrates diversity, promoting an inclusive working environment. To achieve this a wide range of initiatives under a Defence-wide Diversity and Inclusion Programme have been established. While recruitment is an important element, the wider Defence Diversity and Inclusion Programme (DDIP) takes a much broader view of diversity and inclusion and is driving real change by embedding D&I within the leadership and culture and taking steps to increase the retention and progression of people from underrepresented groups.

Press release: Hurricane Irma update

Shelter kits provided by UK aid are being distributed in Anguilla to help those left homeless by Hurricane Irma.

The kits, transported by Britain’s Royal Fleet Auxiliary ship Mounts Bay, are being delivered to people in need by the Anguillan Red Cross.

Crews from RFA Mounts Bay are also today delivering UK aid including shelter, food and water to those affected on Gorda in the British Virgin Islands.

On the Island of Tortola, British military troops are delivering food and water having already helped to make the area secure, enabling aid to be

delivered.

In addition, the UK has helped to distribute water bottles to 700 of the most vulnerable households affected by Hurricane Irma on the British Virgin Islands.

There are now 1,000 UK military troops in the region helping with the relief effort.

International Development Secretary Priti Patel said:

> The UK government continues to deliver UK aid to the victims of Hurricane Irma as a matter of extreme urgency.
>
> We have over 40 tonnes of DFID aid in the region, and more aid is arriving every day.
>
> Our military troops, police officers and aid workers are doing an amazing job on the ground, to get vital supplies to those who need it most.
>
> To suggest the UK reacted slowly and is not doing enough is just plain wrong. We are leading the way, and other countries, are now coming to us for help.

In addition to providing support on the ground, the UK Government is working closely with affected governments to continue to understand what assistance is needed to ensure the right aid is getting to the right place.

Yesterday, International Development Secretary Priti Patel spoke to the Governor of the Virgin Islands, Augustus Jaspert, to discuss emerging needs on the island. Earlier today she briefed the Cabinet on these latest developments.

HMS Ocean, which was loaded in Gibraltar with 5,000 hygiene kits, 10,000 buckets and 500,000 water purification tablets, is due this evening to be deployed to the region.

The government has made £2.5 million available to the Pan American Health Organisation to ensure critical health services are provided in the region, and to reduce the risk of disease spreading.

This is part of the £32 million it has so far pledged to the relief effort.

DFID has deployed 18 staff in total to the region, including to Turks and Caicos, using British expertise to provide urgent relief to those in need and support efforts to restore infrastructure.

The UK Government is being supported by companies in the private sector, including:

- Thomson and Thomas cook who have delivered over 8,000 buckets on

commercial flights
- Virgin, who offered free transport to dispatch relief items including 1776 shelter kits, to Antigua yesterday.

Today, we expect another 288 kits to fly the same route with them.

Notes to editors

- Videos and photos of aid being transported and distributed are available here:
- Flickr: https://www.flickr.com/photos/dfid/sets/72157688805759935
- Google Drive: https://drive.google.com/drive/folders/0B8mjosL6ucd7TkRhdTgwT2s4aXM
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Speech: Hurricane Irma: Sir Alan Duncan's statement, 12 September 2017

At last Thursday's statement I undertook to update the house as appropriate and I thank you Sir for the opportunity to do so now. My Right Honourable Friend the Foreign Secretary is on his way at this very moment to the Caribbean to see for himself our stricken Overseas Territories and further drive the extensive relief efforts that are underway.

The thoughts of this House and the whole country are with those who are suffering the ravages of one of the most powerful Atlantic Hurricanes ever recorded. It followed Hurricane Harvey and was set to be followed by Hurricane Jose.

Over half a million British nationals – either residents or tourists – have been in the path of Hurricane Irma, which has caused devastation across an area spanning well over a thousand miles.

The overall death toll in the circumstances is low, but unfortunately 5 people died in the British Virgin Islands, and 4 in Anguilla.

At this critical moment, our principle focus is on the 80,000 British citizens who inhabit our Overseas Territories of Anguilla, the Turks and Caicos Islands and the British Virgin Islands.

Commonwealth Realms in the Caribbean have also suffered, including Antigua and Barbuda and the Bahamas, as well as other islands such as St Martin and Cuba.

We have around 70 British nationals requiring assistance on St Martin and are working with the US, German and Dutch authorities to facilitate the potential departure of the most vulnerable via commercial means today.

To prepare for the hurricane season, the government acted 2 months ago by dispatching RFA Mounts Bay to the Caribbean in July.

This 16,000-ton landing ship from the Royal Fleet Auxiliary is one of the most capable vessels at our disposal.

And before she left the UK in June the ship was pre-loaded with disaster relief supplies; facilities for producing clean water; and a range of hydraulic vehicles and equipment.

In addition to the normal crew, the government ensured that a special disaster relief team – consisting of 40 Royal Marines and Army personnel – was also on board.

This pre-positioning of one of our most versatile national assets – along with an extra complement of highly skilled personnel – allowed the relief effort to begin immediately after the hurricane had passed.

By Friday night, the team from RFA Mounts Bay had managed to restore power supplies at Anguilla’s hospital, rebuild the emergency operations centre, clear the runway and make the island’s airport serviceable.

The ship then repositioned to the British Virgin Islands, where its experts were able to reopen the airport.

Meanwhile in the UK, the government dispatched 2 RAF transport aircraft on Friday – carrying 52 personnel and emergency supplies for over 1,000 people.

On Saturday, another 2 aircraft left for the region to deliver a Puma transport helicopter and ancillary supplies.

This steady tempo of relief flights has been sustained – yesterday it included a Voyager and a C-17 – and I can assure the House this will continue for as long as required.

And already 40 tonnes of UK aid has arrived, including over 2,500 shelter kits, and 2,300 solar lanterns. Nine tonnes of food and water are being procured locally today for onward delivery. Thousands more shelter kits and

buckets are on the way from UK shortly. HMS Ocean is being loaded with 200 pallets of DFID aid and 60 pallets of Emergency Relief Stores (ERS) today. Five thousand hygiene kits, 10,000 buckets and 504,000 Aquatabs, all DFID funded, are going onto the vessel.

As I speak, 997 British military personnel are in the Caribbean. RFA Mounts Bay arrived in Anguilla again yesterday at dusk as 47 police officers arrived in the British Virgin Islands to assist the local constabulary.

We should all acknowledge and thank the first responders of the Overseas Territories' own governments, who have shown leadership from the start, and are now being reinforced by personnel from the UK.

And many people, military and civilian, have shown fantastic professionalism and courage in their response to this disaster, and I hope I speak for the whole House in saying a resounding and heartfelt thank you.

Now this initial effort will soon be reinforced by the flagship of the Royal Navy, HMS Ocean.

The government has ordered our biggest warship in service to leave her NATO task in the Mediterranean and steam westwards with all speed.

HMS Ocean loaded supplies in Gibraltar yesterday and will be active in the Caribbean in about 10 days.

Within 24 hours of the hurricane striking, my Right Honourable Friend the Prime Minister announced last Thursday a £32 million fund for those who have suffered, but in the first desperate stages, it is not about money – it is about just getting on with it.

And the Foreign Office Crisis Centre has been operating around the clock since last Wednesday, coordinating very closely with DFID and MOD colleagues. They've taken nearly 2,500 calls since then and are handling 2,251 consular cases. The government has convened daily meetings of our COBR crisis committee.

Over the weekend, my Right Honourable Friend the Foreign Secretary spoke to the Governors of Anguilla and the British Virgin Islands – along with Governor Rick Scott of Florida, where Irma has since made landfall over the weekend.

I have spoken to the US Assistant Secretary of State for Europe about the US Virgin Islands in respect of logistics support for the British Virgin Islands.

As well as those affected across the Caribbean, some 420,000 British citizens are in Florida – either as residents or visitors – and UK officials are providing every possible help.

My Right Honourable Friend the Foreign Secretary spoke to our Ambassador in Washington and our Consul General in Miami, who has deployed teams in Florida's major airports to offer support and issue Emergency Travel

Documents to those who need them.

The House will note that Irma has now weakened to a tropical storm, which is moving north west into Georgia.

And on Friday, I spoke to the Prime Minister of Antigua and Barbuda. The hurricane inflicted some of its worst blows upon Barbuda and a DFID team has been deployed on the island to assess the situation and make recommendations. Put starkly, the infrastructure of Barbuda no longer exists. I assured the Prime Minister of our support and I reiterate that this morning.

On Saturday, my Right Honourable Friend the Foreign Secretary spoke to the Prime Minister of Barbados to thank him for his country's superb support, acting as a staging post for other UK efforts across the Caribbean.

Mr Speaker, we should all be humble in the face of the power of nature. Whatever relief we are able to provide will not be enough for many who have lost so much. But hundreds of dedicated British public servants are doing their utmost to help and they will not relent in their efforts.

Find out more about the government's response to Hurricane Irma.

Speech: DSEI 2017 naval technology zone

It's wonderful to be surrounded by examples of the maritime expertise found within Britain's defence sector at DSEI, as I set out the next steps in the Royal Navy's journey of technological innovation.

When HMS Queen Elizabeth departed her builders earlier this summer I described it as a new era of maritime power and that was not a term I used lightly.

These ships will sit at the heart of the Royal Navy and, alongside the nuclear deterrent, will shape the UK's authority in the world for the next half century.

But the reason I used the term maritime power, as opposed to purely naval power, is that this is not a journey we take alone.

It is one we share with the maritime industrial sector and the wider defence supply chain.

The Queen Elizabeth class project sustained hundreds of businesses and thousands of jobs. Together, we proved that maritime investment can be a force for economic prosperity and regional growth as well as national

security.

Meanwhile, at Barrow, submarine construction has settled into a steady drumbeat stretching into the 2030s and with the cutting of steel for the future HMS Glasgow, the same is now true for complex shipbuilding on the Clyde.

And what this programme of maritime investment provides us with is a basis to further strengthen our partnership.

Most obviously, the publication of the National Shipbuilding Strategy last week charted a course towards a more sustainable and competitive industrial capacity.

With the Type 31e general purpose frigate, we have the opportunity to better align the Royal Navy's requirements with those of the export market to help support that ambition.

But the opportunity extends far beyond shipbuilding.

Because with most of the Royal Navy's most important projects now in train, we can now look beyond the platforms, to the weapon systems, sensors and other technologies that will keep us at the forefront of capability in the decades to come.

Within that we have the opportunity to work in partnership to help meet the relentless demand for skills in science and technology.

And this, more than anything else, will be the foundation for our nation's security and prosperity in the years ahead.

Technological ambition

At DSEI 2 years ago, my predecessor outlined the Royal Navy's technological ambition in bold and ambitious terms.

It is a future based on exploiting rapid developments in autonomy and robotics, additive manufacture, novel weaponry and the power of data, underpinned by continued investment in people and training.

We said we would explore the market to identify new capabilities that could be introduced into service quickly and that in doing so, we would use the Royal Navy's global reputation for operational excellence to open up new opportunities for British firms and for British research and development.

Over the past 2 years, I'm pleased to say we've done just that.

Last year's exercise Unmanned Warrior was a case in point.

We brought together technology firms from around the world to show us what their kit could do when put to the test, with UK companies leading the pack.

Together, we broke records and pushed the boundaries of innovation further

than ever before, the ripples of which continue to be felt today.

Six months later, we returned for exercise Information Warrior, doing the same for cyber, ultra-modern communications, information exploitation and artificial intelligence.

In both cases, we knew that industry was far ahead of the military in exploiting the latest developments, but we were surprised by just how far.

During Information Warrior, for example, chest x-rays were passed through a handheld satcom terminal. Normally, this would take 30 minutes to transmit, but using IBM's Aspera bandwidth acceleration technology, it took less than 5.

The benefits this could bring to medical teams deployed at sea with a carrier strike group or 3 Commando Brigade ashore, or indeed with any force deployed at range, are obvious.

Of course, other bandwidth accelerators are out there, but time and again we saw examples like this of commercially available technologies that could have wide application across the armed forces.

And of all the many things we learnt from these exercises, the one lesson which stood out more than any other was the need to be faster and more agile in how we develop and introduce new capabilities into service.

Next steps

I'm proud that the Royal Navy took the initiative to challenge ourselves in this way.

Without doubt, we established the Royal Navy as a leader of innovation within the UK armed forces and internationally.

I'd like to pay tribute to my predecessor, Admiral Sir George Zambellas, whose instinct and enthusiasm was the driving force behind both these exercises.

But the question now is where we go from here.

Having demonstrated the art of the possible, the real test of our ambition is to bring these capabilities into service alongside or in place of existing equipment.

In some cases, the way forward is clear.

A good example is the compact deployable IT system.

It's small, lightweight and takes just minutes to configure, perfect for use at sea or in the field.

The Royal Navy's own innovation team, 'MarWorks', joined with Dstl and Antillion to help accelerate this technology through the development phase.

We put it to use in ‘Information Warrior’ and, liking what we saw, we’ve decided to introduce it in place of 3 Commando Brigade’s current IT straight away.

But this isn’t simply about swapping old kit for new and carrying on as normal. The full potential of the technological opportunity before us is far greater.

From autonomous systems operating in squads to artificial intelligence assisted decision making, what we’ve glimpsed over the past 2 years has the potential to entirely change our approach to operations.

This requires big decisions, with far reaching consequences.

Are we, for instance, prepared to remove existing platforms from service in order to create the financial and manpower headroom to introduce new systems which, in time, could deliver truly transformative advances in capability?

Of course, change on this scale can be disconcerting, but if we hesitate, then we risk falling further behind.

So, for example, based on our experience from Unmanned Warrior and Information Warrior, we know that remotely operated and autonomous systems can make a far greater contribution to operations than is currently the case.

As a first step, we are ready to shift the process of trial and experimentation from the exercise arena to the operational theatre.

That’s why we have deployed 3 unmanned underwater vessels on board the survey ship HMS Enterprise during her current NATO deployment.

But I think we can go further still.

So today I can announce the Royal Navy’s aim to accelerate the incremental delivery of our future mine countermeasures and hydrographic capability (MHC) programme.

Our intention is to deliver an unmanned capability for routine mine countermeasure tasks in UK waters in 2 years’ time.

Similarly, from what we’ve seen over the past 2 years, we know it should be perfectly possible for the Type 31e frigate to operate a vertical lift unmanned air system alongside or perhaps even in place of a manned helicopter from the moment the first ship enters service from 2023.

And as a precursor to this, we plan to work with our partners in the aerospace industry to demonstrate such a capability on a Type 23 frigate next year.

So, just as I challenge the Royal Navy to take the next step forward, there’s also a challenge for you, our partners in industry, to meet us half way with credible solutions that can fulfil our requirements.

And mark my words: other navies will follow in our wake, reinforcing the reputation of British technology and expertise to a global audience.

Open architecture

The pace of technological change is relentless, iteration is constant.

Our current processes, whereby software updates can take months to introduce, simply aren’t fast enough to match our ambition. We need to find an alternative.

The Royal Navy has been at the forefront of open architecture in our submarine combat systems for many years and during Unmanned Warrior, a single command and control interface was central to our success.

Now, we must look to introduce open architecture into operational service far more widely.

To that end, later this year HMS Westminster will go to sea fitted with an open architecture shared infrastructure which enable the rapid integration and development of new capabilities.

If successful, we will roll this system out to the rest of the Type 23s by 2020, and the remainder of the fleet thereafter.

And because this will form the basis for the integration of all weapon systems, engineering sensors and off-board logistics in the future, we have specified that the new Type 31e general purpose frigate should be designed with open architecture from the outset.

What this means in practice is that the Type 31e will feature different app based tools which can access the ship’s data. These will be operated from a series of touchscreen displays, Siri-style voice controlled assistants and perhaps even augmented reality technology.

This is not a gimmick or a fad. As modern warfare becomes ever faster, and ever more data driven, our greatest asset will be the ability to cut through the deluge of information to think and act decisively.

Equally, we need to recognise the aptitudes and instincts of young people leaving schools and colleges today, the so called smartphone generation, and design systems and processes in a way that plays to their strengths.

Open architecture provides the means to do just that, melding technology opportunity with human ingenuity and skill which, incidentally, is the secret behind the Royal Navy’s success over the past 500 years.

Artificial intelligence is also an important part of this future.

Under Project Nelson, the Royal Navy aims to develop a ship’s ‘mind’ at the centre of our warships and headquarters to enable rapid decision making in complex, fast moving operations.

But these opportunities also require us to change our approach to how we design and develop systems, by adopting and defining the Royal Navy's open standards to bring about a more iterative and collaborative approach.

The Royal Navy must work more closely with SMEs and start-ups. We need to tap into their entrepreneurial expertise and, in return, we can help give them the big break they need to succeed.

We also want to find people who might not have trodden the usual conventional career paths but who have the creative and disruptive approach we need.

During Information Warrior we brought together some of the UK's leading experts in artificial intelligence for the UK armed forces first ever AI 'hackathon'.

We provided them with more than a terabyte's worth of information, including radar and sonar data, as well as access to an open architecture infrastructure with standardised data formats and Royal Navy defined interfaces.

Over 3 days they were able to use this information to develop astonishing solutions to real problems at extraordinary speed.

We proved, for example, that a drugs smuggler is no longer a bobbing needle in an oceanic haystack but has an identifiable algorithmic fingerprint. In the engineering world, we can predict, and therefore prevent, component failures.

So, in future, hackathons and agile sprints will become regular events, and we are programming a regular series of Information Warrior exercises between now and 2021.

Scoping for Information Warrior 18 is already underway and we will need your help, through MarWorks, 700X Naval Air Squadron and others, to make it a success

It's encouraging that a number of industry partners have already begun to plan their involvement, and their investment, accordingly, and I would welcome your thoughts on the possibility of an Unmanned Warrior 2020.

Investing in skills

Underpinning all of this is our ability to meet the demand for skills in science, technology, engineering and maths; both within the Royal Navy, and more widely.

I expect most of you saw the images from Nautilus 100 project last month, through which we challenged some of the brightest apprentices and graduates in UK industry to imagine what the future of submarine technology may look like 50 years from now.

From drones that dissolve on demand to algae electric propulsion, science and engineering doesn't get more exciting than this.

Last week, the government launched its “Year of Engineering 2018” campaign with the aim of inspiring the next generation and Nautilus 100 is proof that Royal Navy can make a huge contribution to that objective.

But I know we can do more than simply inspire, and in truth, we can’t afford to wait around in the hope that the education system produces the people we need. We’re prepared to play a much more active role to steer more young people to careers in these areas from an early age.

That’s why we’re working with companies from across the defence and maritime sectors to sponsor a growing number of university technical colleges.

The latest of these, a purpose built, state of the art college in Portsmouth, opened its doors yesterday, just a stone’s throw from QinetiQ’s soon to be built facility at Portsdown Technology Park.

The initial tranche of 140 students will eventually grow to 600, from which 150 STEM qualified students will enter the local and national economy every year.

We have also met with the Scottish government to identify ways we can support the promotion of STEM skills north of the border.

Today I can also announce that the Royal Navy is to shortly affiliate with 4 further UTCs, in Aston, Reading, Newton Abbot and Peterborough.

Unlike Portsmouth, none of these places are traditional naval towns, only one of them is near the sea, but that’s not the point.

The Royal Navy’s future success is indivisible from the UK’s strength in the design and manufacture of advanced systems, and the associated research and development. It’s in our interests to help support the national requirement for STEM skills, as well as our own.

We don’t expect every student we work with to join the navy, but we do want to play our part to help them develop the skills required for a successful and rewarding career, and whether they ultimately choose a career in uniform or in industry, we still gain in the long run.

Conclusion

I’ve spoken a lot about the future but, in drawing to a close, I want to dip into the past.

In the early part of the last century, Jackie Fisher fashioned the Royal Navy into a focused fighting machine that could meet the growing challenges Britain faced in an era of global political upheaval.

He did this by sweeping away the ornaments of Victorian imperial power to make way for new technology, from the torpedo and the turbine engine to the submarine and the destroyer.

Most of all he is remembered for HMS Dreadnought, the battleship that was so

revolutionary that it rendered all others obsolete at a stroke.

Today, we stand on the cusp of another great technological revolution.

It’s not because of a single ship, like the Queen Elizabeth class carriers or even the new Dreadnought class submarines, revolutionary as they will be.

The real revolution comes from a combination of different technologies and trends that are moving forward at the astonishing pace.

They are shaping the future of warfare before our eyes, but they offer the opportunity to keep Britain safer and more prosperous in the years ahead.

Of course, letting go of the familiar to make way for the new is never easy.

A degree of risk is inevitable, but then nothing in innovation or warfare has ever been achieved by playing it safe; and as I see it, the biggest risk of all is carrying on as we are.

International security is deteriorating and demands on the navy are growing, public spending remains tight, why would we not adopt new solutions if they can help us square the circle?

Ultimately, it’s about courage as an organisation. The Royal Navy has always succeeded by being bold.

We’ve seen what the technology can do.

Now we must take a brave step forward to embrace the opportunity before us, and I intend to lead the Royal Navy to do just that.