



## Defence Committee

### Oral evidence: Progress in delivering the British Army's armoured vehicle capability, HC 659

Tuesday 20 October 2020

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Members present: Mr Tobias Ellwood (Chair); Richard Drax; Gavin Robinson; John Spellar; Derek Twigg.

Questions 72-156

#### Witnesses

**I:** Jeremy Quin MP, Minister of State, Minister for Defence Procurement, Air Marshal Richard Knighton CB, Deputy Chief of Defence Staff (Military Capability), Ministry of Defence, Lieutenant General Christopher Tickell CBE, Deputy Chief of the General Staff, British Army, and Chris Bushell, Director General Land, Defence Equipment & Support.

Written evidence from witnesses:

- [Ministry of Defence \(AVF0016\)](#)



## Examination of witnesses

Witnesses: Jeremy Quin MP, Minister of State, Minister for Defence Procurement, Air Marshal Richard Knighton CB, Deputy Chief of Defence Staff (Military Capability), Ministry of Defence, Lieutenant General Christopher Tickell CBE, Deputy Chief of the General Staff, British Army, and Chris Bushell, Director General Land, Defence Equipment & Support.

**Q72 Chair:** Welcome to the House of Commons Defence Committee hearing on the British Army's armoured vehicle capability. The aim of this session is to scrutinise the Department's plans and programmes in the area of land warfare, to understand the current status, to look at our force structure, and to consider future plans and the prospect of a land industrial strategy.

To help us look at those questions and to pursue the matter, I am delighted to welcome the Minister for Defence Procurement, Minister of State Jeremy Quin; Air Marshal Richard Knighton, who is the Deputy Chief of Defence Staff, Military Capability, at the Ministry of Defence; Lieutenant General Christopher Tickell, Deputy Chief of the General Staff in the British Army; and, finally, Mr Chris Bushell, who is Director General Land, Defence Equipment & Support. Sirs, thank you for your time this morning.

Before we progress, you will be aware of some stories in the press at the moment suggesting that there will be a significant reduction in the prospective size of our armed forces after the integrated review. Are you able to comment, dismiss the reports or provide some clarity? Minister, may I offer that to you?

**Jeremy Quin:** Over the past few weeks and months, I have got very used to saying, "Please don't believe everything you read in the press. Please don't pre-empt or prejudge what will be in the integrated review." You know that we are conducting an integrated review. You know that that is a deep and thorough exercise. It is looking at the threat—it is a threat-based assessment. We are not starting with numbers; we are starting by looking at our potential adversaries and at what we expect our armed forces to do around the world in the context of global Britain, and we are judging the capabilities that we require. We are delighted to be talking today about modernising our equipment and our programmes for the future. No decisions have been taken, and the integrated review has not completed. It is still a process that we are working through. Beyond that statement, I have nothing to add, Chair.

**Q73 Chair:** Thank you. Will you say when the integrated review is likely to report?

**Jeremy Quin:** No. A lot of work is being done, but I cannot give you a date for that at this stage.



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**Chair:** Might we see the report before Christmas? Is that a possibility? That is quite a wide landing area for you.

**Jeremy Quin:** You are tempting me into areas where I really should not go, Chair. I understand the interest. A lot of work is being done, we are all keen to see the integrated review reported, but I am afraid that I cannot give you a date at the moment.

Q74 **Chair:** Okay. We look forward to the report whenever it might be. I hope it comes before the new year.

The integrated review will of course be a stock check of understanding the threats that we face—as the Minister mentioned—and confirming our ambition to shape the world beyond our shores. It will also set out a coherent vision of the UK's place in the world. What directions have you received, specifically in relation to land warfare, with regards to the integrated review? What are your instructions? What threats are we likely to face? What will the integrated review instruct the MoD to be ready for?

**Jeremy Quin:** The integrated review will produce a whole panoply of assessments regarding our place in the world, who it is we are looking to, and what the threats are that we assess ourselves against. That will be there in detail as part of the IR, but certain fundamentals are just that—fundamental: the fact that NATO is the cornerstone of our alliances; the fact that we have needs and tasks that we need to maintain, including, obviously, protecting the UK and our territories; and ensuring that we are a forward-leaning, problem-solving member of the world community. Via IOpC, the CDS has set out thoughts as to future strategy and how we meet those needs and threats, but a lot more precision and detail will be provided as part of the IR.

Q75 **Chair:** Thank you for that, Minister. It goes without saying that we believe that we have one of the most professional armed forces in the world, but it is also important to understand that we equip them correctly. Moving towards today's British Army land vehicles, I am afraid that they have been characterised by increasing age and creeping obsolescence.

We have a huge spectrum of vehicles, and we are at an interesting juncture—in relation to the integrated review—of considering upgrades for the Warrior and the Challenger. The Challenger came out in 1998 and the Warrior in 1985. We have the new Ajax recce vehicles and we have the Boxer, the eight-wheeled APC.

In addition, the British Army has a fleet of other vehicles, which it purchased and which are still in existence. Indeed, they are promoted on the MoD's website: the FV430, the Bulldog—which has been around since the 1960s—the Panther, the Jackal, the Coyote, the Stormer, the Wolfhound, the Husky, the Foxhound, the Ridgeback, the Viking and the WMIK.

That is a lot of vehicles, and each one comes with its own procurement cycle and industry behind it. What we saw when we visited Lulworth was the fact that not a lot of discussions are taking place between the companies to make sure that there is interoperability and modularity



between those vehicles. What plans are there to reconcile and reduce the fleet to a more manageable, more practical and more modularised approach, advancing our defence posture I hope in line with what the integrated review will take us towards?

**Jeremy Quin:** I will bring Chris Bushell into this in a second, but to reassure you, your point regarding the utility of having too many platforms is well made. There is a desire to ensure that we have greater commonality. Chris will be able to give you exact examples of that in terms of engines that are interchangeable, sights that have commonality between Ajax and Warrior, and the barrels that are being used. There is a much greater focus on that commonality and how we achieve those efficiencies.

You are absolutely right: in terms of supplies, training and through-life service, there are huge advantages to increasing commonality. The only other point that I would make is that with Ajax, we have the first fully digitalised vehicle coming into service with the Army. It has an open architecture, which will allow future bolt-ons. The software is engineered to ensure that spiral development is going to be so much easier than it ever was in the past. Chris will have other things to add that are of help to the Committee.

**Chris Bushell:** Mr Chairman, you are entirely right: the Army currently has a very wide range of vehicle types, many of which of course have been introduced under the UOR process, due to operations that the Army has been involved in in recent decades. We are living with a legacy of those, and the armoured fighting vehicles strategy will ensure that, as vehicles come in in the future, those that are already on contract and those that we hope to have on contract in the future will benefit from a much greater degree of commonality across the different types.

The engines, for instance, that are going into Boxer and Ajax are from MTU. They are highly reliable engines. They have a health and usage monitoring system, which will provide us with much more data about their reliability and maintainability, and will ensure that we get better availability out of them. We are looking at a common cannon system, which will be used across multiple types of vehicles. In that way, to your point, we need to rationalise across the different fleets. Indeed, later in this inquiry you may well wish to ask about the land industrial strategy, which also plays exactly into your point, Mr Chairman.

**Chair:** Thank you—that is helpful. We will explore some of those vehicles in more detail, but I turn now to Richard Drax.

Q76 **Richard Drax:** Good morning, gentlemen—nice to see you all. It makes me laugh, because I served for nine years, two of them in Germany in Fallingbostal, where we had the FV432. In a typically British manner, we renamed it “Bulldog”. That sounds so aggressive and marvellous and modern, when we know that actually it is just a mobile coffin. That is what we called it in our day, anyway. Putting that aside, Minister, why have our principal armoured capabilities been allowed to fall so far behind



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everybody else's?

**Jeremy Quin:** I think you are making an assumption, Mr Drax. We obviously have a wide range of armoured capability, and I stress the need to look at this in a layered approach. As you fully appreciate, the approach to modern warfare takes in a whole range of capabilities in terms of ISR, deep strike and helicopter support. In answer to that question, if I could bring in the DCGS I am sure that he will have points to raise.

**Lieutenant General Tickell:** I think we would all recognise that in the early part of this century, when we were committed in Iraq and Afghanistan, there was rightly a focus on delivering the right capabilities for the men and women who were involved in those conflicts. There was a deliberate decision to make sure that they were prioritised over other programmes. I am absolutely convinced that that was the right decision. What we are doing now is, of course, modernising the rest of the fleet, which would allow us to deliver a war-fighting capability, able to meet a peer-plus threat.

Of course, we are right at the cusp now of a genuinely exciting and game-changing modernisation programme, as we introduce Ajax, which is, as you know, coming into service with the Household Cavalry Regiment as we speak; Boxer, which will come online from 2023; and then, of course, the Warrior and Challenger upgrades—recognising that we still need the integrated review to land to confirm exact requirements over the next few months. I think there is a huge amount of effort going in at the moment. I can absolutely see, from my position, the opportunities that these capabilities will deliver.

Q77 **Richard Drax:** Thank you very much indeed. Minister, I am not making any assumptions; it is just that, certainly from my experience as a soldier, and watching the lack of investment in the armed forces, we are behind compared with our prime threats. I think that is a matter of fact. Air Marshal Knighton, what are you going to do to improve the state of the UK's armoured capability?

**Air Marshal Knighton:** We talked about some of the programmes that are priorities for defence over the next few years in the earlier part of this discussion. As General Chris has pointed out, the investment we are making in Ajax is seeing us deliver those vehicles now, and those numbers will grow rapidly over the next few years. If you look at the equipment plan that was published in 2019, which is the most recent version, you will see that the plan for new equipment is to spend over £19 billion in the land environment, which compares with the £9 billion that is planned to be spent in the air domain and the £11 billion or so planned to be spent in the Navy.

You can see from that—the figures tell us—that we are investing heavily in the land domain. That is focused around four key projects from an armour perspective, which is the Ajax, Boxer, Challenger and Warrior capability sustainment and upgrade programmes. Those are the capabilities that will



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see exciting modernisation, digitisation and integration in the way that General Chris described a few moments ago.

**Jeremy Quin:** As for Mr Drax's point about upgrades, I think one thing that is apparent when one looks over the last decade and then to the future—you heard it in the oral evidence to the Committee the last time around about skills atrophying and being fragmented—is that there is an awareness that we must ensure that there is a thought process and plans for the kit we buy for the future in terms of regular spiral upgrades. That is what is so exciting about, for example, the open architecture on Ajax. The threat will continue to evolve, and Mr Drax's point is well made that you do need to constantly think about how you are going to be upgrading. It is important that we ensure that new equipment coming into service has exactly that ability. I am sure that you will know this as well as I do in terms of the number of upgrades to Leopard compared with Challenger over the years. There have been some, but it has not been on the same scale. That is a point well made that we need to be very cognisant of for the future.

Q78 **Richard Drax:** Thank you, Minister. I have just one more question for the moment—it may be for General Tickell or Air Marshal Knighton—about the upgrade to the Warrior. Is it going to go ahead, bearing in mind that we have the huge costs of Ajax and other new vehicles? Will the upgrade of the Warrior and all the vehicles we have go ahead? If so, where are we in that programme?

**Air Marshal Knighton:** The programme is in our current plan. The next key phase is for it to come forward and for the full business case to be signed off, and that is currently planned to come to our investment approval committee later in the year.

Your question about the overall balance in the programme and funding is really dependent on the outcome of the integrated review and the spending review. Until that reports, it will be hard for us to commit to the future programme right across defence, whether in armour, air, maritime or strategic command. We have our plans established. We understand the work that we need to do in order to demonstrate value for money and affordability, but this all sits within the context of the integrated review and the spending review. As the Minister pointed out at the start of this session, that is why we are so keen to see the outcome of the integrated review, because that will set the strategy and direction for defence over the coming years and deliver on the Prime Minister's intent to make this the biggest review of foreign, defence, security and development policy since the cold war. I don't know whether there is anything else that General Chris needs to add.

**Lieutenant General Tickell:** No, I am happy.

Q79 **Richard Drax:** Finally, do you agree that, with Ajax being the new modern vehicle—I have sat in it; it is very impressive compared with the Warrior—if money is to be found, it would be tempting to drop Warrior and invest in Ajax?



**Jeremy Quin:** I saw the discussion in the last sitting. I think it is very unfair to start working out which decisions need to be, and will be, made as part of the integrated review regarding our future capabilities. These are different vehicles doing different things, and I do not think that we can really compare like with like. General, you may wish to add the different capabilities that you expect from Ajax and what you would expect from an upgraded Warrior.

**Lieutenant General Tickell:** They have two fundamentally different roles. As you know, Mr Drax, the Warrior is an infantry fighting vehicle, which will get the dismounts on to the objective with all the commensurate firepower and protection. The Ajax platform, which is hugely capable as a reconnaissance and medium-armour platform, does not have the capacity or the lift to put those dismounts on to the objective. Therefore, there is a very defined role for both platforms, and we see both as an integral part of the system that the Minister talked about earlier.

Q80 **Chair:** Could I probe that a bit further? Can we do a quick stock check on where we are with these four main programmes? It is very rare that you get all planets aligning in this way, with a massive upgrade right across the full spectrum. I want to check the record as well. It is difficult for anybody in Britain, much as we love our armed forces, to claim that we have a legacy of respectable platforms, as you implied Minister, because they are obsolete. They are behind the curve compared with our peer-to-peer adversaries and, indeed, our allies. You compare it with the Leopard, the Abrams and the T-14. These bits of equipment from other countries have been upgraded on a regular drumbeat.

Nothing has really happened with the Challenger since 1998; likewise, with the Warrior since 1985. That is why they are obsolete, and the message that must get through to the MoD is that you cannot allow our armed forces personnel to be placed on the battlefield, in harm's way, when their equipment is subservient to that of the enemy peer that they may be facing. I welcome what is happening here, but I am not hearing the news that these programmes are confirmed, so can we go through each one? Is the Challenger 2 upgrade to Challenger 3 ticked in the box—is it going to happen—or are we still waiting for a green light?

**Jeremy Quin:** As you know, the integrated review looks at all our future capabilities. Challenger has been through its demonstration phases. It is at a point where it is capable of coming up before Christmas to main business gate approval, when it would be looked at in terms of other potential opportunities, in terms of other means of achieving the same objectives. That would be a proper process, but we are there with Challenger in terms of being able to take it forward, if that is the decision, and if that is the decision of the integrated review. I cannot confirm whether that will happen or not, as you will appreciate, Mr Chairman, because that would be pre-empting the IR.

Q81 **Chair:** I do not wish for you to do that, and you do not need to repeat that point every time; that is fully understood. I just want to know the details. How much will the Challenger 2 upgrade to Challenger 3 cost?



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**Jeremy Quin:** At the moment, we are negotiating that, so I really cannot share that with the Committee. It is still a matter of negotiation commercially.

Q82 **Chair:** Okay, then we won't have anything. The Challenger 3 upgrade will not physically take place. I suggest that it will not be operational and available for another two or three years. Is that correct? The go-ahead, the green light today—

**Jeremy Quin:** Where we are in that process is that the demonstration phases are complete and we are in a position to take a decision. In terms of the timing and costs of delivery, the numbers and a go/no-go decision, that is all a matter of commercial negotiation with RBSL. It is quite difficult, Chair, so my apologies, but that is the reality of where we are. I am sure you will appreciate that.

Q83 **Chair:** Understood. When will those commercial negotiations have an end date?

**Jeremy Quin:** First, it will be a matter of the IR deciding whether we should be proceeding in this direction. Then it is a matter of the business gate approval. There are many advantages to Challenger—that turret is an extremely exciting proposition—

**Chair:** Minister, sorry, I don't want to go into the benefits—

**Jeremy Quin:** That will not be the only prospect they look at. They will do a proper analysis and look at other potential opportunities as well. If they agree to go with that, there will then be a process—I think Chris Bushell is keen to come in with some further details.

Q84 **Chair:** Before you do so, I am after the timeline rather than the benefits of the turret and otherwise; we will come to that later. I want to know about the timetable, if the IR approves, for when we will see these things operationally available to our cavalry and our tank corps. That is the question I am asking—a basic one: what is the timetable for the new things, if the green light for approval is given through the IR?

**Chris Bushell:** We are at an advanced stage of negotiations with RBSL for the Challenger 2 life extension programme. The decision on whether to advance beyond those negotiations will be down to the IR, but the expectation is that we would move into a contract from next year.

Q85 **Chair:** Thank you. I really wanted to do all four vehicles rather quicker than this. Let us move to the Warrior. We have a price tag—£1.3 billion. How many are you planning to upgrade?

**Chris Bushell:** I'm afraid I refer back to the answer the Minister gave—that is down to the outcome of the IR—

Q86 **John Spellar:** This is ridiculous. You must have contingency planning. I am sorry to have come in late, Chair, but from just the bit I have caught, one thing that the Ministry of Defence does is contingency planning—if this, then that—so why can we not have a straightforward answer? If it



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goes ahead, what is your contingency planning?

**Jeremy Quin:** I was concerned, Chair, that we would frustrate the Committee on this. I totally understand your desire to have this hearing and, indeed, I am sure to put in your two pennies-worth by this route, but unfortunately the reality is that the integrated review has to take decisions on capability, and until it has reported I really cannot say the numbers—

Q87 **Chair:** Minister, I understand that. *[Interruption.]* Because of the technology, if I put my hand up, will you courteously pause? You are repeating what you have done, and that eats away at precious time we need to ask questions. Understood, much hangs on the IR giving green lights, but we would like you to hypothesise: if the green light were given, what is your timetable to getting these things on the frontline? In the case of Warrior, let us go back to ask another question: how many Warriors are operational now?

**Lieutenant General Tickell:** Two brigades' worth, so four battle groups. It is in the region of 600.

Q88 **Chair:** I hope someone has the numbers somewhere. But we can then assume that you would want to upgrade every single one, or around that number, in order to have your two brigades' worth as well.

Let us move on to Ajax. Can you confirm that the intention is to purchase 589—*[Interruption.]*

**Jeremy Quin:** Could you repeat the question in a second, please? We have an announcement going on in the MoD, for which I apologise.

**Chair:** Was that announcement "all operational leave cancelled"? *[Laughter.]* Could you confirm the cost and the number projection for Ajax, and while we're at it, for Boxer?

**Lieutenant General Christopher Tickell:** For Ajax, there was a contract placed for £5.5 billion back in 2014. That is for 589 vehicles of six different variants. For Boxer, there was a contract placed for £2.6 billion in November last year, and that is for 508 vehicles.

Q89 **Chair:** Good. Is the progress of that subject to the IR as well, or is that in the bag?

**Chris Bushell:** No. The Ajax vehicles have an initial operating capability date that has just recently been delayed from July this year until June next year. I am very happy to go into more detail around that.

The Boxer vehicles have an IOC at the moment of—*[Interruption.]* We just lost the sound.

**Chair:** Shall I repeat the question? Can you hear me now?

**Jeremy Quin:** We can hear you now.

Q90 **Chair:** Right. I suggest that we need to invest some money in comms at the MoD.



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Is it fair to say that none of the projects—Challenger 2 upgrade, Warrior, Boxer and Ajax—has the green light yet and that they are subject to the integrated review?

**Chris Bushell:** No, that is not correct. Ajax and Boxer are currently under contract, and we have a delivery schedule and plans for introduction to service. It is just Challenger and Warrior that are subject to the integrated review.

**Chair:** Right. Can I congratulate you on giving me an answer? That is absolutely fantastic.

**Jeremy Quin:** Chair, you will appreciate that, in theory, every single capability is subject to the IR, but what Mr Bushell was saying is absolutely right. Ajax is under contract and at an advanced stage. Boxer is under contract, and we have firm delivery dates.

**Chair:** Okay. You jumped in quickly there. We will now move on to some of the actual capabilities themselves.

Q91 **Gavin Robinson:** Good morning. General Tickell, you mentioned that this is an exciting time for investment in our land capability, but would you accept that it is not an ambitious time? While there will be investment in procurement and in refurbishment, it is essentially a period of managed decline, and we are losing capacity and capability.

**Lieutenant General Tickell:** No, I would not accept that at all. You have to look at the project as a whole, and it goes far beyond the armoured fighting vehicles that we are specifically discussing here. As I look over the next 10 years, all the platforms will bolt in to a digitised spine that will be delivered through the LE TacCIS programme—i.e. our communication system. That will enable us to link any sensor to any shooter in a way that we have never been able to do. When I talk about “any sensor to any shooter”, that is not just within the land domain, but across domains. That is going to be a fundamental change to the way we deliver capability.

Coupled with that is the integration of emerging technology and disruptive technology. You may well have seen the Secretary of State with the chief scientific adviser yesterday at one of our warfighting experiments down on Salisbury Plain—the third one we have run in about 18 months. That is all about introducing autonomy, automation, machine learning, and indeed artificial intelligence. What all those combined will deliver is nothing to do with managed decline, but a fundamental improvement and step change in capability terms for the land forces.

Q92 **Gavin Robinson:** Let me ask you, then, is it right that in SDSR 2015 it was envisaged that the Army’s warfighting division would be capable of fielding two armoured infantry brigades, yet in your written evidence you have indicated that by 2025 the Army will be capable of fielding only one armoured infantry brigade? If that is right, is that not managed decline?

**Lieutenant General Tickell:** SDSR ‘15 set out the requirement to deliver a warfighting division that was capable of high-intensity operations with three combat brigades. It was not specific, as I think you will recognise,



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and indeed the SDSR and national security strategy talk about a warfighting division from a suite of capabilities, which as you have rightly pointed out includes two armoured infantry brigades.

However, you will also recognise that over time, in the past 10 or 15 years, every time we have put a division out of the door—I refer really to Gulf war one and Gulf war two—we have always had a variable geometry in terms of what that warfighting division looks like. That has been driven as much by the threat as anything else, but when you look at the next 10 years, the other part of this will be the key changes that we will be introducing through the modernisation programmes, which will inevitably introduce some veering and hauling in terms of what capabilities we will field at a given point in time, let alone dependent on the threat.

Of course, the third element of this is the integrated operating concept, which the Minister referred to earlier. That places a premium not only on above-the-threshold capability, which is of course the focus of what we are describing this morning, but on below-the-threshold activity, which plays into those capabilities that, for instance, the 77th Brigade currently delivers: cyber, electronic warfare, et al. I think what you will see at any given point is a continued reimagining of what good looks like in terms of that warfighting division. It is worthy of note that our discussions with NATO at the moment—notwithstanding our commitment to the NRI, which of course is absolutely pre-eminent—reflect that they are also reimagining what warfighting divisions look like in the future, because ultimately, we have to give commanders in the field the ability to prosecute operations both above the threshold and below the threshold.

**Q93 Gavin Robinson:** General, it is very difficult to consider what is required in a 10-year phase. It is very difficult to integrate procurement with aspirational capacity need. We have gone from SDSR in 2015 to the modernising defence programme, then to the national security and capability review and the integrated review, and now you are indicating that by 2025, we will only have one armoured infantry brigade. When was that decision taken to move from having two to having one?

**Lieutenant General Tickell:** I would not actually describe it as a decision, per se. I go back to the point that this is largely driven by the threat, what we think good will look like in terms of meeting that threat and what operating concept we think we will now be driving at. For instance, we absolutely see the need to make close combat anticlimactic. Clearly, when you are in close combat, it will still be very frightening and very visceral, but our lessons from, say, Ukraine—from studying that sort of conflict—demonstrate that we have to take the fight to the enemy at a much earlier stage. Therefore, as part of the modernisation programme we are now introducing, we are placing a premium on our ability to conduct the deep fight in a way that, in honesty, we did not fully envisage in 2015.

What that means is that we are investing significantly in ISTAR in order to be able to target our adversaries' key elements at depth. We are also investing heavily in our ability to deliver precision fires, not only in the



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land environment, but ensuring that we can cue other assets from other domains.

We continue to work closely with the United States. I have been there a couple of times recently, working with their Secretary of the Army and their Army Futures Command; our direction is coterminous with theirs. While they are modernising their close combat platforms, they are absolutely driving at getting after the deep battle, in a way that the land environment has historically often asked the air environment to get after.

- Q94 **Gavin Robinson:** It is very hard to plan in a strategic way if our aspirations and goals continue to augment on an 18-month cyclical basis. Are you indicating that going from the SDSR 2015 aspiration of having two armoured infantry brigades to having one is not a shortfall or a gap that needs to be filled?

**Lieutenant General Tickell:** Well, I am saying that our capabilities of the future are absolutely linked to how the threat is evolving, and how the integrated operating concept suggests that we should operate and fight. The key decisions that you are driving at are absolutely part of the integrated review. I hate to keep going back to it, because I know that it is frustrating, but until that lands and is in the public domain, it is difficult to know exactly what "good" looks like.

- Q95 **Gavin Robinson:** Given the passage of time, that is likely to change once it is concluded within the next 18 months.

**Lieutenant General Tickell:** We need to recognise that the threat is continually evolving. Nothing is standing still. You will be better versed than I in the pace of change in technology. Ten, 15, 20 years ago—certainly when I first joined the Army—it was relatively easy to say three divisions in the British Army of the Rhine is what good looks like, and what upgrading platforms based on T-64 would look like. But we are just in a fundamentally different place now. Technology is moving so fast that we should never assume that we will end up in a settled place.

The suggestion that, as we go forward, the Army is going to consist of a whole series of alike-looking formations, regiments or units is erroneous, because we will be introducing technology and capability on an incremental basis, based on technology drops, which means that I would not be at all surprised to see two infantry battalions never looking quite the same, because they will be introducing new equipment as we go, rather the same way that we did on Herrick towards the end of the campaign, whereby no Herrick six-month changeover fielded the same equipment, because we were rapidly introducing kit to take account of the rapidly evolving threat.

**Gavin Robinson:** Thank you. I think Mr Twigg has a question and then I will come back to the issue of the changing pace of technology, if I may, Chair.

- Q96 **Chair:** Yes, he does. I want to confirm—I think I speak for the Committee in saying this—that we are very concerned that we are seeing a reduction



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in the size of our land warfare capabilities, moving from two armoured infantry brigades to one. The versatility, depth and forward presence reminds us that, from Sun Tzu's perspective, "to subdue the enemy without fighting", we need to have presence on the battlefield before the battle begins, and you cannot do that just with high-tech kit turning up late, when the West has become more risk-averse, as the situation in Syria, with Russia taking over that space, absolutely shows. Reducing our armed forces, our land capabilities, by an entire infantry brigade is extremely dangerous. I am sorry to hear that it might be being considered in the integrated review.

**Jeremy Quin:** Chair, I think we ought to come back to you on that. If Chris won't, I will.

**Lieutenant General Tickell:** I don't think that is what I was saying; in fact, I know that is not what I was saying about the outcome of the integrated review. My point is that the integrated review will demonstrate a reimagining of how we deliver land environment capability. That does not for a minute suggest that we will not have the right mass on the ground, because we know that, ultimately, conflicts are won and lost in the land domain. What we need to avoid is getting too focused on a brigade or two brigades, because ultimately it depends on the make-up of those brigades. We absolutely envisage greater integration and capabilities in those brigades, which suggests they could be bigger. They will confer choice on the commander to be able to operate, as I said earlier, both above the threshold and below the threshold. I would suggest that that will deliver significantly more capability than was envisaged in SDR '15.

Q97 **Chair:** You still need the unit to operate, and page 28 of the last SDR makes it very clear that the intention is to have two armoured infantry brigades. Can you, or can you not, say whether the intention is to continue with that, or is this being reviewed?

**Lieutenant General Tickell:** I will hand over to Air Marshal Knighton in a second, but I would point out that those armed infantry brigades were what we describe as triangular brigades, which I think you will recognise, Chair. That offered opportunities in terms of structure, but we would suggest that square brigades, where you are balancing both armour and infantry fighting vehicles, offer a much greater punch and capability—both to ourselves and, indeed, to our allies.

**Air Marshal Knighton:** I can offer a bit of reassurance to the Committee. The headmark is about the UK's ability to deliver a high-end warfighting division. I don't think that is in question at all. We absolutely recognise that NATO is fundamental to the UK's security, and we have a fundamental role to play in that. As the general describes, the capability that we will have to offer NATO over the next decade will be greater than the capability that was envisaged in SDR '15 and better suited for the threat and the way that threat has evolved over the last five years. We predict that it will continue to evolve over the next 10 years and more.

**Chair:** I just make the point that China has 3,500 tanks at the moment.



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Russia has 12,000 tanks. They can certainly match the Challenger, as we have mentioned already. Stalin was the one that said, “mass has a quality of its own,” even if the machines are not particularly good, as with the T-33s. I am really concerned, though, that the integrated review will lead to a reduction in our defence posture in the land numbers.

Q98 **John Spellar:** I am still unclear from the answers—who has been taking these decisions, and when?

**Jeremy Quin:** The integrated review is ongoing. It is a cross-Government review, in which defence is absolutely key. Decisions will be taken a part of the integrated review and will be presented in due course. That is the process, Chair.

Q99 **Derek Twigg:** Minister, in 2025, will a British warfighting division be capable of overmatching the forces of a peer opponent such as Russia?

**Jeremy Quin:** Absolutely. Our objective is to ensure we have a high-end and extremely capable warfighting division, and that comes from a layered approach. We are learning the whole time about what is going on in other theatres, such as in Syria, in Ukraine and, sadly, right now in Armenia and Azerbaijan. We need to understand how to ensure that we have the very top capabilities. That comes from a layered approach. As the General was saying, it comes from investment in ISTAR and deep strike. Absolutely, we will ensure we are in a position, alongside our NATO allies, take on adversaries wherever the threat should come. However, we are asking far more of the Army than that. Through IOPC, we are asking the Army to not just look to one particular domain and our NATO responsibilities, but to be able to more forward-leaning around the world, to be more forward deployed and to be able to have more agility and flexibility. The answer to your question is yes.

**Lieutenant General Tickell:** Again, there is a danger that this becomes a focus on armoured fighting vehicles, but I would, for instance, remind the Committee—

**Chair:** The video has gone, I am afraid. Let’s see if we can re-establish that. Have we established communications? General, I can see and hear you.

**Lieutenant General Tickell:** Yes, I was reminding the Committee that in terms of overmatching our adversaries, it is not just about the land platforms. It is also about capabilities such as the Apache Echo model attack helicopter. We are just taking delivery of that now, which is at the leading edge of that capability.

Q100 **Derek Twigg:** I might have missed this in the earlier discussions. Can you tell me how many Challenger 2s we have currently and how many are operational?

**Lieutenant General Tickell:** 227.

Q101 **Derek Twigg:** Is that in total? Are they all operational as well?



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**Lieutenant General Tickell:** That includes things such as stored operational fleets—i.e. war reserve.

Q102 **Chair:** How many are mothballed at the moment?

**Lieutenant General Tickell:** I am sorry—

Q103 **Derek Twigg:** Can we be clear? How many in total do we have? Are there any mothballed and how many are operational?

**Chair:** Long-term storage.

**Lieutenant General Tickell:** Our fleet is 227. That includes the stored operational fleet, which are those we place in the war reserve or, indeed, at readiness. Then, we have the rest in the frontline. The platforms get moved in and out in order to work them through maintenance and so on.

Q104 **Derek Twigg:** Is Challenger 2 currently capable of undertaking the full range of possible war fighting?

**Lieutenant General Tickell:** Yes, it is. As we have already alluded to, the reason we want to upgrade its capability is to keep pace with the developing threat. The mid-point of this decade is an important waypoint, or there or thereabouts, to make sure we are going to be able to continue to overmatch that threat.

Q105 **Derek Twigg:** For the record, do you want to state what the possible range of war fighting is for the Challenger?

**Lieutenant General Tickell:** The ability to war fight demonstrates that we will be able to take on a peer or peer-plus opponent.

Q106 **Derek Twigg:** In what environment and capabilities?

**Air Marshal Knighton:** I might be able to help here. If we look back at the last 20 years or so, we have seen the tank deployed in a wide range of roles, including peacekeeping in Bosnia. It is in Estonia at the moment for presence and reassurance, and we have seen it operating in the deserts of Iraq. We train regularly for it to be able to operate in Europe as well, in a NATO article 5-like campaign. The intention would be for the Challenger 2 fleet to be able to cover that full range of potential scenarios, all of which we have seen in some form—stand fast the NATO article 5 situation—over the last 20 years or so. That is what we would expect the tank to continue to be used for in the future—across that full spectrum.

Q107 **Derek Twigg:** Do you believe it is still flexible enough to be able to war fight in, say, the desert in the middle east just as capably as in the plains or forests of Europe?

**Air Marshal Knighton:** Yes, absolutely. It was designed and has been modified to help it do that across that full range of potential scenarios. When we look at the world today, that instability and uncertainty around where flashpoints and conflicts are going to occur argues for that range and level of flexibility in all our capabilities in our armed forces.

Q108 **Gavin Robinson:** General Tickell, I will come back to you. You mentioned



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the changing pace of technology and the need for the Army to adapt. Are you embarrassed that the Army is still using vehicles from the 1960s?

**Lieutenant General Tickell:** We need to replace Bulldog, no question. There is a programme called the Armoured Support Vehicle that will replace Bulldog. That will come online at the back end of this decade. In an ideal world, if I had a magic wand, would we do it sooner? Yes, but, frankly, there is continued need to prioritise. Actually, the Bulldog is very cheap to run and delivers people to the right place at the right time, and it is therefore right that we prioritise programmes such as Challenger, Warrior, Ajax and Boxer, but we absolutely recognise that we need to get after Bulldog sooner rather than later.

Q109 **Gavin Robinson:** When you say the end of this decade, are you talking about 2028, 2029 or 2030? Seven years, eight years or nine years—that spectrum?

**Lieutenant General Tickell:** Yes, the money in the programme covers exactly the years you just described, and indeed into the next decade as well.

Q110 **Gavin Robinson:** Are you satisfied that the FV430 series of vehicles is fit for contemporary war-fighting operations at this time?

**Lieutenant General Tickell:** As I just said, we want to replace it. I suggest that its key limitation is the fact that it will not be able to link into the digital spine as our new platforms are able to do. That is why we want to replace it.

Q111 **Gavin Robinson:** When do you think that interface will become too difficult? Do you envisage a situation where there will be other vehicles in the field that are digitally talking to one another that Bulldog cannot interact with?

**Lieutenant General Tickell:** We would not introduce a new platform now unless it can sit on that digital spine. We of course need to make sure that our legacy platforms—Bulldog being a good example—can link into that digital spine, but it will not have the full functionality. I talked about any sensor to any shooter, which of course is what the four key programmes we are talking about will deliver. Bulldog will not be able to do that; its shooter and its sensors are minimal.

Q112 **Gavin Robinson:** So you envisage that Bulldog will be phased out within 10 years. What about the CVR(T)?

**Lieutenant General Tickell:** The CVR(T) is starting to be phased out as Ajax comes online. As I say, we will no doubt go into the details of the programme later, but the Household Cavalry regiment have now taken delivery of their first platforms, and that will significantly increase and accelerate over the coming months.

Q113 **Gavin Robinson:** Do you have a retirement date for CVR(T)?



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**Lieutenant General Tickell:** It is linked to the Ajax programme. I should imagine and expect CVR(T) to be out of service within the next couple of years.

Q114 **Gavin Robinson:** The next couple of years. On Bulldog, I think you were cautious when I was saying the next 10 years. Do you have a definitive date of retirement for Bulldog?

**Lieutenant General Tickell:** No, we do not, not least because, frankly, its replacement is in its very early stages, and I therefore would not want to pin a date to the retirement of Bulldog until I am absolutely confident that we can deliver the capability in a different way.

Q115 **Gavin Robinson:** Going back to my first question, which was about embarrassment and the fast pace of technological change, you acknowledged that Bulldog needs to be replaced. Why is it that when we have these cyclical reviews—the SDSR, the modernising defence programme, the national security capability review, and the integrated review—this has not been progressed much earlier, for a vehicle that is almost 60 years old?

**Lieutenant General Tickell:** I cannot answer the question of why it has not happened before. In terms of the integrated review, we are at a moment for the Army that I have never before witnessed in my 30 years. As the Chair has already described, we are about to have four capital programmes, all being well, get over the line and transform the Army in a way that we have never been able to do in parallel before. While I absolutely recognise your point that Bulldog is something that we need to get after, I would say that it is still delivering the capability that we probably need it to. What is really exciting are the other programmes.

**Gavin Robinson:** Right. Thank you, General.

Q116 **Chair:** Can I extend this a bit further, because I think what you are doing with the Bulldog, even though it is 1960s technology, is actually more what we are going to do on a daily basis over the next few decades? Absolutely, we must prepare for that high-tech, high-risk but low-probability event, but ultimately our day-to-day activities will be stabilisation and upstream engagement, not least because we are being shunted out by countries such as Russia and China of favoured nation status because we are not doing that upstream engagement. You cannot do that, as I said before, with Challenger, Warrior, Boxer or Ajax, but it is exactly what a more versatile, simpler vehicle such as Bulldog, but a modern one, would do. It served well in Iraq, in places like Bosnia and, indeed, in Kosovo and so forth.

It is really interesting that you want to keep this on because you realise its usefulness; yet we do not see investment in this to modernise it in the way that it could be used. I think it is a challenge for the MoD to understand that what you bring to the table in allowing Britain's soft power to be advanced is actually in this area of upstream engagement with our friends, which then denies China and Russia pushing us out in the longer term, in a more subtle way than they would through advancing



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military systems each side of some form of iron curtain.

**Jeremy Quin:** On the strategic point, I am in wholehearted and sincere agreement. At the heart of the IOpC is the principle of being forward-leaning, being prepared to go out there, and having a more agile, more forward-deployed and more present set of armed forces right across the board, working with our friends who want that engagement. We have a great reputation. You spoke right at the start, Mr Chairman, about the professionalism of our armed forces. That is recognised across the world. They want to see us, and they want to see us engaged.

The only note of caution that I would add is that in terms of operating around the world we are seeing a lot of proliferation. That is happening faster than ever before. With the advanced kit that some of our adversaries are developing, we should not assume that they stay within the remit of a small number of powers. We are seeing that advancement in capability on a more global basis, but we are acutely aware of what you are saying in terms of the desire to see our armed forces training, exercising and working alongside partner nations, building those bonds and ensuring that there are not parts of the worlds that are denied us. We are welcomed with open arms on a very broad basis. I do not know whether General Chris wants to add anything.

**Lieutenant General Tickell:** No, Minister.

Q117 **Chair:** Minister, I am pleased to hear you speak this way, but I really want to tease out greater instruction from up on high to the MoD to absolutely prepare for that high-tech capability and the promotion of this transparent combat system that we want to have, which is all talking, all-singing and all-dancing—very high-tech—but ultimately the mainstay of what our armed forces will be doing on a day-to-day basis needs to be far more upstream engagement, because we will be nudged out.

If you do not have forward presence with our allies across the Commonwealth, for example, and in the Middle East and the Caribbean, we will slowly but surely get shunted out because China is gifting military equipment to those countries, which means that they tilt across into subservience and are lured into the Chinese sphere of influence. I hope that there is some instruction in the integrated review to prepare for that high-risk event, which probably won't happen, and be ready on a daily basis for far more upstream engagement and forward presence.

**Jeremy Quin:** That point is absolutely taken on board, Chair.

Q118 **Derek Twigg:** Minister, is the MoD achieving value for money for its programmes?

**Jeremy Quin:** The easy answer would be yes, but I think it is best to go through the process of how we confirm that we are achieving VFM. I suspect that Air Marshal Knighton would be best person to give you some reassurance on that, Mr Twigg.

Q119 **Derek Twigg:** Before we do that, you are saying that you are, but could you give us two or three highlights that confirm that you are achieving



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value for money?

**Jeremy Quin:** I appreciate that the process is important, because VFM in the Ministry of Defence is very different from VFM in virtually any other Government Departments. That is the nature of what we do. Some of the processes—for example, what we would have to go through on Challenger or similar—would be helpful.

Q120 **Derek Twigg:** That is not the question. Minister, you should have an answer to this.

**Air Marshal Knighton:** I think the question was about a specific example of value for money. What the Minister was suggesting was that it is worth explaining that the way in which that is done. The specific example that I suggest that we talk about is Ajax, because that is on contract and we can see the progress that is being made, although that programme has some challenges.

In terms of the way in which we approve this kind of expenditure, the senior responsible owner for the project and the programme team in the defence equipment and support organisation have to present a business case to the investment approvals committee. That has to demonstrate that we have looked at an appropriate range of options, and that the costs and benefits associated with the recommended option means that it represents value for money. There are a series of tests—the accounting officer tests—that have to be proven. A project might change—for example, the initial operating capability date might change—and each time that happens, we have to go through the accounting officer assessment and demonstrate again that it meets those particular requirements.

Chris Bushell will be able to talk a bit more about the contracting arrangements around Ajax, but fundamentally that was a competition. In that case, that was the competitive tension that drove value for money. Mr Bushell might add a little more.

**Chris Bushell:** As Air Marshal Knighton says, it was competition in the first instance. We got a bid in. We examined that bid, tested it, and ended up with a firm price contract that has meant that the capability that we will get is assured and the price that we will pay for that programme of 589 vehicles is assured as well. Furthermore, in the supply chain for that particular vehicle, at least 60% by value will be spent in the UK. We have a process for confirming that that will take place in due course. It is a good example of where we have clearly followed the process, and we believe that we have value for money from it.

Q121 **Derek Twigg:** Then why did Ajax miss its initial operating capability milestone in July?

**Chris Bushell:** Ajax is the first vehicle that is fully digitised with electronic architecture in it. The programme is complex and has had a number of issues. One is optimism bias, which is an expectation that it would deliver when it was planned to. It has had some technical issues, and it has also had some quality issues. They have come to the fore as we have come to



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deliver the first vehicles. But I am pleased to be able to say that we have now got seven of the vehicles in service with the British Army. There are another four awaiting delivery as we speak. The first three turreted Ajax vehicles have actually been loaded into final acceptance by the Army literally today, and there are a further 59 vehicles that are waiting to go through that acceptance process. Indeed, we have a total of 187 vehicles actually in manufacture today. So for Ajax, we are on the cusp of rolling out the fleet of vehicles to the British Army.

**Jeremy Quin:** Chair, I think Mr Twigg is touching on a very important point, which Mr Drax touched on earlier as well. It is that I think it is wrong to deny, and it was said by your witnesses in the last hearing—I think one of them said Carew Wilks’s skills have fragmented and atrophied. Lee Fellows said we are learning how to do armoured vehicles in the UK again—that is Lee Fellows of Lockheed Martin at Ampthill. For the reasons that Mr Drax alluded to, we are on a learning curve here, particularly, I think, when you layer in digitisation.

I do not just blame our industry partners for this. I think there are lessons to be learned inside the MoD and the armed forces, because we are having to learn new skills about the safety testing and about ensuring that we know how to take on board digitised vehicles, and that has been a learning curve.

What is incredibly important is that we learn and harness those lessons, in order that, as this build-out occurs, we are quicker and more agile at doing it. But I think you touched on a very powerful point and it has been a learning experience.

Q122 **Derek Twigg:** What can the first Ajax vehicles delivered this year actually do? Could you enlighten us on that, please?

**Jeremy Quin:** It is the Ares vehicles.

**Chris Bushell:** Yes, the first vehicles are Ares vehicles; those are the seven that have been delivered to the British Army already. They are a support and specialist troop variant, and there are six different variants of Ajax that will be delivered. And it is the turreted version that will have the 40 mm cannon on board. They are part of the collection of vehicles that will be delivered as part of the initial operating capability.

The useful thing about Ajax is that some 85% of the different variants are a common baseline platform, with just the 15% variance on the remaining platforms.

**Jeremy Quin:** I think it would also be helpful for the Committee to know—Mr Bushell, if you wouldn’t mind—that the key thing about the entire Ajax programme is the sensors, and the ability to forward-deploy, and the open architecture. I think it is an incredibly exciting programme from that point of view. Ares is a particular part of that, but I think of the overall capability of Ajax as a fleet.

**Chris Bushell:** Yes, and I think that the exciting aspect of Ajax is that it is a vehicle that will be much easier to upgrade over time, and as we have



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already touched upon, upgrades to vehicles are something that we haven't done a great deal of in recent decades. But actually the land vehicles now, with the generic vehicle architecture, will allow upgrades to be made in a much easier way.

I think that what we will see, through the use of through-life capability and management plans, are planned upgrades into the future as the threat evolves and as the defensive aids and the like need to be added to these vehicles, it will be much easier to do that across a range of vehicles going into the future. And that generic vehicle architecture—the digital backbone—will enable that to occur.

Q123 **Chair:** What I am puzzled about, if I may say so, is why would you use Ares rather than Warrior?

**Jeremy Quin:** I think General Chris should take that, but it is a different nature of vehicle.

**Lieutenant General Tickell:** So, Ares doesn't have a turret on it, and of course Warrior is an infantry fighting vehicle with—in terms of Warrior CSP—a 40 mm stabilised cannon on it. So, it is a very different capability.

Q124 **Chair:** I thought that Ares was your recce vehicle with a turret. Is it not?

**Lieutenant General Tickell:** No, the recce vehicle with a turret is Ajax. That is the turreted version that Chris Bushell just described.

Q125 **Chair:** What does Ares do? What is Ares's function?

**Lieutenant General Tickell:** It is a support vehicle that we would use for assault pioneers or whatever to support the medium armour/reconnaissance squadrons.

Q126 **Chair:** The point I am trying to make is that it is essentially an APC—it holds troops rather than high-tech equipment, ISAR and so forth—but it does not have a turret. I do not understand why you have crafted a fleet of recce vehicles that are far bigger than the Scimitars, which are far nimbler, lighter and quieter. Of course, you now need to house more equipment, but you have procured a vehicle which looks very similar, and performs very similarly, to the Warrior. From a modular perspective, it seems curious. In fact, the Ajax's dimensions are bigger than the Warrior's. It is a beefed-up bigger brother of the Warrior. I am curious as to how we ended up with vehicles that are not so distant from each other, given that with improved modularity you could have improved the spectrum of versatility to meet our needs.

**Lieutenant General Tickell:** I go back to the basic premise that Warrior is an infantry fighting vehicle and therefore you need to be able to get eight dismounts in the back. The physics in the Ajax platform does not allow that to happen. A few years ago, we examined putting an extra wheel station on Ajax in order to create greater capacity in the back—indeed the Americans asked the same question—but that takes you to a platform that is very, very difficult to manoeuvre because the laws of physics do not work. GD were not confident—in fact, they were very



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unconfident—that that would deliver any meaningful capability. But the fit in Ajax allows us to get after all the sensor suites that are so critical to the reconnaissance capability.

In terms of the size difference between CVR(T) and Ajax, I would just say that none of this is about a like-for-like replacement. Of course, what you are seeing in Ajax is a fundamentally different capability from what we have got at CVR(T), whether because of the digital platform, because of the sensor fit or because you are delivering a 40 mm cannon that will overmatch BMP-3 and so on versus the 30mm RARDEN cannon seen on the current fleet of CVR(T)

**Q127 Chair:** I understand all that, but if these companies tell you one thing, I think we need to be better at asking the tougher questions. You say that Warrior is designed for carrying people inside, but Warrior is a chassis. It is a track vehicle with a turret on top, and you want to upgrade it with the very same turret that Ajax will use. You have space in the back of that which could have been used for your ISTAR capabilities, which should all be modular so you can pluck them out and replace them as equipment becomes obsolete.

We are now procuring another line of vehicles in addition to the track vehicle we have that is used as an APC. Rather than unpicking it, there are lessons to be learned here, but if Ajax is to be cancelled, that will probably be because essentially you have created a beefed-up Warrior.

**Lieutenant General Tickell:** On the last point, notwithstanding the IR, I do not think there is any suggestion that Ajax is about to be cancelled. Your point about modularity, though, is really important. The whole point in putting the same turret on Warrior and Ajax absolutely plays to that modularity piece, whether it be the cannon, the sensors or the controls inside the turret.

Of course, that also plays to the procurement of Boxer, which, as you know, Chair, is all about modularity. It offers huge opportunities, in terms of being able to switch the payload on the back of the platform, depending on the situation.

My final point goes back to what the Minister said at the beginning. Your basic premise that we have too many platforms is fully recognised within the Army and, indeed, across the Department, which of course is why we intend to reduce the current fleet of 35 major platforms down to something like 15, not least through the Land Industrial Strategy—I suspect it would be good if we could come on to that at some point.

**Chair:** Thank you for that. Okay, let's move on to the issue of Boxer. Gavin, over to you.

**Q128 Gavin Robinson:** I will give General Tickell a break and go to Richard Knighton, if that's okay. Richard, the Boxer programme is set to deliver 523 vehicles over a nine-year period, which works out at roughly one per week. Why is it taking so long?



**Air Marshal Knighton:** Just to start with, 508 vehicles is the contracted number. The good news is that if you go to Telford, you will see the assembly facility being constructed right now, as we speak. That is going to be a modern facility that will ensure good, high-skilled jobs in that region for a number of years to come. The programme of delivery will be determined partly by the capacity and capability in the facility at Telford, and there's really very little opportunity for us to accelerate that, over the next few years. But we are considering, through our planning as part of the spending review and integrated review, what the options and opportunities might be to accelerate the production rate and delivery, for two reasons. One is that that will help the British Army to make the transition to use of Boxer, which we think is going to be really important for the kind of operations that the Chair talked about earlier. But it's also so that it frees up the capacity to enable us to export vehicles from the facility to potential customers all over the world, contributing, therefore, to the prosperity benefits that come with the commitment to that programme.

Q129 **Gavin Robinson:** You mentioned the fantastic production facility at Telford. Are you aware that, in our session two weeks ago, it was indicated to us that the biggest challenge facing the Boxer programme is industrialisation of that process?

**Air Marshal Knighton:** I have seen the transcripts from the previous sessions that the Committee has had. One of the key risks, when the programme went through approval, was about the ability to establish the production line and ramp up the production—the industrialisation, as you describe it. Chris Bushell will have more recent information, but our perspective on it is that the team who are responsible for building the facility and doing that work to fit it out and ready it for production are actually a really high-quality team. There is good experience they can draw on from the facilities in Germany. While it is a key risk and an important thing to focus on, at the moment things seem to be going pretty well. But Chris Bushell may be able to offer a little bit more up-to-date information.

**Chris Bushell:** I agree with all that. I have been up to RBSL with the Minister; we both visited the facility a little while ago, and they are growing the capability. They are recruiting. They have a strong apprenticeship scheme in place as well, because they are planning for the future. New infrastructure build is under way currently, as we speak. And they are engaging very much with the supply chain in order to ensure that they get deliveries on time. Indeed, at the moment, on the Boxer programme, we are probably running a little ahead of schedule, so we are in a good position.

**Jeremy Quin:** If I may, I will just add that we bring a huge amount to the thought processes around land warfare capabilities. Our understanding in terms of integration, comms and the—*[Inaudible.]* We have a huge amount to bring to the party. I think it is a good challenge regarding industrialisation, because as witnesses said last time round, this is not a game we have been active in for a long time; we have lessons to learn.



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As Chris Bushell pointed out on our visit there, RBSL are able to draw on the knowledge of their German partners. If we are not prepared to give people the opportunity in this country to step up to the mark and deliver on industrialisation, there will only be one answer to that, and I am pleased that we have got a range of programmes that are generating jobs and employment and expertise and skills in this country.

**Chris Bushell:** If I may, Chairman, the other point on Boxer, of course, is the export opportunity. There are a number of countries, beyond the current international programme, that are interested in Boxer and that is something I know that the Government across the piece is looking to lend support to.

Q130 **Gavin Robinson:** I will come to that now, then, and then I will come back to Richard, if that is okay. Mr Bushell, does export bring with it stretched capacity for the facility at Telford? Could we satisfy the orders from others while it is taking us nine years to work through 523 or 508 orders?

**Chris Bushell:** I have been involved in many export campaigns before. Clearly, landing the deal for the export campaign depends very much on that export customer's requirements and then the ability of industry and MoD to support that export—

Q131 **Gavin Robinson:** I am sorry, Mr Bushell—do we not have to satisfy our own requirement and our own orders first? That almost sounds as if, if an ally comes along and says, "Look, I'd like 300 of these things but I need them by 2026," then their order goes first. That can't be right.

**Chris Bushell:** I would agree with you. That is part of the negotiation which would take place with any potential customer as to when they required the vehicles and the rate at which that capacity within industry can be built up. Of course, frequently for the export nations, actually what they wish to see is UK armed forces taking delivery of capability first and then they will learn from the lessons we have learnt. Frequently, British military has been instrumental in supporting those export customers as they go through their own learning curves. So it tends to be a staged process. As I say, there are many advantages to the export customer taking the vehicles at a later stage.

Q132 **Gavin Robinson:** Richard, how big a factor was stretching out the budget profile in reaching a nine-year delivery timeline?

**Air Marshal Knighton:** Affordability is always going to be a factor in judgments that are made about a programme. In this particular case, I'm afraid I can't say what the key determinants were. As I described, we are examining possibilities to accelerate it. That will require us to make some prioritisation decisions around funding and it will depend very heavily on what comes out of the spending review and the integrated review. As I said, we are very clear that the ability to accelerate the programme over the next few years is really very limited, because of the time it takes to establish the production facility. But once it is established, you can imagine how it has a degree of innate capacity—we could move to 24/7 working, for example, put additional shifts in there, maybe put additional



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machinery in there. Those are the kinds of conversations that Defence Equipment and Support and Chris Bushell's team and General Chris's team are having with RBSL when we think about how we are going to generate the capacity to meet those potential export orders and also potentially to deliver faster for the British Army.

Q133 **Gavin Robinson:** Given what General Tickell said earlier about moving to the replacement of Bulldog, do you envisage further orders of Boxer being made by the Army?

**Air Marshal Knighton:** That is definitely something we are thinking about. I am not sure that Boxer would be the right replacement for Bulldog. As the General described, we need to work through the programme for the replacement of Bulldog over the next few years and that will determine what the right answer is. Certainly, as we look out into the 2030s and the evolution and growth of capacity and capability in the Army, Boxer is one of those areas that we think has a lot of utility, and it will continue to serve the Army's needs for many years into the 2030s and '40s.

Q134 **Gavin Robinson:** Do either Chris or Christopher wish to add to that?

**Lieutenant General Tickell:** I agree with what the good Air Marshal said. Boxer is a fantastically capable platform, which has significant utility. I would see us building on that into the future.

**Chris Bushell:** I would continue with that. It is not necessarily just Bulldog. We need to look at a number of other variants of vehicles across the piece in order to reduce the range of vehicle types that we have, thereby gaining the efficiencies of the investment that we have made so far in programmes such as Boxer. That is an area that defence will be looking at going forward into the future. Another course would bring benefits in terms of savings to defence, if we can rationalise down to a lesser number of basic platforms.

**Chair:** Moving on to another platform, let us turn to Warrior.

Q135 **Derek Twigg:** General, are you confident that the Warrior capability sustainment programme can still deliver the required capability without further delay and cost increase?

**Lieutenant General Tickell:** To summarise the capability that the Warrior CSP offers, it will deliver the 40 mm stabilised gun, and a digitised turret and therefore platform. Those two things will fundamentally change the capability of Warrior as an infantry fighting vehicle, both in terms of meeting the threat picture that we would expect it to see and, indeed, in taking its part on the digitised battlefield. So yes, I am absolutely confident that it offers significant capability opportunities for the future.

**Chris Bushell:** May I just add something on Warrior? We now have a very mature design for Warrior, we have four demonstration vehicles, we have completed 72 of the battlefield mission tests and we are well over 50% complete in the reliability growth trials. Again, in Warrior, we now have a very advanced design, which we are confident in.



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**Derek Twigg:** That was not my question. My question was, are you confident that there will not be further delay and cost increase?

**Lieutenant General Tickell:** I think it is probably best if Chris Bushell answers that.

**Chris Bushell:** As I say, we now have confidence in the design and in the reliability. As we touched on much earlier, we are at an advanced stage of negotiations about the future cost, and we hope to be able to complete those shortly.

**Derek Twigg:** Are you confident that there will be no further delay or increased costs? Very simple question.

**Chris Bushell:** Subject to the negotiations that are currently under way, which we have not yet completed. So I cannot comment on the cost aspect for the moment, because we haven't completed the negotiations. In terms of the design and the like, we have an advanced design that we are confident in.

Q136 **Derek Twigg:** I take it you are not confident about increased costs then. For the record, will you tell us how many Warriors we have currently, and how many of the upgraded Warriors we will see in 2025?

**Lieutenant General Tickell:** As I said earlier, the number of Warrior platforms—depending on whether you are talking about turreted platforms, or turreted and non-turreted ones—is north of 600.

**Derek Twigg:** Stick to the turreted ones—how many turreted platforms do we have now?

**Lieutenant General Tickell:** I am not going to give you an exact figure—I can come back to you—but it is in the region of 600.

Q137 **Derek Twigg:** How many of the upgraded vehicles do we expect to have in 2024?

**Lieutenant General Tickell:** That is dependent on two things: the contract negotiations that are ongoing and the integrated review, so I do not think we are able to give you a figure at the moment.

Q138 **Derek Twigg:** Do you accept Lockheed-Martin's assertion that the MoD and the Army are responsible for a considerable proportion of the delays to Warrior?

**Chris Bushell:** I have read the evidence that has been provided and broadly agree with it. Warrior has been a complex commercial construction involving many different parties in its conception. At the outset, and as has been referred to in the evidence, we had an immature design of a cannon. We had many interdependencies in terms of GFX and we had a number of technical issues, so I recognise much of the evidence that has been provided to the Committee so far.

Q139 **Derek Twigg:** So you agree with Lockheed-Martin's assertion.

**Chris Bushell:** I broadly agree with the evidence that is there.



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Q140 **Derek Twigg:** My final question: why have you adopted the complex 40 mm gun when most of our allies are using the proven 30 mm weapon?

**Lieutenant General Tickell:** All capability decisions are based on the threat picture. The infantry fighting vehicle needs to be able to beat a peer or peer-plus enemy. As a working assumption in terms of the threat picture, that is based on something like the BMP-3, and therefore the 40 mm, without going into detail in this forum, will overmatch that capability.

Q141 **Chair:** Who else is moving to 40 mm in NATO?

**Lieutenant General Tickell:** Clearly, we developed that gun with the French. The Americans at the moment are looking at a spread of capability between 40 mm and 45 mm and have yet to decide.

Q142 **Chair:** Okay. Do we not think it would be wiser for NATO to come out with a standard? We have moved from the 7.62 SLR to the 5.56 SA80. That made sense. It means you have a NATO-standardised round. Should we not do the same with the 40 mm cannon?

**Jeremy Quin:** From a strategic point of view, the more interoperability we get, the better. We are certainly pleased with the work that we have done jointly with the French on this. Others may or may not follow in that line. We might also get on to this with Challenger and 120 mm. The strategic point that you make is absolutely well founded. We have to balance the need to make certain that we have the most effective kit that we require with the maximum amount of interoperability. This is a joint plan with the French and others may choose to go down the same route, but I think there will be more to say on the 120 mm.

Q143 **Chair:** I am still trying to understand what discussions are happening with NATO to make this the standardised round for an APC.

**Lieutenant General Tickell:** Those discussions continue through the NATO Army Armaments Group, which currently we chair. I am not in a position to be able to give you chapter and verse on where we are or are not right now.

Q144 **Chair:** So we chair a committee, and we are going ahead with the French, but not necessarily with the Americans. What is the Bradley moving to?

**Lieutenant General Tickell:** That is the point I was just making. They are in the discussions and in the demonstrations on different calibres at the moment. In terms of NATO, you will recognise that decisions on these sorts of things are not made quickly. In a different part of the world, the Americans are likely to move to a different small arms calibre over the next five years. That is not at the moment in tune with the rest of NATO. As you rightly say, NATO is on 5.56, but all of these discussions are ongoing.

Q145 **Chair:** This concerns me. We are advancing into a new chapter in land warfare capability, and there have not been any strategic decisions made by our key security allies on what the basic fundamentals will be on munitions sizes. Surely that should come first.



**Jeremy Quin:** The other witnesses may well add to this, but there would be a concern, given that NATO is not a procurement body, that if there was too much focus on always ensuring that everything is aligned before you agree a programme, the Committee may have far more worries about the ability of the programmes to get off the ground and get completed.

We co-operate and discuss things fully with our NATO partners. We try to get common agreement and some common platforms. It is a good thing that we are working alongside our French partners on this. Challenger is another example of where we are moving towards a situation where there is more interoperability. Certainly, when I am speaking to my opposite numbers, we are constantly talking about the requirements to be more interoperable. Everyone agrees with it in principle. I agree that getting there in practice can sometimes be more problematic, but it is something that we are very aware of. There are other areas where we are working jointly with partners, and it is a good thing.

**Air Marshal Knighton:** We strongly agree with the principle that you lay out, Chair. The operational and logistical benefits of commonality across allies are well recognised and well understood. The challenge for us is that procurement decisions are taken by sovereign nations for sovereign reasons. Sometimes the demands, in terms of the requirement from a particular nation, may differ somewhat, and its breadth of requirement might differ.

The other issue we have is in terms of the sequencing of the programmes. The UK and French move towards 40 mm cannons is partly because that is where we are in our cycle of upgrade of our fleet of armoured fighting vehicles. We judge that that is the right thing to do in order to improve the lethality of that system, and we would hope to persuade our allies and partners that they, too, should move to that, for the reasons that we have identified and for the benefits they gain from riding on the back of the non-recurring investment that we have already made in developing the rounds and the technology. We strongly agree with you, Chair, but as the Minister says, it is not always straightforward dealing with capability collaboration with other allies.

Q146 **Chair:** I am pleased to hear that we are pioneering the way, but I believe that we must work with our NATO partners more strategically. I hear what you are saying, Minister, about it not being a procurement operation, but ultimately the efficiency and functionality of western and European security capability is vastly improved if we have some forethought as to what munitions and so forth we can possibly use. Indeed, further to that, some of the basic bits of military kit could be procured.

Looking at the United States, they have 35 platforms of helicopter. There are only six roles that helicopters perform. In Europe, we have 240 different variants or platforms of helicopters that are procured for military purposes. It means the procurement world needs reconciling if we are to recognise our ultimate ambition: to keep our nation and our nation's interests—and, indeed, our allies' interests—secure. Does the Challenger



2 programme represent value for money?

**Jeremy Quin:** As you will appreciate, Chair, a decision on that will be taken post the IR and at main business gate, where other options will be looked at. You always need a balance. In the case of the upgrade to Challenger 2, we have been looking at the extra capability that that turret would add and the life extension programme—the alternative to buying an alternative MBT. That would be the process that the IAC will have to look through. If the IR approves going in that direction, that decision will be taken at that point. I do not know if Air Marshal Knighton wants to add anything on the process.

**Air Marshal Knighton:** I would add only that the formal judgment—I explained the process earlier, when we discussed Ajax—around the value for money of a case, affordability and so on comes when the full business case comes to the investment approvals committee inside the Department. That then leads to a recommendation to Ministers, because of the size and value of this, before it is formally signed off by the Treasury. That case is due to come to the investment approvals committee before the end of this year.

Q147 **Chair:** We had different views on the delays in the turret upgrade itself—smooth bore or rifled. Minister, I am very conscious that, although we have been quite forthright in our questions, all this happened off your watch, so of course you can sleep well at night. However, I am sure that you probably reflect and look back on it. What do you understand of the delay and of the arguments over smooth bore or rifled, and what caused no decision to be made for many years?

**Jeremy Quin:** You are absolutely right that it has been a long debate. You are quite right that I was not Minister for Defence Procurement in 1998, or anywhere close to being. However, at that time, I appreciate that there was a significant debate about the most effective kind of round, and back in 1998 a rifled barrel was the only way to deliver that round. That was a live discussion with our NATO partners and others. We went down one route. It was a case of British exceptionalism. It was only us and the Omanis who ended up going down that route with Challenger. Our allies went down the smooth bore route. These things are constantly reassessed, and the view now is that the 120 mm, which brings us into interoperability with a number of our NATO partners, is the best way to deliver the higher-grade munitions that we now need for the modern battlefield. The general might want to add to that debate. It has been a long debate, there is no denying that.

**Lieutenant General Tickell:** I will not go back to 1998, because that is certainly before I was conscious of the discussions as well. However, I was intimately involved in the discussion about moving from rifled to smooth bore as part of this programme. Indeed, I was responsible for making the recommendations, both to the Army Board and, ultimately, to the Minister it affected. That was driven by the threat and by, as the Minister just described, the growth potential of the ammunition that we can see and get after, in terms of the smooth bore capability, which we were never going



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to be able to match with a rifled barrel. It was absolutely true that it is about threat. The threat picture evolved, and we have rightly made the decision to change.

Q148 **Chair:** It has taken us a while to get this upgrade. France, Russia and the United States have done three or four upgrades in the interim period. This was built in 1998, and we are now in 2021, so you are looking at 20 years. All the other tanks that I see on the horizon have automatic loaders, yet we still have a person physically lifting the munition into place. Why, in upgrading to Challenger 3, have we not included an automated loader?

**Lieutenant General Tickell:** For us, the technology is not mature enough to put an auto-loader into the turret. I think it is safe to say that those countries that are trying to do that are encountering significant challenges with it.

Q149 **Chair:** This is going to last—the technology is coming online. Is this not something that we should have tasked somebody or a team to look at five years ago? Automatic loaders are standard for most weapons systems now. You get those on everything from submarines to aircraft. In fact, the Warrior has moved that way as well, with the 40 mm cannon that we just spoke about. It is going to happen, isn't it?

**Lieutenant General Tickell:** It goes back to your point about the urgent need to upgrade the main battle tanks. The technology is not mature enough for Challenger 2/3 to put an autoloader in it at the moment. I am not saying that that would not happen over the life of Challenger 3, assuming it gets over the line. At the moment, what we need to do is upgrade the lethality and, indeed, the protection levels on Challenger 3, which places a premium on getting the smooth bore and the other protective systems on to the platform so that we can meet the threat.

Q150 **Chair:** The phrase “land industrial strategy” has been mentioned. I do not know where we are with that with the MoD, because what has been missing is a land industrial strategy. That might have helped in much of the decision making and the time issues over the last number of years. We had an air strategy, and now we have a maritime strategy. Where are we with developing a land industrial strategy? *[Interruption.]*

We lost the witnesses—we will never know. Or they are shy, and do not want to share. We hope they will get back. *[Interruption.]* We are back up and running again.

**Jeremy Quin:** We are, Mr Chairman. I was about to violently agree with you, but you might have to recap just in case, to make sure I am agreeing with the right point.

Q151 **Chair:** You were not dodging the question, then?

**Jeremy Quin:** I certainly was not, no. You may have added more to the end of your phrase that I did not catch, but what I heard you saying is that a land industrial strategy would have helped over the last 10 years, and I would agree. There is a report—DSIS—into our defence and security



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industrial strategy that is ongoing. It will report in due course. I cannot front-run or prejudge it, but there is great pith in what you say.

The evidence given to the Committee last time around about the atrophy of our land industrial components was well and forcefully made by industrial partners. As I have already mentioned to the Committee, I fear that has been matched inside the Ministry of Defence as well. In a regular cycle of upgrades, considerations and taking stuff into service, you run the risk of not having the skills.

We are at a great place at the moment. If you look at what is going on in Merthyr with General Dynamics, there are 230 companies supporting the AJAX programme and 4,100 people employed. There is the £17 million in investment by Lockheed Martin at Ampthill. Look at what RBSL is doing with Boxer. This is an inflection moment. We must not lose those skills. We will see exactly how we do it, but the challenge, now you have got that capability being re-established in the UK, that adds to undoubted science capability that we bring to the consideration of future structures, is that we make certain we do not lose it. I suspect that is what the Committee would tell us, and we would wholeheartedly endorse that point. How we do that comes through DSIS, but it is a very well made point.

**Q152 Chair:** It is important to recognise the strengths the UK has in the areas of science and technology and, indeed, in industry, as well as the long, brave and proud history of military procurement. My question was: are we going to see an actual land-based industrial strategy for the MoD any time soon?

**Jeremy Quin:** We are talking about vehicles today. The vehicle for that is the defence and security industrial strategy, which should be coming through around the same time as the IR. It will certainly be alluded to in the IR. I can't say yes, because that is a Government decision, but everything you said has a lot of resonance, Mr Chairman. We need to capture those skills.

The same is absolutely true in maritime and in other fields of endeavour: if industrial partners can see the direction of travel, and they can see the need for regular upgrades and a constant evolution as the threat evolves, then they will also put the commitment in. They will invest in the skills and the capability. I think that works well for us. It also works well in hitting another defence task, which is the prosperity of the UK. We are focused on export opportunities as well as what we need to acquire for our own capabilities.

**Q153 Chair:** You mentioned the integrated review perhaps pointing to this. It is clearly the elixir to all our troubles and the questions that we are facing here today. The Committee would strongly recommend the development of a land-based industrial strategy as soon as possible, not least to give clarity to the industry on where we want to go from a military perspective, but one also needs to provide clarity on what the military wants.

This is a point I made to General Tickell when we were visiting Lulworth:



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I cannot help stressing that when you put the four vehicles next to each other as they were in Lulworth—the Challenger, the Warrior, the Boxer and the Ajax—there was not a single item or a single bit of equipment on any one of them that you could interchange with each other. You have spoken about Boxer having modularisation, where you can slide the cages out and replace them, whether that be for medical purposes, recce, HQ command posts or APC work—but what you cannot do is take the GPMG off one and place it on another. There are no modularities involved in any of the equipment inside, bar perhaps the radios, which obviously slot into place.

You have equipment that is coming online that is not quite there yet. If you talk to anybody in the tank regiments, they would love to see Brimstone attached to the back of their tank. It is a great bit of kit. The same plug-and-play system could be attached to the back of the Warrior, the Ajax or the Boxer. To have a lock-in system that could adapt for whatever it is that you wish to place on the back of those vehicles, or in the vehicles, would make sense—a UAV launcher or a remote-controlled GPMG, which we are now seeing on Russian vehicles. These are all things that need a simple platform to lock into, of a bespoke size, that is shared across the industry, but that then allows for whatever bit of kit it is—even kit that is yet to be invented.

It could be you need to put a refrigerator up there to put vaccines in because you are doing a humanitarian role. You would not be able to do it and have ubiquitous systems, because all the vehicles we have been talking about may be modular in their own right, but not with each other. Is that a message that is starting to resonate?

**Jeremy Quin:** I am pleased that we are having a series of questions towards the end of this meeting where we are absolutely on the same wavelength. In terms of commonality and increased modularity, we are 100% in agreement that that is important. We need to get you more briefing on this perhaps. I believe I am right in saying—Chris Bushell will correct me if I am wrong—that Boxer and Ajax benefit from the same engine, the MTU, which I think was referred to earlier. The sights on Ajax and Warrior are from Thales, which has a long history of supporting the British armed forces, and have a lot of commonality. I believe the barrels on these two have great commonality. That is absolutely taken on board. Is there more we could do on it? Yes, absolutely, and wherever we see the opportunity for increased commonality and modularity, we will adopt it.

The really exciting thing about Ajax, which is the path for the future, is that with that digitalisation, with the platform that we have and the open architecture, come some of the opportunities you are talking about, be it Brimstone or elsewhere. You can plug and play. It is a software process. What you will without doubt see in the armed forces of the future and in our armoured vehicles is that increasing ability to slot in what we need for the environment in which we are operating and for the many and varied tasks that the Army is being required to perform. That is absolutely taken on board.



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**Chair:** There were four vehicles down in Lulworth. I climbed on top of them and found the spot where you could anchor something in future, but as Procurement Minister you need to tell all these different companies that that is what they need to do—you need to knock those heads together.

Q154 **Richard Drax:** A last question from me, Minister. We are spending billions of pounds, as you know, to support the country during this very difficult time. Our debt is now £2 trillion and rising. Historically, unfortunately, the armed forces are always the first to get hit when cuts are made. Have you heard, or are you hearing, anything at all to indicate that money to spend on all these fantastic programmes will be short in the future? Perhaps you are unable to comment at this point.

**Jeremy Quin:** You know the phrase that I am going to use, Mr Drax—you have just produced it for me—which is that I certainly cannot bind the hands of the Treasury, and I wouldn't dream of doing so. The CSR is a process that will happen. That is as it may be, and those decisions are cross-Government decisions.

I would also say, and we are all aware of this, that we are at an inflexion point in our country's history. We have left the EU, we have got a new vision of being a global Britain—a lot of it is stuff we are familiar with, but we will be doing it with great confidence in the future, in terms of being on the front foot and being a burden-sharing, problem-solving nation—and that requires investment. That is certainly recognised across Government. We need to have armed forces of all descriptions that are able to meet the needs and challenges of the future, and the integrated operating concept, as the CDS has set out.

Q155 **Richard Drax:** You will fight like fury to ensure that our armed forces get the money that they need. Rather than just waiting for the review, I assume that you will input into the review and fight your corner like mad to make sure that this investment gets to where it is desperately needed.

**Jeremy Quin:** Defence has a clear view of how it can help to achieve the ambitions of global Britain, and how we can play into that. We have hugely professional armed forces, as you well know, Mr Drax, from your experience. We will absolutely ensure that the armed forces are equipped properly to meet the challenges that we set for them in the future.

In the past, on occasion, people have set out great ideas as to what the armed forces should be but have not funded them. We will not be doing that. We will make certain that appropriate funding is in place to meet the challenges of the future and to make certain that we have the correct capability.

Q156 **Chair:** To conclude on that note, you spoke about an inflexion point. I think we would absolutely agree with you, because the outcome of the integrated review will determine the role that Britain plays on the global stage—our ability and desire to help shape events beyond our shores. This phrase “global Britain” needs to be more than a strapline; it needs to be an instruction across Whitehall, to say that we need to play a greater role on that international stage. For that, we need the necessary hard



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power.

The shift to an architecture of open systems and a multi-domain approach is well understood and welcomed, but I hope that the message from the Committee today is that another war is taking place—another conflict, far more subtle than what we see in the build-up of armed forces on any border or in any geographical location. The very subtle removal of British influence through China and Russia cleverly developing friendships—through 5G, the one belt, one road systems, and the gifting of military capabilities to our friends across the world—will limit our ability to trade and to influence.

That is why the upstream engagement—the ability to make sure that we keep our friends close to us—is so important. There needs to be that capacity to have a defence posture that includes forward presence. I hope that message is understood as the Minister considers the final chapters as we head towards the integrated review.

**Jeremy Quin:** It is, Chair, and I must say how I appreciate, in the words you have just uttered, the focus on threat. That is—*[Inaudible.]*— review. It is across Government and in all Departments around Government. Thank you very much for focusing on the threat aspect. It is making certain that we meet that threat that the IR is all about.

**Chair:** Thank you for your time, Minister. I know things are very busy over there. I am grateful that everyone was able to get through the technical challenges that we had. Minister of State Jeremy Quin, Air Marshal Richard Knighton, Lieutenant General Christopher Tickell and Mr Chris Bushell, Director General Land, D&ES, I thank you for your time this morning. It has been very illuminating, and it is encouraging to hear that these programmes are now moving forward. But, of course, we await the outcome of the integrated review, to see whether—or how—these projects will transpire. Sirs, thank you for your time, and Committee, thank you.